

# **Appendix D**

*Red Flag and Hazardous Materials*



ENGINEERING  
 ENVIRONMENTAL  
 INSPECTION  
 LAND SURVEYING  
 LAND ACQUISITION  
 PLANNING  
 WATER &  
 WASTEWATER  
 SINCE 1965

OFFICERS  
 William E. Hall, PE  
 Dave Richter, PE, PLS  
 Steven W. Jones  
 Christopher R. Pope, PE  
 B. Keith Bryant, PE  
 Michael Rowe, PE

PROFESSIONAL STAFF  
 Andrew T. Woka, PE  
 Devin L. Stettler, AICP  
 Darryl P. Wineinger, PE  
 Adam C. Post, PE  
 Michael S. Oliphant, AICP  
 E. Rachelle Pemberton, PE  
 Timothy J. Coomes, PLS  
 Jon E. Cudfelter, PE  
 Steven R. Passey, PE  
 Kurt C. Courtney, PE  
 Brian J. Pierson, PE  
 Christopher L. Hammond, PE  
 Paul D. Grolzbach, PE  
 Brian S. Frederick, PE  
 Jay N. Ridens, PE  
 Christopher J. Dyer, PE  
 Matthew R. Lee, PE  
 Christopher J. Wheeler, PE  
 William R. Curtis, PE  
 Jeremy A. Richardson, PE  
 Heather E. Kilgour, PE  
 Adam J. Greulich, PLS  
 Scott M. Siple, PE  
 Whitney D. Naukam, PE  
 Matthew A. Taylor, PE  
 Josh O. Betz, PLS  
 Dann C. Barrett, PE  
 Scott G. Minnich, PE  
 Jack R. Stocks, PE  
 Nicholas J. Kocher, PE  
 Jennifer L. Hart, PE  
 Jeffrey R. Andrews, PE  
 Kelton S. Cunningham, PE

www.ucindy.com  
 (317) 895-2585  
 1625 N. Post Road, Indianapolis, IN 46219

Date: July 19, 2016

To: Hazardous Materials Unit  
 Environmental Services  
 Indiana Department of Transportation  
 100 North Senate Avenue, Room N642  
 Indianapolis, IN 46204

From: Michael S. Oliphant, AICP  
 United Consulting  
 1625 North Post Road  
 Indianapolis, Indiana 46219  
[mikeo@ucindy.com](mailto:mikeo@ucindy.com)

Re: RED FLAG INVESTIGATION  
 Des. No.: 1400918  
 US 421 New Roadway Construction  
 Jefferson County, Indiana

**NARRATIVE**

The proposed project is located within Jefferson County, Indiana in the City of Madison and located through a portion of the National Historic Landmark Madison Historic District. The proposed corridor improvements, located on the Indiana border of the Ohio River, are immediately adjacent to the Milton-Madison Bridge, providing approach access from the north. The limits of the project area begin at the northern approach to the Milton-Madison Bridge and extend to the intersection of US 421/Baltimore Street and US 421/Main Street to the west and through the intersection of SR 56/Sering Street to the east.

The proposed project will analyze alternatives (including the No-build or Do Nothing alternative) based on the ability to improve mobility and safety in the corridor, reduce the environmental impacts of trucks, support economic development by managing access and enhancing pedestrian accessibility, and minimizing impacts to the City of Madison, Jefferson County, and local stakeholders. The project is located in Section 2, Township 3 North, Range 10 East in Madison Township, Jefferson County. The proposed project will require the acquisition of permanent right-of-way. Construction of the proposed project is expected to result in a maximum excavation depth of 10 feet.

**SUMMARY**

Infrastructure			
Indicate the number of items of concern found within 0.5 mile, including an explanation why each item within the 0.5 mile radius will/will not impact the project. If there are no items, please indicate N/A:			
Religious Facilities	2	Recreational Facilities	7
Airports	1	Pipelines	N/A
Cemeteries	N/A	Railroads	N/A
Hospitals	1	Trails	1

Schools	1	Managed Lands	N/A
---------	---	---------------	-----

Explanation:

Religious Facilities – Two religious facilities are located within 0.5 mile of the project. The closest religious facility is 0.15 miles west of the project. No impacts are anticipated.

Recreational Facilities – Seven recreational facilities are located within 0.5 mile of the project. The eastern edge of Jaycee Park is within the southern project limits. Coordination with Madison Parks and Recreation will occur.

Schools – One school is located within 0.5 mile of the project. Although within the 0.5 mile radius investigation area, the identified school is 0.15 northwest of the limits of this project. No impacts are expected.

Hospitals – One hospital is located within 0.5 mile of the project. Kings Daughters Hospital is located 0.5 mile northwest of the project area. No impact is expected; however, coordination with the hospital should occur.

Trail – One trail is located within 0.5 mile of the project. The identified trail is located near the limits of the project. The project could potentially impact this trail. Coordination with the City of Madison will be necessary.

Airports - One private heliport associated with the hospital is located just outside the 0.5 mile search radius. Even though no impact is expected, coordination with the hospital heliport should occur.

<b>Water Resources</b>			
Indicate the number of items of concern found within 0.5 mile, including an explanation why each item within the 0.5 mile radius will/will not impact the project. If there are no items, please indicate N/A:			
NWI - Points	1	NWI - Wetlands	4
Karst Springs	N/A	IDEM 303d Listed Lakes	N/A
Canal Structures – Historic	N/A	Lakes	3
NWI - Lines	1	Floodplain - DFIRM	2
IDEM 303d Listed Rivers and Streams (Impaired)	1	Cave Entrance Density	2
Rivers and Streams	2	Sinkhole Areas	2
Canal Routes - Historic	N/A	Sinking-Stream Basins	N/A
Urbanized Area Boundary	1		

Explanation:

NWI-Wetlands – Four NWI-wetlands are located within 0.5 mile of the project. The nearest wetland is approximately 300 feet south the project. No impact is expected.

NWI-Points – One NWI-point is located within 0.5 mile of the project. Although within the 0.5 mile radius investigation area, the identified NWI-point is 0.45 mile northeast of the project. This wetland point will not be impacted.

NWI-Lines – One NWI-line is located within 0.5 mile of the project. Although within the 0.5 mile radius investigation area, the identified NWI-line is 0.4 mile northwest of the project. No impact is expected.

Lakes- Three lakes are located within 0.5 mile of the project. The nearest lake is 0.26 mile northeast of the project area. No impact is expected.

Floodplain-DFIRM – Two floodplains are located within 0.5 mile of the project. One of the identified floodplains extends within the southern project limits. The project could potentially impact this floodplain. A Waters of the US Report will be prepared, and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Rivers and Streams (Impaired) – One impaired stream is located within 0.5 mile of the project. The stream is impaired due to the presence of E-Coli and PCBs. The closest identified impaired stream is 0.15 mile south of the project. This stream will not be impacted by the project.

Rivers and Streams – Two rivers/streams are located within 0.5 mile of the project. Although within the 0.5 mile radius investigation area, the closest identified river is 0.15 mile south of the project. This river will not be impacted by the project.

Cave Entrance Density – Two cave entrance density sites are located within 0.5 mile of the project. One cave entrance density area is adjacent to the eastern border of the project. The purpose of this map feature is to provide a map layer showing the general distribution of cave entrances in southern Indiana, using unpublished data from a spreadsheet provided by Samuel S. Frushour (Indiana Geological Survey). Locations of individual cave entrances are not shown. No impact is expected.

Sinkhole Areas – Two sinkhole areas are located within 0.5 mile of the project. The closest sinkhole is 0.20 mile northeast of the project. This sinkhole will not be impacted by the project.

Urbanized Area Boundary (UAB) - The project area is located within a UAB. Early notification to the Madison MS4 Coordinator will occur.

<b>Mining/Mineral Exploration</b>			
Indicate the number of items of concern found within 0.5 mile, including an explanation why each item within the 0.5 mile radius will/will not impact the project. If there are no items, please indicate N/A:			
Petroleum Wells	N/A	Petroleum Fields	N/A
Mines – Surface	N/A	Mines – Underground	N/A

Explanation:

No mining/mineral exploration sites are located within the 0.5 mile radius investigation area.

<b>Hazmat Concerns</b>			
Indicate the number of items of concern found within 0.5 mile, including an explanation why each item within the 0.5 mile radius will/will not impact the project. If there are no items, please indicate N/A:			
Brownfield Sites	N/A	Restricted Waste Sites	N/A
Corrective Action Sites (RCRA)	N/A	Septage Waste Sites	N/A
Confined Feeding Operations	N/A	Solid Waste Landfills	N/A
Construction Demolition Waste	N/A	State Cleanup Sites	N/A
Industrial Waste Sites (RCRA Generators)	1	Tire Waste Sites	N/A
Leaking Underground Storage Tanks (LUSTs)	3	Waste Transfer Stations	N/A
Manufactured Gas Plant Sites	1	RCRA Waste Treatment, Storage, and Disposal Sites (TSDs)	N/A
NPDES Facilities	N/A	Underground Storage Tanks	5
NPDES Pipe Locations	N/A	Voluntary Remediation Program	1
Open Dump Sites	N/A	Superfund	N/A
Institutional Control Sites	N/A		

Explanation:

Manufactured Gas Plant Sites – One manufactured gas plant site is within 0.5 mile of the project. Although within the 0.5 mile radius investigation area, the identified manufactured gas plant site is 0.15 mile southwest of the project. No impacts to this facility are anticipated.

Industrial Waste Site (RCRA Generators) – One industrial waste site is within 0.5 mile of the project. Although within the 0.5 mile radius investigation area, the identified industrial waste site is 0.48 mile southwest of the project. No impacts to this facility are anticipated.

Voluntary Remediation Program – One voluntary remediation program site, which is also the Manufactured Gas Plant Site discussed above, is within 0.5 mile of the project. Although within the 0.5 mile radius investigation area, the identified voluntary remediation program site is located outside the limits of this project.

Underground Storage Tanks – Five underground storage tanks are within 0.5 mile of the project. One of the identified underground storage tanks is located near the limits

of the project. According to IDEM's VFC, two USTs are located at Kar-Kwik Muffler Shop, 902 East Second Street. The age and capacity of the USTs are unknown. The USTs are still in place. If excavation or ROW is required in the vicinity of this property, a Phase II Environmental Site Assessment is recommended.

**Leaking Underground Storage Tanks (LUSTs)** – Three leaking underground storage tank sites are within 0.5 mile of the project. Two of the identified leaking underground storage tank sites are located near the limits of the project and the sites are actually one site listed twice. River City Mini-Mart, 150 Harrison Street, southeast corner of First and Harrison (US 421). One 2,000 gallon fiberglass diesel storage tank and 53.57 tons of petroleum contaminated soil were removed from the site in March 2011. Confirmatory sampling indicated that only very low levels of petroleum contamination were present after the removal. IDEM issued a No Further Action Approval Determination Pursuant to Risk Integrated System of Closure on October 22, 2012. The NFA Determination was unconditional closure for soil, ground water and vapor intrusion exposures. No impact is expected from this site.

### **Ecological Information**

The Jefferson County listing of the Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high quality natural communities are attached. The ETR species have been highlighted. **Coordination with USFWS and IDNR is recommended.** A review of the USFWS database did not indicate the presence of endangered bat species in or within 0.5 mile of the project area. Preparation of the Scoping Sheet for the Indiana Bat and Northern Long-Eared Bat Range-Wise Programmatic Information Consultation will be necessary.

### **Cultural Resources**

Historical: The land use in close proximity and within the project area consists of commercial and residential properties. The Jefferson County Madison Township Interim Report shows several historic resources within 0.5 mile of the project. Additional properties may have become 50 years of age since the publication of these reports. A Historic Properties Report is currently being prepared that will evaluate these properties within the proposed project limits.

Archaeological Resources: The proposed project will result in the acquisition of undisturbed right-of-way. As a result, an Archaeological Records Review and Phase Ia Archaeological Survey will be required to identify potentially significant cultural resources within the proposed project limits.

### **RECOMMENDATIONS**

**INFRASTRUCTURE: Recreational Facilities** - The eastern edge of Jaycee Park is within the southern project limits. Coordination with Madison Parks and Recreation should occur.

**Hospitals** - Kings Daughters Hospital is located 0.5 mile northwest of the project area. No impact is expected; however, coordination with the hospital should occur.

Trails – One trail is located near the limits of the project. Coordination with the City of Madison will be necessary.

Airports - One private heliport associated with the hospital is located just outside the 0.5 mile search radius. Even though no impact is expected, coordination with the hospital heliport should occur.

WATER RESOURCES: Floodplains – A floodplain is located near the limits of the project. The project could potentially impact this floodplain. A Waters of the US Report should be prepared and coordination with INDOT ES Ecology and Permitting should occur.

Urbanized Area Boundary (UAB) - The project area is located within a UAB. Early notification to the Madison MS4 Coordinator will occur

MINING/MINERAL EXPLORATION: N/A

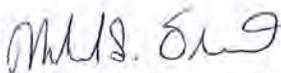
HAZMAT CONCERNS: Underground Storage Tanks - According to IDEM's VFC, two USTs are located at Kar-Kwik Muffler Shop, 902 East Second Street. The age and capacity of the USTs are unknown. The USTs are still in place. If excavation or ROW is required in the vicinity of this property, a Phase II Environmental Site Assessment is recommended. It appears that other facilities within the project area are not identified as hazardous material concerns. A Corridor Study/Phase I Environmental Site Assessment is recommended.

ECOLOGICAL INFORMATION: Several Federal and State listed rare, threatened, and endangered species are known to occur within Jefferson County. Coordination with USFWS and IDNR is recommended to determine the project's effect on Federal and State listed rare, threatened, and endangered species. Preparation of the Scoping Sheet for the Indiana Bat and Northern Long-Eared Bat Range-Wise Programmatic Information Consultation will be necessary.

CULTURAL RESOURCES: Historical: The land use in close proximity and within the project area consists of commercial and residential properties. The Jefferson County Madison Township Interim Report shows several historic resources within 0.5 mile of the project. Additional properties may have become 50 years of age since the publication of these reports. A Historic Properties Report is currently being prepared that will evaluate these properties within the proposed project limits.

Archaeological Resources: The proposed project will result in the acquisition of undisturbed right-of-way. As a result, an Archaeological Records Review and Phase Ia Archaeological Survey will be required to identify potentially significant cultural resources within the proposed project limits.

Prepared by:



Michael S. Oliphant, AICP  
Environmental Specialist  
United Consulting

Checked by:



Devin L. Stettler, MPI, AICP  
Manager, Environmental Services  
United Consulting

INDOT Environmental Services Concurrence: Marlene Mathas

Digitally signed by Marlene Mathas  
DN: cn=Marlene Mathas, o=INDOT Environmental Services  
Date: 2016.07.20 09:46:04 -0400

**Graphics:**

A map for each report section with a 0.50 mile radius buffer around all project area(s) showing all items identified as possible items of concern is attached. If there is not a section map included, please change the YES to N/A:

GENERAL SITE MAP SHOWING PROJECT AREA: YES

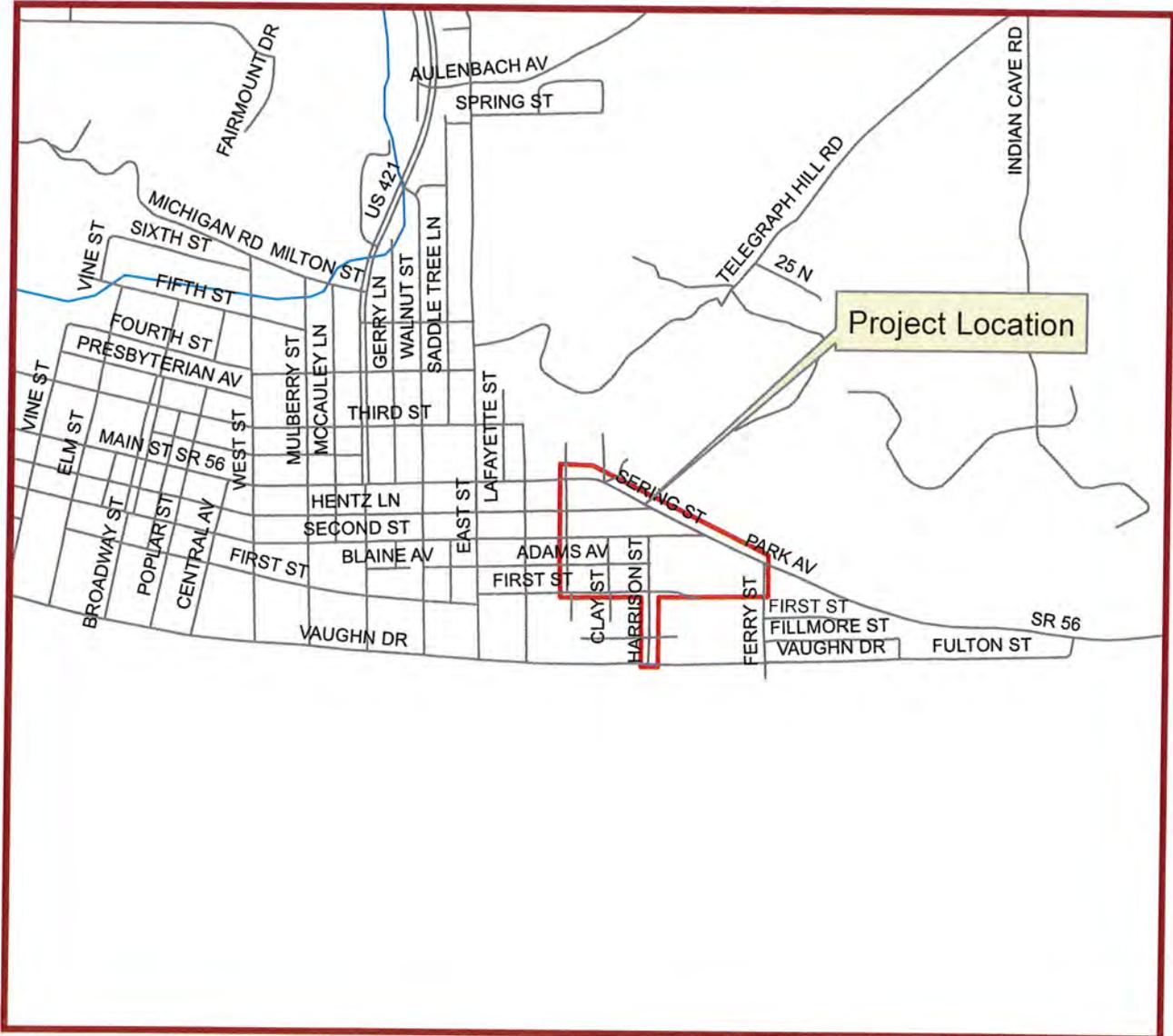
INFRASTRUCTURE: YES

WATER RESOURCES: YES

MINING/MINERAL EXPLORATION: YES

HAZMAT CONCERNS: YES

Red Flag Investigation - General Site Map  
 US 421 New Roadway Construction  
 DES #1400918  
 Jefferson County, Indiana



	<p>Location Map</p>	
	<p>Hazardous Materials Unit          Environmental Services          Indiana Department of Transportation          100 North Senate Avenue, Room N642          Indianapolis, IN 46204</p>	

# Red Flag Investigation - Infrastructure US 421 New Roadway Construction DES #1400918 Jefferson County, Indiana



**Infrastructure Resources**  
Data Source: Indiana Map

Hazardous Materials Unit  
Environmental Services  
Indiana Department of Transportation  
100 North Senate Avenue, Room N642  
Indianapolis, IN 46204

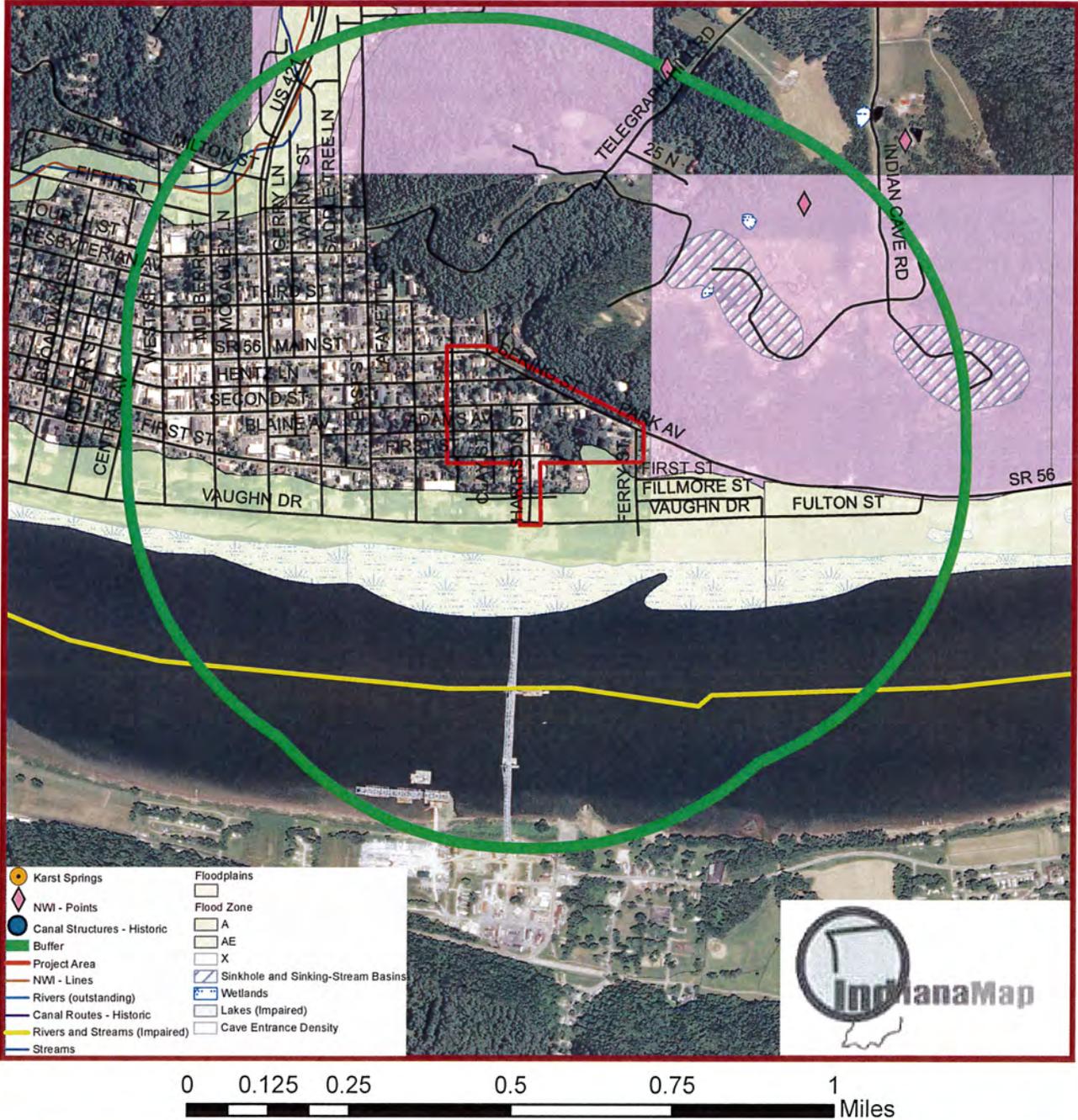


# Red Flag Investigation - Water Resources

## US 421 New Roadway Construction

### DES #1400918

### Jefferson County, Indiana



**Water Resources**  
**Data Source: Indiana Map**  
 Hazardous Materials Unit  
 Environmental Services  
 Indiana Department of Transportation  
 100 North Senate Avenue, Room N642  
 Indianapolis, IN 46204

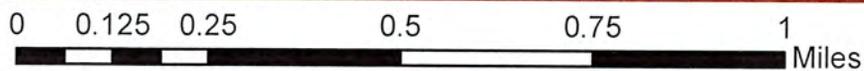
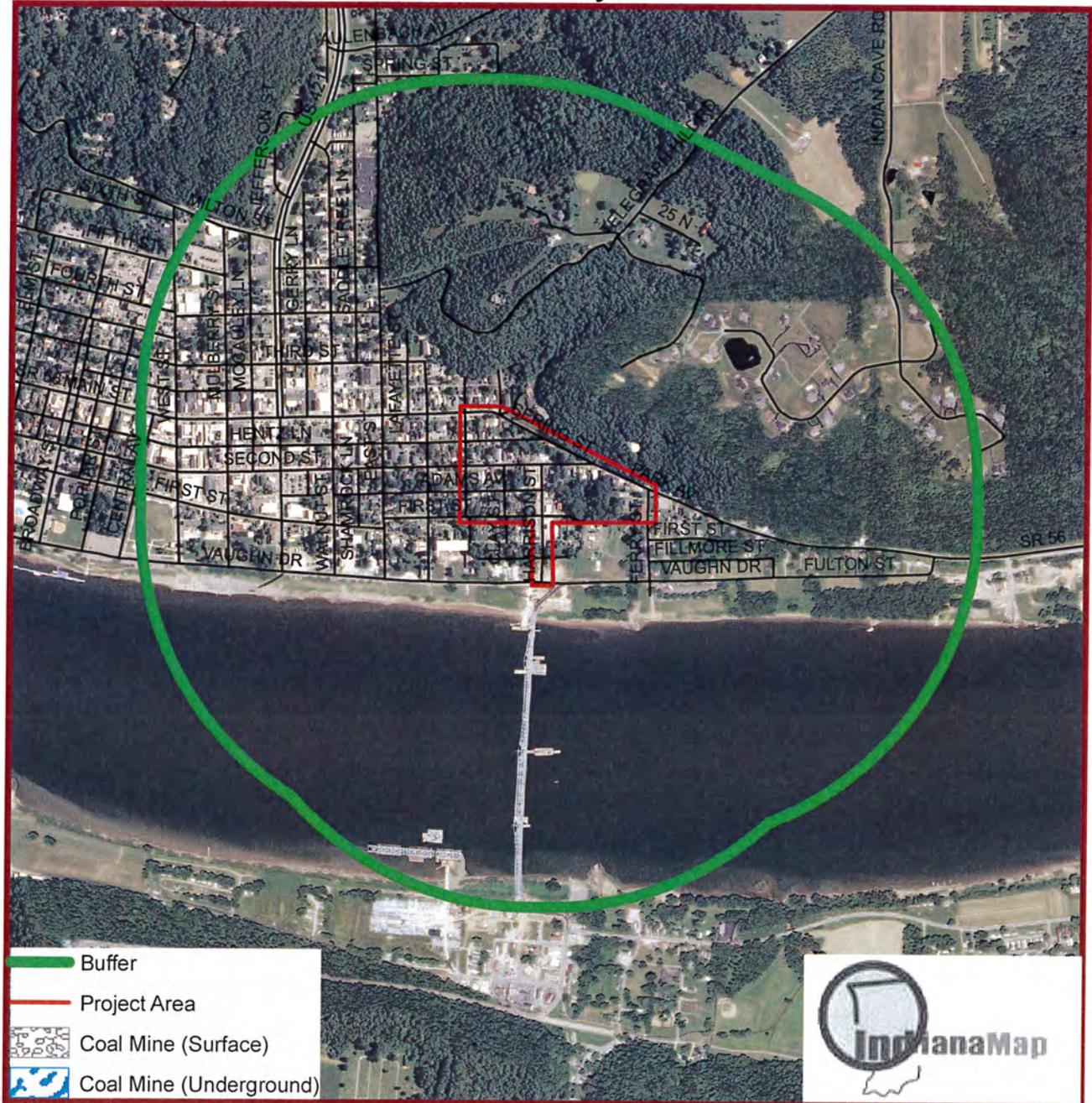


# Red Flag Investigation - Mining Resources

## US 421 New Roadway Construction

### DES #1400918

### Jefferson County, Indiana

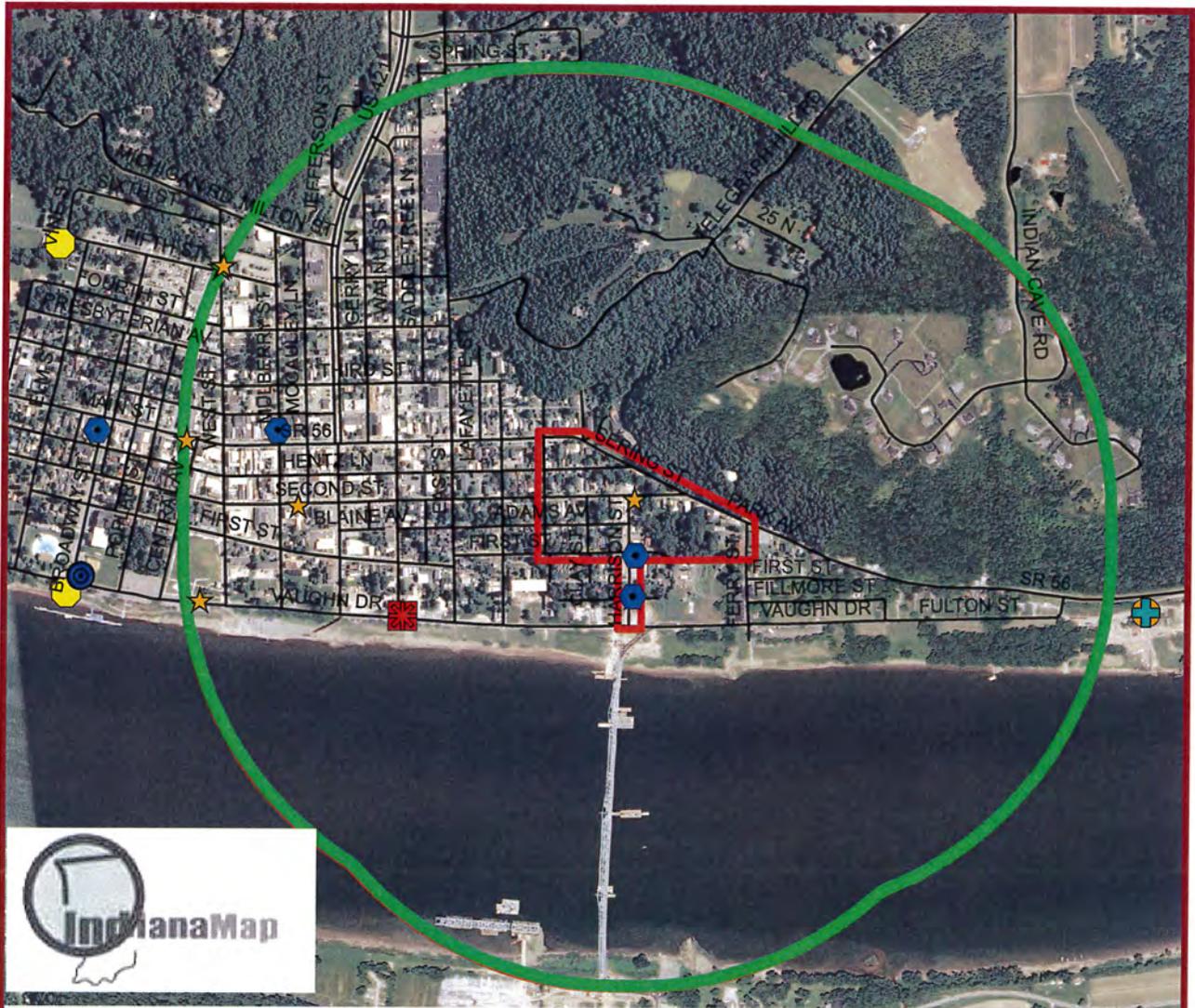


**Mining Resources**  
**Data Source: Indiana Map**

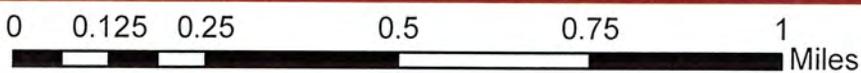
Hazardous Materials Unit  
 Environmental Services  
 Indiana Department of Transportation  
 100 North Senate Avenue, Room N642  
 Indianapolis, IN 46204



Red Flag Investigation - Hazardous Materials  
 US 421 New Roadway Construction  
 DES #1400918  
 Jefferson County, Indiana



-  Construction Demolition Waste Sites
-  Superfund Sites
-  Waste Disposal Storage Handling Sites
-  Open Dump Sites
-  NPDES Pipe Locations
-  Industrial Waste Sites
-  Solid Waste Landfills
-  NPDES Facilities
-  Waste Treatment, Storage, and Disposal Sites
-  Waste Transfer Stations
-  Manufactured Gas Plants
-  Waste Tire Sites
-  Brownfields
-  Underground Storage Tank Sites
-  Waste Septage Sites
-  State Cleanup Sites
-  Leaking Underground Storage Tank Sites
-  Buffer
-  Corrective Action Sites
-  Voluntary Remediation Sites
-  Project Area



Hazardous Materials  
 Data Source: Indiana Map

Hazardous Materials Unit  
 Environmental Services  
 Indiana Department of Transportation  
 100 North Senate Avenue, Room N642  
 Indianapolis, IN 46204



## Indiana County Endangered, Threatened and Rare Species List

### County: Jefferson

Species Name	Common Name	FED	STATE	GRANK	SRANK
<b>Platyhelminthes (Flatworms)</b>					
<i>Sphalloplana weingartneri</i>	Weingartner's Cave Flatworm		WL	G4	S4
<b>Crustacean: Malacostraca, Amphipods</b>					
<i>Crangonyx packardi</i>	Packard's Cave Amphipod		WL	G4	S3
<b>Crustacean: Malacostraca, Isopods</b>					
<b>Caecidotea rotunda</b>	<b>Northeastern Cave Isopod</b>		SR	G2G4	S3
<b>Crustacean: Copepoda</b>					
<b>Diacyclops indianensis</b>	<b>Indiana Groundwater Copepod</b>		SE	G2	S1
<b>Diacyclops lewisi</b>	<b>Lewis' Groundwater Copepod</b>		SE	G1	S1
<b>Mollusk: Bivalvia (Mussels)</b>					
<b>Epioblasma triquetra</b>	<b>Snuffbox</b>	LE	SE	G3	S1
<i>Lampsilis ovata</i>	Pocketbook			G5	S2
<i>Ligumia recta</i>	Black Sandshell			G4G5	S2
<b>Obovaria subrotunda</b>	<b>Round Hickorynut</b>		SE	G4	S1
<b>Plethobasus cyphus</b>	<b>Sheepnose</b>	LE	SE	G3	S1
<i>Pleurobema cordatum</i>	Ohio Pigtoe		SSC	G4	S2
<i>Ptychobranthus fasciolaris</i>	Kidneyshell		SSC	G4G5	S2
<i>Simpsonaias ambigua</i>	Salamander Mussel		SSC	G3	S2
<i>Toxolasma lividus</i>	Purple Lilliput		SSC	G3Q	S2
<i>Villosa lienosa</i>	Little Spectaclecase		SSC	G5	S3
<b>Ellipluran: Collembola</b>					
<b>Pseudosinella fonsa</b>	<b>Fountain Cave Springtail</b>		ST	G3G4	S2
<i>Sminthurides hypogramme</i>	springtail		WL	GNR	S1
<b>Insect: Coleoptera (Beetles)</b>					
<b>Atheta troglaphila</b>			SR	G2	S2
<b>Pseudanophthalmus chthonius</b>	<b>Cave Ground Beetle</b>		SR	G3	S3
<b>Insect: Odonata (Damselflies)</b>					
<b>Archilestes grandis</b>	<b>Great Spreadwing</b>		SR	G5	S3
<b>Arachnida</b>					
<i>Calymmaria cavicola</i>	Cave Funnel-web Spider			GNR	S1
<b>Amphibian</b>					
<b>Cryptobranchus alleganiensis alleganiensis</b>	<b>Eastern Hellbender</b>		SE	G3G4T3T4	S1
<i>Hemidactylium scutatum</i>	Four-toed Salamander		SSC	G5	S2
<b>Lithobates areolatus circulosus</b>	<b>Northern Crawfish Frog</b>		SE	G4T4	S2
<b>Reptile</b>					
<b>Clonophis kirtlandii</b>	<b>Kirtland's Snake</b>		SE	G2	S2
<b>Bird</b>					
<i>Aimophila aestivalis</i>	Bachman's Sparrow			G3	SXB
<b>Ammodramus henslowii</b>	<b>Henslow's Sparrow</b>		SE	G4	S3B

Indiana Natural Heritage Data Center  
Division of Nature Preserves  
Indiana Department of Natural Resources  
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting  
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list  
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank  
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

## Indiana County Endangered, Threatened and Rare Species List

### County: Jefferson

Species Name	Common Name	FED	STATE	GRANK	SRANK
Buteo platypterus	Broad-winged Hawk		SSC	G5	S3B
<b>Cistothorus platensis</b>	<b>Sedge Wren</b>		SE	G5	S3B
Coragyps atratus	Black Vulture			G5	S1N,S2B
<b>Dendroica cerulea</b>	<b>Cerulean Warbler</b>		SE	G4	S3B
Falco peregrinus	Peregrine Falcon		SSC	G4	S2B
<b>Haliaeetus leucocephalus</b>	<b>Bald Eagle</b>		SSC	G5	S2
<b>Lanius ludovicianus</b>	<b>Loggerhead Shrike</b>		SE	G4	S3B
<b>Tyto alba</b>	<b>Barn Owl</b>		SE	G5	S2
Wilsonia citrina	Hooded Warbler		SSC	G5	S3B
<b>Mammal</b>					
Myotis lucifugus	Little Brown Bat		SSC	G3	S2
Myotis septentrionalis	Northern Myotis		SSC	G1G3	S2S3
<b>Myotis sodalis</b>	<b>Indiana Bat or Social Myotis</b>	LE	SE	G2	S1
Perimyotis subflavus	Eastern Pipistrelle		SSC	G3	S2S3
Taxidea taxus	American Badger		SSC	G5	S2
<b>Vascular Plant</b>					
<b>Asplenium ruta-muraria</b>	<b>Wallrue Spleenwort</b>		SR	G5	S2
<b>Aster oblongifolius</b>	<b>Aromatic Aster</b>		SR	G5	S2
<b>Baptisia australis</b>	<b>Wild False Indigo</b>		SR	G5	S2
<b>Carex eburnea</b>	<b>Ebony Sedge</b>		SR	G5	S2
<b>Carex pedunculata</b>	<b>Longstalk Sedge</b>		SR	G5	S2
<b>Carex seorsa</b>	<b>Weak Stellate Sedge</b>		SR	G4	S2
<b>Carex straminea</b>	<b>Straw Sedge</b>		ST	G5	S2
<b>Chaerophyllum procumbens var. shortii</b>	<b>Wild Chervil</b>		ST	G5T3T4Q	S1
<b>Cornus amomum ssp. amomum</b>	<b>Silky Dogwood</b>		SE	G5T5	S1
<b>Cyperus pseudovegetus</b>	<b>Green Flatsedge</b>		SR	G5	S2
<b>Dentaria multifida</b>	<b>Divided Toothwort</b>		SE	G4?	S1
<b>Eleocharis wolfii</b>	<b>Wolf Spikerush</b>		SR	G3G4	S2
<b>Gonolobus obliquus</b>	<b>Angle Pod</b>		SR	G4?	S2
<b>Helianthus angustifolius</b>	<b>Swamp Sunflower</b>		SE	G5	S1
<b>Hydrocotyle americana</b>	<b>American Water-pennywort</b>		SE	G5	S1
Hypericum frondosum	Golden St. John's-wort		SX	G4	SX
Juglans cinerea	Butternut		WL	G4	S3
<b>Juniperus communis</b>	<b>Ground Juniper</b>		SR	G5	S2
<b>Lilium canadense</b>	<b>Canada Lily</b>		SR	G5	S2
Ludwigia decurrens	Primrose Willow		WL	G5	S2
<b>Lycopodium obscurum</b>	<b>Tree Clubmoss</b>		SR	G5	S2
<b>Lygodium palmatum</b>	<b>Climbing Fern</b>		SE	G4	S1
<b>Oenothera perennis</b>	<b>Small Sundrops</b>		SR	G5	S2
Oenothera triloba	Stemless Evening-primrose		SX	G4	SX

Indiana Natural Heritage Data Center  
Division of Nature Preserves  
Indiana Department of Natural Resources  
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting  
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list  
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank  
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

## Indiana County Endangered, Threatened and Rare Species List

County: Jefferson

Species Name	Common Name	FED	STATE	GRANK	SRANK
Orobanche riparia	Bottomland Broomrape		SE	G4?	S2
Oryzopsis racemosa	Black-fruit Mountain-ricegrass		SR	G5	S2
Panax trifolius	Dwarf Ginseng		WL	G5	S2
Panicum scoparium	Broom Panic-grass		SE	G5	S1
Phlox amplifolia	Large-leaved Phlox		SR	G3G5	S2
Poa alsodes	Grove Meadow Grass		SR	G4G5	S2
Ranunculus pusillus	Pursh Buttercup		SE	G5	S1
Rhexia mariana var. mariana	Maryland Meadow Beauty		ST	G5T5	S1
Sagittaria australis	Longbeak Arrowhead		SR	G5	S2
Satureja vulgaris var. neogaea	American Wild Basil		WL	G5	S3
Scirpus purshianus	Weakstalk Bulrush		SR	G4G5	S1
Sida hermaphrodita	Virginia Mallow		SE	G3	S1
Strophostyles leiosperma	Slick-seed Wild-bean		ST	G5	S2
Sullivantia sullivantii	Sullivantia		ST	G4	S2
Thalictrum pubescens	Tall Meadowrue		ST	G5	S2
Tragia cordata	Heart-leaved Noseburn		WL	G4	S2
Valerianella chenopodiifolia	Goose-foot Corn-salad		SE	G5	S1
Viburnum molle	Softleaf Arrow-wood		SR	G5	S2
Wisteria macrostachya	Kentucky Wisteria		SR	G5	S2
Woodwardia areolata	Netted Chainfern		SR	G5	S2
<b>High Quality Natural Community</b>					
Forest - flatwoods bluegrass till plain	Bluegrass Till Plain Flatwoods		SG	G3	S2
Forest - upland dry	Dry Upland Forest		SG	G4	S4
Forest - upland dry-mesic	Dry-mesic Upland Forest		SG	G4	S4
Forest - upland mesic	Mesic Upland Forest		SG	G3?	S3
Primary - cliff limestone	Limestone Cliff		SG	GU	S1
<b>Other Significant Element</b>					
Freshwater Mussel Concentration Area	Mussel Bed		SG	G3	SNR
Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR

Indiana Natural Heritage Data Center  
Division of Nature Preserves  
Indiana Department of Natural Resources  
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting  
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list  
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank  
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

**PHASE I**  
**ENVIRONMENTAL SITE ASSESSMENT**  
**US 421 NEW ROAD ROADWAY CONSTRUCTION**

**JEFFERSON COUNTY, INDIANA**

**Prepared By:**

**Weaver Consultants Group  
7121 Grape Road  
Granger, IN 46530**

**Prepared For:**

**K&S Engineers, Inc.  
9715 Kennedy Avenue  
Highland, Indiana 46375**

December 28, 2016

## EXECUTIVE SUMMARY

---

K&S Engineers, Inc. retained **Weaver Consultants Group** (WCG) to perform a *Phase I Environmental Site Assessment* (ESA) of the Property potentially included in right of way acquisition for the US 421 New Roadway Construction in Madison, Indiana on behalf of Crawford, Murphy & Tilly (CMT) Engineers and Consultants. WCG performed this Phase I ESA in general compliance with the American Society for Testing Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13) in an effort to identify, to the extent feasible, the presence of *recognized environmental conditions* with respect to the Property as defined in ASTM E 1527-13. Limiting conditions, exceptions to, or deletions from this practice are described in **Sections 1.5** and **10.0** of this *report*.

The proposed project is located within Jefferson County, Indiana in the City of Madison and extends through portions of the National Historic Landmark Madison Historic District. The Property for purposes of this Phase I ESA is intended to encompass specific parcels (or parts thereof) identified by CMT for right of way acquisition needed to facilitate the US 421 New Roadway Construction Project through the eastern part of the City of Madison, Indiana under project Alternatives 4, 6, and 8. Alternatives 4 and 6 are similar, each extending essentially from the intersection of Main and Baltimore Streets, thence southeasterly to the intersection of East Second and Harrison Streets, and thence southerly to the northern approach of the Milton-Madison bridge crossing the Ohio River. Alternatives 4 and 6 also include re-surfacing and/or minor right of way acquisitions joining the primary route with Sering Street/Park Avenue at the intersection of East Second Street and Park Avenue. All or parts of 13 parcels of land are identified for right of way acquisition totaling 1.29 to 1.64 acres as indicated by CMT.

Alternative 8 differs from Alternatives 4 and 6 by incorporating a traffic circle near the existing intersection of Sering Street/Park Avenue and Ferry Street further east of the existing route designated for US 421. Alternative 8 includes the acquisition of all or parts of approximately 23 parcels totaling 1.81 acres as indicated by CMT.

Madison was platted in 1810 and the first lots were sold in 1811 (Wikipedia, 2016). Review of *standard historical sources* indicates that residential development and historic industries including a brewery and a tannery were present and mapped by 1886. Parcels considered for acquisition under Alternatives 4 and 6 are largely commercial, and include several that appear to have been originally developed as dwellings during the 19<sup>th</sup> Century, later redeveloped as automotive filling stations during the mid-20<sup>th</sup> Century, and mostly currently, they are utilized

for retail or automotive sales or service purposes. The current and historic use of parcels considered under Alternative 8 are more varied, including a religious organization, an historic brewery, an historic tannery, and many that remain developed and uses as dwellings since the 19<sup>th</sup> Century.

On November 2, 2016, WCG representative Patricia Kostro visually assessed the Property for *recognized environmental conditions*, including but not limited to, the presence of *hazardous substances, hazardous wastes, petroleum products, other wastes, underground storage tanks (USTs), aboveground storage tanks (ASTs), polychlorinated biphenyl (PCB)-containing equipment, or other potential Findings.*

WCG also performed a review of commercially available government records in an effort to identify *recognized environmental conditions* in connection with the Property. This records review addressed not only the Property, but also surrounding properties. The records review also included *reasonably ascertainable* historical data, which can be helpful in identifying the past uses of the Property and surrounding areas, as it may relate to the environmental condition of the Property.

Finally, WCG performed *interviews* with various government agencies and other parties with possible knowledge of the Property and surrounding properties in an effort to identify current and past uses of the Property and surrounding areas, as they may relate to the environmental condition of the Property.

ASTM E 1527-13 defines a *recognized environmental condition* as the presence or likely presence of any *hazardous substances or petroleum products* in, on, or at a *property*: (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or (3) under conditions that pose a *material threat* of a future *release* to the *environment*. *De minimis* conditions are not *recognized environmental conditions*. ASTM defines the term *vapor encroachment condition (VEC)* as the presence or likely presence of "chemical of concern" vapors in the subsurface of the Property caused by the release of vapors from contaminated soil or groundwater or both either on or near the Property.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of *recognized environmental conditions* in connection with the Property except as follows

1. The commercial property located at 901 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961). This *finding*, in conjunction with observations during the site visit (see photograph No. 14 in **Appendix C**), and potential for releases of petroleum products from historical underground storage tank (UST)

systems, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.

2. The commercial property located at 814 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961). This *finding*, in conjunction with observations during the site visit (see photograph No. 15 in **Appendix C**), and potential for releases of petroleum products from historical UST systems. Documentation reviewed on the Indiana Department of Environmental Management's (IDEM) virtual file cabinet (VFC) indicates the possibility of four USTs (two (2) 4,000 gallon gasoline USTs, one (1) 6,000 gallon gasoline UST, and one (1) 1,000 gallon unknown UST) that are listed as Permanently Out of Service, but likely remain on the property. WCG concludes that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
3. The commercial property located at 902 E. Second Street is identified as a filling station in the *fire insurance map* of 1961. This *finding*, in conjunction with observations during the site visit (see photograph No. 17 in **Appendix C**), and potential for releases of petroleum products from historical UST systems, together with documentation reviewed on the VFC indicating the presence of two USTs of unknown capacity leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
4. The commercial property located at 822 E. First Street is identified as a filling station in the *fire insurance map* of 1961. This *finding*, in conjunction with observations during the site visit (see photograph No. 20 in **Appendix C**), and potential for releases of petroleum products from historical UST systems, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
5. The commercial property located at 928 Park Avenue is identified as a brewery in the *fire insurance maps* of 1961 to 1892. A machine shop is indicated as well in the map of 1961. This *finding*, in conjunction with the potential for releases of petroleum products or hazardous substances during historical machine shop operations, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
6. The residential properties currently located at 906, 910, and 918 E. Second Street, and 903 E. First Street, are identified as being part of an historic tannery facility as shown on

fire insurance maps of 1911, 1904, and 1892. This finding, in conjunction with the potential for releases of hazardous substances during tannery operations, leads WCG to conclude that this condition represents a *recognized environmental condition* in connection with the Property.

7. The commercial property located at 901 E. First Street is suspected by WCG to have been utilized at least in part as a filling station and/or drycleaners based on interviews with a local individual. This *finding*, in conjunction with observations during the site visit (see photograph No. 21 in **Appendix C**), and potential for releases of petroleum products from historical UST systems or hazardous substances from an historical dry cleaning operation, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
8. The commercial property located at 114 Sering Street is suspected by WCG to be an historical filling station based on its architecture and location along a thoroughfare. This *finding*, in conjunction with observations during the site visit (see photograph No. 7 in **Appendix C**), and potential for releases of petroleum products from UST systems, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
9. The commercial property at 150 Harrison Street is a non-operating historical and current filling station. By way of correspondence dated December 5, 2016, the IDEM cited the responsible party for violation of UST regulations in connection with the two (2) 10,000 gallon USTs for not being properly closed. The IDEM further stated that both tanks still contain 3 or 4 inches of fuel. Previously, the IDEM assigned Incident No. 200910514 following a site inspection that observed stained pea gravel and adsorbent pads beneath the diesel dispenser. Subsequent inspections suggest the remaining on-site tanks did not undergo any type of temporary closure measures. Additionally, the associated piping and dispensers remain on-site. This *finding*, in conjunction with observations during the site visit (see photograph No. 19 in **Appendix C**), and potential for releases of petroleum products from historical UST systems leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of *controlled recognized environmental conditions* in connection with the Property.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of *historical recognized environmental conditions* in connection with the Property except for the following:

1. The commercial property located at 150 Harrison Street is identified as a filling station in the *fire insurance map* of 1961. A 2,000 gallon diesel UST was closed via removal from this commercial property in March of 2011 along with the removal of approximately 53.57 tons of impacted soil according VFC documents reviewed by WCG. The IDEM granted no further action (NFA) status for Incident No. 200910514 in a letter dated October 22, 2012, following the removal of the 2,000 gallon diesel UST. WCG therefore concludes that the former 2,000-gallon diesel fuel UST represents an *historical recognized environmental condition* in connection with the Property.

With consideration for the likelihood that soil, groundwater, or structures such as drains and sewers might be adversely affected by the *recognized environmental conditions* identified above, WCG recommends that Phase II ESA activities be undertaken. Such Phase II ESA activities should include all areas where *recognized environmental conditions* identified herein. Additionally, WCG notes particularly where existing improvements require demolition to facilitate the project; asbestos inspections should be conducted in accordance with state law. Moreover, WCG notes that certain sources of petroleum projects and hazardous substances are very difficult to identify during a Phase I ESA either because they are not typically recorded in standard information sources or are difficult to visually identify. Examples may include home heating oil storage tanks, water wells, septic systems, or cesspits, and should be expected to be encountered during extensive demolition and/or subsurface work, particularly along new alignments such as proposed in Alternative 8.

This Executive Summary provides a brief overview of the findings of this Phase I ESA. Although the Executive Summary is an integral part of the *report*, it does not substitute for reading the entire *report* or the appended or referenced documents to fully understand the findings and conclusions of this Phase I ESA.

## TABLE OF CONTENTS

---

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Purpose .....	1
1.2	Detailed Scope-of-Services .....	2
1.3	Standard of Care .....	3
1.4	Significant Assumptions .....	3
1.5	Limiting Conditions and Exceptions .....	4
1.6	Special Terms and Conditions .....	4
1.7	User Reliance .....	4
<b>2</b>	<b>PROPERTY DESCRIPTION .....</b>	<b>6</b>
2.1	Location and Legal Description.....	6
2.2	Property and Vicinity General Characteristics .....	6
2.3	Current and Historical Use of the Property.....	7
2.4	Description of Structures, Roads, and Other Property Improvements.	7
2.5	Current Uses of the Adjoining Properties .....	7
<b>3</b>	<b>USER-PROVIDED INFORMATION .....</b>	<b>9</b>
3.1	Recorded Land Title Records .....	9
3.2	Environmental Liens or Activity and Use Limitations .....	9
3.3	Specialized Knowledge .....	10
3.4	Commonly Known or Reasonably Ascertainable Information .....	10
3.5	Valuation Reduction for Environmental Issues .....	10
3.6	Owner, Property Manager, and Occupant Information.....	10
3.7	Reason for Performing Phase I ESA.....	10
3.8	Obvious Indicators of the Presence or Likely Presence of Contamination of the Property .....	10
3.9	Other Information Relevant to the Property .....	10
<b>4</b>	<b>RECORDS REVIEW .....</b>	<b>11</b>
4.1	Standard Environmental Record Sources .....	11
4.1.1	Summary of Database Listings.....	11
4.1.1.1	The Property.....	11
4.1.1.2	Adjoining Properties.....	12
4.1.1.3	Surrounding Properties .....	12
4.1.2	Orphan Sites.....	12
4.2	Additional Environmental Record Sources.....	12
4.2.1	City of Madison Plan Commission Department Records Review .	13
4.2.2	Jefferson County Health Department Records Review .....	13
4.3	Physical Setting Sources .....	13

4.3.1	Topography .....	13
4.3.2	Regional Subsurface Geology .....	14
4.3.3	USDA Soil Survey .....	14
4.4	Historical Use Information .....	14
4.4.1	Standard Historical Sources .....	15
4.4.1.1	Historical USGS Topographic Maps.....	15
4.4.1.2	Fire Insurance Maps .....	16
4.4.1.3	Recorded Land Title Records.....	17
4.4.1.4	Local Street Directories .....	17
4.4.1.5	Historical Reports .....	17
4.4.2	Historical Use Information on the Property .....	17
4.4.3	Historical Use Information on Adjoining Properties.....	18
4.5	Vapor Encroachment Screen .....	18
<b>5</b>	<b>SITE RECONNAISSANCE .....</b>	<b>19</b>
5.1	Methodology and Limiting Conditions .....	19
5.2	General Setting and Observations.....	19
5.3	Interior and Exterior Observations .....	20
5.3.1	Hazardous Substances and Petroleum Products in Connection with Identified Uses .....	20
5.3.2	Storage Tanks.....	20
5.3.2.1	Underground Storage Tanks (USTs).....	20
5.3.2.2	Aboveground Storage Tanks (ASTs).....	21
5.3.3	Odors.....	21
5.3.4	Pools of Liquid.....	21
5.3.5	Pits, Ponds, and Lagoons .....	21
5.3.6	Drums.....	21
5.3.7	Hazardous Substance or Petroleum Product Containers .....	21
5.3.8	Unidentified Substances Containers.....	21
5.3.9	Polychlorinated Biphenyls (PCBs) .....	21
5.3.10	Stains or Corrosion.....	22
5.3.11	Drains and Sumps .....	22
5.3.12	Stained Soil or Pavement .....	22
5.3.13	Stressed Vegetation .....	22
5.3.14	Solid Waste .....	22
5.3.15	Wastewater, Wells, Septic Systems.....	22
<b>6</b>	<b>NON-SCOPE CONSIDERATIONS.....</b>	<b>23</b>

<b>7</b>	<b>INTERVIEWS.....</b>	<b>24</b>
7.1	Interview with Owner(s) .....	24
7.2	Interview with Key Site Manager(s) .....	24
7.3	Interviews with Occupant(s).....	24
7.4	Interviews with Past Owner(s), Operator(s), and Occupant(s) .....	24
7.5	Interviews with Adjoining Property Owner(s) or Occupant(s) .....	24
7.6	Interviews with Local Government Official(s).....	25
7.7	Interviews with Others .....	25
<b>8</b>	<b>FINDINGS, OPINIONS, CONCLUSIONS, AND RECOMMENDATIONS.....</b>	<b>26</b>
8.1	Findings and Opinions .....	26
8.2	Conclusions .....	29
8.3	Recommendations.....	30
<b>9</b>	<b>DATA GAPS.....</b>	<b>31</b>
<b>10</b>	<b>DEVIATIONS.....</b>	<b>32</b>
<b>11</b>	<b>REFERENCES.....</b>	<b>33</b>
<b>12</b>	<b>SIGNATURE OF ENVIRONMENTAL PROFESSIONAL.....</b>	<b>34</b>

**LIST OF APPENDICES**

**Figures**

- Appendix A** Glossary of Terms
- Appendix B** User-Provided Information
- Appendix C** Photographic Documentation
- Appendix D** Regulatory Records Documentation
- Appendix E** Environmental Records and Interview Documentation
- Appendix F** Historical Records Documentation
- Appendix G** Personnel Qualifications

# 1 INTRODUCTION

---

K&S Engineers, Inc. retained **Weaver Consultants Group** (WCG) to perform a *Phase I Environmental Site Assessment* (ESA) of the Property potentially included in right of way acquisition for the US 421 New Roadway Construction in Madison, Indiana on behalf of Crawford, Murphy & Tilly (CMT) Engineers and Consultants (see **Figure 1 - Property Location Map**). WCG performed this Phase I ESA in general compliance with the American Society for Testing Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13) and the terms and conditions of WCG proposal LLCP-002-09-16 dated October 31, 2016 incorporated herein by reference. WCG understands that this Phase I ESA was conducted for the benefit of Crawford, Murphy & Tilly (CMT) Engineers and Consultants and the Indiana Department of Transportation (the *users*).

The following sections of this *report* present our Phase I ESA findings and conclusions. A glossary containing terms and definitions presented in ASTM E 1527-13 as indicated by italicized text in this *report* is included in **Appendix A – Glossary of Terms**. Other appendices presented at the end of the *report* consist of figures, interview and user-provided information, photographic documentation; regulatory records review documentation, historical records, and personnel qualifications.

## 1.1 Purpose

The purpose of this Phase I ESA is to identify and report, to the extent feasible, *recognized environmental conditions* with respect to the Property. ASTM E 1527-13 defines a recognized environmental condition as:

*The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions.*

Performing a Phase I ESA in general compliance with ASTM E 1527-13 may enable a *user* to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability; that is, the practice that constitute

“all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” as defined in 42 U.S.C. Section 9601(35)(B).

## 1.2 Detailed Scope-of-Services

WCG performed this Phase I ESA in general conformance to ASTM E 1527-13. The scope of services for this Phase I ESA included the following:

- A review of standard environmental record sources pursuant to ASTM E 1527-13 regarding environmental activities for the Property and local area properties;
- A review of reasonably ascertainable, practicably reviewable, and publicly available historical aerial photographs, street directories, topographic maps, and non-standard historical information written about the Property in an effort to assess past Property conditions;
- *Interviews* with reasonably available *key site manager(s)*, present *Property owner(s)*, *occupant(s)*, *operator(s)*, *government agency(s)* by or under the supervision of an *environmental professional*;
- A site reconnaissance by an environmental professional in an effort to assess the current use of the Property and to identify potential Findings including but not limited to, the presence of *hazardous substances*, *hazardous wastes*, *petroleum products*, *other wastes*, *underground storage tanks (USTs)*, *aboveground storage tanks (ASTs)*, *polychlorinated biphenyl (PCB)-containing equipment*, or other potential Findings;
- *A site reconnaissance* by or under the supervision of an *environmental professional* from reasonably accessible public thoroughfares in an effort to identify the current use of the adjoining properties and potential Findings including, but not limited to, the presence of *hazardous substances*, *hazardous wastes*, *petroleum products*, other wastes, USTs, ASTs, PCB-containing equipment, or other potential Findings; and
- Tier 1 Vapor Encroachment Screen (VES) to identify the presence or likely presence of contaminant of concern vapors in the subsurface of the Property caused by the release of vapors from impacted soil or groundwater either on or near the Property per ASTM E 2600-10 resulting in a *vapor encroachment condition (VEC)*; and,
- Preparation of this Phase I ESA report.

WCG initiated this Phase I ESA pursuant to the written authorization of K&S Engineers, Inc. on November 1, 2016.

### **1.3 Standard of Care**

WCG conducted this Phase I ESA using a defined scope of services considered appropriate and agreed upon by all parties on the date the service was authorized, unless the scope of services or the methods used were later modified, in writing, and accepted by all parties prior to performance. WCG conducted this Phase I ESA in accordance with generally accepted practices in a manner consistent with that level of care exercised by other members of our profession in the same locality and under similar conditions of time and accessibility of improvements and information. No other representations, expressed or implied, and no warranty or guarantee is included or intended to be part of this Phase I ESA.

The scope of services performed in execution of this assessment may not be appropriate to satisfy the needs of other parties. We, therefore, are not responsible for independent conclusions, opinions, or recommendations of others based on our assessment. Furthermore, this Phase I ESA relates to the environmental conditions of the Property and does not address issues raised in transactions such as business risk, purchase of business entities, or interests therein, or of their assets, that may well involve environmental liabilities pertaining to properties previously owned or operated or other off-site liabilities.

Additionally, the findings of this Phase I ESA are based on WCG's observations, inquiries, and historical research using reasonably ascertainable and practically reviewable information obtained within reasonable time and cost constraints. WCG does not represent that this Phase I ESA is an exhaustive assessment that reflects the findings of all of the information available for the Property, nor is it representative of any future Property conditions. If additional information concerning the Property is discovered, it should be provided to us so that we may evaluate its impact on our conclusions. As such, any activities or episodes that transpire subsequent to this Phase I ESA are not considered in this assessment. A Phase I ESA performed in general compliance with ASTM E 1527-13 is not intended to be an exhaustive assessment of a property nor can it wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property.

### **1.4 Significant Assumptions**

This Phase I ESA is based in part on information obtained from visual observations of the Property and vicinity, commercial data sources, and interviews with government agency representatives, representatives of the owners of the Property and occupants of the Property. WCG assumes this information to be accurate, complete, and representative of Property

conditions unless some fact or circumstance made known to WCG through the course of this assessment reasonably suggests otherwise.

## **1.5 Limiting Conditions and Exceptions**

ASTM E 1527-13 requires that the *environmental professional* shall document, in the *report*, general limitations and basis of review, including limitations imposed by physical obstructions such as adjacent buildings, bodies of water, asphalt, or other paved areas, and other physical constraints (for example snow or rain). WCG identified no limiting conditions in performing this assessment except as listed below:

- Due to the presence of building(s), concrete surfaces, stored equipment and materials, and dense vegetation in several areas, WCG was unable to fully assess the entire exterior surface of the parcels comprising the Property.
- Due to the private residential usage of many of the parcels, fences, and vegetation, the access to or observation of rear yards of such parcels was not possible.

WCG identified no exceptions in performing this assessment except as follows:

- User-provided information in response to the questionnaire provided by WCG was not received as of the writing of this Phase I ESA.
- WCG made no attempt to enter private residences or businesses located on several parcels comprising the Property and was therefore unable to observe their interiors.
- WCG made no attempt to interview the *owners* or *key site managers* of the more than 30 individual parcels of land comprising the Property.

## **1.6 Special Terms and Conditions**

There were no special terms and conditions associated with performing this assessment beyond those in WCG proposal LLCP-002-09-16 dated October 31, 2016.

## **1.7 User Reliance**

This *report* is confidential and was prepared for the exclusive use by Crawford, Murphy & Tilly (CMT) Engineers and Consultants, the Indiana Department of Transportation, and the State of Indiana (the *users*). No additional parties may use the information contained in this *report* without obtaining the written permission of WCG. WCG's duties and obligations extend to *users* and to no other party. WCG's duties and obligations to *users* are not transferable to any person, corporation, or organization without the express written consent of WCG.

This Phase I ESA *report* must be read and interpreted as a whole and can only be considered representative of the conditions of the Property as of the date of our *site reconnaissance* described herein. WCG makes no representation whatsoever concerning the condition of the Property beyond the date of our *site reconnaissance* described herein. Individual sections and appendices of this *report* are dependent on the balance of this *report*, and on the terms, conditions, and stipulations contained in the proposal and any written amendments accepted by WCG.

## 2 PROPERTY DESCRIPTION

---

### 2.1 Location and Legal Description

The Property for purposes of this Phase I ESA is intended to encompass specific parcels (or parts thereof) identified by CMT for right of way acquisition needed to facilitate the US 421 New Roadway Construction Project through the eastern part of the City of Madison, Indiana under project Alternatives 4, 6, and 8. Exhibits by CMT define the specific parcels relevant to each of the three alternatives as shown in **Appendix B**. A boundary encompassing the affected parcels is provided as **Figure 2 – Property Map**.

Alternatives 4 and 6 are similar, each extending essentially from the intersection of Main and Baltimore Streets, thence southeasterly to the intersection of East Second and Harrison Streets, and thence southerly to the northern approach of the Milton-Madison bridge crossing the Ohio River. Alternatives 4 and 6 also include re-surfacing and/or minor right of way acquisitions joining the primary route with Sering Street/Park Avenue at the intersection of East Second Street and Park Avenue. All or parts of 13 parcels of land are identified for right of way acquisition totaling 1.29 to 1.64 acres as indicated by CMT.

Alternative 8 differs from Alternatives 4 and 6 by incorporating a traffic circle near the existing intersection of Sering Street/Park Avenue and Ferry Street further east of the existing route designated for US 421. Alternative 8 includes the acquisition of all or parts of approximately 23 parcels totaling 1.81 acres as indicated by CMT.

The more than 30 parcels considered under this Phase I ESA all appear to be located within Sections 1 and 2, Township 3 North, Range 10 East in Madison Township, Jefferson County. A summary of the parcels understood to be affected by permanent right of way acquisition is listed in **Table 1 – Property Information**, which includes parcel numbers, parcel addresses, abbreviated legal descriptions, and ownership information. Additional information includes a listing as to which US 421 alignment alternatives involve specific parcels as well as the acreage involved as listed on the exhibits provided by CMT.

### 2.2 Property and Vicinity General Characteristics

The proposed project is located within Jefferson County, Indiana in the City of Madison and extends through portions of the National Historic Landmark Madison Historic District. Madison was platted in 1810 and the first lots were sold in 1811 (Wikipedia, 2016). Review of *standard historical sources* indicates that residential development and historic industries including a

brewery and a tannery were present and mapped by 1886. The majority of dwellings date to the late 19<sup>th</sup> Century. Adjoining properties have similar characteristics are mostly residential or commercial (hotels and inns).

### **2.3 Current and Historical Use of the Property**

Parcels considered for acquisition under Alternatives 4 and 6 are largely commercial, and include several that appear to have been originally developed as dwellings during the 19<sup>th</sup> Century, later redeveloped as automotive filling stations during the mid-20<sup>th</sup> Century, and mostly currently, they are utilized for retail or automotive sales or service purposes. The current and historic use of parcels considered under Alternative 8 are more varied, including a religious organization, an historic brewery, an historic tannery, and many that remain developed and uses as dwellings since the 19<sup>th</sup> Century. The current and historical use of specific parcels is listed in **Table 1 – Property Information**.

### **2.4 Description of Structures, Roads, and Other Property Improvements**

Structures on the parcels comprising the Property include dwellings and commercial buildings as previously mentioned. The oldest structures and improvements date to the 19<sup>th</sup> century while the newest were constructed during the mid-20<sup>th</sup> Century. Property cards downloaded by WCG from [www.wthgis.com](http://www.wthgis.com) as presented in **Appendix E – Environmental Records and Interview Documentation** provide specific information regarding structures and other Property improvements on each parcel.

The following utility services are provided or understood to be available to the Property:

- Electric service – provided by Duke Energy;
- Telephone – AT&T;
- Natural gas service – Vectren;
- Potable water – Madison Water Department;
- Sanitary service – Madison Sewer Department; and
- Waste disposal services – Madison Sanitation Department.

WCG photographed select operations and improvements located on the Property to support this written *report*. Those photographs are included in **Appendix C - Photographic Documentation**.

### **2.5 Current Uses of the Adjoining Properties**

The following is a listing of the current adjoining properties including the applicable property name, address, operation, and direction from the Property:

CURRENT ADJOINING PROPERTIES			
Property Name/Occupant	Address	Operation/Use	Direction from the Property
Akshar Neel Corp	831 E. Main Street, Madison, Indiana	Hotel	North
City of Madison Water Department	North side of Sering Street/Park Avenue	Potable water reservoir	North
Madison Pilgram Holiness Church, Inc.	1004 Park Ave, Madison, Indiana	Church	East
Private residents	Various along Sering Street/Park Avenue and Ferry Street	Dwellings	East
Private residents	Various along First Street, Main Street, and Fillmore Street	Dwellings	South
Private residents	Various along Harrison Street, Second Street, and Henzt Lane	Dwellings	West

WCG photographed selected sites, operations, and improvements located at or near the Property to support this written *report*. Those photographs are included in **Appendix C – Photographic Documentation**.

### 3 USER-PROVIDED INFORMATION

---

ASTM E 1527-13 provides that certain Phase I ESA tasks are to be performed by the *user*. According to ASTM E 1527-13, these tasks should be performed by or on behalf of the party seeking to qualify for a Landowner Liability Protection (LLP) to CERCLA Liability. While such information is not required to be provided to the environmental professional, the environmental professional shall request that the *user* provide the information as it may assist the environmental professional in identifying *recognized environmental conditions* in connection with the Property.

We provided the *user* with a questionnaire at the beginning of this Phase I ESA to assist them with these tasks. A copy of the User-Provided Information Questionnaire is included in **Appendix B – User-Provided Information** (Note: the user-provided information questionnaire has not been received). In instances where the *user* did not provide the information requested, WCG has opined on the significance of the absence of this information as per ASTM E 1527-13. The following sections describe our review of the responses received, where applicable.

#### 3.1 Recorded Land Title Records

To meet the requirements of ASTM E 1527-13 and “all appropriate inquiries”, a search for the existence of *environmental liens* or *activity and use limitations* that are filed or recorded against the Property must be conducted. These documents can be commonly found within recorded land title records.

The *user* did not provide WCG with a response concerning *recorded land title records* for the Property nor did the *user* authorize WCG to perform a *recorded land title records* review, which was included as an optional scope of service in our Proposal. As a result, this lack of information could result in a determination that “all appropriate inquiries” was not completed.

#### 3.2 Environmental Liens or Activity and Use Limitations

As mentioned within **Section 3.1**, to meet the requirements of ASTM E 1527-13 and “all appropriate inquiries”, a search for the existence of *environmental liens* and *activity and use limitations* must be conducted.

The *user* did not provide WCG with a response concerning the existence of *environmental liens* or *activity and use limitations* with respect to the Property. As a result, this lack of information could result in a determination that “all appropriate inquiries” was not completed.

### **3.3 Specialized Knowledge**

The *user* did not provide WCG with a response concerning specialized knowledge or experience related to the Property or nearby properties. As a result, this lack of information could result in a determination that “all appropriate inquiries” was not completed.

### **3.4 Commonly Known or Reasonably Ascertainable Information**

The *user* did not provide WCG with a response concerning commonly known or *reasonably ascertainable* information within the local community about the Property that is material to identifying a Finding with respect to the Property. K&S did, however, provide a copy of United Consulting’s July 19, 2016 Red Flag Investigation report. An excerpt of this report is included in **Appendix B – User-Provided Information**. This report lists a leaking underground storage tank (LUST) site at 150 Harrison Street and discusses the IDEM’s issuance of an unrestricted NFR letter in connection with a release from a 2,000-gallon diesel fuel UST. This finding is therefore considered by WCG as an *historic recognized environmental condition* in connection with the Property.

### **3.5 Valuation Reduction for Environmental Issues**

The *user* provided no information regarding the valuation of the parcels comprising the Property. As a result, this lack of information could result in a determination that “all appropriate inquiries” was not completed.

### **3.6 Owner, Property Manager, and Occupant Information**

The *user* only identified the parcels comprising the Property. As a result, this lack of information could result in a determination that “all appropriate inquiries” was not completed.

### **3.7 Reason for Performing Phase I ESA**

The *user* requested that WCG perform this Phase I ESA in support of its environmental due diligence efforts associated with the US 421 New Roadway Construction project.

### **3.8 Obvious Indicators of the Presence or Likely Presence of Contamination of the Property**

The *user* provided, no obvious indicators of the presence or likely presence of contamination exist at the Property except for the Red Flag Report discussed in Section 3.4 above.

### **3.9 Other Information Relevant to the Property**

The *user* did not provide WCG with a response concerning other information relevant to the Property.

## 4 RECORDS REVIEW

---

### 4.1 Standard Environmental Record Sources

According to ASTM E 1527-13, the purpose of reviewing regulatory records is to obtain and review records that will help identify *recognized environmental conditions* in connection with the Property. In addition, some records to be reviewed pertain not only to the Property, but also to properties within an additional ‘*approximate minimum search distance*’ in order to help assess the likelihood of problems from migrating *hazardous substances or petroleum products*. When the term ‘*approximate minimum search distance*’ includes areas outside the Property, it shall be measured from the nearest Property boundary. The term ‘*approximate minimum search distance*’ is used in lieu of the term ‘radius’ in order to include irregularly-shaped properties.

K&S Engineers provided WCG with an Environmental Data Resources Inc. (EDR) Summary Radius Map Report to provide an ASTM records review for the Property. The Summary Radius Report is a computerized search of select state and federal environmental databases that identify various properties with a record of environmental activity. WCG reviewed the Summary Radius Report and summarized the relevant listings in the following sections. A copy of the compiled Radius Report has been included as **Appendix D - Regulatory Documentation**.

#### 4.1.1 Summary of Database Listings

##### 4.1.1.1 The Property

The Property comprises approximately 30 parcels that include businesses and dwellings located within Sections 1 and 2, Township 3 North, Range 10 East in Madison Township, Jefferson County. Based on our review of the Summary Radius Report, the following databases sites are relevant to the Property:

1. Madison Motors      814 Second Street      IN UST
2. River City Marathon      150 Harrison Street      IN UST, IN LUST
3. Kar-Kwik Muffler      902 E. Second Street      IN UST

All three of these findings are considered *recognized environmental conditions* in connection with the Property by WCG as further discussed in Section 4.4.1.2.

Another database site identified very near to the Property is the INDOT Bridge Structure 56, which is believed to be correctly located at the northern approach to the Milton-Madison Bridge over the Ohio River. Inasmuch as this database facility is located along the southern

boundary of the Property and that the topographic slope and inferred groundwater flow direction is southerly, no adverse effect on the Property is anticipated.

#### 4.1.1.2 Adjoining Properties

The Radius Report identified none of the adjoining properties on the governmental databases searched within the *approximate minimum search distances* as shown in **Appendix D**.

#### 4.1.1.3 Surrounding Properties

The Radius Report identified several of the surrounding properties on the governmental databases searched within the *approximate minimum search distances*. These are listed in EDR report as follows:

5		412 BALTIMORE ST	EDR Hist Auto	Higher	175, 0.033, NW
B6	INDIANA GAS/MADISON	116 WALNUT STREET	EDR MGP	Lower	1202, 0.228, WSW
B7	INDIANA GAS - MADISO	116 WALNUT ST.	IN VCP	Lower	1202, 0.228, WSW
8	ROYER CORPORATION	805 EAST ST	IN SCP	Higher	1932, 0.366, NNW
9	CONTINENTAL TELEPHON	419 MULBERRY	IN LUST, IN UST, IN TIER 2	Higher	2192, 0.415, WNW
10	BENNETT DRUM SITE	1225 N. WALNUT, 1690	SEMS, PRP	Lower	2462, 0.466, NW
11	CITY OF MADISON TRAN	610 W ST	IN SWF/LF, IN Financial Assurance	Lower	2628, 0.498, WNW
12	US 421 MILTON MADISO	US-421	KY SHWS	Lower	2987, 0.566, South

#### 4.1.2 *Orphan Sites*

The Radius Report includes a section addressing “Orphan Sites.” Orphan sites are sites, which, due to incomplete geographic location data or incomplete or incorrect address information, cannot be plotted correctly. The Radius Report performed for this Phase I ESA (**Appendix D**) listed one orphan site in vicinity of the Property:

1. Don & Debs Minimarket SR 421 N IN UST, IN LUST

WCG searched the internet finding that database facility has NFA status although its location was not clarified. Given its NFA status, this condition is not regarded as a Finding.

## 4.2 Additional Environmental Record Sources

Additional records reviewed include the July 19, 2016 Red Flag Report prepared by United Consulting. No findings were obtained from these reviews that were not obtained from other standard sources.

Additional sources of relevant historical environmental records were sought by WCG as follows:

- Records on file at the City of Madison Plan Commission; and,
- Records on file at the Jefferson County Health Department; and

The following sections summarize our review of those records.

#### 4.2.1 City of Madison Plan Commission Department Records Review

WCG contacted the City of Madison Plan Commission Department in person on November 1, 2016 for records of hazardous material incidents, USTs or other information for the Property. Louann Waller, Executive Administrative Assistant, has worked for this department for 11 years and has resided in the community for nearly 25 years. She stated there are no records of incidents involving hazardous materials or USTs and she was unable to provide additional information for sites associated with the Property. Ms. Waller was questioned on the likelihood of heating oil tanks that may remain on the Property. She believed that most of the tanks have been removed and that there have been no reported incidents involving these heating tanks.

#### 4.2.2 Jefferson County Health Department Records Review

WCG contacted the Jefferson County Health Department in person on November 1, 2016 for records of hazardous material incidents, USTs or other information for the Property. Mike New, Chief of Environmental Health Specialist, has worked for this department for 14 years. He stated there is not a record of incidents involving hazardous materials or USTs and he was not able to provide additional information for sites associated with the Property. Mr. New was questioned on the likelihood of heating oil tanks that may remain on the Property. He believed that most of the tanks have been removed and that there have been no reported incidents involving these heating tanks.

### 4.3 Physical Setting Sources

WCG obtained and reviewed published, *reasonably ascertainable* information concerning the physical setting of the Property. WCG obtained that information from the following sources:

- A topographic map prepared by USGS.
- IndianaMAP Geology Layer selected at:

<http://maps.indiana.edu/index.html?undefined=undefined>.

The following is a summary of our review of those *physical setting sources*.

#### 4.3.1 Topography

The purpose of the topographic map review is to evaluate the presence of physical structures and/or unique topographic conditions that would be of potential importance in the event of a release or migration of a hazardous material to or from the Property. WCG reviewed the USGS 7.5-minute Madison east quadrangle topographic with minor revisions through 1994 showing the area in which the Property is located (see **Figure 1**). The USGS map shows that the Property

is at an elevation of approximately 510 feet to 480 feet above msl on a level area between Sering Street/Park Avenue to the north and Fillmore Street to the south.

While the groundwater flow direction would be dependent on the geologic unit in which it occurs, surface topography can be used to approximate the probable regional trend of the shallow groundwater flow direction. Perched as it is on the Ohio River alluvial plain, groundwater is inferred to flow south towards the river. Neighboring or adjoining facilities to the north would therefore be most probable to affect groundwater quality beneath the Property.

#### 4.3.2 *Regional Subsurface Geology*

This part of Jefferson County is within the Muscatatuck Plateau physiographic province, in the larger Southern Hills and Lowlands Region and is therefore characterized as broad generally till-covered upland entrenched by valleys. The specific area of the facility is mapped as overlain alluvium.

The regional near-surface hydrostratigraphic units can be generalized into two aquifers: a shallow aquifer zone in more permeable soil (most prominently along the bank of the Ohio River) that may be present in the glacial drift and a deep aquifer in the underlying carbonate bedrock.

#### 4.3.3 *USDA Soil Survey*

The Soil Survey of Jefferson County maps the facility land as within the Huntington-Dearborn-Elkinsville association. These soils are deep, nearly level and gently sloping, well drained soils formed in alluvium or in silty and loamy material; on bottom land and terraces.

### **4.4 Historical Use Information**

The objective in consulting historical sources is to develop a history of the previous uses or occupancies of the Property and the surrounding area in an effort to identify those uses or occupancies that are likely to have resulted in the presence of a Finding in connection with the Property.

According to ASTM E 1527-13, identifying prior uses of the Property is a two-tiered process. The first step is to evaluate uses of the Property from the present back to the year 1940 using *standard historical sources*. The second step involves assessing the uses of the Property prior to the year 1940, or until a time when the Property was not yet developed, again using *standard historical sources*.

#### 4.4.1 Standard Historical Sources

WCG obtained and reviewed the following *standard historical sources* as part of this report:

- Historical USGS 7.5-minute quadrangle maps; and,
- Historical fire insurance maps;

Our review of *standard historical sources* obtained during this Phase I ESA is presented in the following sections. Copies of the historical records that we obtained are included in **Appendix F - Historical Records Documentation**. Summaries of the information provided with each *standard historical source* are discussed in the proceeding sections.

##### 4.4.1.1 Historical USGS Topographic Maps

WCG downloaded and reviewed historical USGS topographic maps obtained from Indiana University's Spatial Data Portal at <http://gis.iu.edu/>. The following table summarizes the findings of our review with respect to the Property and adjoining properties:

HISTORICAL TOPOGRAPHIC MAPS		
Map Name and Size	Date	Observations
Madison East Quadrangle	1948	The Property and adjoining area indicate urban development of the type currently represent.
Madison East Quadrangle	1953	The Property and adjoining area indicate urban development of the type currently represent.
Madison East Quadrangle	1971 PR 1987,MR 1994	The Property and adjoining area indicate urban development of the type currently represent.

Our review of the historical USGS topographic maps of the Property revealed no indications of any apparent conditions that would represent a Finding for the Property. Copies of the historical USGS topographic maps reviewed are included in **Appendix F - Historical Records Documentation**.

#### 4.4.1.2 Fire Insurance Maps

WCG reviewed historical Sanborn maps providing nearly complete coverage of the Property from 1961 to 1886 (or 1897). Historical land use at several locations were identified as Findings (or *recognized environmental conditions*) based on a likelihood of petroleum products or hazardous substances. WCG's Findings judged to also represent *recognized environmental conditions* include the following:

1. The commercial property located at 901 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961).
2. The commercial property located at 814 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961).
3. The commercial property located at 902 E. Second Street is identified as a filling station in the *fire insurance map* of 1961.
4. The commercial property located at 822 E. First Street is identified as a filling station in the *fire insurance map* of 1961.
5. The commercial property located at 928 Park Avenue is identified as a brewery in the *fire insurance maps* of 1961 to 1892. A machine shop is indicated as well in the map of 1961.
6. The currently residential properties located at 906, 910, and 918 E. Second Street, and 903 E. First Street, are identified as being part of an historic tannery facility as shown on fire insurance maps of 1911, 1904, and 1892.

Additional Findings from WCG's review of the fire insurance maps not considered *recognized environmental conditions* based on their expected cross-gradient or downgradient positions with respect to the Property include the following:

1. Boiler room at the historic Meese, Inc. shipping container factory southwest of the Property.
2. Oil house at the historic Meese, Inc. shipping container factory southwest of the Property.
3. Historic dry cleaner along the west side of Ferry Street, south of the Property.
4. Engine room at the historic Harvey Paper Company formerly located beneath what is now the northern approach to the Milton-Madison Bridge.

Annotated copies of the historical fire insurance maps reviewed are included in **Appendix F - Historical Records Documentation**.

#### 4.4.1.3 Recorded Land Title Records

Property cards summarizing information contained in recorded land title records were reviewed by WCG to identify current or prior ownership suggesting the presence of petroleum products or hazardous substances. Current and prior owners were found to be mainly private individuals or couples, or companies with names not suggesting the use of petroleum products or hazardous substances. No specific Findings were obtained by WCG based on review of this information. Copies of the property cards are provided in **Appendix E – Environmental Records and Interview Documentation**.

#### 4.4.1.4 Local Street Directories

Local street directories were not reviewed as part of this Phase I ESA.

#### 4.4.1.5 Historical Reports

No historical reports other than the Red Flag Report already discussed were reviewed during this Phase I ESA.

#### 4.4.2 *Historical Use Information on the Property*

Based on historical resources, Madison was platted in 1810 and the first lots were sold in 1811 (Wikipedia, 2016). Review of *standard historical sources* indicates that residential development and historic industries including a brewery and a tannery were present and mapped by 1886. Parcels considered for acquisition under Alternatives 4 and 6 are largely commercial, and include several that appear to have been originally developed as dwellings during the 19<sup>th</sup> Century, later redeveloped as automotive filling stations during the mid-20<sup>th</sup> Century, and mostly currently, they are utilized for retail or automotive sales or service purposes. The current and historic use of parcels considered under Alternative 8 are more varied, including a religious organization, an historic brewery, an historic tannery, and many that remain developed and uses as dwellings since the 19<sup>th</sup> Century.

Data failure is indicated by the lack of documentation of land use prior to 1886, but given the information available from 1886 until 1961, this is not considered a significant data gap by WCG.

#### 4.4.3 Historical Use Information on Adjoining Properties

The historical use of adjoining properties was found to be mainly residential. An historic school along Ferry Street and a church are not considered significant Findings by WCG.

### 4.5 Vapor Encroachment Screen

WCG conducted a Tier 1 Vapor Encroachment Screen (VES) in general accordance with the ASTM E 2600-10 Standard (Standard) as part of this Phase I ESA. This included a review of potential vapor encroachment sources through information provided by the Radius Report, historical sources, and observations made during our *site reconnaissance*.

Based on our review of available information, potential VECs were identified in association with recognized environmental conditions as listed below:

1. The commercial property located at 901 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961).
2. The commercial property located at 814 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961).
3. The commercial property located at 902 E. Second Street is identified as a filling station in the *fire insurance map* of 1961.
4. The commercial property located at 822 E. First Street is identified as a filling station in the *fire insurance map* of 1961.
5. The commercial property located at 928 Park Avenue is identified as a brewery in the *fire insurance maps* of 1961 to 1892. A machine shop is indicated as well in the map of 1961.

## 5 SITE RECONNAISSANCE

---

WCG representative Ms. Patricia Kostro conducted the *site reconnaissance* on November 2, 2016. During the *site reconnaissance*, weather conditions were sunny, no precipitation, with light winds from the east, and a temperature of approximately 70 degrees Fahrenheit. The following sections summarize observations made during the *site reconnaissance*.

### 5.1 Methodology and Limiting Conditions

WCG's *site reconnaissance* methods included a *site visit* to *visually and/or physically observe* reasonably accessible locations of the Property in an effort to obtain information indicating the likelihood of identifying *recognized environmental conditions* in connection with the Property. Ms. Kostro traversed the Property by foot to observe conditions during the *site reconnaissance*.

The traverse included not only the boundary outlined in the EDR Summary Radius Map Report Inquiry Number: 4763176.2s, but, the specific parcels that would be affected by the new proposed corridor for the US 421 New Road Construction Project. K & S Engineering, Inc. forwarded exhibits for three Alternatives (4, 6, and 8) prepared by CMT. The photographs taken to document conditions encountered at the time of the *site reconnaissance* are presented in **Appendix C – Photographic Documentation**.

WCG also *visually and/or physically observed* adjoining properties from reasonably accessible locations on the Property and public thoroughfares. Limiting conditions encountered at the Property during the *site reconnaissance* are included in **Section 1.5**. Non-scope considerations are discussed further in **Section 6.0**.

### 5.2 General Setting and Observations

Please refer to **Section 2.0** of this *report* for a description of the general setting, adjoining public thoroughfares, utilities, and potable water supply and **Section 4.3** for a description of topographic and geologic/hydrogeologic conditions with respect to the Property.

During the *site visit*, WCG noted the residential and commercial property parcels in relation to the three Alternatives. The parcels were examined to establish Findings on the Property and identify *recognized environmental conditions*. This included documented and undocumented sources. This historic area of Madison, Indiana was established in the late 19<sup>th</sup> Century and the majority of structures (commercial or residential) were built at this time. The general area is residential and wooded with the exception of Harrison Street which is the thoroughfare to the

Milton-Madison Bridge and is lined with historic filling stations. To the east of Harrison Street along the Ohio River is an area containing mostly inns.

The following sections summarize WCG's *site reconnaissance* observations.

### 5.3 Interior and Exterior Observations

As noted in **Section 2.3**, the Property is a historic residential area with residential and commercial structures. Historic uses for the Property include dwellings, businesses, filling stations, a tannery, and a machine shop. The following was observed on the Property during our *site visit*.

#### 5.3.1 Hazardous Substances and Petroleum Products in Connection with Identified Uses

WCG did not observe any chemicals stored or used on the exterior of Property. The interior structures on the Property were not entered or assessed.

WCG did not observe any wastes stored or generated on the Property aside from typical municipal solid waste.

#### 5.3.2 Storage Tanks

##### 5.3.2.1 Underground Storage Tanks (USTs)

WCG observed no apparent surficial indications of USTs (e.g., fill pipes, vent lines, or manways) on the Property during the *site visit*. However, as listed on IDEM's Virtual Filing Cabinet, there are USTs currently or formerly located on the Property:

- 814 E. Second Street
  - (2) 4,000-gal steel tanks (gasoline) – Permanently Out of Service
  - (1) 6,000-gal steel tank (gasoline) – Permanently Out of Service
  - (1) 1,000-gal steel tank (other) – Permanently Out of Service
- 150 E. Harrison Street
  - (2) 10,000-gal steel tanks (gasoline) – Violation in 2016
  - (3) 3,000-gal steel tanks (gasoline) – Permanently Closed in 1992
  - (1) 3,000-gal steel tanks (kerosene) – Permanently Closed in 1992
  - (1) 2,000-gal steel tanks (diesel) – Permanently Closed via Removal in 2011
  - (1) 30-gal steel tanks (other)
- 902 E. Second Street
  - (2) unknown-gal unknown material tanks (gasoline) – Permanently Out of Service

#### 5.3.2.2 Aboveground Storage Tanks (ASTs)

WCG observed no apparent surficial indications presence of ASTs on the Property during the *site visit*.

#### 5.3.3 *Odors*

WCG observed no apparent unusual odors on the Property during the *site visit*.

#### 5.3.4 *Pools of Liquid*

WCG observed no apparent pools of liquid on the Property during the *site visit*.

#### 5.3.5 *Pits, Ponds, and Lagoons*

WCG observed no apparent pits, ponds or Lagoons during the *site visit*.

#### 5.3.6 *Drums*

WCG observed no apparent drums during the *site visit*.

#### 5.3.7 *Hazardous Substance or Petroleum Product Containers*

WCG observed no apparent *hazardous substance or petroleum product* containers during the *site visit*.

#### 5.3.8 *Unidentified Substances Containers*

No apparent unidentified substance containers were observed on the Property or adjoining properties during the *site visit*.

#### 5.3.9 *Polychlorinated Biphenyls (PCBs)*

Although a detailed review of all suspected PCB-containing equipment is beyond the scope of this Phase I ESA, WCG conducted a limited evaluation of the Property in an effort to identify the presence and condition of electrical or hydraulic equipment that is known to or is likely to contain PCBs in insulating or lubricating materials which may be represent a Finding for the Property. PCB-containing equipment and any of its leaked material that may have impacted the Property could be subject to certain regulatory requirements, such as the Federal Toxic Substances Control Act (TSCA), in addition to being identified as a potential *recognized environmental condition* for the Property.

Numerous pole-mounted electrical transformers were observed during the *site visit*, but no obvious indications of releases were observed in association with these facilities.

#### 5.3.10 *Stains or Corrosion*

Apparent stains were located at the historic filling station sites which is indicative of this type of business. According to our observations, the asphalt surfaces exhibiting staining were observed to be in good general condition with no visual indications of cracks and/or joints and regarded as de minimis conditions by WCG.

#### 5.3.11 *Drains and Sumps*

No apparent drains or *sumps* were observed on the Property during the *site visit* except for the stormwater drainage system that runs north to south on the parcels located at 112 Sering Street to 144 Sering Street and ends on Second Street.

#### 5.3.12 *Stained Soil or Pavement*

Apparent stains were located at the historic filling station sites which is indicative for this type of business. According to our observations, the asphalt surfaces exhibiting staining were observed to be in good general condition with no visual indications of cracks and/or joints and regarded as de minimis conditions by WCG.

#### 5.3.13 *Stressed Vegetation*

No apparent stressed vegetation due to releases of chemicals or petroleum products was observed on the Property during the *site visit*.

#### 5.3.14 *Solid Waste*

No apparent evidence of surficial or buried material such as trash, *construction debris*, *demolition debris*, or other solid waste was observed on the Property during the *site visit*.

#### 5.3.15 *Wastewater, Wells, Septic Systems*

**Section 2.4** describes potable and *wastewater* services provided to the Property and our observations concerning storm water. No apparent wells, septic systems, cesspools, or other sources of wastewater were observed on the Property during the *site visit*.

## 6 NON-SCOPE CONSIDERATIONS

---

According to ASTM E 1527–13, there are certain constituents of potential concern not necessarily covered by CERCLA’s “all appropriate inquiries”, which are considered “additional services”. As such the *user* may choose not to include these items. ASTM identifies these items as follows:

- Suspect Asbestos-Containing Materials;
- Biological Agents;
- Cultural and Historic Resources;
- Ecological Resources;
- Endangered Species;
- Health and Safety;
- Indoor Air Quality (unrelated to releases into the environment);
- Industrial Hygiene;
- Lead-Based Paint;
- Lead in Drinking Water;
- Mold;
- Radon;
- Regulatory Compliance; and
- Wetlands.

For the purpose of this Phase I ESA, these items are therefore excluded from this Phase I ESA unless an item is specifically selected by the *user*. No additional non-scope services were requested by the *user* as part of this Phase I ESA.

## 7 INTERVIEWS

---

WCG representative Ms. Patricia Kostro conducted *interviews* of select individuals possessing knowledge of the current and past Property uses in an effort to obtain information concerning the potential presence of *recognized environmental conditions*. Such individuals consist of persons or local agency officials that may have records or knowledge of events or conditions that are not evident during the *site reconnaissance* or records review.

### 7.1 Interview with Owner(s)

Individual Property owners were not interviewed during this Phase I ESA, which is identified by WCG as an exception to the ASTM standard.

### 7.2 Interview with Key Site Manager(s)

Key site managers were not interviewed during this Phase I ESA, which is identified by WCG as an exception to the ASTM standard.

### 7.3 Interviews with Occupant(s)

WCG interviewed Mr. Mike Anderson who identified himself as the occupant of the Property at 822 E. First Street concerning the current and past use of the Property, the facility operations, and recent improvements to the Property. Mr. Anderson has been associated with the Property since the mid-1970s. WCG obtained Mr. Anderson's interview responses during our site visit. The interview responses are included throughout the report. He indicated a recollection of the removal of USTs from 822 E. First Street and 901 E. First Street. WCG considers this a Finding and a *recognized environmental condition* by WCG. A record of this interview is provided in **Appendix E**.

### 7.4 Interviews with Past Owner(s), Operator(s), and Occupant(s)

WCG was not provided information concerning the past owners, operators or occupants; therefore, past owners, operators, and occupants were not interviewed as part of this Phase I ESA. WCG identified this lack of a required interview as a *data gap*, which is discussed further in **Section 9.0**.

### 7.5 Interviews with Adjoining Property Owner(s) or Occupant(s)

The Property is not abandoned therefore the ASTM E 1527-13 does not require *interviews* of the adjoining Property *owners* or *occupants*.

## **7.6 Interviews with Local Government Official(s)**

WCG contacted the following local government agencies as discussed in **Section 4.2** during the Phase I ESA requesting environmental information associated with the Property:

- City of Madison Planning Commission; and
- Jefferson County Health Department.

Information obtained during our interviews (or attempted interviews) with local government officials, is discussed in **Section 4.2**.

## **7.7 Interviews with Others**

WCG interviewed Janice Barnes, Genealogy and Local History personnel at the Jefferson County Public Library. Janice indicated that she has lived in the community for 40 years. She reported recalling that the Property at 901 E. First Street was formerly a laundromat or drycleaners. She called her husband to verify and he reported a similar recollection. This Finding is considered a *recognized environmental condition* in connection with the Property.

## 8 FINDINGS, OPINIONS, CONCLUSIONS, AND RECOMMENDATIONS

---

WCG has performed this Phase I ESA, in general compliance with the scope and limitations of ASTM E 1527-13. Exceptions to or deletions from this practice are described in **Section 1.5** and **Section 10.0** of this report.

### 8.1 Findings and Opinions

Any known or suspect environmental conditions associated with the Property may be separated into the following categories: *recognized environmental conditions*, *historical recognized environmental conditions*, *controlled recognized environmental conditions* and *de minimis* conditions.

WCG has identified the following Findings in connection with the Property. A description of the Finding as well as our opinion of whether the Finding represents a *recognized environmental condition*, *historical recognized environmental condition*, *controlled recognized environmental condition* and *de minimis* condition is summarized below.

1. The commercial property located at 901 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961). This *finding*, in conjunction with observations during the site visit (see photograph No. 14 in **Appendix C**), and potential for releases of petroleum products from historical underground storage tank (UST) systems, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
2. The commercial property located at 814 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961). This *finding*, in conjunction with observations during the site visit (see photograph No. 15 in **Appendix C**), and potential for releases of petroleum products from historical UST systems. Documentation reviewed on the Indiana Department of Environmental Management's (IDEM) virtual file cabinet (VFC) indicates the possibility of four USTs (two (2) 4,000 gallon gasoline USTs, one (1) 6,000 gallon gasoline UST, and one (1) 1,000 gallon unknown UST) that are listed as Permanently Out of Service, but likely remain on the property. WCG concludes that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
3. The commercial property located at 902 E. Second Street is identified as a filling station in the *fire insurance map* of 1961. This *finding*, in conjunction with observations during

the site visit (see photograph No. 17 in **Appendix C**), and potential for releases of petroleum products from historical UST systems, together with documentation reviewed on the VFC indicating the presence of two USTs of unknown capacity leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.

4. The commercial property located at 822 E. First Street is identified as a filling station in the *fire insurance map* of 1961. This *finding*, in conjunction with observations during the site visit (see photograph No. 20 in **Appendix C**), and potential for releases of petroleum products from historical UST systems, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
5. The commercial property located at 928 Park Avenue is identified as a brewery in the *fire insurance maps* of 1961 to 1892. A machine shop is indicated as well in the map of 1961. This *finding*, in conjunction with the potential for releases of petroleum products or hazardous substances during historical machine shop operations, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
6. The residential properties currently located at 906, 910, and 918 E. Second Street, and 903 E. First Street, are identified as being part of an historic tannery facility as shown on fire insurance maps of 1911, 1904, and 1892. This finding, in conjunction with the potential for releases of hazardous substances during tannery operations, leads WCG to conclude that this condition represents a *recognized environmental condition* in connection with the Property.
7. The commercial property located at 901 E. First Street is suspected by WCG to have been utilized at least in part as a filling station and/or drycleaners based on interviews with a local individual. This *finding*, in conjunction with observations during the site visit (see photograph No. 21 in **Appendix C**), and potential for releases of petroleum products from historical UST systems or hazardous substances from an historical dry cleaning operation, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.
8. The commercial property located at 114 Sering Street is suspected by WCG to be an historical filling station based on its architecture and location along a thoroughfare. This *finding*, in conjunction with observations during the site visit (see photograph No. 7 in

**Appendix C)**, and potential for releases of petroleum products from UST systems, leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.

9. The commercial property at 150 Harrison Street is a non-operating historical and current filling station. By way of correspondence dated December 5, 2016, the IDEM cited the responsible party for violation of UST regulations in connection with the two (2) 10,000 gallon USTs for not being properly closed. The IDEM further stated that both tanks still contain 3 or 4 inches of fuel. Previously, the IDEM assigned Incident No. 200910514 following a site inspection that observed stained pea gravel and adsorbent pads beneath the diesel dispenser. Subsequent inspections suggest the remaining on-site tanks did not undergo any type of temporary closure measures. Additionally, the associated piping and dispensers remain on-site. This *finding*, in conjunction with observations during the site visit (see photograph No. 19 in **Appendix C)**, and potential for releases of petroleum products from historical UST systems leads WCG to conclude that this condition represents a *recognized environmental condition* and VEC in connection with the Property.

Additional Findings from WCG's review of the fire insurance maps not considered *recognized environmental conditions* based on their expected cross-gradient or downgradient positions with respect to the Property include the following:

1. Boiler room at the historic Meese, Inc. shipping container factory southwest of the Property.
2. Oil house at the historic Meese, Inc. shipping container factory southwest of the Property.
3. Historic dry cleaner along the west side of Ferry Street, south of the Property.
4. Engine room at the historic Harvey Paper Company formerly located beneath what is now the northern approach to the Milton-Madison Bridge.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of *controlled recognized environmental conditions* in connection with the Property.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of historical environmental conditions in connection with the Property except for the following:

1. The commercial property located at 150 Harrison Street is identified as a filling station in the *fire insurance map* of 1961. A 2,000 gallon diesel UST was closed via removal from this commercial property in March of 2011 along with the removal of approximately 53.57 tons of impacted soil according VFC documents reviewed by WCG. The IDEM granted no further action (NFA) status for Incident No. 200910514 in a letter dated October 22, 2012, following the removal of the 2,000 gallon diesel UST. WCG therefore concludes that the former 2,000-gallon diesel fuel UST represents an *historical recognized environmental condition* in connection with the Property.

## 8.2 Conclusions

WCG performed this Phase I ESA, in general compliance with the scope and limitations of ASTM E 1527-13 of US 421 New Roadway Construction project in Jefferson County, Madison, Indiana. Exceptions to, or deletions from, this practice are described in **Section 1.5** and **10.0** of this *report*.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of *recognized environmental conditions* in connection with the Property, except for the following where releases of petroleum products or hazardous substances to the soil, groundwater, or structures is considered reasonably likely:

1. The commercial property located at 901 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961).
2. The commercial property located at 814 E. Second Street is identified as a filling station in several *fire insurance maps* (1948 and 1961).
3. The commercial property located at 902 E. Second Street is identified as a filling station in the *fire insurance map* of 1961.
4. The commercial property located at 822 E. First Street is identified as a filling station in the *fire insurance map* of 1961.
5. The commercial property located at 928 Park Avenue is identified as a brewery in the *fire insurance maps* of 1961 to 1892. A machine shop is indicated as well in the map of 1961.
6. The currently residential properties located at 906, 910, and 918 E. Second Street, and 903 E. First Street, are identified as being part of an historic tannery facility as shown on fire insurance maps of 1911, 1904, and 1892.

7. The commercial property located at 901 E. First Street is suspected by WCG to have been utilized at least in part as a filling station and/or drycleaner's based on interviews with a local individuals.
8. The commercial property located at 114 Sering Street is suspected by WCG to be an historical filling station based on its architecture and location along a thoroughfare.
9. The commercial property located at 150 Harrison Street is suspected by WCG to be a non-operating historical and current filling station.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of *controlled recognized environmental conditions* in connection with the Property.

Based upon the assessments described in this *report*, this Phase I ESA has revealed no evidence of *historical recognized environmental conditions* in connection with the Property except for the following:

1. The commercial property located at 150 Harrison Street is identified as a filling station in the *fire insurance map* of 1961, but received an unrestricted letter from the IDEM connection with a 2000 gallon leaking underground storage tank incident.

### **8.3 Recommendations**

With consideration for the likelihood that soil, groundwater, or structures such as drains and sewers might be adversely affected by the *recognized environmental conditions* identified above, WCG recommends that Phase II ESA activities be undertaken. Such Phase II ESA activities should include all areas where *recognized environmental conditions* identified herein. Additionally, WCG notes particularly where existing improvements require demolition to facilitate the project; asbestos inspections should be conducted in accordance with state law. Moreover, WCG notes that certain sources of petroleum projects and hazardous substances are very difficult to identify during a Phase I ESA either because they are not typically recorded in standard information sources or are difficult to visually identify. Examples may include home heating oil storage tanks, water wells, septic systems, or cesspits that should be expected to be encountered during extensive demolition and/or subsurface work, particularly along new alignments such as proposed in Alternative 8.

## 9 DATA GAPS

---

ASTM E 1527-13 defines a *data gap* as lack of or inability to obtain information required by the practice despite *good faith* efforts by the *environmental professional* to gather such information.

WCG was unable to identify the first developed use of the Property based on the *reasonable ascertainable* information gathered from *standard historical sources*. Therefore, this *data gap* is considered a *data failure*. Based on *reasonably ascertainable* existing historical records for the Property and the nature of the historical property uses as agrarian, WCG believes that this *data gap* would not be significant in our assessment of whether *recognized environmental conditions* exist on the Property.

User-provided information has not been received as of yet. Therefore, this *data gap* is considered a *data failure*.

## 10 DEVIATIONS

---

Deletions and deviations from ASTM E 1527-13 during this Phase I ESA are described in **Section 1.5** of this *report*.

## 11 REFERENCES

---

The following references not provided or documented in the Appendices includes the following:

1. American Society for Testing Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13).
2. USDA Soil Survey of Jefferson County.
3. Geologic references.

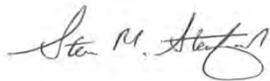
## 12 SIGNATURE OF ENVIRONMENTAL PROFESSIONAL

---

"I, declare that, to the best of my professional knowledge and belief, I meet the definition of *environmental professional* as defined in §312.10 of 40 CFR 312" and

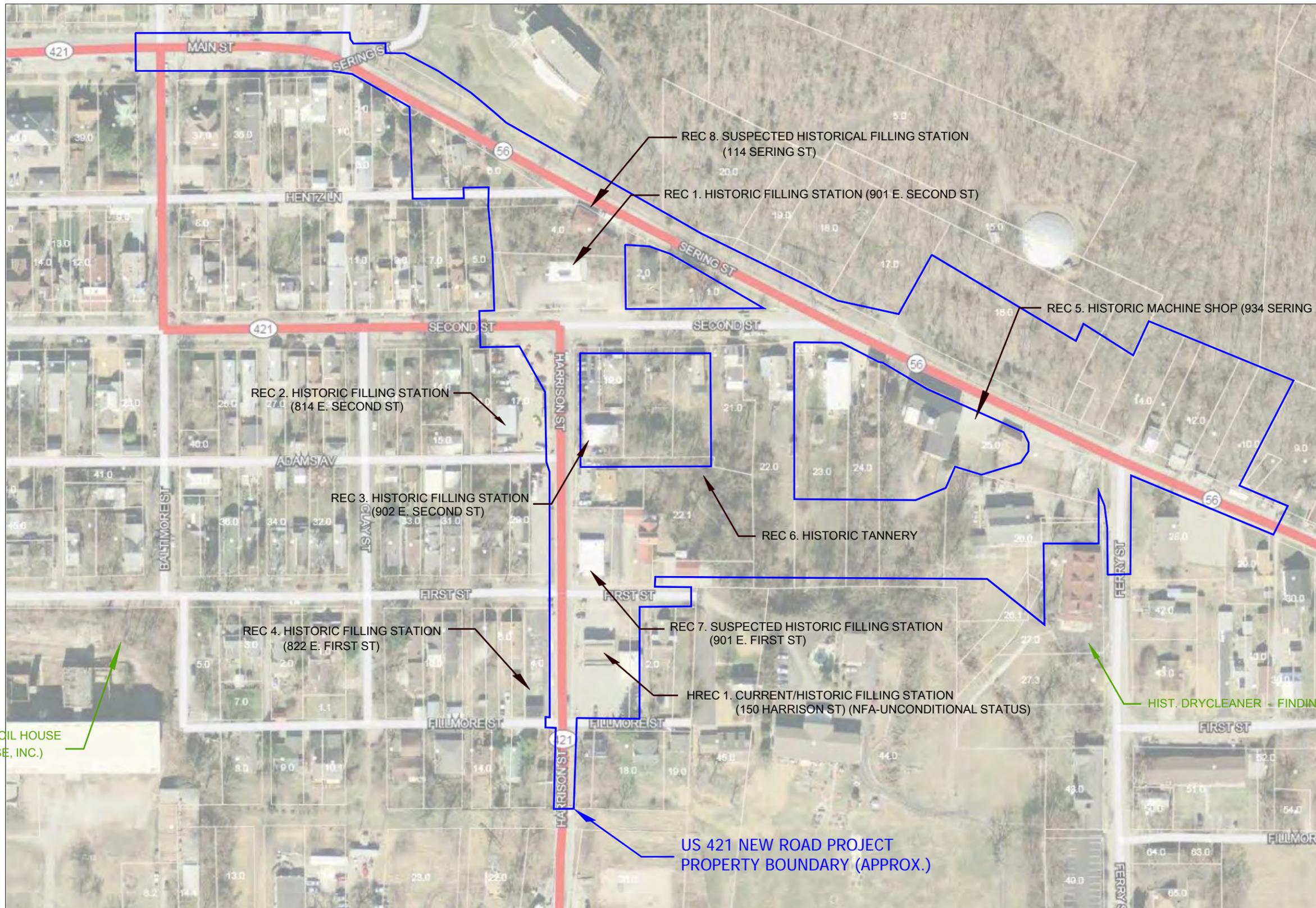
"I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."

This Phase I ESA was performed by, or under direct supervision of, the undersigned *environmental professional*. Resumes are included in **Appendix G - Personnel Qualifications**.



---

Steven M. Stanford, Indiana LPG #968  
Environmental Practice Group, Granger Operations Manager

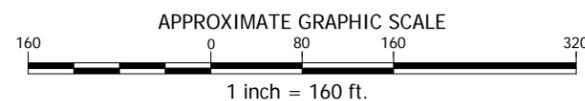


SOURCE: <http://jefferson.in.wthgis.com/>

EXPLANATION:

- - PHASE I PROPERTY BOUNDARY (APPROX.)
- HIST. DRYCLEANER - FINDING UNLIKELY TO IMPACT PROPERTY
- 1. HIST. FILLING STATION - RECOGNIZED ENVIRONMENTAL CONDITION (TYP.)

COPYRIGHT © 2016 WEAVER CONSULTANTS GROUP. ALL RIGHTS RESERVED.



PREPARED FOR:  
**INDIANA  
DEPARTMENT OF  
TRANSPORTATION**

**PROPERTY MAP**  
US 421 NEW ROADWAY CONSTRUCTION  
JEFFERSON COUNTY, INDIANA

REUSE OF DOCUMENTS  
THIS DOCUMENT, AND THE DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF WEAVER CONSULTANTS GROUP, AND IS NOT TO BE USED IN WHOLE OR IN PART, WITHOUT THE WRITTEN AUTHORIZATION OF WEAVER CONSULTANTS GROUP.

**Weaver  
Consultants  
Group**

GRANGER, INDIANA  
(574) 271-3447 www.wcgrp.com

DRAWN BY: SMS  
REVIEWED BY: PK  
DATE: 11/02/2016  
FILE: 4462-351-02  
CAD: US 421 F.2.dwg

**FIGURE 2**

## Adam Burns

---

**From:** Foheybreting, Nicole K <NFoheyBreting@indot.IN.gov>  
**Sent:** Monday, January 9, 2017 12:41 PM  
**To:** Adam Burns  
**Cc:** Mathas, Marlene; Harrington, Susan  
**Subject:** RE: 1400918 - Project 421 - Phase I ISA  
**Attachments:** ENV PhaseIESA 1400918 for Roadway Services \_Approved NFB 1-9-17 reduced.pdf

Good afternoon Adam –

I hope you had a great weekend. Thank you for making the edits and updates to the Phase I for Des No. 1400918 – Project 421, dated November 5<sup>th</sup> and Revised December 28, 2016 (reduced file attached).

Based on my current understanding, it appears as though the preferred alternative(s) that this project is leaning toward will not include the purchase of property or subsurface work in the vicinity of the historical dry cleaning facility near Park Avenue and Ferry Street. Therefore, based on this current standing, the need to complete additional investigation associated with the historical dry cleaner does not appear warranted. If the scope of the project changes and Alignment 8 is selected, then it would be beneficial to include the historical dry cleaner in the Phase II investigation.

Overall, the Phase I appears to have identified several RECs within the proposed project area and the determinations and recommendations in the Phase I appear rational and warranted.

Please let me know if there are any questions or concerns or if I can be of any additional assistance.

Sincerely,  
Nicole

### Nicole Fohey-Breting

#### *HazMat Specialist*

100 North Senate Avenue RM N642

Indianapolis, Indiana 46204

**Office:** (317) 232-0626

**Email:** [NFoheyBreting@indot.in.gov](mailto:NFoheyBreting@indot.in.gov)



---

**From:** Adam Burns [mailto:aburns@cmtengr.com]  
**Sent:** Friday, January 06, 2017 3:09 PM  
**To:** Foheybreting, Nicole K <NFoheyBreting@indot.IN.gov>  
**Subject:** RE: 1400918 - Project 421 - Phase I ISA

**\*\*\*\* This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. \*\*\*\***

No worries Nicole. Thank you.

**ADAM J. BURNS. P.E., MBA | Project Manager**

---

# PHASE II LIMITED SUBSURFACE INVESTIGATION

US 421 NEW ROADWAY CONSTRUCTION

DES NO. 1400918

MADISON, JEFFERSON COUNTY, INDIANA

PREPARED FOR:

**CRAWFORD, MURPHY & TILLY**

DECEMBER 1, 2017

Prepared by:



**Complex Environment. Creative Solutions.**

6971 Hillside Court  
Indianapolis, IN 46256  
Telephone: 317.400.1633  
[www.metricenv.com](http://www.metricenv.com)

**SIGNATURES OF ENVIRONMENTAL PROFESSIONALS**  
**PHASE II LIMITED SUBSURFACE INVESTIGATION REPORT**  
**DES NO. 1400918 US 421 NEW ROADWAY CONSTRUCTION PROJECT**  
**MADISON, JEFFERSON COUNTY, INDIANA**

This Phase II Limited Subsurface Investigation Report was prepared by Metric Environmental, LLC (Metric) for Crawford, Murphy & Tilly.

  
\_\_\_\_\_  
QA/Technical Reviewer: 12-1-2017  
Date  
Vince Epps, CHMM, LEED® AP  
Vice President/Senior Environmental Scientist

  
\_\_\_\_\_  
Project Manager: 12-1-2017  
Date  
Charlotte Bramble  
Senior Project Manager

  
\_\_\_\_\_  
Prepared by: 12-1-2017  
Date  
Kennita Jones  
Environmental Geologist

## TABLE OF CONTENTS

<b>SIGNATURES OF ENVIRONMENTAL PROFESSIONALS .....</b>	<b>I</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>III</b>
<b>1.0 INTRODUCTION .....</b>	<b>1</b>
<b>2.0 FIELD ACTIVITIES .....</b>	<b>2</b>
2.1 SOIL BORINGS.....	2
<b>3.0 FINDINGS .....</b>	<b>6</b>
3.1 SOIL ANALYTICAL RESULTS .....	6
<b>4.0 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>8</b>
<b>5.0 REFERENCES .....</b>	<b>10</b>
<b>APPENDIX A - EXHIBITS .....</b>	<b>A</b>
EXHIBIT 1 – SITE VICINITY MAP .....	A
EXHIBIT 2 – SOIL BORING LOCATIONS .....	A
EXHIBIT 3A-1 – SOIL ANALYTICAL RESULTS (VOCs) .....	A
EXHIBIT 3A-2 – SOIL ANALYTICAL RESULTS (VOCs CONT.) .....	A
EXHIBIT 3B-1 – SOIL ANALYTICAL RESULTS (PAHs) .....	A
EXHIBIT 3B-2 – SOIL ANALYTICAL RESULTS (PAHs CONT.) .....	A
EXHIBIT 3C-1 – SOIL ANALYTICAL RESULTS (RCRA METALS) .....	A
EXHIBIT 3C-1 – SOIL ANALYTICAL RESULTS (RCRA METALS CONT.) .....	A
<b>APPENDIX B - BORING LOGS .....</b>	<b>B</b>
<b>APPENDIX C – TABLES .....</b>	<b>C</b>
TABLE 3A – SOIL ANALYTICAL RESULTS (VOCs) .....	C
TABLE 3B – SOIL ANALYTICAL RESULTS (PAHs).....	C
TABLE 3C – SOIL ANALYTICAL RESULTS (RCRA METALS/LEAD) .....	C
<b>APPENDIX D - DEFINITIONS AND ACRONYMS .....</b>	<b>D</b>
<b>APPENDIX E - LABORATORY ANALYTICAL RESULTS .....</b>	<b>E</b>

## EXECUTIVE SUMMARY

Metric performed a Phase II Limited Subsurface Environmental Site Assessment for the US 421 New Roadway Construction Project, located in Madison, Jefferson County, Indiana. The project begins at the intersection of East 2<sup>nd</sup> Street & Harrison Street. The project consists of portions of East 2<sup>nd</sup> Street east and west of the Harrison Street intersection before terminating south along Harrison Street, ending just north of the Fillmore Street intersection. The project limits also included portions of Sering Street northwest and southeast of the East 2<sup>nd</sup> Street intersection.

During a Phase I ESA conducted by Weaver Consultants Group in 2016, Weaver Consultants identified nine *recognized environmental conditions* (RECs) associated with current and former uses along the project corridor. Based on recommendations in the Phase I ESA, and following a review by the Indiana Department of Transportation (INDOT), twenty-one (21) soil boring locations were proposed for soil sampling within the US 421 New Roadway Construction project area. In the project area located south of Fillmore Street to Second Street, utility work to a depth of approximately 6 feet below ground surface (bgs) is proposed; therefore, soil boring depths in this area were proposed to a maximum depth of 10 feet bgs. In the northern portion of the project area from Second Street north to Main Street, potential utility work and excavation to grade are proposed; therefore, soil boring depths in this area were proposed to a maximum depth of 20 feet bgs. Groundwater within the region is typically encountered at a depth below 30 feet bgs and was not encountered during this investigation; therefore, groundwater samples were not collected.

Metric advanced a total of 21 soil borings along the project corridor. Soil samples were collected from each of the soil borings and analyzed for contaminants of concern (COCs) commonly associated with the RECs identified in the Phase I ESA.

Samples collected from twenty (20) of the soil borings were submitted for laboratory analysis of VOCs, lead, and PAHs. Soil samples collected from soil boring 421-SB-21 were submitted for laboratory analysis of VOCs and RCRA metals.

Results of all soil samples collected were compared to the 2017 Indiana Department of Environmental Management Remediation Closure Guide Screening Levels (IDEM RCG SLs) for regulatory guidance. Specifically soil samples were compared to the IDEM RCG soil migration to groundwater (MTG) and residential direct contact SLs.

Based on the results of the collected soil data, Metric presents the following conclusions:

- Concentrations of 1, 2, 4-trimethylbenzene were detected in samples 421-SB-19 (0'-2') and 421-SB-19 (6'-8') at 2.8 mg/kg and 0.45 mg/kg respectively, above the applicable IDEM RCG MTG SL of 1.6 mg/kg and below the applicable residential direct contact SL of 220 mg/kg.

- Naphthalene was detected in soil samples 421-SB-08 (0'-2') and sample 421-SB-19 (2'-4') at 0.79 mg/kg and 1.1 mg/kg respectively, above the applicable IDEM RCG soil MTG SL of 0.11 mg/kg, but below the residential direct SL of 53 mg/kg.
- 1-methylnaphthalene was detected in soil sample 421-SB-19 (2'-4') at a concentration of 1.3 mg/kg above the applicable IDEM RCG MTG SL of 1.2 mg/kg, but below the applicable residential direct contact SL of 250 mg/kg.
- Arsenic was detected in soil sample 421-SB-21 (0'-2') at a concentration of 8.3 mg/kg above the applicable IDEM RCG MTG SL of 5.9 mg/kg, but below the residential direct contact SL of 9.5 mg/kg. The arsenic concentration is within anthropogenic background concentrations commonly encountered within urban environments in Indiana which can range from undetectable concentrations up to approximately 13 mg/kg; therefore, the detectable concentration of arsenic encountered during this Phase II LSI does not appear to be attributable to a specific release.
- Lead concentrations above laboratory detection limits were reported in all of the soil samples collected with the exception of soil sample 421-SB-21 (8'-10'); however, the lead concentrations did not exceed the applicable soil MTG SL of 270 mg/kg or the Toxicity Characteristic Leaching Procedure (TCLP) screening level of 100 mg/kg.

Metric conducted the Phase II Subsurface Investigation of the US 421 project corridor to further assess the concerns listed in the preceding Phase I ESA conducted by Weaver in 2016. The purpose of this Phase II investigation is to identify existing soil impacts that may impair the project corridor and affect design, scope, schedule, and/or budget of construction activities during the proposed US 421 project.

None of the COC concentrations exceeded applicable TCLP screening levels and do not appear hazardous. However, soils excavated from areas where COC concentrations exceed the applicable IDEM RCG soil MTG SLs will be required to be properly disposed of in a municipal landfill. Additionally, workers who may come into contact with the impacted soils will be required to wear appropriate personal protective equipment (PPE), including disposable nitrile gloves to prevent any personal contact with impacted soils encountered at the site. Soil boring locations, depth intervals, and associated areas where COC concentrations exceed applicable SLs are summarized in the following table:

Soil Boring	Depth Interval	Parcel/Location
421-SB-08	0'-2'	910 E Second Street; Parcel: 39-13-02-141-021.000-007 South side of Second St. approximately 175 feet east of Harrison St.
421-SB-19	2'-4'	822 E First Street; Parcel: 39-13-02-144-004.000-007 West side of Harrison St. between First St. and Fillmore St.

---

Soil Boring	Depth Interval	Parcel/Location
<b>421-SB-20</b>	0'-2'	150 Harrison St.; Parcel: 39-13-02-144-003.000-007 East side of Harrison St. between First St. and Fillmore St.

Based on the results of this Phase II investigation, no further investigation of the soil is warranted at this time.

## 1.0 INTRODUCTION

Metric Environmental LLC. performed a Phase II Limited Subsurface Investigation (Phase II LSI) of the US 421 New Roadway Construction Project (the Project corridor), beginning at the intersection of East 2<sup>nd</sup> Street & Harrison Street. The project consists of portions of East 2<sup>nd</sup> Street east and west of the Harrison Street intersection before terminating south along Harrison Street, ending just north of the Fillmore Street intersection. Portions of Sering Street northwest and southeast of the East 2<sup>nd</sup> Street intersection were also included in this investigation.

This investigation was recommended as a result of the findings of the preceding Phase I Environmental Site Assessment (Phase I ESA) conducted by Weaver Consultants Group (Weaver) in 2016. A Site Vicinity Map is provided as **Exhibit 1** located in **Appendix A**.

The site is located approximately 0.5 miles east of downtown Madison. The project consists of right-of-way (ROW) and open lot space of a few properties along Harrison Street. The project is located in a mixed commercial/residential area.

According to the 2016 Phase I ESA conducted by Weaver, the following environmental concerns associated with the proposed Project were identified:

1. A former filling station located at 901 East 2<sup>nd</sup> Street.
2. A former filling station located at 814 East 2<sup>nd</sup> Street.
3. A former filling station located at 902 East 2<sup>nd</sup> Street.
4. A former filling station located at 822 East 1<sup>st</sup> Street.
5. A former machine shop located at 928 Park Avenue.
6. A former tannery located east of the East 2<sup>nd</sup> Street & Harrison Street intersection.
7. A suspect filling station located at 901 East 1<sup>st</sup> Street.
8. A suspect filling station located at 114 Sering Street.
9. A current filling station located at 150 Harrison Street.

Metric conducted this Phase II LSI of the proposed roadway construction limits to further assess the concerns listed above. Based on recommendations in the Phase I ESA, and following a review by the INDOT, twenty-one (21) soil boring locations were proposed for soil sampling within the US 421 New Roadway Construction project area. Metric proposed four (4) soil borings to a depth of 20 feet bgs from Second Street north to Main Street consistent with the excavation of existing ground surface to proposed grade and utility work presented in the proposed scope of construction activities. Metric proposed seventeen (17) soil borings to a depth of 10 feet bgs south of Fillmore Street to Second Street consistent with the potential utility and storm sewer excavation in the proposed construction scope of work. Since this a proposed roadway construction project, any impacts encountered associated with the above listed concerns are anticipated to be encountered at shallow depths within the soils; therefore, groundwater samples were not collected during this investigation.

## 2.0 FIELD ACTIVITIES

### 2.1 Soil Borings

Prior to advancing soil borings at the site, Indiana Underground Plant Protection Service (IUPPS) was contacted to mark public underground utilities. In addition to IUPPS, Ground Penetrating Radar Systems of Indiana (GPRS) a private utility locate company was contracted to conduct a limited geophysical survey of the proposed boring areas. A ground penetrating radar (GPR) instrument and electro-magnetic (EM) instrument were used by the private utility locate company to clear the proposed boring locations of any buried anomalies and/or utility lines that may impede the proposed borings.

On August 30, 2017, Metric advanced a total of twenty-one (21) soil borings along the proposed roadway construction limits. The borings were advanced using hydraulic direct-push dual tube techniques with a track-mounted Geoprobe<sup>®</sup> equipped with 4-foot steel samplers lined with dedicated, disposable acetate liners. Four of the borings located north of East 2<sup>nd</sup> Street were advanced until refusal was encountered or to a maximum depth of approximately 20 feet below ground surface (bgs), whichever was encountered first. The additional seventeen (17) soil borings were advanced until refusal or to a maximum depth of approximately 10 feet bgs, whichever was encountered first. Soil boring 421-SB-01 was intended to be advanced to a total depth of 20 feet bgs; however, limestone refusal was encountered at a depth of 16 feet bgs. Soil boring 421-SB-09 was intended to be advanced to a total depth of 10 feet bgs; however, heaving sand refusal was encountered at a depth of 8.5 feet bgs. Each boring that encountered probe refusal was offset 1-5 feet from the original location and reattempted. Up to two (2) additional offset attempts were conducted at each boring location where probe refusal occurred. Probe refusal reoccurred at corresponding or shallower depths in all offset borings conducted. Bedrock or hard till was suspected to be the cause of the probe refusal in each of the applicable borings.

A photoionization detector (PID) was utilized in the field to screen every two foot interval of each soil boring advanced for the presence of organic vapors. An elevated reading on a PID may indicate the presence of volatile organic compounds (VOCs) such as petroleum and/or chlorinated compounds. Soil lithology, PID measurements and any pertinent observations (i.e. staining, odors, etc.) while advancing the borings were recorded on soil boring logs. Soil boring logs are provided as **Appendix B**.

Three (3) sample intervals were selected from each of four 20-foot bgs borings for laboratory analysis, which were advanced north of East 2<sup>nd</sup> Street. In the additional seventeen (17) soil borings, two intervals were selected from each boring for laboratory analysis. In each of the soil borings sampled, one surface soil sample (0-2 feet – below sub base material) was collected for laboratory analysis. Additional sample intervals were selected for laboratory analysis based on a consideration of field observations, field screening using the PID, likely UST depth intervals, or likely migration pathways of constituents of concern (COCs).

EPA SW-846 Method 5035 was used to collect soil samples for VOC analysis. An approximately 5-gram soil sample was measured in the field using a Terra Core sampler from laboratory supplied Method 5035 field ready soil sampling kits and placed into each of the associated sample kit vials. Soil samples collected for laboratory analysis of polycyclic aromatic hydrocarbons (PAHs), lead, and RCRA Metals were placed into unused dedicated laboratory supplied 4 oz. jars. The soil samples were staged in a cooler on ice at approximately 4 degrees Celsius until they were submitted to the Pace Analytical laboratory in Indianapolis, Indiana under proper chain of custody documentation the following day. The boring locations are depicted in **Exhibit 2**. The boring locations and parameters analyzed during this project are summarized below in **Table 1**.

**Table 1: Soil Parameter Analysis Summary**

Boring Designation	Sample Depth (ft. bgs)	Location	Concern	Analyses (EPA SW-846)
421-SB-01	0-2 8-10 14-16	ROW – 114 Sering Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-02	0-2 6-8 18-20	Private Lot – 901 East 2 <sup>nd</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-03	0-2 8-10 18-20	Private Lot – 901 East 2 <sup>nd</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-04	0-2 6-8 18-20	Private Lot – 901 East 2 <sup>nd</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-05	0-2 8-10	ROW – 814 East 2 <sup>nd</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-06	0-2 6-8	ROW – 902 East 2 <sup>nd</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-07	0-2 8-10	ROW – 906 East 2 <sup>nd</sup> Street	Former filling station / tannery	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-08	0-2 8-10	ROW – 906 East 2 <sup>nd</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-09	0-2 4-6	ROW – 814 East 2 <sup>nd</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-10	0-2 8-10	ROW – 902 East 2 <sup>nd</sup> Street; along Harrison Street	Former filling station / tannery	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-11	0-2 8-10	ROW – 903 East 2 <sup>nd</sup> Street; along Harrison Street	Former filling station / tannery	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-12	0-2 8-10	ROW – 213 East Harrison Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-13	0-2 6-8	Private Lot – 901 East 1 <sup>st</sup> Street; along Harrison Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-14	0-2 8-10	ROW – 213 East Harrison Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-15	0-2 4-6	ROW – 901 East 1 <sup>st</sup> Street; along Harrison Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)

421-SB-16	0-2 6-8	ROW – 150 Harrison Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-17	0-2 6-8	Private Lot – 822 East 1 <sup>st</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-18	0-2 6-8	ROW – 150 Harrison Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-19	2-4 6-8	Private Lot – 822 East 1 <sup>st</sup> Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-20	0-2 6-8	ROW – 150 Harrison Street	Former filling station	VOCs (8260) Lead (6010) PAHs (8270)
421-SB-21	0-2 8-10	ROW – 928 Park Avenue	Former machine shop	VOCs (8260) RCRA Metals (6010)

PAHs = polycyclic aromatic hydrocarbons  
 VOCs = volatile organic compounds

### 3.0 FINDINGS

Laboratory analytical results of soil samples collected were compared to the most recent Indiana Department of Environmental Management (IDEM) Remediation Closure Guide (RCG) screening levels (SLs) including migration to groundwater (MTG) SLs and residential direct contact SLs.

Site data collected from field activities and laboratory analysis is summarized below.

#### 3.1 Soil Analytical Results

During field activities, an elevated organic vapor concentration and petroleum like odors were encountered at the 2'-6' bgs interval of soil boring 421-SB-19 (31.8 – 70.1 ppm). Elevated organic vapor measurements paired with petroleum odors are indicative of the presence of petroleum hydrocarbons in soil; however, no VOCs were detected above applicable MTG SLs in the soil samples analyzed, with the exception of 1,2,4-trimethylbenzene, naphthalene, 1-methylnaphthalene.

Samples collected from twenty (20) of the soil borings were collected and submitted for laboratory analysis of VOCs, lead, and PAHs. Soil samples collected from soil boring 421-SB-21 were submitted for laboratory analysis of VOCs and RCRA metals. Exceedances of the constituents in the soil samples collected are listed below:

- VOCs:
  - Concentrations of 1, 2, 4-trimethylbenzene were detected in samples 421-SB-19 (0'-2') and 421-SB-19 (6'-8') at 2.8 mg/kg and 0.45 mg/kg respectively, above the applicable IDEM RCG MTG SL of 1.6 mg/kg and below the applicable residential direct contact SL of 220 mg/kg.
- PAHs:
  - Naphthalene was detected in soil samples 421-SB-08 (0'-2') and sample 421-SB-19 (2'-4') at 0.79 mg/kg and 1.1 mg/kg respectively, above the applicable IDEM RCG soil MTG SL of 0.11 mg/kg, but below the residential direct SL of 53 mg/kg.
  - 1-methylnaphthalene was detected in soil sample 421-SB-19 (2'-4') at a concentration of 1.3 mg/kg above the applicable IDEM RCG MTG SL of 1.2 mg/kg, but below the applicable residential direct contact SL of 250 mg/kg.
- RCRA Metals:
  - Arsenic was detected in soil sample 421-SB-21 (0'-2') at a concentration of 8.3 mg/kg above the applicable IDEM RCG MTG SL of 5.9 mg/kg, but below the residential direct contact SL of 9.5 mg/kg. The arsenic concentration is within anthropogenic background concentrations commonly encountered within urban environments in Indiana which can range from undetectable concentrations up to approximately 13

mg/kg; therefore, the detectable concentration of arsenic encountered during this Phase II LSI does not appear to be attributable to a specific release.

- Lead concentrations above laboratory detection limits were reported in all of the soil samples collected with the exception of soil sample 421-SB-21 (8'-10'); however, these detectable concentrations of lead did not exceed the applicable soil MTG SL of 270 mg/kg or the TCLP screening level of 100 mg/kg.

None of the COC concentrations exceeded applicable TCLP screening levels and do not appear hazardous. However, soils excavated from areas where COC concentrations exceed the applicable IDEM RCG soil MTG SLs will be required to be properly disposed of in a municipal landfill. Additionally, workers who may come into contact with the impacted soils will be required to wear appropriate personal protective equipment (PPE), including disposable nitrile gloves to prevent any personal contact with impacted soils encountered at the site. Soil boring locations, depth intervals, and associated areas where COC concentrations exceed applicable SLs are summarized in the following table:

Soil Boring	Depth Interval	Parcel/Location
421-SB-08	0'-2'	910 E Second Street; Parcel: 39-13-02-141-021.000-007 South side of Second St. approximately 175 feet east of Harrison St.
421-SB-19	2'-4'	822 E First Street; Parcel: 39-13-02-144-004.000-007 West side of Harrison St. between First St. and Fillmore St.
421-SB-20	0'-2'	150 Harrison St.; Parcel: 39-13-02-144-003.000-007 East side of Harrison St. between First St. and Fillmore St.

Field boring logs are included in **Appendix B**. Soil analytical results are summarized in attached **Tables 3A-3C** located in the attachments. The laboratory analytical report is included as **Appendix D**.

#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

Metric performed a Phase II Limited Subsurface Environmental Site Assessment for the US 421 New Roadway Construction Project, located in Madison, Jefferson County, Indiana. The project begins at the intersection of East 2<sup>nd</sup> Street & Harrison Street. The project consists of portions of East 2<sup>nd</sup> Street east and west of the Harrison Street intersection before terminating south along Harrison Street, ending just north of the Fillmore Street intersection. The project limits also included portions of Sering Street northwest and southeast of the East 2<sup>nd</sup> Street intersection.

During a Phase I ESA conducted by Weaver Consultants Group in 2016, Weaver Consultants identified nine *recognized environmental conditions* (RECs) associated with current and former uses along the project corridor. Based on recommendations in the Phase I ESA, and following a review by the Indiana Department of Transportation (INDOT), twenty-one (21) soil boring locations were proposed for soil sampling within the US 421 New Roadway Construction project area. In the project area located south of Fillmore Street to Second Street, utility work to a depth of approximately 6 feet below ground surface (bgs) is proposed; therefore, soil boring depths in this area were proposed to a maximum depth of 10 feet bgs. In the northern portion of the project area from Second Street north to Main Street, potential utility work and excavation to grade are proposed; therefore, soil boring depths in this area were proposed to a maximum depth of 20 feet bgs. Groundwater within the region is typically encountered at a depth below 30 feet bgs and was not encountered during this investigation; therefore, groundwater samples were not collected.

Metric advanced a total of 21 soil borings along the project corridor. Soil samples were collected along the corridor and analyzed for chemicals of concern commonly associated with the RECs identified within the Phase I ESA.

Samples collected from twenty (20) of the soil borings were collected and submitted for laboratory analysis of VOCs, lead, and PAHs. Soil samples collected from soil boring 421-SB-21 were submitted for laboratory analysis of VOCs and RCRA metals. Exceedances of the constituents in the soil samples collected are listed below:

- VOCs:
  - Concentrations of 1, 2, 4-trimethylbenzene were detected in samples 421-SB-19 (0'-2') and 421-SB-19 (6'-8') at 2.8 mg/kg and 0.45 mg/kg respectively, above the applicable IDEM RCG MTG SL of 1.6 mg/kg and below the applicable residential direct contact SL of 220 mg/kg.
- PAHs:
  - Naphthalene was detected in soil samples 421-SB-08 (0'-2') and sample 421-SB-19 (2'-4') at 0.79 mg/kg and 1.1 mg/kg respectively, above the applicable IDEM RCG soil MTG SL of 0.11 mg/kg, but below the residential direct SL of 53 mg/kg.

- 1-methylnaphthalene was detected in soil sample 421-SB-19 (2'-4') at a concentration of 1.3 mg/kg above the applicable IDEM RCG MTG SL of 1.2 mg/kg, but below the applicable residential direct contact SL of 250 mg/kg.
- RCRA Metals:
  - Arsenic was detected in soil sample 421-SB-21 (0'-2') at a concentration of 8.3 mg/kg above the applicable IDEM RCG MTG SL of 5.9 mg/kg, but below the residential direct contact SL of 9.5 mg/kg. The arsenic concentration is within anthropogenic background concentrations commonly encountered within urban environments in Indiana which can range from undetectable concentrations up to approximately 13 mg/kg; therefore, the detectable concentration of arsenic encountered during this Phase II LSI does not appear to be attributable to a specific release.
  - Lead concentrations above laboratory detection limits were reported in all of the soil samples collected with the exception of soil sample 421-SB-21 (8'-10'); however, these detectable concentrations of lead did not exceed the applicable soil MTG SL of 270 mg/kg or the Toxicity Characteristic Leaching Procedure screening level of 100 mg/kg.

Metric conducted the Phase II Subsurface Investigation of the US 421 project corridor to further assess the concerns listed in the preceding Phase I ESA conducted by Weaver in 2016. The purpose of this Phase II investigation is to identify existing soil impacts that may impair the project corridor and affect design, scope, schedule, and/or budget of construction activities during the proposed US 421 project.

None of the COC concentrations exceeded applicable TCLP screening levels and do not appear hazardous. However, soils excavated from areas where COC concentrations exceed the applicable IDEM RCG soil MTG SLs will be required to be properly disposed of in a municipal landfill. Additionally, workers who may come into contact with the impacted soils will be required to wear appropriate personal protective equipment (PPE), including disposable nitrile gloves to prevent any personal contact with impacted soils encountered at the site. Soil boring locations, depth intervals, and associated areas where COC concentrations exceed applicable SLs are summarized in the following table:

Soil Boring	Depth Interval	Parcel/Location
421-SB-08	0'-2'	910 E Second Street; Parcel: 39-13-02-141-021.000-007 South side of Second St. approximately 175 feet east of Harrison St.
421-SB-19	2'-4'	822 E First Street; Parcel: 39-13-02-144-004.000-007 West side of Harrison St. between First St. and Fillmore St.
421-SB-20	0'-2'	150 Harrison St.; Parcel: 39-13-02-144-003.000-007 East side of Harrison St. between First St. and Fillmore St.

Based on the results of this Phase II investigation, no further investigation of the soil is warranted at this time.

## 5.0 REFERENCES

Weaver Consultants Group (Weaver). (2017). *Proposed Phase II Sample Locations, US 421 New Roadway Construction, Madison, Jefferson County, Indiana*. Indiana

**From:** [Adam Burns](#)  
**To:** [Oliphant, Mike](#); [Stettler, Devin](#)  
**Cc:** [Heather Lacey](#); [Adam Burns](#)  
**Subject:** FW: 1400918 - Project 421 - Phase 2 LSI  
**Date:** Monday, December 11, 2017 1:08:15 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)  
[image005.png](#)  
[image006.png](#)  
[ENV Ph2LSI 1400918 for Roadway Services concurrence\\_nfb\\_12-11-17.pdf](#)

---

---

**From:** Foheybreting, Nicole K [mailto:NFoheyBreting@indot.IN.gov]  
**Sent:** Monday, December 11, 2017 9:47 AM  
**To:** Adam Burns <aburns@cmtengr.com>  
**Cc:** Mathas, Marlene <MMathas@indot.IN.gov>  
**Subject:** RE: 1400918 - Project 421 - Phase 2 LSI

Good morning Adam –

I hope all is well and you had a great weekend. I received your voicemail checking in on the status of the Phase II for Des No. 1400918.

I have wrapped up the review of the document and the updated text – much better overall. Please find the attached Phase II with concurrence. This document has also been saved to ProjectWise in the HazMat Phase II folder.

Hope you have a great week.  
Sincerely,  
Nicole

**Nicole Fohey-Breting**

***HazMat Specialist***

100 North Senate Avenue RM N642  
Indianapolis, Indiana 46204

**Office:** (317) 232-0626

**Email:** [NFoheyBreting@indot.in.gov](mailto:NFoheyBreting@indot.in.gov)



# *Appendix E*

## *Noise Analysis*

## Adam Burns

---

**From:** Giffin, Toni <ToGiffin@indot.IN.gov>  
**Sent:** Monday, February 13, 2017 1:33 PM  
**To:** Carlin, Whitney  
**Cc:** Harrington, Susan; Bales, Ronald; Carlin, Whitney; Adam Burns; Lana Sumner  
**Subject:** RE: 1400918 - Project 421 - Noise Report

Good afternoon Whitney,

A traffic noise analysis report was completed by Crawford, Murphy & Tilly on January 30, 2017 to evaluate potential traffic noise impacts associated with the US 421 New Road Construction. The need for the proposed project is to increase operational efficiency and traffic safety by relieving congestion at a series of 90-degree turns on US 421 between the Milton-Madison Bridge and Main Street, while reducing the environmental impacts associated with idling and braking of trucks in the City of Madison, Jefferson County, Indiana.

Traffic noise was evaluated at eight (8) common noise environments (CNE), and eight (8) receptors were chosen to represent the study area locations within the CNE's. Traffic noise levels were evaluated for the existing (2015) and projected (2040) traffic volumes for the No-Build and Build Alternatives. Based on this analysis, of the total 178 dwelling units within the eight (8) CNEs, there were two (2) dwelling units in CNE 1 and one (1) dwelling unit in CNE 4 that would approach or exceed the NAC of 67 dB(A) under the Build Alternative scenario. For the three receptors experiencing a noise impact, the feasibility of constructing a noise barrier was analyzed. The INDOT Traffic Noise Analysis Procedure states that "...noise barriers require long, uninterrupted segments of barrier to be feasible. As such, if there are existing access points and/or driveways, it is not feasible to construct effective noise barriers for the roadway." Based on this analysis, it was determined that noise abatement using noise barriers would not be feasible due to existing driveway connections and intersecting streets that would not allow for an uninterrupted barrier.

Therefore, based on the studies thus far accomplished, the State of Indiana has not identified any locations where noise abatement is likely. A reevaluation of the noise analysis will occur during final design. If during final design it is determined that conditions have changed such that noise abatement is feasible and reasonable, the abatement measures might be provided. The final decision on the installation of any abatement measure will be made upon the completion of the project's final design.

This email will serve as INDOT's approval of the traffic noise analysis report for the US 421 New Road Construction in the City of Madison, Jefferson County, Indiana.

### **Toni Lynn Giffin**

#### ***Environmental Manager II***

Indiana Department of Transportation  
Indiana Government Center North  
100 North Senate Avenue, Room N642  
Indianapolis, IN 46204

**Office:** (317) 232-1490

**Fax:** (317) 233-4929

**Email:** [togiffin@indot.in.gov](mailto:togiffin@indot.in.gov)



**Traffic Noise Analysis  
Technical Memorandum  
US 421 New Road Construction  
Madison, Jefferson County, Indiana**

**Des. No. 1400918  
CMT No. 15709-01**

**January 30, 2017**

*Authored By:*



---

8790 Purdue Road  
Indianapolis, Indiana 46268  
P: 317.298.4500 | F: 317.298.4503

---

[www.cmtengr.com](http://www.cmtengr.com) | *Centered in Value*

## TABLE OF CONTENTS

### Chapter One - Project History and Background

1.0	Project Planning and Description.....	1-1
1.1	Purpose and Need.....	1-1

### Chapter Two - Noise Background and Regulations

2.0	Noise ANALYSIS Background INFORMATION.....	2-1
2.1	Federal Regulations.....	2-1
2.2	State Policy.....	2-3

### Chapter Three - Existing Conditions

3.0	Existing Land Use.....	3-1
3.1	Traffic Conditions.....	3-1
3.2	Roadway Information.....	3-1
3.2.1	US 421.....	3-1
3.2.2	State Road 56.....	3-1
3.2.3	Second Street.....	3-2

### Chapter Four - Noise Monitoring and Model Comparison

4.0	Purpose.....	4-1
4.1	Noise Receptor Selection.....	4-1
4.2	Field Noise Measurement Methodology.....	4-2
4.3	Model Validation Results.....	4-2

### Chapter Five - Noise Analysis Methodology

5.0	Introduction.....	5-1
5.1	Roadway Geometry and Physical Features.....	5-1
5.2	Traffic Volume, Composition, and Speeds.....	5-1
5.3	Receptors.....	5-1
5.4	Noise Model Results.....	5-2

### Chapter Six - Consideration of Abatement

6.0	Introduction.....	6-1
6.1	Feasibility.....	6-1
6.2	Reasonableness.....	6-1
6.3	Noise Abatement Considerations.....	6-2
6.3.1	Traffic Management Measures:.....	6-2
6.3.2	Alteration of Horizontal and Vertical Alignments:.....	6-2
6.3.3	Acquisition of Property:.....	6-2
6.3.4	Noise Insulation of Public Use or Nonprofit Institutional Structures:.....	6-3
6.3.5	Construction of Noise Barriers:.....	6-3
6.4	Statement of Likelihood.....	6-3

**Chapter Seven - Construction Noise**

7.0 Construction Noise .....7-1

**Chapter Eight - Coordination**

8.0 Coordination with Local Government Officials .....8-1

**Chapter Nine - Summary**

9.0 Summary .....9-1

**TABLES**

Table 2-1: FHWA Noise Abatement Criteria (NAC).....2-3  
 Table 4-1: Common Noise Environment Descriptions .....4-2  
 Table 4-2: Model Validation Summary .....4-3  
 Table 5-1: Noise Impact Summary.....5-3

**APPENDICES**

**Appendix A: Traffic Data**

Table A-1: Traffic Design Hourly Volume, Composition, and Speed Limit (Existing and Future No Build).....A-1  
 Table A-2: Traffic Design Hourly Volume, Composition, and Speed Limit (Existing and Future Build) .....A-3

**Appendix B: Noise Monitoring Information**

Equipment Calibration Certificates .....B-1  
 Site Data Logs .....B-5  
 Vehicle Data Logs .....B-13

**Appendix C: Exhibits**

Exhibit 1 – Location Map  
 Exhibit 2 – General Land Use Map  
 Exhibit 3 – Historic Districts  
 Exhibit 4 – Noise Analysis Elements  
 Exhibit 5 – Noise Receptor Locations – CNE 1 and CNE 2  
 Exhibit 6 - Noise Receptor Locations – CNE 3, CNE 4 and CNE 5  
 Exhibit 7 - Noise Receptor Locations – CNE 6, CNE 7 and CNE 8

**Appendix D: Noise Modeling and Validation Results**

Noise Receptor Values Summary Table .....D-1  
 TNM Sound Level Results-Existing .....D-2  
 TNM Sound Level Results-Future No-Build .....D-6  
 TNM Sound Level Results-Future Build .....D-10  
 Noise Modeling Validation Values .....D-14

## GLOSSARY OF ACRONYMS

CFR	Code of Federal Regulations
CNE	Common Noise Environment
dB	Decibel
dB(A)	Decibels, A-Weighted
DHV	Design Hourly Volume
FHWA	Federal Highway Administration
INDOT	Indiana Department of Transportation
LA <sub>max</sub>	A-weighted, Maximum, Sound Level
L <sub>eq(h)</sub>	equivalent hourly sound level
LOS	Level of Service
MAP-21	The Moving Ahead for Progress in the 21st Century Act
mph	Miles per Hour
NAC	Noise Abatement Criteria
NHS	National Highway System
NEPA	National Environmental Policy Act
RTA	Real Time Analysis
TNM 2.5	FHWA Traffic Noise Model Version 2.5

# CHAPTER ONE

## ***Project History and Background***

---

### **1.0 PROJECT PLANNING AND DESCRIPTION**

The proposed project is planned for the US 421 approach to the Milton-Madison Bridge in Jefferson County, Indiana in the City of Madison. The undertaking involves providing approach access from the north beginning at the intersection of Baltimore Street and Main Street. The approximate study limits are shown on Exhibit 1 – Location Map.

In 2010, due to the critically poor condition of the Milton-Madison structure, a plan to further rehabilitate the bridge with a superstructure replacement was developed and constructed in 2014. Increasing traffic patterns, including significant escalation in truck traffic has strained the operations along US 421 between the Milton-Madison Bridge and the intersection with Main Street.

### **1.1 PURPOSE AND NEED**

The need for improvement is caused by poor geometry of the existing roadway alignment which has led to vehicle congestion. This congestion has led to a history of vehicle collisions throughout the corridor. Additionally, the poor geometry has led to increased noise and air pollution. The City of Madison, Indiana Department of Transportation, and Federal Highway Administration previously committed to improving the approach roadway conditions as part of the Milton-Madison Bridge Rehabilitation.

The purpose of the proposed project is to increase operational efficiency and traffic safety by relieving congestion at a series of 90-degree turns on US 421 between the Milton-Madison Bridge and Main Street, while reducing the environmental impacts associated with idling and braking of trucks. Additionally, the project will support opportunities for economic development in the community by managing access and enhancing pedestrian accessibility in the project area.

## CHAPTER TWO

# Noise Background and Regulations

---

### 2.0 NOISE ANALYSIS BACKGROUND INFORMATION

Noise is generally defined as unwanted sound. Its loudness is measured in terms of sound pressure level expressed in decibels (dB) and is composed of different frequencies. The decibel scale is logarithmic and expresses the ratio of the sound pressure unit being measured to a standard reference level. Most sounds occurring in the environment do not consist of a single frequency, but rather a broad band of differing frequencies. The human ear is less sensitive to higher and lower frequencies than mid-range frequencies. To compensate for low-end and high-end frequency insensitivity and render noise levels readings more meaningful, an "A-weighting" scale is used to approximate the response of the human ear. The A-weighted decibel (dB(A)) unit measures perceptible sound energy and factors out the fringe frequencies.

The dB(A) may indicate the level of environmental noise at an instant in time, but community noise levels vary continuously. Most environmental noise includes a composite of noise from different sources, creating a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of traffic noise, the equivalent hourly sound level  $L_{eq(h)}$  is commonly used.  $L_{eq(h)}$  is defined as the equivalent steady-state sound level over a one-hour period which contains the same acoustic energy as the time-varying sound level during the same period.  $L_{eq(h)}$  is the hourly value of  $L_{eq}$  measured in dB(A). Noise levels referred to in this report are stated as hourly-equivalent sound pressure levels  $L_{eq(h)}$  in terms of dB(A).

As decibels are logarithmic units, sound levels cannot be added by ordinary arithmetic means. The following general relationships provide a basic understanding of sound generation and propagation:

- ◆ The noise level from a line source, such as moving traffic on a road will decrease approximately 3 dB(A) with every doubling of distance.
- ◆ Research has indicated that a difference of 10 dB(A) is perceived half as loud, or twice as loud, to the human ear.
- ◆ Typically, the human ear can barely perceive a 3 dB(A) change in loudness.

### 2.1 FEDERAL REGULATIONS

The Federal Aid Highway Act of 1970 required the Federal Highway Administration (FHWA) to develop noise standards and abatement requirements for highway traffic noise. These standards are contained in Title 23, Code of Federal Regulations (CFR), Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*<sup>1</sup>. This regulation applies to highway construction

---

<sup>1</sup> *Procedures for Abatement of Highway Traffic and Construction Noise*, 23 CFR 772. Federal Highway Administration, July 13, 2011.

projects where a state department of transportation has requested Federal funding for participation in the project. 23 CFR 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. The regulations do not mandate that the abatement criteria be met in all situations, but rather require that reasonable and feasible efforts be made to provide noise mitigation when the abatement criteria are approached or exceeded. Per 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with FHWA noise standards.

FHWA has developed three “project types” to assess noise analysis applicability. Federal regulations only apply to Type I and Type II projects. Type III projects are ones that do not meet the classifications of a Type I or Type II project and do not require a noise analysis. The proposed US 421 improvement project is classified as a Type I project, as it includes construction of a highway on new location. Therefore, a traffic noise analysis is required for the full project limits.

The FHWA regulations establish Noise Abatement Criteria (NAC) activity categories based on land use to assess potential traffic noise impacts as defined in 23 CFR 772. The FHWA NAC and description of activity categories are shown in Table 2-1. Traffic noise impacts occur when predicted design year noise levels under the build scenario approach, meet or exceed the NAC, or if there are substantial increases in traffic noise over existing conditions, independent of the NAC.

The FHWA NAC are used to identify locations where traffic noise impacts occur. The NAC are not used as goals for noise attenuation design criteria or design targets.

**Table 2-1: FHWA Noise Abatement Criteria (NAC)**

Activity Category	Noise Abatement Criteria	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 <sup>1</sup>	67 (Exterior)	Residential.
C	67 (Exterior)	Active sports 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 stations, recording studios, schools, and television studios.
E <sup>1</sup>	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.

<sup>1</sup> Includes undeveloped lands permitted for this activity category.  
Note: Values are Hourly "A-Weighted" Sound Level - Decibels (dB(A))

Source: FHWA, 23 CFR, Part 772<sup>2</sup>

## 2.2 STATE POLICY

FHWA requires that all states have an approved policy to identify and address highway traffic noise impacts. The Indiana Department of Transportation (INDOT) *Traffic Noise Analysis Procedure* (INDOT, 2011) was developed to implement the requirements of 23 CFR Part 772 and the noise-related requirements of the National Environmental Policy Act (NEPA) of 1969. FHWA approved the INDOT policy, made effective July 13, 2011. The structure of the policy focuses on the following principal elements:

1. Identification of Noise-Sensitive Land Uses.
2. Determination of Existing Noise Levels.
3. Prediction of Future Noise Levels.
4. Identification of Traffic Noise Impacts.
5. Identification and Consideration of Abatement.
6. Consideration of Construction Noise.
7. Coordination with Local Government Officials.

<sup>2</sup> *Procedures for Abatement of Highway Traffic and Construction Noise*, 23 CFR 772. Federal Highway Administration, July 13, 2011.

The following sections document the project's compliance with FHWA and INDOT policies regarding highway noise.

FHWA has deferred to the State agencies to define the noise level that "approaches" the NAC and to define a substantial increase in traffic noise levels. INDOT defines noise impacts as follows:

- ◇ Predicted traffic noise levels are predicted to approach, meet, or exceed the NAC, with approach defined as to be within 1 dB(A) of the appropriate NAC activity category; or
- ◇ Predicted traffic noise levels substantially increase by 15.0 dB(A) or more, over the existing traffic generated noise levels. (as predicted by FHWA TNM 2.5)

## CHAPTER THREE

# *Existing Conditions*

---

### 3.0 EXISTING LAND USE

The land use adjacent to the proposed project improvements consists of mixed uses typical of suburban growth (See Exhibit 2 – General Land Use Map). Land uses in the study corridor primarily include residential (both single and multi-family uses) and commercial uses. The project area is located within portions of both the Madison National Historic Landmark Historic District and the Madison National Register Historic District. (See Exhibit 3 – Historic Districts)

### 3.1 TRAFFIC CONDITIONS

The existing traffic conditions were modeled by the project team to confirm visual observations of congestion and capacity issues. The morning peak hour operates at acceptable levels-of-service (LOS) A and B, but the evening peak hour operates far less efficiently at LOS E and F. A queue forms south of 2nd Street for northbound US 421 on Harrison Street and is evidenced by the increased travel time for northbound traffic during the PM peak (2.4-minute increase).

Intersection performance was analyzed as a mobility measure of effectiveness. The intersection performance results indicate that for the No Build, if no alignment, capacity or intersection control changes are implemented, congestion issues will worsen as traffic volumes increase.

### 3.2 ROADWAY INFORMATION

#### 3.2.1 US 421

US 421 is listed as a MAP-21 National Highway System (NHS) Principal Arterial by the FHWA. It travels north-south, connecting Michigan City, Indiana to Wilmington, North Carolina. Through the project area, the speed limit is 30 mph. From the Milton-Madison Bridge to the intersection of Harrison Street, there is one twelve-foot lane in each direction of travel. From Harrison Street, US 421 turns west along 2<sup>nd</sup> Street and then north onto Baltimore Street, where both streets are 32 feet wide (not including curb and gutter) to allow on-street parking. US 421 west of the Main Street/Baltimore Street intersection has two 12-foot lanes in each direction and an 8-foot parking lane on either side of the roadway.

#### 3.2.2 State Road 56

Indiana State Road 56 in Jefferson County is listed as a MAP-21 NHS Principal Arterial by the FHWA and travels east-west from Hazleton, Indiana to Aurora, Indiana. The speed limit through the project area is 30 mph. SR-56 has one 11' travel lane in each direction with no shoulder on the north side and a narrow 4' sidewalk almost flush with the mainline pavement on the south side. SR-56 follows the same alignment as US 421 on Main Street between Jefferson Street and Baltimore Street.

### **3.2.3 Second Street**

Second (2<sup>nd</sup>) Street in Madison, Indiana is designated as a minor arterial by Jefferson County. Second Street travels east-west through Madison. From Baltimore Street to Harrison Street, 2<sup>nd</sup> Street is a part of US 421. The existing 32' section consists of two travel lanes with parking allowed on both sides of the street.

## CHAPTER FOUR

# ***Noise Monitoring and Model Comparison***

---

### **4.0 PURPOSE**

The assessment of traffic noise impacts requires the use of predictive models to quantify the likely noise levels for a variety of scenarios. To use numerical modeling to predict traffic noise levels, it must first be demonstrated that the use of approved noise prediction methods satisfactorily estimate the noise levels. This is accomplished by comparing field measured (data included in Appendix B) values to predicted values. The measure of satisfactory comparison is if the measured and predicted values differ by no more than 3 dB(A). A favorable comparison indicates the noise source is predominantly from highways (at least at the time of the measurements), and the model results represent valid predictions suitable for use in assessing impacts. This section describes the field monitoring and model validation conducted for the project.

### **4.1 NOISE RECEPTOR SELECTION**

Ambient noise measurements are not required at each receptor location. Instead, a representative sample of ambient noise measurements can be taken within the project area, with a minimum of one measurement for each common noise environment (CNE). A CNE is a group of receptors that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features.

FHWA defines a receptor as a discrete or representative location of a CNE for any of the activities listed in Table 4-1. Primary consideration should be given to exterior areas where frequent human use occurs for activity categories A, B, C, and E. Consideration should be given to activity category D land uses only if no exterior uses are identified.

The represented receptors within the CNEs are assumed to have similar traffic noise levels as the selected representative receptor. A total of eight CNEs (labeled 1 through 8 in Table 4-1), and 8 receptors, were chosen to represent the study area. The location of CNEs and selected individual representative receptor sites are shown on Exhibit 4.

**Table 4-1: Common Noise Environment Descriptions**

CNE ID	Representative Receptor Description	Activity Category	INDOT Approach Criterion dB(A)	No. of Receptors in CNE
1	SFR – Front yard	B	66	32
2	Motel/Hotel – Front yard	E	71	47
3	SFR – Front yard	B	66	19
4	SFR – Front yard	B	66	25
5	SFR – Front yard	B	66	27
6	SFR – Front yard	B	66	11
7	SFR – Front yard	B	66	10
8	SFR – Front yard	B	66	3

*SFR=Single Family Residence*

## 4.2 FIELD NOISE MEASUREMENT METHODOLOGY

Existing noise levels were monitored at eight locations along the study corridor using a Quest SoundPro DL Type 2 noise meter (1/1 and 1/3 octave RTA). These locations are shown on Exhibit 4. Noise monitoring was conducted on August 2, 2016 between the hours of 8 am to 12:30 pm.

The  $L_{eq(h)}$  levels were recorded for 15-minute intervals at each location. During each noise measurement, the noise meter was tripod-mounted and the microphone was located approximately five feet above the ground surface. The meter was calibrated with the manufacturer-supplied standard noise calibrator before use, and was checked before each sound level measurement session. No adjustments to the calibration were required during any of the monitoring. A foam windscreen (supplied by the manufacturer) was used during all sound measurements.

Simultaneous to the monitoring, traffic volumes were recorded, by hand, and classified into five vehicle types: automobiles, medium trucks (two-axles with six wheels), heavy trucks (three or more axles), buses, and motorcycles. Noise sources other than traffic noise also were noted. All weather parameters were within acceptable ranges, with dry pavement and winds were calm or light, for conducting noise measurements.

## 4.3 MODEL VALIDATION RESULTS

Model validation is a process for testing a model to ensure that it produces reliable results and to confirm that traffic noise is the predominant noise source at the receptor locations. In general, validation involves comparing actual noise measurements obtained with the sound level meter to the noise levels predicted by the model for existing conditions at the same location. The model is considered to be verified if the model results are within  $\pm 3$  dB(A) of the field measurements recorded at the site for the same conditions.

Measured and predicted noise levels are shown in Table 4-2. The difference in the measured and predicted value noise levels fell within 3 dB(A), except for receptors 1 and 8. Receptor site 1 was located near an intersection with a stop sign. Traffic on the cross street was not simultaneous collected with the receptor traffic. Additionally, there were several car doors slamming and people shouting as they drove by, while the sound level meter was recording. As such, the meter recorded two measurements over 80 LA<sub>max</sub> and one at nearly 100 LA<sub>max</sub>. Receptor site 8 was at the edge of town just prior to the Milton-Madison bridge. During the sound level measurements, there were two Harley Davidson motorcycles and a truck, without a muffler, that accelerated at a high rate of speed and caused very high increases in the sound level meter readings. The meter recorded one measurement each over 80 LA<sub>max</sub>, 90 LA<sub>max</sub> and 100 LA<sub>max</sub>. We believe that these environmental factors account for the difference in the sound level meter measurements and the modeled data. However, the results of the modeled versus measured sound level validations for the remaining six receptor locations fell within a  $\pm 3$  dB(A) range. Therefore, based on these comparisons, the TNM 2.5 model is determined to be a valid method for predicting the highway traffic noise for the propose US 421 project.

**Table 4-2: Model Validation Summary**

Receptor Location <sup>1</sup>	General Propagation Path Characteristics	Measured Sound Levels / TNM 2.5 Model Validation Sound Level (dB(A))	Variation (dB(A))
CNE 1	No Obstructions, Grass	72 / 66	5
CNE 2	No Obstructions, Grass	55 / 55	0
CNE 3	No Obstructions, Grass	68 / 69	1
CNE 4	No Obstructions, Vegetation	59 / 59	0
CNE 5	No Obstructions, Grass	68 / 68	0
CNE 6	No Obstructions, Gravel	63 / 61	3
CNE 7	No Obstructions, Grass	67 / 65	3
CNE 8	No Obstructions, Grass	76 / 61	15

Notes: See Exhibit 4 for model validation locations.

Calculated noise levels have been rounded to the nearest whole numbers. The values in the "Increase Over Existing dB(A)" column were computed based on the calculated raw noise levels and then rounded to the nearest whole number. Therefore, some values in this column may not appear to be calculated correctly.

Sources: CMT field measurements and TNM 2.5 modeling.

## CHAPTER FIVE

# Noise Analysis Methodology

---

### 5.0 INTRODUCTION

Traffic noise levels were predicted using FHWA's TNM 2.5, the current approved model for predicting and analyzing traffic noise. Three scenarios, Existing Condition, No-Build Alternative, and the Build Alternative were analyzed. The Existing Condition was defined as the current roadway geometry with 2015 traffic characteristics and the No-Build scenario uses current roadway geometry with forecasted (2040) traffic characteristics. The final scenario is the prediction of traffic noise levels if the proposed action is constructed with projected traffic volumes (2040). Data inputs into TNM 2.5 include roadway geometry, traffic data and traffic control (stop signs, traffic lights, etc.), and receptor location and elevation.

### 5.1 ROADWAY GEOMETRY AND PHYSICAL FEATURES

Roadway geometry (existing and proposed) was obtained from project geometric plans. Building locations and elevation data were obtained from project specific mapping, aerial photography, and field reconnaissance.

### 5.2 TRAFFIC VOLUME, COMPOSITION, AND SPEEDS

Existing and forecasted traffic volumes, speeds, and vehicle classifications (automobile, medium truck, heavy truck, bus and motorcycle) were obtained from forecasts developed for the proposed project. Traffic volumes were obtained using tube and intersection counts conducted by members of the project team. The turning count volumes were used to develop design hourly volumes (DHVs) for local streets that did not have tube counts conducted. The traffic volumes and turning counts were adjusted using the INDOT adjustment factors for the corresponding weekday in October. Per direction from INDOT, an area growth rate was assumed. The traffic volumes, design hourly volumes, traffic composition and speeds used in the analysis are shown in Tables A-1 and A-2 in Appendix A.

### 5.3 RECEPTORS

As discussed in Section 4.1, 8 CNEs were chosen to represent the study area. Receptors in the CNEs are all single-family or multi-family residences except for two hotels in CNE 2. Receptor locations were based on review of aerial photography, topographic mapping, and field reconnaissance. Receptor locations were placed in outdoor gathering spaces where most outdoor activity is assumed to occur. As such, receptors were located at a front porch, if one existed, otherwise they were located on a deck/patio or in back yard. Receptors are shown on Exhibit 4 and are listed on Table 5-1. The CNEs and individual noise receptors at most locations along the roadways were at-grade. Elevations for individual noise receptors were 5 feet above ground elevation per FHWA.

## 5.4 NOISE MODEL RESULTS

Table 5-1 summarizes the modeled noise levels for the Existing (2015) and Projected (2040) No-Build and Build scenarios for the representative receptors within each of the eight CNEs. The existing modeled traffic noise levels were compared to the Build Alternative traffic noise levels to determine if any dwelling units will experience a substantial increase of 15.0 dB(A) or more because of the Build Alternative. Based on this analysis, none of the dwelling units within the eight CNEs in the study area will experience a substantial increase of 15 dB(A) or greater. In fact, of the 178 total dwelling units within the study area, 106 (60%) would experience a decrease in noise levels because of the Build Alternative. Further, 54 (30%) of the dwelling units in the study area would experience a decrease in noise levels of at least 3 dB(A) or more under the Build scenario. Typically, this is the noise level at which an observer can barely perceive a change in loudness. These decreases in noise levels are due to the relocation of the primary travel route (US 421) being shifted away from the residential areas in the project study area.

The modeled noise levels for the Build Alternative scenario were also analyzed to determine if any dwelling units would approach or exceed the FHWA's NAC. Additionally, INDOT defines approaching the NAC for residential as within 1 dB(A) for a level of 66 dB(A). Based on this analysis, of the total 178 dwelling units within the eight CNEs, there were a total of 2 dwelling units in CNE 1 and 1 dwelling unit in CNE 4 that would approach or exceed the NAC of 67 dB(A) under the Build Alternative scenario.

**Table 5-1: Noise Impact Summary**

Representative Receptor/ CNE ID	Land Use Activity Category	Numbers by Activity <sup>1</sup>	Number of Dwelling Units Represented	INDOT Approach Criterion dB(A)	Existing (2015)		2040 No-Build Scenario		2040 Build Scenario		
					Existing (2015) Noise Level dB(A)	Number of Dwelling Units Impacted	2040 No-Build Scenario Noise Level dB(A)	Number of Dwelling Units Impacted	2040 Build Scenario Noise Level dB(A)	Increase/Decrease Over Existing <sup>2</sup>	Number of Dwelling Units Impacted
1	B	31 SFR, 1 MFR	33	66	67	2	66	2	66 <sup>3</sup>	-1	2
2	E	2 Hotels	47	71	60	0	61	0	62	2	0
3	B	18 SFR, 1 MFR	20	66	66	5	66	5	64	-2	0
4	B	23 SFR, 2 MFR	27	66	64	14	65	14	67 <sup>3</sup>	3	1
5	B	27 SFR	27	66	63	4	64	6	62	-1	0
6	B	11 SFR	11	66	62	0	63	0	66	4	0
7	B	10 SFR	10	66	62	0	63	0	58	-3	0
8	B	3 SFR	3	66	57	0	58	0	54	-2	0

<sup>1</sup> SFR=Single Family Residential, MFR=Multi-Family Residential

<sup>2</sup> Calculated noise levels have been rounded to the nearest whole numbers. The values in the "Increase Over Existing dB(A)" column were computed based on the calculated raw noise levels and then rounded to the nearest whole number. Therefore, some values in this column may not appear to be calculated correctly.

<sup>3</sup> These values are that of the impacted dwelling units.

## CHAPTER SIX

# *Consideration of Abatement*

---

### 6.0 INTRODUCTION

Potential traffic noise impacts were identified for three dwelling units within two CNEs based on the predicted (2040) noise levels for the Build Alternative scenario developed using TNM 2.5.

Per INDOT Noise Policy,<sup>3</sup> noise abatement must be considered when traffic noise impacts are identified. In addition, any noise abatement measure must be determined to be both feasible and reasonable for implementation.

### 6.1 FEASIBILITY

Feasibility means that INDOT believes abatement of traffic noise impacts is prudent based on all the following factors:

- ◆ Acoustic Feasibility: INDOT requires that noise barriers achieve a 5dB(A) reduction at a majority (greater than 50%) of the impacted receptors. If a barrier cannot achieve this acoustic goal, abatement is considered to not be acoustically feasible.
- ◆ Engineering Feasibility: INDOT requires noise abatement measures to be based on sound engineering practices and standards and requires that any measures be evaluated at the optimum location. For instances in which the roadway is located on fill and is at a higher location than nearby receptors, a barrier will be evaluated near the shoulder. For instances in which the roadway is located below the nearby receptors, a barrier will be evaluated near the edge of the right-of-way near the receptors. In addition, noise barriers require long, uninterrupted segments of barrier to be feasible. As such, if there are existing access points and/or driveways, it is not feasible to construct effective noise barriers for the roadway.

### 6.2 REASONABLENESS

Reasonableness means that INDOT believes abatement of traffic noise impacts is prudent based on all the following factors:

- ◆ Consideration and Obtaining Views of Residents and Property Owners: If a public hearing is required per the INDOT Public Involvement Manual, a survey will be mailed to each benefitted resident to determine if a noise barrier is requested. If a public hearing is not required per the INDOT Public Involvement Manual, a survey will be mailed and the total number of respondents must be more than 50% of the

---

<sup>3</sup> *Traffic Noise Analysis Procedure*, INDOT, 2011.

benefited receptors and affected property owners. The concerns and opinions of the property owner and the unit occupants will be balanced with other considerations in determining whether a barrier is appropriate for a given location.

- ◆ Cost effectiveness: A barrier is determined to be cost-effective if a 5 dB(A) reduction can be achieved at a cost of no more than \$25,000 per benefited receptor if a majority of the nearby receptors in a common noise environment were not constructed prior to the roadway. A cost of \$30,000 per benefited receptor is allowed if a majority (more than 50%) of the nearby receptors in a common noise environment were constructed prior to the initial construction of the existing roadway.
- ◆ INDOT Design Goal for Noise Abatement: FHWA requires that traffic noise abatement achieve a substantial noise reduction. INDOT's goal for substantial noise reduction is to provide at least a 7.0 dB(A) reduction for benefited first row receptors in the design year. However, conflicts with adjacent lands may make it impossible to achieve substantial noise reduction at all impacted first row receptors. Therefore, the noise reduction design goal for Indiana is 7dB(A) for a majority (greater than 50%) of the impacted first row receptors.

### **6.3 NOISE ABATEMENT CONSIDERATIONS**

The following FHWA strategies were considered for the predicted highway traffic noise impacts.

#### **6.3.1 Traffic Management Measures:**

Traffic management measures were not considered reasonable and feasible for abating noise impacts for any receptor. Measures such as installation of additional traffic control devices, prohibition of vehicle types, time-use restrictions, speed limit reductions, and exclusive lane designations would be detrimental to the proposed project's ability to function as an US highway.

#### **6.3.2 Alteration of Horizontal and Vertical Alignments:**

A change in the horizontal or vertical alignment of the highway may reduce noise levels at noise sensitive receivers. Suppressing the highway's vertical alignment to create a natural berm between the highway and receivers or shifting the highway's horizontal alignment away from noise sensitive receivers and closer to less sensitive receivers are two methods to accomplish this measure. Usually, this approach is limited to use on projects on new alignment as a means of avoiding impacts rather than as an abatement measure. It is may be very expensive to alter the alignment of a highway to reduce noise levels. This noise abatement option was not applied.

#### **6.3.3 Acquisition of Property:**

INDOT may acquire property rights to allow for the construction of a noise barrier. The cost of the property purchased must be included in the barrier's reasonableness determination. The purchase of property and/or buildings for noise barrier construction to reduce noise impacts was considered. The amount of property required for this option to be effective would create significant additional impacts (e.g., in terms of displacements and historic properties), which were determined to outweigh the benefits of land acquisition.

#### **6.3.4 Noise Insulation of Public Use or Nonprofit Institutional Structures:**

Highway agencies may only consider noise insulation for Activity Category D land use facilities listed in Table 2-1. Since no Activity Category D land uses were impacted, this noise abatement option was not applied.

#### **6.3.5 Construction of Noise Barriers:**

Noise barriers are the most commonly used form of noise abatement and are the only form of noise abatement required for consideration on Federal or Federal-aid projects in accordance with 772.13(c)(1). Noise barriers are solid obstructions built between the highway and the receivers along the highway. The effectiveness of a noise barrier depends on the distance and elevation difference between the roadway and receptor and the available placement location for a barrier. To be effective, a noise barrier must break the line of sight between the highest point of a noise source and a receiver. It also must be long enough to prevent sounds from passing around the ends, having no openings such as driveways or intersecting streets, and be dense enough so the noise would not be transmitted through it.

For the three receptors experiencing a noise impact, the feasibility of constructing a noise barrier was analyzed. Based on this analysis, it was determined that noise abatement using noise barriers would not be feasible due to the existing driveway connections and intersecting streets.

### **6.4 STATEMENT OF LIKELIHOOD**

Based on the studies thus far accomplished, the State of Indiana has not identified any locations where noise abatement is likely. Noise abatement at these locations is based upon preliminary design costs and design criteria. Noise abatement has not been found to be feasible because none of the considerations were deemed feasible and reasonable. A reevaluation of the noise analysis will occur during final design. If during final design it has been determined that conditions have changed such that noise abatement is feasible and reasonable, the abatement measures might be provided. The final decision on the installation of any abatement measure(s) will be made upon the completion of the project's final design and the public involvement processes.

## CHAPTER SEVEN

# ***Construction Noise***

---

### **7.0 CONSTRUCTION NOISE**

It is difficult to predict levels of construction noise at a specific receiver or group of receivers. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. Daily construction normally occurs during daylight hours when people tolerate occasional loud noises. The duration for individual receivers should be short; therefore, there are no anticipated disruptions of normal activities. However, the project plans and specifications include provisions requiring the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and maintenance of muffler systems.

## CHAPTER EIGHT

# *Coordination*

---

### 8.0 COORDINATION WITH LOCAL GOVERNMENT OFFICIALS

Since most of the proposed project would be constructed on an existing highway facility, the potential for local officials and developers to help minimize adverse noise impacts using careful land use planning exists only in undeveloped areas. The project corridor does not have any undeveloped lands. There are no active building permits within the study corridor. As there are no undeveloped lands in the corridor, noise contours were not developed.

## CHAPTER NINE

# Summary

---

### 9.0 SUMMARY

A Highway Traffic Noise Analysis was prepared for the proposed US 421 new road construction project to determine the predicted traffic noise impacts. Traffic noise levels were evaluated for the existing (2015) and projected (2040) traffic volumes for the No-Build and Build scenarios.

**Existing (2015):** Of the 178 dwelling units in the study area, 25 dwelling units in CNEs 1, 3, 4 and 5 meet or exceed the NAC.

**Projected (2040) No Build:** Of the 178 dwelling units in the study area, 27 dwelling units in CNEs 1, 3, 4, and 5 meet or exceed the NAC and are therefore considered impacted under the No Build scenario.

**Projected (2040) Build:** Of the 178 dwelling units in the study area, there were a total of two (2) dwelling units in CNE 1 and 1 dwelling unit in CNE 4 that would approach or exceed the NAC of 67 dB(A) under the Build Alternative scenario. Further, none of the dwelling units in the study area will experience a substantial increase of 15 dB(A) or greater under the Build Alternative.

There would be 106 (60%) dwelling units that would have a decrease in noise levels because of the Build Alternative. Fifty-four (54) dwelling units would experience a decrease in noise levels of at least 3 dB(A) or more under the Build scenario, the noise level at which an observer can barely perceive a change in loudness. These decreases in noise levels are due to the relocation of the primary travel route (US 421) being shifted away from the residential areas in the project study area.

All noise receptors are depicted on Exhibits 5, 6 and 7. All noise receptor TNM 2.5 values are listed on page D-1 of Appendix D.

Based on the INDOT Traffic Noise Analysis Procedure, the feasibility of a noise barrier was evaluated for the three (3) impacted dwelling units under the Build Alternative. However, based on this analysis, it was determined that noise abatement using noise barriers would not be feasible because existing driveway connections and intersecting streets in proximity of the impacted receptors would not allow for an uninterrupted barrier. The INDOT Traffic Noise Analysis Procedure states that “...noise barriers require long, uninterrupted segments of barrier to be feasible. As such, if there are existing access points and/or driveways, it is not feasible to construct effective noise barriers for the roadway.”

# APPENDIX A

## Traffic Data

**Table A-1: Traffic Design Hourly Volume, Composition, and Speed Limit (Existing and Future No Build)**

Roadway Segment/ Vehicle Type	Existing (2015) DHV	Existing Speed Limit (mph)	Projected (2040) DHV	Future Speed Limit (mph)
<b>US 421/Harrison St. (project limits to 2<sup>nd</sup> St.)</b>				
Auto	781	30	1074	30
Medium Truck	96	30	132	30
Heavy Truck	17	30	23	30
Buses	2	30	3	30
Motorcycles	21	30	29	30
<b>US 421/Main St. (Baltimore St. to St. Michael's Ave.)</b>				
Auto	897	30	1162	30
Medium Truck	118	30	153	30
Heavy Truck	30	30	39	30
Buses	1	30	1	30
Motorcycles	20	30	26	30
<b>Main St. (Roosevelt St. to Baltimore St.)</b>				
Auto	293	30	351	30
Medium Truck	41	30	49	30
Heavy Truck	11	30	14	30
Buses	2	30	2	30
Motorcycles	7	30	9	30
<b>SR 56/Sering St. (Roosevelt to 2<sup>nd</sup> St.)</b>				
Auto	293	30	388	30
Medium Truck	41	30	55	30
Heavy Truck	11	30	15	30
Buses	2	30	2	30
Motorcycles	7	30	10	30
<b>SR 56/Sering St. (2<sup>nd</sup> St. to project limits)</b>				
Auto	293	30	362	30
Medium Truck	41	30	51	30
Heavy Truck	11	30	14	30
Buses	2	30	2	30
Motorcycles	7	30	9	30
<b>US 421/2<sup>nd</sup> St. (Harrison St. to Baltimore St.)</b>				
Auto	769	30	910	30
Medium Truck	95	30	18	30
Heavy Truck	16	30	1	30
Buses	2	30	2	30
Motorcycles	21	30	30	30
<b>2<sup>nd</sup> St. (Harrison St. to Sering St.)</b>				
Auto	44	25	76	30
Medium Truck	4	25	7	30
Heavy Truck	1	25	1	30
Buses	0	25	0	30
Motorcycles	1	25	2	30
<b>1<sup>st</sup> St. (in entirety)</b>				
Auto	17	25	24	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	1	25

Roadway Segment/ Vehicle Type	Existing (2015) DHV	Existing Speed Limit (mph)	Projected (2040) DHV	Future Speed Limit (mph)
<b>Clay St. (in entirety)</b>				
Auto	2	25	4	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25
<b>St. Michael's Ave. (in entirety)</b>				
Auto	37	25	53	25
Medium Truck	0	25	1	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	1	25	1	25
<b>Baltimore St. (South of 2<sup>nd</sup> St.)</b>				
Auto	37	25	53	25
Medium Truck	0	25	1	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	1	25	1	25
<b>2<sup>nd</sup> St. (West of Baltimore St.)</b>				
Auto	148	25	205	25
Medium Truck	10	25	14	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	4	25	6	25
<b>Baltimore St. (North of Main St.)</b>				
Auto	7	25	11	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25
<b>Roosevelt St. (North of Main St.)</b>				
Auto	2	25	4	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25
<b>Fillmore St. (in entirety)</b>				
Auto	6	25	6	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25

**Table A-2: Traffic Design Hourly Volume, Composition, and Speed Limit (Existing and Future Build)**

Roadway Segment/ Vehicle Type	Existing (2015) DHV	Existing Speed Limit (mph)	Projected (2040) DHV	Future Speed Limit (mph)
<b>US 421/Harrison (project limits to 2<sup>nd</sup> St.)</b>				
Auto	781	30	1079	30
Medium Truck	96	30	133	30
Heavy Truck	17	30	23	30
Buses	2	30	3	30
Motorcycles	21	30	29	30
<b>US 421/Main (Baltimore St. to St. Michael's Ave.)</b>				
Auto	897	30	1238	30
Medium Truck	118	30	163	30
Heavy Truck	30	30	41	30
Buses	1	30	1	30
Motorcycles	20	30	28	30
<b>Main St. (Roosevelt St. to Baltimore St.)</b>				
Auto	293	30	NA	NA
Medium Truck	41	30	NA	NA
Heavy Truck	11	30	NA	NA
Buses	2	30	NA	NA
Motorcycles	7	30	NA	NA
<b>SR 56/Sering St. (Roosevelt St. to 2<sup>nd</sup> St.)</b>				
Auto	293	30	NA	NA
Medium Truck	41	30	NA	NA
Heavy Truck	11	30	NA	NA
Buses	2	30	NA	NA
Motorcycles	7	30	NA	NA
<b>SR 56/Sering St. (2<sup>nd</sup> St. to project limits)</b>				
Auto	293	30	NA	NA
Medium Truck	41	30	NA	NA
Heavy Truck	11	30	NA	NA
Buses	2	30	NA	NA
Motorcycles	7	30	NA	NA
<b>New Sering St. (2<sup>nd</sup> St. to dead end)</b>				
Auto	NA	NA	3	25
Medium Truck	NA	NA	0	25
Heavy Truck	NA	NA	0	25
Buses	NA	NA	0	25
Motorcycles	NA	NA	0	25
<b>US 421/2<sup>nd</sup> St. (Harrison St. to Baltimore St.)</b>				
Auto	769	30	203	30
Medium Truck	95	30	4	30
Heavy Truck	16	30	0	30
Buses	2	30	0	30
Motorcycles	21	30	7	30
<b>US 421/Baltimore St. (2<sup>nd</sup> St. to Main St.)</b>				
Auto	769	30	51	30
Medium Truck	95	30	1	30
Heavy Truck	16	30	0	30
Buses	2	30	0	30
Motorcycles	21	30	2	30

Roadway Segment/ Vehicle Type	Existing (2015) DHV	Existing Speed Limit (mph)	Projected (2040) DHV	Future Speed Limit (mph)
<b>2<sup>nd</sup> St. (Harrison St. to Sering St.)</b>				
Auto	44	25	381	30
Medium Truck	4	25	53	30
Heavy Truck	1	25	15	30
Buses	0	25	2	30
Motorcycles	1	25	10	30
<b>1<sup>st</sup> St. (in entirety)</b>				
Auto	17	25	24	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	1	25
<b>Clay St. (in entirety)</b>				
Auto	2	25	4	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25
<b>St. Michael's Ave. (in entirety)</b>				
Auto	37	25	53	25
Medium Truck	0	25	1	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	1	25	1	25
<b>Baltimore St. (South of 2<sup>nd</sup> St.)</b>				
Auto	37	25	53	25
Medium Truck	0	25	1	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	1	25	1	25
<b>2<sup>nd</sup> St. (West of Baltimore St.)</b>				
Auto	148	25	205	25
Medium Truck	10	25	14	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	4	25	6	25
<b>Baltimore St. (North of Main St.)</b>				
Auto	7	25	11	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25
<b>Roosevelt St. (North of Main St.)</b>				
Auto	2	25	4	25
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25
<b>Fillmore St. (in entirety)</b>				
Auto	6	25	6	25

Roadway Segment/ Vehicle Type	Existing (2015) DHV	Existing Speed Limit (mph)	Projected (2040) DHV	Future Speed Limit (mph)
Medium Truck	0	25	0	25
Heavy Truck	0	25	0	25
Buses	0	25	0	25
Motorcycles	0	25	0	25
<b>New US 421 (Harrison St. to Baltimore St.)</b>				
Auto	NA	NA	1238	30
Medium Truck	NA	NA	163	30
Heavy Truck	NA	NA	41	30
Buses	NA	NA	1	30
Motorcycles	NA	NA	28	30

# APPENDIX B

## Noise Monitoring Information



# Calibration Certificate No. 1115453

<b>Instrument:</b>	<b>Sound Level Meter</b>	<b>Date Calibrated:</b>	<b>7/22/2016</b>	<b>Cal Due:</b>	<b>07/22/2017</b>				
<b>Model:</b>	<b>SoundPro SE_DL2</b>	<b>Status:</b>	<table border="1"><tr><td>Received</td><td>Sent</td></tr><tr><td>X</td><td>X</td></tr></table>	Received	Sent	X	X		
Received	Sent								
X	X								
<b>Manufacturer:</b>	<b>Quest</b>	<b>In tolerance:</b>	<table border="1"><tr><td>X</td><td>X</td></tr></table>	X	X				
X	X								
<b>Serial number:</b>	<b>BIJ080007</b>	<b>Out of tolerance:</b>	<table border="1"><tr><td></td><td></td></tr></table>						
<b>Tested with:</b>	<b>Microphone QE7052 s/n 28875</b>	<b>See comments:</b>							
	<b>Preamplifier n/a s/n 0607 1011</b>	<b>Contains non-accredited tests:</b>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>						
<b>Type (class):</b>	<b>2</b>	<b>Calibration service:</b>	Basic <input checked="" type="checkbox"/> Standard <input type="checkbox"/>						
<b>Customer:</b>		<b>Address:</b>							
<b>Tel/Fax:</b>	<b>/</b>								

Tested in accordance with the following procedures and standards:  
 Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012  
 SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

**Instrumentation used for calibration:** Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence	Cal. Due
				Cal. Lab / Accreditation	
483B-Norsonic	SME Cal Unit	31079	Jan 28, 2015	Norsonic SA	Jan 28, 2017
DS-360-SRS	Function Generator	123268	Jan 28, 2015	SRS	Jan 28, 2017
34401A-Agilent Technologies	Digital Voltmeter	MY53003818	Jan 11, 2014	Agilent Provider #93107	Jan 11, 2017
SD700-Extech	Meteo Station	Q769118	Feb 18, 2014	INNOCAL	Feb 18, 2017
PC Program 1019 Norsonic	Calibration software	v.6.1T	Validated Nov 2014	Scantek, Inc.	-
1251-Norsonic	Calibrator	34103	May 28, 2015	Scantek, Inc./ NVLAP	May 28, 2017
Quest-Cal	Multifunction calibrator	KZ7060002	Jan 30, 2014	Scantek, Inc./ NVLAP	Jan 30, 2017

**Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).**

**Environmental conditions:**

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
23.0	101.00	45.0

Calibrated by:	Steven Boertmann	Authorized signatory:	CM
Signature	STEVEN BOERTMANN	Signature	CHRIS MCEVOY
Date	7-22-16	Date	7-22-16

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.

Document stored C:\Nor1504\Slm\2014\Q\$proSE2\_BIJ080007\_M4.doc

Page 1 of 2

**Results summary:** Device complies with following clauses of mentioned specifications:

CLAUSES <sup>1</sup> FROM IEC/ANSI STANDARDS REFERENCED IN PROCEDURES:	RESULT <sup>2,3</sup>	EXPANDED UNCERTAINTY (coverage factor 2) [dB]
INDICATION AT THE CALIBRATION CHECK FREQUENCY - ANSI S1.4 CLAUSE 3.2	Passed	0.20,15
FREQUENCY WEIGHTINGS: A NETWORK - IEC 61672-3 ED.1 CLAUSE 12	Passed	0.2
FREQUENCY WEIGHTINGS: C NETWORK - IEC 61672-3 ED.1 CLAUSE 12	Passed	0.2
FREQUENCY WEIGHTINGS: Z NETWORK - IEC 61672-3 ED.1 CLAUSE 12	Passed	0.2
FREQUENCY AND TIME WEIGHTINGS AT 1 KHZ IEC 61672-3 ED.1 CLAUSE 13	Passed	0.2
LEVEL LINEARITY ON THE REFERENCE LEVEL RANGE - IEC 61672-3 ED.1 CLAUSE 14	Passed	0.3
LEVEL LINEARITY INCLUDING THE LEVEL RANGE CONTROL - IEC 61672-3 ED.1 CLAUSE 15	Passed	0.3
TONEBURST RESPONSE - IEC 61672-3 ED.1 CLAUSE 16	Passed	0.3
PEAK C SOUND LEVEL - IEC 61672-3 ED.1 CLAUSE 17	Passed	0.35
FILTER TEST 1/OCTAVE: FLAT FREQUENCY RESPONSE - IEC 61260, CLAUSE 4.10 & #5.9	Passed	0.25
FILTER TEST 1/3OCTAVE: FLAT FREQUENCY RESPONSE - IEC 61260, CLAUSE 4.10 & #5.9	Passed	0.25

- <sup>1</sup> The results of this calibration apply only to the instrument type with serial number identified in this report.
- <sup>2</sup> Parameters are certified at actual environmental conditions.
- <sup>3</sup>

**Comments:** The instrument was tested and met all specifications found in the referenced procedures.

**Note:** The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger. Compliance with any standard cannot be claimed based solely on the periodic tests.

**Tests made with the following attachments to the instrument:**

Microphone: Quest QE7052 s/n 28875 for acoustical test
Preamplifier: Quest n/a s/n 0607 1011 for all tests
Other: line adaptor ADP005 (18pF) for electrical tests and 1448 (18pF) for noise test
Accompanying acoustical calibrator: Quest QC-20 s/n QOJ030008
Windscreen: none

Measured Data: in Test Report # \_\_\_\_\_ of ... pages.

**Place of Calibration: Argus Hazco**  
 46410 Continental Dr.  
 Chesterfield, MI 48047

Ph/Fax: 586-840-3220/ -3221  
[www.argus-hazco.com](http://www.argus-hazco.com)

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.

Document stored C:\Nor1504\Slm\2014\Q5proSE2\_BIJ080007\_M4.doc

Page 2 of 2

SoundPro SF\_DL2 s/n: BIJ080007 ID:  
 Date: 7/22/2016 By: SB  
 Due: 07/22/2017



A better experience.

# Calibration Certificate

0004047

<b>Instrument:</b>	<b>Acoustical Calibrator</b>	<b>Date Calibrated:</b>	<b>6/8 /20 16</b>	<b>Cal Due:</b>	<b>06/08 /20 17</b>
<b>Model:</b>	<b>QC-10</b>	<b>Status:</b>	<b>Received</b>	<b>Sent</b>	
<b>Manufacturer:</b>	<b>Quest</b>	<b>In tolerance:</b>	<b>X</b>	<b>X</b>	
<b>Serial number:</b>	<b>Q100 10063</b>	<b>Out of tolerance:</b>			
<b>Class (IEC 60942):</b>	<b>1</b>	<b>See comments:</b>			
<b>Barometer type:</b>		<b>Contains non-accredited tests:</b>	<b>Yes</b>	<b>X</b>	<b>No</b>
<b>Barometer s/n:</b>					
<b>Customer:</b>		<b>Address:</b>			
<b>Tel/Fax:</b>	<b>7</b>				

**Tested in accordance with the following procedures and standards:**  
 Calibration of Noise Dosimeters, Sound Meters, and Calibrators, Rev. Chf 04

**Instrumentation used for calibration:** Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence	
				Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SIME Cal Unit	31079	Jan 28, 2015	Norsonic SA	Jan 28, 2017
DS-360-SRS	Function Generator	123268	Jan 28, 2015	SRS	Jan 28, 2017
34401A-Agilent Technologies	Digital Voltmeter	MYS3003818	Jan 11, 2014	Agilent Provider #93107	Jan 11, 2017
SD700-Extech	Meteo Station	Q769118	Feb 18, 2014	INNOCAL	Feb 18, 2017
140-Norsonic	RealTime Analyzer	1406966	May 8, 2014	Norsonic SA	May 8, 2017
PC Program 1018 Norsonic	Calibration software	v.6.1T	Validated Nov 2014	Scantek, Inc.	-
40AG-GRAS	Microphone	173539	Jan 16, 2015	Scantek, Inc. / NVLAP	Jan 16, 2017
NN1203-Norsonic	Preamplifier	138531	Jan 16, 2015	Norsonic SA	Jan 16, 2017

**Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK)**

<b>Calibrated by:</b>	Steven Boertmann	<b>Authorized signatory:</b>	Chris McEvoy
Signature	STEVEN BOERTMANN	Signature	CHRIS MCEVOY
Date	6-8-16	Date	6-8-16

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory. This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.  
 Document stored as: C:\Nor1504\Cal\2014\Quest10-old\_Q10010063\_M1.doc Page 1 of 3

Results summary: Device was tested and complies with following clauses of mentioned specifications:

CLAUSES <sup>1</sup> FROM STANDARDS REFERENCED IN PROCEDURES:	MET <sup>2</sup>	NOT MET	COMMENTS
<b>Manufacturer specifications</b>			
Manufacturer specifications: Sound pressure level	X		
Manufacturer specifications: Frequency	X		
Manufacturer specifications: Total harmonic distortion	X		
<b>Current standards</b>			
ANSI S1.40:2006 B.3 / IEC 60942: 2003 B.2 - Preliminary inspection	X		Unit older than the standard
ANSI S1.40:2006 B.4.4 / IEC 60942: 2003 B.3.4 - Sound pressure level	X		Unit older than the standard
ANSI S1.40:2006 A.5.4 / IEC 60942: 2003 A.4.4 - Sound pressure level stability	-	-	Unit older than the standard
ANSI S1.40:2006 B.4.5 / IEC 60942: 2003 B.3.5 - Frequency	X		Unit older than the standard
ANSI S1.40:2006 B.4.6 / IEC 60942: 2003 B.3.6 - Total harmonic distortion	X		Unit older than the standard
<b>Older standards (obsolete)</b>			
IEC 60942: 1997 B.2 - Preliminary inspection	X		
IEC 60942: 1997 B.3.3 - Sound pressure level	X		
IEC 60942: 1997 B.3.4 - Sound pressure level stability	X		
IEC 60942: 1997 B.3.5 - Frequency	X		
IEC 60942: 1997 B.3.6 - Total harmonic distortion	X		
ANSI S1.40: 1984 (R1997) 4.4.2 Sound pressure level in the coupler	X		Not applicable
ANSI S1.40: 1984 (R1997) 4.4 Frequency sound in the coupler	X		Not applicable
ANSI S1.40: 1984 (R1997) 4.10 Total harmonic distortion	X		Not applicable

<sup>1</sup> The results of this calibration apply only to the instrument type with serial number identified in this report.

<sup>2</sup>

**Main measured parameters <sup>3</sup>:**

Measured <sup>4</sup> /Acceptable <sup>5</sup> Tone frequency (Hz):	Measured <sup>4</sup> /Acceptable <sup>5</sup> Total Harmonic Distortion (%):	Measured <sup>4</sup> /Acceptable Level <sup>5</sup> (dB):
994.62 ± 0.99/1000.0 ± 10.0	0.63 ± 0.10/ < 3	114.09 ± 0.02/114.0 ± 0.4

<sup>3</sup> The stated level is valid at reference conditions.

<sup>4</sup> The above expanded uncertainties for frequency and distortion are calculated with a coverage factor k=2; for level k=4.53

<sup>5</sup> Acceptable parameters values are from the current standards

Barometer indication	Nominal indication
----------------------	--------------------

**Environmental conditions:**

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
22.0 ± 1.0	100.00 ± 0.001	35.0 ± 2.0

**Tests made with following attachments to instrument:**

Calibrator ½" Adaptor Type:
Other:

**Adjustments:** Unit was not adjusted.

**Comments:** The instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.

Compliance with any standard cannot be claimed based solely on the periodic tests.

**Place of Calibration: Argus Hazco**

46410 Continental Dr.  
Chesterfield, MI 48047

Ph/Fax: 586-840-3220/ -3221  
[www.argus-hazco.com](http://www.argus-hazco.com)

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.

This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Document stored as: C:\Nor1504\Cal\2014\Questc10-old\_QJK010063\_M1.doc

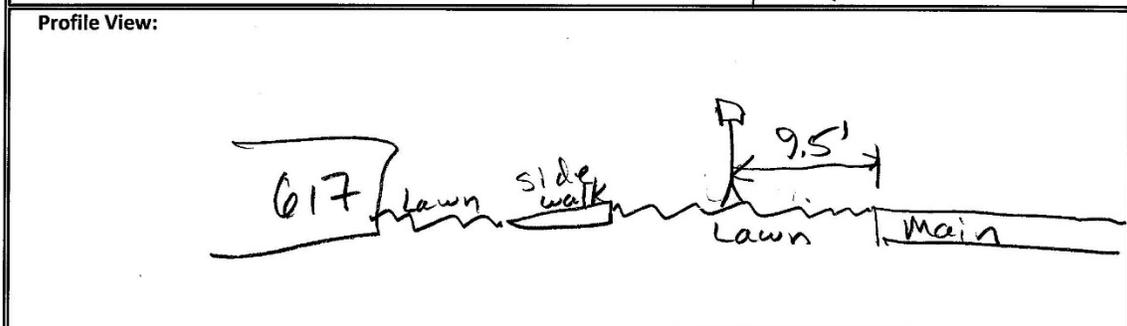
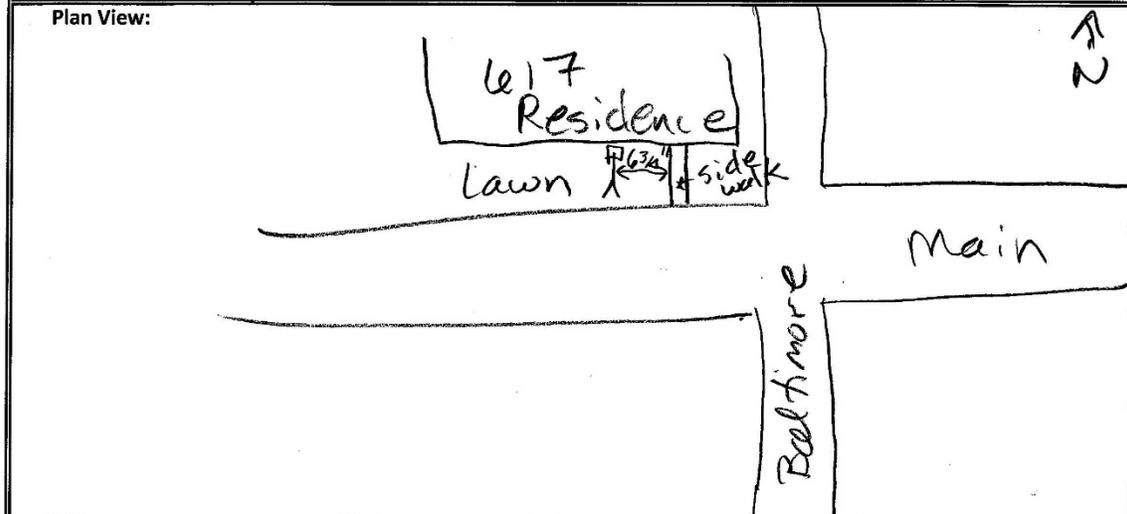
Page 2 of 2

Existing Noise Measurements

Site Data Log  
CMT, Inc.

birds - cont  
car door  
yelling  
loudly

Site: 1	Date: 10:07a 8/2/16	Location (address and/or lat/long): 617 Main St.	Observer: LJS
Travel Direction: —	Site Surface: Lawn	Nearby Landmark: —	
Grade (%): —	Pavement Type: Asphalt	Distance to Landmark: —	



Temperature: (°F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Cloud Cover Class	Weather Conditions
87	72	1.2	N	2-3	somewhat sunny

Classes of Cloud Cover

Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night ( 50% or more cloud cover)

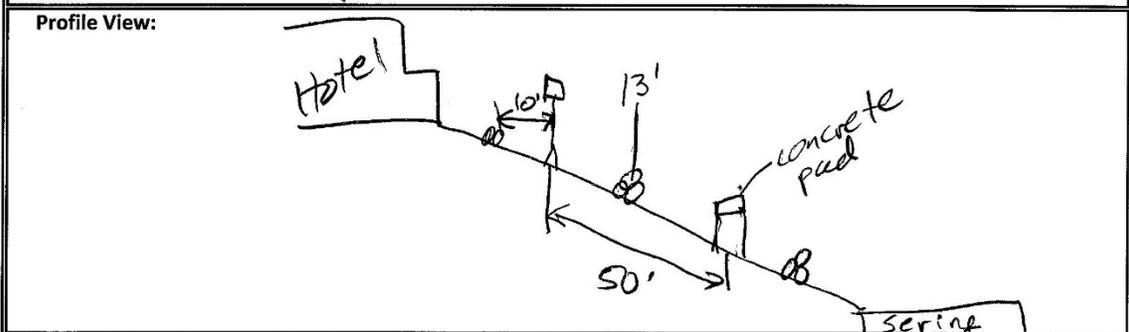
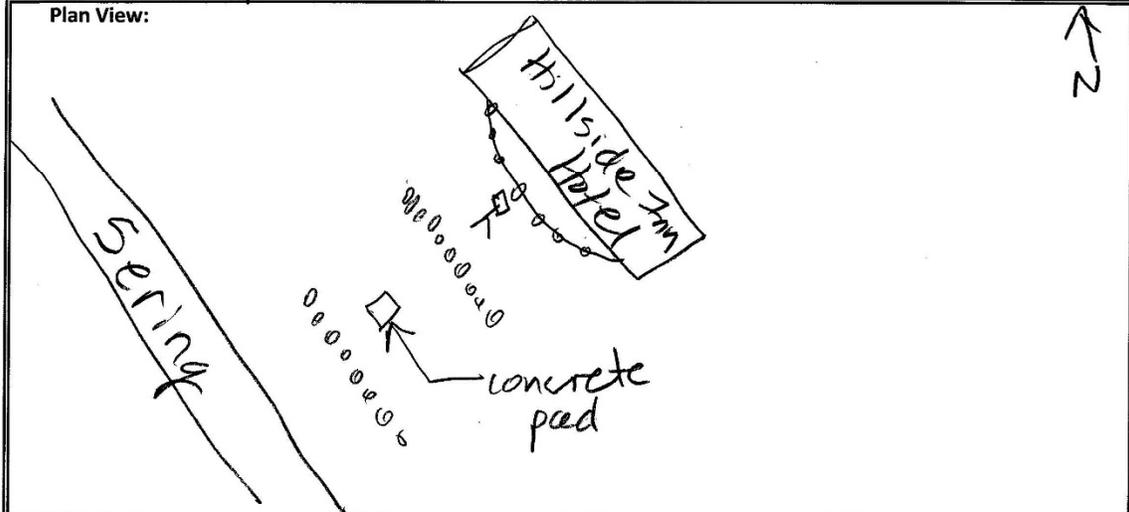
Existing Noise Measurements

Site Data Log

CM7, Inc.

birds  
people talking

Site: 2	Date: 9:19a 8/2/16	Location (address and/or lat/long): 831 E. Main	Observer: LJS
Travel Direction: —	Site Surface:	Nearby Landmark: —	
Grade (%): —	Pavement Type: Asphalt	Distance to Landmark: —	



Temperature: (°F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Cloud Cover Class	Weather Conditions
85	72	↑ 3.0	NW	2	Haze

Classes of Cloud Cover

Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night (50% or more cloud cover)

horn

Existing Noise Measurements

Site Data Log

CM7, Inc.

Site: 3	Date: 10/31/16	Location (address and/or lat/long): 313 Baltimore		Observer: LJS	
Travel Direction: —	Site Surface: Lawn	Nearby Landmark: —			
Grade (%): —	Pavement Type: Asphalt	Distance to Landmark: —			
<p>Plan View:</p>					
<p>Profile View:</p>					
Temperature: (°F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Cloud Cover Class	Weather Conditions
86	72	2.9	N	2-3	sunny

Classes of Cloud Cover

Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night (50% or more cloud cover)

Existing Noise Measurements

Site Data Log

CMT, Inc.

Site: 4	Date: 9:43a 8/2/16	Location (address and/or lat/long): 708 Main	Observer: LJS		
Travel Direction: —	Site Surface: Lawn	Nearby Landmark: Irongate Inn			
Grade (%): —	Pavement Type: Asphalt	Distance to Landmark: —			
<p>Plan View:</p>					
<p>Profile View:</p>					
Temperature: (°F) 87	Relative Humidity (%) 69	Wind Speed (mph) —	Wind Direction —	Cloud Cover Class 2	Weather Conditions somewhat sunny

Classes of Cloud Cover

Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night ( 50% or more cloud cover)

Existing Noise Measurements  
Site Data Log

yelling  
saw

Site: 5	Date: 10/5/16 8/2/16	Location (address and/or lat/long): 712 2nd	Observer: LJS		
Travel Direction: —	Site Surface: Lawn	Nearby Landmark: —			
Grade (%): —	Pavement Type: Asphalt	Distance to Landmark: —			
<p>Plan View:</p>					
<p>Profile View:</p>					
Temperature: (°F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Cloud Cover Class	Weather Conditions
82	70	0.2	NNE	2-3	partly sunny

Classes of Cloud Cover

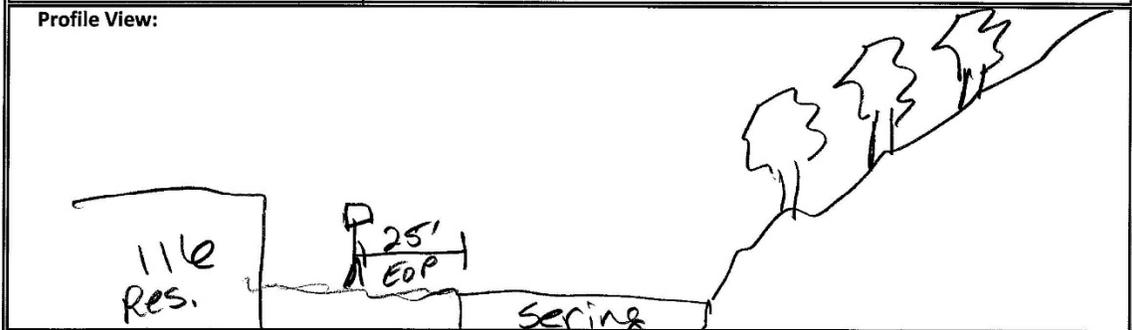
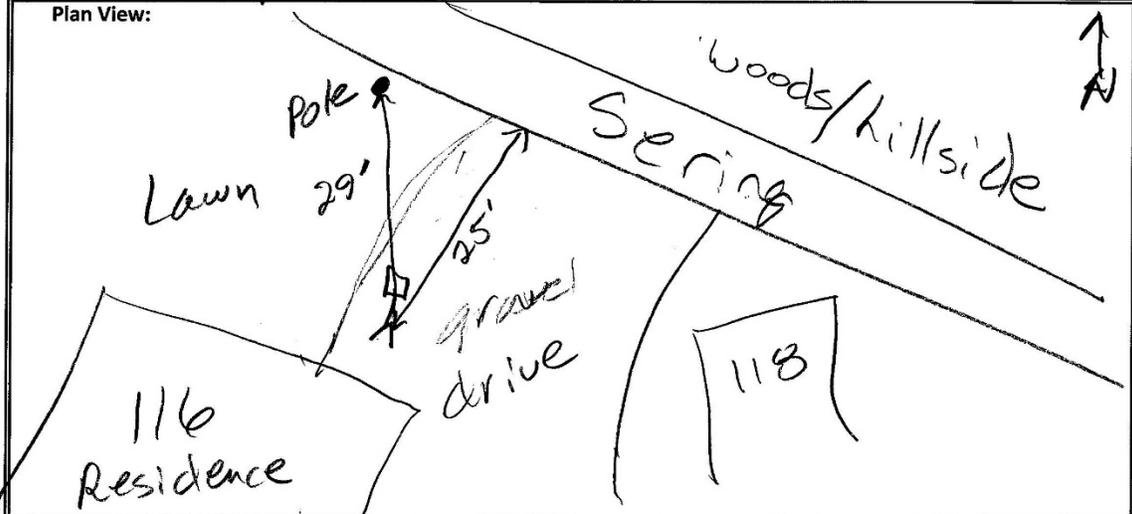
Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night ( 50% or more cloud cover)

Existing Noise Measurements

birds

Site Data Log  
CMT, Inc.

Site: <u>6</u>	Date: <u>8/2/16</u>	Location (address and/or lat/long): <u>116 Sering</u>	Observer: <u>LJS</u>
Travel Direction: <u>—</u>	Site Surface: <u>Lawn / Gravel</u>	Nearby Landmark: <u>—</u>	
Grade (%): <u>—</u>	Pavement Type: <u>Asphalt</u>	Distance to Landmark: <u>—</u>	



Temperature: (°F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Cloud Cover Class	Weather Conditions
74	88	0	—	2	some haze

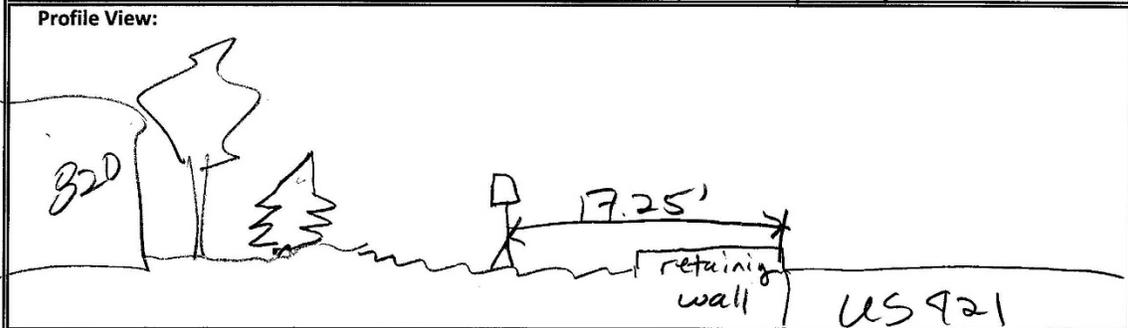
Classes of Cloud Cover

Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night ( 50% or more cloud cover)

Existing Noise Measurements

Site Data Log  
CMT, Inc.

Site: 7	Date: 11:38a 8/2/16	Location (address and/or lat/long): 820 Fillmore (side yard)	Observer: LSS
Travel Direction: —	Site Surface: Lawn	Nearby Landmark: —	
Grade (%): —	Pavement Type: Asphalt	Distance to Landmark: —	



Temperature: (°F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Cloud Cover Class	Weather Conditions
91	64	2.8	N	3	Sunny

Classes of Cloud Cover

Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night ( 50% or more cloud cover)

Existing Noise Measurements

Site Data Log

UMT, Inc.

Cicadas  
really loud  
2harley+truck

Site: <b>8</b>	Date: <b>11:50a</b> <b>8/20/16</b>	Location (address and/or lat/long): <b>Across Filmore from 150 Harrison</b>			Observer: <b>LJS</b>
Travel Direction: <b>—</b>	Site Surface: <b>Lawn</b>	Nearby Landmark:			
Grade (%): <b>—</b>	Pavement Type: <b>Asphalt</b>	Distance to Landmark:			
<p>Plan View:</p>					
<p>Profile View:</p>					
Temperature: (°F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Cloud Cover Class	Weather Conditions
<b>87</b>	<b>59</b>	<b>0</b>	<b>—</b>	<b>3</b>	<b>Sunny</b>

Classes of Cloud Cover

Class	Description
1	Heavily overcast
2	Lightly overcast (either w/ continuous sun or the sun obscured intermittently by clouds 20% to 80% of the time)
3	Sunny (sun essentially unobscured by clouds at 80% of the time)
4	Clear night (less than 50% cloud cover)
5	Overcast night ( 50% or more cloud cover)

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
1	8/2	In front of 617 Main St. (north side)								Observer: GTB 10:16 door 5/16
Travel Direction:	Time:									
West Bound										
East Bound	10:07 - 10:22	25-30	                         			③				
West Bound										
East Bound										

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
1	7/2	617 Main St								BEA
West Bound	10:07 - 10:22	30 mph (Posted)	       	       	 (5)	 (3)				
East Bound										
West Bound										
East Bound										

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
2	8/2	Below Hillside Turn, And to Top Tier								Observer: GTB
West Bound										
East Bound	9:19 - 9:34									
West Bound										
East Bound										

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
2	7/2	Hillside Inn (front hill)	30 mph (Posted)	11444444 III (18)	1 (1)			1 (1)		Observer: BEA
West Bound	9:19 - 9:34									
East Bound										
West Bound										
East Bound										

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
3	8/2	West side of Hwy. South of alley, adj. to no parking sign								Observer: GTB 10:33 - 04 600 by 400 10:40 - 400
West Bound										
South East Bound	10:31 - 10:46	25	                   	                   	I					
West Bound										
East Bound										



Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
4	8/2	West side alley, south side Main St								
Travel Direction:	Time:									
West Bound										
East Bound	9:43- 9:58	20	15	11	2					
West Bound										
East Bound										

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
4	7/2	708 Main								Observer: BEA
Travel Direction:	Time:									
West Bound	9:43	30 mph (P.S. speed)	Auto: 1 (26)	1						
East Bound	9:58									
West Bound										
East Bound										



Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Observer:						
5	7/2	712 2nd St.	BEA						
Travel Direction:	Time:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
West Bound	10:55 - 11:10	30 mph (Posted)	           (64)	(3)	(1)		 (4)		
East Bound									
West Bound									
East Bound									

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
6	8/2	S. Side Spring / House 118 driveway								Observer: GTB
West Bound										
East Bound	49 8:37 -9:04	30	PKLNU	PKLNU	1	①				
West Bound										
East Bound										

Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Observer:
6	7/2	118 Spring (west driveway)							BEA
Travel Direction:	Time:								
West Bound	8:49	30 mph (posted)		①	①				
East Bound	9:04		②3						
West Bound									
East Bound									



Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Observer:	Vehicle Data Log											
				Travel Direction:	Time:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:		
7	7/12	SW Corner Harrison & Fillmore Allys	BEA												
	11:39 - 11:54	30 mph (Posted)	   	⑦	②	①									
				North West Bound											
				East Bound											
				West Bound											
				East Bound											

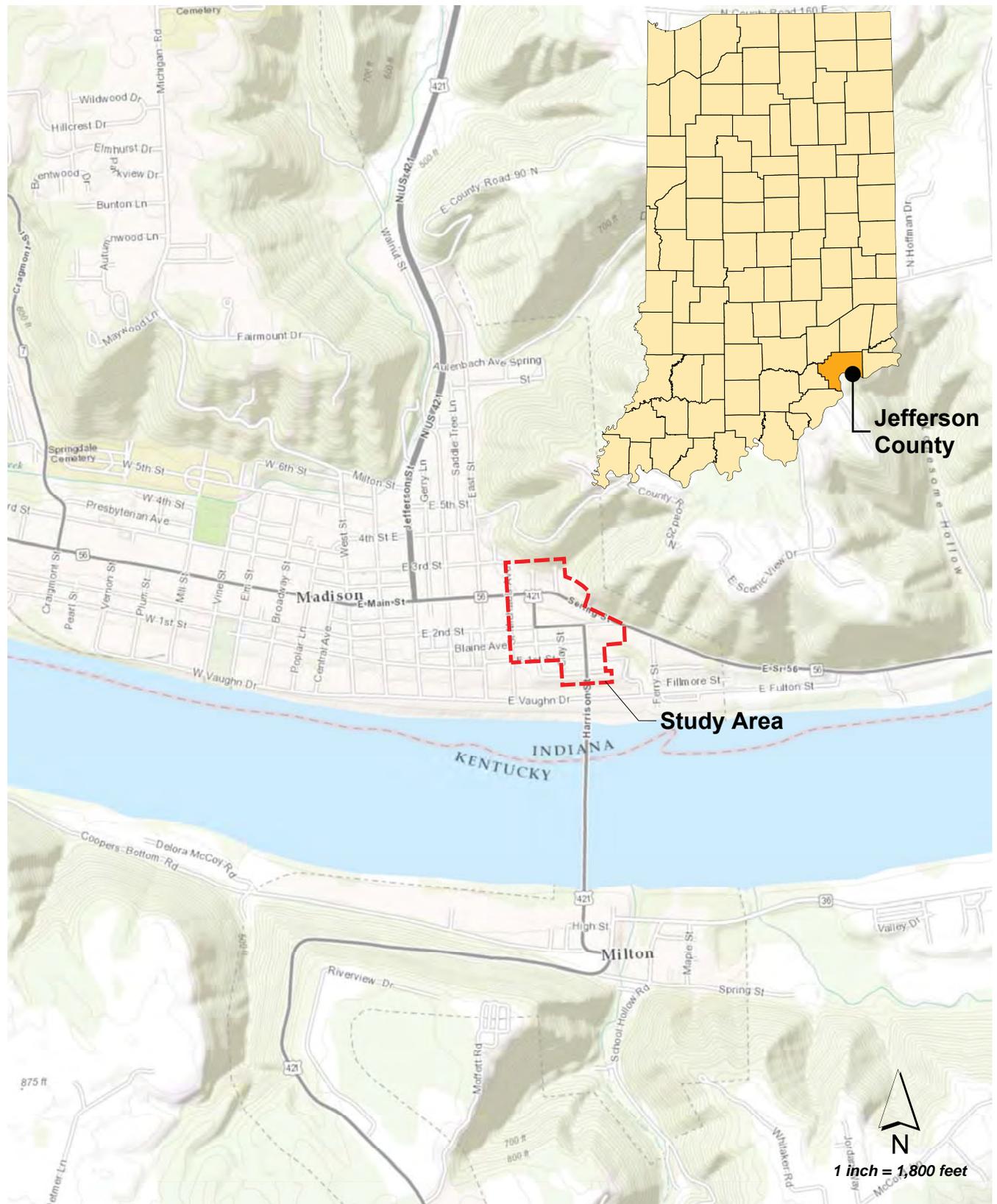


Existing Noise Measurements  
Vehicle Data Log

Site:	Date:	Location:	Predominant Vehicle Speed (mph)	Auto:	Medium Truck:	Heavy Truck:	Bus:	Motorcycle:	Other:	Comments:
B	1/17	SE corner of 12th St & 11th St	35 mph (70 lead)	Auto:                               (81)	3					
	11:59									
	12:14									
North West Bound										
East Bound										
West Bound										
East Bound										

# APPENDIX C

## Exhibits

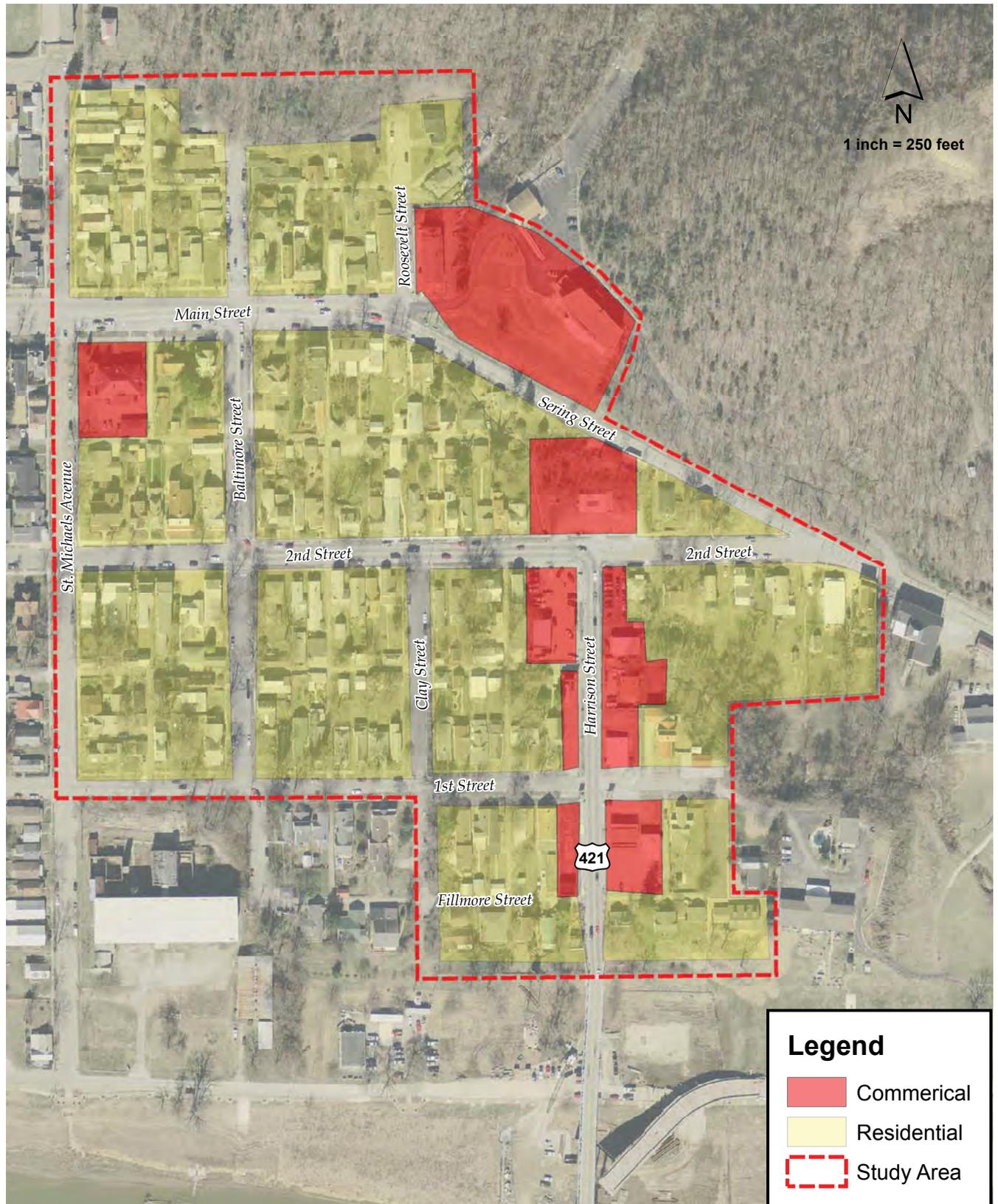


Source: Basemap: ESRI Worlds Topographic Map.



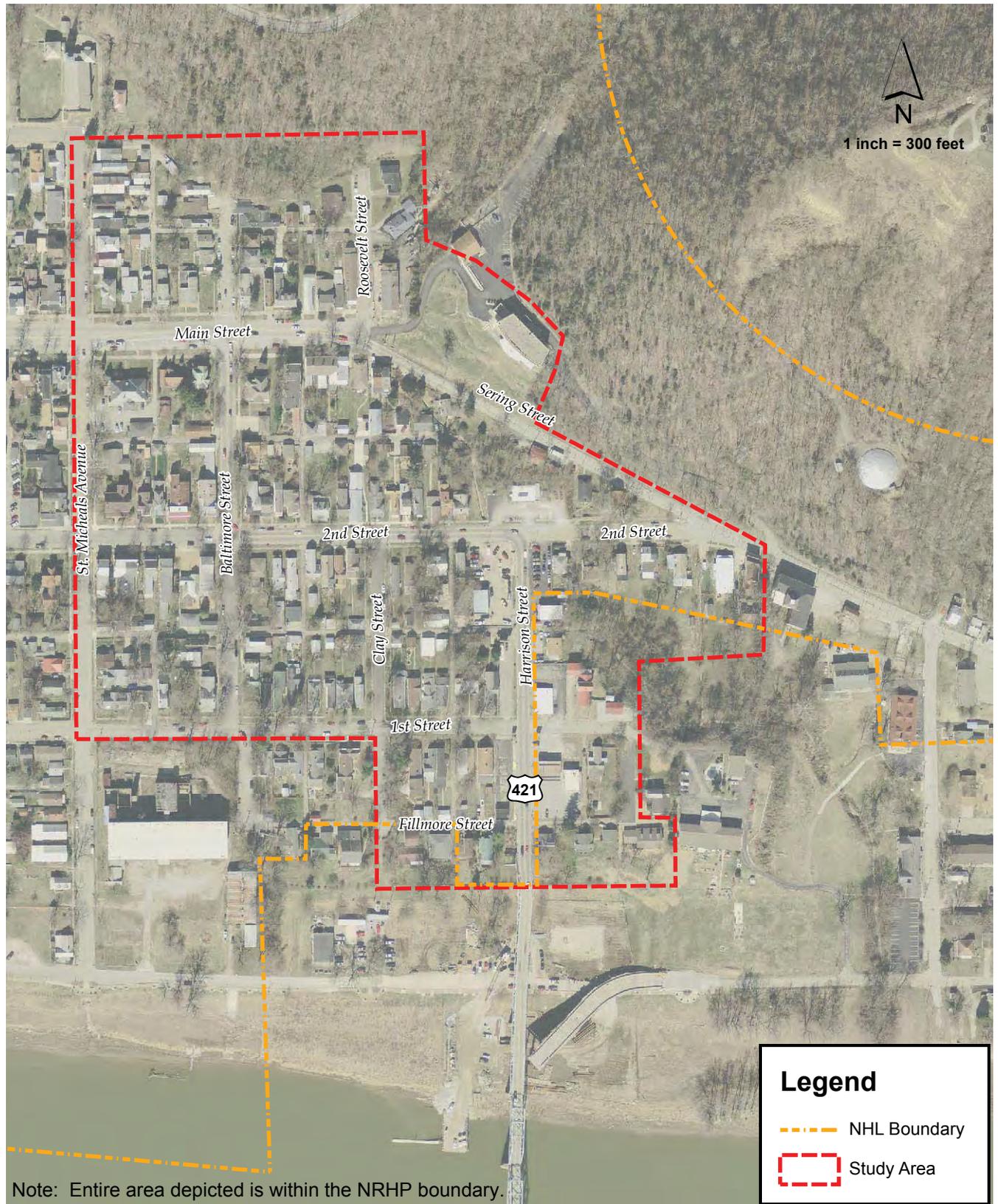
## Location Map

### Exhibit 1



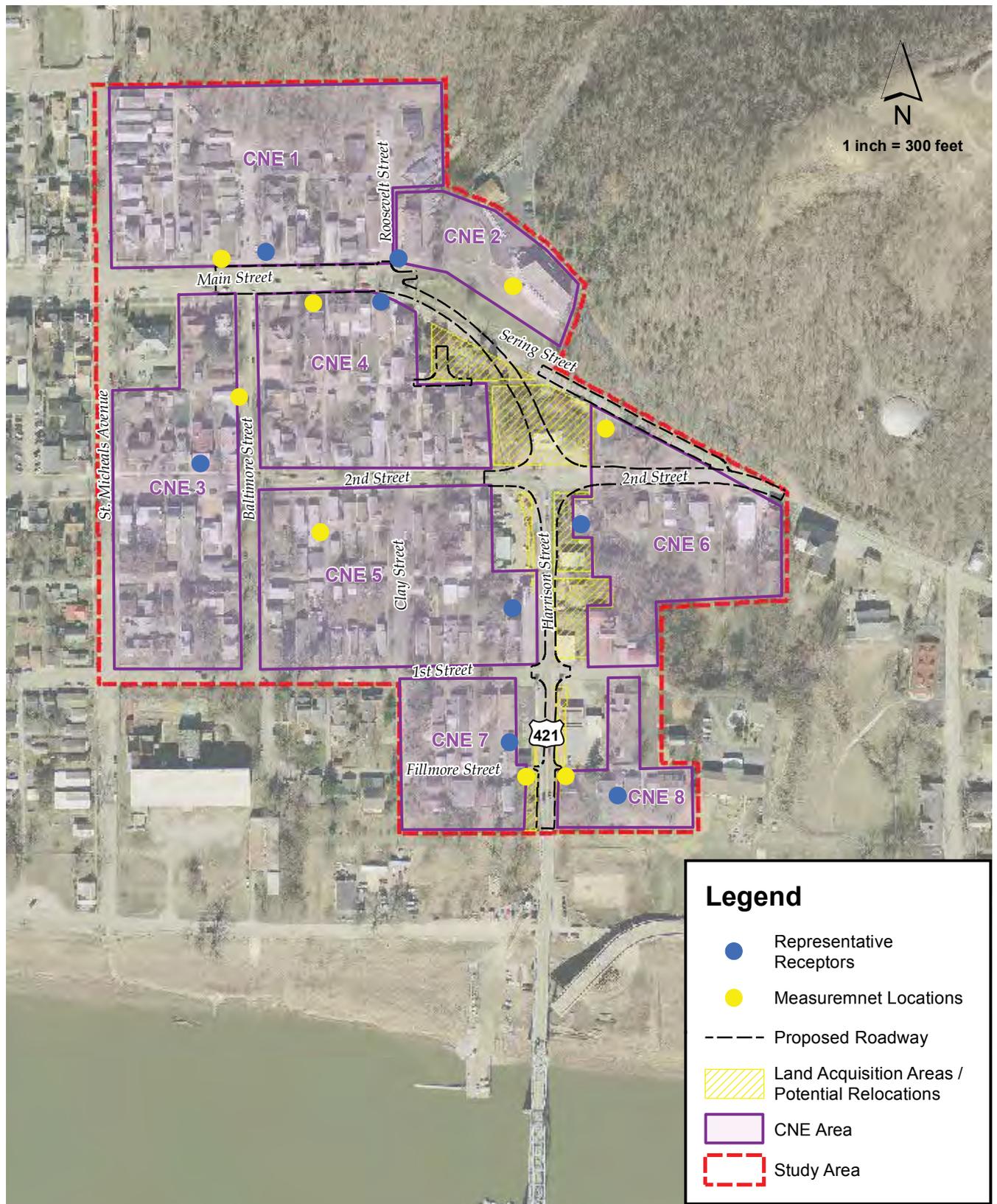
## General Land Use Map

### Exhibit 2



# Historic Districts

## Exhibit 3

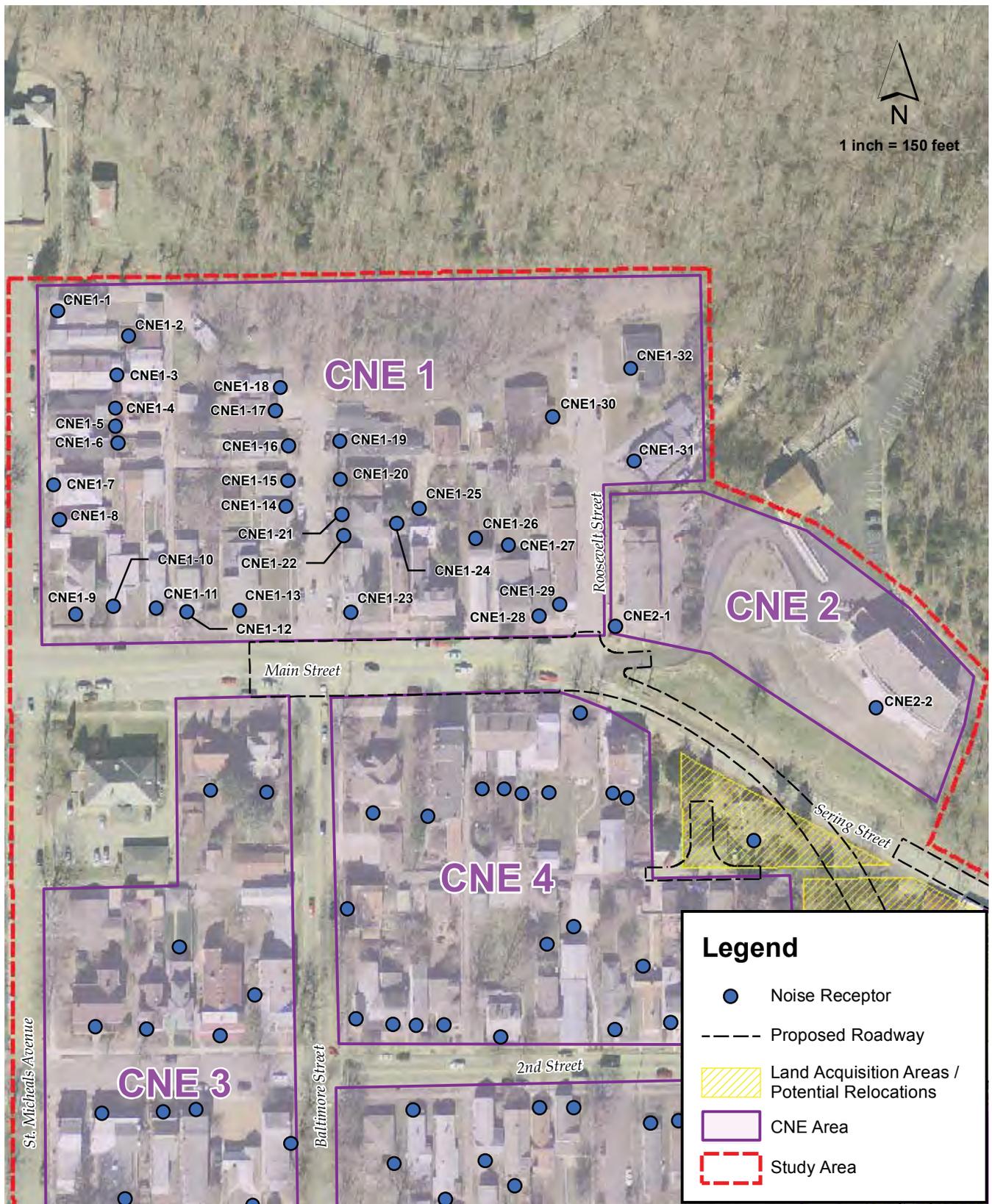


Source: Aerial: NAIP 2012 Full Color 1M



## Noise Analysis Elements

### Exhibit 4

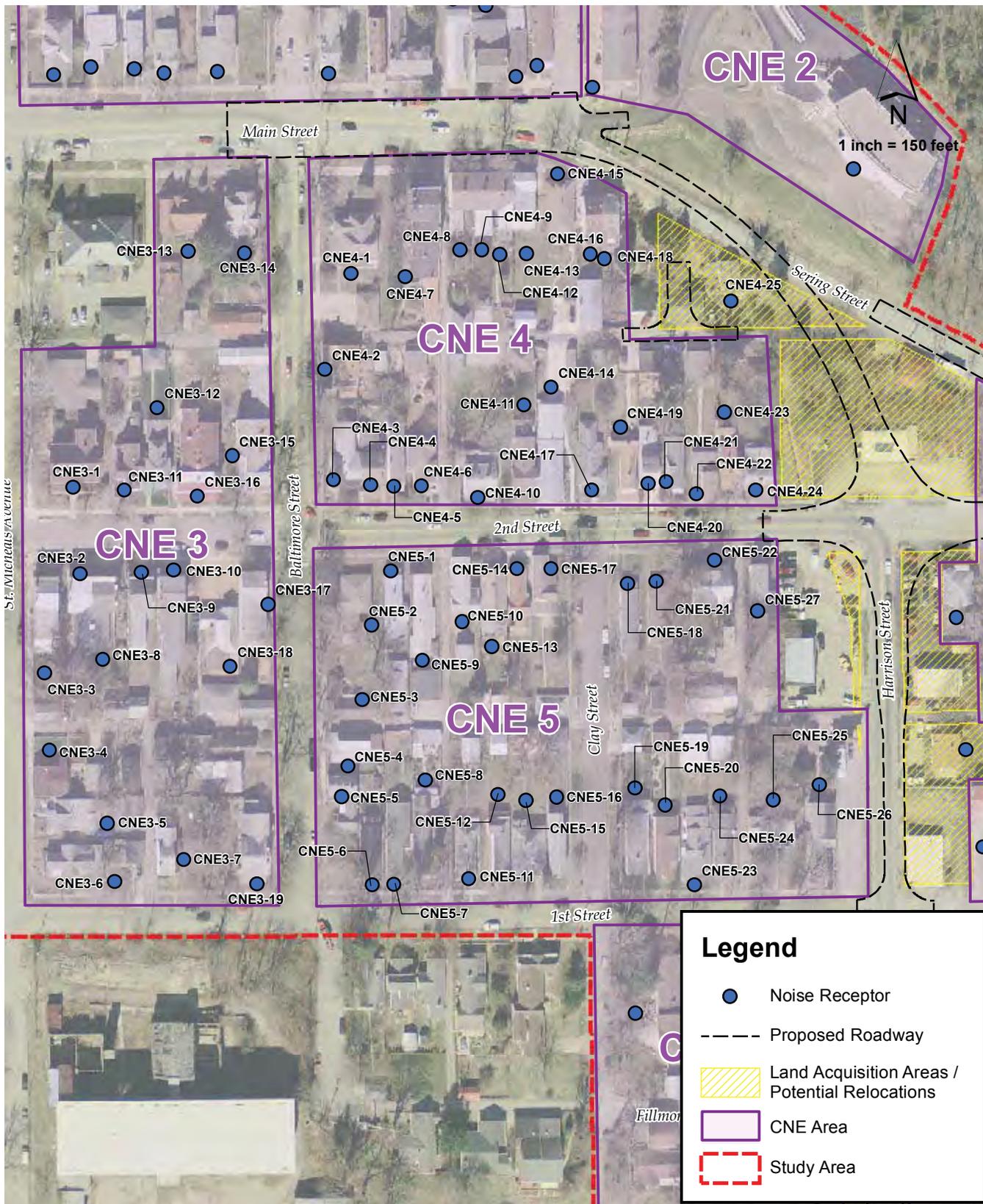


Source: Aerial: NAIP 2012 Full Color 1M



## Noise Receptor Locations - CNE 1 and CNE 2

### Exhibit 5

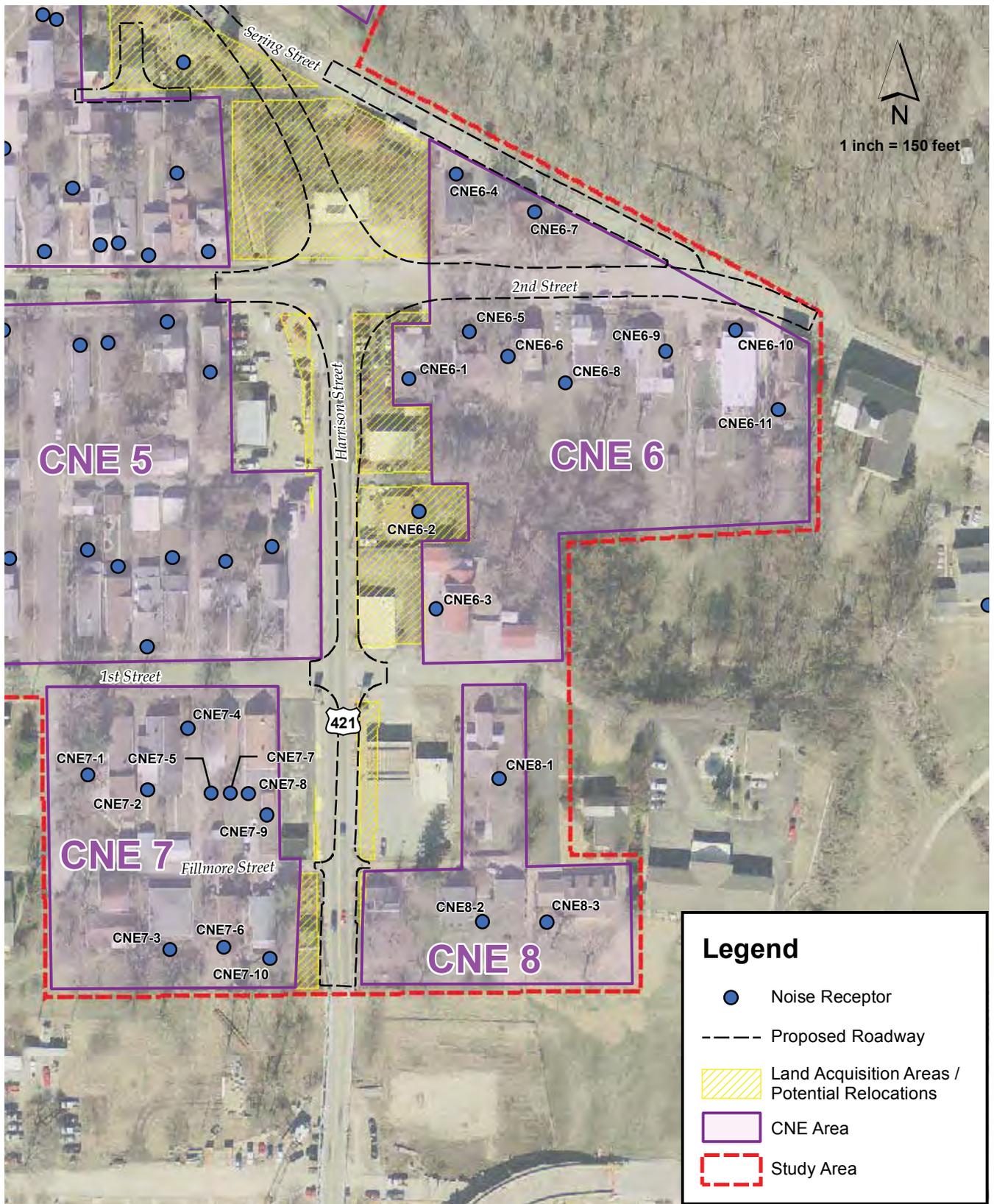


Source: Aerial: NAIP 2012 Full Color 1M



# Noise Receptor Locations - CNE 3, CNE 4 and CNE 5

## Exhibit 6



Source: Aerial: NAIP 2012 Full Color 1M



# Noise Receptor Locations - CNE 6, CNE 7 and CNE 8

## Exhibit 7

# APPENDIX D

## Noise Modeling and Validation Results

### Noise Modeling Receptor Values

Noise Receptor Name	# Dwelling Units	Existing Scenario dB(A)	2040 No-Build Scenario dB(A)	2040 Build Scenario dB(A)	Noise Receptor Name	# Dwelling Units	Existing Scenario dB(A)	2040 No-Build Scenario dB(A)	2040 Build Scenario dB(A)
CNE1-1	1	52.4	53.1	51.7	CNE4-13	1	59.2	59	59
CNE1-2	1	52.3	52	49.2	CNE4-14	1	60.9	61.3	57.4
CNE1-3	1	53.2	52.9	50.4	CNE4-15	1	63.9	64.8	66.7
CNE1-4	1	54.1	53.8	51.6	CNE4-16	1	58.5	58.8	60.2
CNE1-5	1	54.6	54.4	52.3	CNE4-17	1	67.5	68.5	60.7
CNE1-6	1	55.1	55	53	CNE4-18	1	58.3	58.8	60.4
CNE1-7	1	56.2	56.9	56.2	CNE4-19	1	61.6	62.5	58.2
CNE1-8	1	57.4	58	57.3	CNE4-20	1	66.5	67.5	60.8
CNE1-9	1	64.5	65.4	65.5	CNE4-21	1	66.2	67.3	60.9
CNE1-10	1	63.8	64.5	64.5	CME4-22	1	67.7	68.8	62.2
CNE1-11	1	64.7	65.4	65.3	CNE4-23	1	60.5	61.5	61
CNE1-12	1	65.7	66.3	66.2	CNE4-24	2	67.1	68.3	63.2
CNE1-13	1	66.4	66.7	66	CNE4-25	1	58.4	59.3	65.2*
CNE1-14	1	59.9	59.2	56.1	CNE5-1	1	70.1	71	61.8
CNE1-15	1	58.8	58.1	54.9	CNE5-2	1	64.6	64.9	57
CNE1-16	1	57.7	56.9	53.2	CNE5-3	1	60.6	60.7	54.8
CNE1-17	1	56.4	55.6	51.7	CNE5-4	1	58.6	58.9	55.1
CNE1-18	1	55.7	54.9	50.8	CNE5-5	1	58.1	58.5	55.7
CBE1-19	1	57.6	56.8	55.5	CNE5-6	1	56.7	56.7	55.3
CNE1-20	1	58.7	57.8	56.8	CNE5-7	1	56.2	56.1	54.5
CNE1-21	1	60.2	59.3	58.4	CNE5-8	1	56.6	56.8	50.8
CNE1-22	1	61	60.1	59.4	CNE5-9	1	61.4	61.9	53.8
CNE1-23	1	66.5	65.9	65.8	CNE5-10	1	63.5	64.2	55.3
CNE1-24	1	58.9	58.2	58.1	CNE5-11	1	55.8	55.6	53.6
CNE1-25	1	57.7	57.1	57	CNE5-12	1	56.1	56.4	50.2
CNE1-26	1	57.8	57.4	57.7	CNE5-13	1	61.5	62.2	53.5
CNE1-27	2	57.5	57.3	57.5	CNE5-14	1	68.9	70	60.6
CNE1-28	1	61.9	62.3	64.2	CNE5-15	1	55.9	56.3	50.3
CNE1-29	1	60.1	60.5	61.7	CNE5-16	1	56.1	56.5	50.5
CNE1-30	1	53.3	52.8	51.9	CNE5-17	1	68.6	69.7	60.3
CNE1-31	1	53.1	52.9	54.9	CNE5-18	1	65.8	66.8	58.9
CNE1-32	1	51	50.7	52.8	CNE5-19	1	56.5	57.2	54.8
CNE2-1	17	60.2	60.8	62.4	CNE5-20	1	56.6	57.3	55.2
CNE2-2	30	57.9	58.7	60.4	CNE5-21	1	65.8	66.9	59.2
CNE3-1	1	62.3	63.1	62.1	CNE5-22	1	68.2	69.3	61.4
CNE3-2	1	63.4	64.4	63.6	CNE5-23	1	57.1	57.7	56.1
CNE3-3	1	57.1	57.8	56.1	CNE5-24	1	57.9	58.8	56.7
CNE3-4	1	55.4	56.1	54	CNE5-25	1	60	61.1	58.7
CNE3-5	1	54	54	50.1	CNE5-26	1	63	64.3	62.1
CNE3-6	1	53.4	53.6	50.6	CNE5-27	1	62.7	63.8	60.2
CNE3-7	1	54.6	54.7	51.6	CNE6-1	1	61.5	62.7	65.8
CNE3-8	1	58	58.2	55.1	CNE6-2	1	59.7	61	62.8*
CNE3-9	1	63.9	64.7	63.4	CNE6-3	1	59.9	61.1	60.4
CNE3-10	1	64.7	65.3	63.6	CNE6-4	1	64.4	65.6	62.5
CNE3-11	1	63.5	64	62.4	CNE6-5	1	59.7	60.9	64.9
CNE3-12	1	62	61	55.9	CNE6-6	1	57.8	59	62.4
CNE3-13	1	63.7	62.4	58.3	CNE6-7	1	64.7	65.9	62.3
CNE3-14	1	69.1	67.3	58.9	CNE6-8	1	55.9	57	60.1
CNE3-15	1	67.4	66.1	59.6	CNE6-9	1	57.7	58.8	60.1
CNE3-16	2	66.1	66.2	63.7	CNE6-10	1	62.1	63.1	62.3
CNE3-17	1	66.5	66.6	61.6	CNE6-11	1	56.8	57.9	56.7
CNE3-18	1	60.9	60.9	56.3	CNE7-1	1	54.7	55.5	51.3
CNE3-19	1	57.1	57.8	56.3	CNE7-2	1	55.8	56.8	51.8
CNE4-1	1	68	66.2	58.9	CNE7-3	1	54.4	55.5	52.5
CNE4-2	1	71.9	70	59.7	CNE7-4	1	58.1	59	54.2
CNE4-3	1	72.4	71.3	62.2	CNE7-5	1	58.4	59.5	54.1
CNE4-4	1	69.7	69.8	61.1	CNE7-6	1	57.3	58.5	55.5
CNE4-5	1	68.9	69.3	60.7	CNE7-7	1	59.4	60.5	55.1
CNE4-6	1	68.3	69	60.4	CNE7-8	1	60.4	61.5	56.5
CNE4-7	1	63.2	61.8	57.8	CNE7-9	1	61.7	63	58.4
CNE4-8	1	61	60.1	58.5	CNE7-10	1	60.9	62.2	60
CNE4-9	1	60.4	59.7	58.7	CNE8-1	1	56.3	57.5	53.4
CNE4-10	2	69.1	70.1	61.3	CNE8-2	1	56.5	57.7	54.2
CNE4-11	1	61.7	62.1	57	CNE8-3	1	53.7	54.8	51.4
CNE4-12	1	59.8	59.3	58.7					

**Notes:**

All values are depicted in LAeq1h and have been rounded to the nearest whole number.

\* - These receptors may be acquired/relocated as a part of the project development.

157090100-04

30 January 2017  
TNM 2.5  
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

157090100-04  
US 421 Existing 2015  
INPUT HEIGHTS

68 deg F, 50% RH

RESULTS: SOUND LEVELS

CMT, Inc.  
LJS

RESULTS: SOUND LEVELS  
PROJECT/CONTRACT:

RUN:

BARRIER DESIGN:

ATMOSPHERICS:

Receiver

Receiver Name	No.	#DUs	Existing LAeq1h		No Barrier		Increase over existing		Type Impact	With Barrier		Calculated minus Goal dB
			LAeq1h	Crit'n	LAeq1h	Crit'n	Calculated	Crit'n		Calculated LAeq1h	Noise Reduction	
			dB	dB	dB	dB	dB	dB		dB	dB	dB
CNE1-1	192	1	0.0	52.4	66	52.4	15	52.4	15	52.4	0.0	7
CNE1-2	193	1	0.0	52.3	66	52.3	15	52.3	15	52.3	0.0	7
CNE1-3	194	1	0.0	53.2	66	53.2	15	53.2	15	53.2	0.0	7
CNE1-4	195	1	0.0	54.1	66	54.1	15	54.1	15	54.1	0.0	7
CNE1-5	196	1	0.0	54.6	66	54.6	15	54.6	15	54.6	0.0	7
CNE1-6	197	1	0.0	55.1	66	55.1	15	55.1	15	55.1	0.0	7
CNE1-7	199	1	0.0	56.2	66	56.2	15	56.2	15	56.2	0.0	7
CNE1-8	200	1	0.0	57.4	66	57.4	15	57.4	15	57.4	0.0	7
CNE1-9	202	1	0.0	64.5	66	64.5	15	64.5	15	64.5	0.0	7
CNE1-10	203	1	0.0	63.8	66	63.8	15	63.8	15	63.8	0.0	7
CNE1-11	204	1	0.0	64.7	66	64.7	15	64.7	15	64.7	0.0	7
CNE1-12	205	1	0.0	65.7	66	65.7	15	65.7	15	65.7	0.0	7
CNE1-13	206	1	0.0	66.4	66	66.4	15	66.4	15	66.4	0.0	7
CNE1-14	208	1	0.0	59.9	66	59.9	15	59.9	15	59.9	0.0	7
CNE1-15	209	1	0.0	58.8	66	58.8	15	58.8	15	58.8	0.0	7
CNE1-16	210	1	0.0	57.7	66	57.7	15	57.7	15	57.7	0.0	7
CNE1-17	211	1	0.0	56.4	66	56.4	15	56.4	15	56.4	0.0	7
CNE1-18	212	1	0.0	55.7	66	55.7	15	55.7	15	55.7	0.0	7
CBE1-19	213	1	0.0	57.6	66	57.6	15	57.6	15	57.6	0.0	7
CNE1-20	214	1	0.0	58.7	66	58.7	15	58.7	15	58.7	0.0	7
CNE1-21	215	1	0.0	60.2	66	60.2	15	60.2	15	60.2	0.0	7
CNE1-22	217	1	0.0	61.0	66	61.0	15	61.0	15	61.0	0.0	7
CNE1-23	218	1	0.0	66.5	66	66.5	15	66.5	15	66.5	0.0	7
CNE1-24	219	1	0.0	58.9	66	58.9	15	58.9	15	58.9	0.0	7

C:\US 421\Noise\Existing\US421 Existing 2015

**RESULTS: SOUND LEVELS**

		157090100-04										
CNE1-25	220	1	0.0	57.7	66	57.7	15	---	57.7	0.0	7	-7.0
CNE1-26	221	1	0.0	57.8	66	57.8	15	---	57.8	0.0	7	-7.0
CNE1-27	222	2	0.0	57.5	66	57.5	15	---	57.5	0.0	7	-7.0
CNE1-28	223	1	0.0	61.9	66	61.9	15	---	61.9	0.0	7	-7.0
CNE1-29	225	1	0.0	60.1	66	60.1	15	---	60.1	0.0	7	-7.0
CNE1-30	226	1	0.0	53.3	66	53.3	15	---	53.3	0.0	7	-7.0
CNE1-31	227	1	0.0	53.1	66	53.1	15	---	53.1	0.0	7	-7.0
CNE1-32	228	1	0.0	51.0	66	51.0	15	---	51.0	0.0	7	-7.0
CNE2-1	230	17	0.0	60.2	71	60.2	15	---	60.2	0.0	7	-7.0
CNE2-2	231	30	0.0	57.9	71	57.9	15	---	57.9	0.0	7	-7.0
CNE3-1	233	1	0.0	62.3	66	62.3	15	---	62.3	0.0	7	-7.0
CNE3-2	234	1	0.0	63.4	66	63.4	15	---	63.4	0.0	7	-7.0
CNE3-3	235	1	0.0	57.1	66	57.1	15	---	57.1	0.0	7	-7.0
CNE3-4	236	1	0.0	55.4	66	55.4	15	---	55.4	0.0	7	-7.0
CNE3-5	237	1	0.0	54.0	66	54.0	15	---	54.0	0.0	7	-7.0
CNE3-6	239	1	0.0	53.4	66	53.4	15	---	53.4	0.0	7	-7.0
CNE3-7	240	1	0.0	54.6	66	54.6	15	---	54.6	0.0	7	-7.0
CNE3-8	241	1	0.0	58.0	66	58.0	15	---	58.0	0.0	7	-7.0
CNE3-9	242	1	0.0	63.9	66	63.9	15	---	63.9	0.0	7	-7.0
CNE3-10	243	1	0.0	64.7	66	64.7	15	---	64.7	0.0	7	-7.0
CNE3-11	244	1	0.0	63.5	66	63.5	15	---	63.5	0.0	7	-7.0
CNE3-12	246	1	0.0	62.0	66	62.0	15	---	62.0	0.0	7	-7.0
CNE3-13	247	1	0.0	63.7	66	63.7	15	---	63.7	0.0	7	-7.0
CNE3-14	248	1	0.0	69.1	66	69.1	15	Snd Lvl	69.1	0.0	7	-7.0
CNE3-15	249	1	0.0	67.4	66	67.4	15	Snd Lvl	67.4	0.0	7	-7.0
CNE3-16	250	2	0.0	66.1	66	66.1	15	Snd Lvl	66.1	0.0	7	-7.0
CNE3-17	253	1	0.0	66.5	66	66.5	15	Snd Lvl	66.5	0.0	7	-7.0
CNE3-18	254	1	0.0	60.9	66	60.9	15	---	60.9	0.0	7	-7.0
CNE4-1	257	1	0.0	68.0	66	68.0	15	Snd Lvl	68.0	0.0	7	-7.0
CNE4-2	258	1	0.0	71.9	66	71.9	15	Snd Lvl	71.9	0.0	7	-7.0
CNE4-3	261	1	0.0	72.4	66	72.4	15	Snd Lvl	72.4	0.0	7	-7.0
CNE4-4	262	1	0.0	69.7	66	69.7	15	Snd Lvl	69.7	0.0	7	-7.0
CNE4-5	263	1	0.0	68.9	66	68.9	15	Snd Lvl	68.9	0.0	7	-7.0
CNE4-6	264	1	0.0	68.3	66	68.3	15	Snd Lvl	68.3	0.0	7	-7.0
CNE4-7	265	1	0.0	63.2	66	63.2	15	---	63.2	0.0	7	-7.0
CNE4-8	266	1	0.0	61.0	66	61.0	15	---	61.0	0.0	7	-7.0
CNE4-9	267	1	0.0	60.4	66	60.4	15	---	60.4	0.0	7	-7.0
CNE4-10	268	2	0.0	69.1	66	69.1	15	Snd Lvl	69.1	0.0	7	-7.0
CNE4-11	269	1	0.0	61.7	66	61.7	15	---	61.7	0.0	7	-7.0
CNE4-12	270	1	0.0	59.8	66	59.8	15	---	59.8	0.0	7	-7.0
CNE4-13	271	1	0.0	59.2	66	59.2	15	---	59.2	0.0	7	-7.0
CNE4-14	272	1	0.0	60.9	66	60.9	15	---	60.9	0.0	7	-7.0

30 January 2017

C:\US 421\Noise\Existing\US421 Existing 2015

**RESULTS: SOUND LEVELS**

**157090100-04**

CNE3-19	274	1	0.0	57.1	66	57.1	15	---	57.1	0.0	7	-7.0
CNE4-15	276	1	0.0	63.9	66	63.9	15	---	63.9	0.0	7	-7.0
CNE4-16	277	1	0.0	58.5	66	58.5	15	---	58.5	0.0	7	-7.0
CNE4-17	278	1	0.0	67.5	66	67.5	15	Snd Lvl	67.5	0.0	7	-7.0
CNE4-18	279	1	0.0	58.3	66	58.3	15	---	58.3	0.0	7	-7.0
CNE4-19	280	1	0.0	61.6	66	61.6	15	---	61.6	0.0	1	-7.0
CNE4-20	281	1	0.0	66.5	66	66.5	15	Snd Lvl	66.5	0.0	7	-7.0
CNE4-21	282	1	0.0	66.2	66	66.2	15	Snd Lvl	66.2	0.0	7	-7.0
CNE4-22	283	1	0.0	67.7	66	67.7	15	Snd Lvl	67.7	0.0	7	-7.0
CNE4-23	284	1	0.0	60.5	66	60.5	15	---	60.5	0.0	7	-7.0
CNE4-24	285	2	0.0	67.1	66	67.1	15	Snd Lvl	67.1	0.0	7	-7.0
CNE4-25	286	1	0.0	58.4	66	58.4	15	---	58.4	0.0	7	-7.0
CNE5-1	288	1	0.0	70.1	66	70.1	15	Snd Lvl	70.1	0.0	7	-7.0
CNE5-2	289	1	0.0	64.6	66	64.6	15	---	64.6	0.0	7	-7.0
CNE5-3	290	1	0.0	60.6	66	60.6	15	---	60.6	0.0	7	-7.0
CNE5-4	291	1	0.0	58.6	66	58.6	15	---	58.6	0.0	7	-7.0
CNE5-5	292	1	0.0	58.1	66	58.1	15	---	58.1	0.0	7	-7.0
CNE5-6	293	1	0.0	56.7	66	56.7	15	---	56.7	0.0	7	-7.0
CNE5-7	294	1	0.0	56.2	66	56.2	15	---	56.2	0.0	7	-7.0
CNE5-8	295	1	0.0	56.6	66	56.6	15	---	56.6	0.0	7	-7.0
CNE5-9	296	1	0.0	61.4	66	61.4	15	---	61.4	0.0	7	-7.0
CNE5-10	297	1	0.0	63.5	66	63.5	15	---	63.5	0.0	7	-7.0
CNE5-11	298	1	0.0	55.8	66	55.8	15	---	55.8	0.0	7	-7.0
CNE5-12	300	1	0.0	56.1	66	56.1	15	---	56.1	0.0	7	-7.0
CNE5-13	301	1	0.0	61.5	66	61.5	15	---	61.5	0.0	7	-7.0
CNE5-14	302	1	0.0	68.9	66	68.9	15	Snd Lvl	68.9	0.0	7	-7.0
CNE5-15	303	1	0.0	55.9	66	55.9	15	---	55.9	0.0	7	-7.0
CNE5-16	304	1	0.0	56.1	66	56.1	15	---	56.1	0.0	7	-7.0
CNE5-17	305	1	0.0	68.6	66	68.6	15	Snd Lvl	68.6	0.0	7	-7.0
CNE5-18	307	1	0.0	65.8	66	65.8	15	---	65.8	0.0	7	-7.0
CNE5-19	308	1	0.0	56.5	66	56.5	15	---	56.5	0.0	7	-7.0
CNE5-20	309	1	0.0	56.6	66	56.6	15	---	56.6	0.0	7	-7.0
CNE5-21	310	1	0.0	65.8	66	65.8	15	---	65.8	0.0	7	-7.0
CNE5-22	311	1	0.0	68.2	66	68.2	15	Snd Lvl	68.2	0.0	7	-7.0
CNE5-23	312	1	0.0	57.1	66	57.1	15	---	57.1	0.0	7	-7.0
CNE5-24	313	1	0.0	57.9	66	57.9	15	---	57.9	0.0	7	-7.0
CNE5-25	314	1	0.0	60.0	66	60.0	15	---	60.0	0.0	7	-7.0
CNE5-26	315	1	0.0	63.0	66	63.0	15	---	63.0	0.0	7	-7.0
CNE5-27	316	1	0.0	62.7	66	62.7	15	---	62.7	0.0	7	-7.0
CNE6-1	318	1	0.0	61.5	66	61.5	15	---	61.5	0.0	7	-7.0
CNE6-2	319	1	0.0	59.7	66	59.7	15	---	59.7	0.0	7	-7.0
CNE6-3	320	1	0.0	59.9	66	59.9	15	---	59.9	0.0	7	-7.0

30 January 2017

3

C:\US 421\Noise\Existing\US421 Existing 2015



157090100-04

30 January 2017  
TNM 2.5  
Calculated with TNM 2.5

Average pavement type shall be used unless  
a State highway agency substantiates the use  
of a different type with approval of FHWA.

157090100-04

US 421 Future No Build 2040

INPUT HEIGHTS

68 deg F, 50% RH

RESULTS: SOUND LEVELS

CMT, Inc.  
LJS

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

RUN:

BARRIER DESIGN:

ATMOSPHERICS:

Receiver

Name	No.	#DUs	Existing		No Barrier		Increase over existing		Type Impact	With Barrier		Calculated minus Goal dB
			L Aeq1h	dBA	L Aeq1h	dBA	Calculated	Crit'n		Calculated	Crit'n	
CNE1-1	192	1	52.4	53.1	66	66	0.7	15	----	53.1	0.0	7
CNE1-2	193	1	52.3	52.0	66	66	-0.3	15	----	52.0	0.0	7
CNE1-3	194	1	53.2	52.9	66	66	-0.3	15	----	52.9	0.0	7
CNE1-4	195	1	54.1	53.8	66	66	-0.3	15	----	53.8	0.0	7
CNE1-5	196	1	54.6	54.4	66	66	-0.2	15	----	54.4	0.0	7
CNE1-6	197	1	55.1	55.0	66	66	-0.1	15	----	55.0	0.0	7
CNE1-7	199	1	56.2	56.9	66	66	0.7	15	----	56.9	0.0	7
CNE1-8	200	1	57.4	58.0	66	66	0.6	15	----	58.0	0.0	7
CNE1-9	202	1	64.5	65.4	66	66	0.9	15	----	65.4	0.0	7
CNE1-10	203	1	63.8	64.5	66	66	0.7	15	----	64.5	0.0	7
CNE1-11	204	1	64.7	65.4	66	66	0.7	15	----	65.4	0.0	7
CNE1-12	205	1	65.7	66.3	66	66	0.6	15	Snd LVI	66.3	0.0	7
CNE1-13	206	1	66.4	66.7	66	66	0.3	15	Snd LVI	66.7	0.0	7
CNE1-14	208	1	59.9	59.2	66	66	-0.7	15	----	59.2	0.0	7
CNE1-15	209	1	58.8	58.1	66	66	-0.7	15	----	58.1	0.0	7
CNE1-16	210	1	57.7	56.9	66	66	-0.8	15	----	56.9	0.0	7
CNE1-17	211	1	56.4	55.6	66	66	-0.8	15	----	55.6	0.0	7
CNE1-18	212	1	55.7	54.9	66	66	-0.8	15	----	54.9	0.0	7
CBE1-19	213	1	57.6	56.8	66	66	-0.8	15	----	56.8	0.0	7
CNE1-20	214	1	58.7	57.8	66	66	-0.9	15	----	57.8	0.0	7
CNE1-21	215	1	60.2	59.3	66	66	-0.9	15	----	59.3	0.0	7
CNE1-22	217	1	61.0	60.1	66	66	-0.9	15	----	60.1	0.0	7
CNE1-23	218	1	66.5	65.9	66	66	-0.6	15	----	65.9	0.0	7
CNE1-24	219	1	58.9	58.2	66	66	-0.7	15	----	58.2	0.0	7

C:\US 421\Noise\Future No Build\US421 Future 2040 No Build

1

30 January 2017

**RESULTS: SOUND LEVELS**

**157090100-04**

CNE1-25	220	1	57.7	57.1	66	-0.6	15	---	57.1	0.0	7	-7.0
CNE1-26	221	1	57.8	57.4	66	-0.4	15	---	57.4	0.0	7	-7.0
CNE1-27	222	2	57.5	57.3	66	-0.2	15	---	57.3	0.0	7	-7.0
CNE1-28	223	1	61.9	62.3	66	0.4	15	---	62.3	0.0	7	-7.0
CNE1-29	225	1	60.1	60.5	66	0.4	15	---	60.5	0.0	7	-7.0
CNE1-30	226	1	53.3	52.8	66	-0.5	15	---	52.8	0.0	7	-7.0
CNE1-31	227	1	53.1	52.9	66	-0.2	15	---	52.9	0.0	7	-7.0
CNE1-32	228	1	51.0	50.7	66	-0.3	15	---	50.7	0.0	7	-7.0
CNE2-1	230	17	60.2	60.8	71	0.6	15	---	60.8	0.0	7	-7.0
CNE2-2	231	30	58.0	58.7	71	0.7	15	---	58.7	0.0	7	-7.0
CNE3-1	233	1	62.3	63.1	66	0.8	15	---	63.1	0.0	7	-7.0
CNE3-2	234	1	63.4	64.4	66	1.0	15	---	64.4	0.0	7	-7.0
CNE3-3	235	1	57.1	57.8	66	0.7	15	---	57.8	0.0	7	-7.0
CNE3-4	236	1	55.5	56.1	66	0.6	15	---	56.1	0.0	7	-7.0
CNE3-5	237	1	54.0	54.0	66	0.0	15	---	54.0	0.0	7	-7.0
CNE3-6	239	1	53.4	53.6	66	0.2	15	---	53.6	0.0	7	-7.0
CNE3-7	240	1	54.6	54.7	66	0.1	15	---	54.7	0.0	7	-7.0
CNE3-8	241	1	58.0	58.2	66	0.2	15	---	58.2	0.0	7	-7.0
CNE3-9	242	1	63.9	64.7	66	0.8	15	---	64.7	0.0	7	-7.0
CNE3-10	243	1	64.7	65.3	66	0.6	15	---	65.3	0.0	7	-7.0
CNE3-11	244	1	63.5	64.0	66	0.5	15	---	64.0	0.0	7	-7.0
CNE3-12	246	1	62.0	61.0	66	-1.0	15	---	61.0	0.0	7	-7.0
CNE3-13	247	1	63.7	62.4	66	-1.3	15	---	62.4	0.0	7	-7.0
CNE3-14	248	1	69.1	67.3	66	-1.8	15	Snd Lvl	67.3	0.0	7	-7.0
CNE3-15	249	1	67.4	66.1	66	-1.3	15	Snd Lvl	66.1	0.0	7	-7.0
CNE3-16	250	2	66.1	66.2	66	0.1	15	Snd Lvl	66.2	0.0	7	-7.0
CNE3-17	253	1	66.5	66.6	66	0.1	15	Snd Lvl	66.6	0.0	7	-7.0
CNE3-18	254	1	60.9	60.9	66	0.0	15	---	60.9	0.0	7	-7.0
CNE4-1	257	1	68.0	66.2	66	-1.8	15	Snd Lvl	66.2	0.0	7	-7.0
CNE4-2	258	1	71.9	70.0	66	-1.9	15	Snd Lvl	70.0	0.0	7	-7.0
CNE4-3	261	1	72.4	71.3	66	-1.1	15	Snd Lvl	71.3	0.0	7	-7.0
CNE4-4	262	1	69.7	69.8	66	0.1	15	Snd Lvl	69.8	0.0	7	-7.0
CNE4-5	263	1	68.9	69.3	66	0.4	15	Snd Lvl	69.3	0.0	7	-7.0
CNE4-6	264	1	68.3	69.0	66	0.7	15	Snd Lvl	69.0	0.0	7	-7.0
CNE4-7	265	1	63.2	61.8	66	-1.4	15	---	61.8	0.0	7	-7.0
CNE4-8	266	1	61.0	60.1	66	-0.9	15	---	60.1	0.0	7	-7.0
CNE4-9	267	1	60.4	59.7	66	-0.7	15	---	59.7	0.0	7	-7.0
CNE4-10	268	2	69.1	70.1	66	1.0	15	Snd Lvl	70.1	0.0	7	-7.0
CNE4-11	269	1	61.7	62.1	66	0.4	15	---	62.1	0.0	7	-7.0
CNE4-12	270	1	59.8	59.3	66	-0.5	15	---	59.3	0.0	7	-7.0
CNE4-13	271	1	59.2	59.0	66	-0.2	15	---	59.0	0.0	7	-7.0
CNE4-14	272	1	60.9	61.3	66	0.4	15	---	61.3	0.0	7	-7.0

C:\US 421\Noise\Future No Build\US421 Future 2040 No Build

2

30 January 2017

**157090100-04**

**RESULTS: SOUND LEVELS**

CNE3-19	274	1	57.1	57.8	66	0.7	15	----	57.8	0.0	7	-7.0
CNE4-15	276	1	63.9	64.8	66	0.9	15	----	64.8	0.0	7	-7.0
CNE4-16	277	1	58.5	58.8	66	0.3	15	----	58.8	0.0	7	-7.0
CNE4-17	278	1	67.5	68.5	66	1.0	15	Snd Lvl	68.5	0.0	7	-7.0
CNE4-18	279	1	58.3	58.8	66	0.5	15	----	58.8	0.0	7	-7.0
CNE4-19	280	1	61.6	62.5	66	0.9	15	----	62.5	0.0	7	-7.0
CNE4-20	281	1	66.5	67.5	66	1.0	15	Snd Lvl	67.5	0.0	7	-7.0
CNE4-21	282	1	66.2	67.3	66	1.1	15	Snd Lvl	67.3	0.0	7	-7.0
CME4-22	283	1	67.7	68.8	66	1.1	15	Snd Lvl	68.8	0.0	7	-7.0
CNE4-23	284	1	60.5	61.5	66	1.0	15	----	61.5	0.0	7	-7.0
CNE4-24	285	2	67.1	68.3	66	1.2	15	Snd Lvl	68.3	0.0	7	-7.0
CNE4-25	286	1	58.5	59.3	66	0.8	15	----	59.3	0.0	7	-7.0
CNE5-1	288	1	70.1	71.0	66	0.9	15	Snd Lvl	71.0	0.0	7	-7.0
CNE5-2	289	1	64.6	64.9	66	0.3	15	----	64.9	0.0	7	-7.0
CNE5-3	290	1	60.6	60.7	66	0.1	15	----	60.7	0.0	7	-7.0
CNE5-4	291	1	58.6	58.9	66	0.3	15	----	58.9	0.0	7	-7.0
CNE5-5	292	1	58.1	58.5	66	0.4	15	----	58.5	0.0	7	-7.0
CNE5-6	293	1	56.7	56.7	66	0.0	15	----	56.7	0.0	7	-7.0
CNE5-7	294	1	56.2	56.1	66	-0.1	15	----	56.1	0.0	7	-7.0
CNE5-8	295	1	56.6	56.8	66	0.2	15	----	56.8	0.0	7	-7.0
CNE5-9	296	1	61.5	61.9	66	0.4	15	----	61.9	0.0	7	-7.0
CNE5-10	297	1	63.5	64.2	66	0.7	15	----	64.2	0.0	7	-7.0
CNE5-11	298	1	55.8	55.6	66	-0.2	15	----	55.6	0.0	7	-7.0
CNE5-12	300	1	56.1	56.4	66	0.3	15	----	56.4	0.0	7	-7.0
CNE5-13	301	1	61.5	62.2	66	0.7	15	----	62.2	0.0	7	-7.0
CNE5-14	302	1	68.9	70.0	66	1.1	15	Snd Lvl	70.0	0.0	7	-7.0
CNE5-15	303	1	56.0	56.3	66	0.3	15	----	56.3	0.0	7	-7.0
CNE5-16	304	1	56.1	56.5	66	0.4	15	----	56.5	0.0	7	-7.0
CNE5-17	305	1	68.6	69.7	66	1.1	15	Snd Lvl	69.7	0.0	7	-7.0
CNE5-18	307	1	65.8	66.8	66	1.0	15	Snd Lvl	66.8	0.0	7	-7.0
CNE5-19	308	1	56.5	57.2	66	0.7	15	----	57.2	0.0	7	-7.0
CNE5-20	309	1	56.6	57.3	66	0.7	15	----	57.3	0.0	7	-7.0
CNE5-21	310	1	65.8	66.9	66	1.1	15	Snd Lvl	66.9	0.0	7	-7.0
CNE5-22	311	1	68.2	69.3	66	1.1	15	Snd Lvl	69.3	0.0	7	-7.0
CNE5-23	312	1	57.1	57.7	66	0.6	15	----	57.7	0.0	7	-7.0
CNE5-24	313	1	57.9	58.8	66	0.9	15	----	58.8	0.0	7	-7.0
CNE5-25	314	1	60.0	61.1	66	1.1	15	----	61.1	0.0	7	-7.0
CNE5-26	315	1	63.0	64.3	66	1.3	15	----	64.3	0.0	7	-7.0
CNE5-27	316	1	62.7	63.8	66	1.1	15	----	63.8	0.0	7	-7.0
CNE6-1	318	1	61.5	62.7	66	1.2	15	----	62.7	0.0	7	-7.0
CNE6-2	319	1	59.8	61.0	66	1.2	15	----	61.0	0.0	7	-7.0
CNE6-3	320	1	59.9	61.1	66	1.2	15	----	61.1	0.0	7	-7.0

**30 January 2017**

**3**

**C:\US 421\Noise\Future No Build\US421 Future 2040 No Build**

**RESULTS: SOUND LEVELS**

**157090100-04**

Dwelling Units	# DUs	Noise Reduction			64.4	66	65.6	66	1.2	15	65.6	0.0	7	-7.0
		Min	Avg	Max										
		dB	dB	dB										
CNE6-4	321	1	64.4	65.6	66	65.6	66	1.2	15	65.6	0.0	7	-7.0	
CNE6-5	322	1	59.7	60.9	66	60.9	66	1.2	15	60.9	0.0	7	-7.0	
CNE6-6	323	1	57.9	59.0	66	59.0	66	1.1	15	59.0	0.0	7	-7.0	
CNE6-7	324	1	64.7	65.9	66	65.9	66	1.2	15	65.9	0.0	7	-7.0	
CNE6-8	325	1	56.0	57.0	66	57.0	66	1.0	15	57.0	0.0	7	-7.0	
CNE6-9	326	1	57.7	58.8	66	58.8	66	1.1	15	58.8	0.0	7	-7.0	
CNE6-10	327	1	62.1	63.1	66	63.1	66	1.0	15	63.1	0.0	7	-7.0	
CNE6-11	328	1	56.9	57.9	66	57.9	66	1.0	15	57.9	0.0	7	-7.0	
CNE7-1	330	1	54.7	55.5	66	55.5	66	0.8	15	55.5	0.0	7	-7.0	
CNE7-2	331	1	55.8	56.8	66	56.8	66	1.0	15	56.8	0.0	7	-7.0	
CNE7-3	332	1	54.4	55.5	66	55.5	66	1.1	15	55.5	0.0	7	-7.0	
CNE7-4	333	1	58.1	59.0	66	59.0	66	0.9	15	59.0	0.0	7	-7.0	
CNE7-5	334	1	58.4	59.5	66	59.5	66	1.1	15	59.5	0.0	7	-7.0	
CNE7-6	335	1	57.3	58.5	66	58.5	66	1.2	15	58.5	0.0	7	-7.0	
CNE7-7	336	1	59.4	60.5	66	60.5	66	1.1	15	60.5	0.0	7	-7.0	
CNE7-8	337	1	60.4	61.5	66	61.5	66	1.1	15	61.5	0.0	7	-7.0	
CNE7-9	338	1	61.7	63.0	66	63.0	66	1.3	15	63.0	0.0	7	-7.0	
CNE7-10	339	1	60.9	62.2	66	62.2	66	1.3	15	62.2	0.0	7	-7.0	
CNE8-1	341	1	56.3	57.5	66	57.5	66	1.2	15	57.5	0.0	7	-7.0	
CNE8-2	342	1	56.5	57.7	66	57.7	66	1.2	15	57.7	0.0	7	-7.0	
CNE8-3	343	1	53.7	54.8	66	54.8	66	1.1	15	54.8	0.0	7	-7.0	
<b>Dwelling Units</b>		<b># DUs</b>	<b>Min</b>	<b>Avg</b>	<b>Max</b>									
			dB	dB	dB									
All Selected		178	0.0	0.0	0.0									
All Impacted		27	0.0	0.0	0.0									
All that meet NR Goal		0	0.0	0.0	0.0									

RESULTS: SOUND LEVELS

157090100-04

CMT, Inc.  
LJS

30 January 2017  
TNM 2.5  
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:  
157090100-04

RUN:  
US 421 Future SPA/Alternative 6

BARRIER DESIGN:  
INPUT HEIGHTS

Average pavement type shall be used unless  
a State highway agency substantiates the use  
of a different type with approval of FHWA.

ATMOSPHERICS:  
68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h dBA	No Barrier		Increase over existing		Type Impact	With Barrier		Calculated minus Goal dB
				LAeq1h Calculated dBA	Crit'n dBA	Calculated dB	Crit'n Sub'l Inc dB		Calculated LAeq1h dBA	Noise Reduction Calculated dB	
CNE1-1	194	1	52.4	51.7	66	-0.7	15	---	51.7	0.0	7
CNE1-2	195	1	52.3	49.2	66	-3.1	15	---	49.2	0.0	7
CNE1-3	196	1	53.2	50.4	66	-2.8	15	---	50.4	0.0	7
CNE1-4	197	1	54.1	51.6	66	-2.5	15	---	51.6	0.0	7
CNE1-5	198	1	54.6	52.3	66	-2.3	15	---	52.3	0.0	7
CNE1-6	199	1	55.1	53.0	66	-2.1	15	---	53.0	0.0	7
CNE1-7	200	1	56.2	56.2	66	0.0	15	---	56.2	0.0	7
CNE1-8	201	1	57.4	57.3	66	-0.1	15	---	57.3	0.0	7
CNE1-9	202	1	64.5	65.5	66	1.0	15	---	65.5	0.0	7
CNE1-10	203	1	63.8	64.5	66	0.7	15	---	64.5	0.0	7
CNE1-11	204	1	64.7	65.3	66	0.6	15	---	65.3	0.0	7
CNE1-12	205	1	65.7	66.2	66	0.5	15	Snd Lvl	66.2	0.0	7
CNE1-13	206	1	66.4	66.0	66	-0.4	15	Snd Lvl	66.0	0.0	7
CNE1-14	207	1	59.9	56.1	66	-3.8	15	---	56.1	0.0	7
CNE1-15	208	1	58.8	54.9	66	-3.9	15	---	54.9	0.0	7
CNE1-16	209	1	57.7	53.2	66	-4.5	15	---	53.2	0.0	7
CNE1-17	210	1	56.4	51.7	66	-4.7	15	---	51.7	0.0	7
CNE1-18	211	1	55.7	50.8	66	-4.9	15	---	50.8	0.0	7
CNE1-19	212	1	57.6	55.5	66	-2.1	15	---	55.5	0.0	7
CNE1-20	213	1	58.7	56.8	66	-1.9	15	---	56.8	0.0	7
CNE1-21	214	1	60.2	58.4	66	-1.8	15	---	58.4	0.0	7
CNE1-22	215	1	61.0	59.4	66	-1.6	15	---	59.4	0.0	7
CNE1-23	216	1	66.5	65.8	66	-0.7	15	---	65.8	0.0	7
CNE1-24	217	1	58.9	58.1	66	-0.8	15	---	58.1	0.0	7

C:\US 421\NOISE\FUTURE BUILD\SPA\_ALTERNATIVE 6\US421 Future SPA\_Alternative 6

**157090100-04**

**RESULTS: SOUND LEVELS**

CNE1-25	218	1	57.7	57.0	66	-0.7	15	----	57.0	0.0	7	-7.0
CNE1-26	219	1	57.8	57.7	66	-0.1	15	----	57.7	0.0	7	-7.0
CNE1-27	220	2	57.5	57.5	66	0.0	15	----	57.5	0.0	7	-7.0
CNE1-28	221	1	61.9	64.2	66	2.3	15	----	64.2	0.0	7	-7.0
CNE1-29	222	1	60.1	61.7	66	1.6	15	----	61.7	0.0	7	-7.0
CNE1-30	223	1	53.3	51.9	66	-1.4	15	----	51.9	0.0	7	-7.0
CNE1-31	224	1	53.1	54.9	66	1.8	15	----	54.9	0.0	7	-7.0
CNE1-32	225	1	51.0	52.8	66	1.8	15	----	52.8	0.0	7	-7.0
CNE2-1	227	17	60.2	62.4	71	2.2	15	----	62.4	0.0	7	-7.0
CNE2-2	228	30	57.9	60.4	71	2.5	15	----	60.4	0.0	7	-7.0
CNE3-1	230	1	62.3	62.1	66	-0.2	15	----	62.1	0.0	7	-7.0
CNE3-2	231	1	63.4	63.6	66	0.2	15	----	63.6	0.0	7	-7.0
CNE3-3	232	1	57.1	56.1	66	-1.0	15	----	56.1	0.0	7	-7.0
CNE3-4	233	1	55.4	54.0	66	-1.4	15	----	54.0	0.0	7	-7.0
CNE3-5	234	1	54.0	50.1	66	-3.9	15	----	50.1	0.0	7	-7.0
CNE3-6	235	1	53.4	50.6	66	-2.8	15	----	50.6	0.0	7	-7.0
CNE3-7	236	1	54.6	51.6	66	-3.0	15	----	51.6	0.0	7	-7.0
CNE3-8	237	1	58.0	55.1	66	-2.9	15	----	55.1	0.0	7	-7.0
CNE3-9	238	1	63.9	63.4	66	-0.5	15	----	63.4	0.0	7	-7.0
CNE3-10	239	1	64.7	63.6	66	-1.1	15	----	63.6	0.0	7	-7.0
CNE3-11	240	1	63.5	62.4	66	-1.1	15	----	62.4	0.0	7	-7.0
CNE3-12	242	1	62.0	55.9	66	-6.1	15	----	55.9	0.0	7	-7.0
CNE3-13	243	1	63.0	58.3	66	-5.4	15	----	58.3	0.0	7	-7.0
CNE3-14	244	1	69.1	58.9	66	-10.2	15	----	58.9	0.0	7	-7.0
CNE3-15	245	1	67.4	59.6	66	-7.8	15	----	59.6	0.0	7	-7.0
CNE3-16	246	2	66.1	63.7	66	-2.4	15	----	63.7	0.0	7	-7.0
CNE3-17	248	1	66.5	61.6	66	-4.9	15	----	61.6	0.0	7	-7.0
CNE3-18	249	1	60.9	56.3	66	-4.6	15	----	56.3	0.0	7	-7.0
CNE3-19	250	1	68.0	56.3	66	-11.7	15	----	56.3	0.0	7	-7.0
CNE4-1	252	1	71.9	58.9	66	-13.0	15	----	58.9	0.0	7	-7.0
CNE4-2	253	1	72.4	59.7	66	-12.7	15	----	59.7	0.0	7	-7.0
CNE4-3	254	1	69.7	62.2	66	-7.5	15	----	62.2	0.0	7	-7.0
CNE4-4	256	1	68.9	61.1	66	-7.8	15	----	61.1	0.0	7	-7.0
CNE4-5	257	1	68.3	60.7	66	-7.6	15	----	60.7	0.0	7	-7.0
CNE4-6	258	1	63.2	60.4	66	-2.8	15	----	60.4	0.0	7	-7.0
CNE4-7	259	1	61.0	57.8	66	-3.2	15	----	57.8	0.0	7	-7.0
CNE4-8	260	1	60.4	58.5	66	-1.9	15	----	58.5	0.0	7	-7.0
CNE4-9	261	1	69.1	58.7	66	-10.4	15	----	58.7	0.0	7	-7.0
CNE4-10	262	2	61.7	61.3	66	-0.4	15	----	61.3	0.0	7	-7.0
CNE4-11	263	1	59.8	57.0	66	-2.8	15	----	57.0	0.0	7	-7.0
CNE4-12	264	1	59.2	58.7	66	-0.5	15	----	58.7	0.0	7	-7.0
CNE4-13	265	1	60.9	59.0	66	-1.9	15	----	59.0	0.0	7	-7.0

C:\US 421\NOISE\FUTURE BUILD\SPA\_ALTERNATIVE 6\US421 Future SPA\_Alternative 6

**157090100-04**

**RESULTS: SOUND LEVELS**

CNE4-14	266	1	57.1	57.4	66	0.3	15	----	57.4	0.0	7	-7.0
CNE4-15	267	1	63.9	66.7	66	2.8	15	Snd Lvl	66.7	0.0	7	-7.0
CNE4-16	268	1	58.5	60.2	66	1.7	15	----	60.2	0.0	7	-7.0
CNE4-17	269	1	67.5	60.7	66	-6.8	15	----	60.7	0.0	7	-7.0
CNE4-18	270	1	58.3	60.4	66	2.1	15	----	60.4	0.0	7	-7.0
CNE4-19	271	1	61.6	58.2	66	-3.4	15	----	58.2	0.0	7	-7.0
CNE4-20	272	1	66.5	60.8	66	-5.7	15	----	60.8	0.0	7	-7.0
CNE4-21	273	1	66.2	60.9	66	-5.3	15	----	60.9	0.0	7	-7.0
CNE4-22	274	1	67.7	62.2	66	-5.5	15	----	62.2	0.0	7	-7.0
CNE4-23	275	1	60.5	61.0	66	0.5	15	----	61.0	0.0	7	-7.0
CNE4-24	276	2	67.1	63.2	66	-3.9	15	----	63.2	0.0	7	-7.0
CNE4-25	277	1	58.4	65.2	66	6.8	15	----	65.2	0.0	7	-7.0
CNE5-1	279	1	70.1	61.8	66	-8.3	15	----	61.8	0.0	7	-7.0
CNE5-2	280	1	64.6	57.0	66	-7.6	15	----	57.0	0.0	7	-7.0
CNE5-3	281	1	60.6	54.8	66	-5.8	15	----	54.8	0.0	7	-7.0
CNE5-4	282	1	58.6	55.1	66	-3.5	15	----	55.1	0.0	7	-7.0
CNE5-5	283	1	58.1	55.7	66	-2.4	15	----	55.7	0.0	7	-7.0
CNE5-6	284	1	56.7	55.3	66	-1.4	15	----	55.3	0.0	7	-7.0
CNE5-7	285	1	56.2	54.5	66	-1.7	15	----	54.5	0.0	7	-7.0
CNE5-8	286	1	56.6	50.8	66	-5.8	15	----	50.8	0.0	7	-7.0
CNE5-9	287	1	61.4	53.8	66	-7.6	15	----	53.8	0.0	7	-7.0
CNE5-10	288	1	63.5	55.3	66	-8.2	15	----	55.3	0.0	7	-7.0
CNE5-11	290	1	55.8	53.6	66	-2.2	15	----	53.6	0.0	7	-7.0
CNE5-12	291	1	56.1	50.2	66	-5.9	15	----	50.2	0.0	7	-7.0
CNE5-13	292	1	61.5	53.5	66	-8.0	15	----	53.5	0.0	7	-7.0
CNE5-14	293	1	68.9	60.6	66	-8.3	15	----	60.6	0.0	7	-7.0
CNE5-15	294	1	55.9	50.3	66	-5.6	15	----	50.3	0.0	7	-7.0
CNE5-16	295	1	56.1	50.5	66	-5.6	15	----	50.5	0.0	7	-7.0
CNE5-17	296	1	68.6	60.3	66	-8.3	15	----	60.3	0.0	7	-7.0
CNE5-18	297	1	65.8	58.9	66	-6.9	15	----	58.9	0.0	7	-7.0
CNE5-19	298	1	56.5	54.8	66	-1.7	15	----	54.8	0.0	7	-7.0
CNE5-20	299	1	56.6	55.2	66	-1.4	15	----	55.2	0.0	7	-7.0
CNE5-21	300	1	65.8	59.2	66	-6.6	15	----	59.2	0.0	7	-7.0
CNE5-22	301	1	68.2	61.4	66	-6.8	15	----	61.4	0.0	7	-7.0
CNE5-23	302	1	57.1	56.1	66	-1.0	15	----	56.1	0.0	7	-7.0
CNE5-24	303	1	57.9	56.7	66	-1.2	15	----	56.7	0.0	7	-7.0
CNE5-25	304	1	60.0	58.7	66	-1.3	15	----	58.7	0.0	7	-7.0
CNE5-26	305	1	63.0	62.1	66	-0.9	15	----	62.1	0.0	7	-7.0
CNE5-27	306	1	62.7	60.2	66	-2.5	15	----	60.2	0.0	7	-7.0
CNE6-1	308	1	61.5	65.8	66	4.3	15	----	65.8	0.0	7	-7.0
CNE6-2	309	1	59.7	62.8	66	3.1	15	----	62.8	0.0	7	-7.0
CNE6-3	310	1	59.9	60.4	66	0.5	15	----	60.4	0.0	7	-7.0

C:\US 421\NOISE\FUTURE BUILD\SPA\_ALTERNATIVE 6\US421 Future SPA\_Alternative 6

RESULTS: SOUND LEVELS		157090100-04												
Dwelling Units	# DUs	Noise Reduction			66	62.5	64.4	62.5	66	-1.9	15	62.5	7	-7.0
		Min	Avg	Max										
		dB	dB	dB										
CNE6-4	311	1	64.4	62.5	66	-1.9	15	62.5	7	-7.0				
CNE6-5	312	1	59.7	64.9	66	5.2	15	64.9	7	-7.0				
CNE6-6	313	1	57.8	62.4	66	4.6	15	62.4	7	-7.0				
CNE6-7	314	1	64.7	62.3	66	-2.4	15	62.3	7	-7.0				
CNE6-8	315	1	55.9	60.1	66	4.2	15	60.1	7	-7.0				
CNE6-9	316	1	57.7	60.1	66	2.4	15	60.1	7	-7.0				
CNE6-10	317	1	62.1	62.3	66	0.2	15	62.3	7	-7.0				
CNE6-11	318	1	56.8	56.7	66	-0.1	15	56.7	7	-7.0				
CNE7-1	320	1	54.7	51.3	66	-3.4	15	51.3	7	-7.0				
CNE7-2	321	1	55.8	51.8	66	-4.0	15	51.8	7	-7.0				
CNE7-3	322	1	54.4	52.5	66	-1.9	15	52.5	7	-7.0				
CNE7-4	323	1	58.1	54.2	66	-3.9	15	54.2	7	-7.0				
CNE7-5	324	1	58.4	54.1	66	-4.3	15	54.1	7	-7.0				
CNE7-6	325	1	57.3	55.5	66	-1.8	15	55.5	7	-7.0				
CNE7-7	326	1	59.4	55.1	66	-4.3	15	55.1	7	-7.0				
CNE7-8	327	1	60.4	56.5	66	-3.9	15	56.5	7	-7.0				
CNE7-9	328	1	61.7	58.4	66	-3.3	15	58.4	7	-7.0				
CNE7-10	329	1	60.9	60.0	66	-0.9	15	60.0	7	-7.0				
CNE8-1	331	1	56.3	53.4	66	-2.9	15	53.4	7	-7.0				
CNE8-2	332	1	56.5	54.2	66	-2.3	15	54.2	7	-7.0				
CNE8-3	333	1	53.7	51.4	66	-2.3	15	51.4	7	-7.0				
<b>Dwelling Units</b>		<b># DUs</b>	<b>Min</b>	<b>Avg</b>	<b>Max</b>									
			dB	dB	dB									
All Selected		178	0.0	0.0	0.0									
All Impacted		3	0.0	0.0	0.0									
All that meet NR Goal		0	0.0	0.0	0.0									

C:\US 421\NOISE\FUTURE BUILD\SPA\_ALTERNATIVE 6\US421 Future SPA\_Alternative 6

## Noise Modeling Validation Values

Noise Receiver Name	Modeled dB(A)
CNE 1	66.4
CNE 2	54.9
CNE 3	69.1
CNE 4	58.7
CNE 5	67.6
CNE 6	60.7
CNE 7	64.5
CNE 8	61

**Note:**

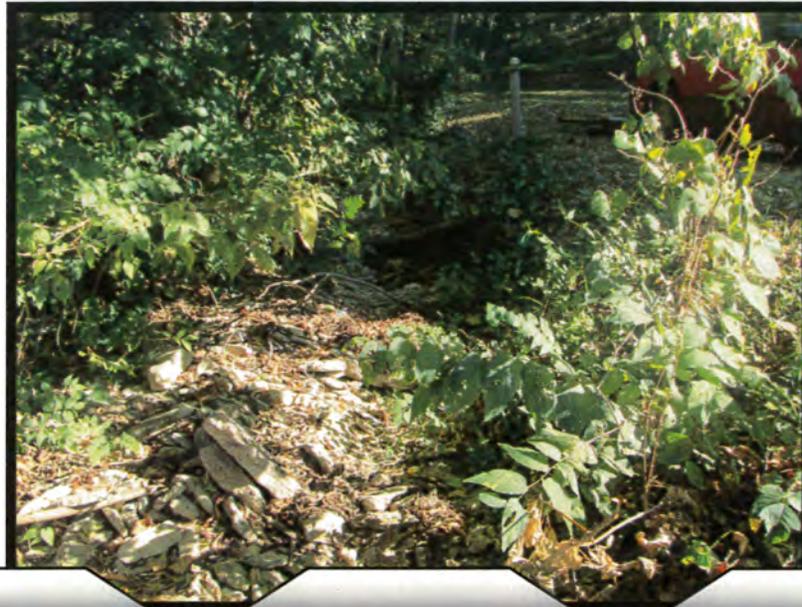
All values are depicted in LAeq1h and have been rounded to the nearest whole number.

# **Appendix F**

*Ecological and Water Resources*

---

# Waters of the U.S. Report



---

US 421 New Roadway Construction  
Des. No.: 1400918  
Jefferson County, Indiana

---

*Prepared By:*

Submitted to:

Indiana Department of Transportation  
Environmental Services  
Ecology & Waterway Permitting  
100 North Senate Avenue, Room N642  
Indianapolis, Indiana 46204



---

1625 North Post Road  
Indianapolis, Indiana 46219-1995  
Phone: (317) 895-2585 or (800) 536-2594  
Fax: (317) 895-2596

---

Waters of the U.S. Report  
US 421 New Roadway Construction  
Jefferson County, Indiana

**1) Introduction:**

The proposed project is located within Jefferson County, Indiana in the City of Madison and located through a portion of the National Historic Landmark Madison Historic District. The proposed corridor improvements, located on the Indiana border of the Ohio River, are immediately adjacent to the Milton-Madison Bridge, providing approach access from the north. The limits of the project area begin at the northern approach to the Milton-Madison Bridge and extend to the intersection of US 421/Baltimore Street and US 421/Main Street to the west and through the intersection of SR 56/Sering Street to the east.

The proposed project will analyze alternatives (including the No-build or Do Nothing alternative) based on the ability to improve mobility and safety in the corridor, reduce the environmental impacts of trucks, support economic development by managing access and enhancing pedestrian accessibility, and minimizing impacts to the City of Madison, Jefferson County, and local stakeholders. The project is located in Section 2, Township 3 North, Range 10 East in Madison Township, Jefferson County.

United Consulting performed a jurisdictional determination of the boundaries of “waters of the United States (U.S.)”, including wetlands on September 24, 2015 using the U.S. Army Corps of Engineers Wetland Delineation Manual (Technical Report Y-87-1) and the 2010 U.S. Army Corps of Engineers - Midwestern Supplement. The study location included areas within the existing and proposed right-of-way. Three streams were located within the investigation area of the project during the field reconnaissance.

**2) Regulatory Definitions:**

The U.S. Army Corps of Engineers (COE) and the U.S. Environmental Protection Agency (EPA) jointly define wetlands as:

“Those areas that inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

***Hydrophytic Vegetation (Wetland Vegetation)*** – The sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen due to excessive water content. When hydrophytic vegetation comprises a community where indicators of hydric soils and wetland hydrology also occur, the area has wetland vegetation.

The indicator status of plant species is expressed in terms of the estimated probabilities of the species occurring within wetland conditions within a given region. The indicator categories as defined by the U.S. Army Corps of Engineers are:

Obligate Wetland (OBL): Occurs almost always (estimated probability > 99%) under natural conditions in wetlands.

Facultative Wetlands (FACW): Usually occurs in wetlands (estimated probability 67% - 99%), but occasionally found in non-wetlands.

Facultative (FAC): Equally likely to occur in wetlands or non-wetlands (estimated probability 34% - 66%).

Facultative Upland (FACU): Usually occurs in non-wetlands, but occasionally found in wetlands (estimated probability 1% - 33%).

Obligate Upland (UPL): Occurs almost always (estimated probability > 99%) in uplands.

Plants that fall under the category of OBL, FACW and FAC are considered wetland species. The percentage of the dominant wetland species in each of the vegetation strata in the sample area determines the hydrophytic or wetland status of the plant community.

**Hydric Soil (Wetland Soil)** – A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils.

Mineral soils that experience long periods of anaerobic conditions become gleyed, i.e., gray. Mineral soils which are subject to somewhat less inundation and/or saturation may develop bright redox features and low matrix chroma. Soils having redox features and low matrix chroma are indicative of a fluctuating water table.

**Hydrology** - Wetlands are periodically inundated or saturated to the soil surface for a portion of the growing season. The duration of inundation or saturation in wetlands is generally greater than 5 percent of the growing season. These hydrologic conditions affect the vegetation, which can survive in these areas by eliminating most “upland” vegetation species, leaving a predominance of hydrophytic species.

### **3) Project Site Information:**

**National Wetland Inventory Map** - The National Wetlands Inventory (NWI) map does not show the presence of wetlands within the investigation area. A copy of the corresponding NWI map is attached in the appendix.

**NRCS Soil Survey** - The Natural Resources Conservation Service (NRCS) – Jefferson County Soil Survey identifies the project location as having three soil types. A copy of

the Soil Survey Map is attached in the appendix. The following table lists each soil type located within the investigation area and indicates if it is shown on the NRCS Hydric Soils List for Jefferson County.

<b>Soil Name</b>	<b>Hydric</b>
<i>Eden flaggy silty clay loam</i>	No
<i>Elkinsville silt loam</i>	No
<i>Huntington silt loam</i>	No

Following is a brief summary of each soil series from the NRCS Official Soil Series Description:

1. Eden Series

The Eden series consists of moderately deep, well drained, slowly permeable soils that formed in residuum from interbedded calcareous shale, siltstone, and limestone. These soils are on hillsides and narrow ridgetops with slopes ranging from 2 to 70 percent. Mean annual temperature is about 55 degrees Fahrenheit and mean annual precipitation is about 43 inches.

2. Elkinsville Series

The Elkinsville series consists of very deep, well drained soils on stream terraces and flood-plain steps. They formed in 20 to 40 inches of loess or silty sediments and the underlying loamy alluvium. Slope ranges from 0 to 40 percent. Mean annual precipitation is about 40 inches, and mean annual temperature is about 52 degrees Fahrenheit.

3. Huntington Series

The Huntington series consists of very deep, well drained, moderately permeable soils that formed in alluvium on flood plains. Slopes range from 0 to 15 percent, but 0 to 5 percent is dominant. Mean annual temperature is 56 degrees Fahrenheit, and mean annual precipitation is 39 inches.

**4) Site Reconnaissance:**

A site reconnaissance of the proposed project area was conducted on September 24, 2015 by United Consulting. The purpose of the reconnaissance was to identify areas of jurisdictional “waters of the U.S.” and isolated wetlands. This determination included areas within the existing and proposed right-of-way limits of the US 421 New Roadway Construction project.

The project area is dominated by commercial and residential land uses. Drainage within the investigation area is conveyed via a storm sewer system. There were no jurisdictional or non-jurisdictional roadside ditches observed within the investigation area.

No wetlands as defined by the U.S. Army Corps of Engineers Wetland Delineation Manual (Technical Report Y-87-1) and the 2010 U.S. Army Corps of Engineers -

Midwestern Supplement were identified within the investigation area. As a result, no data points were taken.

During the site reconnaissance, three unnamed tributaries (UNT) to the Ohio River were identified within the investigation area.

**Streams -**

The jurisdictional opinions were determined using the May 30, 2007 “U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook”. All drainages that displayed a defined channel and ordinary high water mark were considered streams. Three UNT’s to the Ohio River are located within the investigation area. The following table summarizes the characteristics of the three UNT’s to the Ohio River within the investigation area.

<i>Stream/Unnamed Reference</i>	<i>Trib.</i>	<i>Stream Type</i>	<i>OHWM Width</i>	<i>OHWM Depth</i>	<i>USGS Blue Line</i>	<i>Likely Waters of the U.S.</i>
<b>UNT #1</b>		Ephemeral	8 feet	12 inches	No	Yes
<b>UNT #2</b>		Ephemeral	5 feet	8 inches	No	Yes
<b>UNT #3</b>		Ephemeral	6 feet	10 inches	No	Yes

No other regulated rivers, streams, ditches, or wetlands were identified within the investigation area.

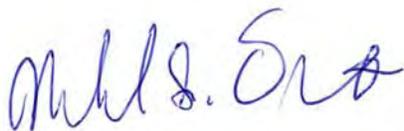
**5) Summary and Conclusions:**

United Consulting inspected the project area on September 24, 2015 performing a jurisdictional determination and delineation of the boundaries of “waters of the U.S.”, including wetlands. The purpose of this report is to identify areas of jurisdictional waters of the United States (“waters of the U.S.”).

Three UNT’s to the Ohio River are located within the investigation area. No other streams, jurisdictional ditches, or wetlands were identified within the investigation area. In this region, the Louisville District of the U.S. Army Corps of Engineers has final discretionary authority over all jurisdictional determinations of “waters of the U.S.” including wetlands under Section 404 of the Clean Water Act (CWA).

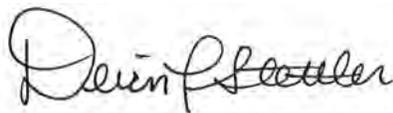
In conclusion, while this report represents our best professional judgment based on our knowledge and experience, the Louisville District of the U.S. Army Corps of Engineers has final discretionary authority over all jurisdictional determinations of “waters of the U.S.” including wetlands under Section 404 of the Clean Water Act (CWA) in this region. Therefore, it is recommended that a copy of this report be furnished to the Louisville District of the U.S. Army Corps of Engineers to confirm the results of our findings.

Prepared by,  
**United Consulting**



---

Michael S. Oliphant, A.I.C.P.  
Environmental Specialist

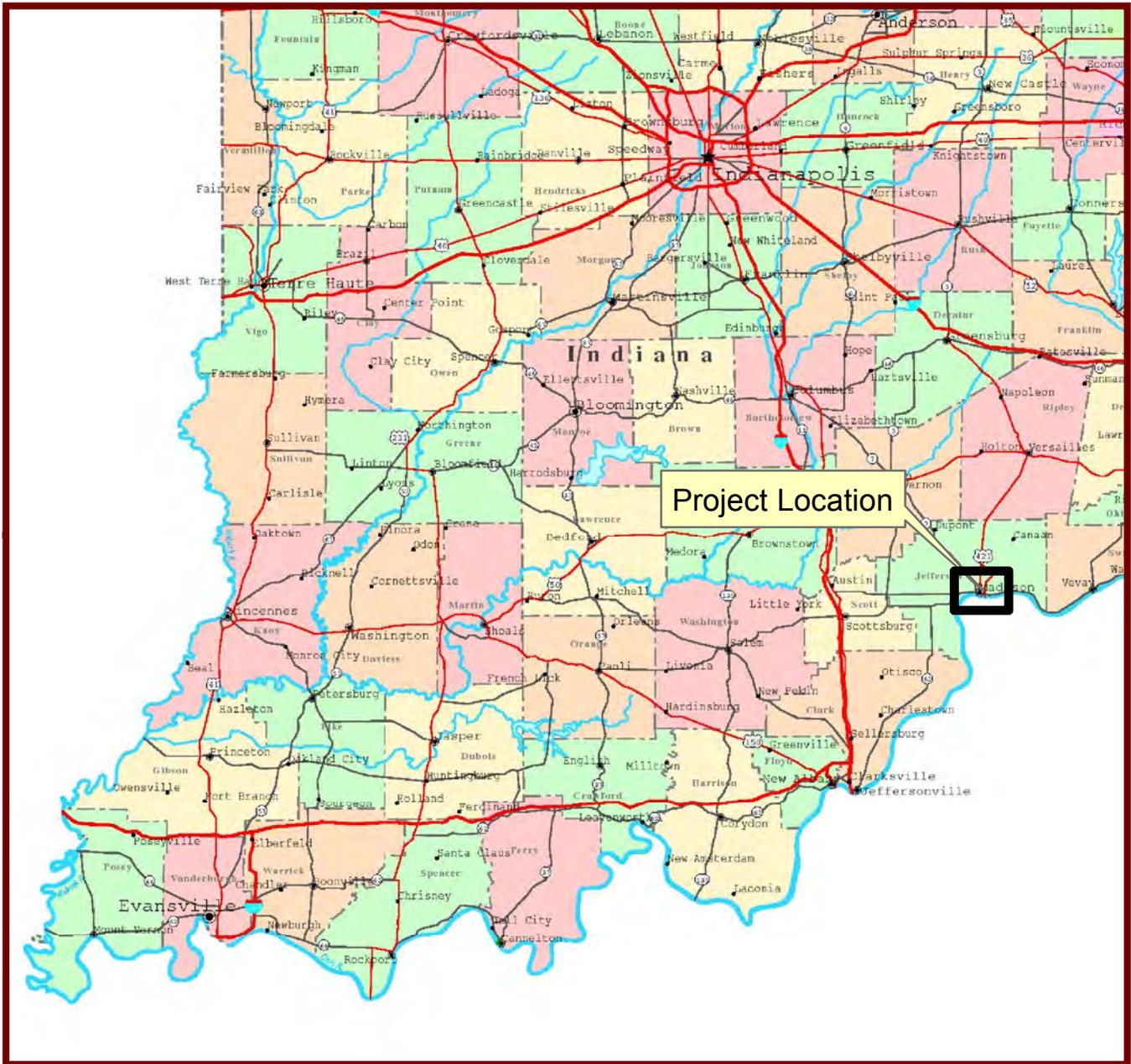


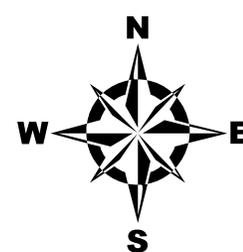
---

Devin L. Stettler, M.PI, A.I.C.P.  
Manager, Environmental Services

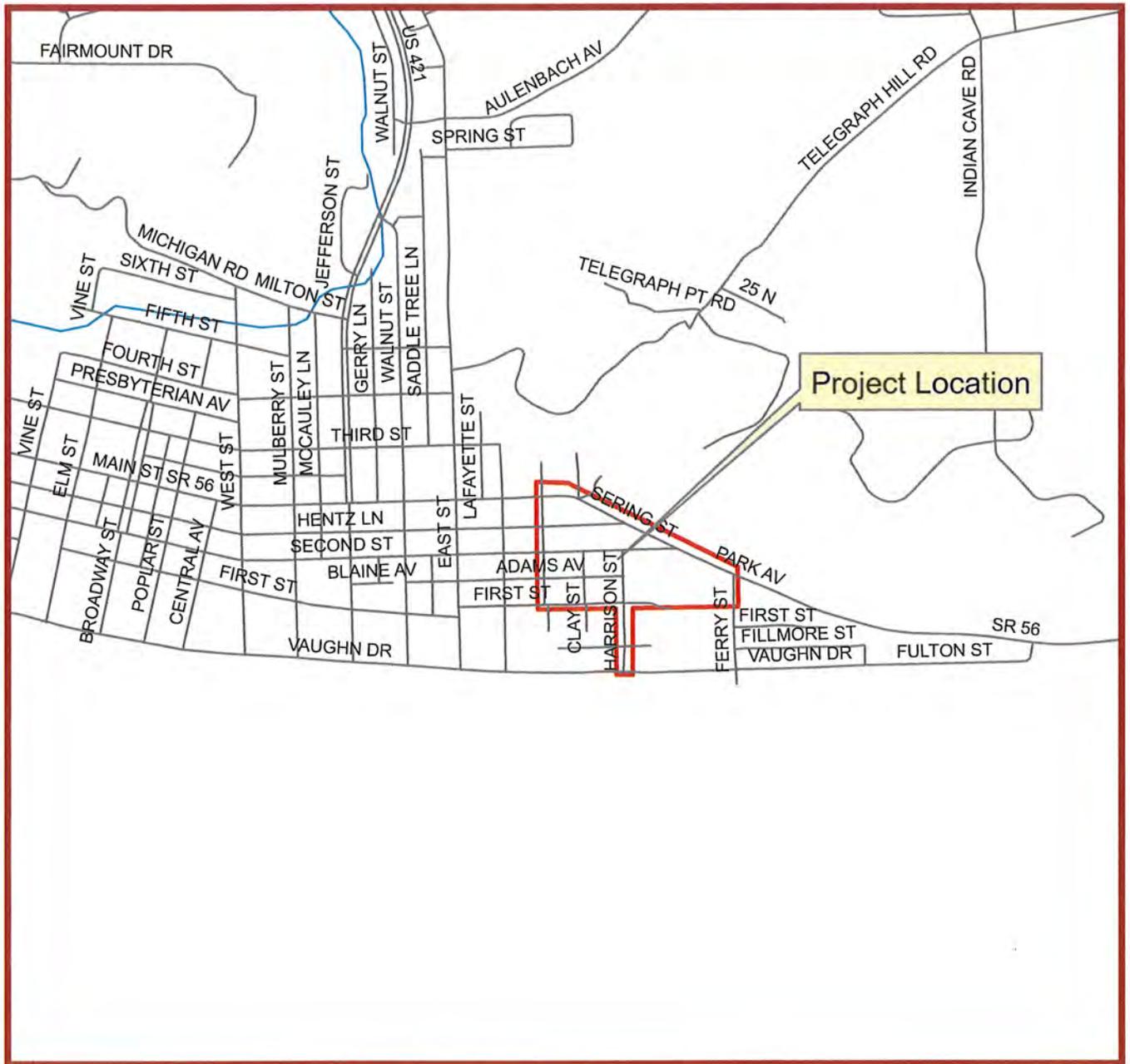
November 9, 2015  
Date

# US 421 New Roadway Construction



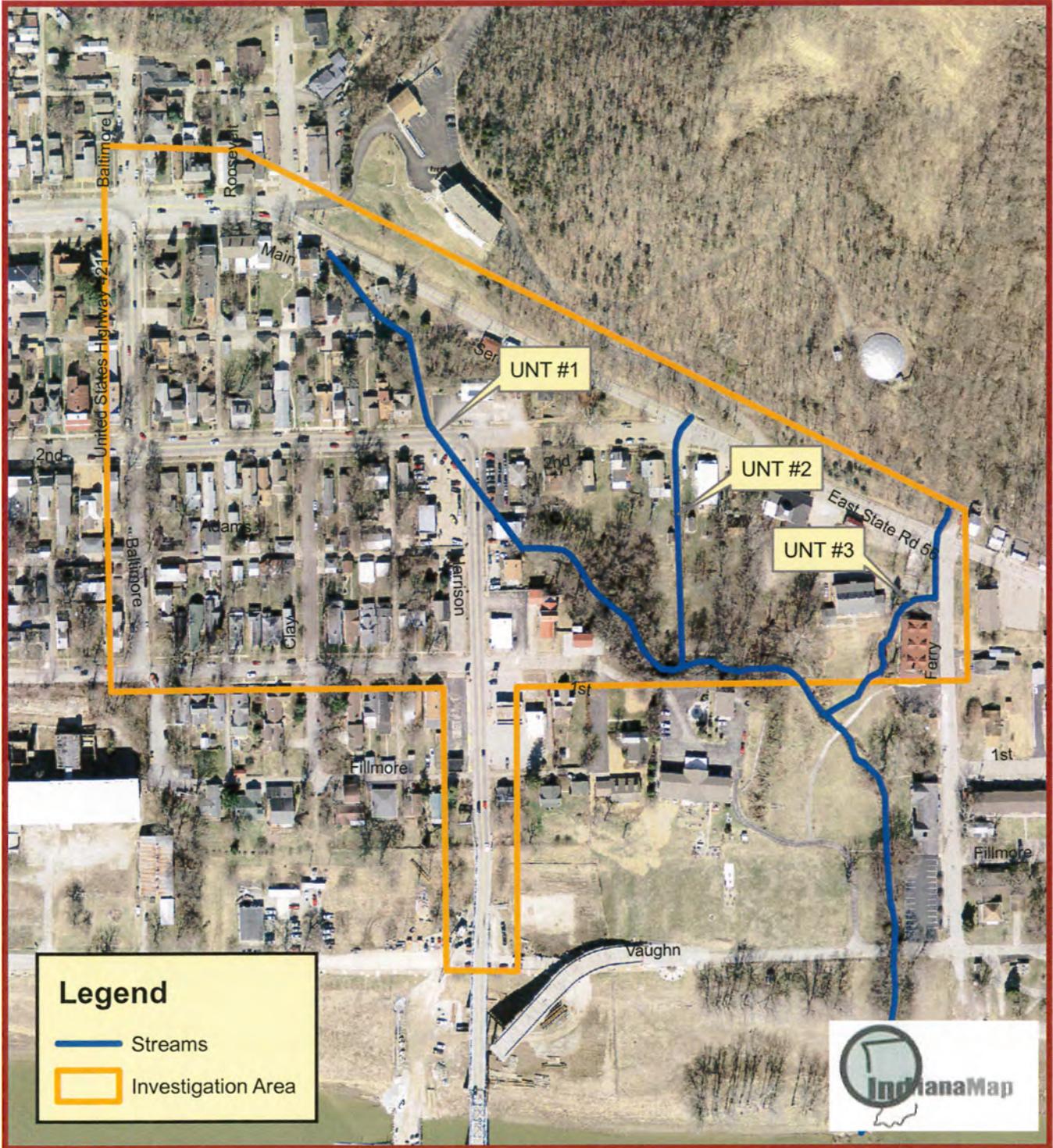
	<p><b>Indiana Highway Map</b></p> <p>Indiana Department of Transportation Environmental Services Ecology &amp; Waterway Permitting 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p>	
---	---	---

# US 421 New Roadway Construction



 <p><b>UNITED</b> Consulting</p>	<p style="text-align: center;"><b>Location Map</b></p> <p style="text-align: center;">Indiana Department of Transportation Environmental Services Ecology &amp; Waterway Permitting 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p>	
---	--	---

# US 421 New Roadway Construction

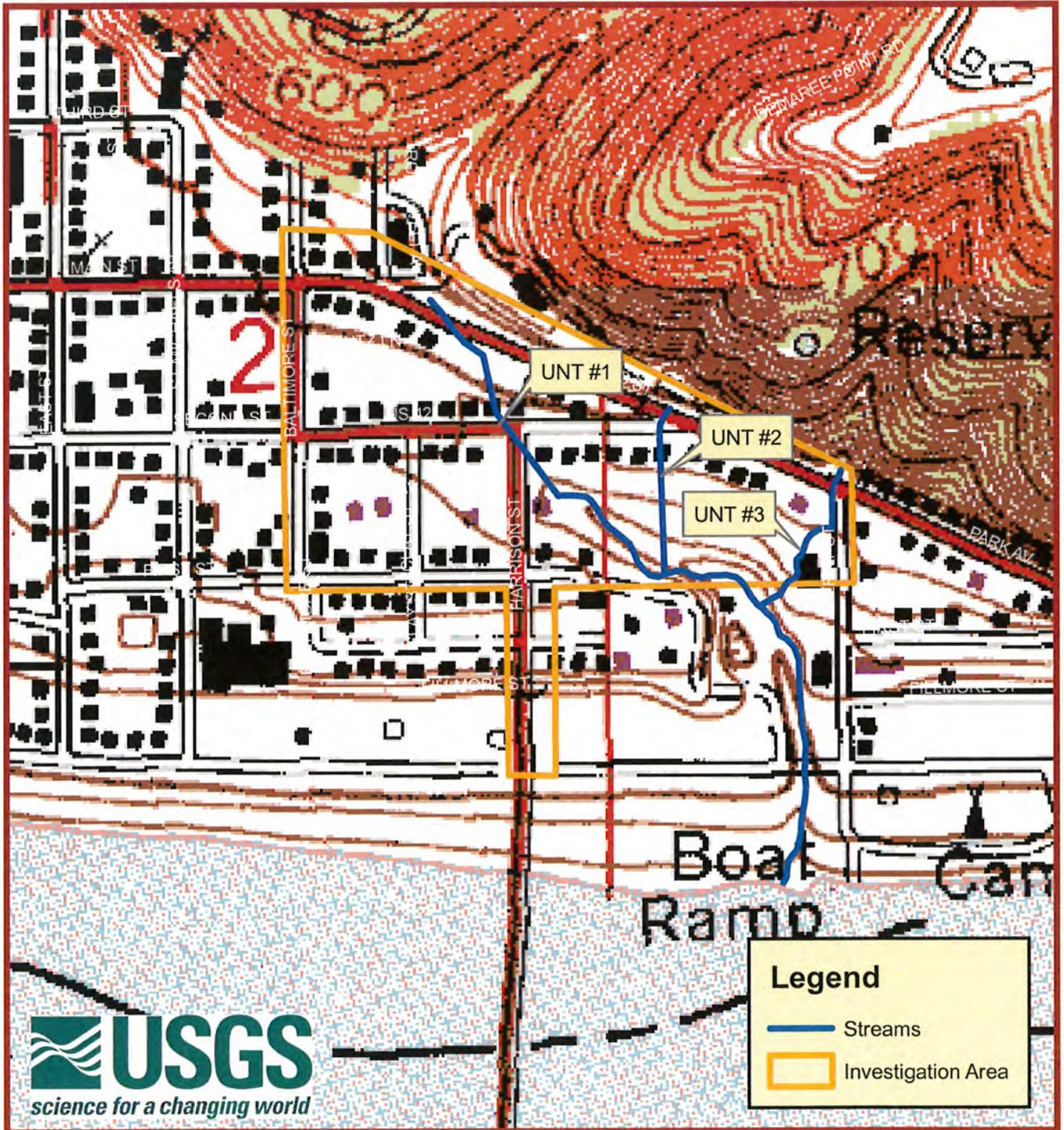


## Aerial Photograph

Indiana Department of Transportation  
Environmental Services  
Ecology & Waterway Permitting  
100 North Senate Avenue, Room N642  
Indianapolis, Indiana 46204



# US 421 New Roadway Construction

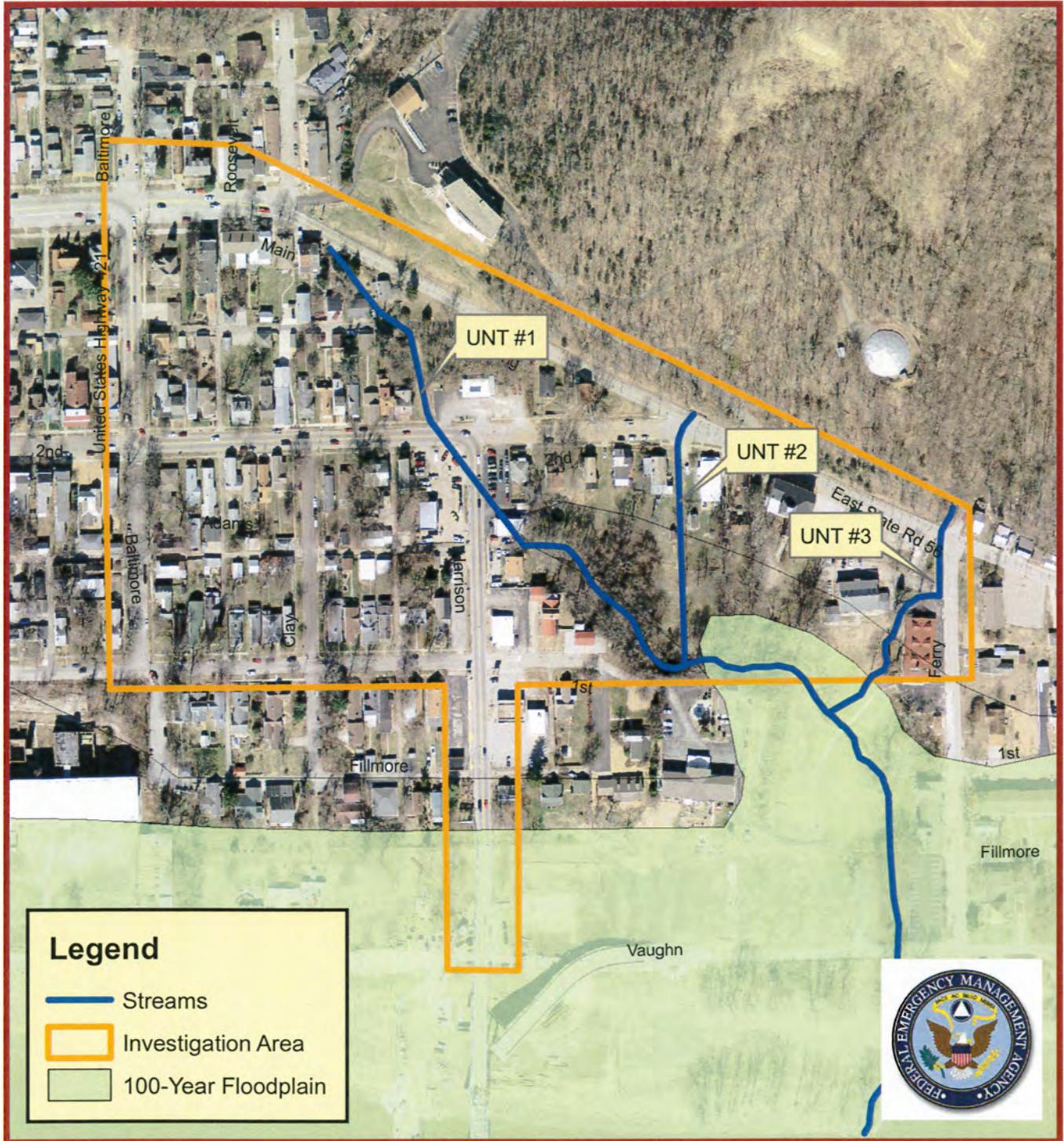


## United States Geological Survey Quadrangle

Indiana Department of Transportation  
Environmental Services  
Ecology & Waterway Permitting  
100 North Senate Avenue, Room N642  
Indianapolis, Indiana 46204

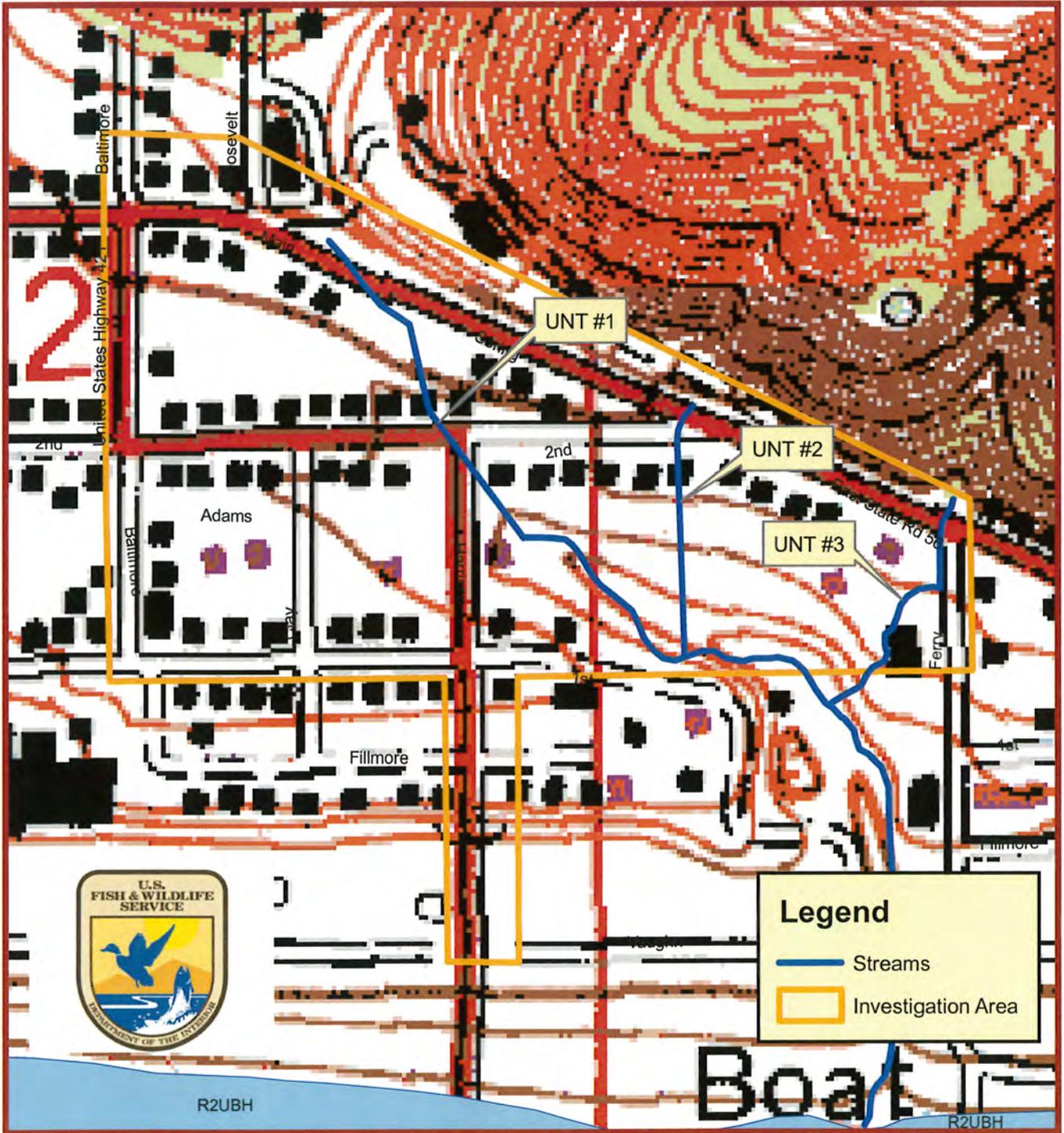


# US 421 New Roadway Construction



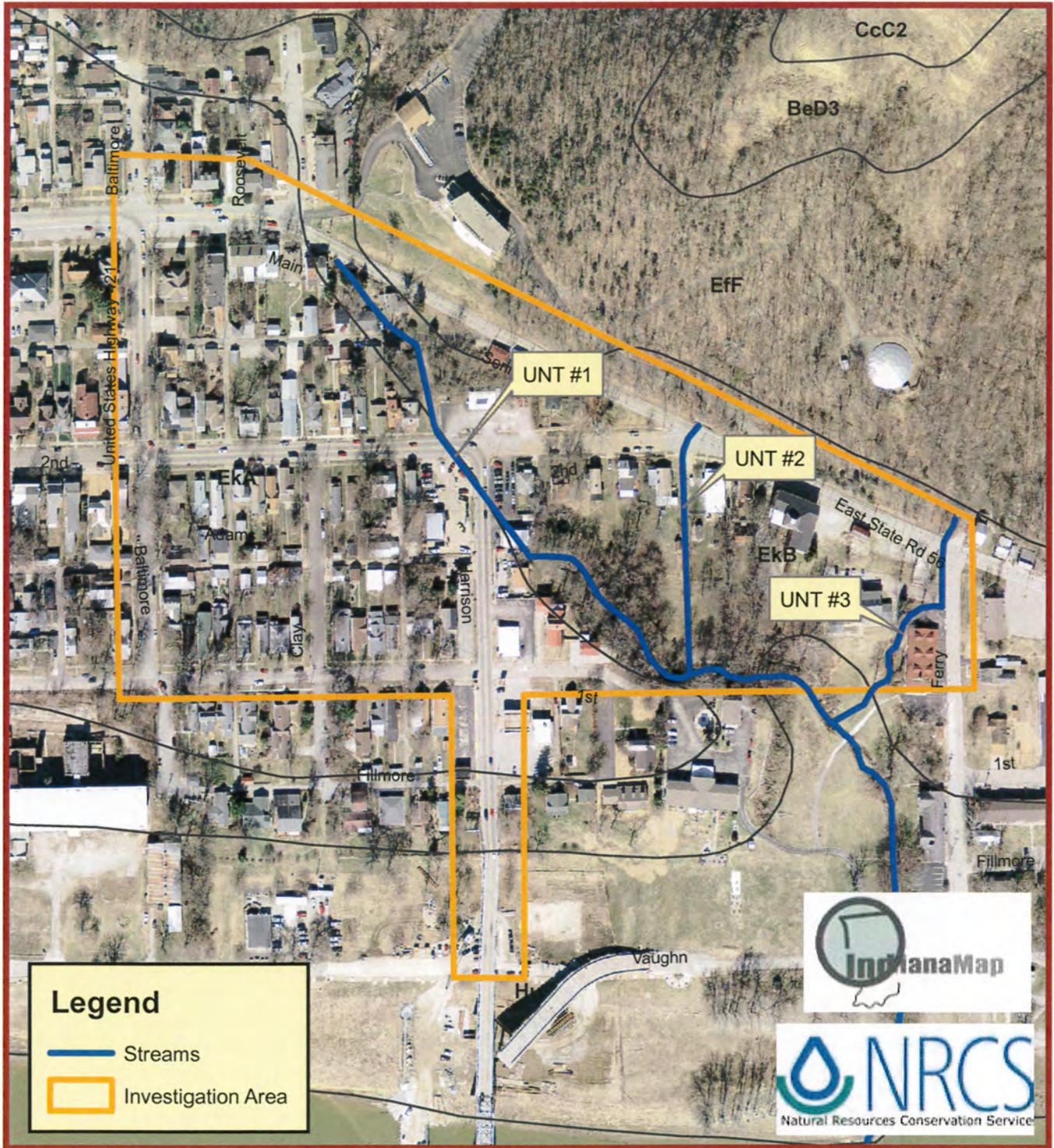
	<b>Digital Flood Insurance Rate Map</b>	
	Indiana Department of Transportation Environmental Services Ecology & Waterway Permitting 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204	

# US 421 New Roadway Construction



	<h2>National Wetlands Inventory Map</h2>	
	<p>Indiana Department of Transportation Environmental Services Ecology &amp; Waterway Permitting 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p>	

# US 421 New Roadway Construction

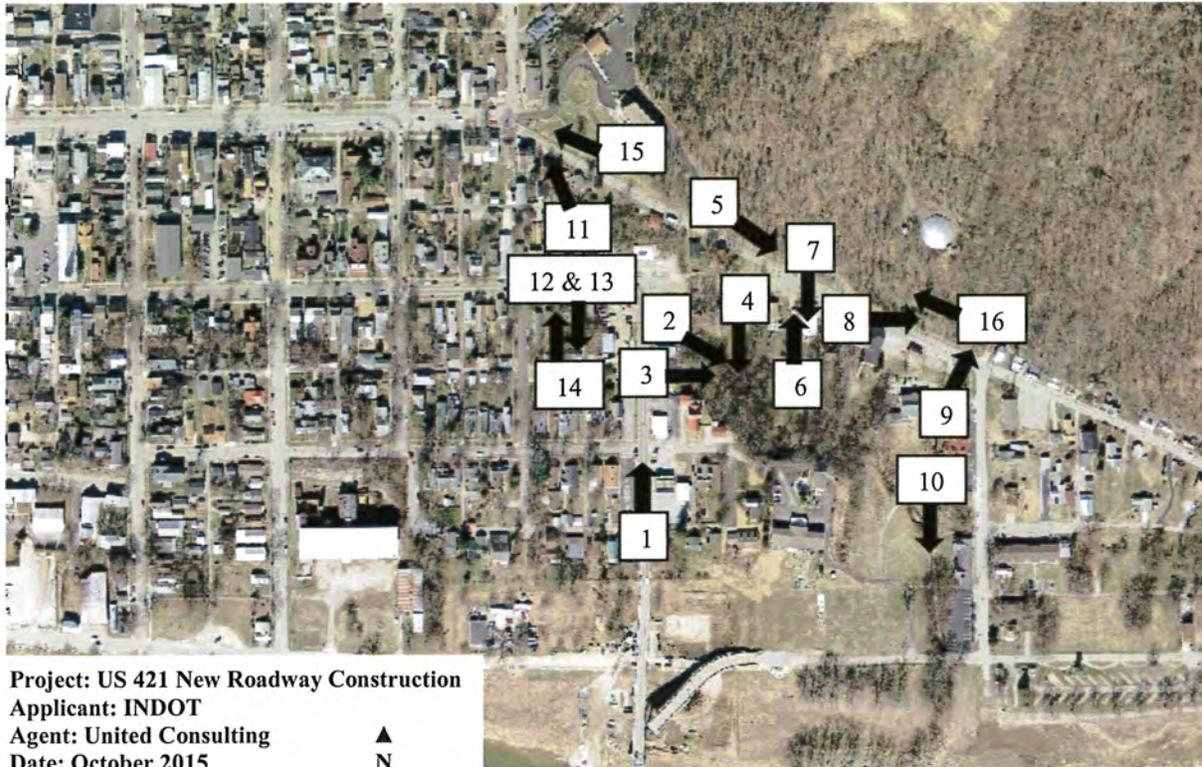


	<p>Natural Resources Conservation Service Soils Map</p>	
	<p>Indiana Department of Transportation Environmental Services Ecology &amp; Waterway Permitting 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p>	

# Photo Orientation Map

## US 421 New Roadway Construction

### Jefferson County, Indiana



Photograph Number	Photo Description
Photograph #1	Looking north along US 421 toward 3rd Street.
Photograph #2	Looking southeast toward UNT #1.
Photograph #3	Looking east toward UNT #1.
Photograph #4	Looking south toward UNT #1.
Photograph #5	Looking southeast toward UNT #2.
Photograph #6	Looking north toward UNT #2.
Photograph #7	Looking south toward UNT #2.
Photograph #8	Looking east along SR 56 toward embankment.
Photograph #9	Looking northeast toward UNT #3.
Photograph #10	Looking south toward UNT #3.
Photograph #11	Looking northwest along UNT #1.
Photograph #12	Looking southeast along UNT #1.
Photograph #13	Looking southeast along UNT #1.
Photograph #14	Looking north toward UNT #1.
Photograph #15	Looking northwest along SR 56.
Photograph #16	Looking northwest along SR 56.

US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #1: Looking north along US 421 toward 3<sup>rd</sup> Street.



Photograph #2: Looking southeast toward UNT #1.



US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #3: Looking east toward UNT #1.



Photograph #4: Looking south toward UNT #1.



US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #5: Looking southeast toward UNT #2.



Photograph #6: Looking north toward UNT #2.



US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #7: Looking south toward UNT #2.



Photograph #8: Looking east along SR 56 toward embankment.



US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #9: Looking northeast toward UNT #3.



Photograph #10: Looking south toward UNT #3.



US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #11: Looking northwest along UNT #1.



Photograph #12: Looking southeast along UNT #1.



US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #13: Looking southeast along UNT #1.



Photograph #14: Looking north toward UNT #1.



US 421 New Roadway Construction  
Jefferson County, Indiana



Photograph #15: Looking northwest along SR 56.



Photograph #16: Looking northwest along SR 56.



## **ATTACHMENT**

### **PRELIMINARY JURISDICTIONAL DETERMINATION FORM**

#### **BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): November 9, 2015**

**B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:**

Mr. Michael Oliphant  
United Consulting  
1625 North Post Road  
Indianapolis, Indiana 46219  
317-895-2585

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:**

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:** The proposed project is located within Jefferson County, Indiana in the City of Madison and located through a portion of the National Historic Landmark Madison Historic District. The proposed corridor improvements, located on the Indiana border of the Ohio River, are immediately adjacent to the Milton-Madison Bridge, providing approach access from the north. The limits of the project area begin at the northern approach to the Milton-Madison Bridge and extend to the intersection of US 421/Baltimore Street and US 421/Main Street to the west and through the intersection of SR 56/Sering Street to the east.

The proposed project will analyze alternatives (including the No-build or Do Nothing alternative) based on the ability to improve mobility and safety in the corridor, reduce the environmental impacts of trucks, support economic development by managing access and enhancing pedestrian accessibility, and minimizing impacts to the City of Madison, Jefferson County, and local stakeholders. The project is located in Section 2, Township 3 North, Range 10 East in Madison Township, Jefferson County.

United Consulting performed a jurisdictional determination of the boundaries of "waters of the United States (U.S.)", including wetlands on September 24, 2015 using the U.S. Army Corps of Engineers Wetland Delineation Manual (Technical Report Y-87-1) and the 2010 U.S. Army Corps of Engineers - Midwestern Supplement. The study location included areas within the existing and proposed right-of-way. Three streams were located within the investigation area of the project during the field reconnaissance.

**(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)**

State: Indiana County/parish/borough: Jefferson City:

Madison

Center coordinates of site (lat/long in degree decimal format): Lat. 38 44' 02.44° N, Long. 82 22 11.11° W.

Universal Transverse Mercator:

Name of nearest waterbody: UNT to Ohio River

Identify (estimate) amount of waters in the review area:

Non-wetland waters: See table linear feet: See table width (ft) and/or acres.

Cowardin Class:

Stream Flow:

Wetlands: 0.00 acres.

Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal: See table

Non-Tidal: See table

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

Office (Desk) Determination. Date:

Field Determination. Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less

compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable. This preliminary JD finds that there "may be" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply**

- checked items should be included in case file and, where checked and requested, appropriately reference sources below):

Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: November 9, 2015.

Data sheets prepared/submitted by or on behalf of the applicant/consultant.

Office concurs with data sheets/delineation report.

Office does not concur with data sheets/delineation report.

Data sheets prepared by the Corps: .

Corps navigable waters' study: .

U.S. Geological Survey Hydrologic Atlas: .

USGS NHD data.

USGS 8 and 12 digit HUC maps.

U.S. Geological Survey map(s). Cite scale & quad name: Madison 1:24,000.

- USDA Natural Resources Conservation Service Soil Survey.  
Citation: Jefferson County Soil Survey Map.
- National wetlands inventory map(s). Cite name: Madison.
- State/Local wetland inventory map(s): .
- FEMA/FIRM maps: Jefferson County.
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date): Jefferson County 2012.  
or  Other (Name & Date): .
- Previous determination(s). File no. and date of response letter: .
- Other information (please specify): .

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

\_\_\_\_\_  
Signature and date of  
Regulatory Project Manager  
(REQUIRED)

\_\_\_\_\_  
Signature and date of  
person requesting preliminary JD  
(REQUIRED, unless obtaining  
the signature is impracticable)

<b>Site number</b>	<b>Longitude</b>	<b>Latitude</b>	<b>Cowardin Class</b>	<b>Estimated amount of aquatic resource in review area</b>	<b>Stream Flow</b>	<b>Tidal/Non-Tidal</b>	<b>Class of aquatic resource</b>
UNT #1	85.369714	38.734917	Riverine	1,300 linear feet, 0.23 acre	Ephemeral	Non-Tidal	Non-Section 10 – Waters
UNT #2	85.368368	38.735165	Riverine	465 linear feet, 0.05 acre	Ephemeral	Non-Tidal	Non-Section 10 – Waters
UNT #3	85.366754	38.734408	Riverine	395 linear feet, 0.05 acre	Ephemeral	Non-Tidal	Non-Section 10 – Waters

# **Appendix G**

*Public Involvement*

# OPEN HOUSE

CLIFTY INN – OVERLOOK ROOM\*  
2221 Clifty Drive  
Thursday, Dec. 3 | 4-7 p.m.

---

**Project 421** is the Indiana Department of Transportation’s study of the half-mile section of U.S. Route 421 through Madison that approaches the Milton-Madison Bridge, which spans the Ohio River between Madison and Milton, Ky. The purpose of the project is to select a route that best addresses the safety concerns, mobility challenges and economic development needs of Madison.

The Project 421 team wants to meet with the community to gather input before substantially beginning the study of U.S. 421. This is an informal meeting, so there will be no formal presentation.

*\*Enter via north park gate off SR 62. There is no admission charge to enter the park for this meeting.*

**Project421.com**



## Public Open House Meeting 1 - Dec. 3, 2015

Name (please print)	Address	Organization (if applicable)
MIKE PEAK	2116 EAST CROSS ROAD	
Laura Hodges	301 Hillcrest Dr Madison	Madison City Council
Carol Hertz	1324 Michigan Rd.	
Marian McAlister	2345 Sunset Ct.	
Brian + Lori Martin	104 Senny Street	
John DeLuca	514 E Main St.	
John Carr	IDNR, Historic Pres & Archiver, 402 W. Washington, Rm W274, Indpls 46204	Representing Indiana SHPO
Mary Jane Greyman	718 E. 2nd St. 47250	
VAREIA CRISAFULLI	832 W. MAIN ST. 47250	
MARC CASH		
CARL Glesing	2515 Woods Edge Dr MADISON	
Tom Campbell	614 E Second MADISON	
Happy Smith	220 Walnut Madison	3316 rowland@gmail.com
Owen McCall	" " "	mccallowen@gmail.com

**Public Open House**  
**Meeting 1 - Dec. 3, 2015**

Name (please print)	Address	Organization (if applicable)
Mr. & Mrs. J. Muncie	723 E. First Street 47250	
Mr. & Mrs. MARVIN EADES	2838 N OLD SR 62 47250	
Colby King	9245 W 900 N 47227	FPBH, Inc.
Cynthia Smoots	803 East First St 47250	
Key NEACE	709 E MAIN 47250	
NANCY YIESLA	709 E-MAIN 47250	
Ginny Welch	509 West St 47250	
Dee Comstock	708 E main 47250	
Sharon Schaefer	2006 E. Schaefer Rd	
A. J. Brammer	1224 E. Telegraph Hill Road	WORX-FM
Randy & Cindy Bellamy	2651 W. Division Rd. Huntington, IN	
David Alcorn	225 Wildwood Dr.	
Troy Morgan	300 Sunrise Dr. Madison IN	
John Staicer		

**Public Open House**  
**Meeting 1 - Dec. 3, 2015**

Name (please print)	Address	Organization (if applicable)
Robin Henderson	614 E Main St Madison	
Linda Lytle	414 St. Michaels Ave. Madison	Visit Madison, Inc.
EVOLYN WHEELER +	519 E MAIN ST MADISON	CHRIST EPISC. CHURCH
Tom Davis	230 Reynolds Dr, Lebanon	
Becky Daw	"	
Todd CALVERT	1020 W MAIN ST / 714 E MAIN W	
KATHIE PETKOVIC	906 E. 1st St.	RIVERBOAT INN
Frank Tzff	609 West Main Madison	
Pam Newhouse	416 E. Main, Madison	
Larry Newhouse	416 E. Main St Madison	
Marcia McCracka	521 E. Main St Madison	
Wick McCracka	" " "	
Jennifer Ransom	2006 East Sahara Road	
Robert Smith	1046 W MAIN ST MADISON	3100 District City Council

**Public Open House**  
**Meeting 1 - Dec. 3, 2015**

Name (please print)	Address	Organization (if applicable)
Rick Grote	612 Spring St. 47250	
Renee Bruck	310 West St. Madison 47250	Madison Courier
Fred Byrrell	315 W 3rd	
India Cooper	"	
Janet Dierkes	805 E First Madison 47250	
Kay Wettershus	711 Walnut St. Madison, IN.	
Tom Wettershus	" "	
Bernard Kelley	926 Park Ave. Madison IN.	
Dawn Welch	City of Madison	City of Madison
Dave McComb	705 East Main.	MADISON.
Jon Ward	307 Jefferson St. Madison	RoundAbout Madison
ROBERT LITTLE	2044 N. RYKERS RIDGE RD.	COMMISSIONER.
Teresa Bennett	450 W Skyline Dr, Madison	
Janet Henderson	1846 Crozier Madison	City Council



**Public Open House**  
**Meeting 1 - Dec. 3, 2015**

Name (please print)	Address	Organization (if applicable)
Andrew Forrester	205 Mill St. Madison, IN 47250	City of Madison
Mr & Mrs Bob Waller	105 Cherry Trace Madison 47250	Public
Robert E. Wall DDS	989 E. Telegraph Pt.	Public Madison Riverfront
NORBERT SCHAFER	4857 E. 900 N, MADISON	JEFF COUNTY
Paul Berry	511 Brentwood	CITY COUNCIL
JAMES & KENNETH ALEXANDER	1223 Wells Dr (902 Filmore St)	<del>City of Madison</del>
LARRY HENRY	1238 W. Main St	—
ALBERT POWERS JR	114 SEPINA ST	MADISON (Plan Comm)
KARL EAGLE	225 GREEN RD	
Bob Mann	1009 W. First	
Donna Denning	5048 N. SR 62 Madison, IN 47250	Madison
Amy Smith	407 W. 1st Street	
Sherril Carol Coy		



## INDIANA DEPARTMENT OF TRANSPORTATION

### News Release

FOR IMMEDIATE RELEASE

January 29, 2016

### INDOT to Host Second Public Open House for Project 421 in Madison

MADISON, Ind. – The Indiana Department of Transportation (INDOT) is hosting its second public open house regarding Project 421 – the study of the half-mile section of U.S. Route 421 through Madison that approaches the Milton-Madison Bridge, which spans the Ohio River between Madison and Milton, Ky.

INDOT and the project team have identified nine alternatives for consideration. This public open house will allow residents to discuss these routes and recommend the alternative they prefer. The purpose of this project is to select a route that best addresses the safety concerns, mobility challenges and economic development needs of Madison.

What: Public open house for Project 421

When: Thursday, February 18, 2016  
4-7 p.m.

Where: Brown Gymnasium  
100 Broadway St.  
Madison, IN 47250

INDOT representatives and the project team will be available during the open house to address questions, comments and concerns, and project displays will be available throughout the evening. Information will be posted to the project website [www.project421.com](http://www.project421.com) immediately following the meeting.

###



**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
ROBERT W. STEELE	P.O. BOX 529 VERSAILLES, IN	A NOBODY
Robert E. Wall & ps	999 E. Telegraph Point Madison IN	
TROY MORGAN	300 SUNRISE DR. MADISON IN	MADISON CITY COUNCIL
BETSEY VONDERHEIDE	413 E THIRD ST, MADISON IN 47250	citizen
Wayne Engler	505 Poplar St.	retired loafer
Daniel + Jessica Butler	727 W. Main St., Madison, IN 47250	citizen & Preservation Planner
Louann Waller	101 W. Main Madison	City of Madison
Bob & Merry Fourhman	377 Brentwood Dr.	Madison
Andrew Forrester	205 Mill St	City of Madison
Darrell Henderson	1844 Crozier	City of Madison
Bernard Kelley	926 PARK AVE. MADISON	
Melinda + Tony Castor	800 S. Grange Hall Rd. Hanover	Anthony J. Castor, Attorney
Burke Jones	917 W 2ND ST. MADISON IN	CITY OF MADISON
Jim Storm	428 Mulberry St. MADISON	

BOB CANITA

906 FILMORE

CLINCY MCCABE

205 ST MICHAEL'S AV

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Bob Court	733 W MAIN ST, MADISON	
Luis Alvarez	Milton Ky	
Connie Huntington	226 Fairmount Drive, Madison	
Ray C. Uois	1429 Beae St MADISON	
Julie Johnson	608 W. 2nd Madison	
Kiera Rogers	807 E. 2nd Madison	
Kathy + Charlie	Kahling 790 Michigan Rd	
James Alexander	1923 Wells Dr MADISON	
Eleanor Alexander	1923 Wells Dr MADISON	
Shirley Herrick	309 Hargan Dr Madison	
Douglas Perry	507 E Main St, Madison	
Larry + Angela Graves	1162 N. Spillman Ln, Milton, Ky.	
PHIL STEWART	9903 W New Bethel rd Leighton, IN	
A. J. Brammer	1224 E Telegraph Hill Road	WORK-FIRM

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Dkt Speer	803 Fillmore	
Larry Red Dog Collins	1024 Walnut St.	Michael Baker Fort L
PAUL DAVIS	716 FILLMORE	
Cheryl A. Berach	204 St. Michael's Ave	
Shirley W. Jones	1012 Park Ave	
John Johnson	122 W. Hutchinson St	
Laura Macon	703 Montclair St	
Markt Wylie	1129 W. Main St.	
KEV WASSER	Cragmont St.	
Mr & Mrs C.W. Wetherhus	701 Walnut St.	
Jan Vethuis	701 E. 2nd St.	
Jacob Sams	903 east 2st	
Joan DeLeon	701 W 2nd St	

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
BRAN & LARI MARTIN	104 SPRING ST.	
Peggy Vlerebome		
TED Sullivan	310 MILL ST., MADISON	
NORBERT SCHAFER		
MIKE PEAK		
Lue Turner	1794 E Key Ave Madison	
Wayne Turner	1794 E. Key Ave Madison	
TJANA ROGERS	1917 E. TELEGRAPH Hill Rd MADISON	
HOWARD C. JACKSON	2953 SUNSET COURT MADISON	
Steve Allen	523 Phillips Ln. Madison	
Cynthia J Miner		
Steve Miner		
Maxim Eades	2858 N OLD SR 62 Madison W	
Tommy Campbell	614 E SECOND MADISON	

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Bill Koble	624 E 2nd St Madison	
Michele Ward	125 St. Michaels Ave.	
Kara Tucker	" " " "	
JOHN A SCHAFER	2006 E. SCHAFER Rd.	
F. E. GUNTER	211 W. 2	
Sharon Schafar	2006 E. Schafar Rd -	
Brian Jackson	1055 BROAD Rd MADISON	City of Madison
Joy Keen	1014 Park Ave Madison	
TODD CALVERT	713 EAST MAIN ST	
Ken Pettit	EAST ST	MADISON
Dave Linger	Michigan Rd	
Ed + Myrna Messie	3014 W. Black Rd. Madison	
DAN HODGES	301 Hillcrest Dr, MADISON	
Bob Phillips	5235 W 1050 N Depot W	

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Karl Kishi	225 GREEN ROAD	#4 FIRE Co.
Jenn. Fox Ransom	<del>2000</del> 2000 E. Schafer Rd	
David Alcorn	225 Wildwood Dr.	City Council
dan Stanley	212 St. Michael's Ave.	
Teresa Bennett	450 W Skyline Madison	
Jim + Kelly Smith	617 E Main Madison	
Sharon + Dave Dreyfus	217 E. 4th Madison	N/A
Boyd + Wendy	712 East Main Madison	
Thomas Bragg	512 EAST Main	
Ron Hopper	944 W. 2nd St Madison	
Bob + Terri Waller	105 Cherry Trace	
Dave Collins	413 Elm St.	
JIM COUNTER	415 GREEN RD	
DOUG Ehrnreiter	Milton Ky	DRIVER



**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Carol Wilhelm	707 W. Main St.	

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Roxi Burns	920 E 2nd St	
Mary Pat Puckett	496 E Telegraph Pt. Rd	
Charles Ricketts	" " "	
Steve McAtee	605 Clifty Drive	Madison Auto Service
Scott Baldwin	1450 Clifty Dr.	
Dena Getz	1124 N Bee Camp Rd	
David Getz	"	
Ginny Welch	509 West St	City
Damon Welch	" " "	"
Gerry Reilly	804 W. 2nd St. Apt. 2	<del>ABA</del> Lanier
Betsy Lyman	1050 Michigan Road	HDBR
Patrick Dowley	1486 E. State Road 56	
Robert & Annette Smith	1046 W. Main Madison	City Council Member
Rodney M Kelley	930 West First	
Anne Anderson	3084 W 500N Madison	—
JEFF BRUKUS SR.	939 W. MAIN ST. CITY	

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Larry W. Newhouse	416 E. Main St, Madison	Madison Main Street
Judy Richardson	318 Presbyterian Ave	<del>Madison</del>
Vickie Young & Sandy Palmer	1032 PARK AVE	RESIDENT
Kathy McKalip	1460 E. 400 N	Madison Main Street - Met. Vanguard
Charles Rogus	100 N Senate Ave Indpls	INDOT
Don Clapman	175 E Main St	
William J. Langley	P.O. box 17 Madison	
Renee Bruck	2487 Castor Ln, Madison	
Dorise Sherman	310 West St. Madison	Madison Courier
JOHN STALCER	424 East St Madison	Self
Kathie Petkovic	500 West St Madison	H&M
Happy Smith	<sup>KATHIE PETKOVIC</sup> 906 E 1st St. MADISON	RIVERBOAT INN
Owen McCall	220 Walnut St.	Resident
	220 Walnut St.	Madison

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
FRANK HIGH	611 N. 1000 W LEXINGTON IN	
Pick Grabe	701 S INDIAN CREEK.	
Bill Voth	504 Montclair MADISON	
Al Huntington	226 FAIRMOUNT DR., 47250	
Teri Adler	714 E. Main 47250	
MEL POLK	507 E. MAIN ST 47250	
RONALD BARNES	815 Park Pike MILTON, Ky 40045	
ALBERT POWERS JR	114 Spring St Madison	
Richard Dickie	9850 Upper Dry Fork Rd 47250	
Shirley Gland	1937 Adams Dr. Nelson IN 47258	
LARRY & Roselyn WATKINS	672 N. 1000 W. LEXINGTON. IN	
Janet Geyman	712 E 2nd St. Madison IN	
JOHN BRUNS	808 FILMORE ST MADISON	
Jenny Bradley	808 FILMORE ST Madis	

**Public Open House**  
**Feb. 18, 2016**

Name (please print)	Address	Organization (if applicable)
WE Robertson	209 Culshaw Lane, Beefat Ky	
JOHN COOKE	700 N. HERDFURN LANE	
Kaeli Black	216 Spruce lane	American Red Cross
LINDA PIERA	150 Broadway apt 101 Madison, WI	American Red Cross
Jerry R. Steinerwald	319 Greenbriar Rd. Hanover	
GARY BURDETTE	705 E. SECOND ST.	
Kevin Harrell	403 W. Second ST.	
NICK ELLIS	747 S. ROGERS	
Dan Dattilo	1426 Wyandotte Ct. Madison, WI	City Council
Whitney Mydtt		MMSP
Gerald Kelley	147 SPRUCE LN HANOVER	CONCERNED CITIZEN
MARTIN BEYER	402 W. 1 <sup>ST</sup>	" "
Bob Stucker	402 W 1 <sup>ST</sup>	" "
Pam Newhouse	416 E. Main, Madison	citizen

# OPEN HOUSE

Moved to Jefferson County Public Library  
420 West Main Street

Thursday, Aug. 18 | 4-7 p.m.

---

The project team has been conducting technical studies to provide crucial insight to narrow the pool of nine alternatives. Based on this data and public feedback, the alternatives have been narrowed to four.

At this public open house, residents can **review and provide feedback for the proposed alternatives** to help the team move toward selection of the final, preferred and facilitate other potential opportunities for the corridor.

No formal presentation will be provided, but team members will be available throughout the duration of the open house to answer questions.

The purpose of Project 421 is to select a route that best addresses the safety concerns, mobility challenges and economic development needs of Madison.

**Project421.com**



**Public Open House  
Meeting 3 - Aug. 18, 2016**

Name (please print)	Address	Organization (if applicable)
NORBERT SCHAFER	4857 E #900 N MADISON 47250	
ROBERT Little	2044 N. RYKERS RIDGE RD MADISON	
Brett Eppley	101 W. Main St.	Madison Courier
Brian + Lori Martin	104 Sering Street	
<i>[Signature]</i>	13 Cobbleston	
Don word	307 Jefferson St	RoundAbout Madison
Laura Hodges	301 Hillcrest Dr. Madison	Madison City Council
Hurley Adams	220 E. main ST.	
Jan Velma	701 E. 2nd	resident Cornerstone
TROY MORGAN	300 SUNRISE DR.	MADISON CITY COUNCIL
Tom DATTILO	1802 HARTNER HILL	
Citra Grappner	25 N Music Drive Hawver	
Camille Jife	608 MULBERRY St.	
Larry Inax	316 Mill St Madison	Chamber of Commerce JCIFE

**Public Open House  
Meeting 3 - Aug. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Annalisa Strickland	Madison	Resident
Mark E. May	9657 N. Copeland Rd. Rd. Madison	
Judy Corcum	712 E. 2nd St., Madison, IN	
Roger Jacobson	712 E 2nd St Madison IN	
David Carlow	747 W. MAIN ST. MADISON	CITY OF MADISON
June Chatham	1487 N. Thompson Rd. Madison	
Karl Easton	225 GREEN ROAD MADISON	CITY PLANNING COMM.
Frank Charlotte Taff	609 W Main St Madison IN	
MARVIN GADES	2858 N OLD SR 62 MADISON IN	
Frank Carolyn GUNTER	211 W. 2nd ST	
Deb Morrison	102 Serving St	
Russell VOSSLER	623 E. 2nd St. MADISON	
Jeremy Sage	WKRN News	
Robert Adams	4777 E. St. Rd. 56	Madison

**Public Open House  
Meeting 3 - Aug. 18, 2016**

Name (please print)	Address	Organization (if applicable)
David J. Krentz	65 N. Kenyon 1001 E Vaughn Dr. 47250	Property Owner
Kay YIESLA	709 E MAIN	PROPERTY OWNER
Linda Lytle	414 St. Michaels Ave	Visit Madison, Inc.
Melanie Douglas	702 N. Shore, Jeffersonville IN	US Sen. Joe Donnelly
BETSEY VONDERHEIDE	413 E THIRD ST MADISON, IN 47250	property-owner/citizen
Tommy Lampell	614 E Second	OWNER
<del>Cheryl G...</del>		
Eleanor & James Alexander		
Carla Vander	623 E 2nd	property owner
TED SULLIVAN	310 MILK ST. Madison	PROPERTY OWNER
Sarah Whicker	2973 New Hope Rd. Bedford, KY	
Jim Whicker		
Lynn W. Min	723 E. 1st MADISON	
Bobby Phillips	5235 W 1050 N Dupont	

**Public Open House  
Meeting 3 - Aug. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Robert E. Wall DDS	989 E. Telegraph Rd Madison	
MIKE PITTMAN	420 ELM ST. MADISON	
Dee Comstock	208 E Main Madison	
Mary Jo O'Connor	3799 Scotts Ridge Rd Madison	
Jim Rogers	146 Hendricks Circle Mad.	
Kenneth W. Durick	1212 Park X VC	
<del>Steve Rogers</del>	807 E 2nd St	
Fred Koehler	414 Broadway St	
Gudy Koehler	" "	
REGINA KALB	718 EAST MAIN, MADISON, IN	
Peggy Vleehome	809 E. 2 <sup>nd</sup> St., Madison, IN	
Jan Mc Fadden	311 E. 2 <sup>nd</sup> St, Madison, IN	
Shay Perry	507 E. Main St. Madison IN	
Paul Dinkhouse	416 E. Main St. Madison	

**Public Open House  
Meeting 3 - Aug. 18, 2016**

Name (please print)	Address	Organization (if applicable)
Larry Newhouse	416 E. Main St., Madison, IN	
Damon & Ginny	509 West St., Madison, IN	
FRED BURKELL	315 W 3 <sup>rd</sup> St	
Renee Bruck	310 West St., Madison	Madison Courier
A.J. Brammer	1224 E. Telegraph Hill, Madison, IN 47250	WORX-FM
Laura Macon	814 E First St, Madison	
Thomas Seedorf	512 EAST MAIN	
Albert Powers	114 Seung St	
Robert & Annette Smith	1046 W Main St	
Candy Bellamy	2651 W Division Huntington IN	
Jerry Cusack	2108 N. US 421 MADISON	
John & Shann Schafu	2006 E. Schuyler Rd Madison	

# **Appendix H**

*Environmental Justice*

# US 421 New Roadway Construction Jefferson County, Indiana Des. No.: 1400918

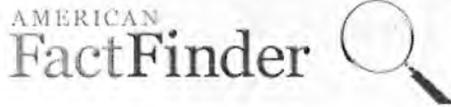


	Census Tract Map	
	Indiana Department of Transportation 100 North Senate Avenue, Room N642 Indianapolis, IN 46204	

**Des. No. 1400918: US 421 New Roadway Construction**  
 Environmental Justice Data Analysis  
 Comparison of City of Madison to Census Tracts 9665 and 9666

	COC		AC 1	AC 2
	City of Madison	Census Tract 9665		
<b>LOW-INCOME POPULATION EJ ANALYSIS</b>				
Population for whom poverty status is determined: Total	11006	5331		1761
Population for whom poverty status is determined: Income in 1999 below poverty level	1120	596		113
<b>Percent Low-Income</b>	<b>10.2%</b>	<b>11.2%</b>		<b>6.4%</b>
<b>125 Percent of COC</b>	<b>12.7%</b>	<b>AC ≤ 125% COC</b>	<b>AC ≤ 125% COC</b>	<b>AC ≤ 125% COC</b>
<b>Population of EJ Concern</b>		<b>No</b>	<b>No</b>	<b>No</b>
<b>MINORITY POPULATION EJ ANALYSIS</b>				
Total population: Total	12032	5367		1856
Total population: Not Hispanic or Latino	11951	5348		1856
Total population: Not Hispanic or Latino; White alone	11140	5165		1723
Total population: Not Hispanic or Latino; Black or African American alone	462	43		23
Total population: Not Hispanic or Latino; American Indian and Alaska Native alone	12	12		0
Total population: Not Hispanic or Latino; Asian alone	179	116		56
Total population: Not Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	0	0		0
Total population: Not Hispanic or Latino; Some other race alone	50	0		0
Total population: Not Hispanic or Latino; Two or more races	108	12		54
Total population: Two races including Some other race	13	0		13
Total population: Two races excluding Some other race	95	12		41
Total population: Hispanic or Latino	81	19		0
Total population: Hispanic or Latino; White alone	56	15		0
Total population: Hispanic or Latino; Black or African American alone	0	0		0
Total population: Hispanic or Latino; American Indian and Alaska Native alone	0	0		0
Total population: Hispanic or Latino; Asian alone	0	0		0
Total population: Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	0	0		0
Total population: Hispanic or Latino; Some other race alone	12	4		0
Total population: Hispanic or Latino; Two or more races	13	0		0
Total population: Two races including Some other race	13	0		0
Total population: Two races excluding Some other race	0	0		0
<b>Number Non-white/minority</b>	<b>892</b>	<b>202</b>		<b>133</b>
<b>Percent Non-white/minority</b>	<b>7.4%</b>	<b>3.8%</b>		<b>7.2%</b>
<b>125 Percent of COC</b>	<b>9.3%</b>	<b>AC ≤ 125% COC</b>	<b>AC ≤ 125% COC</b>	<b>AC ≤ 125% COC</b>
<b>Population of EJ Concern</b>		<b>No</b>	<b>No</b>	<b>No</b>

Source: 2013 US Census Bureau



B03002

HISPANIC OR LATINO ORIGIN BY RACE

Universe: Total population  
2009-2013 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

	Census Tract 9665, Jefferson County, Indiana		Census Tract 9666, Jefferson County, Indiana		Madison city, Indiana
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Total:	5,367	+/-374	1,856	+/-199	12,032
Not Hispanic or Latino:	5,348	+/-378	1,856	+/-199	11,951
White alone	5,165	+/-384	1,723	+/-182	11,140
Black or African American alone	43	+/-52	23	+/-26	462
American Indian and Alaska Native alone	12	+/-23	0	+/-11	12
Asian alone	116	+/-84	56	+/-77	179
Native Hawaiian and Other Pacific Islander alone	0	+/-16	0	+/-11	0
Some other race alone	0	+/-16	0	+/-11	50
Two or more races:	12	+/-22	54	+/-61	108
Two races including Some other race	0	+/-16	13	+/-23	13
Two races excluding Some other race, and three or more races	12	+/-22	41	+/-56	95
Hispanic or Latino:	19	+/-26	0	+/-11	81
White alone	15	+/-25	0	+/-11	56
Black or African American alone	0	+/-16	0	+/-11	0
American Indian and Alaska Native alone	0	+/-16	0	+/-11	0
Asian alone	0	+/-16	0	+/-11	0
Native Hawaiian and Other Pacific Islander alone	0	+/-16	0	+/-11	0
Some other race alone	4	+/-8	0	+/-11	12
Two or more races:	0	+/-16	0	+/-11	13
Two races including Some other race	0	+/-16	0	+/-11	13
Two races excluding Some other race, and three or more races	0	+/-16	0	+/-11	0

	Madison city, Indiana
	Margin of Error
Total:	+/-20
Not Hispanic or Latino:	+/-57
White alone	+/-171
Black or African American alone	+/-131
American Indian and Alaska Native alone	+/-23
Asian alone	+/-62
Native Hawaiian and Other Pacific Islander alone	+/-18
Some other race alone	+/-60
Two or more races:	+/-73
Two races including Some other race	+/-23
Two races excluding Some other race, and three or more races	+/-70
Hispanic or Latino:	+/-53
White alone	+/-49
Black or African American alone	+/-18
American Indian and Alaska Native alone	+/-18
Asian alone	+/-18
Native Hawaiian and Other Pacific Islander alone	+/-18
Some other race alone	+/-18
Two or more races:	+/-23
Two races including Some other race	+/-23
Two races excluding Some other race, and three or more races	+/-18

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

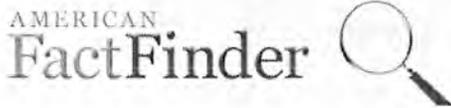
While the 2009-2013 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

#### Explanation of Symbols:

1. An '\*\*\*' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '\*\*\*\*' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '\*\*\*\*\*' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.



B17001

POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE

Universe: Population for whom poverty status is determined  
2009-2013 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

	Census Tract 9665, Jefferson County, Indiana		Census Tract 9666, Jefferson County, Indiana		Madison city, Indiana
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Total:	5,331	+/-372	1,761	+/-193	11,006
Income in the past 12 months below poverty level:	596	+/-273	113	+/-65	1,120
Male:	220	+/-132	22	+/-28	495
Under 5 years	27	+/-40	0	+/-11	95
5 years	0	+/-16	0	+/-11	0
6 to 11 years	1	+/-12	0	+/-11	8
12 to 14 years	1	+/-12	0	+/-11	20
15 years	0	+/-16	0	+/-11	0
16 and 17 years	10	+/-20	0	+/-11	10
18 to 24 years	70	+/-84	2	+/-4	72
25 to 34 years	37	+/-51	0	+/-11	47
35 to 44 years	34	+/-42	0	+/-11	44
45 to 54 years	0	+/-16	0	+/-11	63
55 to 64 years	40	+/-51	20	+/-27	114
65 to 74 years	0	+/-16	0	+/-11	22
75 years and over	0	+/-16	0	+/-11	0
Female:	376	+/-179	91	+/-55	625
Under 5 years	76	+/-66	0	+/-11	76
5 years	0	+/-16	0	+/-11	0
6 to 11 years	52	+/-71	0	+/-11	42
12 to 14 years	0	+/-16	8	+/-13	8
15 years	0	+/-16	0	+/-11	0
16 and 17 years	0	+/-16	0	+/-11	0
18 to 24 years	25	+/-42	7	+/-14	32
25 to 34 years	81	+/-62	0	+/-11	103
35 to 44 years	12	+/-32	14	+/-24	42
45 to 54 years	31	+/-43	15	+/-17	95
55 to 64 years	51	+/-54	0	+/-11	67
65 to 74 years	14	+/-23	26	+/-26	89
75 years and over	34	+/-33	21	+/-24	71
Income in the past 12 months at or above poverty level:	4,735	+/-424	1,648	+/-196	9,886
Male:	2,306	+/-264	712	+/-128	4,642
Under 5 years	96	+/-76	0	+/-11	251
5 years	34	+/-41	20	+/-31	54
6 to 11 years	112	+/-65	34	+/-27	197

	Census Tract 9665, Jefferson County, Indiana		Census Tract 9666, Jefferson County, Indiana		Madison city, Indiana
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
12 to 14 years	228	+/-112	11	+/-11	218
15 years	0	+/-16	0	+/-11	22
16 and 17 years	131	+/-84	9	+/-14	151
18 to 24 years	195	+/-85	29	+/-37	383
25 to 34 years	191	+/-108	159	+/-68	660
35 to 44 years	317	+/-91	133	+/-61	591
45 to 54 years	410	+/-113	98	+/-59	683
55 to 64 years	354	+/-111	74	+/-53	771
65 to 74 years	120	+/-58	71	+/-42	399
75 years and over	118	+/-58	74	+/-43	262
Female:	2,429	+/-252	936	+/-127	5,244
Under 5 years	127	+/-75	55	+/-35	255
5 years	20	+/-31	0	+/-11	20
6 to 11 years	120	+/-75	141	+/-54	335
12 to 14 years	17	+/-26	0	+/-11	157
15 years	14	+/-26	11	+/-15	122
16 and 17 years	87	+/-79	52	+/-44	164
18 to 24 years	90	+/-80	21	+/-23	374
25 to 34 years	166	+/-73	83	+/-48	374
35 to 44 years	242	+/-96	128	+/-70	598
45 to 54 years	510	+/-130	188	+/-62	943
55 to 64 years	417	+/-107	81	+/-55	734
65 to 74 years	271	+/-89	59	+/-35	549
75 years and over	348	+/-103	117	+/-41	619

**Legend:**

**Boundaries**

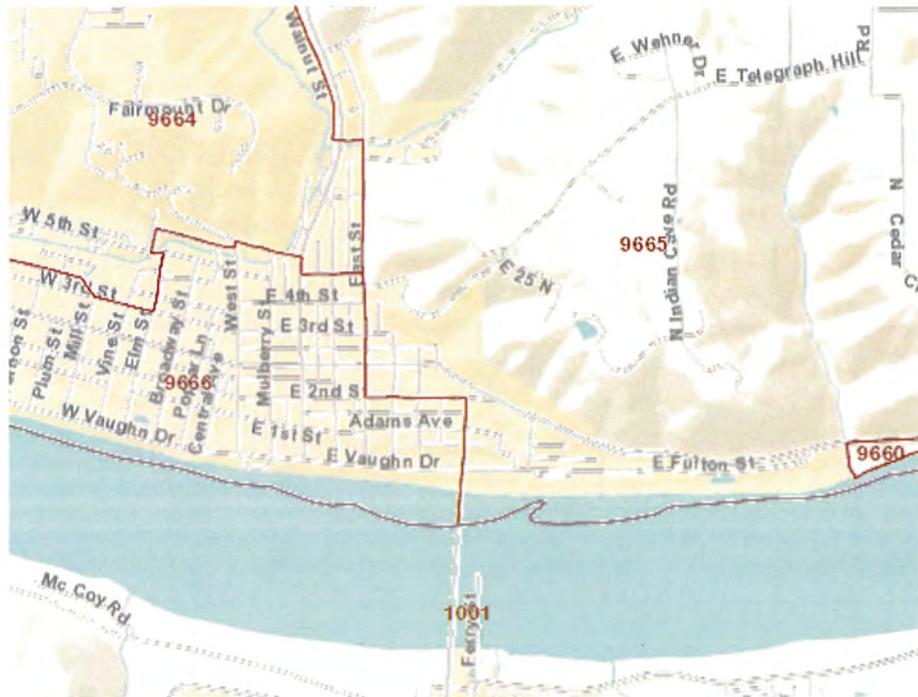
- State
- '14 County

-  '14 Census Tract

**Features**

- Major Road
- Street
- Stream/Waterbody

Items in grey text are not visible at this zoom level



# **Appendix I**

*Section 4(f)*

## **I. Introduction:**

Section 4(f) of the US Department of Transportation Act of 1966 states that USDOT-funded projects are prohibited from using land from certain properties unless there is no feasible and prudent alternative to the use of the Section 4(f) resource. The proposed action must also include planning to minimize harm to the property that would result from such use. The purpose of Section 4(f) is to protect historic sites, publicly owned park and recreation lands, and wildlife and waterfowl refuges. The following paragraphs detail the Section 4(f) impacts associated with this project.

### **A) Project Location:**

The Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) desire to improve the approach roadway to the Milton-Madison Bridge over the Ohio River. The proposed project is located within Jefferson County, Indiana in the City of Madison and located through a portion of the National Historic Landmark District (NHL) and the National Register of Historic Places (NRHP) - Madison Historic District. The project is located in Section 2, Township 3 North, Range 10 East in Madison Township, Jefferson County.

### **B) Purpose and Need:**

#### Need for the US 421 Road Construction Project

The need for improvement is caused by poor geometry of the existing roadway alignment which has led to vehicle congestion. This congestion has led to a history of vehicle collisions throughout the corridor. Additionally, the poor geometry has led to increased noise and air pollution. The City of Madison, INDOT, and FHWA previously committed to improving the approach roadway conditions as part of the Milton-Madison Bridge Replacement. Overall, the need for improvement is caused by poor geometry and safety, traffic congestion, air pollution, noise pollution, poor pedestrian connectivity, and perpetual impacts to historic properties. The following paragraphs further describe each aspect of the project need.

#### 1) Enhance Mobility and Safety in the Corridor

With approximately 11,500 vehicles per day, including 920 local commercial trucks, using US 421 over the Ohio River between Milton, Kentucky and Madison, Indiana, the efficiency of the corridor is essential to not only the citizens of Madison but the traveling public of Indiana. Additionally, the importance of this route is highlighted by the next nearest river crossings being located at Markland Dam over 26 miles upstream and I-265 Ohio River Bridge East End Crossing in Louisville, Kentucky over 46 miles downstream. Commuters in both Jefferson County, Indiana and Trimble County, Kentucky travel the US 421 Bridge over the Ohio River to access jobs, emergency and health care facilities, and commerce, with 70% of the trips crossing the US 421 Bridge having origins or destinations within Madison.

Currently, vehicles traveling along US 421 must negotiate a series of 90-degree turns in a residential neighborhood intermingled with commercial businesses on a segment of highway north of the US 421 Bridge. Many of the properties adjacent to the existing roadway are contributing to the Madison NHL Historic District and Madison NRHP Historic District within the City of Madison. Traveling northbound, vehicles must make a left turn from US 421/Harrison Street to Second Street and a right turn from Second Street to Baltimore Street, before turning left from Baltimore Street onto SR-56/East Main Street. Additionally, vehicular access to/from adjacent properties is limited during peak hour traffic due to congestion along US 421. The poor access has contributed to the underutilization of several parcels along US 421 north of the bridge.

Project 421

Draft Section 4(f) Evaluation

Des. No.: 1400918

Des. No.: 1400918

Section 4(f) Analysis

Page 1

I-1

Crash records were collected from INDOT over a four year period (January 1, 2012 through September 30, 2015). North of the US 421 Bridge, 22 crashes were reported along US 421 south of the intersection with SR-56.

- One crash was reported at the Harrison Street/Fillmore Alley intersection.
- Six crashes, including two injury collisions, were reported at the Harrison Street intersection with First Street and the adjacent approaches. The majority of these crashes were rear-end and right-angle collisions; northbound bridge traffic will often use First Street as a cut-through to avoid delays along Second Street and Baltimore Street. The right-angle collisions can be traced to drivers failing to yield right-of-way.
- Six crashes were reported at the Harrison Street/Second Street intersection and adjacent approaches. The majority of these crashes were rear-end (vehicles backing up to clear space for turning trucks) and side-swipe (trucks not being able to make left turns and avoid oncoming vehicles within the pavement limits).
- Four crashes, including one injury collision, were reported at the Second Street/Baltimore Street intersection and the adjacent approaches. The majority of these crashes can be traced to drivers failing to yield right of-way and performing unsafe turning maneuvers.
- Five crashes, including one injury collision, were reported at the Baltimore Street intersection with SR-56. The majority of these crashes can be traced to drivers failing to yield right of-way and performing unsafe turning maneuvers.

## 2) Environmental Impact of Trucks

The existing US 421 corridor accommodates approximately 920 commercial trucks per day. Tight turning radii at roadways intersecting US 421 are inadequate for truck movements, forcing large trucks to travel outside of their designated lane and use multiple lanes when turning. Trucks often must wait until the adjacent lane is clear of other traffic before completing turns. Alternately, trucks resort to driving on the outside curb and/or sidewalk to complete turns if there is not a clear space in the adjacent lane. The noise, vibration, and air pollution caused by idling, braking, and accelerating trucks along the existing US 421 route degrades the quality of life for adjacent residents.

## 3) Pedestrian Connectivity

Currently, the US 421 corridor has limited means to accommodate pedestrian traffic (i.e. sidewalks, multi-use paths, bike lanes, etc.). The lack of pedestrian facilities along this corridor restricts connectivity among neighborhoods, businesses, historic sites, and the new pedestrian facility on the Milton-Madison Bridge. Also, the new pedestrian facility along the Milton-Madison Bridge is inaccessible from 2<sup>nd</sup> Street. Pathway users must access the facility from a stairway underneath the bridge.

Residents, business owners, and local officials view US 421 north of the Milton-Madison Bridge as a gateway into their community. Several underutilized properties have been identified adjacent to existing US 421 north of the Milton-Madison Bridge. Facilitating pedestrian connectivity to these properties will bring added visibility and marketability to this area.

#### 4) Impacts to Contributing Historic Properties

Currently, thirty-three properties identified as contributing to the Madison NHL District and the Madison NRHP Historic District are adjacent to the existing US 421 alignment. The existing alignment bisects a residential neighborhood within the Madison NHL District and Madison NRHP Historic District. All properties within this neighborhood, including thirty-three contributing properties to the Madison NHL and the Madison NRHP Historic District are subject to air, noise, and vibration pollutants. In addition, access to these properties is often impaired or limited during peak hours due to the heavy volume of truck traffic.

##### Purpose of the US 421 Road Construction Project

The purpose of the proposed project is to increase operational efficiency and traffic safety by relieving congestion at a series of 90-degree turns on US 421 between the Milton-Madison Bridge and Main Street, while reducing the environmental impacts associated with idling and braking of trucks. Additionally, the project will support opportunities for economic development in the community by managing access and enhancing pedestrian accessibility in the project area.

The purpose of the proposed project is summarized in the following four bullets:

- Enhance mobility and safety in the corridor, distinguishing between local and through traffic.
- Reduce the environmental impact of trucks through the corridor.
- Support opportunities for economic development in the community by managing access and enhancing pedestrian accessibility.
- Reduce the number of contributing historic properties impacted by US 421 vehicular traffic.

#### **C) Project History:**

The Milton-Madison Bridge Project was a joint effort between the Kentucky Transportation Cabinet (KYTC), INDOT, and the FHWA to replace the aging US 421 Bridge over the Ohio River between Milton, Kentucky and Madison, Indiana. The original US 421 Bridge over the Ohio River contained a steel truss structure with a total length of 3,181 feet 6 3/8 inches. It had two 10-foot travel lanes and no shoulders.

In the mid-1990s, KYTC undertook a planning study and environmental overview to replace the US 421 Bridge over the Ohio River. This study identified a number of potential river crossing alternatives and assembled information on the environmental constraints existing at that time. However, no final alternative was selected for implementation. Therefore, the existing structure was rehabilitated in 1997 to extend the life by 10 to 20 years.

In 2009, a Fracture Critical Inspection (a visual inspection of key bridge members) was undertaken as part of the KYTC's routine bridge maintenance activities, which identified numerous bridge elements that were in poor or serious conditions. Due to the severity of the inspection findings, the Milton-Madison Bridge was replaced in 2014. Due to the accelerated need to address the structural integrity of the bridge, bridge approach improvements aspects of the project were not incorporated. It was expected that bridge approach improvements would come at a later time to address mobility and access.

## **D) Project Description:**

The proposed project is located within Jefferson County, Indiana in the City of Madison and located through a portion of the Madison NHL District and Madison NRHP Historic District. The proposed corridor improvements, located on the Indiana border of the Ohio River, are immediately adjacent to the Milton-Madison Bridge, providing approach access from the north. The limits of the project area begin at the northern approach to the Milton-Madison Bridge and extend to the intersection of US 421/Baltimore Street and US 421/Main Street to the west and through the intersection of SR-56/Sering Street to the east.

The current alignment routes nearly 11,500 vehicles through a series of 90-degree turns in a mixed commercial and residential neighborhood, causing traffic congestion, safety concerns, and negative environmental impacts. The congestion and environmental pollution is heightened due to the large volume of truck traffic (8% of the overall AADT). Most trucks are forced to idle at the intersections waiting for clear gaps in oncoming traffic because the trucks are required to complete turns outside of their lane due to inadequate turning radii at intersections.

The proposed project analyzed alternatives (including the No-build or Do Nothing alternative) based on the ability to improve mobility and safety in the corridor, reduce the environmental impacts of trucks, support economic development by managing access and enhancing pedestrian accessibility, and minimizing impacts to the City of Madison, Jefferson County, and local stakeholders.

### **II. Description of Section 4(f) Properties:**

The details of the Madison NRHP Historic District and Madison NHL District are discussed in the paragraphs below. The Madison NRHP Historic District includes most of the Madison NHL District. A figure showing the limits of each district can be found in Appendix A.

**Madison NRHP Historic District** – The Madison NRHP Historic District contains more than 2,200 resources and was listed in 1973. At the time of the nomination, the Madison NRHP Historic District was recognized for having significance in the areas of Architecture, Commerce, and Transportation. The district is also significant in the areas of Industry and Recreation. The district's period of significance was 1806 and extends to 1970.

**Madison NHL District** – The Madison NHL District contains 1,695 Contributing resources and 401 Non-Contributing resources. The Madison NHL District is significant under the thematic framework of “Expressing Cultural Values” as Madison “embodies the distinguishing characteristics of nearly all popular architectural styles from the early nineteenth to early twentieth centuries as demonstrated in a small river town.” It is also significant under the thematic framework of “Creating Social Institutions and Movements.” Specifically: “the community of Madison was integrally involved in the mid-nineteenth century national issues of Abolitionism, the Underground Railroad, and the growth of African-American communities.” The period of significance is circa 1817 to circa 1939.

### **III. Consideration of Alternatives:**

Prior to consideration of any alternative which results in the use of Section 4(f) property, Section 4(f) requires consideration of a reasonable range of feasible and prudent alternatives which avoid the use of Section 4(f) property, including the No-Build Alternative. Feasible and prudent avoidance alternatives are those that avoid using any Section 4(f) property and do not cause other

severe problems of a magnitude that substantially outweigh the importance of protecting the Section 4(f) property.

An avoidance alternative is not considered feasible if it cannot be constructed as a matter of sound engineering judgment. An avoidance alternative is not considered prudent if:

- 1) It compromises the project to a degree that it is unreasonable to proceed in light of the project's stated purpose and need (i.e., the alternative doesn't address the purpose and need of the project);
- 2) It results in unacceptable safety or operational problems;
- 3) After reasonable mitigation, it still causes severe social, economic, or environmental impacts; severe disruption to established communities; severe or disproportionate impacts to minority of low-income populations; or severe impacts to environmental resources protected under other Federal statutes;
- 4) It results in additional construction, maintenance, or operational costs of extraordinary magnitude;
- 5) It causes other unique problems or unusual factors; or
- 6) It involves multiple factors as outlined above that, while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

If the evaluation of avoidance alternatives identifies a feasible and prudent alternative that would not result in the use of Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweigh the importance of protecting the Section 4(f) property, Section 4(f) requires that it be selected as the Preferred Alternative.

If the evaluation of avoidance alternatives concludes that there is no feasible and prudent avoidance alternative, then, from among the alternatives that would use Section 4(f) property, the alternative that causes the least overall harm to Section 4(f) property may be approved. This analysis is required when multiple alternatives that use Section 4(f) property remain under consideration. If the assessment of overall harm finds that two or more alternatives are substantially equal, FHWA can approve any of those alternatives. To determine which of the alternatives would cause the least overall harm, seven factors set forth in 23 CFR 774.3(c) (I) must be balanced. When comparing the alternatives under these factors, comparable mitigation measures are considered. The first four factors relate to the net harm that each alternative would cause to a Section 4(f) property:

- 1) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- 2) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- 3) The relative significance of each Section 4(f) property; and
- 4) The views of the officials with jurisdiction over each Section 4(f) property.

The remaining three factors to be compared take into account any substantial problem with any of the alternatives remaining under consideration on issues beyond Section 4(f). These factors are:

- 5) The degree to which each alternative meets the purpose and need for the project;
- 6) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- 7) Substantial differences in costs among the alternatives.

By balancing the seven factors, all relevant concerns are considered to determine which alternative would cause the least overall harm to Section 4(f) property, which allows FHWA to fulfill its statutory mandate to make project decisions in the best overall public interest.

This Section 4(f) evaluation discloses the various impacts to Section 4(f) property that would result from the alternatives under consideration. The Environmental Assessment (EA) prepared for this project included a draft of this Section 4(f) evaluation. FHWA has considered all comments received on the evaluation and has finalized the comparison of all factors involved in the analysis and identification of the alternative resulting in the overall least overall harm to Section 4(f) property.

#### **A) Development and Evolution of Alternatives Considered:**

Nine preliminary build alternatives and a no-build alternative were identified for evaluation in this report. They are briefly discussed below. Advantages and disadvantages for each alternative include generic factors as well as site-specific advantages and disadvantages based upon initial review of geometric, environmental and traffic impacts. The initial traffic analysis includes analysis of the forecasted traffic volumes as well as variations of the traffic demands to provide a sensitivity analysis of the project area.

##### No-Build Alternative

This alternative would not result in improvements to the condition of the existing roadway. This alternative would not meet the objectives of the purpose and need: It would not improve maneuverability, reduce commercial vehicle impacts, reduce impacts to contributing properties and improve pedestrian connectivity; nor would it improve safety conditions or increase passing opportunities or decrease vehicular crashes.

##### 1) Improved US 421 Intersection

This alternative keeps US 421 on its existing alignment but upgrades the intersections to accommodate the turning radii required for the larger semis using the corridor. Corner radii would be improved at the Main Street /Baltimore Street, Baltimore Street /2<sup>nd</sup> Street and 2<sup>nd</sup> Street /Harrison Street intersections.

##### 2) Reroute US 421 along 2<sup>nd</sup> Street to Jefferson Street

In this alternative, after turning west onto 2<sup>nd</sup> Street, US 421 would continue along 2<sup>nd</sup> Street to Jefferson Street. At Jefferson Street, US 421 would turn north (right) through historic downtown

Madison before rejoining the existing US 421 alignment. Existing 2<sup>nd</sup> Street is stop-controlled at all intersections west of Baltimore Street.

### 3) Signalized T-Intersection with SR-56 Intersecting US 421

US 421 would be at-grade at the intersection with 1<sup>st</sup> Street in this alternative. North of 1<sup>st</sup> Street, US 421 would be built up in order to bridge over 2<sup>nd</sup> Street and then would turn to connect to Main Street at the Roosevelt Street/Main Street intersection. West of where SR-56 intersects 2<sup>nd</sup> Street, SR-56 would turn to “T” into US 421. The intersection of US 421 and SR-56 would be signalized.

### 4) Signalized T-Intersection with US 421 Intersecting SR-56

Similar to the previous alternative, US 421 would be at-grade at the intersection with 1<sup>st</sup> Street. North of 1<sup>st</sup> Street, US 421 would be built up in order to bridge over 2<sup>nd</sup> Street and then would turn to intersect SR 56 between Main Street and 2<sup>nd</sup> Street, creating a “T” intersection. SR-56 would maintain its current alignment. The intersection of US 421 and SR 56 would be signalized.

### 5) Four-Leg Two-Way Stop-Control Intersection at 2<sup>nd</sup> Street & Harrison Street

For this alternative, US 421 would be at-grade at the intersection with 1<sup>st</sup> Street and 2<sup>nd</sup> Street. North of 2<sup>nd</sup> Street, US 421 would cut through the hillside as it turns to connect to Main Street at the Roosevelt Street/Main Street intersection. The four-leg intersection would be stop-controlled on the east and west approaches.

### 6) Four-Leg Signalized Intersection at 2<sup>nd</sup> Street & Harrison Street

Utilizing the same geometrics as the previous alternative, US 421 would be at-grade at the intersection with 1<sup>st</sup> Street and 2<sup>nd</sup> Street. North of 2<sup>nd</sup> Street, US 421 would cut through the hillside as it turns to connect to Main Street at the Roosevelt Street/Main Street intersection. Unlike the previous alternative, the four-leg intersection would be signal-controlled.

### 7) Single-Quadrant Interchange

This alternative includes many of the same elements as the Signalized T-Intersection with US 421 Intersecting SR-56 alternative except that the similar elements are shifted to the east enough to maintain the current Harrison Street roadway. Starting at the Filmore Alley, US 421 would shift east and be at-grade at the intersection with 1<sup>st</sup> Street. North of 1<sup>st</sup> Street, US 421 would be built up in order to bridge over 2<sup>nd</sup> Street and then would turn to intersect SR-56 between Main Street and 2<sup>nd</sup> Street, creating a “T” intersection. SR-56 would maintain its current alignment. The intersection of US 421 and SR-56 would be signalized. Meanwhile, Harrison Street would shift west south of the Adams Alley and intersect 1<sup>st</sup> Street just west of the new US 421/1<sup>st</sup> Street intersection.

### 8) Roundabout at SR-56 and Ferry Street

This alternative turns US 421 east starting north of the Milton-Madison Bridge approach. US 421 would head east a little further north than the 1<sup>st</sup> Street alignment before turning northeast to tie

in at the existing location of the SR-56/Ferry Street intersection. Due to the irregular intersection geometry, the intersection will be redesigned to be a single lane roundabout to better and more safely accommodate all approaches to the intersection. US 421 would then follow the existing SR-56 alignment to Main Street.

#### 9) US 421 Bridge Over 2<sup>nd</sup> Street, Direct Connection to Main Street

The alignment for US 421 in this alternative is the same as in the Signalized T-Intersection with SR-56 Intersecting US 421 alternative. US 421 would be at-grade at the intersection with 1<sup>st</sup> Street. North of 1<sup>st</sup> Street, US 421 would be built up in order to bridge over 2<sup>nd</sup> Street and then would turn to connect to Main Street at the Roosevelt Street/Main Street intersection. SR-56 would turn west at the existing SR-56/2<sup>nd</sup> Street intersection and follow 2<sup>nd</sup> Street to Baltimore Street. At Baltimore Street, SR-56 would turn north and intersect US 421 at Main Street. The intersection of US 421 and SR-56 at Main Street and Baltimore Street would be stop-controlled on the northbound and southbound approaches.

### **B) Initial Screening of Alternatives:**

Through discussion with INDOT, FHWA, the City of Madison, Consulting Parties, and residents of the City of Madison, nine preliminary build alternatives and a no-build alternative were developed. An evaluation matrix was constructed to compare the alternatives based on mainline (US 421) operations, local traffic operations, environmental impacts, access, supporting economic development and cost. The extent of the analysis will attempt to encompass the impacts of the proposed alternatives on the surrounding road network, as congestion on US 421 could also impact local street operations.

The evaluation conducted for the initial screening consisted primarily of desktop environmental/historical reviews, microscopic traffic analysis, and conceptual geometric designs. From the analysis results, it became quickly apparent that the alternatives that kept any mainline traffic on the existing route could be eliminated because traffic operation results did not meet the purpose and need of enhancing mobility; thus, eliminating alternatives 2, 3, and 9. Due to the similarities in configuration between Alternative 4 and 5, the results of both alternatives were compared. Because Alternative 4 outperformed Alternative 5 in terms of mobility and safety, Alternative 5 was eliminated. Alternative 7, while providing good mobility results, was eliminated because of its lesser safety benefits, significant footprint, and overall right-of-way impact. Alternative 1, the no-build, will be carried forward as a baseline for comparison. Alternatives 4, 6, and 8 best meet the purpose and need of enhancing traffic flow and safety in the corridor and were forwarded for further analysis.

### **C) Description of Alternatives Carried Forward for Detailed Evaluation:**

Of the alternatives carried forward for further evaluation, the only one that would avoid the use of a Section 4(f) property is the No-Build.

In addition to this avoidance alternative, three alternatives that would result in the use of both Section 4(f) properties (Madison NHL District and Madison NRHP Historic District) have been considered. These consisted of:

1) Alternative 4 (“Grade-Separated”) Alternative carrying US 421 north-south over Second Street. US 421 would be at-grade at the intersection with 1<sup>st</sup> Street. North of 1<sup>st</sup> Street, US 421 would be  
Project 421 Page 8

Draft Section 4(f) Evaluation

Des. No.: 1400918

Des. No.: 1400918

Section 4(f) Analysis

I-8

built up in order to bridge over 2<sup>nd</sup> Street and then would turn to intersect SR-56 between Main Street and 2<sup>nd</sup> Street, creating a “T” intersection. SR-56 would maintain its current alignment. The intersection of US 421 and SR-56 would be signalized. A figure showing this alternative can be seen at Appendix A, A-4.

2) Alternative 6 (“At-Grade Alternative”) utilizing the same geometrics as the previous alternative, US 421 would be at-grade at the intersection with 1<sup>st</sup> Street and 2<sup>nd</sup> Street. North of 2<sup>nd</sup> Street, US 421 would cut through the hillside as it turns to connect to Main Street at the Roosevelt Street/Main Street intersection. A figure showing this alternative can be seen at Appendix A, A-5

3) Alternative 8 (“Roundabout” Alternative) would carry traffic east to Ferry Street via a new terrain roadway and an “at grade” roundabout interchange. This alternative turns US 421 east starting at the end of the Milton-Madison Bridge approach. US 421 would head east a little further north than the 1<sup>st</sup> Street alignment before turning northeast to tie in at the existing location of the SR-56/Ferry Street intersection. Due to the irregular intersection geometry, the intersection would be redesigned to be a single lane roundabout to better and more safely accommodate all approaches to the intersection. US 421 would then follow the existing SR-56 alignment to Main Street. A figure showing this alternative can be seen at Appendix A, A-6.

To further evaluate the four primary alternatives, additional criteria, consistent with the project purpose and need, were outlined to enhance the alternative selection process and reflect the broader project goals and objectives. Since the reduction of environmental impacts of trucks through the corridor was such a large driver to the project initiation, both *Environmental Considerations* and *Freight Movement* became secondary criteria, subdivided into measurable criteria. Additionally, factors reflecting a need to support economic development opportunities by managing access and enhancing pedestrian connectivity were identified through municipal amenity and pedestrian access measures. Finally, while not a direct principle highlighted in the purpose and need, the importance of delivering the project was highlighted through *Schedule Implications* and *Project Cost* filters. These non-traffic related criteria were then evaluated by project leadership consisting of INDOT Project and Program Management, City of Madison Community Leaders and the consultant Project Team to ensure they reflected the purpose and need of the project.

#### **IV. Use of Section 4(f) Properties by Remaining Alternatives:**

##### **A) Feasibility and Prudence of Avoidance Alternatives:**

**Alternative 1.** This is the “No-Build” Alternative and would have no effect on the Madison NHL District and Madison NRHP Historic District. Existing traffic conditions and roadways would remain the same. No temporary or permanent right-of-way would be acquired for this project. Neither vibration nor noise would decrease; the historic resources would continue to suffer from truck traffic. This alternative has been excluded from further consideration.

The No-Build Alternative violates the first two prudence factors evaluated. The use of the No-Build alternative does not address the purpose and need of the project and its implementation would perpetuate the unacceptable safety and operational problems along the existing corridor.

Therefore, the conclusion drawn from consideration of avoidance alternatives is that there is no feasible and prudent alternative that completely avoids the use of both Section 4(f) properties (Madison NHL District and Madison NRHP Historic District)

**B) Use of Section 4(f) Properties by Remaining Alternatives:**

The most common form of use occurs when land from a Section 4(f) resource is permanently incorporated into a transportation facility through fee-simple purchase or permanent easement. A constructive use occurs when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the property are substantially diminished. A temporary use occurs when there is a temporary occupancy of the Section 4(f) property that is adverse in terms of the statute's preservation purpose. It has been determined that the existing right of way within the project area has been properly recorded; reacquisition of the existing right of way will not be required.

Historic properties are the only Section 4(f) properties identified within the project area. Highly significant properties within the project area include the Madison NRHP Historic District and the Madison NHL District.

The impacts associated with the remaining alternatives that would result in the use of these Section 4(f) properties are discussed in the following section, and are identified in the table at the end of this section. Graphics depicting these alternatives in proximity to Section 4(f) properties are presented in Appendix A. The following paragraphs further describe the Section 4(f) impacts for each alternative.

**Madison NRHP Historic District:**

**Alternative 4.** Alternative 4 is a “Grade-Separated” Alternative. Alternative 4 carries US 421 north-south with an increased grade and bridge over Second Street. State Road (SR) 56 would curve into US 421 with a stop. Retaining walls would be present north of First Street along the roadway and also along SR-56 and US 421. A cul-de-sac or hammerhead turnaround would be needed in an alley for trash pick-up and emergency access.

By changing the grade and introducing retaining walls and a bridge, this alternative has an impact on the design of the historic street plan. The undertaking would require the acquisition of approximately 2.14 acres of temporary/permanent right-of-way from the Madison NRHP Historic District.

This alternative would result in total acquisitions of the following buildings, structures, objects, or sites that contribute to the Madison NRHP Historic District:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
901 E Second St	0.40	Not Inventoried	Contributing	0.40
112 Sering St	0.18	Not Inventoried	Contributing	0.18
Culvert	N/A	Not Inventoried	Contributing	N/A
Hotel Ruins Site	N/A	Not Inventoried	Contributing	N/A

12JE0552	N/A	Not Inventoried	Contributing	N/A
12JE 0553	N/A	Not Inventoried	Contributing	N/A
12JE0555	N/A	Not Inventoried	Contributing	N/A

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel, but not the acquisition and demolition of the any building, structure, or object:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
116 Sering St	0.12	Not Inventoried	Contributing	0.03
118 Sering St	0.25	Not Inventoried	Contributing	0.01
831 E Main St	10.23	Not Inventoried	Contributing	0.11

As part of the Section 106 process for the project, it was determined that per 36 CFR 800.5(a)(2)(i), the undertaking will cause “physical destruction of or damage to all or part of the property,” in this case the National Register of Historic Places District, and per 36 CFR 800.5(a)(2)(iii); resources within the Madison NRHP Historic District will be removed from their historic location. The alternative would not be consistent with the Secretary’s Standards for the Treatment of Historic Properties, and thus would constitute an adverse effect under 36 CFR 800.5(a)(2)(ii). The direct effect/damage to individual Contributing resources constitutes a small portion of the Madison NRHP Historic District, but the criteria set forth in 36 CFR 800.5(a)(2)(i) through (iii) apply; hence these actions will still constitute an Adverse Effect.

The introduction of the modern bridge structure within a residential area will constitute a change to the NRHP’s physical features. The introduction of the bridge will change the character of the easternmost section of the Madison NRHP Historic District, around the old brewery where the working class homes and the community of Fulton were located. Pedestrian access between the working class/Fulton neighborhood and the old plat of Madison will be maintained. However, the elevated bridge and retaining walls will create a barrier between the historic areas of Madison and Fulton that is both visual and spatial. Per 36 CFR 800.5(a)(2)(iv), there will be a change “of the character of the property’s use or of physical features within the property’s setting.”

The introduction of the bridge and the retaining walls will diminish the integrity of the eastern portion of the Madison NRHP Historic District. However, the historians believe that the immense size of the district means that it will still remain eligible as a whole. The elevated alignment would have a greater effect on the broader historic district because the bridge and alignment change would be visible from both the east and west sides of the district, especially along Second Street. Noise and vibration are projected to decrease as a result of less accelerating and decelerating, but per 36 CFR 800.5(a)(2)(v), there will be an “introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features.”

Vibration from construction constitutes another threat to the historic fabric of the nineteenth century buildings. Vibration monitoring will be a part of the stipulations of the MOA. Additionally, construction plans could be required of the contractor prior to the beginning of any work activities that require blasting or result in vibration. These construction plans could be developed with input from a consulting party advisory committee and address special provisions, the timing of specific construction activities and the identification of “no-work zones”.

**Alternative 6.** Alternative 6 is an “At-Grade” Alignment. US 421 would remain on the existing north-south Harrison Street alignment with a widened intersection and turn radii. North of the Second Street intersection US 421 would follow a new alignment on horizontal curve to the north and west tying into Main Street at Roosevelt Street. US 421 would move north-south without a stop, via a new terrain roadway beginning at the north side of Second Street and tying into Main/Sering Street. Second Street (east-west) would contain a stop. A traffic signal would be constructed at this intersection. A 15 to 20 foot grade change between Second Street and Sering/US 421 would require a retaining wall. SR-56 would become an access road.

By changing the grade, introducing retaining walls, and creating a cul de sac at SR-56, this alternative has an impact on the “concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.” The undertaking would require the acquisition of approximately 2.18 acres of temporary/permanent right-of-way.

This alignment would result in total acquisitions of the following contributing buildings, structures, objects, or sites:

Address	Parcel Size (Acres)	IHSSI No & Rating	NRHP Status	Acres of Impact
901 E Second St	0.40	Not inventoried	Contributing	0.40
106/112 Sering St	0.29	Not inventoried	Contributing	0.18
Hotel Ruins Site	N/A	Site 12JE0549	Contributing	N/A
N/A	N/A	Site 12JE0552	Contributing	N/A
N/A	N/A	Site 12JE0553	Contributing	N/A
N/A	N/A	Site 12JE0555	Contributing	N/A
Culvert	N/A	Site 12JE0561	Contributing	N/A

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
831 E Main St	10.23	Not inventoried	Contributing	0.11
904 E Second	0.41	Not inventoried	Contributing	0.012
924 E Second	0.64	077-377-32057 Contributing	Contributing	0.005
926 E Second	0.39	077-377-32058 Contributing	Contributing	0.005

As part of the Section 106 process for the project, it was determined that per 36 CFR 800.5(a)(2)(i), the undertaking will cause “physical destruction of or damage to all or part of the property,” in this case the Madison NRHP Historic District, and per 36 CFR 800.5(a)(2)(iii), resources within the Madison NRHP Historic District will be removed from their historic location. The alternative would not be consistent with the Secretary’s Standards for the Treatment of Historic Properties, and thus would constitute an adverse effect under 36 CFR 800.5(a)(2)(ii). While the direct effect/ damage to individual resources occurs on a small portion of the Madison NRHP Historic District, these property impacts represent a small number of the properties within

the Madison NRHP Historic District, The criteria set forth in 36 CFR 800.5(a)(2)(i) through (iii) apply; hence these actions will still constitute an Adverse Effect.

The introduction of the US 421 connection between Second Street and Main/Sering Street will constitute a change to the NRHP’s physical features. The introduction of the roadway connection and retaining walls will occur on the east side of the district, where the working class homes and Fulton community were located. Per 36 CFR 800.5(a)(2)(iv), there will be a change “of the character of the property’s use or of physical features within the property’s setting” since this side of the district will take on a different feeling and association than in the rest of the district.

The construction of the at-grade roadway with retaining walls will diminish the integrity of that portion of the Madison NRHP Historic District. However, the historians believe that the immense size of the district means that it will still remain eligible as a whole. The at-grade alignment would have less of an effect on the historic district than Alternative 4 because it would not be as noticeable from western parts of the district, due to obstruction from the existing built environment. Noise and vibration are projected to decrease as a result of the trucks not accelerating and decelerating but, per 36 CFR 800.5(a)(2)(v), there will be an “introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features.”

Vibration from construction constitutes another threat to the historic fabric of the nineteenth century buildings. Vibration monitoring will be a part of the stipulations of the MOA. Additionally, construction plans could be required of the contractor prior to the beginning of any work activities that require blasting or result in vibration. These construction plans could be developed with input from a consulting party advisory committee and address special provisions, the timing of specific construction activities and the identification of “no-work zones”.

**Alternative 8.** Alternative 8 is a “New Alignment” alternative and would carry traffic east to Ferry Street via a new terrain roadway and an “at grade” roundabout interchange. Retaining walls would be needed along the north side of the SR-56 but these walls would not provide a visual barrier within the district itself. This alternative routes traffic away from the Madison NRHP Historic District but in the process impacts the greatest number of individual resources.

This alternative has the least visual impact on the district but it does directly impact the most Contributing resources, and it introduces curvilinear elements into an overall layout of the street network that has been historically defined by a grid. The undertaking would require the acquisition of approximately 5.64 acres of temporary/permanent right-of-way.

This alignment would result in the total acquisitions of the following contributing buildings, structures, objects or sites:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
920 E Second St	0.45	Not inventoried	Contributing	0.43
1001 Park Ave	0.19	077-377-32062 Contributing	Contributing	0.19
1003 Park Ave	0.10	Not inventoried	Contributing	0.10
1009 Park Ave	0.19	Not inventoried	Contributing	0.19
Culvert	N/A	Not inventoried	Contributing	0.02

This alternative would have a direct effect on the following parcels that have contributing resources on them, resulting in right-of-way acquisition for part of the parcel but not for its resource:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
904 1 <sup>st</sup> St	0.15	Xx	Contributing	0.11
904 E Second St	0.09	Not inventoried	Contributing	0.006
906 E Second St	0.30	Not inventoried	Contributing	0.01
910 E Second St	0.29	Not inventoried	Contributing	0.01
924 E Second St	0.64	Xx	Contributing	0.20
926 Park Ave	0.39	Xx	Contributing	0.14
928 Park Ave	0.73	077-377-32059 Notable	Contributing	0.47
1004 Park Ave	0.50	077-377-32063 Notable	Contributing	0.001
City of Madison	Xx	Xx	Contributing	0.74

As part of the Section 106 process for this project, it was determined that per 36 CFR 800.5(a)(2)(i), the undertaking will cause “physical destruction of or damage to all or part of the property,” in this case the Madison NRHP Historic District, and per 36 CFR 800.5(a)(2)(iii), resources within the NRHP Historic District will be removed from their historic location. The alternative would not be consistent with the Secretary’s Standards for the Treatment of Historic Properties, and thus would constitute an adverse effect under 36 CFR 800.5(a)(2)(ii). This alternative has the most direct impacts to individual resources and to the total acreage of the NRHP (5.64 acres.) This is the only option that includes impacts to two Notable-rated parcels within the Madison NRHP Historic District, though the actual buildings will not be demolished. The direct effect/damage to individual resources occurs on a small portion of the Madison NRHP Historic District, and even though these property impacts represent a small portion of properties within the Madison NRHP Historic District, both 36 CFR 800.5(a)(2)(i) and (ii) apply. These actions will still constitute an Adverse Effect.

The introduction of the new roadway and roundabout within a residential area will constitute a change to the NRHP’s physical features. The introduction of the roadway and roundabout will impact the easternmost section of the Madison NRHP Historic District, the area of Fulton near the old brewery where the working class homes were located. This alternative has been designed to avoid acquisition of the old brewery buildings and to avoid the vibration impacts on the high-style brick residences within the historic district. Per 36 CFR 800.5(a)(2)(iv), there will be a change “of the character of the property’s use or of physical features within the property’s setting.”

The roadway, roundabout, and retaining walls will diminish the integrity of the eastern portion of the Madison NRHP Historic District along SR-56 and the interconnectedness of the historic plat of Madison to the town of Fulton and the working class area. The historians believe that the immense size of the district means that it will still remain eligible as a whole even though this particular section of it will have its integrity significantly diminished. Per 36 CFR 800.5(a)(2)(v), there will be an “introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features.”

Vibration from construction constitutes another threat to the historic fabric of the nineteenth century buildings. Vibration monitoring will be a part of the stipulations of the MOA. Additionally, construction plans could be required of the contractor prior to the beginning of any work activities that require blasting or result in vibration. These construction plans could be developed with input from a consulting party advisory committee and address special provisions, the timing of specific construction activities and the identification of “no-work zones”.

**Madison NHL District (2006):**

**Alternative 4.** Alternative 4 is a “Grade-Separated” Alternative. Alternative 4 carries US 421 north-south with an increased grade and bridge over Second Street. SR-56 would curve into US 421 with a signalized intersection. Retaining walls would be present north of First Street along the roadway and also along SR-56 and US 421. A cul-de-sac or hammerhead turnaround would be needed in an alley for trash pick-up and emergency access.

By changing the grade and introducing retaining walls and a bridge, this alternative has an impact on the design of the historic street plan. The undertaking would require the acquisition of approximately 2.14 acres of temporary/permanent right-of-way.

This alternative would result in total acquisitions of the following buildings, structures, objects, or sites that contribute to the Madison NHL District:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
112 Sering St.	0.29	Contributing	0.18
Culvert	N/A	Contributing	0.13
Site 12JE0552	N/A	Contributing	N/A
Site 12JE0553	N/A	Contributing	N/A
Site 12JE0555	N/A	Contributing	N/A

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel but not in an acquisition of the Contributing buildings on those parcels:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
116 Sering St.	0.12	Contributing	0.03
118 Sering St.	0.25	Contributing	0.01

As part of the Section 106 process for the project, it was determined that per 36 CFR 800.5(a)(2)(i), the undertaking will cause “physical destruction of or damage to all or part of the property,” in this case the Madison NHL District, and per 36 CFR 800.5(a)(2)(iii), two resources within the property will be removed from their historic location, a house at 112 Sering Street and a culvert that contributes to the landscape of the district. The alternative would not be consistent with the Secretary’s Standards for the Treatment of Historic Properties, and thus would constitute an adverse effect under 36 CFR 800.5(a)(2)(ii). The effect/damage to individual resources occurs on a small portion of the Madison NHL District; these four impacted properties represent less than one percent of the estimated 1,695 contributing properties within the Madison NHL District. The

criteria set forth in 36 CFR 800.5(a)(2)(i) through (iii) apply; hence these actions will still constitute an Adverse Effect.

The introduction of the modern bridge structure within a residential area will constitute the most dramatic change to the NHL's physical features. The modern bridge will change the character of the easternmost section of the Madison NHL District near the working class area of Fulton, around the old brewery. Accommodations have been made that will allow for pedestrian traffic in this area but the easternmost section of the NHL will effectively be visually separated from the rest of the NHL. Per 36 CFR 800.5(a)(2)(iv), there will be a change "of the character of the property's use or of physical features within the property's setting."

The bridge will constitute a visual barrier that will bifurcate the Madison NHL District. The introduction of the bridge and the retaining walls will diminish the integrity of that portion of the Madison NHL District. The historians believe that the immense size of the district means that the NHL will still remain eligible but "concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" between the easternmost section and the rest of the NHL will be diminished. The elevated alignment would have a greater effect on the broader historic district because the bridge and alignment change would be visible from the west side of the district, especially along Second Street. Noise and vibration are projected to decrease as a result of the trucks only accelerating and decelerating at the intersection, but per 36 CFR 800.5(a)(2)(v), there will be an "introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features."

Vibration from construction constitutes another threat to the historic fabric of the nineteenth century buildings. Vibration monitoring will be a part of the stipulations of the MOA. Additionally, construction plans could be required of the contractor prior to the beginning of any work activities that require blasting or result in vibration. These construction plans could be developed with input from a consulting party advisory committee and address special provisions, the timing of specific construction activities and the identification of "no-work zones".

**Alternative 6.** Alternative 6 is an "At-Grade" Alignment. US 421 would remain on the existing north-south Harrison Street alignment with a widened intersection and turn radii. North of the Second Street intersection US 421 would follow a new alignment on horizontal curve to the north and west tying into Main Street at Roosevelt Street. US 421 would move north-south without a stop, via a new terrain roadway beginning at the north side of Second Street and tying into Main/Sering Street. Second Street (east-west) would stop at US 421. A new traffic signal would be constructed at this intersection. A 15 to 20 foot grade change between Second and Sering/US 421 would require a retaining wall. SR-56 would become an access road.

By changing the grade and introducing retaining walls, this alternative has an impact on the "concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" of the historic street plan. The undertaking would require the acquisition of approximately 2.18 acres of temporary/permanent right-of-way.

This alignment would result in total acquisitions of the following buildings, structures, objects or sites:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NHL Status
106/112 Sering St	0.29	Not inventoried	Contributing
Hotel Ruins Site	N/A	Site 12JE0549	Contributing
N/A	N/A	Site 12JE0552	Contributing
N/A	N/A	Site 12JE0553	Contributing
N/A	N/A	Site 12JE0555	Contributing
Culvert	N/A	Site 12JE0561	Contributing

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel but not an acquisition of the Contributing buildings on the parcels:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
904 E Second St	0.09	Contributing	0.012
924 E Second St	0.64	Contributing	0.005
926 E Second St	0.39	Contributing	0.005

As part of the Section 106 process for the project, it was determined that per 36 CFR 800.5(a)(2)(i), the undertaking will cause “physical destruction of or damage to all or part of the property,” in this case the Madison NHL District, and per 36 CFR 800.5(a)(2)(iii), three resources within the district will be removed from their historic location and three will be impacted through parcel acquisition. The alternative would not be consistent with the Secretary’s Standards for the Treatment of Historic Properties, and thus would constitute an adverse effect under 36 CFR 800.5(a)(2)(ii). This alternative directly affects six individual resources, representing less than one percent of the Contributing resources within the Madison NHL District. The criteria set forth in 36 CFR 800.5(a)(2)(i) through (iii) apply; hence these actions will still constitute an Adverse Effect.

The introduction of the US 421 roadway connecting US 421 between Second Street and Main/Sering Street will constitute a change to the NHL’s physical features. The introduction of the roadway connection and retaining walls will occur on the east side of the district, where the working class homes and Fulton community were located. Per 36 CFR 800.5(a)(2)(iv), there will be a change “of the character of the property’s use or of physical features within the property’s setting.”

The construction of the at-grade roadway with retaining walls will diminish the integrity of that portion of the Madison NHL District. However, the historians believe that the immense size of the district means that it will still remain eligible as a whole. The at-grade alignment would be less of an effect on the Madison NHL District than Alternative 4 because it would not be as noticeable from western parts of the district, due to obstruction from the existing built environment. Noise and vibration are projected to decrease as a result of the trucks not accelerating and decelerating but, per 36 CFR 800.5(a)(2)(v), there will be an “introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features.”

Vibration from construction constitutes another threat to the historic fabric of the nineteenth century buildings. Vibration monitoring will be a part of the stipulations of the MOA. Additionally,

construction plans could be required of the contractor prior to the beginning of any work activities that require blasting or result in vibration. These construction plans could be developed with input from a consulting party advisory committee and address special provisions, the timing of specific construction activities and the identification of “no-work zones”.

**Alternative 8.** Alternative 8 is a “New Alignment” alternative and carries traffic east to Ferry Street via a new terrain roadway and roundabout interchange. Retaining walls would be needed along the north side of SR-56 but these walls would not provide a visual barrier within the district itself. This alternative routes the traffic away from the majority of the historic resources, but this alternative impacts the greatest number of individual resources.

By changing the grade and introducing retaining walls and a bridge, this alternative has an impact on the design of the historic street plan. The undertaking would require the acquisition of approximately 5.64 acres of temporary/permanent right-of-way.

This alternative would result in the most total acquisitions of the following buildings, structures, objects, and sites of any of the alternatives:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
920 E Second St	0.45	Contributing	0.43
1001 Park Ave	0.19	Contributing	0.19
1003 Park Ave	0.10	Contributing	0.10
1009 Park Ave	0.19	Contributing	0.19
Culvert	N/A	Contributing	.02

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel but not an acquisition of the building that contributes to the NHL:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
904 E Second St	0.09	Contributing	0.006
906 E Second St	0.30	Contributing	0.01
910 E Second St	0.29	Contributing	0.01
924 E Second St	0.64	Contributing	0.20
926 Park Ave	0.39	Contributing	0.14
928 Park Ave	0.73	Contributing	0.47
1004 Park Ave	0.50	Contributing	0.001
City of Madison	Xx	Contributing	0.74

As part of the Section 106 process for the project, it was determined that per 36 CFR 800.5(a)(2)(i), the undertaking will cause “physical destruction of or damage to all or part of the property,” in this case the Madison NHL District, and per 36 CFR 800.5(a)(2)(iii), five resources within the District will be removed from their historic location and eight will be impacted through parcel acquisition. The alternative would not be consistent with the Secretary’s Standards for the Treatment of Historic Properties, and thus would constitute an adverse effect under 36 CFR 800.5(a)(2)(ii). This alternative directly affects five individual resources, representing less than one percent of the Contributing resources within the Madison NHL District. The criteria set forth Project 421

in 36 CFR 800.5(a)(2)(i) through (iii) apply; hence these actions will still constitute an Adverse Effect.

The introduction of the US 421 roadway connecting US 421 between Second Street and Main/Sering Street will constitute a change to the NHL's physical features. The introduction of the roadway connection and retaining walls will occur on the east side of the district, where the working class homes and Fulton community were located. Per 36 CFR 800.5(a)(2)(iv), there will be a change "of the character of the property's use or of physical features within the property's setting."

The construction of the at-grade roadway with retaining walls will diminish the integrity of that portion of the Madison NHL District. However, the historians believe that the immense size of the district means that it will still remain eligible as a whole. The at-grade alignment would be less of an effect on the Madison NHL District than Alternative 4 because it would not be as noticeable from western parts of the district, due to obstruction from the existing built environment. Noise and vibration are projected to decrease as a result of the trucks not accelerating and decelerating but, per 36 CFR 800.5(a)(2)(v), there will be an "introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features."

Vibration from construction constitutes another threat to the historic fabric of the nineteenth century buildings. Vibration monitoring will be a part of the stipulations of the MOA. Additionally, construction plans could be required of the contractor prior to the beginning of any work activities that require blasting or result in vibration. These construction plans could be developed with input from a consulting party advisory committee and address special provisions, the timing of specific construction activities and the identification of "no-work zones".

#### **V. Assessment of Least Overall Harm to Section 4(f) Properties by Remaining Alternatives:**

Because the evaluation of avoidance alternatives concluded that there is no feasible and prudent avoidance alternative, an assessment of remaining alternatives to identify the alternative that causes the least overall harm to Section 4(f) property is required. To determine which of the alternatives would cause the least overall harm, the following seven factors set forth in 23 CFR 774.3(c)(l) must be balanced.

#### **A) Ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property):**

Alternative 4 would have effects upon the Madison NRHP Historic District and Madison NHL District. These effects relate to the relocation of US 421 within the Madison NRHP Historic District and Madison NHL District. Implementation of Alternative 4 would result in greater impacts upon contributing properties than Alternative 6. Given that Alternative 4 would be an elevated roadway, it is recognized that it would be visible from a greater distance than would Alternative 6 and Alternative 8. It is also noted that the presence of the elevated roadway would block the view shed of businesses and residences in the area. The presence of the elevated roadway would further separate the eastern limits of the Madison NRHP Historic District and Madison NHL District from the remainder of the districts.

Alternative 8 would also have effects upon the NRHP Historic District and Madison NHL District. These effects relate to the relocation of US 421 within the Madison NRHP Historic District and Madison NHL District. This alternative would affect more buildings, structures, objects, or sites

than Alternative 4 or 6. It would also involve a greater number of right-of-way encroachments from properties contributing to the Madison NRHP Historic District and Madison NHL District than Alternatives 4 or 6. It would also introduce a potential new barrier (new roadway and roundabout) into the Madison NRHP Historic District.

Alternative 6 would also have effects upon the Madison NRHP Historic District and Madison NHL District. These effects relate to the relocation of US 421 within the Madison NRHP Historic District and Madison NHL District. Alternative 6 would require the second least number of encroachments upon contributing properties within the Madison NRHP Historic District and Madison NHL District. Additionally, Alternative 6 results in the fewest overall conflicts with adjacent properties. Alternative 6 would involve the least overall impact to the Madison NRHP Historic District and Madison NHL District minimizing the amount of mitigation required for the project.

Alternative 8, would result in the greatest harm upon the Madison NRHP Historic District and Madison NHL District, because the alignment cuts through the most Section 4(f) properties and passes within the vicinity of a former cemetery. Alternative 4 would involve less harm upon the Madison NRHP Historic District and Madison NHL District than Alternative 8 because it has a smaller overall footprint, but the addition of a bridge creates a new vertical barrier in the Madison NRHP Historic District and Madison NHL District. Alternative 6 would have the least harm upon the Madison NRHP Historic District and Madison NHL District of the three build alternatives because it has a smaller footprint and does not introduce a divisive vertical barrier.

**B) Relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection:**

Alternatives 4, 6, and 8 would relocate US 421 within the Madison NRHP Historic District and Madison NHL District, and although these alternatives would result in the use of properties from within the districts, in comparison to the Existing US 421 Alignment alternatives, these alternatives would benefit the Districts as a whole. INDOT and the FHWA are committed to forming a Historic Preservation Advisory Committee to ensure the project is designed in a manner that respects the historic qualities, landscapes, buildings, and features in the Madison NRHP Historic District and the NHL District. Additionally, the City of Madison will employ a Historic Preservation Officer for the purpose of seeking new opportunities to apply for grants and other assistance for use in improvements for the Madison NRHP Historic District and NHL District.

The Alternative No. 4 “Grade Separated Alternative” would separate nearly two residential blocks (north of East 1<sup>st</sup> Street to East Second Street) from the remaining neighborhood and the Madison NRHP Historic District. By changing the grade and introducing retaining walls and a bridge, this alternative has an impact on the design of the historic street plan. FHWA and INDOT would salvage and the City of Madison would store limestone removed from culverts, walls, and walks with the intent of incorporating such stone within the construction of this alternative.

Alternative 6 is an “At-Grade” Alignment. US 421 would remain on the existing north-south Harrison Street alignment with a widened intersection and turn radii. North of the Second Street intersection US 421 would follow a new alignment on horizontal curve to the north and west tying into Main Street at Roosevelt Street. US 421 would move north-south without a stop, via a new terrain roadway beginning at the north side of Second Street and tying into Main/Sering Street. Second Street (east-west) would stop at US 421. A traffic signal would be installed. A 15 to 20 foot grade change between Second Street and Sering/US 421 would require a retaining wall.

Project 421

Draft Section 4(f) Evaluation

Des. No.: 1400918

Des. No.: 1400918

Section 4(f) Analysis

Page 20

I-20

SR-56 would become an access road. FHWA and INDOT would salvage and the City of Madison would store limestone removed from culverts, walls, and walks with the intent of incorporating such stone within the construction of this alternative.

Alternative 8 is a “New Alignment” alternative and carries traffic east to Ferry Street via a new terrain roadway and roundabout interchange. Retaining walls would be needed along the north side of SR-56 but these walls would not provide a visual barrier within the districts. This alternative routes the traffic away from the majority of the historic resources. This alternative impacts the greatest number of individual resources. FHWA and INDOT would salvage and the City of Madison would store limestone removed from culverts, walls, and walks with the intent of incorporating such stone within the construction of this alternative.

As a result, Alternative 6 the “At-Grade” Alignment ranks most favorably, relative to the other alternatives, and has the least harm remaining after accounting for mitigation.

**C) Relative significance of each Section 4(f) property:**

Section 4(f) properties identified within the project area are limited to historic properties. Highly significant properties in the project area include the Madison NRHP Historic District and the Madison NHL District.

The Madison NRHP Historic District is recognized by the federal government as worthy of preservation for its local, state, and national significance. The NRHP is a program of the National Park Service, it is administered at the state level by each respective state. In Indiana, the Indiana Department of Natural Resources administers the National Register of Historic Places Program.

The Madison NHL District is a nationally significant historic district designated by the Secretary of the Interior because it possess exceptional value or quality in illustrating or interpreting the heritage of the United States.

The following tables summarize impacts by remaining alternatives to resources contributing to both the Madison NRHP Historic District and the Madison NHL District:

**Madison NRHP Historic District:**

**Alternative 4.** Alternative 4 is a “Grade-Separated” Alternative. This alternative would result in total acquisitions of the following buildings, structures, objects, or sites that contribute to the Madison NRHP Historic District:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
901 E Second St	0.40	Not Inventoried	Contributing	0.40
112 Sering St	0.18	Not Inventoried	Contributing	0.18
Culvert	N/A	Not Inventoried	Contributing	N/A
Hotel Ruins Site	N/A	Not Inventoried	Contributing	N/A
12JE0552	N/A	Not Inventoried	Contributing	N/A
12JE 0553	N/A	Not Inventoried	Contributing	N/A
12JE0555	N/A	Not Inventoried	Contributing	N/A

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel, but not the acquisition and demolition of the any building, structure, or object:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
116 Sering St	0.12	Not Inventoried	Contributing	0.03
118 Sering St	0.25	Not Inventoried	Contributing	0.01
831 E Main St	10.23	Not Inventoried	Contributing	0.11

**Alternative 6.** Alternative 6 is an “At-Grade” Alignment. This alignment would result in total acquisitions of the following contributing buildings, structures, objects, or sites:

Address	Parcel Size (Acres)	IHSSI No & Rating	NRHP Status	Acres of Impact
901 E Second St	0.40	Not inventoried	Contributing	0.40
106/112 Sering St	0.29	Not inventoried	Contributing	0.18
Hotel Ruins Site	N/A	Site 12JE0549	Contributing	N/A
N/A	N/A	Site 12JE0552	Contributing	N/A
N/A	N/A	Site 12JE0553	Contributing	N/A
N/A	N/A	Site 12JE0555	Contributing	N/A
Culvert	N/A	Site 12JE0561	Contributing	N/A

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
831 E Main St	10.23	Not inventoried	Contributing	0.11
904 E Second	0.41	Not inventoried	Contributing	0.012
924 E Second	0.64	077-377-32057 Contributing	Contributing	0.005
926 E Second	0.39	077-377-32058 Contributing	Contributing	0.005

**Alternative 8.** Alternative 8 is a “New Alignment” alternative. This alignment would result in the total acquisitions of the following contributing buildings, structures, objects or sites:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
920 E Second St	0.45	Not inventoried	Contributing	0.43
1001 Park Ave	0.19	077-377-32062 Contributing	Contributing	0.19
1003 Park Ave	0.10	Not inventoried	Contributing	0.10
1009 Park Ave	0.19	Not inventoried	Contributing	0.19

Culvert	N/A	Not inventoried	Contributing	0.02
---------	-----	-----------------	--------------	------

This alternative would have a direct effect on the following parcels that have contributing resources on them, resulting in right-of-way acquisition for part of the parcel but not for its resource:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NRHP Status	Acres of Impact
904 1 <sup>st</sup> St	0.15	Xx	Contributing	0.11
904 E Second St	0.09	Not inventoried	Contributing	0.006
906 E Second St	0.30	Not inventoried	Contributing	0.01
910 E Second St	0.29	Not inventoried	Contributing	0.01
924 E Second St	0.64	Xx	Contributing	0.20
926 Park Ave	0.39	Xx	Contributing	0.14
928 Park Ave	0.73	077-377-32059 Notable	Contributing	0.47
1004 Park Ave	0.50	077-377-32063 Notable	Contributing	0.001
City of Madison	Xx	Xx	Contributing	0.74

**Madison NHL District:**

**Alternative 4.** Alternative 4 is a “Grade-Separated” Alternative. This alternative would result in total acquisitions of the following buildings, structures, objects, or sites that contribute to the Madison NHL District:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
112 Sering St.	0.29	Contributing	0.18
Culvert	N/A	Contributing	0.13
Site 12JE0552	N/A	Contributing	N/A
Site 12JE0553	N/A	Contributing	N/A
Site 12JE0555	N/A	Contributing	N/A

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel but not in an acquisition of the Contributing buildings on those parcels:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
116 Sering St.	0.12	Contributing	0.03
118 Sering St.	0.25	Contributing	0.01

**Alternative 6.** Alternative 6 is an “At-Grade” Alignment. This alignment would result in total acquisitions of the following buildings, structures, objects or sites:

Address	Parcel Size (Acres)	IHSSI No. & Rating	NHL Status
106/112 Sering St	0.29	Not inventoried	Contributing
Hotel Ruins Site	N/A	Site 12JE0549	Contributing
N/A	N/A	Site 12JE0552	Contributing
N/A	N/A	Site 12JE0553	Contributing
N/A	N/A	Site 12JE0555	Contributing
Culvert	N/A	Site 12JE0561	Contributing

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel but not an acquisition of the Contributing buildings on the parcels:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
904 E Second St	0.09	Contributing	0.012
924 E Second St	0.64	Contributing	0.005
926 E Second St	0.39	Contributing	0.005

**Alternative 8.** Alternative 8 is a “New Alignment” alternative. This alternative would result in the most total acquisitions of the following buildings, structures, objects, and sites of any of the alternatives:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
920 E Second St	0.45	Contributing	0.43
1001 Park Ave	0.19	Contributing	0.19
1003 Park Ave	0.10	Contributing	0.10
1009 Park Ave	0.19	Contributing	0.19
Culvert	N/A	Contributing	.02

This alternative would have a direct effect on the following parcels, resulting in right-of-way acquisition for part of the parcel but not an acquisition of the building that contributes to the NHL:

Address	Parcel Size (Acres)	NHL Status	Acres of Impact
904 E Second St	0.09	Contributing	0.006
906 E Second St	0.30	Contributing	0.01
910 E Second St	0.29	Contributing	0.01
924 E Second St	0.64	Contributing	0.20
926 Park Ave	0.39	Contributing	0.14
928 Park Ave	0.73	Contributing	0.47
1004 Park Ave	0.50	Contributing	0.001
City of Madison	Xx	Contributing	0.74

#### **D) Views of the officials with jurisdiction over each Section 4(f) property:**

Historic properties are the only Section 4(f) properties identified within the project area. The Indiana State Historic Preservation Officer (SHPO), National Park Service (NPS) and Advisory Council on Historic Preservation (ACHP) are the officials with jurisdiction over these properties. Section 106 consultation performed to date indicates that all of these alternatives will result in an adverse effect upon the Madison NRHP Historic District and NHL District. However, the severity of the adverse effects upon the district as well as other properties determined individually eligible for Madison NRHP Historic District and Madison NHL District listing varies by alternative.

A consulting parties meeting was held on August 11, 2016, in the City Center. An invitation to the consulting party meeting was sent to all who had previously accepted consulting party status as well as property owners of contributing resources in the APE. The purpose of the day-long consulting party meeting was to discuss the project alternatives, Section 4(f) resources, the status of the effects study and archaeological investigations, and mitigation ideas. The meeting also included a walking tour showing project activities under the alternatives carried forward.

On August 19, 2016, SHPO provided comments on the meeting and memorandum of the “Effects of the US 421 New Road Project” (letter dated June 28, 2016). SHPO agreed that Alternatives 4 and 6 would cause adverse effects but that Alternative 6 “is less likely to have as severe an overall impact on the Madison [NHL] District or Madison [NRHP] District.”

SHPO stated that the effects memorandum speaks generally to increases or decreases in noise but at the consulting party meeting on August 11, the numbers of properties “that are or would be at or above the 67 dB that level that FHWA recognizes as mitigatable... were stated orally. It would be helpful for the consulting parties to have the [noise] figures in writing.”

SHPO also stated that if construction would discourage access east of the Second Street and Harrison/US 421 intersection, then that would be an adverse effect. In addition, eliminating access to on-street parking under Alternative 6 could also cause an adverse effect under Alternative 6, based on the testimony of a local resident. SHPO elaborated, “[a] change in the use or configuration of Second Street that results in a lack or shortage of parking for residents of that block likely would diminish the utility of contributing houses on that street and discourage their continued use.” SHPO acknowledged that the archaeology report would be forthcoming. SHPO recommended that the feasibility of moving the main story of the house at 112 Sering Street be examined by an architect or engineer if that house would be acquired. Finally, regarding mitigation, SHPO recommended that this project’s mitigation budget “provide generously for appropriate mitigation” as the project “would result in a rather large gash through the historic districts.” SHPO continued, “[t]he engineering and construction costs, in any case, will be many times greater than any amount that will be provided for mitigation for this project in Madison, one of Indiana’s most historically and architecturally significant communities.”

In response to an email sent to all consulting parties on September 2, 2016 requesting formal written comments on effects, NPS provided formal comments on the August 11, 2016 consulting parties meeting in an email dated September 8, 2016. NPS stated: “the proposed overpass bridge in Alternative 4 is totally unacceptable. While Alternative 6 is still an adverse effect on the NHL, it is more acceptable than other options. We do insist on stoplights at the intersection for the safety of the local residents and to maintain the walkability of the NHL Historic District. I agree with local residents that a [tasteful] welcome to Madison and the NHL needs to be incorporated into the retaining wall along the Hillside below the hotel. We would like to see the wall terraced in several

increments to soften the harsh visual of a tall wall. Materials used to construct the retaining wall need to be sympathetic to historical stone materials used throughout the historic district.”

On September 15, 2016, in response to an email from INDOT, NPS provided guidance for the appropriate level of documentation under the Historic American Building Survey, Historic American Engineering Record, and Historic American Landscapes Survey.

A finding of “Adverse Effect” was issued by FHWA on February 14, 2017. A letter informing consulting parties of the finding was sent on February 14, 2017.

A conference call to discuss the mitigation stipulations was held on March 9, 2017 with consulting parties. The meeting discussed the adverse effect in general and the stipulations proposed to mitigate the adverse effect.

### **E) Degree to which each alternative meets the project purpose and need:**

All of the remaining alternatives (4, 6, and 8) under consideration would meet the Purpose and Need. The purpose of the proposed project is summarized in the following four bullets followed by a summary of how each of the remaining alternative meets the selected purpose and need:

- 1) Enhance mobility and safety in the corridor, distinguishing between local and through traffic.

Alternatives 4, 6, and 8 all meet the purpose and need of enhancing traffic flow and safety in the corridor. Alternative 6 provides the highest level of traffic operations and safety for the US 421 corridor. Alternative 8 provides a higher level of traffic operation and safety than Alternative 4.

- 2) Reduce the environmental impact of trucks through the corridor.

The three build alternatives all generate less noise pollution, due to the elimination of 90-degree alignment changes. Alternative 4 provides free flow US 421 traffic, but requires a significant grade to bridge over 2<sup>nd</sup> Street. Alternative 8 provides a reduction in noise pollution with gentle grades, but vehicles, particularly trucks, must slow to navigate the roundabout before accelerating again. Alternative 6 provides a greater reduction in noise pollution because the grade up to Main Street is less than Alternative 4 and US 421 traffic is not required to yield as in Alternative 8.

Alternative 4 reduces emissions by providing a direct connection to Main Street, but a significant grade is required to bridge over 2<sup>nd</sup> Street, lessening those improvements when compared to the other build alternatives. Alternative 8 utilizes more gradual vertical grades than the other build alternatives, resulting in greater reductions to emissions, but vehicles must travel further to reach Main Street, which lessens the benefits associated with the reduced grades. Alternative 6 provides the greatest reduction in emissions by prioritizing the mainline US 421 traffic with a direct connection to Main Street and reducing the vertical grade.

- 3) Support opportunities for economic development in the community by managing access and enhancing pedestrian accessibility.

Five criteria were developed to measure the potential opportunities created by each alternative. Those criteria were: visitor parking, aesthetics, green-space areas, opportunity for a visitor’s center, and pedestrian access. Each element is examined in relation to the four alternatives below.

## A) Visitor Parking

Madison is an entry into the state of Indiana, and the project area is located adjacent to local trail facilities and the Milton-Madison Bridge. A desire has been expressed to provide a parking location for those visiting Madison and/or for those wanting to park and take advantage of the nearby pedestrian network. It should be noted that visitor parking is not included in the scope of work. This criteria only determines if the opportunity exists, once the alternative is built.

Alternative 4 has a possibility of providing approximately 20 parking spaces on the parcels acquired east of existing Harrison Street between 1<sup>st</sup> and 2<sup>nd</sup> Streets. Alternative 8 has the possibility of providing approximately 30 parking spaces on the east side of US 421 south of 1<sup>st</sup> Street. On the east side of US 421, Alternative 6 could potentially provide approximately 40 parking spaces.

## B) Aesthetics

Alternative 4 has excess property acquisition east of US 421 that would be available for aesthetic treatments, but the roadway will be elevated above that area, so making them a prominent facility would be challenging. There would be a small opportunity to add some sort of aesthetic treatment to the bridge and/or the retaining wall in the bluff below the Hillside Inn with Alternative 4. However, the height and scale of the bridge retaining walls would require extensive enhancement to make it more appealing within the districts.

Similar to Alternative 4, Alternative 6 has excess property acquisition on the east side of US 421. This land would be visible to US 421 traffic, offering a great opportunity for aesthetic treatment. The bluff and retaining wall below the Hillside Inn also offers a canvas for enhancement opportunities. Alternative 8 has a large retaining wall that, similar to Alternative 4, would be challenging to make aesthetically pleasing. The central island of the roundabout presents a highly visible location for a gateway feature. The space between the US 421 NB approach and the Ferry St. approach to the roundabout and the northeast corner of the US 421 / Harrison St. intersection offer additional locations for enhancements.

## C) Green-Space Areas

Green-space areas have been identified during community engagement as a mechanism to beautify the entrance into Madison from Kentucky. Alternative 4 would have green space potential along the east side of US 421, but it would not be very visible due to the bridge. Alternative 6 would have slightly more green space potential than Alternative 4, however, it would be visible to vehicle traffic. The greatest potential for green-space areas lies with Alternative 8 due to the large right of way footprint required.

## D) Visitor's Center

With the Milton-Madison Bridge being one of the few southern entry points into Indiana, the opportunity for a visitor's center has been considered as a mechanism to welcome visitors to Madison and the state of Indiana. Alternatives 4, 6 and 8 could potentially accommodate a visitor's center along the east side of existing Harrison Street.

## E) Pedestrian Access

All of the remaining build alternatives provide opportunities for pedestrian connectivity and mobility throughout the project limits. Because of constantly moving traffic operations and novelty of configuration in Madison, Alternative 8 is the least preferable alternative with respect to pedestrians. Additionally, due to the size of the primary intersection footprint, Alternative 6 is slightly less desirable than Alternative 4, but more preferable than Alternative 8. The installation of a traffic signal will improve pedestrian performance with Alternative 6. Finally, the bridge over 2<sup>nd</sup> Street provides a separation among vehicular traffic and pedestrians to provide the safest crossing. However, the bridge may create a perceived divide in the corridor for pedestrian traffic. Existing pedestrian access along and around the US 421 corridor often does not meet current ADA standards. Intersections do not have curb ramps and sidewalk cross slopes exceed maximums in certain locations. In all of the build alternatives, the pedestrian network would receive needed upgrades to current ADA standards, as well as the possibility for a connection to the Milton-Madison Bridge. The connection to the bridge would route bicyclists from the shared-use trail to the wide shoulder and pedestrians from the trail to the pedestrian path on the west side of the bridge. The network will accommodate both pedestrians and bicyclists within the project area, with a future connection to a larger Madison bicycle network also in the build alternatives.

- 4) Reduce the number of contributing historic properties impacted by US 421 vehicular traffic.

The project area is located in a dense urban setting with mostly historic-era residential, commercial, religious, recreational, municipal, industrial, and educational buildings and facilities. The project area includes two overlapping historic districts: the Madison NRHP Historic District and the Madison NHL District. The new alignment required for Alternative 8 results in the greatest number of impacts to contributing and non-contributing structures and parcels. Alternatives 4 and 6 impact the same number of structures and parcels, but Alternative 6 impacts two more contributing structures and/or parcels than Alternative 4.

## **F) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f):**

The issues described below were the primary issues of concern identified during public involvement activities and the development of the project conducted to date.

### Neighborhood Cohesion

Neighborhood cohesion would be most negatively affected by the Alternative No. 4. The Community Advisory Committee (CAC), the City of Madison, and the general public have expressed concern that the addition of a grade separated crossing of Second Street would effectively represent a barrier to pedestrians.

### Residential and Business Property Impacts

The table below compares the commercial and residential encroachments and relocations associated with each alternative:

Alternative	Residential Encroachment	Commercial Encroachment	Residential Relocation	Commercial Relocation
<b>Alternative #4</b>	6	9	1	4
<b>Alternative #6</b>	3	8	1	3
<b>Alternative #8</b>	11	11	5	4

Alternatives 4, 6 and 8 removes US 421 traffic from the historic residential neighborhood on Baltimore and 2<sup>nd</sup> Streets, eliminates truck over-tracking into opposing travel lanes, reduces emissions from less starting and stopping of vehicles and reduces noise from less starting and stopping of vehicles. Alternative 6 results in the greatest reduction in US 421 corridor travel times. Alternatives 6 and 8 maintains connectivity to the local street network and provides less visual impact to the Madison NRHP Historic District and Madison NHL District than Alternative 4. Alternatives 4, 6 and 8 maintains access to properties along Harrison Street. Alternative 6 results in less residential and commercial right-of-way encroachments when compared to Alternatives 4 and 8.

Substantial differences in costs among the alternatives

Project costs, not including relocation costs, associated with the remaining alternatives under consideration are estimated to be as follows:

- 1) Alternative 4 Grade Separation– \$6.53 million;
- 2) Alternative 6 “at grade” - \$5.27 million; and
- 3) Alternative 8 – Roundabout - \$6.87 million.

In comparing these costs, it can be seen that the addition of a grade separated crossing over Second Street in Alternative 4 results in increased overall costs when compared to alternative 6. Alternative 8 has the largest footprint of the alternatives which translates into the highest overall project costs.

**G) Summary of Assessment of Least Overall Harm to Section 4(f) Properties by Remaining Alternatives:**

The seven factors set forth in 23 CFR 774.3(c)(l) were compared for the remaining alternatives under consideration (refer to table below). Alternative 6 ranks most favorably, relative to the other alternatives, with regard to Section 4(f) property impacts, the ability to mitigate adverse effects, the relative severity of remaining harm after mitigation, views of the officials with jurisdiction, relative satisfaction of the stated project Purpose and Need, neighborhood cohesion impacts, relocations, right-of-way impacts, and CAC / public input. The following table shows the impacts associate with Alternatives 4, 6, and 8:

<b>Summary of Alternatives Evaluation and Impacts upon Section 4(f) Properties</b>			
<b>Project Impacts / Effects</b>	<b>Project Alternatives</b>		
	<b>Alternative 4 "Grade-Separation" Option</b>	<b>Alternative 6 is an "At-Grade" Option</b>	<b>Alternative 8 is a "New Alignment" Option</b>
<b>Properties Within the Madison NRHP Historic District - Relocations and/or Encroachments</b>			
Contributing Residential Properties	1	1	4
Contributing Business Properties	6	6	4
Non-Contributing Residential Properties	1	0	2
Non-Contributing Business Properties	6	1	4
<b>Properties Within the Madison NHL District – Relocations and/or Encroachments</b>			
Contributing Residential Properties	3	4	8
Contributing Business Properties	0	0	0
Non-Contributing Residential Properties			
Non-Contributing Business Properties	5	5	3
<b>Factors for Consideration (774.3(c)(1)(i-vii))</b>			
Ability to mitigate adverse effects	High	Medium	High
Relative severity of remaining harm after mitigation	Medium	Low	High
Relative significance of each Section 4(f) property	High	High	High
Views of officials with jurisdiction (SHPO) – Adverse Effect for all alternatives, relative severity	High	Medium	High
Relative satisfaction of Purpose and Need	+	+	+
Magnitude of any adverse effects to non-4(f) resources			
Reduced Emissions	Yes	Yes	Yes
Noise Impacts	Yes	Yes	Yes
Business Relocations	7	7	8
CAC / Public input	+	++	=
Public Informational Meeting input	+	++	=
Additional residential building relocations	5	4	10
Natural Resources (streams, wetlands, forest)	1	1	2
Project Cost (millions)**	6.53	5.27	6.87

\*\* Project cost estimates include construction, right of way (not including relocation), and engineering costs. Key: ++ Very Positive Effect; + Positive Effect; = Status Quo; - Negative Effect; - - Very Neg

Based upon comparison of Section 4(f) impacts and other factors associated with the alternatives that would satisfy the project Purpose and Need, Alternative 6 results in the least overall harm to Section 4(f) property in light of the statute's preservation purpose. Therefore, this alternative is recommended to be the Preferred Alternative.

## **H) Measures to Minimize Harm:**

Measures to minimize harm to the identified Section 4(f) properties, such as landscaping or other street amenities, creation of an Advisory Team, avoidance or treatment of the red house on 116 Sering Street, improved pedestrian access of affected areas within the Madison NRHP Historic District and Madison NHL District, among other context sensitive mitigation measures, were identified. Mitigation measures have been incorporated into a MOA wer through Section 106 consultation. The final draft of the MOA which incorporated substantive consulting party comments was provided to consulting parties on August 4, 2017. A copy of the MOA is located in appendix C. The MOA is expected to be executed by the signatory agencies in the near future.

Therefore, the Preferred Alternative will incorporate all possible planning to minimize harm to Section 4(f) property, and will cause the least overall harm to Section 4(f) property after consideration of mitigation measures.

## **VI. Coordination:**

The following individuals or organizations participated as consulting parties for this project: The following parties responded affirmatively to the invitation to join consultation of October 9, 2015: Camille Fife; Historic Madison, Inc.; Grand Traverse Band of Ottawa Chippewa Indians; Vickie Young; Patrick Cunningham; Peoria Tribe of Indians of Oklahoma; Jefferson County Historical Society; City of Madison Office of Preservation; Cornerstone Society; Indiana Landmarks—Southern Regional Office; Bob Canida; Main Street Program; Tracey Keller; NPS; Chippewa Cree Cultural Resources Preservation Department; Peter Woodburn & Wayne Kyle (Woodburn & Kyle Consultants); Steven Thomas (Thomas Family Winery); United Keetoowah Band of Cherokee Indians of Oklahoma; Miami Tribe of Oklahoma; National Trust for Historic Preservation; ACHP; Jan Vetrhus (October 16, 2015); Margaret (Peggy) Vlerebome; Aron and Roxi Burns; Kathie Petkovic; Teri Lu Adler; Harriet (Happy) Smith. Jefferson County Preservation Council declined to participate. SHPO is a designated consulting party. The additional following residents requested consulting party status or attended a consulting party meeting held on August 11, 2016: Bernard Kelly; Darren and Morgan Alexander; Reverand Robert Leach; Rick Grote; Fred and Judy Koehler; Margaret Balough Hillery; Christian and Cynthia Mejean; Robert and Nancy Cheatham; Kathy Griffin; and John Kinman.

On October 16, 2015, resident Jan Vetrhus contacted W&A via email. Vetrhus had received an invitation to join consultation on behalf of the Cornerstone Society. Since Vetrhus had stepped down as the president of the Cornerstone Society, she requested individual consulting party status as a resident who lives “in the affected area.”

On October 16, 2015, resident Margaret (Peggy) Vlerebome asked to be added to the list of consulting parties.

On October 21, 2015, the United Keetoowah Band of Cherokee Indians in Oklahoma (UKB) acknowledged receipt of invitation to join consultation and stated they had no comments or objections “at this time ... However, if any human remains are inadvertently discovered, please cease all work and contact us immediately.” The letter also stated, “UKB reserves the right to re-enter consultation at any time on this project.”

On October 27, 2015, residents Aron and Roxi Burns contacted FHWA and requested consulting party status.

The ACHP responded to the invitation to join consultation via a letter dated November 4, 2015. ACHP declined the invitation to join consultation “at this time,” but noted “if FHWA determines through consultation with the consulting parties that the undertaking will adversely affect historic properties or that the development of a programmatic agreement is necessary, the FHWA must notify the ACHP in accordance with Section 106 of our regulations . . . In addition, FHWA should provide us with the documentation outlined in 36 CFR 800.11(e).”

SHPO responded to the invitation to join consultation on November 4, 2015. SHPO suggested that the mayor of the City of Madison and the Jefferson County Board of Commissioners be invited to joined Section 106 consultation. Both parties were invited to join consultation via letters dated November 4, 2015 and February 2, 2016.

On November 9, 2015, NPS sent an email to W&A instructing them to invite the “National Trust and the National Council on Historic Preservation” to join consultation. W&A replied to the NPS the same day, informing that the National Trust and ACHP had previously been sent invitations to join consultation. The National Trust had not responded to the letter, and the ACHP had declined to participate “at this time.”

On November 10, 2015, NPS asked if FHWA’s preservation officer had responded to the invitation to join consultation and also sent an email to ACHP asking if they would reconsider their response to the invitation to the join consultation.

On November 10, 2015, Kathie Petkovic, owner of the Riverboat Inn and Suites, contacted INDOT and requested consulting party status. W&A provided consulting party information in a letter dated November 13, 2015.

The ACHP in an email responded to the NPS inquiry on November 12, 2015, and noted they had not declined the invitation for the project, and that “[w]e expect to be notified when there is more information developed for the alternatives carried forward that would indicate a basis for our involvement, such as potential for impacts to the Madison NHL District or adverse effects to any other historic properties.”

On November 12, 2015, NPS contacted INDOT and stated it would be appropriate to “explain the project more clearly and re-invite the ACHP to participate” before the discussion of alternatives was brought forth later in the process.

On November 17, 2015, W&A exchanged emails with Link Ludington, the representative of the Cornerstone Society regarding consulting party status, the meeting scheduled for December 3, 2015, and contact information for the Society.

Also on November 17, 2015, Michele Curran, Ph.D., the representative for NPS stated she would not attend the first consulting party meeting but “would be available to participate via the phone.” Curran added, “I will attend later meetings when the alternatives are presented.”

On November 19, 2015, a representative for the Chippewa-Cree Tribe contacted FWHA and stated they would be unable to attend the first consulting party meeting but requested to receive meeting minutes or notes “so that we can stay in the loop on this project.”

Also on November 19, 2015, John Stacier, the representative for Historic Madison, requested W&A resend the notification of the December 3, 2015, meeting as he had not received it.

On November 23, 2015, resident Teri Lu Adler asked to be registered as a consulting party. Adler stated she planned to attend the December 3, 2015, meeting. W&A provided Adler with the invitation to join consultation on November 23, 2015.

Consulting party Vickie Young contacted W&A on November 24, 2015. Young stated she would be unable to attend the first consulting party meeting, but “I do look forward to a follow-up email and being able to attend a meeting with others in person soon.”

On December 2, 2015, Elizabeth Merritt, a representative from the National Trust responded to the invitation to join consultation. Merritt stated, “In light of the potential adverse effects of this project on the National Historic Landmark District in Madison, and our involvement in the Milton-Madison Bridge project, the National Trust would like to participate as a consulting party under Section 106 for the US 421 Approach project.” W&A provided meeting information on the same day.

A consulting parties meeting was held December 3, 2015, at the Clifty Falls Inn in Clifty Falls State Park, Madison, Indiana. The meeting discussed the project in general, noting that it was early in the process. The prior study for the Milton-Madison Bridge Project initially included this approach but it was later eliminated from the project. It was noted that the prior study is a few years old and this study is starting with a blank slate. W&A discussed that historic and archaeological studies would occur but noted no reports had yet been produced. It was also explained that the W&A archaeologist had completed a records search of those resources within a one-mile radius and that pending the selection of the preferred alternative, an archaeological field reconnaissance may be necessary.

Consulting parties discussed the importance of US 421 as “gateway” into Madison and the current adverse conditions due to truck traffic. The group also discussed and commented on the importance of the area as a cohesive neighborhood or district. Regarding impacts to historic resources, consulting parties said that the NHL could not be impacted. Kelsey Noack Myers, Chippewa-Cree Indians of the Rocky Boy’s Reservation, noted there are tribes with a demonstrated interest in this area prior to the Indian Removal Act. The Ohio River is one example of a resource important to the Chippewa-Cree and others. She asked for more content during consulting party meetings about archaeological resources within the project area. The group also discussed whether the APE should expand or contract based on the alternative. The meeting concluded with a request for consulting parties to identify resources that they felt are so important to the community that they should not be impacted. Camille Fife said that the entire NHL is important as a whole.

In summing up the meeting, W&A noted that those at the meeting had expressed concerns over the present US 421 and the impact that it has on individual resources. Impacts include: drainage, noise, vibrations, and a situation that inhibits walkability and the cohesiveness of neighborhoods. The consulting parties expressed a desire for a project that is pedestrian friendly and honors the NHL and the working-class character of the east side of Madison. The entrance is important to the community.

During the meeting, NPS sent an email to the project team and consulting parties discussing Section 110 of the National Historic Preservation Act.

A public information meeting was held later the same day, also at Clifty Falls Inn. At that meeting, attendees shared information with W&A about cultural resources within the APE and Madison, including the presence of an underground culvert beneath Harrison Street and the reported location of a burial ground (possibly Native American) at Ferry Street near Park School. Attendees also shared information on specific resources in the APE and offered suggestions or sources for further research. Harriet (Happy) Smith joined consultation at that meeting.

On December 4, 2015, Happy Smith sent W&A an email providing additional information on the APE.

On December 15, 2015, Jan Vetrhus shared research on the Fulton area history via email.

W&A met with staff of the Survey and Registration team of Indiana Department of Natural Resources-Division of Historic Preservation and Archaeology (IDNR-DHPA) on January 12, 2016, regarding the Madison NRHP Historic District and its partial overlap with the Madison NHL District within the APE. Participants discussed extending the period of significance for the Madison NRHP Historic District, appropriate themes for the extended period of significance to 1970 for the NRHP, and the consideration of contributing and Non-Contributing properties to the NRHP.

A second consulting party meeting was held February 16, 2016, at the Ivy Tech campus in Madison, Indiana. Michele Curran, NPS, stated that the Indiana Historic Sites and Structures Inventory (IHSSI) numbers used in the report should be removed from the discussion of the NHL, since the designations of “Notable” and “Outstanding” do not apply to the NHL. She stated all captions should be removed from the photographs of the NHL. She also stated that Section 110 was not mentioned in the HPR.

On February 15, 2016, Link Ludington of the Cornerstone Society provided comments and materials in response to the HPR.

On February 16, 2016, consulting party Greg Sekula (Indiana Landmarks) sent CMT a photograph of a bridge to consider if the bridge option of the investigated alternatives were to move forward.

On February 17, 2016, Elizabeth S. Merritt, of the National Trust for Historic Preservation, referenced electronic communication received as part of the consultation process and asked if “any of the other consulting parties have been dropped from the communication chain, or is it just the National Trust?” Merritt added, “We would appreciate an explanation, and we ask that remedial measures be taken.” (Note: W&A responded on February 17, 2016 that a package was mailed to all consulting parties on January 27, 2016, via US Postal Service; the package contained the invitation to the meeting, the call-in number for those who could not attend, and a CD copy of the Historic Property Report. The Trust’s package was not returned to the W&A office, W&A offered to schedule a call to answer any questions.)

Also on February 17, 2016, Teri Lu Adler forwarded CMT an email and photograph of a stone arch bridge sent by Jan Vetrhus that showed “appropriate materials” for design of the undertaking.

Michele Curran, National Park Service, provided seven comments on the second consulting party meeting in an email on February 18, 2016. Comments addressed the project name and reference, visual aids, the HPR, and the consultation process. Curran stated, “Correspondence regarding the *US 421 New Road Project in the City of Madison, Jefferson County, Indiana, INDOT DES. No.: 1400918, DHPA No.:18317* should include that official project identification and title. While it

is interesting that the project is being presented as 'Project 421 Gateway to Madison' it is not appropriate to use that name in regard to official NHPA or NEPA consultation. The coined title for the project is being more prominently presented than its legal title, and I think it is misleading. It would be more appropriate for the contractor to use its business name as a header on material developed by them than it is to use a slogan-type heading."

Regarding the hand-outs presented at the consulting party meeting, Curran stated "The map-handouts presented at the Section 106 meeting need to be larger. The legend needs to be larger and more clearly and accurately labeled. I recommend a bold, black **X** be used to identify properties that will be demolished and a bold, black **I** be used to identify properties that will be affected." In the same letter, Curran commented further on visual representations of the undertaking: "It is important that an artist rendering of the visual appearance of the overpass be developed so that people can see exactly what the overpass would look like in the neighborhood. Dimensions of the overpass should be included in the rendering...height above the street, width across the street, length of the incline and decline....how many feet. The representations presented at the meeting provided information regarding the appearance of the overpass, but not the surrounding neighborhood. I think it is important that a ground level photograph of the neighborhood in the vicinity of the proposed overpass be used and then the rendering of the overpass be inserted onto that photograph. This method would provide a much more accurate visual aid to the consultants and to the public."

Regarding Section 110, Curran stated, "I would like to remind you that **§ Section 110** of the **National Historic Preservation Act** [16 U.S.C. 470h-2(f) — *Federal undertakings affecting National Historic Landmarks*] requires that '(f) Prior to the approval of any Federal undertaking which may directly and adversely affect any National Historic Landmark, the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark, and shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.'"

Curran stated, "As presented, all nine alternatives will have an adverse effect on the NHL with the overpass options providing a more significant adverse effect" and also commented on the consultation process: "It is of concern that the National Trust was not contacted via email about the meeting on February 16? Was the Advisory Council on Historic Preservation (ACHP) FHWA liaison Mary Ann Naber contacted via email? I found it unusual that they were not present at the meeting. Please revise your contact list to ensure that all the consults are notified of meetings. "

Curran further provided comments on the HPR: "The Historic Property Report was well done. I would ask that the IHSSI acronym be explained and that the information from the State of Indiana database be addressed in a section of its own. The state survey is important and should be discussed and explained in its own right. Language used in the IHSSI should not be used in the section on the National Historic Landmark. Please remove paragraph 3 from page 15 and correct the captions on all photographs." And, additionally, commented: "In the first paragraph, 'There are approximately 1700 contributing resources within the NHL and around 200 of those are within the APE for this project. As many as X (number) NHL properties will be directly or indirectly affected by the project.' Finally, Curran stated, "All NHL properties that will be affected by the project should be photographed and included in the Historic Property Report. The caption should include the following; Property Name, address or location. Alternatives X, Y, Z, etc. would result in the demolition of the property or an effect on the property."

The SHPO provided comments on February 24, 2016, to the HPR and consulting parties meeting. SHPO agreed with the comments of NPS that the HPR was well done and did not offer any recommendations beyond those presented by NPS. However, SHPO did note, “We think there is some value in retaining, in some fashion, the relative ratings of properties that are used in the Indiana Historic Sites and Structures Inventory (i.e., contributing, notable, and outstanding.” Those comparative ratings could become more usual later in the alternatives analysis and in the Section 106 consultation, if, for example, it becomes necessary to take a building but there is a choice of which building to take.”

SHPO further noted that “[a]voidance and minimization of adverse effects on the [NHL] must certainly be given appropriate consideration.” The SHPO noted that the “concerns and wishes” of consulting parties should also be carefully considered. For that reason, SHPO declined to express strong preferences for any of the alternatives but elected to “Offer some thoughts about possible adverse effects and about various ways to minimize them.”

SHPO stated, “Although the format was novel to my staff, the February 16 consulting party meeting was productive, in that it elicited many insightful comments and suggestions, especially from local consulting parties. My staff thinks, as many of the other consulting parties had commented, that more detail about the kinds of effects that would occur to various properties that contribute to the National Historic Landmark (“NHL”) district or the National Register of Historic Places (“NRHP”) district would be necessary before many of the current alternatives could be eliminated. There probably will be numerous contributing properties that will be affected visually by many of the alternatives. However, it seems to us that it would be most valuable to know which contributing properties would have to be taken, or that would have to lose part of their yard or grounds, for each of the alternatives.”

In addition, SHPO added, “It is our impression at this time that Alternative 1 (No build) is probably the only alternative under consideration that would not introduce any new adverse effects or intensified adverse effects in comparison to US 421’s current effects, of which local consulting parties had complained in the initial consulting parties meeting on December 3, 2015. However, it does not seem likely that the *status quo*, represented by Alternative 1, would be a satisfactory outcome for many, if any, of the local consulting parties. We realize, however, that for comparison purposes, Alternative 1 will be retained throughout the review process, until a preferred alternative is selected.”

Regarding the other alternatives, SHPO noted, “it appears to us that only Alternative 3 (Reroute along 2nd Street) could possibly be constructed without causing a physical impact to any of the buildings (or their yards) that contribute to either the Madison NHL District or the Madison NRHP Historic District. However, as it is currently envisioned, Alternative 3 would require vehicles to come to a stop at each of the intersections along the stretch of 2nd Street on which it would be routed, which likely would result in an increase in the amount of noise and vibration produced by accelerating and decelerating trucks within the NHL and Madison NRHP Historic Districts over that which currently is produced. Substituting synchronized, three-color traffic signals at those intersections might reduce the noise from acceleration and deceleration, but it probably would put US 421 truck traffic on 2nd Street in close proximity to even more historic buildings than does the current US 421 alignment, which includes the much wider Main Street for part of its route through the districts. Thus, the effects of traffic noise and vibration might still be greater than those occurring along the current alignment, even if traffic moved through the districts more smoothly than at present.”

With regard to the at-grade alignments, SHPO noted, “Either elevating Harrison Street over 2nd Street (as in alternatives 4, 5, 7, and 9) or running an at-grade Harrison Street between retaining walls and through a cut in the hillside (as in alternatives 6A and 6B) seemed to be more palatable to many of the local consulting parties at the February 16 meeting if the retaining walls of an elevated roadway or retaining walls along a cut were to wear a veneer of local stone. That possibility certainly is worth exploring, as that retaining wall treatment could be quite attractive visually. In our experience with other highway projects, however, we typically have seen form-lined concrete used in such situations, rather than stone, even when stone veneer had been suggested by a consulting party. It is our impression that there could be a significant difference in cost between stone veneer and form-lined concrete. We recommend that the consultants obtain at least rough estimates of the costs of stone veneer and form-lined concrete before the next consulting parties meeting, so that the economic practicality of using stone is known and can be shared and discussed with the consulting parties.”

Regarding grade-separated alternatives, SHPO noted, “On the subject of a grade-separated Harrison Street, my staff heard comments to the effect that elevating Harrison over 2nd Street would create the impression that the parts of the NHL and Madison NRHP Historic Districts lying east of the elevated street are visually, if not also physically, cut off from the rest of their districts. In one discussion group, my staff's suggestion of elevating Harrison on a bridge structure, rather than on fill, in order to preserve some sight lines from one side of Harrison to the other, caused even greater concern. At least one local consulting party said it would give the neighborhood too much of an urban feel and would be unattractive. Another expressed concern that such a large and covered, undeveloped area would be inviting to those seeking a dark and secluded place for criminal activities. Those are reasonable concerns. We wonder, however, whether it might still be worthwhile to estimate, at least roughly, how expensive it would be to elevate Harrison Street on a bridge structure with at least modest architectural detailing, in case it proves to be economically imprudent to use stone veneer on retaining walls. That way, a comparison of costs could be shared and discussed, if the idea of form-lined, concrete retaining walls were at that point to strike the consulting parties as less appealing than a bridge structure.”

Finally, SHPO stated, “We understand that no archaeological field work will be performed before a preferred alternative is identified, but we will be glad to review a report on that investigation whenever it becomes available.”

Greg Sekula responded on behalf of Indiana Landmarks to the HPR and consulting parties meeting in a letter dated February 29, 2016. Indiana Landmarks offered “no significant recommended changes to the HPR as presented” but concurred with the comment from NPS “that resources in the National Register and National Historic Landmark districts should be evaluated only under the ratings of ‘contributing’ and ‘non-contributing’ and that other rating references identified in the . . . IHSSI. . . should be segregated into a separate section of the document and not co-mingled.” Landmarks also agreed with the extension of the period of significance to 1970 for the Madison NRHP Historic District.

Landmarks also stated “it would be helpful to quantify the number of contributing and non-contributing resources impacted for each alternative. This should include, in particular, the number of contributing properties/resources that would be demolished under each alternative.” Landmarks concurred “with comments expressed by many consulting party participants at the February 16th meeting that the following alternatives, as presented, be eliminated from the project: No Build (Alternative 1), Improved Intersections (Alternative 2), Reroute along 2nd Street

(Alternative 3), and Roundabout at SR-56 and Ferry Street (Alternative 8). More detailed information is needed on the remaining alternatives to better assess impacts.”

On March 2, 2016, FHWA, INDOT, and project consultants spoke with the ACHP regarding the alternatives and the consulting party meeting held February 16, 2016. The project consultants presented the alternatives discussed at the consulting party meeting and summarized responses received. Following the conference call, the ACHP indicated they would formally participate in consultation on the project and would provide a formal letter. The ACHP wrote accepting consultation for the project in a letter dated March 8, 2016. The letter stated, in part, that, “Our decision to participate in this consultation is based on the *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, contained within our regulations. The criteria are met because the project will have substantial impacts on important historic properties, and has the potential for presenting procedural problems.”

On March 10, 2016, NPS responded to the meeting summary sent the same day by W&A and stated, “Please amend my first comment about removing the IHSSI information from the section on the NHL. Please add that I stated the Indiana Survey is important and should be added and discussed in a section of its own.”

Peggy Vlerebome also responded on March 10, 2016 and recommended grammatical/typographical edits to the meeting summary.

On the same day Joe Bunch, the Assistant Chief of the United Keetoowah Band of Cherokee Indians responded and provided updated contact for information for the Tribal Historic Preservation Officer (THPO).

ACHP responded to a project email sent by W&A on May 6, 2016, and stated, “It is really helpful to know that the project is moving along and that there are clear next steps laid out to guide further progress. I appreciate being kept in the loop on the project, as I’m sure others do, and look forward to working with all the consulting parties to develop the best project we can to meet the needs of the community.”

On May 6, 2016, Jan Vetrhus sent an email requesting additional information about the project with regards to her property and asked questions regarding the noise and vibration studies.

On May 17, 2016, CMT provided Alternative Exhibits and Alternative Renderings to NPS in response to a request by NPS.

On June 8, 2016, W&A sent a project update to consulting parties and provided a link to the alternatives graphics presented at the Citizen’s Advisory Committee (CAC) meeting, which had been slightly revised based on CP comments. W&A noted the graphics were being provided for information purposes only.

On June 9, 2016, the Madison Preservation Planner, Jessica Butler, expressed support for Alternative No. 8, and also stated she would no longer be participating as a consulting party but would be involved in the project where the public is invited. Butler supported Alternative 8 for the following reasons: “1) Pulling the intersection to the east of the Landmark District, therefore causing a less negative impact of detachment (of east-of-bridge properties), 2) Traffic calming (this alternative isn’t matched by any other in its safety analysis), 3) Scale (I do not support the Project 421

alternatives that raise roadway to a grade that is not pedestrian scale), 4) Design opportunity for a true gateway.”

On June 9, 2016, NPS stated “it is crucial that the Section 106 consulting parties have the opportunity to meet prior to the determination of a final alternative. We have not had a meeting since the presentation of nine alternatives and it is important that the Section 106 consultation includes further discussion on the final four alternatives.” (W&A responded that it was important to discuss the alternatives and that a meeting to do so would take place in early August.)

John Stacier echoed the comments of NPS in an email of June 9, 2016, stating “we need to meet and talk again sooner rather than later.” Stacier explained, “It’s important to have an in-person dialogue with all the parties about the merits and drawbacks of each of these choices. Consultation is a process, not an one-and-done meeting. I’m frankly surprised we did not have a meeting in conjunction with the recent CAC meeting.”

On June 28, an invitation to a consulting party meeting to be held on August 11, 2016 was emailed to all consulting parties along with information on how to access the Effects Memorandum on INDOT’s IN-SCOPE website.

In an email dated July 18, 2016, Jan Vetrhus asked questions about the alternatives, the broader environmental process, and other projects in the area. Vetrhus noted, “In addition to the height of the bridge and trucks, the lighting and the height of the retaining wall, has INDOT provided the requested noise and vibration analysis - it’s talked about in general terms in this report.” Vetrhus also noted, “Drainage is still a problem, as well.” W&A responded in an email on July 29, 2016 that specialized studies would be discussed at the next consulting party meeting.

NPS emailed on July 18, 2016, and stated, “It is truly important that the INDOT team find a way to show the height of the bridge and the additional height of transport trucks on top of the bridge as well as lighting on the bridge. I think it is crucial that that is shown, not just illustrated. I have no sure idea of how to accomplish that illustration....other than the use of balloons or some other obvious visual.” W&A responded in an email on July 29, 2016.

On July 29, 2016, Teri Lu Adler stated, “It is also important to show the impact all the way to Main Street. An overpass will affect not only the properties on Second St but all the adjacent ones between Second and Main.”

On August 10, 2016, Link Ludington emailed the consulting parties and agencies to state that Alternative 6 had been identified as the “preferred” alternative in the Comprehensive Plan for the City of Madison.

A consulting parties meeting was held on August 11, 2016, in the City Center. The invitation to the consulting party meeting had been sent to all who had previously accepted consulting party status as well as property owners of contributing resources in the APE. The additional following residents requested consulting party status or attended the meeting: Bernard Kelly; Darren and Morgan Alexander; Reverend Robert Leach; Rick Grote; Fred and Judy Koehler; Margaret Balough Hillery; Christian and Cynthia Mejean; Robert and Nancy Cheatham; Kathy Griffin; and John Kinman.

The purpose of the day-long consulting party meeting was to discuss the project alternatives, Section 4(f) resources, the status of the effects study and archaeological investigations, and Project 421

mitigation ideas. The meeting also included a walking tour showing project activities under the alternatives carried forward.

During the meeting the group asked questions about the alternatives, including information about grade changes, signal installation and noise and vibration studies. Following the walking tour, the discussion turned Section 106, Section 110, and Section 4(f). Consulting parties asked if any of the resources would subject to “constructive use.” Following a discussion of the alternatives, consulting parties asked about adding limestone to the bridge under Alternative 4, the height of limestone walls under Alternatives 4 and 6, and potential drainage issues. The representative for NPS revisited the discussion of noise increases at fourteen homes under Alternative 4 and requested additional information when the noise analysis was available. It was also noted by another party of that the Fulton community began at the corporation limit lines of Madison and another party asked about the traffic noise associated with a bridge versus on the ground.

The meeting broke into groups to discuss mitigation options. Themes that emerged from these smaller discussions were:

- Landscaping (and removal of billboards—billboards might be local) Landscaping should account for engineering, drainage, and artistry. Landscaping as gateway. Some called for terracing of retaining walls.
- Signalized intersection (on-demand) for pedestrian and bicycle traffic across Harrison/US 421;
- Advisory Team that includes a mix of representatives including artists, and could include some consulting parties. Generally the MOA stipulates MOA participants. Curran said that the NPS is an automatic reviewer of design plans. Allen noted we only get to about 30 percent design under NEPA, so it is a good idea to touch base during the design process
- Avoidance or treatment of the red house on Sering Street (106/112 Sering Street)
- Pedestrian and bicycle access

John Stacier thanked W&A for a “good meeting” in an email dated August 11, 2016 and stated, “The presentations went well and the input from the consulting parties I thought to be well informed. I’m pleased we got everything on the agenda covered in the time allotted.”

A public open house was held on August 15, 2016 in the City of Madison. At least one attendee stated that Alternative 4 does not fit the character of historic Madison.

On August 19, 2016, SHPO provided comments on the meeting and memorandum of the “Effects of the US 421 New Road Project” (letter dated June 28, 2016). SHPO agreed that Alternatives 4 and 6 would cause adverse effects but that Alternative 6 “is less likely to have as severe an overall impact on the Madison [NHL] District or Madison [NRHP] District.”

SHPO stated that the effects memorandum speaks generally to increase or decrease in noise but at the consulting party meeting on August 11, the numbers of properties “that are or would be at or above the 67 dBA that level that FHWA recognizes as mitigatable ... were stated orally. It would be helpful for the consulting parties to have the [noise] figures in writing.”

SHPO also stated that if construction would discourage access east of the Second Street and Harrison/US 421 intersection, then that would be an adverse effect. In addition, eliminating access to on-street parking under Alternative 6 could also cause an adverse effect under Alternative 6, Project 421

based on the testimony of a local resident. SHPO elaborated, “[a] change in the use or configuration of Second Street that results in a lack or shortage of parking for residents of that block likely would diminish the utility of contributing houses on that street and discourage their continued use.” SHPO acknowledged that the archaeology report would be forthcoming. SHPO recommended that the feasibility of moving the main story of the house at 112 Sering Street be examined by an architect or engineer if that house would be acquired. Finally, regarding mitigation, SHPO recommended that this project’s mitigation budget “provide generously for appropriate mitigation” as the project “would result in a rather large gash through the historic districts.” SHPO continued, “[t]he engineering and construction costs, in any case, will be many times greater than any amount that will be provided for mitigation for this project in Madison, one of Indiana’s most historically and architecturally significant communities.”

In response to an email sent to all consulting parties on September 2, 2016 requesting formal written comments on effects, NPS provided formal comments on the meeting in an email dated September 8, 2016. NPS stated: “the proposed overpass bridge in Alternative 4 is totally unacceptable. While Alternative 6 is still an adverse effect on the NHL, it is more acceptable than other options. We do insist on stoplights at the intersection for the safety of the local residents and to maintain the walkability of the NHL Historic District. I agree with local residents that a [tasteful] welcome to Madison and the NHL needs to be incorporated into the retaining wall along the Hillside below the hotel. We would like to see the wall terraced in several increments to soften the harsh visual of a tall wall. Materials used to construct the retaining wall need to be sympathetic to historical stone materials used throughout the historic district.”

Jan Vetrhus provided formal comments on the project’s effects in an email dated September 8, 2016. Vetrhus expressed a preference for Alternative 6 and noted that Alternative 4 “would impose a huge new structure that would cut the neighborhood in half, visually, and add significant walls.” In contrast, Alternative 6 could “enhance” the district, “[w]ith the appropriate design and mitigation.” Vetrhus stated that the retaining wall under Alternative 6 should be constructed “in such a way to restore the historic landscape that included terraced rock walls. Plantings and natural rock must be used to reduce the noise and provide visual continuity with the historic district. I believe the JCHS made historic photos available. Materials from the remnants of the old stone walls should be re-used as much as possible.” Vetrhus also stated “[i]t is. . .very important that a traffic signal is installed at 2<sup>nd</sup> and Harrison” for pedestrian and bicycle safety. Vetrhus continued, “The choice of the traffic signal should not have overhead wires, but be designed into the neighborhood. That intersection should also be designed to discourage through traffic from turning into the neighborhood.” Finally, Vetrhus stated “[t]raffic calming must be built into the design so that through traffic, especially trucks, do not roar onto Main Street at maximum speed. Since Alternative 6 reduces the need to stop, it is essential that traffic is slowed naturally as it enters Main Street. Pedestrian crossings on Main Street need to be safe.”

On September 15, 2016, in response to an email from INDOT, NPS provided guidance for the appropriate level of documentation for mitigation purposes under the Historic American Building Survey, Historic American Engineering Record, and Historic American Landscapes Survey.

On November 18, 2016, the SHPO concurred with the findings of the Phase Ia Records Check and Reconnaissance Report. Two sites will require a Phase Ib “unless they can be avoided by construction activities and five sites will require additional archival research and photo documentation. “If any prehistoric or historic archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-

21-1-27 and -29 requires that the discovery be reported to the Department of Natural Resources.” The letter further reminded that federal and state regulations and statues must be followed.

A finding of “Adverse Effect” was issued by FHWA on February 14, 2017. A letter informing consulting parties of the finding was sent on February 14, 2017.

A conference call to discuss the mitigation stipulations was held on March 9, 2017 with consulting parties. The meeting discussed the adverse effect in general and the stipulations proposed to mitigate the adverse effect. Conference call meeting minutes can be found in Appendix B.

A draft Memorandum of Agreement (MOA) was provided to consulting parties on April 27, 2017 for review.

During the March 9, 2017 conference call, INDOT agreed to investigate relocating the house at 112 Sering Street to another location within Madison. An investigation into the possibility of relocating the house, especially the cost associated with moving the house at 112 Sering Street was conducted. Quotes were obtained from two independent house moving companies to develop the house relocation costs. Available city appraising data was used to estimate the land cost for the move, and RSM Means (2016), a published industry cost estimating handbook was utilized to estimate the remaining costs associated with relocating the structure. The result of that investigation is included in Appendix B.

In a May 9, 2017 review letter, Indiana landmarks provided comments in regards to funding additional historic preservation staff for the City of Madison, the historic advisory committee, and relocation cost estimates associated with 106/112 Sering Street.

In a May 24, 2017 review letter, the IDNR SHPO requested more specificity be included in the MOA regarding mitigation measures.

The revised draft of the MOA which incorporated substantive consulting party comments was provided to consulting parties on June 27, 2017.

In a June 27, 2017 email, John Stacier requested a hard copy of the MOA. A conference call to discuss the mitigation stipulations was held on July 11, 2017 with consulting parties. The purpose of the call was to discuss the MOA and other documents that had been uploaded to INSCOPE on June 27, 2017. The consulting parties discussed funding additional historic preservation staff for the City of Madison, the historic advisory committee, and relocation cost estimates associated with 106/112 Sering Street. A summary of the conference call was issued on July 17, 2017. Conference call meeting minutes can be found in Appendix B.

On July 28, 2017 the ACHP provided comments in regards to the formatting of the MOA. The comments and suggestions were incorporated into the MOA. In an August 12, 2017 email, the ACHP expressed satisfaction with the revised MOA and have no objection to the agreement moving forward. A copy of the August 12, 2017 email is located in Appendix B.

The final draft of the MOA which incorporated substantive consulting party comments was provided to consulting parties on August 4, 2017. A copy of the MOA is attached to this document. The MOA is expected to be executed by the signatory agencies in the near future.

## **VII. Conclusion:**

Based upon the above considerations, there is no feasible and prudent alternative to the use of land from the Madison NRHP Historic District and the Madison NHL District. The proposed action includes all possible planning to minimize harm to each of the districts resulting from such use.

# Index to Appendices

The original 4f evaluation included all the relevant 106 materials.

## Appendix A: Graphics

A-1	Project Location Map
A-2	Aerial Location Map
A-3	USGS Quadrangle Map
A-4	Alternative #4 Figure
A-5	Alternative #6 Figure
A-6	Alternative #8 Figure

## Appendix B: Section 106 Documentation

B-1 – B-240	Section 106 Adverse Effect Finding
B-241 – B-244	March 9, 2017 Conference Call Summary
B-245 – B-247	Relocation Estimate
B-248 – B-250	July 11, 2017 Conference Call Summary
B-251	ACHP Email

Located in Appendix C of the Environmental Assessment.

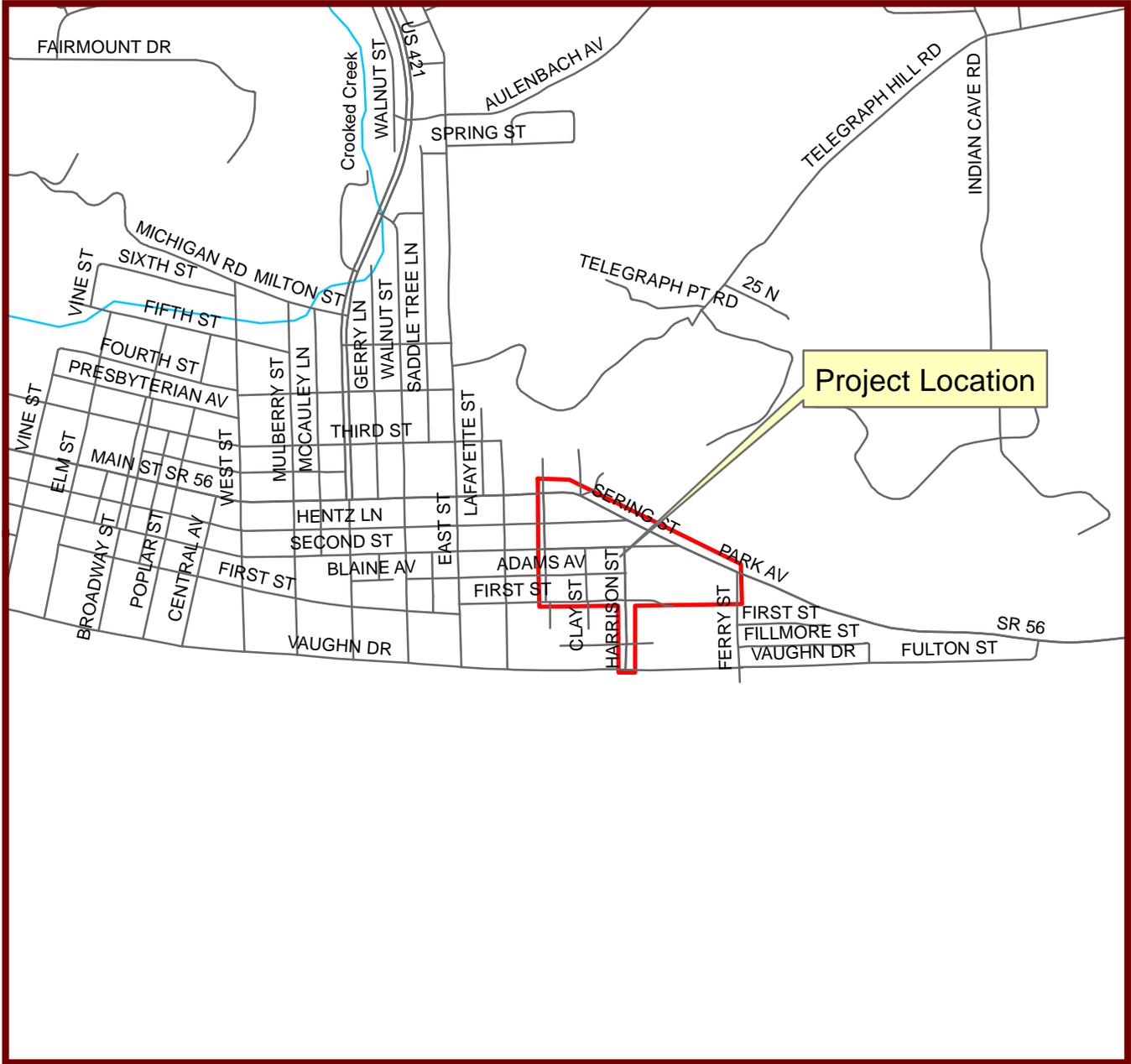
## Appendix C: Draft Memorandum of Agreement (MOA)

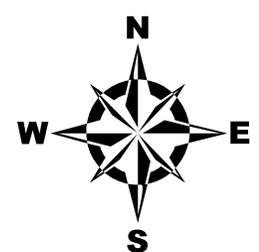
C-1 – C-25	Draft MOA
------------	-----------

# *Appendix A*

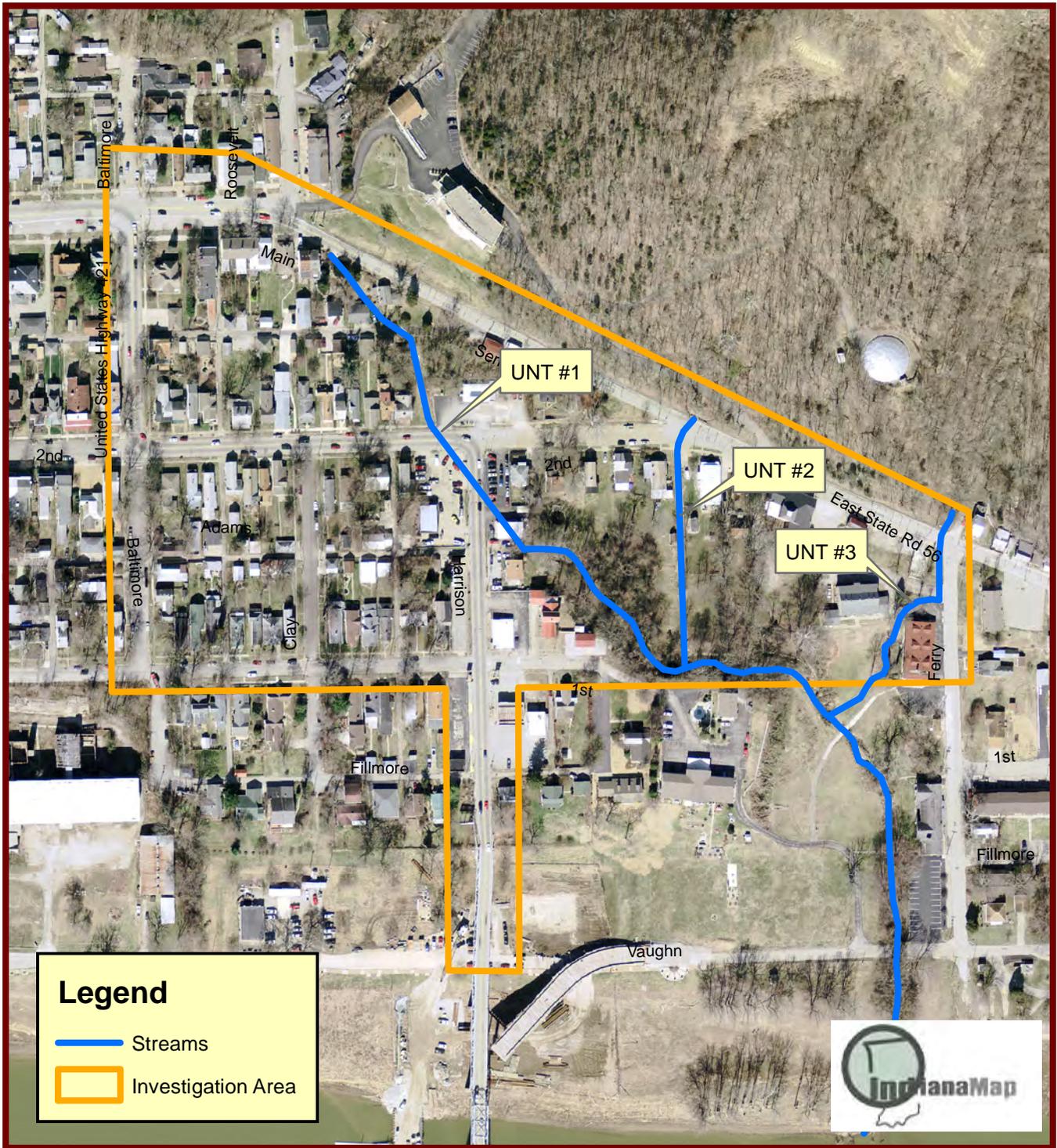
## *Graphics*

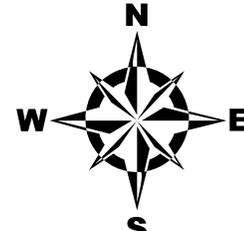
# Project 421



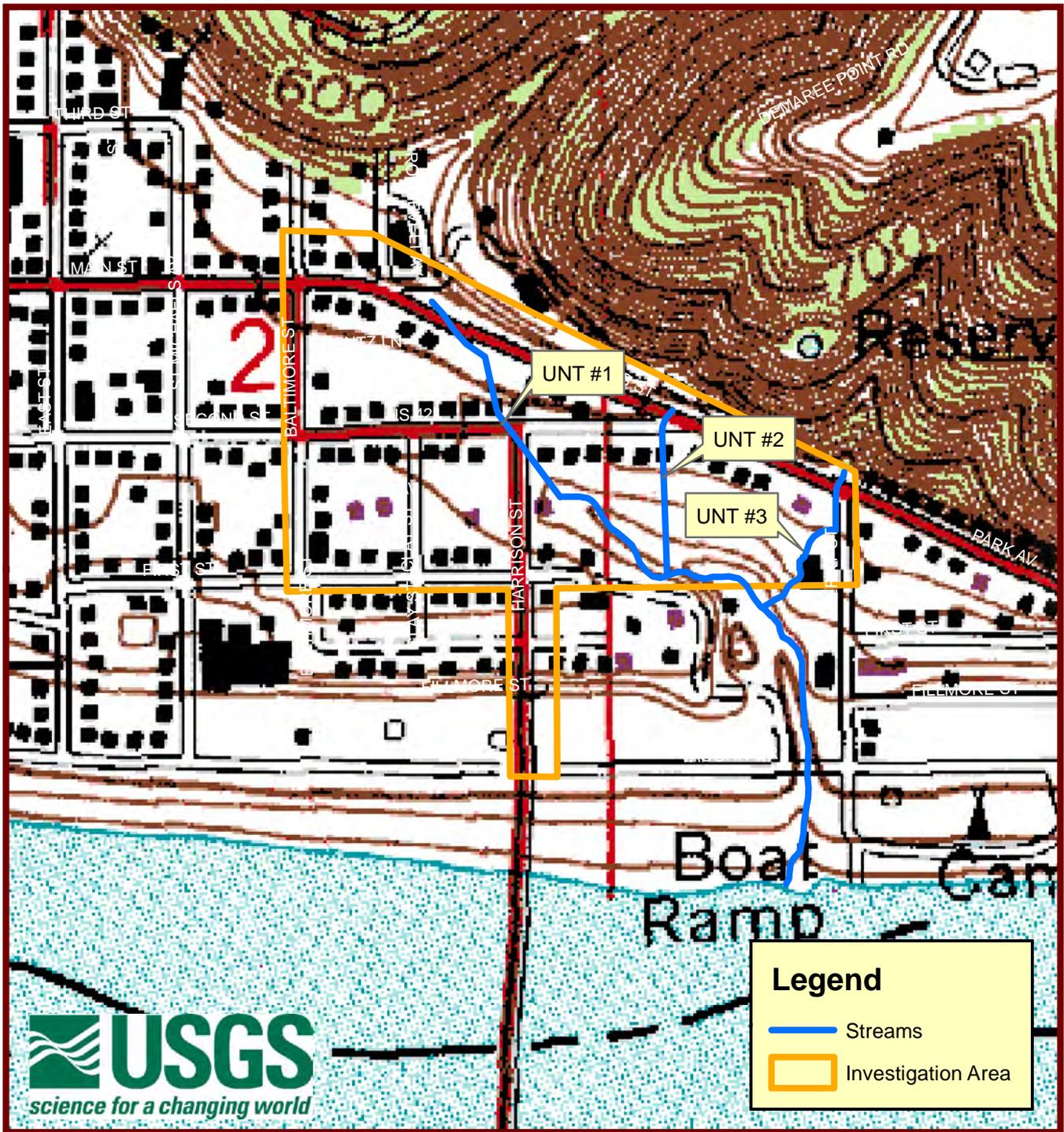
	<h3>Project Area Map</h3> <p>Indiana Department of Transportation Environmental Services Cultural Resources Office 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p>	
---	---	---

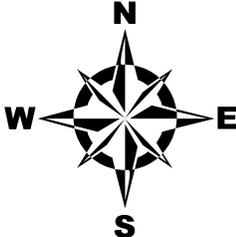
# Project US 421



	<p><b>Aerial Photograph</b></p> <p>Indiana Department of Transportation Environmental Services Cultural Resources Office 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p>	
---	---	---

# Project 421



	<p>United States Geological Survey Quadrangle</p> <p>Indiana Department of Transportation Environmental Services Cultural Resources Office 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p>	
---	---	---

PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 4

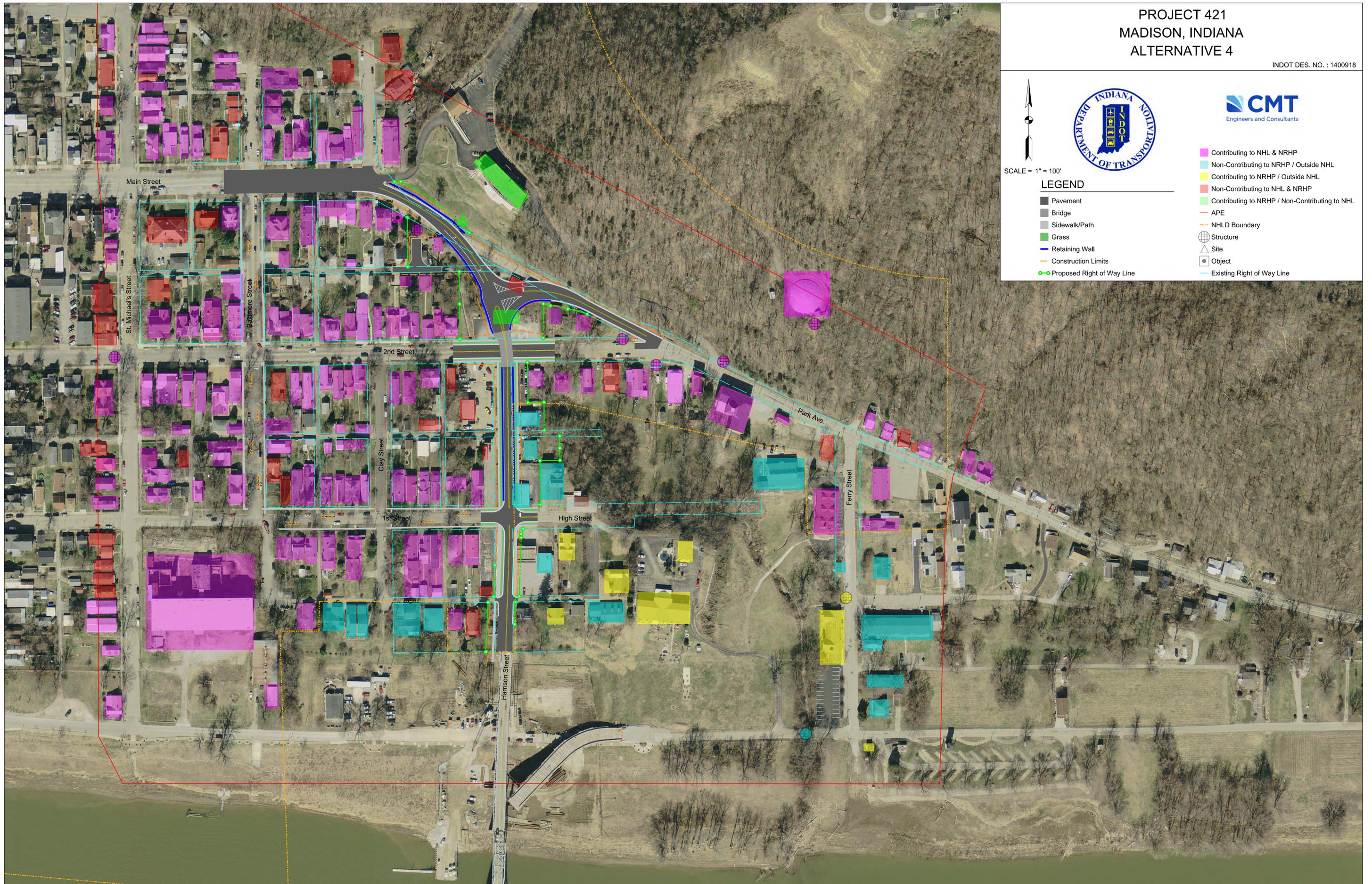
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
|  | Contributing to NHL & NRHP                     |
|  | Non-Contributing to NRHP / Outside NHL         |
|  | Contributing to NRHP / Outside NHL             |
|  | Non-Contributing to NHL & NRHP                 |
|  | Contributing to NRHP / Non-Contributing to NHL |
|  | APE  |
|  | NHLD Boundary                                  |
|  | Structure                                      |
|  | Site   |
|  | Object   |
|  | Existing Right of Way Line                     |
|  | Proposed Right of Way Line                     |
|  | Pavement                                       |
|  | Bridge   |
|  | Sidewalk/Path                                  |
|  | Grass  |
|  | Retaining Wall                                 |
|  | Construction Limits                            |



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 6

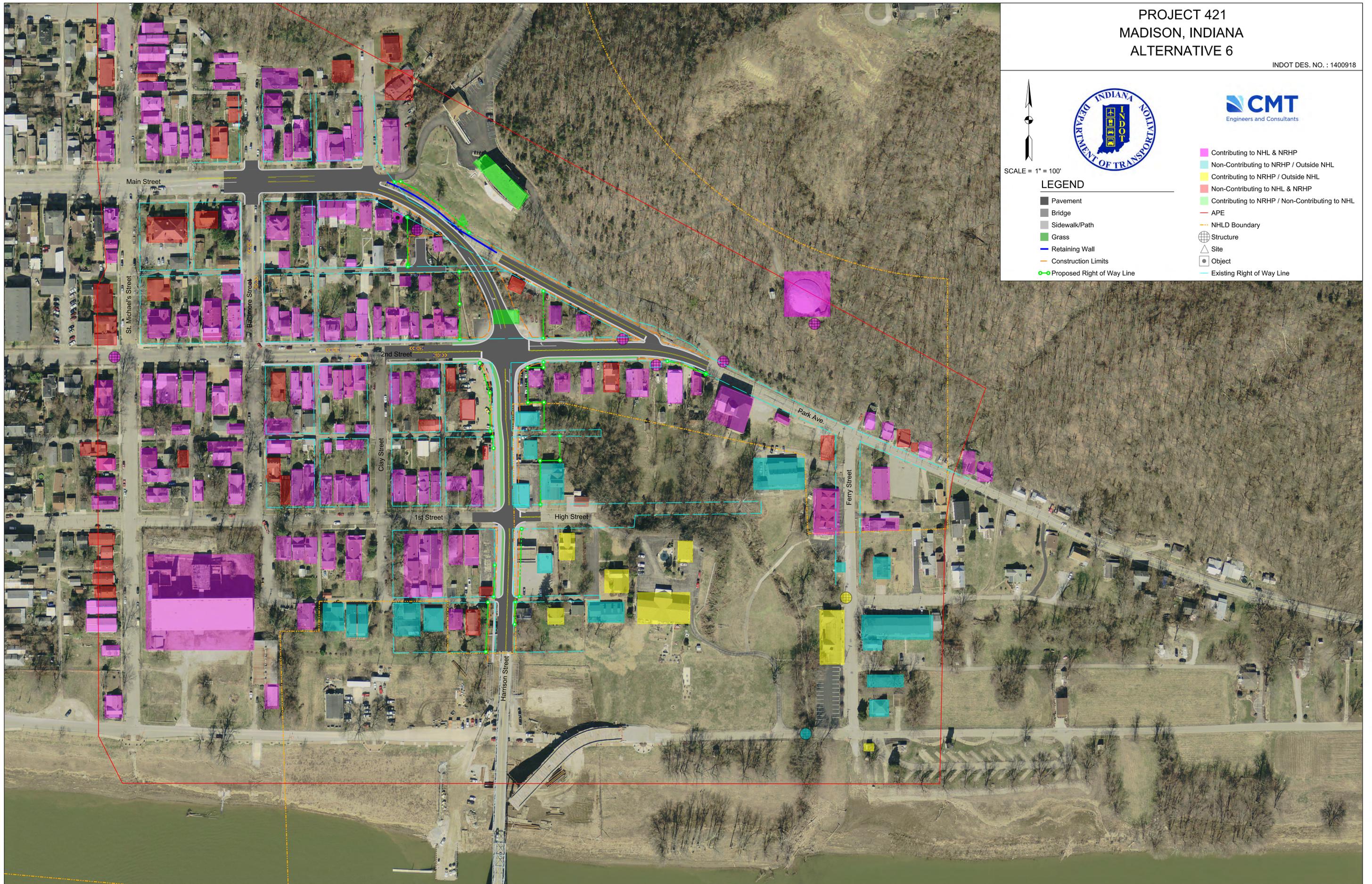
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
|  | Contributing to NHL & NRHP                     |
|  | Non-Contributing to NRHP / Outside NHL         |
|  | Contributing to NRHP / Outside NHL             |
|  | Non-Contributing to NHL & NRHP                 |
|  | Contributing to NRHP / Non-Contributing to NHL |
|  | APE  |
|  | NHLD Boundary                                  |
|  | Structure                                      |
|  | Site   |
|  | Object   |
|  | Existing Right of Way Line                     |
|  | Proposed Right of Way Line                     |
|  | Pavement                                       |
|  | Bridge   |
|  | Sidewalk/Path                                  |
|  | Grass  |
|  | Retaining Wall                                 |
|  | Construction Limits                            |



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 8

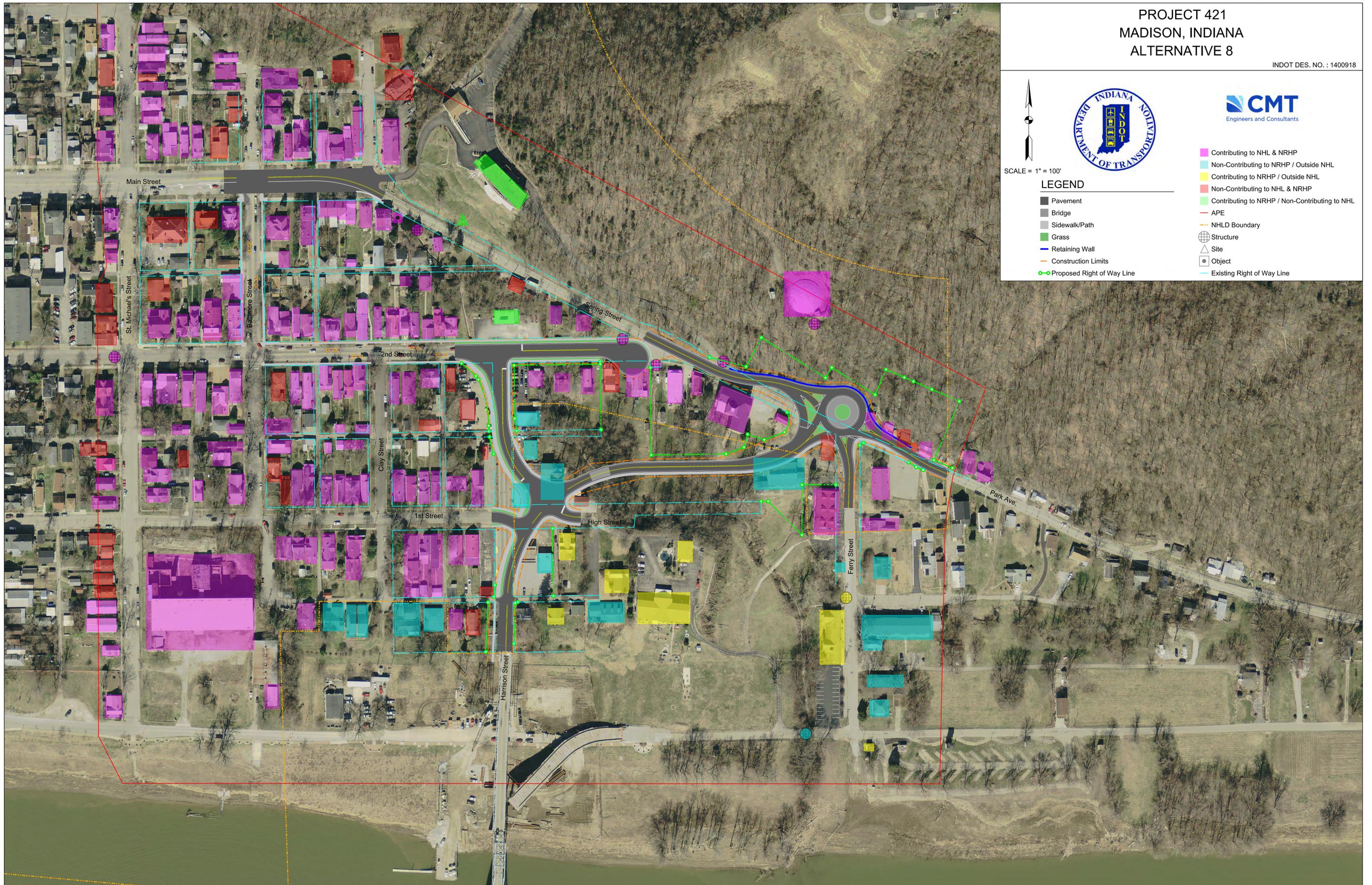
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
| Contributing to NHL & NRHP                     | Non-Contributing to NRHP / Outside NHL |
| Contributing to NRHP / Outside NHL             | Non-Contributing to NHL & NRHP         |
| Contributing to NRHP / Non-Contributing to NHL | APE                                    |
| Pavement                                       | NHLD Boundary                          |
| Bridge   | Structure                              |
| Sidewalk/Path                                  | Site                                   |
| Grass  | Object                                 |
| Retaining Wall                                 | Existing Right of Way Line             |
| Construction Limits                            | Proposed Right of Way Line             |



# *Appendix B*

## *Section 106*



# INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue  
Room N642  
Indianapolis, Indiana 46204

PHONE: (317) 233-2061  
FAX: (317) 232-4929

**Michael R. Pence, Governor**  
**Brandye L. Hendrickson,**  
**Commissioner**

April 27, 2017

Dear Consulting Party:

The Indiana Department of Transportation (INDOT) with funding from the Federal Highway Administration (FHWA) is planning a project in Madison, Jefferson County, Indiana: US 421 New Road Construction (Des. No.: 1400918). Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertaking on historic properties (both archaeological and structures). In addition, Section 110 of the National Historic Preservation Act provides guidance on the special requirements for protecting NHLs, including statutory requirements and resolution of adverse effects.

Weintraut & Associates identified two aboveground historic properties within the project's Area of Potential Effects: the Madison, Indiana National Historic Landmark District and the Madison National Register of Historic Places District. On February 14, 2017, FHWA signed a finding of Adverse Effect on the Madison, Indiana National Historic Landmark District and the Madison National Register of Historic Places District. A conference call was held on March 9, 2017, to discuss ways to mitigate those adverse effects.

During that conference call, consulting parties asked that INDOT consider relocating the house at 112 Sering Street to another location within Madison. Since that time, CMT has investigated the possibility of relocating the house, especially the cost associated with moving the house at 112 Sering Street. CMT received quotes from two independent house moving companies to develop the house relocation costs. Available city appraising data was used to estimate the land cost for the move, and RSM Means (2016), a published industry cost estimating handbook was utilized to estimate the remaining costs associated with relocating the structure. The result of that investigation is attached. While we recognize that this house is part of the historic fabric of the area, we are proposing salvaging the materials from the house rather than moving it; as we believe those mitigation funds can be better utilized in other context sensitive finishes throughout the project.

The project consultants have prepared a Memorandum of Agreement that reflects the discussion and the agreed upon stipulations from that conference call. There are some portions of the Memorandum of Agreement that are highlighted, pending further discussion with the National Park Service. A member of the project team will be reaching out to Dr. Curran to finalize the appropriate language.

You may access the **Memorandum of Agreement (Des. No.: 1400918; DHPA No.: 18317)** at the IN-SCOPE website located at the following link.

<http://netservices.indot.in.gov/Section106Documents/Default.aspx>

The Des No. is the most efficient search term, once in IN-SCOPE. Any invited consulting party who makes such a request to Weintraut & Associates within seven (7) days of receipt of this notification will receive a hard copy of this material.

To facilitate the development of this project, please respond with comments on the **Memorandum of Agreement for the US 421 New Road Project (Des. No.: 1400918; DHPA No.: 18317) within 30 days of the transmittal of this letter.** If you have comments on a specific stipulation, please refer to the page and line number in your comment. Please direct any comments to Linda Weintraut via email at [linda@weintrautinc.com](mailto:linda@weintrautinc.com) or 317-733-9770.

Tribal contacts may contact Shaun Miller at [smiller.indot.in.gov](mailto:smiller.indot.in.gov) or 317-233-2061 or Michelle Allen at FHWA at [michelle.allen@dot.gov](mailto:michelle.allen@dot.gov) or 317-226-7344.

Thank you for your participation in this project.

Best regards,

Anuradha Kumar  
Manager, Cultural Resources Office  
INDOT Environmental Services

Enclosure

Emc: Michelle Allen, FHWA  
Linda Weintraut, Weintraut & Associates  
Adam Burns, Crawford Murphy & Tilly

<b>HISTORIC HOUSE RELOCATION</b>			
<b>FINAL QUANTITY</b>			<b>361300</b>
			<b>\$</b>



Des. No. 1400918 - US 421 East Approach to Milton-Madison Bridge	Job No. 15709-01-00
Madison, Indiana	Calc's By: RCC Date: 4/19/2017
Jefferson County	CHK By: AJB Date: 4/20/2017

CODE NUMBER	PAY ITEM NAME	
<b>HISTORIC HOUSE RELOCATION</b>		

ITEM #	DESCRIPTION	UNIT	QUANTITY	UNIT \$	COST
	Building Relocation (1)	Lsum	1	\$ 35,000.00	\$ 35,000.00
	Relocation Incidentals				
	Utility Drops	Each	11.00	\$ 4,500.00	\$ 49,500.00
	Maintenance of Traffic	Day	6.00	\$ 800.00	\$ 4,800.00
	Site Improvements				
	Utility Connections	Each	5.00	\$ 2,750.00	\$ 13,750.00
	Foundation Construction	SFT	800.00	\$ 15.75	\$ 12,600.00
	Permitting	Lsum	1.00	\$ 650.00	\$ 650.00
	Site Acquisition	Acre	0.20	\$ 225,000.00	\$ 45,000.00
				<b>Base Relocation Subtotal</b>	<b>\$ 161,300.00</b>
	Interior Renovation (2)*	SFT	800.00	\$ 250.00	\$ 200,000.00
Notes:					
1	Building relocation quotes provided by Wolfe Movers (North Manchester, IN) and MCF House Movers (Petersburg, IN).				
2	Interior Renovation cost generated from RSM Means (2016), Single Story, Luxury Finish				
	* Potential Deferred Costs				
				<b>TOTAL</b>	<b>\$ 361,300.00</b>

## CONSULTING PARTY MEETING SUMMARY

**DATE:** July 11, 2017, 10 to 10:45 a.m.  
**LOCATION:** Conference Call  
**SUBJECT:** US 421 New Road Construction (Des. No.: 1400918)  
Conference Call to discuss Mitigation Stipulations

### ATTENDEES:

Nicole Schell, City of Madison  
Link Ludington, Cornerstone Society  
Greg Sekula, Indiana Landmarks  
MaryAnn Naber, Advisory Council on Historic Preservation  
Betsy Merritt, National Trust for Historic Preservation  
Teri Lu Adler, Resident  
Peggy Vlrebome, Resident  
Rick Grote, Resident  
John Carr, Indiana Department of Natural Resources, Division of Historic Preservation & Archaeology/ State Historic Preservation Officer (IDNR,DHPA/SHPO)  
Wade Tharp, (IDNR,DHPA/SHPO)  
Michelle Allen, Federal Highway Administration (FHWA)  
David Clarke, FHWA  
Whitney Carlin, Indiana Department of Transportation (INDOT)  
Patrick Carpenter, INDOT-Cultural Resources Office (CRO)  
Mary Kennedy, INDOT-CRO  
Shaun Miller, INDOT-CRO  
Anthony Ross, INDOT-CRO  
Devin Stettler, United Consulting  
Adam Burns, Crawford, Murphy & Tilly (CMT)  
Linda Weintraut, Weintraut & Associates (W&A)

Michelle Allen (FHWA) thanked everyone for joining the call. Adam Burns provided a roll call of consulting parties; those on the call answered affirmatively.

Linda Weintraut stated that the purpose of the call was to discuss the Memorandum of Agreement (MOA) and other documents that had been uploaded to INSCOPE on June 27, 2017. She said that she hoped that the consulting parties had a chance to review the consulting party comment form since it documents how each comment was addressed and the location of that change within the MOA. Weintraut noted consulting parties had expressed specific concern about three topics; those topics would be discussed during this call.

The first topic was the historic preservation officer for the City of Madison; presently it is a part time position. Weintraut said that INDOT had tried to accommodate concerns of the consulting parties regarding staffing by writing the stipulation such that the position would be funded as a part time position for four years or as a fulltime for two years. Greg Sekula (Indiana Landmarks) said that Landmarks had hoped that the funding would enhance one or both the positions with additional staff such that the historic preservation officer could become a fulltime position. Link Ludington (Cornerstone Society) indicated that he understood that flexibility is in the best interest of the city but it is disappointing from the standpoint of the preservation community that a firm commitment to a fulltime historic preservation officer is not being made.

Relocation Costs associated with the house at 106/112 Sering Street: Burns walked through the letter that had been distributed on INSCOPE at the same time as the MOA. This letter detailed the costs associated with moving the house, the path that would likely be used, a potential relocation site, and renovation costs, all of which totaled about \$389,500.

Both Ludington and Sekula expressed disagreement with the costs provided for renovation for the house, once it reached its destination. Ludington said that he understood that this is a lot of money to move the house but without knowing the history associated with the house, it is difficult to agree that moving the house is too great a cost. He had not been in the house, and to his knowledge, no historical research had been conducted on the house.

Allen said that FHWA looks at the cost of the endeavor and the desire of the community when looking for ways to mitigate adverse effects. There does not seem to be a general community consensus to move this house.

Regarding the Advisory Committee, Weintraut pointed to the specific stipulations that had been added, especially those that detailed the topics that the Advisory Committee would review and comment upon. Sekula said from his experience, the Advisory Committee was a worthwhile endeavor in terms of reviewing design and addressing aesthetic issues. Betsy Merritt (National Trust for Historic Preservation) said that she agreed and would appreciate the opportunity to call in rather than attending in person. FHWA indicated that this would be possible.

MaryAnn Naber (Advisory Council on Historic Preservation) asked what the basis would be for calling each meeting (i.e.: would meetings be scheduled regularly or based on milestones?) Burns said that the intent of convening a meeting would be triggered by a design milestone.

John Carr (IDNR, DHPA/SHPO) said that he agreed with the Advisory Council. He liked Stipulation I.B.5., but was hopeful that there could be regular updates on design details. Adam Burns said that a project update could be provided every other month in the form of a newsletter but asked the consulting parties to recognize that sometimes there is little in terms of updates because design moves in fits and starts.

Weintraut said the MOA would be updated to reflect the two changes requested by the Advisory Council and the SHPO).

Rick Grote, the owner of the house at 106/112 Sering Street, posed questions about timing of the project and the salvage of architectural details. Grote expressed concern regarding the salvage operation. Weintraut said that the MOA provides for a dispensation plan that sets forth the process by which the architectural items are salvaged. She said in past projects, it had occurred after the house was vacated. In a prior project, a consultant had tagged, photographed, and inventoried items such as door knobs, doors, molding, items that other property owners within the district had then used in their homes. Grote said that he would like to keep the furnaces, etc. It was suggested that this should be part of the purchase agreement and would not have to be part of the salvage. Grote also questioned the timing of the purchase of this house since he has tenants who are not renewing their lease and he has concerns about his ability to rent it to others. Burns said that we are sensitive to those issues but purchase cannot occur until after NEPA is concluded (3 to 4 months) and after the Uniform Act procedures, right of way engineering, property appraisal and negotiations, are completed (about 9 months).

Next Steps: Send in comments prior to the **deadline on July 27, 2017**. The MOA will be updated to include the two additional items discussed today; then it will be circulated for review and signature.

The meeting adjourned at 10:45.

## Oliphant, Mike

---

**To:** Adam Burns  
**Subject:** RE: US 421 New Road Project (Des 1400918) Consulting Party Call Summary

---

**From:** MaryAnn Naber [<mailto:mnaber@achp.gov>]  
**Sent:** Saturday, August 12, 2017 2:54 PM  
**To:** Allen, Michelle (FHWA)  
**Cc:** Patrick Carpenter; Sarah Stokely  
**Subject:** Re: US 421 New Road Project (Des 1400918) Consulting Party Call Summary

Hi, Michelle-

Thank you for providing the latest draft of the MOA for the US 421 Project for our review and comment. Thank you for making the changes we discussed. We are satisfied with the draft provided dated August 2, 2017, and have no objection to the agreement moving forward in this form.

MARYANN NABER  
Senior Program Analyst, FHWA Liaison  
Advisory Council on Historic Preservation

---

**From:** Allen, Michelle (FHWA) <[michelle.allen@dot.gov](mailto:michelle.allen@dot.gov)>  
**Sent:** Friday, August 4, 2017 12:44 PM  
**Subject:** RE: US 421 New Road Project (Des 1400918) Consulting Party Call Summary  
**To:** MaryAnn Naber <[mnaber@achp.gov](mailto:mnaber@achp.gov)>  
**Cc:** Patrick Carpenter <[pacarpenter@indot.in.gov](mailto:pacarpenter@indot.in.gov)>

Hi MaryAnn,

I have attached both the redline and clean versions of the MOA. We have made a couple changes that were discussed during our conference call with consulting parties, and also the changes you recommended. We did get a response from our SHPO, but they did not have any recommended changes to the agreement. No other written comments were received on the last version.

We will be sending out an email so the other consulting parties can view the changes made as well, but I wanted to get you the redline and word versions to help with your review.

If possible, can you get us any remaining comments or changes in the next two weeks? Then we will work to prepare for signatures.

Thanks,  
Michelle Allen  
FHWA-IN  
(317) 226-7344

---

**From:** MaryAnn Naber [ MaryAnn Naber [<mailto:mnaber@achp.gov>]  
**Sent:** Tuesday, August 01, 2017 10:36 AM  
**To:** Allen, Michelle (FHWA)

# *Appendix C*

## *Memorandum of Agreement*

**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON, MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

**WHEREAS** the Federal Highway Administration (“FHWA”) proposes corridor improvements for United States (US) 421 at its approach to the Milton-Madison Bridge over the Ohio River for the US 421 New Road Project in Madison (“Project”), in Madison Township, Jefferson County, Indiana; and

**WHEREAS** the US 421 New Road Project is subject to Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and its implementing regulations (36 C.F.R. Section 800 [2017]) and Section 110(f) of the National Historic Preservation Act; and

**WHEREAS** the FHWA, in consultation with the Indiana State Historic Preservation Officer (“Indiana SHPO”), has defined the US 421 New Road Project’s area of potential effects (“APE”), for aboveground resources as the term is defined in 36 C.F.R. Section 800.16(d) , to be the area encompassed by the boundary as shown on APE Map in Attachment A; and

**WHEREAS** the FHWA, in consultation with the Indiana SHPO, has defined the Project APE for archaeological resources, as the term defined in 36 C.F.R. Section 800.16(d), to be the area within construction right-of-way; and

**WHEREAS** the FHWA, in consultation with the Indiana SHPO, has found that the Madison National Register of Historic Places (“NRHP”) Historic District and the Madison National Historic Landmark (“NHL”) Historic District are within the APE; and

**WHEREAS** the Madison NRHP Historic District and the Madison NHL Historic District are listed in the NRHP; and

**WHEREAS** the FHWA, in consultation with the Indiana SHPO, has determined pursuant to 36 C.F.R. Section 800.5(a) that the Project will have an adverse effect on the Madison NRHP Historic District and the Madison NHL Historic District; and

**WHEREAS** the FHWA has consulted with the Indiana SHPO and the National Park Service (“NPS”) to resolve the adverse effect on the Madison NRHP Historic District and the Madison NHL Historic District and FHWA shall, “to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark”; and

**WHEREAS** the following properties are non-contributing resources within the Madison NRHP Historic District and will be demolished as part of this undertaking: 114 Sering Street, 210 Harrison Street, and 202 Harrison Street; and

**WHEREAS** the following properties are non-contributing resources within the Madison NHL Historic District and will be demolished as part of this undertaking: 114 Sering Street and 901 East Second Street; and

**WHEREAS** the following properties are contributing resources within the Madison NRHP Historic District and will be demolished as part of this undertaking: 901 East Second Street, 106/112 Sering Street, Site 12JE0549 (Hotel Ruins), and Sites 12JE0551, 12JE0552 (stone retaining wall), 12JE0553 (stone retaining walls and stairs), 12JE0555 (stone retaining wall), and 12JE0561 (culvert); and

**WHEREAS** the following properties are contributing resources within the Madison NHL Historic District and will be demolished as part of this undertaking: 106/112 Sering Street, Site 12JE0549 (Hotel Ruins), and Sites 12JE0551, 12JE0552 (stone retaining wall), 12JE0553 (stone retaining walls and stairs), 12JE0555 (stone retaining wall), and 12JE0561 (culvert); and

**WHEREAS** the public was given an opportunity to comment on the undertaking's adverse effect in a notice published on July 1, 2017 in the *Madison Courier*; and

**WHEREAS** the FHWA has notified the Advisory Council on Historic Preservation (“Council”) of the adverse effect and invited the Council's participation in the project, pursuant to 36 CFR Section 800.6(a)(1), in a letter dated October 15, 2015; and

**WHEREAS** the Council has elected to participate in consultation in a letter dated March 8, 2016; and

**WHEREAS** the NPS has participated in consultation and has been invited to concur with this Memorandum of Agreement (“MOA”); and

**WHEREAS** the FHWA, in consultation with the Indiana SHPO, has invited the Indiana Department of Transportation (“INDOT”) to participate in the consultation and to become a signatory to this MOA; and

**WHEREAS** the City of Madison has participated in consultation and elected to become an invited signatory to this MOA; and

**WHEREAS** the United Keetoowah Band of Cherokee Indians, Absentee Shawnee Tribe of Oklahoma, Eastern Shawnee Tribe of Oklahoma, Red Cliff Band of Lake Superior Chippewa Indians, Michigan, Grand Traverse Band of Ottawa and Chippewa Indians, Michigan, Chippewa-Cree Indians of the Rocky Boy’s Reservation, Saginaw Chippewa Tribe of Michigan, Miami Tribe of Oklahoma, and the Peoria Tribe of Indians of Oklahoma were invited to participate in consultation; and

**WHEREAS** the Grand Traverse Band of Ottawa Chippewa Indians, Peoria Tribe of Indians of Oklahoma, Chippewa Cree Indians of the Rocky Boy’s Reservation, United Keetoowah Band of Cherokee Indians of Oklahoma, and Miami Tribe of Oklahoma have participated in the consultation; and

**WHEREAS** Consulting Parties have participated in consultation as identified in Attachment B;

**NOW, THEREFORE**, the FHWA and the Indiana SHPO agree that, upon FHWA's approval of the Project, the Project shall be implemented in accordance with the following stipulations in order to take into account the effect of the Project on historic properties.

## **STIPULATIONS**

FHWA, in coordination with INDOT, shall ensure that the following measures are carried out:

### **I. PROFESSIONAL QUALIFICATIONS**

**A.** In consultation with the Indiana SHPO, INDOT shall ensure that all work performed pursuant to this MOA is performed or supervised by a qualified individual and/or team(s) that meet the Secretary of the Interior’s Professional Qualification Standards as outlined in Appendix A to 36 CFR 61 for history, archaeology, architectural history, architecture, and/or historic architecture, as appropriate.

**B.** The individual and/or team(s) performing or supervising the archaeology investigations shall have supervisory experience in the prehistoric and historic archaeology of the southeastern Indiana region. All work performed or supervised by such person or persons shall be conducted pursuant the provisions of Indiana Code 14-21-1, 312 Indiana Administrative Code 21, 312 Indiana Administrative Code 22, and the most current “Guidebook for Indiana Historic Sites and Structures Inventory-Archaeological Sites.”

### **II. MITIGATION MEASURES**

**A.** The FHWA and INDOT, in recognition of the significance of Madison as a National Historic Landmark, shall consider and, wherever feasible, shall implement a design with elements that best reflect the historic fabric and incorporate facets of the historic landscape of the Madison NRHP Historic District and the Madison NHL Historic District including but not limited to protecting existing character-defining landscape features, both cultural and natural, and dealing with light, sound, and air quality issues.

**B.** As soon as practical, FHWA and INDOT (and/or their consultants) will convene a Historic Preservation Advisory Committee (“Advisory Committee”) to ensure that the Project is designed in a manner that respects the historic qualities, landscapes, buildings, and features in the Madison NRHP Historic District and the Madison NHL Historic District. Responsibilities of and participation on the Advisory Committee include the following:

**1.** Representatives of the following jurisdictions and organizations will be invited by FHWA to participate on the Advisory Committee, based upon their established geographic connection to or specific interest in the Madison NRHP Historic District and/or the Madison NHL Historic District, or expertise pertaining to the historic preservation area: selected representatives of the City of Madison and all consulting parties identified in Attachment B. Representatives from INDOT or the Indiana SHPO may participate in Advisory Committee meetings at their discretion.

**2.** As soon as practical, FHWA will convene the Advisory Committee for an initial organizational meeting to establish processes and procedures for the operation of the Advisory Committee and to select the number of and the dates of future meetings to ensure the timely completion of the project. The Advisory Committee will review plans, comment, and make specific recommendations regarding the Project design, scopes of work, and details for consideration by FHWA. Advisory Committee meetings will be held in Madison, Indiana; Advisory Committee members will have the opportunity to participate via teleconference upon request. The Advisory Committee will be chaired by a representative from INDOT or by a consultant. The chair will be responsible for convening meetings of the Advisory Committee, preparing and maintaining a summary of meetings, and preparing and submitting Advisory Committee recommendations to FHWA for consideration and action, in consultation with the Indiana SHPO.

**3.** The Advisory Committee will function in an advisory capacity to assist INDOT in developing Project design details to implement the measures stipulated in this MOA regarding the Madison NRHP Historic District and the Madison NHL Historic District.

**4.** INDOT and/or its consultants will provide project updates every other month to Advisory Committee members that will include new or altered project design details. This project update will be distributed to members via electronic mail. Additionally, INDOT and/or its consultants will provide any materials needed for review by the Advisory Committee at least fifteen (15) days before scheduled meetings. In addition to comments voiced in meetings, Advisory Committee members may provide written comments to the chair within fifteen (15) days following the scheduled meeting.

**5.** Specific design topics reviewed by the Advisory Committee shall include but are not limited to: pedestrian and non-motorized vehicle access; appropriate parking; the use of streetscape elements such as historically scaled lighting, contextually appropriate street fixtures, native landscape plantings, and as stipulated below in Stipulation II.D. and II.E., a context sensitive gateway feature and architecturally appropriate retaining walls.

**6.** Based on the comments provided by the Advisory Committee members, the chair will develop recommendations and submit them to FHWA and INDOT for consideration and action, in consultation with the Indiana SHPO.

**7.** FHWA shall have the authority for final approval of actions regarding the implementation of measures to avoid, minimize, or mitigate effects to the Madison NRHP Historic District and the Madison NHL Historic District.

**C.** INDOT shall salvage, where feasible, and the City of Madison shall store limestone removed from culverts, walls, and walks with the intent of incorporating such stone within the construction of the Project. If the limestone cannot feasibly be incorporated into this project, it shall be made available to residents of the Madison NRHP Historic District and the Madison NHL Historic District for use within those districts.

**D.** INDOT shall incorporate architecturally appropriate retaining walls in terms of height, scale, and aesthetic treatment into the design of the project. INDOT shall, where feasible, incorporate limestone salvaged from culverts, walls, and walks into the design of the retaining walls.

**E.** INDOT shall incorporate a context-sensitive gateway feature into the final construction of the project.

**F.** INDOT shall, where feasible, salvage architectural details from the home at 112 E. Sering Street and offer them for use in other residences in the NHL or NRHP. INDOT or its consultant will develop a Dispensation Plan; the Advisory Committee will have thirty (30) days to review and comment. INDOT or its consultant will oversee the dispensation of the salvaged architectural details. A report will be provided to FHWA and the Advisory Committee after all architectural details have been removed and dispensed.

**G.** The City of Madison will employ a Historic Preservation Officer for the purpose of seeking new opportunities to apply for grants and other assistance for use in improvements for the Madison NRHP Historic District and Madison NHL Historic District. The Historic Preservation Officer shall meet the qualifications specified in *The Secretary of the Interior's Historic Preservation Professional Qualification Standards, Federal Register, June 20, 1997*. The City may elect to receive reimbursement of \$40,000.00 annually for a period of two (2) years or for \$20,000.00 annually for a period of four (4) years. This reimbursement shall not exceed \$80,000.00. This stipulation will be implemented through an INDOT Local Public Agency (LPA) agreement with the City of Madison.

**H.** INDOT shall reimburse the Historic Preservation Officer and the Madison Historic District Board of Review for activities and educational training for program members and employees. The reimbursement shall not exceed five thousand dollars (\$5,000.00) per year and shall be applicable for two years.

I. INDOT shall monitor historic properties for potential construction and traffic vibration damage. Attachment C lists the properties where monitoring is scheduled to occur. A Vibration Monitoring Plan shall be developed and presented to the Historic Preservation Advisory Committee for a thirty (30) day review and comment period. The Plan shall include provisions for pre- and post-construction surveys, installation of vibration monitoring devices and visual inspection during construction. As appropriate, INDOT will observe the vibration monitors and make the determination as to whether vibration from construction and traffic could cause damage to historic properties. INDOT or its consultant shall provide regularly-scheduled reports to the Advisory Committee summarizing the results of the data generated by the monitoring devices.

1. If damage occurs as a result of Project activities, INDOT or their contractors shall be responsible for repair of any resulting vibration damage to historic properties. Any repairs will be coordinated in advance with the SHPO to ensure they are carried out in accordance with *The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* ("Secretary's Standards"). Where access to privately owned property is necessary for monitoring or damage repair, consent shall be obtained prior to entry. If access is denied, a good faith effort shall be made by INDOT to identify an alternative historic property nearby for monitoring that is likely to experience similar impacts.
2. Construction activities shall occur in accordance with local noise regulations, policies, and guidance to minimize adverse noise effects.
3. INDOT shall require the contractor to obtain all necessary permitting to allow oversize vehicles or heavy loads to access the Project site. INDOT's standard specifications state that the contractor must confirm allowable routing with the local government if they are going to use local roads.
4. INDOT shall ensure that the contractor utilize a Traffic and Parking Management Plan for maintenance of traffic during construction that is sensitive to the historic districts and makes practical and reasonable efforts to minimize impacts to historic districts.
5. INDOT shall include provisions in their contract that limit construction activities and construction noise during special events. INDOT, with input from the City of Madison, shall identify the special events for which these provisions apply.

### III. TREATMENT OF ARCHAEOLOGICAL RESOURCES

#### A. Statutory and Regulatory Standards

1. The studies completed pursuant to Stipulation III.E. shall demonstrate a level of effort consistent with the 36 C.F.R. part 800 regulations in effect on

the date upon which the last of the required signatories has signed this MOA and provide FHWA with the information to determine, in consultation with the Indiana SHPO, which archaeological properties are eligible for inclusion in the NRHP. FHWA shall acknowledge and seek the special expertise of any federally recognized Indian Tribes which have previously entered into consultation in assessing the eligibility of historic properties that may possess religious and cultural significance to them.

**2.** In implementing Stipulation III.A through III.G., INDOT may consult with the consulting parties listed in Attachment B and others identified in accordance with the 36 C.F.R. part 800 regulations in effect on the date upon which this MOA is fully executed.

**3.** In accordance with Section 304 of the NHPA and the 36 C.F.R. part 800 regulations in effect on the date upon which this MOA is fully executed INDOT and its consultants, shall ensure that sensitive information regarding the nature and location of human remains and grave goods, and the location, character, and ownership of archaeological sites is kept confidential from the public.

**4.** In ensuring that any human remains and grave goods identified are treated in a sensitive, respectful, and careful manner, INDOT shall be guided by the Council's "Policy Statement Regarding Treatment of Human Remains and Grave Goods" (February 23, 2007) and the Native American Graves Protections and Repatriation Act ("NAGPRA") regulations set forth in 43 C.F.R. part 10, and other guidelines as appropriate.

**5.** If any human remains are encountered during the project, work shall cease in the immediate area and the human remains left undisturbed. INDOT shall contact the county coroner and law enforcement officials immediately, and the discovery must be reported to the Indiana SHPO within two (2) business days. The discovery must be treated in accordance with Indiana Code 14-21-1 and 312 Indiana Administrative Code 22. Work at this site shall not resume until a plan for the treatment of the human remains is developed and approved in consultation with the Indiana SHPO, the INDOT Cultural Resources Office, and any appropriate consulting parties.

**6.** Modification or modifications ("modifications") to the Project which fall outside of the archaeological APE, depicted in Attachment A, dated October 2016, shall be subject to archaeological identification and evaluation and assessment per Stipulations III.B. and III.C. If FHWA determines that the modifications have the potential to cause adverse effects on archaeological resources, then FHWA shall treat the archaeological resource in accordance with Stipulation III.G. .

7. Any dispute regarding the report(s) shall be resolved in accordance with Stipulations IV.A.

## **B. Identification & Evaluation**

1. Before commencing ground-disturbing activities in the Project archaeological APE for the Preferred Alternative, INDOT shall complete the identification and evaluation of archaeological properties contributing to the Madison Historic District and National Historic Landmark in accordance with applicable Federal and State standards and guidelines listed in Stipulations I and III.A.

2. INDOT shall prepare and distribute a final Identification and Evaluation report in accordance with Stipulations I and III.A.

3. Upon completion of the evaluation, FHWA shall follow the procedures set forth in the 36 C.F.R. part 800 regulations in effect on the date upon which this MOA is fully executed which shall include updated documentation described in those regulations, if it is determined that no historic properties shall be affected.

## **C. Assessment of Effects**

1. In consultation with the Indiana SHPO, federally recognized Indian Tribes that may ascribe traditional cultural and religious significance to affected properties, and other parties whom FHWA deems appropriate, FHWA shall determine if the Project shall adversely affect archeological properties determined eligible for inclusion in the NRHP pursuant to the 36 C.F.R. part 800 regulations in effect on the date upon which this MOA is fully executed.

2. If, in consultation with the Indiana SHPO, federally recognized Indian Tribes that may ascribe traditional cultural and religious significance to affected properties, and other parties whom FHWA deems appropriate, FHWA determines the Project may adversely affect NRHP-eligible archeological properties, then FHWA shall make reasonable efforts to avoid or minimize the adverse effect. If, after this consultation, FHWA determines it is not possible to avoid or minimize adverse effects, then FHWA shall treat the archaeological resource in accordance with Stipulation III.G. of the MOA.

3. Any dispute regarding the determination of effects on NRHP-eligible archaeological properties shall be resolved in accordance with applicable Federal and State standards and guidelines listed in Stipulation IV.A.

## **D. Avoidance**

1. Consultation with the Indiana SHPO has determined that the following properties are within the Archaeology APE and must be avoided or subjected

to archival research and photo documentation,: Sites 12JE0549, 12JE0552, 12JE0553, 12JE0555, and 12JE0561.

2. Consultation with the Indiana SHPO has determined that Sites 12JE0551 and 12JE0553 within the Archaeology APE must be avoided or subjected to additional archaeological investigations. If avoidance is not feasible, INDOT will submit a plan for further archaeological investigations to the SHPO for review and comment and will follow the provisions in Stipulation III.E.

3. INDOT shall investigate a design that avoids Sites 12JE0549, 12JE0551, 12JE0552, 12JE0553, 12JE0555, and 12JE0561.

### **E. Additional Investigations**

1. Where avoidance is not possible, all archaeological investigations shall be conducted according to applicable Federal and State standards and guidelines listed in Stipulations I and III.A.

2. To maximize the opportunity to avoid adverse effects, the required archaeological investigations shall be conducted as soon as practicable upon securing the appropriate rights to access property.

3. INDOT, in consultation with the Indiana SHPO, and other parties deemed appropriate by INDOT, shall take reasonable measures to avoid disinterment and disturbance to human remains and grave goods of religious and cultural significance to Native Americans, including investigations associated with modifications of the Project.

### **F. Documentation Standards**

1. If Sites 12JE0552, 12JE0553, 12JE0555, and 12JE0561 cannot be avoided by construction activities, INDOT shall develop, or provide funding for a consultant to develop, Historic American Engineering Record (HAER) Level II documentation of Sites 12JE0552, 12JE0553, 12JE0555, and 12JE0561 for submittal to the Library of Congress. Level II requires a sketch plan, large format photographs and a narrative per HAER standards. The NPS shall review the work of the HAER documentation submitted by INDOT to ensure the work meets the required standard and format. INDOT and its consultants shall prepare the documentation for submission through the HAER Program to the Library of Congress in Washington, D.C.

2. If Site 12JE0549 cannot be avoided by construction activities, INDOT shall develop or provide funding for a consultant to develop Historic American Landscapes Survey (HALS) Level II documentation of Site 12JE0549 for submittal to the Library of Congress. Level II requires a sketch plan, large format photographs and a narrative per HALS standards. The NPS shall review the work of the HALS documentation submitted by INDOT to ensure

the work meets the required standard and format. INDOT and its consultants shall prepare the documentation for submission through the HALS Program to the Library of Congress in Washington, D.C.

### **G. Treatment**

If FHWA, in consultation with the Indiana SHPO, federally recognized Indian Tribes that may ascribe traditional cultural and religious significance to affected properties, and other parties whom FHWA deems appropriate, determines that the adverse effect cannot be avoided or minimized, then FHWA shall develop and implement a Treatment Plan(s), as part of the above consultation, to mitigate the adverse effects to an archeological resource on a site-by-site basis. The implementation of the Treatment Plan(s) must be completed for each site prior to the initiation of any Project construction activities within a segment that could affect that site.

## **IV. ADMINISTRATIVE PROVISIONS**

Disagreement and misunderstanding about how this MOA is, or is not, being implemented shall be resolved in the following manner:

### **A. Dispute Resolution**

**1.** If the Indiana SHPO or any invited signatory to this MOA should object in writing to the FHWA regarding any action carried out or proposed with respect to the US 421 New Road Project or implementation of this MOA, then the FHWA shall consult with the objecting party to resolve this objection. If after such consultation the FHWA determines that the objection cannot be resolved through consultation, then the FHWA shall forward all documentation relevant to the objection to the Council, including the FHWA's proposed response to the objection. Within forty-five (45) days after receipt of all pertinent documentation, the Council shall exercise one of the following options:

- a) Provide the FHWA with a staff-level recommendation, which the FHWA shall take into account in reaching a final decision regarding its response to the objection; or
- b) Notify the FHWA that the objection will be referred for formal comment pursuant to 36 C.F.R. Section 800.7(c), and proceed to refer the objection and comment. The FHWA shall take into account the Council's comments in reaching a final decision regarding its response to the objection.

**2.** If comments or recommendations from the Council are provided in accordance with this stipulation, then the FHWA shall take into account any Council comment or recommendations provided in accordance with this stipulation with reference only to the subject of the objection. The FHWA's

responsibility to carry out all actions under the MOA that are not the subject of the objection shall remain unchanged.

## **B. Post-Review Discovery**

In the event that one or more historic properties—other than the Madison NRHP Historic District, the Madison NHL Historic District, and Sites 12JE0549, 12JE0551, 12JE0552, 12JE0553, 12JE0555, and 12JE0561—are discovered or that unanticipated effects on historic properties are found during the implementation of this MOA, the FHWA shall follow the procedure specified in 36 C.F.R. Section 800.13, as well as IC 14-21-1-27 and IC 14-21-1-29, by stopping work in the immediate area and informing the Indiana SHPO and the INDOT Cultural Resources Office of such unanticipated discoveries or effects within two (2) business days. Any necessary archaeological investigations will be conducted according to the provisions of IC 14-21-1, 312 IAC 21, and 312 IAC 22 and the most current *Guidebook for Indiana Historic Sites and Structures Inventory – Archaeological Sites*.

## **C. Amendment**

Any signatory to this MOA may request that it be amended, whereupon the parties shall consult to consider the proposed amendment. 36 C.F.R. 800.6(c)(7) shall govern the execution of any such amendment.

## **D. Duration**

If the terms of this MOA have not been implemented by December 31, 2028, then this MOA shall be considered null and void. In such an event, the FHWA shall so notify the parties to this MOA and, if it chooses to continue with the Project, then it shall reinitiate review of the US 421 New Road Project in accordance with 36 C.F.R. Sections 800.3 through 800.7.

## **E. Termination**

- 1.** Any signatory to this MOA may terminate it by providing a notice of thirty (30) days to the other parties, provided that the parties shall consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.
- 2.** In the event of termination, the FHWA shall comply with 36 C.F.R. Sections 800.3 through 800.7 with regard to the review of the Project.

The execution of this MOA by the FHWA, INDOT, ACHP, the Indiana SHPO, and the City of Madison, Indiana, and the implementation of its terms evidence that the FHWA has afforded the Council an opportunity to comment on the Project and its effect on historic properties and that the FHWA has taken into account the effects of the Project on historic properties.

**SIGNATORIES (required):**

FEDERAL HIGHWAY ADMINISTRATION

INDIANA STATE HISTORIC PRESERVATION OFFICER

ADVISORY COUNCIL ON HISTORIC PRESERVATION

**INVITED SIGNATORIES:**

INDIANA DEPARTMENT OF TRANSPORTATION

CITY OF MADISON, INDIANA

**CONCURRING PARTIES**

**SIGNATORY PAGE**

**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

**REQUIRED SIGNATORY**

FEDERAL HIGHWAY ADMINISTRATION

By: *Michelle Allen*  
*bw* Mayela Sosa, Division Administrator

Date: *9.27.17*

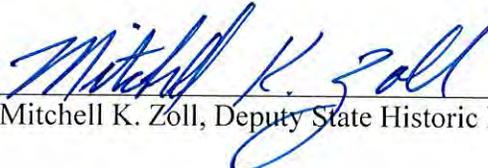
US 421 New Road Project (Des. No. 1400918)  
August 16, 2017

**SIGNATORY PAGE**

**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

**REQUIRED SIGNATORY**

INDIANA STATE HISTORIC PRESERVATION OFFICER

By:  Date: September 14, 2017  
Mitchell K. Zoll, Deputy State Historic Preservation Officer

While the ACHP signature was after the Section 4(f) submittal, FHWA was provided a copy for their records.

**SIGNATORY PAGE**

**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

**REQUIRED SIGNATORY**

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Valerie Hawley  
Name, Title  
FOR JOHN FOWLER  
EXECUTIVE DIRECTOR

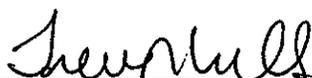
Date: 10/5/17

**SIGNATORY PAGE**

**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

**INVITED SIGNATORY**

INDIANA DEPARTMENT OF TRANSPORTATION

By:   
Trevor Mills, PE  
Deputy Commissioner  
Engineering and Asset Management

Date: 9/15/17



**SIGNATORY PAGE**

**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

Optional: **CONCURRING PARTY**

By: Gregory A. Akubue, SRO Director Date: 8-16-17  
Name, Title Indiana Landmarks

SIGNATORY PAGE

MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918

Optional: CONCURRING PARTY

By: John Staicer, President Historic Madisons Date: 8/18/17  
Name, Title

SIGNATORY PAGE

MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON, MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918

Optional: CONCURRING PARTY

By: R. Dudley, PRESIDENT  
Name, Title  
CORNERSTONE SOCIETY, INC.

Date: 31 AUG. 2017

US 421 New Road Project (Des. No. 1400918)  
August 16, 2017

18

**SIGNATORY PAGE**

**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

Optional: **CONCURRING PARTY**

By:   
Name, Title

Date: 8-17-17

**SIGNATORY PAGE**

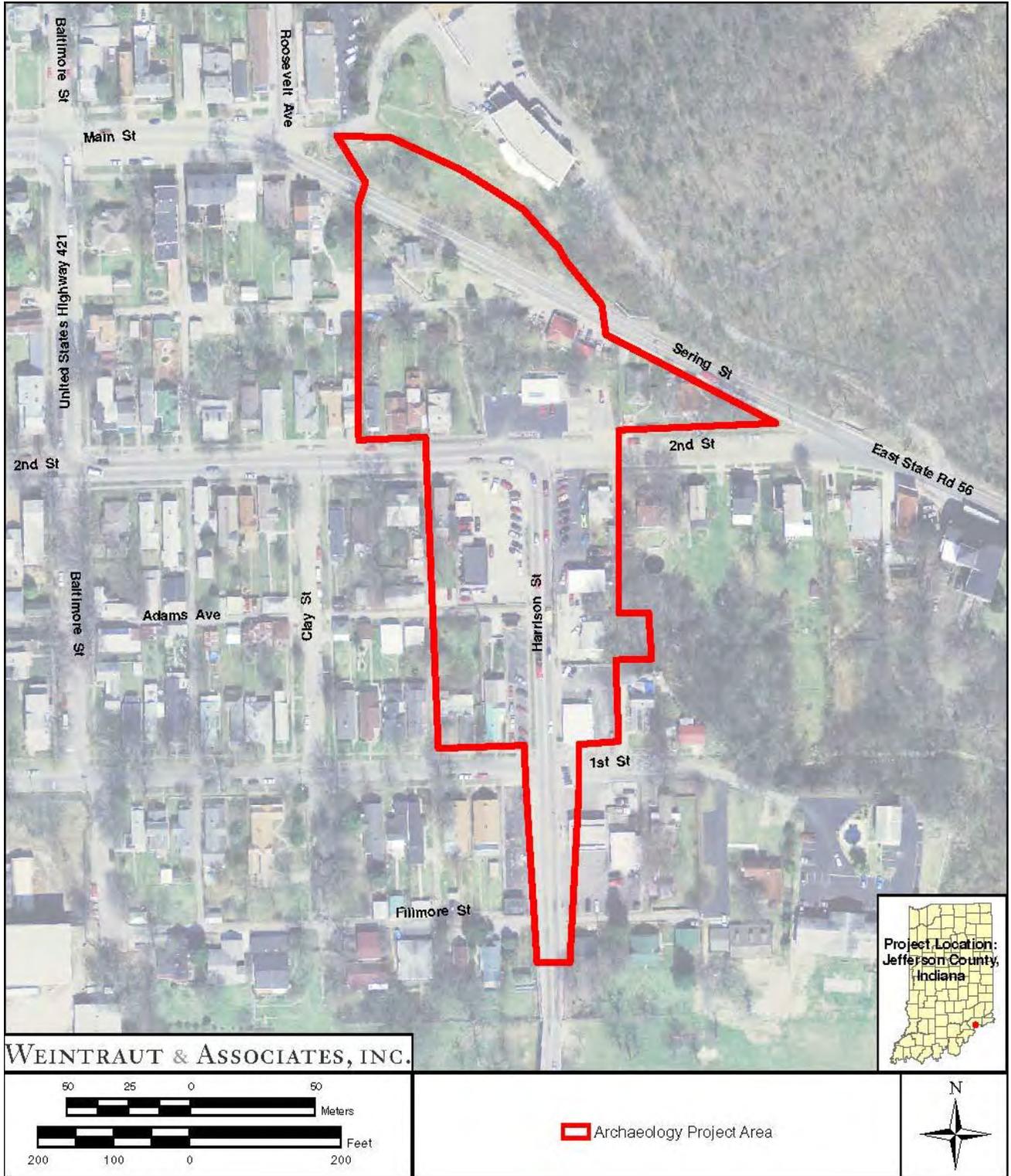
**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
THE INDIANA DEPARTMENT OF TRANSPORTATION, AND  
THE INDIANA STATE HISTORIC PRESERVATION OFFICER  
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION  
PURSUANT TO 36 C.F.R. Section 800.6(b)(iv)  
REGARDING THE US 421 NEW ROAD PROJECT  
IN MADISON , MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA  
DES. NO. 1400918**

Optional: **CONCURRING PARTY**

By: Bob Canida  
Name, Title

Date: 8-17-17

## Attachment A



Attachment A-1: Archaeology Area of Potential Effects

US 421 New Road Project (Des. No. 1400918)  
August 16, 2017



Attachment A-2: Aboveground Area of Potential Effects

US 421 New Road Project (Des. No. 1400918)  
August 16, 2017

## Attachment B

**Consulting Parties:**

Advisory Council on Historic Preservation  
National Park Service  
State Historic Preservation Officer  
Indiana Department of Transportation  
Federal Highway Administration  
Chippewa-Cree Indians of the Rocky Boy's Reservation  
Grand Traverse Band of Ottawa and Chippewa Indians, Michigan  
Miami Tribe of Oklahoma  
Peoria Tribe of Indians of Oklahoma  
United Keetoowah Band of Cherokee Indians  
City of Madison, Office of Preservation  
Cornerstone Society, Inc.  
Historic Madison Foundation  
Historic Madison, Inc. (Bob Canida)  
Indiana Landmarks – Southern Regional Officers  
Jefferson County Commissioners  
Jefferson County Historical Society  
Madison Main Street  
Madison Pilgrim Holiness Church, Inc.  
National Trust for Historic Preservation  
Walnut Street Initiative Madison  
Teri Lu Adler, RLA, ASLA  
Darren & Morgan Alexander  
Robert & Nancy Cheatham  
Patrick Cunningham  
Camille Fife  
Kathy Griffin  
Rick Grote  
Margaret Balough Hillery  
Tracy Keller  
Bernard Kelley  
John Kinman  
Fred and Judy Koehler  
Wayne Kyle  
Christian & Cynthia Mejean  
Kathie Petkovic  
Steven and Elizabeth Thomas  
Jan Vetrhus  
Peggy Vlerebome  
Peter Woodburn  
Vickie Young

## Attachment C

<b>Address</b>	<b>NHL</b>	<b>NRHP</b>
818 E 1st St.	C	C
820 E 1st St.	C	C
819 E 1st St.	C	C
802 E 2nd St.	C	C
804 E 2nd st.	C	C
808 E 2nd St.	C	C
904 E 2nd St.	C	C
906 E 2nd St.	C	C
910 E 2nd St.	C	C
920 E 2nd St.	C	C
924 E 2nd St.	C	C
926 E 2nd St.	C	C
928 E 2nd St.	C	C
723 E 2nd St.	C	C
801 E 2nd St.	C	C
803 E 2nd St.	C	C
805 E 2nd St.	C	C
807 E 2nd St.	C	C
809 E 2nd St.	C	C
811 E 2nd St.	C	C
813 E 2nd St.	C	C
614 E Main St.	C	C
704 E Main St.	C	C
708 E Main St.	C	C
710 E Main St.	C	C
712 E Main St.	C	C
714 E Main St.	C	C
716 E Main St.	C	C
718 E Main St.	C	C
102 Sering St.	C	C
104 Sering St.	C	C
116 Sering St.	C	C
118 Sering St.	C	C
701 E Main St.	C	C
705 E Main St.	C	C
707 E Main St.	C	C
709 E Main St.	C	C
711 E Main St.	C	C
713 E Main St.	C	C
715 E Main St.	C	C
717 E Main St.	C	C
801 E Main St.	C	C
831 E Main St.	C	C

**(C=Contributing)**



# United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
Custom House, Room 244  
200 Chestnut Street  
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO:

September 28, 2017

9043.1  
ER 17/0383

Michelle Allen  
Federal Highway Administration  
575 North Pennsylvania Street, Room 254  
Indianapolis, Indiana 46204

Dear Ms. Allen:

The Department of the Interior (Department) has reviewed the Section 4(f) Evaluation for the US 421 / New Road / Milton-Madison Bridge approach project in Madison, Indiana (project). The purpose of the project is to increase operational efficiency and traffic safety by relieving congestion at a series of turns on US 421 between the Milton-Madison Bridge and Main Street, while reducing the environmental impacts associated with idling and braking of trucks. The US 421 corridor is located within the Madison Historic District, which is listed on the National Register of Historic Places (NRHP), and is a National Historic Landmark (NHL).

The Department offers the following comments and recommendations for your consideration.

## **Section 4(f) Comments**

The Section 4(f) Evaluation (document) describes the existing Madison Historic District, the structures which are contributing resources of the district, and their relationship to US 421 in the project area. The project sponsors are the Indiana Department of Transportation (DOT) and the Federal Highway Administration (FHWA). The document considers effects under Section 4(f) of the Department of Transportation Act of 1966 (codified at 49 U.S.C. 303) associated with the project.

The Madison Historic District was listed on the NRHP in 1973, and designated as an NHL in 2006. The NHL period of significance from 1817 to 1939, with over 1,600 contributing resources. Multiple themes and property types are represented in the district.

The project developed and evaluated nine action alternatives, which represented different ways of meeting the project purpose and need. Additional screening and evaluation resulted in three action alternatives, and one no-build alternative, carried forward for consideration. None of the action alternatives would avoid the use of the 4(f) resources in the Madison Historic District. Several properties that are contributing resources to the Madison Historic District would be demolished as part of the selected alternative, alternative six.

Under the selected alternative, 11 parcels with NRHP contributing resources and six individual resources within the NHL would be impacted through right of way acquisition, removal, and/or demolition, constituting an adverse effect to both the NRHP and NHL. There would be a change to the character of the district and its physical features. The project area of the historic district would take on a different feeling and association than the rest of the district, as a result of the project. The impacted resources represent a small number of the properties within the NRHP and NHL historic district, however, and historians believe that district as a whole will remain eligible for the NRHP and as an NHL.

The Federal Highway Administration (FHWA) and Indiana Department of Transportation (DOT) concluded that alternative six, the selected alternative, is the most prudent alternative, and that the action constitutes an adverse effect pursuant to Section 106 of the National Historic Preservation Act, as amended (36 CFR 800.5(a)(1)). The National Park Service (NPS) was a consulting party in the Section 106 review process with FHWA and Indiana DOT.

The Department's review concurs with the determination that the project's selected alternative constitutes an adverse effect on historic resources, that it will cause the least overall harm to Section 4(f) properties after consideration of mitigation measures, and that there is no feasible or prudent alternative that would meet the purpose and need of the project and avoid the use and impact of the Section 4(f) properties.

The FHWA, Indiana State Historic Preservation Office (SHPO), Indiana DOT, and Advisory Council on Historic Preservation have initiated an agreement regarding mitigation measures to be included in the project. Demolition of the historic properties and impacts to any archeological resources would be mitigated through several measures detailed in the draft memorandum. The NPS has participated in the development of the agreement, and will review the proposed design with the parties listed above. The Department determines that if the Memorandum of Agreement with the SHPO is fully executed, it will have no objection to the 4(f) evaluation and concur with the measures to mitigate the adverse effects of the project.

The Department has a continuing interest in working with the FHWA and the Indiana DOT to ensure impacts to resources of concern are adequately addressed. For issues concerning Section 4(f) resources, please contact Tokey Boswell, Chief, Planning and Compliance Division, Midwest Regional Office, National Park Service, 601 Riverfront Drive, Omaha, Nebraska 68102, or by telephone at 402-661-1534.

We appreciate the opportunity to provide these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Lindy Nelson", with a long horizontal flourish extending to the right.

Lindy Nelson  
Regional Environmental Officer



U.S. Department  
of Transportation

**Federal Highway  
Administration**

# Memorandum

---

Subject: Statement of Legal Sufficiency  
US 421 Road Construction Project  
Jefferson County, Indiana  
Des. No.: 1400918

Date: October 2, 2017

From: Hazem Isawi  
Attorney Advisor (HCC-MA)

In Reply Refer To: HCC-MA

To: Michelle Allen  
Planning and Environmental Specialist  
Indiana Division (HDA-IN)

I have reviewed the above-referenced Section 4(f) Evaluation. The various comments submitted on the draft appear to be satisfied. I find the document legally sufficient.

# **Appendix J**

*Additional Information*

Indiana Department of Transportation (INDOT)  
 State Preservation and Local Initiated Projects FY 2018 - 2021

SPONSOR	CONTR ACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Estimated Cost left to Complete Project*	PROGRAM	PHASE	FEDERAL	MATCH	2018	2019	2020	2021
	34467 / 1173314	M 01	SR 7	Slide Correction	SR-7 at Hanging Rock Hill in Madison	Seymour	.198	NHPP	\$695,860.00	Road Construction	CN	\$8,484.80	\$2,121.20	(\$655,860.00)	\$666,466.00		
Comments: Move CN phase and UT/CN from FY 2018 to FY 2019. No MPO																	
	36124 / 1298206	Init.	SR 62	Small Structure Pipe Lining	0.34 miles E of the US 421 and SR 62 Junction	Seymour	0	STP		Bridge Construction	CN	\$96,000.00	\$24,000.00	\$120,000.00			
	36177 / 1298583	Init.	SR 250	Slide Correction	10.68 miles W of Switzerland County Line	Seymour	.1	STP		Road Construction	CN	\$1,192,568.80	\$298,142.20	\$1,490,711.00			
	37592 / 1400918	Init.	US 421	New Road Construction	From the approach of the Madison Milton Bridge to SR-56	Seymour	1.116	NHPP		Statewide Construction	CN	\$6,688,000.00	\$1,672,000.00		\$8,360,000.00		
										Statewide ROW	RW	\$768,000.00	\$192,000.00	\$960,000.00			
										Statewide Consulting	PE	\$600,032.00	\$150,008.00	\$750,040.00			
										SMFR	RW	\$192,000.00	\$48,000.00	\$240,000.00			
										SMFR	PE	\$150,008.00	\$37,502.00	\$187,510.00			
										SMFR	CN	\$1,920,000.00	\$480,000.00		\$2,400,000.00		
	38178 / 1500208	Init.	VA VARI	Bridge Inspections	Countywide Bridge Inspection and Inventory Program for Cycle Years 2018-2021	Seymour	0	STP		Local Bridge Program	PE	\$129,058.37	\$0.00		\$64,614.25	\$7,517.55	\$56,926.57
										100% Local Funds	PE	\$0.00	\$32,264.59		\$16,153.56	\$1,879.39	\$14,231.64
	39064 / 1592470	Init.	US 421	Single Location Bridge Inspection	Madison Milton Bridge over the Ohio River FY 2018/2019 - Pay to KY	Seymour	0	NHPP		Bridge Consulting	PE	\$60,000.00	\$15,000.00	\$60,000.00	\$15,000.00		
	39151 / 1600072	Init.	SR 7	HMA Overlay, Preventive Maintenance	From 0.35 miles N of SR 62 (Industrial Dr) to 1.61 miles S of SR 250	Seymour	2.822	STP		District Other Construction	CN	\$578,400.00	\$144,600.00		\$723,000.00		
	39398 / 1593046	A 01	SR 250	Bridge Deck Overlay	2.99 miles W of SR 7, over Big Camp Creek	Seymour	0	STP	\$597,120.00	Bridge Consulting	PE	\$65,600.00	\$16,400.00	\$82,000.00			
Comments: Amend PE phase in FY 2018 to the current STIP. No MPO.																	
	39398 / 1593046	A 02	SR 250	Bridge Deck Overlay	2.99 miles W of SR 7, over Big Camp Creek	Seymour	0	STP	\$515,120.00	Bridge Construction	CN	\$412,096.00	\$103,024.00			\$515,120.00	
Comments: Amend CN phase in FY 2020. No MPO.																	
	39885 / 1600495	Init.	SR 256	Bridge Deck Overlay	5.05 miles W SR-62, over Little Creek	Seymour	0	STP		Bridge Construction	CN	\$923,977.60	\$230,994.40				\$1,154,972.00
										Bridge ROW	RW	\$36,000.00	\$9,000.00			\$45,000.00	

\*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for informational purposes.  
 Des. No. 1400918

**United States Department of the Interior  
National Park Service  
Land & Water Conservation Fund**

**Detailed Listing of Grants Grouped by County**

Today's Date: 6/16/2017

Page: 15

**INDIANA - 18**

Grant ID & Element	Type	Grant Element Title	Grant Sponsor	Amount	Status	Date Approved	Exp. Date	Cong. District
<b>JASPER</b>								
268 - XXX	D	LA RUE POOL IMPROVEMENTS	RENSELAER PARK BOARD	\$21,000.00	C	1/13/1977	6/30/1979	5
355 - XXX	D	SPENCER PARK DEVELOPMENT	DEMOTTE PARK BOARD	\$192,000.00	C	4/10/1979	6/30/1984	5
385 - XXX	A	D/SPENCER PARK ACQUISITION	DEMOTTE PARK BOARD	\$16,150.00	C	2/13/1981	12/31/1985	1
438 - XXX	C	D/REMINGTON COMMUNITY PARK	REMINGTON PARK BOARD	\$100,000.00	C	2/16/1985	12/31/1989	5
<b>JASPER County Total:</b>				<b>\$329,150.00</b>		<b>County Count:</b>	<b>4</b>	
<b>JAY</b>								
187 - XXX	D	SPORTLAND PARK DEVELOPMENT	PORTLAND PARK BOARD	\$30,589.82	C	2/21/1975	12/31/1977	2
243 - XXX	D	NORTHEND PARK	PORTLAND PARK BOARD	\$23,000.00	C	2/11/1976	12/31/1978	2
<b>JAY County Total:</b>				<b>\$53,589.82</b>		<b>County Count:</b>	<b>2</b>	
<b>JEFFERSON</b>								
183 - XXX	D	CLIFTY FALLS CAMPGROUND	DEPT. OF NATURAL RESOURCES	\$191,689.22	C	2/6/1975	12/31/1977	9
218 - XXX	D	CLIFTY FALLS SERVICE AREA	DEPT. OF NATURAL RESOURCES	\$67,330.00	C	6/9/1975	12/31/1977	9
409 - XXX	R	CLIFTY FALLS STATE PARK ENTRY REHAB	DEPT. OF NATURAL RESOURCES	\$64,500.00	C	8/29/1983	9/15/1984	9
<b>Jefferson County Total:</b>				<b>\$323,519.22</b>		<b>County Count:</b>	<b>3</b>	
<b>JOHNSON</b>								
148 - XXX	C	NEW WHITELAND PARK	NEW WHITELAND PARK BOARD	\$15,000.00	C	7/13/1973	6/30/1975	6
369 - B	D	JOHNSON COUNTY PARK-PHASE I	JOHNSON COUNTY PARK BOARD	\$69,060.00	C	2/26/1980	12/31/1984	2
<b>JOHNSON County Total:</b>				<b>\$84,060.00</b>		<b>County Count:</b>	<b>2</b>	

Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA)

Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat

**Scoping Worksheet**

*Updated December 2016*

Complete the following steps to determine whether a project is within the scope of the range-wide programmatic informal consultation and identify potential project effects on either the Indiana bat or Northern long-eared bat (NLEB). This worksheet will also assist in identifying the appropriate Avoidance and Minimization Measures (AMMs) to be implemented in order to reduce effects to be discountable or insignificant (Not Likely to Adversely Affect only). The following information is needed to complete this form: project scope (including any construction methods to be used), project location, habitat characterization, completed survey results, and AMMs to be included in the project.

**STEP 1: PROGRAMMATIC SCOPE** (User’s Guide page 3-5)

*If answers to any of these questions are “yes”, the project is NOT covered by the range-wide programmatic informal consultation. Proceed no further in completing this worksheet. Refer to the User’s Guide to identify whether the project is covered by the range-wide programmatic formal consultation or whether individual consultation with the appropriate Service Field Office is necessary. If answers to all of the questions are “no”, proceed with Step 2 of this Worksheet.*

	Yes	No
1. Is the project within 0.5 mile from an Indiana bat and/or northern long-eared bat hibernaculum <b>and</b> 1) involves construction activities extending outside the existing road/rail surface, <b>or</b> 2) involves activities wholly within the existing road/rail service <sup>1</sup> but includes percussive or other activities that increase noise above existing traffic/background levels, <b>or</b> 3) is limited to the maintenance of existing facilities <b>with new ground disturbance (outside or within suitable summer habitat<sup>2</sup> or tree removal/trimming (within suitable summer habitat)?</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Will project activities result in the removal of suitable forest habitat <sup>3</sup> for bats >100 feet from existing road/rail surfaces <b>at any time of year</b> (unless summer bat Presence/Probable Absence (P/A) surveys <sup>4</sup> are negative)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Will the project clear suitable forest habitat at any distance from a road during the active season <sup>5</sup> for bats (unless summer bat P/A surveys are negative)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Will the project remove documented Indiana bat or NLEB roosting/foraging habitat <sup>6</sup> or travel corridors <sup>7</sup> (based on radio telemetry) <b>at any time of year</b> or remove trees within 0.25 miles of documented roosts <b>at any time of year</b> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>1</sup> Road surface is defined as the driving surface and shoulders (may be pavement, gravel, etc.) and rail surface is defined as the edge of the rail ballast.

<sup>2</sup> See the USFWS’s current summer survey guidance for our latest definitions of suitable habitat.

<sup>3</sup> Refer to <http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html>

<sup>4</sup> P/A summer surveys conducted within the fall swarming/spring emergence range of a documented Indiana bat hibernacula (contact local Service Field Office for appropriate **distance from hibernacula**) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

<sup>5</sup> Coordinate with the local Service Field Office for active season dates.

<sup>6</sup> Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics.

	Yes	No
5. Will the project impact a known hibernaculum, or a karst feature (e.g., sinkhole, losing stream, or spring) that could result in effects to a known hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Will the project raise the road profile above the tree canopy within 1,000 feet of known summer habitat (based on documented roosts and/or captures)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Does the project exclude tree removal activities, but involve percussives or other activities that increase noise above existing traffic/background levels within documented bat habitat?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Does the project involve slash pile burning within 0.5 miles of a hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Does the project involve new lighting that increases illumination above ambient conditions and that DOES NOT incorporate full cut-off, downward facing lights directed away from forested areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Will bridge and/or structure removal, replacement, or maintenance activities make the bridge/structure no longer suitable for roosting (when assessment shows bat colonies are known to roost under the bridge/structure)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. Will bridge and/or structure maintenance activities likely disturb bats when a maternity colony of bats is documented to be present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## STEP 2: POTENTIAL PROJECT EFFECTS

### **No Effect (NE)** (User's Guide page 5-6)

If answers to any of the criteria below are "yes" the project will have "No Effect" on the Indiana bat and/or NLEB. Stop here. Document "No Effect" on the Project Submittal Form (Appendix B of the User's Guide) and retain for your files. No coordination with the Service is required. Otherwise, proceed with this Worksheet.

Check "NA" if the project will not involve the listed activity or condition.

	Yes	No	N/A
1. Is the project outside the species' range <sup>8</sup> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Is the project inside the species range with no suitable summer habitat (must also be greater than 0.5 miles from any hibernaculum unless meeting exceptions #3, 4, and 5 listed below)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Does the project (anywhere, including within 0.5 miles of any hibernaculum) consist of non-construction activities, such as bridge/abandoned structure assessment, property inspections, development of planning and technical studies, property sales, and equipment purchases?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Are all project activities (anywhere, including within 0.5 miles of any hibernaculum) conducted completely within the existing road/rail surface and do not involve percussive or other activities that increase noise above existing traffic/background levels (e.g., road line painting)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Are all project activities (anywhere, including within 0.5 mile of hibernacula) outside suitable summer bat habitat and limited to maintenance of existing facilities (e.g., rest areas, stormwater detention basins) with no new ground disturbance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Does the project involve maintenance, alteration, or removal of a bridge/structure and the results of a bridge/abandoned structure assessment indicates no signs of bats?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The next sets of questions will step through the process for determining whether a project "May Affect, but is Not Likely to Adversely Affect" the Indiana bat and/or NLEB. AMMs may be required. If AMM's cannot be implemented, or actions "May Affect, but are Likely to Adversely Affect" either bat species, refer to the User Guide to identify whether the project is covered by the range-wide

<sup>7</sup> Documented travel corridor - for the purposes of this BA, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) tree corridors located directly between documented roosting and foraging habitat.

<sup>8</sup> See <http://ecos.fws.gov/speciesProfil>

programmatic formal consultation or whether individual consultation with the appropriate Service Field Office is necessary. Follow the appropriate instructions of the User Guide and document on the Project Submittal Form (Appendix B of the User Guide).

**May Affect, Not Likely to Adversely Affect (NLAA) - AMMs Not Required** (User's Guide page 6-7)

If answers to any of the questions below are "Yes", that component of the project "May Affect, but is Not Likely to Adversely Affect" the Indiana bat and/or NLEB and AMM's are not required for these activities. Document on the Project Submittal Form (Appendix B of the User's Guide). Proceed with this worksheet if the project includes any additional components.

Do any of the conditions below describe the project?	Yes	No	Unknown
1. Project is inside the species range and within suitable bat habitat, but with negative bat P/A summer surveys <sup>9,10</sup> (must also be greater than 0.5 miles of a hibernaculum). *If no bat surveys have been performed check "no" - presence of bats is to be assumed and AMM's will be required.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Project is within 300 feet of the existing road/rail surface and in areas that contain suitable habitat (but no documented habitat) and does not involve tree removal, but includes percussives or other activities that increase noise above existing traffic/background levels (must also be greater than 0.5 miles of a hibernaculum).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Activities are limited to slash pile burning (must also be greater than 0.5 miles of a hibernaculum).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Activities are limited to wetland or stream protection activities associated with compensatory mitigation that do not clear suitable habitat (must also be greater than 0.5 miles of a hibernaculum).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Activities (anywhere, including within 0.5 mile of hibernacula) with suitable summer bat habitat present, but limited to the maintenance of existing facilities (e.g., rest areas, stormwater detention basins) with no new ground disturbance or tree removal/trimming.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**STEP 3: AVOIDANCE AND MINIMIZATION MEASURES**

**May Affect, Not Likely to Adversely Affect - AMMs Required** (User's Guide page 7-8)

For the actions below, site-specific AMM(s) may be required to make the project NLAA for either bat species. If there is an applicable AMM, it **MUST** be implemented for the project to be eligible for use within the range-wide programmatic informal consultation. If an AMM listed below is not applicable (based on the type of action/effect), document why it is not applicable. For some projects, additional project-specific AMM(s) not listed below may be needed. If such additional AMM(s) are implemented, document them.

TREE REMOVAL	Yes	No
Will the project remove trees that are suitable maternity, roosting, foraging, or traveling habitat for Indiana Bat or NLEB? If "No", proceed to next activity. [*Note: "Trees" refers to trees that are suitable habitat for each species.]	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1. Will tree removal at any time of year occur outside 100 feet of existing road surface and greater than 0.5 mile from any hibernacula? (Note: If "yes", this action is not covered under the range-wide programmatic <u>informal</u> consultation. Proceed no further with worksheet. Refer to the User Guide to identify whether the project is covered by the range-wide programmatic <u>formal</u> consultation or whether individual consultation with the appropriate Service Field Office is necessary. If "no", proceed to question #2.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>9</sup> Refer to <http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html>

<sup>10</sup> P/A summer surveys conducted within the fall swarming/spring emergence range of a documented Indiana bat hibernacula (contact local Service Field Office for appropriate distance from hibernaculum) that result in a negative finding requires additional consultation with the local USFWS FO to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

<b>TREE REMOVAL</b>	Yes	No
2. Will documented Indiana bat and/or NLEB roosts and/or surrounding summer habitat within 0.25 miles of documented roosts (based on radio telemetry) be altered <i>at any time of year</i> ? (Note: If "yes", this action is not covered under the range-wide programmatic <u>informal</u> consultation. Proceed no further with worksheet. Refer to the User Guide to identify whether the project is covered by the range-wide programmatic <u>formal</u> consultation or whether individual consultation with the appropriate Service Field Office is necessary.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unless P/A summer surveys document that the species are not likely to be present, all of the AMMs listed below are required, as applicable (e.g., no bridge work will occur). Indicate on the Project Submittal Form which of the following tree removal AMMs will be implemented.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>TREE REMOVAL AMM 1:</b> Modify all phases/aspects of project (e.g. temporary work areas, alignments) to the extent practicable to avoid tree removal in excess of what is required to implement project safely. (Note: Tree Removal AMM 1 is an avoidance measure, the full implementation of which may not always be practicable. In those cases, projects may still be NLAA as long as Tree Removal AMM's 2, 3, and 4 are implemented.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>TREE REMOVAL AMM 2:</b> Apply time of year restrictions for tree removal when bats are not likely to be present.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>TREE REMOVAL AMM 3:</b> Ensure tree removal is limited to that specified in project plans. Install bright orange flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits. Ensure that contractors understand the clearing limits and how they are marked in the field.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>TREE REMOVAL AMM 4:</b> Avoid cutting down documented Indiana bat and NLEB roosts that are still suitable for roosting or documented foraging habitat <i>at any time of year</i> . Avoid cutting down trees within 0.25 miles of documented roosts <i>at any time of year</i> . Ensure that suitable roosts remain on the landscape rather than focusing on general forest loss.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<b>LIGHTING</b>	Yes	No
1. Will the project involve the use of lighting during construction? <i>If "No", proceed to next activity.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Will the project action install permanent lighting? <i>If "No", proceed to next activity.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If the answer to either of above is "yes", indicate on the project submittal form which lighting AMM's will be implemented.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>LIGHTING AMM 1:</b> Direct temporary lighting away from suitable habitat during construction during the active season <sup>11</sup> .	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>LIGHTING AMM 2:</b> Use downward-facing, full cut-off lens lights, and direct lighting away from suitable habitat when installing new or replacing existing permanent lights.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>BRIDGE MAINTENANCE, ALTERATION OR REMOVAL</b>	Yes	No
Does the project involve structure or bridge maintenance, removal or other alteration? <i>If "No", proceed to next activity.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unless bridge assessments or P/A surveys have occurred to document that the species are not likely to be present, the AMMs listed below will be required, as applicable. Indicate on the Project Submittal Form which of the following AMMs will be implemented.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>BRIDGE AMM 1:</b> To completely avoid direct effects to roosting bats, perform any bridge repair, retrofit, maintenance, and/or rehabilitation work during the winter hibernation period and follow Bridge AMM5. Or if during the active season, does not disturb or harass roosting bats in any way or alter roosting potential. (Note: Bridge AMM 1 is an avoidance measure for direct effects. If this cannot be applied, projects may still be NLAA as long as Bridge AMM's 2, 3, 4 and 5 are implemented.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>11</sup> Coordinate with the local Service Field Office for active season dates.

BRIDGE MAINTENANCE, ALTERATION OR REMOVAL	Yes	No
<b>BRIDGE AMM 2:</b> If construction activity is planned during the active season, perform a bridge assessment for presence of bats	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>BRIDGE AMM 3:</b> If bridge assessment for bats suggests presence of bats, ensure activity will not disturb bats. The following types of bridge work can be conducted with the presence of bats: <ul style="list-style-type: none"> <li>Above deck work that does not drill down to the underside of deck or include percussives (vibration) or noise levels above general traffic (e.g., road paving, wing-wall work, work above that does not drill down to the underside of the deck,).</li> <li>Below deck work that is conducted away from roosting bats and does not involve percussives or noise level above general traffic (e.g., some abutment, beam end, scour, or pier repair). Also, follow Lighting AMM 1.</li> </ul>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>BRIDGE AMM 4:</b> If bridge assessment for bats suggests presence of a small number of bats (5) <sup>12</sup> , Conduct bridge repair, retrofit, maintenance, and/or rehabilitation work (including activities with percussives) outside of pup season (June 1–July 31) AND in the evening while the bats are feeding, starting one hour after sunset, and ending one hour before daylight excluding the hours between 10:00 p.m. and midnight. <sup>13</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>BRIDGE AMM 5:</b> Ensure suitable roosting sites remain after any bridge work is completed. Suitable roosting sites may be incorporated into the design of a new bridge.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

STRUCTURE (ARTIFICIAL ROOSTS) MAINTENANCE, ALTERATION OR REMOVAL	Yes	No
Does the project involve any maintenance, removal, or other alteration of artificial roosts such as rest areas, offices, sheds, outbuildings, barns, and parking garages?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Unless abandoned structure assessments <sup>14</sup> have occurred to document that the species are not likely to be present, the AMMs listed below will be required, as applicable. Indicate on the Project Submittal Form which of the following AMMs will be implemented.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>STRUCTURE AMM 1:</b> If the goal of the project is to exclude bats, coordinate with the local Service Field Office and follow Acceptable Management Practices for Bat Control Activities in Structures guidance document. <sup>15</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>STRUCTURE AMM 2:</b> Perform any maintenance and/or repair work during the winter hibernation period unless a hibernating colony of bats is present.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>STRUCTURE AMM 3:</b> If maintenance and/or repair work will be performed outside of the winter hibernation period, determine if work will occur in an area with roosting bats. If there is observed bat activity (or signs of frequent bat activity), Transportation Agencies/State DOTs will conduct maintenance activity or similar structure alteration when bats are not present (e.g., foraging) or in a manner that will not disturb them.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>STRUCTURE AMM 4:</b> If roosting bats or signs of roosting bats are observed Transportation Agencies/State DOTs will avoid removing the structure. NOTE: If there are concerns about human health/safety/property, coordinate with a nuisance wildlife control officer and the local Service Field Office.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<sup>12</sup> This number is far lower than the typical maternity colony size (USFWS 2007, 2014).

<sup>13</sup> Keeley and Tuttle (1999) indicated peak night roost usage is between 10pm-midnight.

<sup>14</sup> Structure assessment for occupied buildings means a cursory inspection for bat use. For abandoned buildings a more thorough evaluation is required (See User Guide Appendix D for bridge/abandoned structure assessment guidance).

<sup>15</sup> See [https://www.whitenosesyndrome.org/sites/default/files/resource/wns\\_nwco\\_amp\\_1\\_april\\_2015\\_0.pdf](https://www.whitenosesyndrome.org/sites/default/files/resource/wns_nwco_amp_1_april_2015_0.pdf)

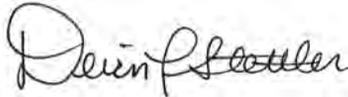
HIBERNACULA		
	Yes	No
The following AMM is required, as applicable. Indicate on the Project Submittal Form if the AMM will be implemented.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>HIBERNACULUM AMM 1:</b> For projects located within karst areas, on-site personnel will use best management practices <sup>15</sup> , secondary containment measures, or other standard spill prevention and countermeasures to avoid impacts to possible hibernacula. Where practicable, a 300 foot buffer will be employed to separate fueling areas and other major contaminant risk activities from caves, sinkholes, losing streams and springs in karst topography.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

A project that involves these activities and implements all applicable AMMs "May Affect, but is not likely to Adversely Affect" the Indiana bat and/or NLEB. With the implementation of the applicable AMMs, the project IS covered by the range-wide programmatic informal consultation. Document on the Project Submittal Form (Appendix B of the User's Guide).

Worksheet Prepared By: Michael S. Oliphant

Digitally signed by Michael S. Oliphant  
DN: cn=Michael S. Oliphant, o=United Consulting, ou,  
email=mikeo@ucindy.com, c=US  
Date: 2017.08.28 10:57:32 -0400

Name (Please print)



Worksheet Reviewed By: \_\_\_\_\_

Name (Please print)

United Consulting 8/28/17

Firm/Organization

Date

United Consulting 8/28/17

Firm/Organization

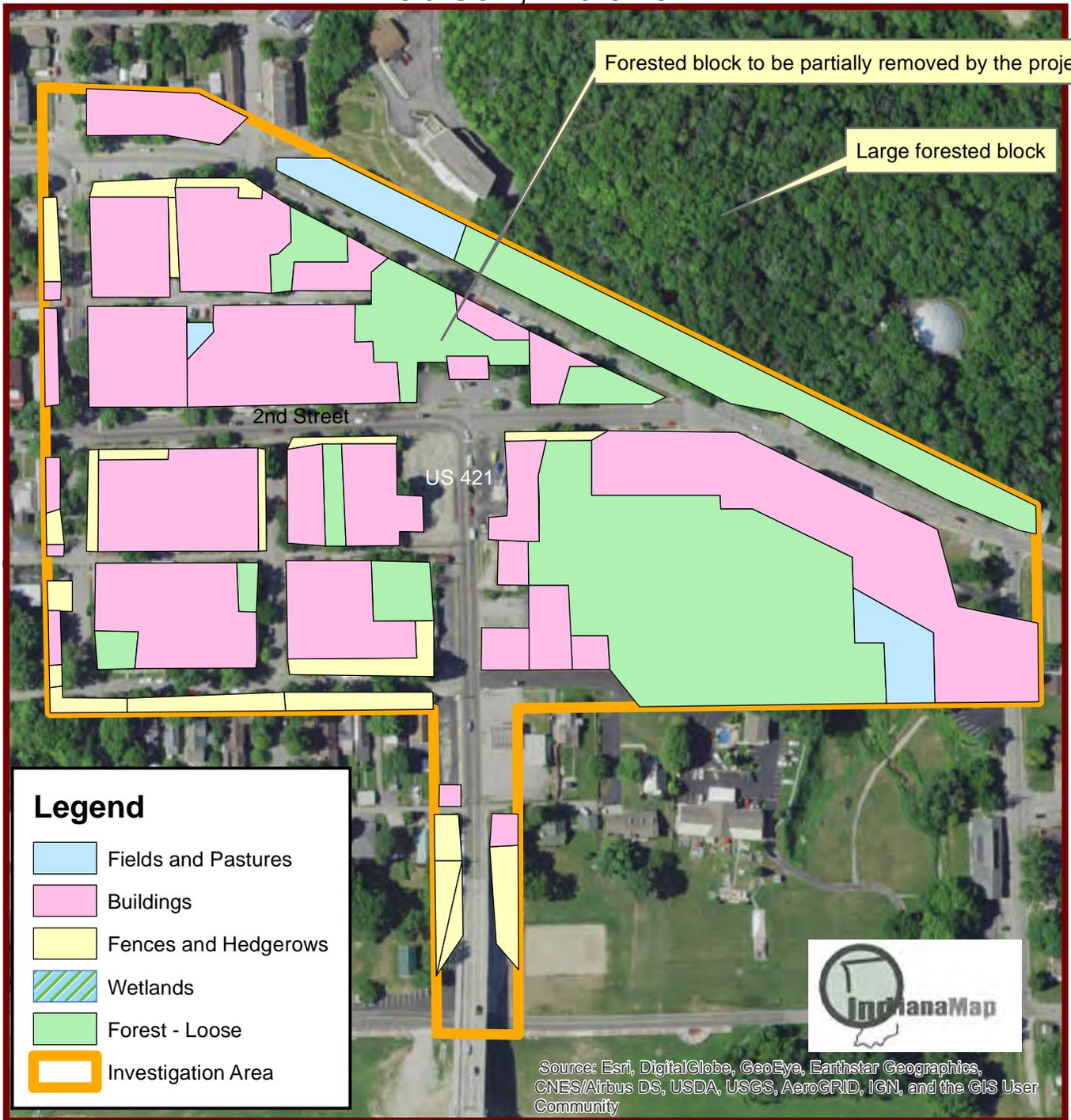
Date

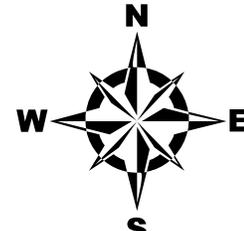
<sup>15</sup> Coordinate with the appropriate Service Field Office on recommended best management practices for karst in your state.

# Project 421

## Des. No.: 1400918

### Madison, Indiana



 <p>Des. No.: 1400918</p>	<h3>Land Cover Type Map</h3> <p>Indiana Department of Transportation Environmental Services Ecology &amp; Waterway Permitting 100 North Senate Avenue, Room N642 Indianapolis, Indiana 46204</p> <p>Additional Information</p>	 <p>J-9</p>
--	--	--

Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA)

Range-wide Programmatic Consultation for  
Indiana Bat and Northern Long-eared Bat

**Project Submittal Form**

*Updated December 2016*

If not using the Assisted Determination Key in the U.S. Fish and Wildlife Service (Service) Information for Planning and Conservation (IPaC) System, transportation agencies must provide this submittal form (or a comparable Service approved form) with provide project-level information for use of the range-wide programmatic consultation covering actions that may affect the Indiana bat and/or northern long-eared bat (NLEB). The completed form should be submitted to the appropriate Service Field Office prior to project commencement. For more information, see the Standard Operating Procedure for Site Specific Project(s) Submission in the User's Guide.

By submitting this form, the transportation agency ensures that the proposed project(s) adhere to the criteria and conditions of the range-wide programmatic consultation, as outlined in the biological assessment (BA) and biological opinion (BO). Upon submittal of this form, the appropriate Service Field Office may review the project-specific information provided and request additional information. For projects that may affect, but are not likely to adversely affect (NLAA) the Indiana bat and/or NLEB, if the applying transportation agency is **not** contacted by the Service with any questions or concerns within 14 calendar days of form submittal, it may proceed under the range-wide programmatic consultation and assume concurrence of the NLAA determination made by the Service in the BO. For projects that may affect, and are likely to adversely affect (LAA) the Indiana bat and/or the NLEB, the appropriate Service Field Office will respond (see recommended response letter template) within 30 calendar days of receiving a complete project-level submission, which includes, but may not be limited to this completed form.

Further instructions on completing the submittal form can be found by hovering your cursor over each text box.

---

1. Date:

2. Lead agency:

*This refers to the Federal governmental lead action agency initiating consultation; select FHWA, FRA or FTA as appropriate.*

3. Requesting agency:

*This refers to the transportation agency completing the form (it may or may not be the same as the Lead Agency).*

Name:

Title:

Phone:

Email:

4. Consultation code<sup>1</sup>:

5. Project name(s):

6. Project description:

*Please attach additional documentation or explanatory text if necessary*

7. Project location (county, state):

*If not delineated in IPaC, attach shape files*

8. For species **other than Indiana bat and NLEB** (from IPaC official species list):

No effect – project(s) are inside the range, but no suitable habitat (see additional information attached).

May affect – see additional information provided for those species (see attached or forthcoming).

**Please confirm and identify how the proposed project(s) adhere to the criteria of the BO by completing the following (see User Guide Section 2.0):**

<sup>1</sup> Available through IPaC System Official Species List: <https://ecos.fws.gov/ipac/>

## NO EFFECT

### 9. For Indiana bat/NLEB, if applicable, select your no effect determination:

No effect – project(s) are outside the species' range. *submittal form complete*

No effect – project(s) are inside the species range with no suitable **summer** habitat; project(s) must also be greater than 0.5 miles from any hibernaculum unless meeting exceptions listed below. *submittal form complete*

No effect – project(s) do not involve any construction activities (e.g., bridge/**abandoned structure** assessments, property inspections, planning and technical studies, property sales, property easements, and equipment purchases). *submittal form complete*

No effect – project(s) are completely within existing road/rail surface and do not involve percussive or other activities that increase noise above existing traffic/background levels (e.g., road line painting). *submittal form complete*

**No effect - project(s) are outside suitable summer bat habitat and limited to the maintenance of existing facilities (e.g., rest areas, stormwater detention basins) with no new ground disturbance.**

No effect – project(s) includes maintenance, alteration, or **removal** of bridge(s)/structure(s) and indicate(s) no signs of bats from results of a bridge/**abandoned** structure assessment. *submittal form complete*  
*Otherwise, please continue below.*

## MAY AFFECT, NOT LIKELY TO ADVERSELY EFFECT – W/O AMMS

### 10. For Indiana bat/NLEB, if applicable, select your may affect, NLAA determination (without implementation of AMMs):

NLAA – project(s) are inside the species range and within suitable bat habitat, but **negative** bat presence/absence (P/A) surveys; must also be greater than 0.5 miles from any hibernaculum. *submittal form complete*

**NLAA – project(s) are within 300 feet of the existing road/rail surface and in area that contain suitable habitat (but no documented habitat) that do not involve tree removal, but include percussives or other activities that increase noise above existing traffic/background levels (must also be greater than 0.5 miles of a hibernaculum).** *submittal form complete*

NLAA – project(s) are limited to slash pile burning (**must also be greater than 0.5 miles from any hibernaculum**). *submittal form complete*

NLAA – project(s) are limited to wetland or stream protection activities associated

with compensatory wetland mitigation that do not clear suitable habitat (**must also be greater than 0.5 miles from any hibernaculum**). *submittal form complete*

NLAA – project(s) *anywhere*, including within 0.5 mile of hibernacula, with suitable summer bat habitat present that are limited to the maintenance of existing facilities (e.g., rest areas, stormwater detention basins) with no new ground disturbance or tree removal/trimming. *submittal form complete*

*Otherwise, please continue below.*

## MAY EFFECT, NOT LIKELY TO ADVERSELY AFFECT – WITH AMMs

11. For Indiana bat/NLEB, if applicable, document your may affect, NLAA determination by completing the following section (**with implementation of AMMs**; use #13 to document AMMs).

Affected Resource/Habitat Type:

a. Trees

Verify that all tree removal occurs greater than 0.5 mile from any hibernaculum

Verify that the project is within 100 feet of existing road/rail surfaces

Verify that no documented Indiana bat and/or NLEB roosts and/or surrounding summer habitat within 0.25 mile of documented roosts will be impacted

Verify that all tree removal will occur outside the active season (i.e., will occur in winter)<sup>2</sup>:

Acres of trees proposed for removal:

b. Bridge/Structure Work Projects

Proposed work:

Timing of work:

Evidence of bat activity on/in bridge/structure? Yes:            No:

Verify that work will be conducted outside the active season, or if during the active season, verify that no roosting bats will be harmed or disturbed in any way

Verify that work will not alter roosting potential in any way

<sup>2</sup> Coordinate with the local Service Field Office for appropriate dates

Verify that all applicable lighting minimization measures will be implemented

MAY AFFECT, LIKELY TO ADVERSELY AFFECT

12. For Indiana bat/NLEB, if applicable, document your may affect, LAA determination by completing the following section (use #13 to document AMMs).

Affected Resource/Habitat Type:

a. Trees

Verify that all tree removal occurs greater than 0.5 mile from any hibernaculum

Project Location:

0-100 feet from edge of existing road/rail surface

100-300 feet from edge of existing road/rail surface

Verify that no documented Indiana bat roosts or surrounding summer habitat within 0.25 mile of documented roosts will be impacted between May 1 and July 31

Verify that no documented NLEB roosts or surrounding summer habitat within 150 feet of documented roosts will be impacted between June 1 and July 31

Timing of tree removal:

Acres of trees proposed for removal:

b. Bridge/Structure Work Projects

Proposed work:

Timing of work:

Verify no signs of a colony

Verify that work will not alter roosting potential in any way

13. For Indiana bat/NLEB, **if applicable to the action type**, the following AMMs will be implemented<sup>3</sup> unless P/A surveys and/or bridge/**abandoned** structure assessments<sup>4</sup> **have occurred to** document that the species are not likely to be present:

General AMM 1 (required for all projects):

<sup>3</sup> See AMMs Fact Sheet (Appendix C) for more information on AMMs

<sup>4</sup> Structure assessment for occupied buildings means a cursory inspection for bat use. For abandoned buildings a more thorough evaluation is required (See User Guide Appendix D for bridge/abandoned structure assessment guidance).

Tree Removal AMM 1  
Tree Removal AMM 2 (required for NLAA)  
Tree Removal AMM 3 (required for all projects)  
Tree Removal AMM 4 (required for NLAA)  
Tree Removal AMM 5 (required for LAA)  
Tree Removal AMM 6 (required for LAA)  
Tree Removal AMM 7 (required for LAA)

Bridge AMM 1  
Bridge AMM 2 (required for all projects during active season)  
Bridge AMM 3 (required for NLAA during active season)  
Bridge AMM 4 (required for NLAA during active season)  
Bridge AMM 5 (required for all projects)

Structure AMMs are required for all Indiana bat projects, required for NLAA NLEB projects.

Structure AMM 1  
Structure AMM 2  
Structure AMM 3  
Structure AMM 4

Lighting AMM 1 (required for all projects during the active season)  
Lighting AMM 2 (required for all projects)

Hibernacula AMM 1 (required for all projects)

14. For Indiana bat, if applicable, compensatory mitigation measures will also be required to offset adverse effects on the species (see Section 2.10 of the BA). Please verify the mechanism in which compensatory mitigation will be implemented and that sufficient information is provided to the Service.

Range-wide In-Lieu Fee Program, The Conservation Fund

State, Regional, Recovery Unit-Specific In-Lieu Fee Program

Name:

Conservation Bank

Name:

Location:

Local Conservation Site(s)

Name:

Location:

Description:



# US 421 New Road Construction

Des. No. 1400918

City of Madison

Jefferson County, Indiana

Indiana Department of Transportation

## Alternatives Analysis Report

---

### Analysis Summary

March 2016



8790 Purdue Road  
Indianapolis, IN 46268

# Table of Contents

---

## Contents

1.0	Introduction.....	1
1.1	Project Description.....	1
1.2	Existing Conditions.....	2
1.2.1	Roadways.....	2
1.2.2	Intersections.....	3
1.3	Purpose and Need.....	4
1.4	Alternatives.....	4
2.0	Selection of Preferred Alternative.....	5
2.1	Methodology.....	5
2.1.1	Traffic Data and Forecasts.....	6
2.1.2	Safety Analysis.....	6
2.1.3	Operational Analysis.....	6
2.2	Preliminary Alternatives.....	6
2.2.1	No-Build.....	7
2.2.2	Improved US 421 Intersections.....	7
2.2.3	Reroute US 421 along 2nd Street to Jefferson Street.....	8
2.2.4	Signalized T-Intersection with SR-56 Intersecting US 421.....	9
2.2.5	Signalized T-Intersection with US 421 Intersecting SR-56.....	10
2.2.6	Four-Leg Two-Way Stop-Control Intersection at 2nd St. & Harrison St.....	11
2.2.7	Four-Leg Signalized Intersection at 2nd St. & Harrison St.....	12
2.2.8	Single-Quadrant Interchange.....	13
2.2.9	Roundabout at SR-56 and Ferry Street.....	14
2.2.10	US 421 Bridge Over 2nd Street, Direct Connection to Main Street.....	15
2.2.11	US 421 Bridge Over 2nd Street, Direct Connection to Main Street with Traffic Signal.....	16
2.3	Preliminary Alternatives.....	16
2.3.1	Safety Analysis.....	16
2.3.2	Operational Analysis.....	20
2.4	Preliminary Alternative Screening.....	26
3.0	Secondary Alternative Screening.....	27
3.1	Environmental Consideration.....	27
3.1.1	Waterways.....	27
3.1.2	Hazardous Materials.....	27
3.1.3	Cultural Resources.....	28
3.1.4	Noise Pollution.....	28
3.1.5	Air Pollution/Emissions.....	28

3.2	Risk to Project Schedule.....	29
3.2.1	Property Acquisition.....	29
3.2.2	Resource Mitigation.....	29
3.3	Municipal Amenities.....	29
3.3.1	Visitor Parking.....	29
3.3.2	Aesthetics.....	30
3.3.3	Green-Space Areas.....	30
3.3.4	Visitor’s Center.....	30
3.3.5	Pedestrian Access.....	30
3.4	Movement of Freight.....	31
3.5	Cost.....	31
3.6	Secondary Analysis Evaluation.....	32
4.0	Summary and Recommendations.....	33

## Appendices

Appendix A – Conceptual Alternative Layouts

Appendix B – Traffic Volumes

Appendix C – VISSIM Operations Analysis

Appendix D – HSM Crash Analysis

Appendix E – Cultural Resources Information

## List of Figures

Figure 1 - Project Location.....	1
Figure 2 - Study Area Intersections.....	5
Figure 3 - Improved US 421 Intersections.....	7
Figure 4 - Reroute US 421 along 2nd Street to Jefferson Street.....	8
Figure 5 - Signalized T-Intersection with SR-56 Intersecting US 421.....	9
Figure 6 - Signalized T-Intersection with US 421 Intersecting SR-56.....	10
Figure 7 - Four-Leg Intersection at 2nd St. & Harrison St.....	12
Figure 8 - Single-Quadrant Interchange.....	13
Figure 9 - Roundabout at SR-56 and Ferry Street.....	14
Figure 10 - US 421 Bridge Over 2nd Street, Direct Connection to Main Street.....	15
Figure 11 - Preliminary Screening Evaluation Matrix.....	26
Figure 12 - Symbology Definition.....	32
Figure 13 - Secondary Analysis Evaluation Matrix.....	32

## List of Tables

Table 1 - Existing Facility Information.....	2
Table 2 - Crash Severity Summary January 2012 - September 2015.....	16
Table 3 - Crash Type Summary.....	17
Table 4 - Calibration of HSM Predictive Models.....	18
Table 5 - HSM Predictive Model Results.....	19
Table 6 - Traffic Information Summary.....	20
Table 7 - 2015 Existing Conditions.....	21
Table 8 - US 421 Corridor Travel Time Summary.....	22
Table 9 - 2040 Mainline Operational Analysis Summary.....	23
Table 10 - Local Street Operational Analysis Summary.....	24
Table 11 - Accommodating Increased Demand.....	25
Table 12 - Cultural Resource Property Impacts.....	28
Table 13 - Conceptual Cost Estimate.....	31

## 1.0 Introduction

This report documents the analysis and selection process for a proposed realigned Indiana approach to the US 421 Milton-Madison Bridge in Jefferson County. Originally comprised of one project to complete the bridge and both bridge approaches, accelerated deterioration of the bridge required the project be broken into three pieces to allow the bridge portion of the project to be completed faster in order to keep this vital Ohio River crossing open.

The Milton-Madison Bridge Study project was completed in April 2014. The current project is the Indiana approach portion of the original Milton-Madison project.

## 1.1 Project Description

The proposed project is located within Jefferson County, Indiana, in the City of Madison and located through a portion of the Madison National Historic Landmark Historic District and the Madison National Register Historic District. The proposed corridor improvements, located on the Indiana border of the Ohio River, are immediately adjacent to the Milton-Madison Bridge, providing approach access from the north. The limits of the study area begin at the northern approach to the Milton-Madison Bridge and extend to the intersection of Jefferson Street and Main Street as seen in Figure 1. The limits of the project area begin at the northern approach to the Milton-Madison Bridge and extend to the intersection of Baltimore Street and Main Street.

The current alignment routes nearly 11,500 vehicles through a series of 90-degree turns in a mixed commercial and residential neighborhood, causing traffic congestion, safety concerns, and negative environmental impacts. The congestion and environmental pollution is heightened due to the large volume of truck traffic, nearly 8% of the traffic volume. Those trucks are forced to idle at the intersections waiting for clear gaps in oncoming traffic because the trucks are required to complete turns outside of their lane due to inadequate turning radii at intersections.

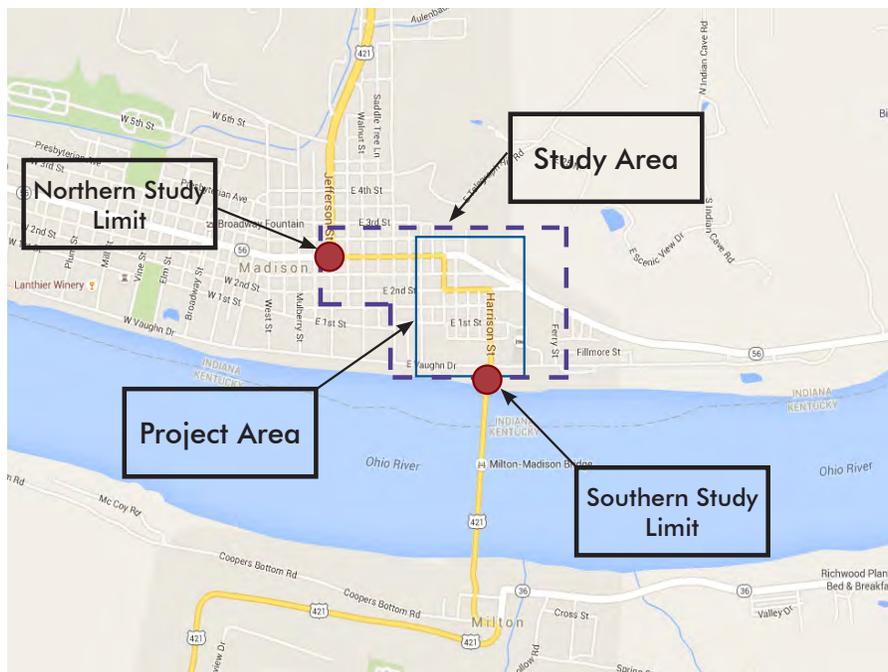


Figure 1 - Project Location

The proposed project will analyze alternatives (including the No-build or Do Nothing alternative) that will seek to improve mobility and safety through the corridor while minimizing impacts to the adjacent local road network and reducing environmental impacts from idling and braking vehicles. The project will also seek to support opportunities for economic development through enhanced pedestrian network connectivity. **FIGURE 1** shows the project area in relation to Madison, Indiana and Milton, KY.

## 1.2 Existing Conditions

### 1.2.1 Roadways

The proposed project will directly impact several state and local roads. **Table 1** summarizes existing roadway information within the study area. The study area extends from St. Michaels Ave. on the west to Ferry St. on the east and Vaughn Dr. on the south end to Main St. on the north. The study area also includes the intersection of Main Street and Jefferson Street to make sure the existing traffic signal is not adversely affected.

*Table 1 - Existing Facility Information*

Facility	Functional Classification	No. of Primary Lanes	2015 ADT	Speed Limit
US 421	Principal Arterial	2 (4 west of Baltimore)	11,458	30 mph
SR-56	Principal Arterial	2	3,582	30 mph
2nd Street	Minor Arterial	2	1,663	30 mph
Vaughn Drive	Major Collector	2	948	30 mph
All other project area roads	Local Street	2	41 - 655	25/30 mph

**US 421** – US 421 is listed as a MAP-21 National Highway System (NHS) Principal Arterial by the Federal Highway Administration (FHWA). It travels north-south, connecting Michigan City, Indiana to Wilmington, North Carolina. Through the project area, the speed limit is 30 mph. From the Milton-Madison Bridge to the intersection of Main Street and Baltimore Street, there is one twelve-foot lane in each direction of travel. The segments along 2nd Street and Baltimore Street are 32 feet wide (not including curb and gutter) to allow on-street parking. US 421 west of the Main Street/Baltimore Street intersection has two 12-foot lanes in each direction and an 8-foot parking lane on either side of the roadway.

**Indiana SR-56** – Indiana State Road 56 in Jefferson County is listed as a MAP-21 NHS Principal Arterial by the FHWA and travels east-west from Hazleton, Indiana to Aurora, Indiana. The speed limit through the project area is 30 mph. SR-56 has one 11' travel lane in each direction with no shoulder on the north side and a narrow 4' sidewalk almost flush with the mainline pavement on the south side. SR-56 follows the same alignment as US 421 on Main Street between Jefferson Street and Baltimore Street.

**2nd Street** – Second Street (2nd) in Madison, Indiana is designated as a minor arterial by Jefferson County. Second Street travels east-west through Madison. From Baltimore Street to Harrison Street, 2nd Street is a part of US 421. The existing 32' section consists of two travel lanes with parking allowed on both sides of the street.

**Vaughn Drive** – Existing Vaughn Drive is a 22-foot wide two-lane road designated by Jefferson County as a local collector. The alignment parallels the Ohio River with a river walk trail running adjacent to the south side of the road. While Vaughn Drive is within the study area, it is grade separated from US 421 and has negligible impact to US 421 operations.

### 1.2.2 Intersections

The impacts of the proposed project to through and local traffic will be studied, including the impacts to a few major intersections. A brief description and an aerial view of each intersection is provided below.

**Main Street (US 421/SR-56) and Baltimore Street (US 421)** – This existing intersection is four-legged with stop control on the north and south Baltimore Street approaches. The northbound and southbound approaches are single lane with parallel parking allowed on both sides of the street. The eastbound approach consists of one through lane in each direction and a right-turn lane, as well as parking lanes on both sides of the street. The westbound approach has one through travel lane in each direction with a wide parking lane on the south side and a narrower parking lane on the north side of the roadway. West of Baltimore Street, Main Street becomes a four-lane road with parallel parking on both sides of the street. Highway US 421 turns west onto Main Street from the northbound Baltimore Street approach.



**Baltimore Street (US 421) and 2nd Street (US 421)** – This existing intersection is four-legged with stop control on all approaches. Highway US 421 exists on the westbound and southbound approaches. All approaches are single lane with parallel parking allowed on both sides of the street.



**2nd Street (US 421) and Harrison Street (US 421)** – This existing intersection is three-legged with stop control on the northbound approach. Highway US 421 exists on the eastbound and northbound approaches. Parallel parking is allowed on both sides of the eastbound and westbound approaches. All approaches are single lane.



**2nd Street and Sering Street/Park Avenue (SR-56)** – This existing intersection is three-legged with stop control on the eastbound approach. All approaches are single lane. The eastbound approach to the intersection has an approximate 63 degree skew and parallel parking is allowed on both sides. The north side of the east approach has a retaining wall varying in height from approximately 2-4' north of the sidewalk. This retaining wall protects utilities located in that intersection corner.

**Park Avenue (SR-56) and Ferry Street**– This existing intersection is three-legged with stop control on the northbound approach. All approaches are single lane. The northbound approach has an approximate 22 degree skew. All approaches have no curb and gutter and little to no shoulder.



### 1.3 Purpose and Need

In the mid-1990s, KYTC undertook a planning study and environmental overview to replace the Milton-Madison Bridge over the Ohio River and realign the approach roadway to enhance traffic patterns in the Madison, IN and Milton, KY communities. However, no final alternative was selected, and the existing structure was rehabilitated in 1997. In 2010, due to the critically poor condition of the structure, a plan to further rehabilitate the bridge with a superstructure replacement was developed and constructed in 2014. Due to the accelerated project schedule needed to address the structural integrity of the bridge, INDOT, through coordination with Section 106 Consulting Parties committed to enhance mobility and access to the US 421 Bridge during a subsequent roadway project. Increasing traffic patterns, including significant escalation in truck traffic has strained the operations along US 421 between the Milton-Madison Bridge and the intersection with Main Street. The need for the proposed project is due to existing operational inefficiency and mobility along the US 421 corridor and existing and projected development in the area.

The need for improvement is caused by poor geometry of the existing roadway alignment which has led to vehicle congestion. This congestion has led to a history of vehicle collisions throughout the corridor. Additionally, the poor geometry has led to increased noise and air pollution. The City of Madison, Indiana Department of Transportation, and Federal Highway Administration previously committed to improving the approach roadway conditions as part of the Milton-Madison Bridge Rehabilitation.

The purpose of the proposed project is to increase operational efficiency and traffic safety by relieving congestion at a series of 90-degree turns on US 421 between the Milton-Madison Bridge and Main Street, while reducing the environmental impacts associated with idling and braking of trucks. Additionally, the project will support opportunities for economic development in the community by managing access and enhancing pedestrian accessibility in the project area.

The purpose of the proposed project is summarized in the following four bullets:

- Enhance mobility and safety in the corridor, distinguishing between local and through traffic.
- Reduce the environmental impact of trucks through the corridor.
- Support opportunities for economic development in the community by managing access and enhancing pedestrian accessibility.
- Reduce the number of contributing historic properties impacted by US 421 vehicular traffic.

### 1.4 Alternatives

A number of possible alternatives have been developed for analysis based on their ability to meet the defined purpose and need of project. Additionally, some alternatives were developed based on input provided from members of the community during a public open house held in Madison on December 3rd, 2015. Eleven alternatives will be initially evaluated for their ability to meet the purpose of the project. Two of the alternatives are the same geometry as another alternative but utilize a different type of intersection control. The evaluation criteria will include network traffic analyses, environmental and historical impact reviews, right-of-way requirements and relative cost estimates. The eleven identified alternatives include:

- No-Build
- Reroute US 421 down 2nd St. to Jefferson St.
- Signalized T-intersection with SR-56 intersecting US 421
- Signalized T-intersection with US 421 intersecting SR-56
- Signalized 4-leg at-grade intersection at Harrison St. & 2nd St.
- Roundabout Intersection at the existing SR-56/Ferry St. intersection
- US 421 Bridge over 2nd St. connecting to Main St. with stop-control at Baltimore St.
- Improved Existing US 421 Intersections
- 4-leg at-grade intersection at Harrison St. & 2nd St. with two-way stop-control
- Single-Quadrant Interchange
- US 421 Bridge over 2nd St. connecting to Main St. and signalized at Baltimore St.

These alternatives are further described in [Section 2.2](#).

## 2.0 Selection of Preferred Alternative

### 2.1 Methodology

This process used a two-step evaluation to select the appropriate solution to the stated purpose of the project. Through discussion with INDOT, the City of Madison, and residents of the City of Madison, ten preliminary build alternatives and a no-build alternative were developed. An evaluation matrix was constructed to compare the alternatives based on mainline (US 421) operations, local traffic operations, environmental impacts, access, supporting economic development and cost.

The extent of the analysis will attempt to encompass the impacts of the proposed alternatives on the surrounding road network, as congestion on US 421 could also impact local street operations. A map of the proposed study area and intersections is provided in [Figure 2](#). Analysis of US 421 will extend from the Milton-Madison Bridge to north of the Jefferson Street/Main Street intersection. Analysis of the local road network will extend from St. Michaels Avenue on the west to Ferry Street on the east, and from Vaughn Drive on the south to Main Street on the north.



*Figure 2 - Study Area Intersections*

The analyses include the existing conditions based upon counts conducted in 2015. Future analyses will include the construction year (2020) and design year (2040). For each analysis year, the morning (AM) and evening (PM) peak hours will be analyzed.

### 2.1.1 Traffic Data and Forecasts

Traffic data used for the study was based upon counts conducted during the month of October by members of the project team. Forty-eight hour tube counts were done along US 421 and SR-56 in six locations. Those six locations were:

- On SR-56 east of the 2nd Street/SR-56 intersection;
- On SR-56 west of the 2nd Street/SR-56 intersection;
- On Main Street west of the Baltimore Street intersection;
- On 2nd Street between Baltimore Street and Clay Street;
- On Harrison Street between 1st Street and 2nd Street; and
- On Harrison Street between Filmore Alley and the Milton-Madison Bridge.

Intersection turning movement counts were taken one weekday during a 3-hour period around both the AM and PM peak hours for each study intersection in [Figure 2](#). The tube counts were used to come up with an average design hourly volume (DHV) percentage to calculate AADTs for the local streets.

The existing 2015 traffic volumes are provided in [Exhibit B1](#). [Exhibit B2](#) shows the 2020 no-build traffic volumes and [Exhibit B3](#) provides the 2040 no-build traffic volumes.

An origin-destination (O-D) matrix was developed using the existing road network and traffic counts. The O-D matrix was developed for use in reassigning traffic for the various alternatives to estimate operational changes with the changing geometries. The O-D matrix was developed in two stages: main thoroughfare corridors and local streets. The reason it was developed in two stages was because the study area network is laid out in a grid fashion and would have required complex routing in order to account for the multiple routes vehicles could travel. Instead, the US 421 and SR-56 corridors were developed using specific origin and destination locations and local street intersection origin-destination routes were created using the movement percentages for each approach. Together, one O-D matrix was created for the entire study area.

### 2.1.2 Safety Analysis

Historical crash data was compiled from several sources to analyze existing surface roads in the build and no-build scenarios. The procedures laid out in the Highway Safety Manual (HSM) were used to estimate the impacts of the various alternatives and traffic shifts associated with those alternatives. Calibration factors computed from historical crash data and HSM-predicted crash rates were used to estimate expected crash frequencies in the construction and design year scenarios.

### 2.1.3 Operational Analysis

A comprehensive operational analysis was conducted for the study area. An initial model to analyze signalized and unsignalized intersections was created using Synchro (Version 8.0.806.77) software. The Synchro model was then exported to create a microsimulation model of the entire study area using VISSIM (version 7.08). The purpose of this model was to analyze the study area as a whole in order to capture effects of mainline changes on local traffic conditions. By developing this secondary model, each element in the network would be analyzed for its impacts on the rest of the network. Results are presented to compare each alternative's performance against the others and to confirm that the preferred alternative will operate efficiently.

## 2.2 Preliminary Alternatives

Ten preliminary build alternatives and a no-build alternative were identified for evaluation in this report. They are briefly discussed below. Advantages and disadvantages for each alternative include generic factors as well as site-specific advantages and disadvantages based upon initial review of geometric, environmental and traffic impacts. The initial traffic analysis includes analysis of the forecasted traffic volumes as well as variations of the traffic demands to provide a sensitivity analysis of the project area. A summary of this sensitivity analysis is provided in the evaluation matrix in [Section 2.3](#). A plan view of each build alternative may be found in Appendix A.

### 2.2.1 No-Build

The No-Build Alternative includes all existing roads for the 2015, 2020 and 2040 scenarios, but with no geometric improvements. This alternative will serve as a baseline for comparison for build alternatives.

Advantages:

- No right-of-way needed.
- No earthwork required.

Disadvantages:

- US 421 takes traffic through an historic residential neighborhood along 2nd Street and Baltimore Street.
- Semi-trucks are unable to make turns at intersections within their lanes and the existing roadway footprint.

- Required stopping and starting of vehicles, particularly trucks, will send higher amounts of emissions into the air.
- Required stopping and starting of vehicles, particularly trucks, will continue to cause vibrations that damage nearby historic buildings.
- Long queues develop in peak hours due to multiple required stops and over-tracking by longer vehicles.
- Added noise pollution is created by the stopping and starting of large trucks.

### 2.2.2 Improved US 421 Intersections

This alternative keeps US 421 on its existing alignment but upgrades the intersections to accommodate the turning radii required for the larger semis using the corridor. Corner radii would be improved at the Main St. /Baltimore St., Baltimore St. /2nd St. and 2nd St. /Harrison St. intersections.

Advantages:

- Minimizes construction impact to historic structures and properties.
- Eliminates truck over-tracking into opposing travel lanes.
- Little earthwork required.

Disadvantages:

- Keeps US 421 on existing alignment through an historic residential neighborhood.
- US 421 traffic still required to make multiple

stops through the corridor, which slows progression

- Does not solve emission and vibration problems caused by the starting and stopping of trucks at the required stops.
- Noise pollution still created through an historic residential neighborhood by large trucks.
- Displaced homes in the northeast corner of Baltimore St. and 2nd St.



Figure 3 - Improved US 421 Intersections

### 2.2.3 Reroute US 421 along 2nd Street to Jefferson Street

In this alternative, after turning west onto 2nd Street, US 421 would continue along 2nd Street to Jefferson Street. At Jefferson Street, US 421 would turn north (right) through historic downtown Madison before rejoining the existing US 421 alignment. Existing 2nd Street is all-way stop-controlled at all intersections west of Baltimore Street.

#### Advantages:

- Minimizes construction impact to historic structures and properties at the intersection of Baltimore and 2nd Street
- Eliminates truck over-tracking into opposing travel lanes.
- Little earthwork required.

#### Disadvantages:

- 2nd Street is all-way stop-controlled from Jefferson Street to Baltimore Street, slowing progression and requiring additional stopping and starting of vehicles.
- Places US 421 traffic through a different residential neighborhood with less capacity than Main Street.
- The added required stops will increase emissions in the historic district.
- The added stopping and starting of trucks will cause additional noise and vibration.



Figure 4 - Reroute US 421 along 2nd Street to Jefferson Street

### 2.2.4 Signalized T-Intersection with SR-56 Intersecting US 421

US 421 would be at-grade at the intersection with 1st Street in this alternative. North of 1st Street, US 421 would be built up in order to bridge over 2nd Street and then would turn to connect to Main Street at the Roosevelt Street/Main Street intersection. West of where SR-56 intersects 2nd Street, SR-56 would turn to “T” into US 421. The intersection of US 421 and SR-56 would be signalized.

#### Advantages:

- Prioritizes the US 421 through movement within the corridor.
- Fewer required stops for mainline traffic.
- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.
- Reduces US 421 corridor travel times.

#### Disadvantages:

- Local 2nd Street access to US 421 is removed.
- The US 421 bridge and retaining walls would divide the Historic Landmark District and the National Register Historic District.
- Displaced historic homes and businesses north of 2nd Street and east of Harrison St.
- Loss of access to US 421 from properties along Harrison St. between 1st & 2nd St.
- Significant grade required to bridge 2nd Street, which will not decrease emissions.



Figure 5 - Signalized T-Intersection with SR-56 Intersecting US 421

### 2.2.5 Signalized T-Intersection with US 421 Intersecting SR-56

Similar to the previous alternative, US 421 would be at-grade at the intersection with 1st Street. North of 1st Street, US 421 would be built up in order to bridge over 2nd Street and then would turn to intersect SR-56 between Main Street and 2nd Street, creating a "T" intersection. SR-56 would maintain its current alignment. The intersection of US 421 and SR-56 would be signalized.

#### Advantages:

- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- Fewer required stops for mainline traffic.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.
- Reduces US 421 corridor travel times.

#### Disadvantages:

- Local 2nd Street access to US 421 is removed.
- The US 421 bridge and retaining walls would divide the Historic Landmark District.
- More difficult to prioritize the US 421 through movement than the previous alternative.
- Displaced historic homes and businesses north of 2nd Street.
- Loss of access to US 421 from properties along Harrison St. between 1st & 2nd St.
- Significant grade required to bridge 2nd Street, which will not decrease emissions.



Figure 6 - Signalized T-Intersection with US 421 Intersecting SR-56

### 2.2.6 Four-Leg Two-Way Stop-Control Intersection at 2nd St. & Harrison St.

For this alternative, US 421 would be at-grade at the intersection with 1st Street and 2nd Street. North of 2nd Street, US 421 would cut through the hillside as it turns to connect to Main Street at the Roosevelt Street/Main Street intersection. The four-leg intersection would be stop-controlled on the east and west approaches.

#### Advantages:

- Prioritizes the US 421 through movement through the corridor.
- No required stops for mainline traffic until Walnut Street.
- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.
- Reduces US 421 corridor travel times.
- Maintains connectivity to the local street network.
- Less visual impact to the historic district than a bridge option.
- Maintains access to properties along Harrison Street.

#### Disadvantages:

- Displaced historic homes and businesses north of 2nd Street.
- SR-56 traffic shifted onto 2nd Street east of Harrison Street.
- Significant excavation into the hillside required to tie in the roadway at Roosevelt St. and 2nd Street.
- Retaining wall needed for cutting into the hillside.



*Figure 7 - Four-Leg Intersection at 2nd St. & Harrison St.*

### 2.2.7 Four-Leg Signalized Intersection at 2nd St. & Harrison St.

Utilizing the same geometrics as the previous alternative, US 421 would be at-grade at the intersection with 1st Street and 2nd Street. North of 2nd Street, US 421 would cut through the hillside as it turns to connect to Main Street at the Roosevelt Street/Main Street intersection. Unlike the previous alternative, the four-leg intersection would be signal-controlled.

#### Advantages:

- Prioritizes the US 421 through movement through the corridor.
- Fewer required stops for mainline traffic.
- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.
- Reduces US 421 corridor travel times.
- Maintains connectivity to the local street network.
- Less visual impact to the historic district than a bridge option.
- Maintains access to properties along Harrison Street.

#### Disadvantages:

- Displaced historic homes and businesses north of 2nd Street.
- SR-56 traffic shifted onto 2nd Street east of Harrison Street.
- Significant excavation into the hillside required to tie in the roadway at Roosevelt St. and 2nd Street.
- Retaining wall needed for cutting into the hillside.

### 2.2.8 Single-Quadrant Interchange

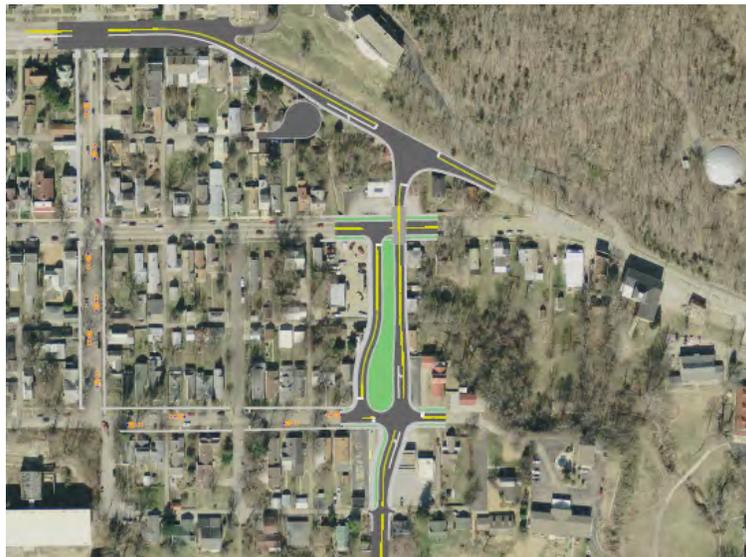
This alternative includes many of the same elements as the Signalized T-Intersection with US 421 Intersecting SR-56 alternative except that the similar elements are shifted to the east enough to maintain the current Harrison Street roadway. Starting at the Filmore Alley, US 421 would shift east and be at-grade at the intersection with 1st Street. North of 1st Street, US 421 would be built up in order to bridge over 2nd Street and then would turn to intersect SR-56 between Main Street and 2nd Street, creating a “T” intersection. SR-56 would maintain its current alignment. The intersection of US 421 and SR-56 would be signalized. Meanwhile, Harrison Street would shift west south of the Adams Alley and intersect 1st Street just west of the new US 421/1st Street intersection.

#### Advantages:

- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- Fewer required stops for mainline traffic.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.
- Reduces US 421 corridor travel times.
- Maintains local street connectivity.

#### Disadvantages:

- The US 421 bridge and retaining walls would divide the Historic Landmark District.
- More difficult to prioritize the US 421 through movement.
- Displaced historic homes and businesses north of 2nd Street and on either side of Harrison Street.
- Large roadway footprint required.
- Significant grade required to bridge 2nd Street, which will not decrease emissions.
- Creates a modern feel that would not keep with the historic nature of the area.



*Figure 8 - Single-Quadrant Interchange*

### 2.2.9 Roundabout at SR-56 and Ferry Street

An idea that routes US 421 further east around more of the Historic Landmark District, this alternative turns US 421 east starting at the end of the Milton-Madison Bridge approach. US 421 will head east a little further north than the 1st Street alignment before turning northeast to tie in at the existing location of the SR-56/Ferry Street intersection. Due to the irregular intersection geometry, the intersection will be redesigned to be a single lane roundabout to better and more safely accommodate all approaches to the intersection. US 421 would then follow the existing SR-56 alignment to Main Street.

#### Advantages:

- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- No required stops for mainline traffic through the project area.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.
- Impacts to the Historic Landmark District are moved more towards the edge of the district.
- Enhanced intersection safety.

#### Disadvantages:

- The US 421 alignment would cross an area of archaeological concern.
- Further distance to travel would cause a slight increase in corridor travel times.
- Displaced historic homes and businesses east of Harrison Street, south of 2nd Street and north of Park Avenue.
- Large intersection footprint.
- Elimination of 2nd Street access to SR-56.
- Significant impact to the historic grid/plot of the area.



Figure 9 - Roundabout at SR-56 and Ferry Street

### 2.2.10 US 421 Bridge Over 2nd Street, Direct Connection to Main Street

The alignment for US 421 in this alternative is the same as in the Signalized T-Intersection with SR-56 Intersecting US 421 alternative. US 421 would be at-grade at the intersection with 1st Street. North of 1st Street, US 421 would be built up in order to bridge over 2nd Street and then would turn to connect to Main Street at the Roosevelt Street/Main Street intersection. SR-56 would turn west at the existing SR-56/2nd Street intersection and follow 2nd Street to Baltimore St. At Baltimore St., SR-56 would turn north and intersect US 421 at Main Street. The intersection of US 421 and SR-56 at Main Street and Baltimore Street would be stop-controlled on the northbound and southbound approaches.

#### Advantages:

- Prioritizes the US 421 through movement through the corridor.
- Removes required stops for mainline traffic until Walnut Street.
- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.
- Reduces US 421 corridor travel times.

#### Disadvantages:

- Local 2nd Street access to US 421 is removed.
- The US 421 bridge and retaining walls would divide the Historic Landmark District.
- Displaced historic homes and businesses north of 2nd Street.
- Loss of access to US 421 from properties along Harrison St. between 1st & 2nd St.
- Significant grade required to bridge 2nd Street, which will add emissions.
- SR-56 traffic rerouted onto previous US 421 alignment through a residential neighborhood.



*Figure 10 - US 421 Bridge Over 2nd Street, Direct Connection to Main Street*

### 2.2.11 US 421 Bridge Over 2nd Street, Direct Connection to Main Street with Traffic Signal

This alternative is the same as the previous alternative as far as geometry. The only difference is the intersection of US 421 and SR-56 at Main Street and Baltimore Street would be signalized.

**Advantages:**

- Prioritizes the US 421 through movement through the corridor.
- Requires fewer stops for mainline traffic.
- Removes US 421 traffic from the historic residential neighborhood on Baltimore and 2nd Streets.
- Eliminates truck over-tracking into opposing travel lanes.
- Reduces emissions from less starting and stopping of vehicles.
- Reduces noise from less starting and stopping of vehicles.

- Reduces US 421 corridor travel times.

**Disadvantages:**

- Local 2nd Street access to US 421 is removed.
- The US 421 bridge and retaining walls would divide the Historic Landmark District.
- Displaced historic homes and businesses north of 2nd Street.
- Loss of access to US 421 from properties along Harrison St. between 1st & 2nd St.
- Significant grade required to bridge 2nd Street, which will add emissions.
- SR-56 traffic rerouted onto previous US 421 alignment through a residential neighborhood.

## 2.3 Preliminary Alternatives

Enhanced corridor mobility and safety were the two highest rated project goals based on discussions with local and state leaders. To make sure those goals are met, safety and operational analyses were conducted for each of the alternatives. Highway Safety Manual (HSM) procedures were used for the safety analyses. Synchro and VISSIM software was utilized to conduct the operational analyses.

### 2.3.1 Safety Analysis

A safety analysis was conducted to evaluate the proposed alternatives' effects on safety along the existing and proposed US 421 and SR-56 corridors. This analysis included a review of historic crashes as well as a comparison of the alternatives for safety performance.

#### 2.3.1.1 Existing Crash History

Historic crash data were reviewed along US 421 and SR-56 in the study area. The crash data were provided by INDOT. Between January 2012 and September 2015, 31 crashes were reported within the study area along US 421 and/or SR-56. A breakdown of the crashes by type and location is provided in [Table 2](#). No fatalities were reported in the study area during the time period being analyzed.

It should be noted that during the crash data period analyzed, construction was taking place on the Milton-Madison Bridge. The construction activities may have affected the number of crashes that occurred in two ways. The impact may have been positive as construction activities could have discouraged motorists from traveling through the corridor and, with lower traffic volumes, fewer crashes may have occurred. Conversely, construction activities and traffic pattern changes through the construction zone may have caused driver confusion, resulting in an increased number of crashes than normal.

*Table 2 - Crash Severity Summary January 2012 - September 2015*

Location	Off-Road			Side Swipe			Side Swipe			Right Angle / Turning			Other / Unknown			Total
	PD	PI	F	PD	PI	F	PD	PI	F	PD	PI	F	PD	PI	F	
US 421	4	0	0	4	2	0	2	1	0	8	2	0	1	0	0	24
SR-56	3	1	0	2	0	0	0	0	0	1	0	0	0	0	0	7
Total	7	1	0	6	2	0	2	1	0	9	2	0	1	0	0	31
Percentage	26%			26%			10%			35%			3%			100%

PD = Property Damage  
PI = Personal Injury  
F = Fatality

The data show that approximately 77% of the crashes occur along US 421. The higher crash frequency on US 421 is likely due to the higher traffic volumes as compared to SR-56 and the queuing that currently occurs during peak hours on US 421.

The predominant type of crash was right angle/turning at 35%. Other common crash types were off-road and rear-end at 26% each. Based on the primary cause reported for these crashes, some analysis can be made on the crashes that were observed.

- Right angle and turning crashes occurred primarily on US 421. The common factor cited for the crash was “failure to yield the right-of-way”. Some of these crashes may be due to drivers trying to maneuver through gaps too small in heavy opposing traffic.
- Rear-end crashes commonly can be caused by congested traffic. The recurring primary factor in these crashes was “following too closely”. It is assumed most of these occurred due to driver inattentiveness in queues.
- Off-road crashes were split evenly between SR-56 and US 421. SR-56 currently has neither paved shoulder nor curb and gutter for most of the study area. The off-road crashes on SR-56 might be reduced by the addition of curb and gutter to help prevent vehicles from leaving the roadway.

A further breakdown and distribution of the historical crash types is provided in [Table 3](#). The percentages were compiled from the available data. The predominant crash types experienced on US 421 are right angle and rear-end (25%), while ran off the road crashes are the far more common crash type on SR-56 (57%).

*Table 3 - Crash Type Summary*

Type of Crash	US 421	SR-56	Total
Same Direction Sideswipe	13%	--	10%
Right Angle	25%	--	19%
Backing Crash	4%	--	3%
Rear-End	25%	29%	26%
Left Turn	17%	14%	16%
Ran Off Road	17%	57%	26%

Right-angle crashes are commonly seen where vehicles make left turns. The existing US 421 requires traffic to make numerous turns to navigate to Main Street. All of the right-angle and turning crashes on US 421 occurred at the turns in alignment. The turning crashes on SR-56 occurred at the SR-56/2nd Street intersection.

Both highways had a high percentage of rear-end crashes (25% for US 421, 29% for SR-56), which are typically seen in stopped traffic. Both highways experienced rear-end crashes at intersections experiencing a high volume of turning vehicles.

An analysis of the identified causes of crashes confirms that traffic congestion is the root cause of a majority of crashes in the study area. Sixty-one percent of crashes reported are due to vehicles following too closely or failing to yield. These causes often lead to rear-end and right-angle or turning crashes.

### 2.3.1.2 Predicted Future Crash History

The Highway Safety Manual (HSM) was used to evaluate how each alternative would impact crash frequency within the study area on US 421 and SR-56. The previously analyzed historical crash data was used to develop a local calibration factor for each highway. This was accomplished by calculating the Safety Performance Function (SPF) for urban arterials as laid out in the HSM for the existing conditions. The outputs were then compared to observed crash frequencies from 2012 – 2015. The full results of the historical crash analysis may be found in [Appendix D](#). The ratio of observed crashes to predicted crashes for each corridor was used as a calibration factor that was subsequently applied to all 2020 and 2040 scenarios. The calibration factor for each corridor may be seen in [Table 4](#).

*Table 4 - Calibration of HSM Predictive Models*

Existing Conditions	HSM Predictions			Observed Crashes per Year	Calibration Factor
	Total	FI	PDO	2012-2015	
US 421	28.47	9.761	18.709	24	0.8
SR-56	2.62	0.924	1.696	7	2.7
<b>Total</b>	31.09	10.685	20.405	31	1.0

The calibration factors were used in the no-build and build scenarios. SR-56 has experienced more crashes in recent history than is predicted, while US 421 has experienced a few less crashes than expected in the past few years. A calibration factor greater than 1.0 was used for SR-56 to account for the greater than expected number of crashes, while a calibration factor less than 1.0 was used for US 421. Any segments that reverted to local streets in a build scenario were given a calibration factor of 1.0 based on the calibration factor from [Table 4](#) for the entire study area. The results of the predictive analyses for all alternatives may be found in [Table 5](#).

*Table 5 - HSM Predictive Model Results*

Analysis Year		2020 Build	2040 Build	2040 % Change from No-Build	
Alternative	1	No-Build	8.1	10.8	
	2	Improved Existing US 421 Intersections	8.1	10.8	0.0%
	3	Reroute US 421 Down 2nd St. to Jefferson St.	9.6	12.8	18.5%
	4	SR-56 Signalized T-Intersection into US 421	7.0	9.4	-13.0%
	5	US 421 Signalized T-Intersection into SR-56	7.5	10.1	-6.5%
	6a	4-Leg TWSC Intersection at 2nd St. / Harrison St.	6.5	8.6	-20.4%
	6b	4-Leg Signalized Intersection at 2nd St. / Harrison St.	6.7	9.2	-14.8%
	7	Single Quadrant Interchange	7.6	9.9	-8.3%
	8	US 421 Roundabout at SR-56 and Ferry St.	6.7	8.3	-23.1%
	9a	US 421 Bridge Over 2nd St.; Direct Connection to Main St.	7.7	10.0	-7.4%
	9b	US 421 Bridge Over 2nd St.; Direct Connection to Main St. with Traffic Signal	8.1	10.6	-1.9%

As seen in [Table 5](#), most of the alternatives will produce a net decrease in crashes per year in the study area compared to the No-Build alternative. Reroute US 421 Down 2nd Street to Jefferson Street is the only alternative to cause a net increase in crashes per year in the project area. The reason for this increase is due to a closer proximity of fixed objects to travel lanes and more interactions with on-street parking.

The alternative with the greatest predicted reduction in crash frequency installs a roundabout at the existing SR-56/Ferry Street intersection (23.1%). It is not surprising that this alternative offers the greatest reduction in crash frequency as studies have shown that installing a roundabout reduces crashes and those that do occur are less severe. The 4-Leg Intersection with Two-Way Stop-Control (TWSC) alternative follows with a 20.4% reduction in crash frequency. The 4-Leg Signalized Intersection and SR-56 Signalized T-Intersection into US 421 alternatives present the next best reductions in crash frequency, 14.8% and 13.0%, respectively.

### 2.3.2 Operational Analysis

A detailed operational analysis was conducted for all build and no-build alternatives. The analyses were done to assess the impacts to both the mainline and local street networks. The operational analysis was also used to measure the impacts on vehicle emissions through the study area.

Traffic volumes for the operational analyses were obtained using tube and intersection counts in the study area conducted by members of the project team. The turning count volumes were used to develop design hourly volumes (DHVs) for local streets that did not have tube counts conducted. The traffic volumes and turning counts were adjusted using the INDOT adjustment factors for the corresponding weekday in October. Per direction from INDOT, an area growth rate of 1.3% per year was assumed based on regional models. A DHV percentage of 9.3% was calculated by taking the average DHV percentage for all of the tube counts conducted in the study area. The adjusted AADTs and DHVs for the study area roadways may be seen in [Table 6](#).

*Table 6 - Traffic Information Summary*

Street	2015 AADT	2040 AADT	2015 DHV	2040 DHV
Harrison Street (US 421)	9855	13612	917	1266
2nd Street (US 421)	9689	13382	902	1245
2nd Street (W. of Baltimore)	1663	2297	155	214
Baltimore Street (S. of 2nd St.)	414	572	39	54
1st Street (W. of Baltimore)	484	669	46	63
Park Ave. (SR-56)	3582	4948	334	461
Main Street (US 421)	11458	15826	1066	1472
St. Michaels Ave. (S. of Main)	252	349	24	33
Roosevelt St.	41	57	4	6
Ferry St.	615	850	58	80
Baltimore Street (N. of Main)	41	57	4	6
Vaughn Drive	948	1310	89	122
1st Street (E. of Harrison St.)	484	669	46	63
1st Street (E. of Ferry St.)	121	168	12	16
Clay Street	111	154	11	15
Main Street (W. of Jefferson)	7698	10362	716	964
Jefferson St. (N. of Main)	7970	11008	742	1024
Jefferson St. (S. of Main)	3094	4274	288	398

[https://secure.in.gov/indot/files/TrafficStatistics\\_2014\\_AADT\\_AdjustementFactors\\_06102015.pdf](https://secure.in.gov/indot/files/TrafficStatistics_2014_AADT_AdjustementFactors_06102015.pdf)

Analysis Procedure

The existing roadway network was first laid out using Synchro. Models were created with existing and future traffic volumes. Synchro was used first in order to better model signal timings for the existing traffic signals within the study area. Any alternatives developed requiring additional traffic signals were also modeled in Synchro to create appropriate signal timing plans. Once the existing conditions Synchro model was completed, it was exported so that it could be imported into VISSIM.

VISSIM was used to analyze each alternative so that the effect of individual elements to the model could be analyzed. Highway Capacity Manual (HCM) 2010 default values were used for modeling traffic behavior. An origin-destination (O-D) matrix was created for the mainline network for both AM and PM traffic volumes. This was done so that vehicle routing was more easily adjusted to how traffic patterns would change with each alternative. Once the VISSIM models were prepared, travel time and delay results were compiled in output files for use in comparing the alternatives. Existing network VISSIM runs may be found in [Appendix C](#).

Analysis Results

From meetings with state and local officials and residents, congestion had been identified as an issue in the study area. The existing conditions were modeled to confirm visual observations and to make sure no other congestion or capacity issues were noticed that had not been previously brought up. The results of the current conditions analysis are presented in [Table 7](#).

*Table 7 - 2015 Existing Conditions*

Criteria	AM	PM
Mainline Worst Intersection LOS	A	E
Mainline Worst Approach LOS	B	F
Mainline Network Delay (veh-hr)	6.3	27.3
Local Street Worst Intersection LOS	A	A
Local Street Worst Approach LOS	A	A
Northbound Travel Time (min)	2.59	5.00
Southbound Travel Time (min)	2.39	2.70

The results in [Table 7](#) confirm that congestion is present within the study area on US 421. The morning peak hour operates at acceptable levels-of-service (LOSs), but the evening peak hour operates far less efficiently at LOS E. A queue forms south of 2nd Street for northbound US 421 on Harrison Street and is portrayed by the increased travel time for northbound traffic during the PM peak (2.4 minute increase). The northbound queuing had been brought to the project team’s attention by local residents during initial public meetings. The local street network operates efficiently at LOS A for both peak hours, indicating no additional local street congestion issues exist.

Enhanced corridor mobility is one of the highest priority objectives for the project. In order to evaluate corridor mobility, vehicle travel times from the Milton-Madison Bridge to north of the Jefferson Street/Main Street intersection for both northbound and southbound traffic for each alternative were aggregated. The results of the travel time analysis are shown in [Table 8](#).

Table 8 - US 421 Corridor Travel Time Summary

		US 421 North-bound Travel Time (min)		US 421 South-bound Travel Time (min)		
Alternative			AM	PM	AM	PM
	1	No-Build	3.23	7.32	2.54	6.34
	2	Improved Existing US 421 Intersections	3.23	7.32	2.54	6.34
	3	Reroute US 421 Down 2nd St. to Jefferson St.	3.25	13.18	5.93	22.37
	4	SR-56 Signalized T-Intersection into US 421	2.06	2.39	1.98	2.27
	5	US 421 Signalized T-Intersection into SR-56	2.12	2.56	2.06	2.38
	6a	4-Leg TWSC Intersection at 2nd St. / Harrison St.	1.94	2.09	1.94	2.15
	6b	4-Leg Signalized Intersection at 2nd St. / Harrison St.	2.01	2.29	2.05	2.35
	7	Single-Quadrant Interchange	2.09	2.32	2.03	2.23
	8	US 421 Roundabout at SR-56 and Ferry St.	2.65	2.44	2.44	2.63
	9a	US 421 Bridge Over 2nd St.; Direct Connection to Main St.	2.03	7.11	1.95	2.45
	9b	US 421 Bridge Over 2nd St.; Direct Connection to Main St. with Traffic Signal	2.32	3.57	2.11	2.32

As may be expected with increased traffic and no alignment, capacity or intersection control changes, the No-Build and the Improved Existing US 421 Intersections alternatives saw increased travel time for both northbound and southbound traffic, particularly the PM peak hour. The Four-Leg Intersection with Two-Way Stop-Control (TWSC) experienced the shortest travel times for all directions and times of day. This would be expected since this alternative implements no stop control on US 421 traffic until Walnut Street. The Four-Leg Intersection with Signal Control, SR-56 Signalized T-Intersection into US 421 and Single-Quadrant Interchange alternatives followed with only a minimal addition of travel time over the previous alternatives. It is important to point out that while the roundabout alternative experiences 20-30 second longer travel times than the best performing alternative, US 421 traffic is required to travel approximately 250' further distance to get to the same point. The added distance would add 6 seconds of necessary travel time in each direction at 30 MPH compared to alternatives following the existing Harrison Street alignment.

Along with corridor travel times, intersection performance was analyzed as another mobility measure of effectiveness. The performance criteria set forth in the HCM 2010 for signalized, unsignalized and roundabout intersections were used to analyze intersection delay and provide a level-of-service (LOS) for the results of the VISSIM analyses. The mainline LOS and delay for each alternative is shown in [Table 9](#).

*Table 9 – 2040 Mainline Operational Analysis Summary*

			Worst Intersection LOS		Worst Approach LOS		Mainline Network Delay (veh-hr)	
			AM	PM	AM	PM	AM	PM
Alternative	1	No-Build	C	F	D	F	13.3	74.3
	2	Improved Existing US 421 Intersections	C	F	D	F	13.3	74.3
	3	Reroute US 421 Down 2nd St. to Jefferson St.	D	F	F	F	35.8	88.9
	4	SR-56 Signalized T-Intersection into US 421	A	B	B	F	7	21.3
	5	US 421 Signalized T-Intersection into SR-56	A	C	B	F	7.1	23.3
	6a	4-Leg TWSC Intersection at 2nd St. / Harrison St.	A	C	B	F	5.8	30.0
	6b	4-Leg Signalized Intersection at 2nd St. / Harrison St.	A	B	B	D	7	18.7
	7	Single-Quadrant Interchange	A	B	C	F	6.9	15.7
	8	US 421 Roundabout at SR-56 and Ferry St.	A	B	B	D	7.2	18.8
	9a	US 421 Bridge Over 2nd St.; Direct Connection to Main St.	C	F	E	E	10.4	115.6
	9b	US 421 Bridge Over 2nd St.; Direct Connection to Main St. with Traffic Signal	B	C	B	E	9.8	34.1

The intersection performance results in [Table 9](#) echo the results from [Table 8](#) for the No-Build and the Improved Existing US 421 Intersections alternatives that if no alignment, capacity or intersection control changes are implemented, congestion issues will worsen as traffic volumes increase. The SR-56 Signalized T-Intersection into US 421, 4-Leg Signalized Intersection, Single-Quadrant Interchange, and US 421 Roundabout at SR-56 and Ferry St. alternatives provide the best intersection LOSs along the mainline corridors. Out of those four alternatives, the 4-Leg Signalized Intersection and the US 421 Roundabout at SR-56 and Ferry St. alternatives provide a better LOS on all approaches to mainline intersections, including side street approaches. Both alternatives accrue a similar amount of total mainline network delay over the peak hours. For many of the alternatives, the lower approach LOS results occurred at mainline intersections other than the intersection between US 421 and SR-56. The intersection of Baltimore Street and Main Street commonly saw longer delays for the northbound Baltimore Street approach. This is most likely due to fewer gaps in traffic on Main Street with US 421 traffic being rerouted further east on Main Street.

While mainline network operations are a high project priority, attention to impacts to the surrounding local street network are also a priority. Queues extending back to local street intersections hinder operations for local street users. The results for local street intersection operations are found in [Table 10](#).

Table 10 - Local Street Operational Analysis Summary

			Worst Intersection LOS		Worst Approach LOS		Local Network Avg. Delay (sec. / veh.)	
			AM	PM	AM	PM	AM	PM
Alternative	1	No-Build	A	A	A	A	6.21	5.70
	2	Improved Existing US 421 Intersections	A	A	A	A	6.21	5.70
	3	Reroute US 421 Down 2nd St. to Jefferson St.	A	F	A	F	6.39	87.47
	4	SR-56 Signalized T-Intersection into US 421	A	C	A	E	5.57	10.91
	5	US 421 Signalized T-Intersection into SR-56	A	F	A	F	5.47	32.22
	6a	4-Leg TWSC Intersection at 2nd St. / Harrison St.	A	A	A	A	5.06	6.52
	6b	4-Leg Signalized Intersection at 2nd St. / Harrison St.	A	A	A	B	5.10	5.57
	7	Single-Quadrant Interchange	A	A	A	A	2.98	4.90
	8	US 421 Roundabout at SR-56 and Ferry St.	A	A	A	A	4.40	5.08
	9a	US 421 Bridge Over 2nd St.; Direct Connection to Main St.	A	E	A	F	6.20	28.55
	9b	US 421 Bridge Over 2nd St.; Direct Connection to Main St. with Traffic Signal	A	A	A	A	6.21	5.90

Many alternatives had local street intersections operating at LOS A. The alternatives that did not have acceptable intersection LOS results were Rerouting US 421 Down 2nd St. to Jefferson St., US 421 Signalized T-Intersection into SR-56 and US 421 Bridge Over 2nd St.; Direct Connection to Main Street. The Single-Quadrant Interchange had the least local network average delay, with the US 421 Roundabout at SR-56 and Ferry St. and the 4-Leg Signalized Intersection alternatives having the next lowest local network average delays, respectively.

While wanting to provide alternatives that operated acceptably to the design year, a sensitivity analysis was also done to see if the alternatives could accommodate unexpected additional growth. The results of the sensitivity analysis are shown in [Table 11](#). The simple Yes/No results are based solely on whether or not acceptable intersection LOSs were maintained.

*Table 11 - Accommodating Increased Demand*

			Mainline Accommodates Higher Demands (20% Increase)	Local Streets Accommodate Higher Demands (20% Increase)	Mainline Accommodates Higher East-West Traffic (20% Increase)
Alternative	1	No-Build	No	Yes	No
	2	Improved Existing US 421 Intersections	No	Yes	No
	3	Reroute US 421 Down 2nd St. to Jefferson St.	No	No	No
	4	SR-56 Signalized T-Intersection into US 421	Yes	No	Yes
	5	US 421 Signalized T-Intersection into SR-56	Yes	No	Yes
	6a	4-Leg TWSC Intersection at 2nd St. / Harrison St.	No	Yes	No
	6b	4-Leg Signalized Intersection at 2nd St. / Harrison St.	Yes	Yes	Yes
	7	Single-Quadrant Interchange	Yes	Yes	Yes
	8	US 421 Roundabout at SR-56 and Ferry St.	Yes	Yes	Yes
	9a	US 421 Bridge Over 2nd St.; Direct Connection to Main St.	No	No	No
	9b	US 421 Bridge Over 2nd St.; Direct Connection to Main St. with Traffic Signal	No	Yes	No

The results of the sensitivity analysis were varied and included no changes to signal timings in order to provide similar comparisons. The SR-56 Signalized T-Intersection into US 421 and the US 421 Signalized T-Intersection into SR-56 were able to accommodate additional growth on the mainline, but operations at local street intersections deteriorated. This is most likely due to a decrease in acceptable gaps for vehicles turning onto the mainline from side streets, causing queues to stretch back to local intersections. The 4-Leg Signalized Intersection, Single-Quadrant Interchange and US 421 Roundabout at SR-56 and Ferry St. alternatives were all able to accommodate the increased traffic volumes for both mainline and local street networks.

## 2.4 Preliminary Alternative Screening

The build and no-build alternatives were evaluated based on several criteria mostly pertaining to the project's purpose and need to enhance mobility and safety in the corridor. Evaluation criteria consistent with enhancing mobility and safety were included in 2040 Mainline (US 421) Operations and 2040 Local Traffic Operations sections. General assessments of environmental impacts, access, supporting economic development and project cost were used as tie-breakers to narrow down the list of alternatives to a more manageable number.

The evaluation conducted for the initial screening consisted primarily of desktop environmental/historical reviews, microscopic traffic analysis, and conceptual geometric designs. The results of the initial evaluation are shown in **Figure 11**.

	No-Build	Improved Existing US-421 Intersections	Reroute US-421 down 2nd St. to Jefferson St.	SR 56 Signalized Intersection into US 421	US 421 Signalized T-Intersection into SR 56	4-Leg TWSC Intersection at 2nd St. / Harrison St.	4-Leg Signalized Intersection at 2nd St. / Harrison St.	Single-Quadrant Interchange	Roundabout at SR 56 and Ferry St.	US 421 Bridge Over 2nd St., Direct Connection to Main St.	US 421 Bridge Over 2nd St., Direct Connection to Main St. with Traffic Signal	
2040 Mainline (US 421) Operations	US 421 Corridor Northbound Travel Time [AM/PM] (min.)	3.23 / 7.32	3.23 / 7.32	3.25 / 13.18	2.06 / 2.39	2.12 / 2.56	1.94 / 2.09	2.01 / 2.29	2.09 / 2.32	2.65 / 2.44	2.03 / 7.11	2.32 / 3.57
	US 421 Corridor Southbound Travel Time [AM/PM] (min.)	2.54 / 6.34	2.54 / 6.34	5.93 / 22.37	1.98 / 2.27	2.06 / 2.38	1.94 / 2.15	2.05 / 2.35	2.03 / 2.23	2.44 / 2.63	1.95 / 2.45	2.11 / 2.32
	Mainline Worst Intersection LOS [AM/PM]	C / F	C / F	D / F	A / B	A / C	A / C	A / B	A / B	A / B	C / F	B / C
	Mainline Worst Approach LOS [AM/PM]	D / F	D / F	F / F	B / F	B / F	B / F	B / F	C / F	B / D	E / E	B / E
	Mainline Network Delay [AM/PM] (veh-hr)	13.3 / 74.3	13.3 / 74.3	35.8 / 88.9	7.0 / 21.3	7.1 / 23.3	5.8 / 30.0	7.0 / 18.7	6.9 / 15.7	7.2 / 18.8	10.4 / 115.6	9.8 / 34.1
	Average Northbound Corridor Travel Speed [AM/PM] (mph)	14.4 / 6.4	14.4 / 6.4	14.3 / 3.5	22.0 / 18.9	21.6 / 17.9	23.2 / 21.6	22.4 / 19.7	22.0 / 19.8	17.7 / 15.8	22.2 / 6.3	19.4 / 12.6
	Average Southbound Corridor Travel Speed [AM/PM] (mph)	18.6 / 7.4	18.6 / 7.4	7.9 / 2.1	22.8 / 20.0	22.3 / 19.2	23.3 / 21.1	22.1 / 19.7	22.6 / 20.6	19.6 / 18.2	23.4 / 18.6	21.6 / 19.7
	Mainline Accommodates Higher Demands (20% increase)	No	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No
	Local Streets Accommodate Higher Demands (20% increase)	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes
	Mainline Accommodates 20% Increased East-West Thru Traffic	No	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No
	Enhance Corridor Safety	0.0%	0.0%	18.5%	-13.0%	-6.5%	-20.4%	-14.8%	-8.3%	-23.1%	-7.4%	-1.9%
	2040 Local Traffic Operations	Local Network Average Delay (seconds/veh)	6.21 / 5.70	6.21 / 5.70	6.39 / 87.47	5.57 / 10.91	5.47 / 32.22	5.06 / 6.42	5.10 / 5.57	2.98 / 4.90	4.40 / 5.08	6.20 / 28.55
Local Street Worst Intersection LOS [AM/PM]		A / A	A / A	A / F	A / C	A / F	A / A	A / A	A / A	A / A	A / E	A / A
Local Street Worst Approach LOS [AM/PM]		A / A	A / A	A / F	A / E	A / F	A / A	A / B	A / A	A / A	A / F	A / A
Wayfinding Signage Opportunities (# intersections)		4	4	3	4	4	4	4	4	5	3	3
Environmental Impacts	Contributing Properties Impacted (Res./Comm.)	0 / 0	4 / 1	4 / 2	5 / 1	4 / 1	2 / 1	2 / 1	7 / 1	6 / 4	7 / 1	7 / 1
	Non-Contributing Properties Impacted (Res./Comm.)	0 / 0	1 / 3	1 / 3	1 / 6	1 / 5	1 / 6	1 / 6	1 / 5	3 / 3	1 / 6	1 / 6
	Individually Eligible Properties Impacted (Res./Comm.)	0 / 0	0 / 0	0 / 0	0 / 2	0 / 2	0 / 1	0 / 1	0 / 3	2 / 4	0 / 2	0 / 2
	Reduced Emissions	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Noise Pollution											
	Area of Archaeological Concern	No	No	No	No	No	No	No	No	Yes	No	No
	Overall Impact to Historical District											
Access	Loss of Commercial Access to Mainline (US-421)	0	0	0	5	5	0	0	2	4	5	5
	Loss of Access to Local Streets	No	No	No	Yes	Yes	No	No	No	Yes	Yes	Yes
	Non-Motorized Vehicular Access to Businesses	0	8	8	4	4	7	7	3	6	4	4
	Commercial Access Gained to Mainline (US-421)	0	0	17	2	2	3	3	2	4	3	3
Support Economic Development	R/W Acquisition (acres)	0.00	0.34	0.28	0.93	0.63	0.92	0.92	1.12	2.21	0.64	0.64
	Complete Parcel Acquisition	0	2	1	5	5	4	4	10	9	5	5
	Excess, Non-Value Added, R/W Acquisition (acres)	0.00	0.10	0.04	0.33	0.61	0.63	0.63	1.00	2.10	0.56	0.56
	Future Land Use and Greenspace (acres)	0.00	0.25	0.17	0.51	0.61	0.74	0.74	1.30	2.47	0.50	0.50
	Increased Visibility to Commercial Buildings	0	0	19	2	2	3	3	2	6	3	3
Project Costs	Construction Cost (in millions)	\$0.00	\$2.31	\$3.53	\$6.53	\$6.45	\$5.27	\$5.47	\$6.87	\$7.03	\$6.68	\$6.87
	Right of Way Cost (in millions)	\$0.00	\$0.33	\$0.17	\$0.83	\$0.83	\$0.69	\$0.69	\$1.63	\$1.61	\$0.82	\$0.82
	Utility Relocation Costs (in millions)	\$0.00	\$0.25	\$0.25	\$1.00	\$1.00	\$1.01	\$1.01	\$1.10	\$1.00	\$1.00	\$1.00
	Total Project Costs (in millions)	\$0.00	\$2.89	\$3.95	\$8.36	\$8.28	\$6.97	\$7.17	\$9.60	\$9.64	\$8.50	\$8.69

Figure 11 - Preliminary Screening Evaluation Matrix

From the analysis results shown in **Figure 11**, it became quickly apparent that the alternatives that kept any mainline traffic on the existing route could be eliminated because traffic operation results did not meet the purpose and need of enhancing mobility eliminating alternatives 2, 3, and 9. Alternative 5 was eliminated because it did not provide supplementary benefits above better performing alternatives. Alternative 7, while providing good mobility results, was eliminated because of its lesser safety benefits, significant footprint, and overall right-of-way impact. Alternative 1, the no-build, will be carried forward as a baseline for comparison. Alternatives 4, 6, and 8 best meet the purpose and need of enhancing traffic flow and safety in the corridor and will move forward for further analysis.

### 3.0 Secondary Alternative Screening

To further evaluate the four primary alternatives, additional criteria, consistent with the project purpose and need, were outlined to enhance the alternative selection process and reflect the broader project goals and objectives. Since the reduction of environmental impacts of trucks through the corridor was such a large driver to the project initiation, both Environmental Considerations and Freight Movement became primary criteria, subdivided into measurable criteria. Additionally, factors reflecting a need to support economic development opportunities by managing access and enhance pedestrian connectivity were identified through municipal amenity and pedestrian access measures. Finally, while not a direct principle highlighted in the purpose and need, the importance of delivering the project was highlighted through Schedule Implications and Project Cost filters. These non-traffic related criteria were then evaluated by project leadership consisting of INDOT Project and Program Management, City of Madison Community Leaders and the consultant Project Team to ensure they reflected the purpose and need of the project.

### 3.1 Environmental Consideration

Because environmental considerations were included as part of the purpose and need of the project, multiple criteria were developed assessing several impacts to environmental resources. The criteria will assist in determining whether or not the purpose and need objectives in respect to environmental considerations are met. Impacts from the construction of the alternatives, as well as vehicle impacts, will be assessed in the subsequent sections.

#### 3.1.1 Waterways

The project area includes one identified waterway with three tributaries. Currently, the waterway runs through the project area in an east-west direction emanating from Harrison Street south of 2nd Street through a residential area for approximately 660 ft. and then turns to a north-south direction before outletting to the Ohio River. The waterway is fed by three tributaries all running in a general north-south direction from the bluff. A stacked stone ditch located along Roosevelt Street passes under SR 56 and continues southeast to 2nd Street where it passes through another culvert before outletting into the aforementioned waterway. A second tributary collects bluff runoff from an open ditch in a concrete culvert on the north side of SR-56 where SR-56 intersects 2nd Street. The culvert crosses under SR-56 and outlets runoff into a stacked stone ditch before outletting to the aforementioned waterway. The third tributary crosses under SR-56 on the west side of the SR-56 / Ferry St. intersection through a pipe culvert that outlets to an open ditch, which subsequently outlets to the aforementioned waterway. The Waters of the U.S. Report and Red Flag Investigation (Appendix E) provide additional details regarding the waterways.

Alternative 8 has the most impact on waterways, as it must channelize the waterway in order to cross it. Alternatives 4 and 6 both cul-de-sac the alley between Main Street and 2nd Street. The cul-de-sac construction for both alternatives would impact the stacked stone ditch that begins south of the Roosevelt Street / SR-56 intersection.

#### 3.1.2 Hazardous Materials

A red flag investigation that was conducted identified one underground storage tank (UST) and two leaking underground storage tanks within the project area. The two leaking USTs are located at 150 N. Harrison Street, and the other UST is located at 902 E. 2nd Street. See the Red Flag Investigation ([Appendix E](#)) for further information.

Alternative 8 will impact the two leaking USTs at 150 N. Harrison St. as the US 421 alignment will cut through the property, but will not impact the other UST. Alternatives 4 and 6 may not impact the leaking USTs as they only acquire a narrow section of right-of-way from the property at 150 N. Harrison St., but both alternatives will impact the UST at 902 E. 2nd St.

### 3.1.3 Cultural Resources

The project area is located in a dense urban setting with mostly historic-era residential, religious, recreational, municipal, industrial, and educational buildings and facilities. The project area includes two overlapping historic districts: the Madison Historic District and the Madison National Historic Landmark Historic District. 36 CFR 800.5(a)(1) is being utilized to evaluate, review, and advise on the potential impacts within these districts. Detailed information on this process can be found in [Appendix E](#). A summary of the contributing property impacts is shown in [Table 12](#).

*Table 12 – Cultural Resource Property Impacts*

	Contributing to NHL and NRHP, Full Impact	Contributing to NRHP, Full Impact	Contributing Impacts	R/W Acquisition, Full (properties/ acres)
Alternative 1	0	0	0	0
Alternative 4	1	1	2	6/1.64
Alternative 6	2	1	3	6/1.38
Alternative 8	5	0	5	12/3.80

The new alignment required for Alternative 8 generated the greatest number of impacts to contributing and non-contributing structures and parcels. Alternatives 4 and 6 impact the same number of structures and parcels, but Alternative 6 impacts two more contributing structures and/or parcels than Alternative 4.

### 3.1.4 Noise Pollution

The existing 90-degree turns present in Alternative 1 require multiple stops and starts for US 421 traffic. At each start and stop, trucks generate a significant amount of noise. The noise created can create vibrations that have the potential to cause damage to the nearby structures.

The three build alternatives all generate less noise pollution, due to the elimination of 90-degree alignment changes. Alternative 4 provides free flow US 421 traffic, but requires a significant grade to bridge over 2nd Street. Alternative 8 provides a reduction in noise pollution with gentle grades, but vehicles, particularly trucks, must slow to navigate the roundabout before accelerating again. Alternative 6 provides a greater reduction in noise pollution because the grade up to Main Street is less than Alternative 4, and US 421 traffic is not required to yield as in Alternative 8.

### 3.1.5 Air Pollution/Emissions

Another type of pollution created from numerous starts and stops of vehicles is air pollution from vehicle emissions. More emissions are released by vehicles accelerating from a stopped condition versus maintaining speed. The results of this criteria mirror those of the previous noise pollution section.

Alternative 1 would experience the greatest amount of emissions due to the starting and stopping of vehicles at the three stop-controlled intersections between Main Street and the Milton-Madison Bridge. Alternative 4 reduces emissions by providing a direct connection to Main Street, but a significant grade is required to bridge over 2nd Street, lessening those improvements when compared to the other build alternatives. Alternative 8 utilizes more gradual vertical grades than the other build alternatives, resulting in greater reductions to emissions, but vehicles must travel further to reach Main Street, which lessens the benefits associated with the reduced grades. Alternative 6 provides the greatest reduction in emissions by prioritizing the mainline US 421 traffic with a direct connection to Main Street and reducing the vertical grade.

## 3.2 Risk to Project Schedule

An inherent goal of every project is to maintain a consistent project development and delivery schedule. Certain elements, that may be necessary for this project, have the potential to cause significant delay during design and/or construction, increasing the risk to maintaining the project's schedule. Delays from these elements can cause inflationary cost increases during the project development timeline. The two primary elements that may impact this project's schedule are property acquisition and resource mitigation.

### 3.2.1 Property Acquisition

Most of the proposed alternatives require some property acquisition in order to improve the roadway network. As the property acquisition process takes place, any parcel or parcels that can't reach an agreement, proceed to condemnation, and add significant amounts of time to the process.

Alternative 1 would not have any schedule risk, as it does not require property acquisition. Alternative 8 would have the greatest amount of risk to the schedule because it requires acquisition from the most parcels. Alternatives 4 and 6 require a similar amount of property acquisition, which is much less than Alternative 8. The risk for Alternative 6 may be slightly higher than Alternative 4 because it requires full acquisition from more properties in the Madison National Historic Landmark District.

### 3.2.2 Resource Mitigation

Per the National Environmental Policy Act of 1970, federal agencies are required to assess the environmental impacts of their proposed actions prior to making decisions. Because this project is federally funded and all of the build alternatives will have an adverse effect, the project must seek to minimize and mitigate any impacts to cultural resources. Due to the awareness and involvement of the local community and historical precedents, the potential for significant mitigation being required exists. Minimizing impacts will be critical to reducing risks from resource mitigation during the design phase.

Alternative 1 would not require resource mitigation because the alternative is viewed as having no effect. Alternative 8, would likely result in the most significant mitigation expense, because the alignment cuts through numerous properties and will pass within the vicinity of a former cemetery. Alternative 4 will have less risk from resource mitigation than Alternative 8 because it has a smaller overall footprint, but the addition of a bridge creates a new vertical barrier in the Historic Landmark District. Alternative 6 will have the least risk of the three build alternatives because it has a smaller footprint and does not have a divisive vertical barrier.

## 3.3 Municipal Amenities

Supporting opportunities for economic development through access and pedestrian mobility is one of the project purpose and need objectives. Five criteria were developed to measure the potential opportunities created by each alternative. Those criteria were: visitor parking, aesthetics, green-space areas, opportunity for a visitor's center, and pedestrian access. Each element is examined in relation to the four alternatives below.

### 3.3.1 Visitor Parking

Madison is an entry to the state of Indiana, and the project area is located adjacent to local trail facilities and the Milton-Madison Bridge. A desire has been expressed to provide a parking location for those visiting Madison and/or for those wanting to park and take advantage of the nearby pedestrian network. It should be noted that visitor parking is not included in the scope of work. This criteria only determines if the opportunity exists, once the alternative is built.

Alternative 1 has no location available along US 421 to provide this parking. Alternatives 4 has a possibility of providing approximately 20 parking spaces on the parcels acquired east of existing Harrison Street between 1st and 2nd Streets. Alternative 8 has the possibility of providing approximately 30 parking spaces on the east side of US 421 south of 1st Street. On the east side of US 421, Alternative 6 could potentially provide approximately 40 parking spaces.

### 3.3.2 Aesthetics

The existing corridor in Alternative 1 offers no room to add any sort of aesthetic treatment within the right of way beyond what is already present to make US 421 a gateway. Alternative 4 has excess property acquisition east of US 421 that would be available for aesthetic treatments, but the roadway will be elevated above that area, so making them a prominent facility would be challenging. There would be a small opportunity to add some sort of aesthetic treatment to the bridge and/or the retaining wall in the bluff below the Hillside Inn with Alternative 4. However, the height and scale of the bridge retaining walls would require extensive enhancement to make more appealing within the districts.

Similar to Alternative 4, Alternative 6 has excess property acquisition on the east side of US 421. This land would be visible to US 421 traffic, offering a great opportunity for aesthetic treatment. The bluff and retaining wall below the Hillside Inn also offers a canvas for enhancement opportunities. Alternative 8 has a large retaining wall that, similar to Alternative 4, would be challenging to make aesthetically pleasing. The central island of the roundabout presents a highly visible location for a gateway feature. The space between the US 421 NB approach and the Ferry St. approach to the roundabout and the northeast corner of the US 421 / Harrison St. intersection offer additional locations for enhancements.

### 3.3.3 Green-Space Areas

Green-space areas have been identified during community engagement as a mechanism to beautify the entrance into Madison from Kentucky. Alternative 1 has no opportunity for green-space as the right of way is fully utilized. Alternative 4 would have green space potential along the east side of US 421, but it would not be very visible due to the bridge. Alternative 6 would have slightly more green space potential than Alternative 4; however, it would be visible to vehicle traffic. The greatest potential for green-space areas lies with Alternative 8 due to the large right of way footprint required.

### 3.3.4 Visitor's Center

With the Milton-Madison Bridge being one of the few southern entry points into Indiana, the opportunity for a visitor's center has been considered as a mechanism to welcome visitors to Madison and the state of Indiana. While the design of a visitor's center is not included in the scope of work for this project, the opportunity is being evaluated as part of the project development. Out of the four alternatives, Alternative 1 is the only alternative that does not have the potential to include a visitor's center location along the project corridor. Alternatives 4, 6 and 8 could potentially accommodate a visitor's center along the east side of existing Harrison Street.

### 3.3.5 Pedestrian Access

Existing pedestrian access along and around the US 421 corridor often does not meet current ADA standards. Intersections do not have curb ramps, and sidewalk cross slopes exceed maximums in certain locations. In all of the build alternatives, the pedestrian network would receive needed upgrades to current ADA standards, as well as the possibility for a connection to the Milton-Madison Bridge. The connection to the bridge would route bicyclists from the shared-use trail to the wide shoulder and pedestrians from the trail to the pedestrian path on the west side of the bridge. The network will accommodate both pedestrians and bicyclists within the project area, with a future connection to a larger Madison bicycle network also in the build alternatives.

The four alternatives provide opportunities for pedestrian connectivity and mobility throughout the project limits. Because of constantly moving traffic operations and novelty of configuration in Madison, alternative 8 is the least preferable alternative with respect to pedestrians. Additionally, due to the size of the primary intersection footprint, alternative 6 is slightly less desirable than alternative 4, but more preferable than alternative 8. The installation of a traffic signal will improve pedestrian performance with alternative 6. Finally, the bridge over 2nd Street provides a separation between vehicular traffic and pedestrians to provide the safest crossing. However, the bridge may create a perceived divide in the corridor for pedestrian traffic.

### 3.4 Movement of Freight

Because a significant percentage of traffic on both US 421 and SR 56 is heavy truck traffic, facilitating uncomplicated movements for truck drivers will aid in improving traffic flow along US 421 and reduce the environmental impacts associated with the current alignment. Facilitating uncomplicated truck movements is one way to address the project’s purpose and need for both minimizing the environmental impacts associated with trucks in the corridor and supporting opportunities for economic development.

Alternative 1 provides the most difficult route for trucks to follow because of the 90 degree turns and multiple stops, and therefore has no positive impact on the community. Alternative 8 shifts the alignment to the east before heading back west, adding significant distance to the overall route. Additionally, the introduction of a roundabout at Ferry Street and SR 56, while an improvement over the existing condition, is not a desirable intersection configuration for trucks. Alternatives 4 and 6 provide the most direct route to Main Street for truck traffic, with Alternative 6 being more desirable of the two because of the lesser grade to connect at Main Street.

### 3.5 Cost

Conceptual construction cost estimates for each alternative were developed and broken out into construction cost, right of way cost, and utility relocation cost. The construction costs include costs associated with mitigating adverse effects to the historical districts. A summary of the conceptual costs may be seen in [Table 13](#).

*Table 13 - Conceptual Cost Estimate*

		1	4	6	8
		No-Build	SR 56 Signalized T-Intersection into US 421	4-Leg TWSC Intersection at 2nd St. / Harrison St.	Roundabout at SR 56 and Ferry St.
Project Costs	Construction Cost (in millions)	\$ -	\$ 7.72	\$ 4.37	\$ 7.07
	Right of Way Cost (in millions)	\$ -	\$ 1.17	\$ 1.32	\$ 1.99
	Utility Relocation Costs (in millions)	\$ -	\$ 1.00	\$ 1.00	\$ 1.40
	Total Project Costs (in millions)	\$ -	\$ 9.89	\$ 6.69	\$ 10.46

The no-build alternative has the best performance for this criteria because there is no cost associated with this alternative, but it does not meet the project’s purpose and need. After the no-build, Alternative 6 has the next lowest cost of \$6.69 million, which is more than \$3 million less than both Alternatives 4 and 8. Alternatives 4 and 8 are estimated to cost \$9.89 million and \$10.46 million, respectively.

### 3.6 Secondary Analysis Evaluation

A secondary analysis of the three primary build options and the no-build option was presented in [Section 3.0](#). The analysis included quantifying environmental impacts using conceptual level configurations, determining impacts to historic properties, and analyzing opportunities to support economic development. The results of the secondary analysis are summarized in [Figure 13](#). [Figure 12](#) below defines the meaning of the symbols in [Figure 13](#).

Poor	Fair	Good	Great

Figure 12 - Symbolology Definition

		1	4	6a	8
		No-Build	SR 56 Signalized T- Intersection into US 421	4-Leg TWSC Intersection at 2nd St. / Harrison St.	Roundabout at SR 56 and Ferry St.
<b>Environmental Consideration</b>	Air Pollution/Emissions	Major	Moderate	Minor	Minor
	Noise Pollution	Major	Moderate	Minor	Minor
	Area of Archaeological Concern				
	Overall Impact to NHL				
	Overall Impact to NRHP				
<b>Risk to Schedule</b>	Property Acquisition				
	Resource Mitigation				
<b>Municipal Amenities</b>	Parking	No	Yes	Yes	Yes
	Aesthetics				
	Green-Space Areas				
	Visitor's Center	No	Yes	Yes	Yes
<b>Pedestrian Access</b>	Safe Crossing of US 421	Yes	Yes	No	No
	Safe Crossing of 2nd Street	Yes	Yes	Yes	Yes
	Safe Route for Bicycles Through Area	No	Yes	Yes	Yes
	Possibility for Connection to River Bridge	No	Yes	Yes	Yes
<b>Movement of Freight</b>	Ease of Route from M-M Bridge to Main Street				
	Number of Potential Stops	3	1	1	1

Figure 13 - Secondary Analysis Evaluation Matrix

## 4.0 Summary and Recommendations

The finding of this report is that the Indiana approach to the Milton-Madison Bridge on US 421 requires realignment. Current congestion, mobility, and air and noise pollution problems will continue and get worse as traffic volumes increase in the future. This project will enhance operational efficiency and safety through the US 421 corridor, reduce the environmental impacts of truck traffic, support opportunities for economic development, and minimize impacts to the National Historic Landmark and the National Register of Historic Places.

The preferred alternative is a four-leg intersection at the existing 2nd Street / Harrison Street intersection. The four-leg intersection meets the purpose and needs of the project in that it provides high levels of traffic operations and safety for the US 421 corridor while also seeking to minimize environmental and historic impacts to the surrounding area and historic districts. Additionally, it provides opportunities to support economic development and municipal amenities along the corridor while also providing pedestrian access. The preferred alternative also offers a lower overall project cost compared to most of the other build alternatives, providing a quality project that delivers the most benefit for the dollars spent.

# Appendix A

---

## Conceptual Alternative Layouts

- Alternative 2 – Improved US 421 Intersections
- Alternative 3 – Reroute US 421 along 2<sup>nd</sup> Street to Jefferson Street
- Alternative 4 – Signalized T-Intersection with SR-56 intersecting US 421
- Alternative 5 – Signalized T-Intersection with US 421 intersecting SR-56
- Alternative 6 – Four-Leg Intersection at 2<sup>nd</sup> Street and Harrison Street
- Alternative 7 – Single-Quadrant Interchange
- Alternative 8 – Roundabout at SR-56 and Ferry Street
- Alternative 9 – US 421 Bridge Over 2<sup>nd</sup> Street, Direct Connection to Main Street

PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 2

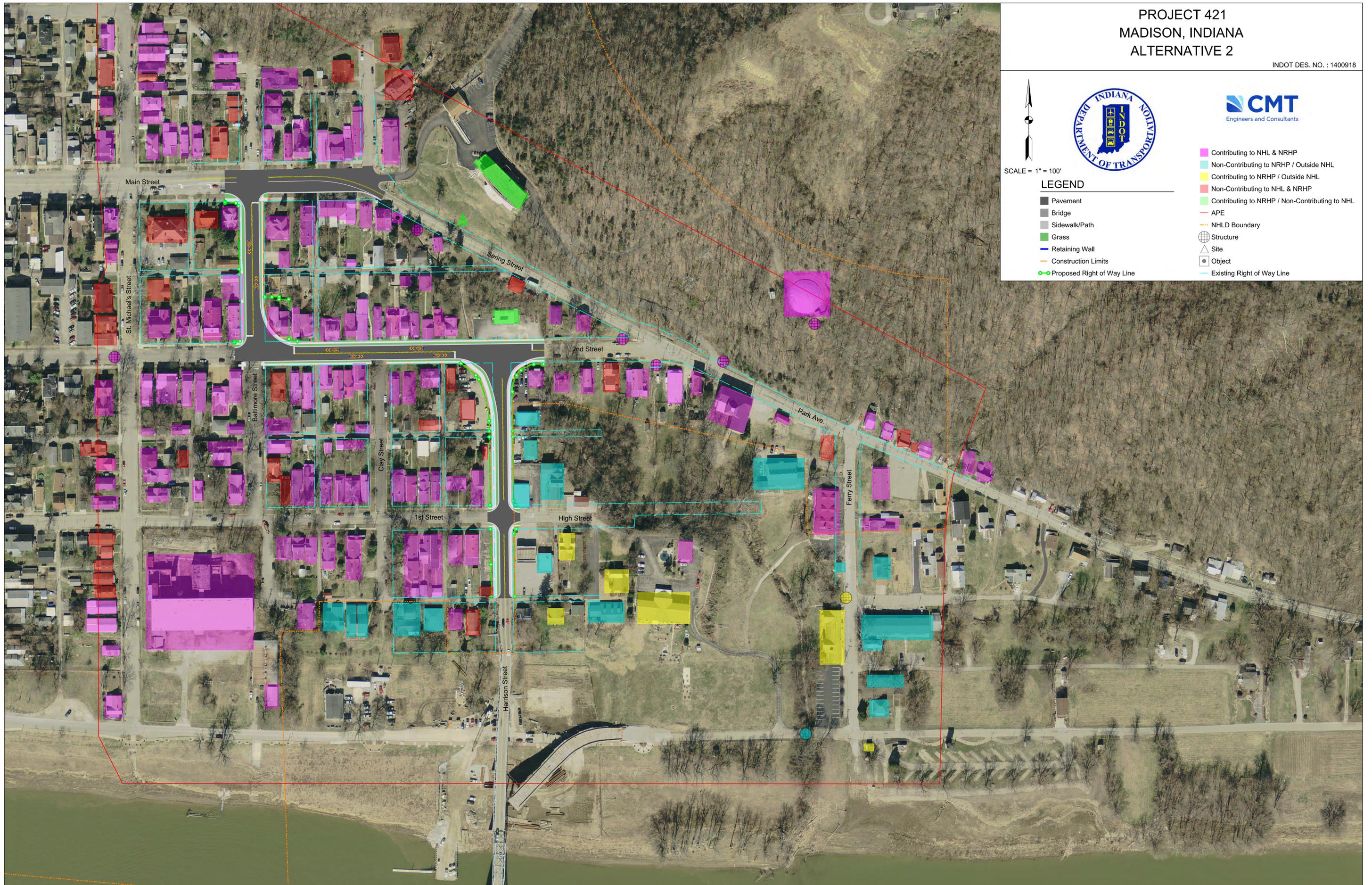
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- Pavement
- Bridge
- Sidewalk/Path
- Grass
- Retaining Wall
- Construction Limits
- Proposed Right of Way Line
- Contributing to NHL & NRHP
- Non-Contributing to NRHP / Outside NHL
- Contributing to NRHP / Outside NHL
- Non-Contributing to NHL & NRHP
- Contributing to NRHP / Non-Contributing to NHL
- APE
- NHLD Boundary
- Structure
- Site
- Object
- Existing Right of Way Line



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 3

INDOT DES. NO. : 1400918



LEGEND

- Pavement
- Bridge
- Sidewalk/Path
- Grass
- Retaining Wall
- Construction Limits
- Proposed Right of Way Line
- Contributing to NHL & NRHP
- Non-Contributing to NRHP / Outside NHL
- Contributing to NRHP / Outside NHL
- Non-Contributing to NHL & NRHP
- Contributing to NRHP / Non-Contributing to NHL
- APE
- NHLD Boundary
- Structure
- Site
- Object
- Existing Right of Way Line



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 4

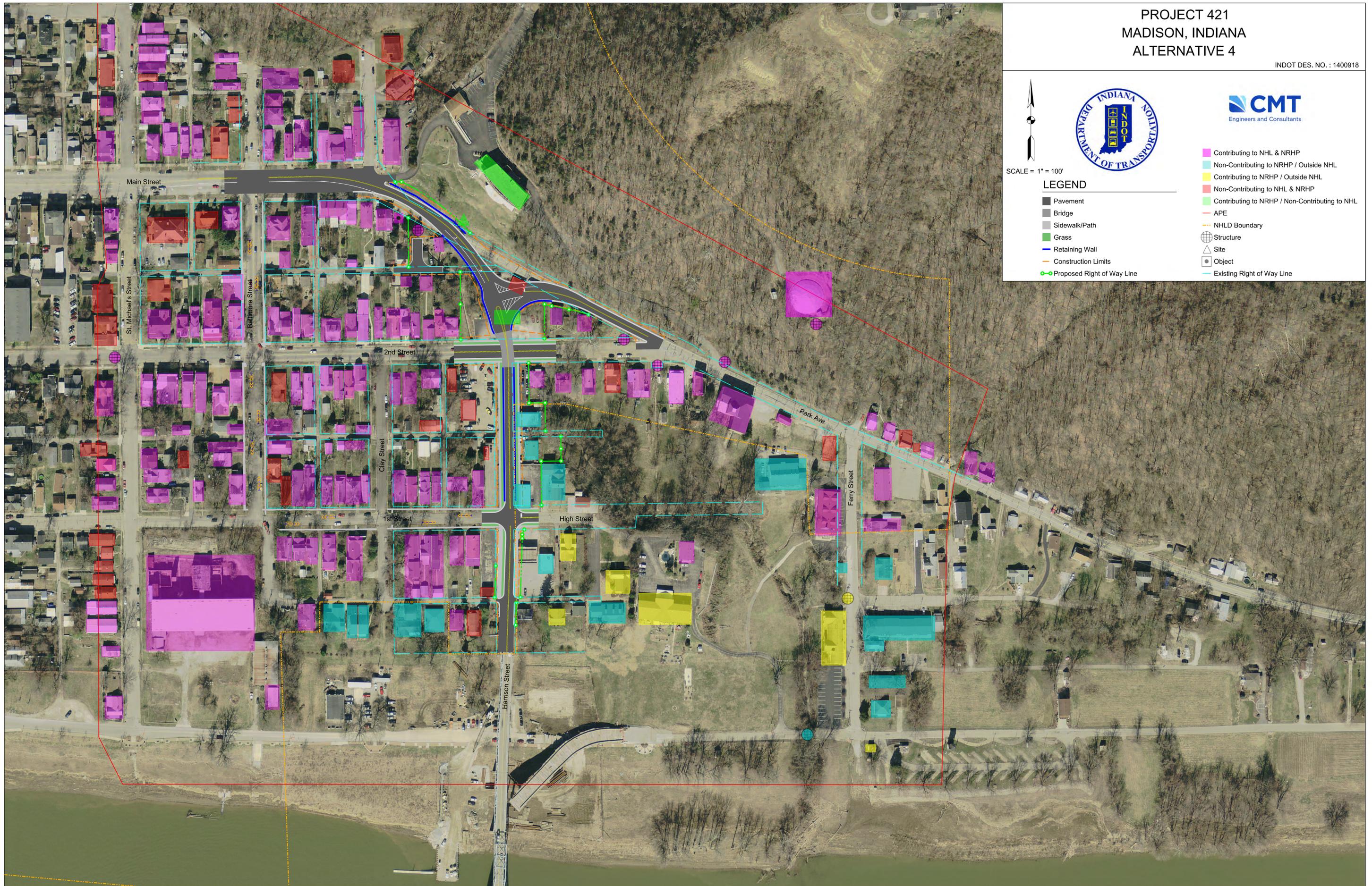
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
|  | Contributing to NHL & NRHP                     |
|  | Non-Contributing to NRHP / Outside NHL         |
|  | Contributing to NRHP / Outside NHL             |
|  | Non-Contributing to NHL & NRHP                 |
|  | Contributing to NRHP / Non-Contributing to NHL |
|  | APE  |
|  | NHLD Boundary                                  |
|  | Structure                                      |
|  | Site   |
|  | Object   |
|  | Existing Right of Way Line                     |
|  | Proposed Right of Way Line                     |
|  | Pavement                                       |
|  | Bridge   |
|  | Sidewalk/Path                                  |
|  | Grass  |
|  | Retaining Wall                                 |
|  | Construction Limits                            |



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 5

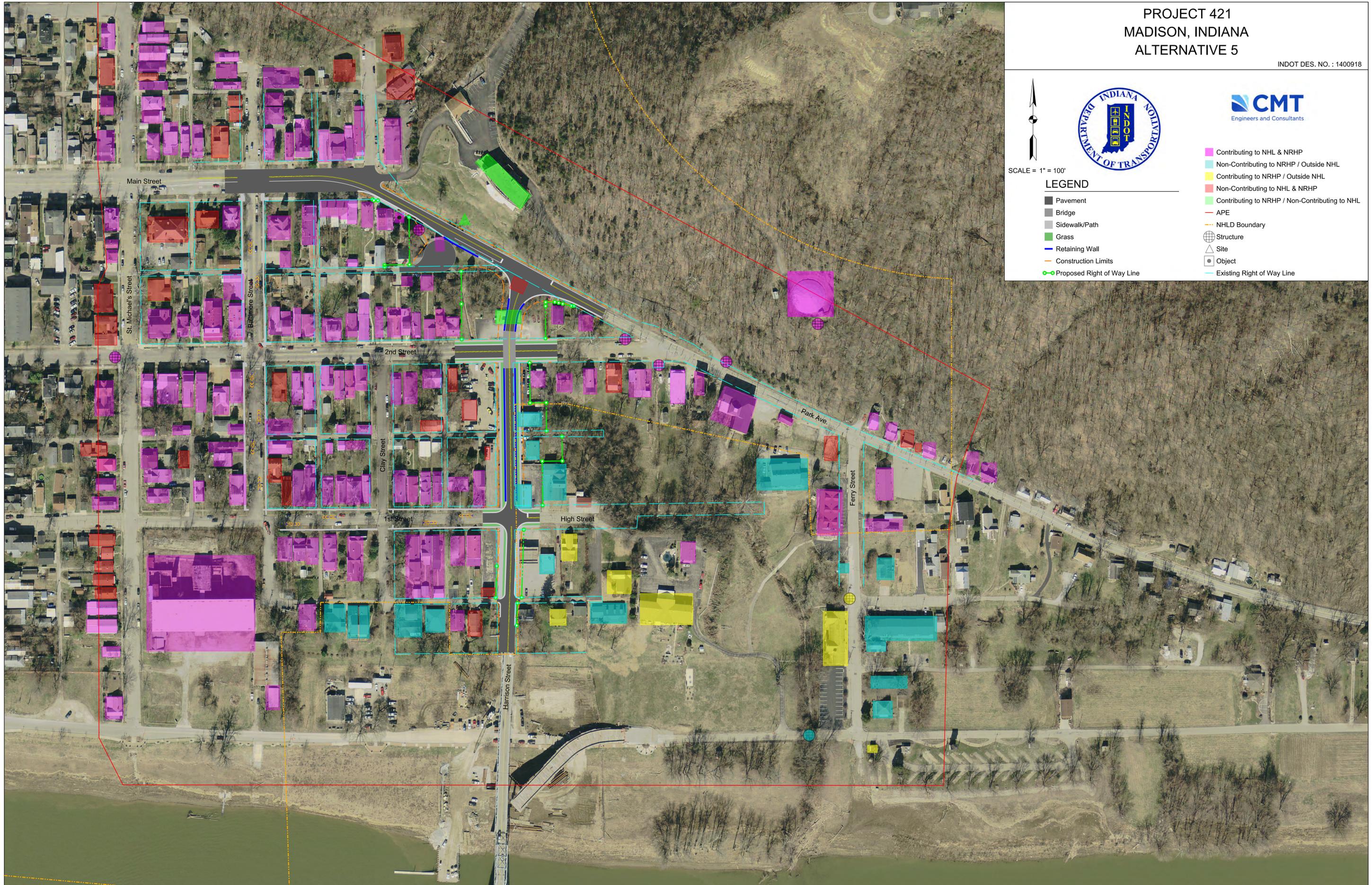
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- Pavement
- Bridge
- Sidewalk/Path
- Grass
- Retaining Wall
- Construction Limits
- Proposed Right of Way Line
- Contributing to NHL & NRHP
- Non-Contributing to NRHP / Outside NHL
- Contributing to NRHP / Outside NHL
- Non-Contributing to NHL & NRHP
- APE
- NHLD Boundary
- Structure
- Site
- Object
- Existing Right of Way Line



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 6

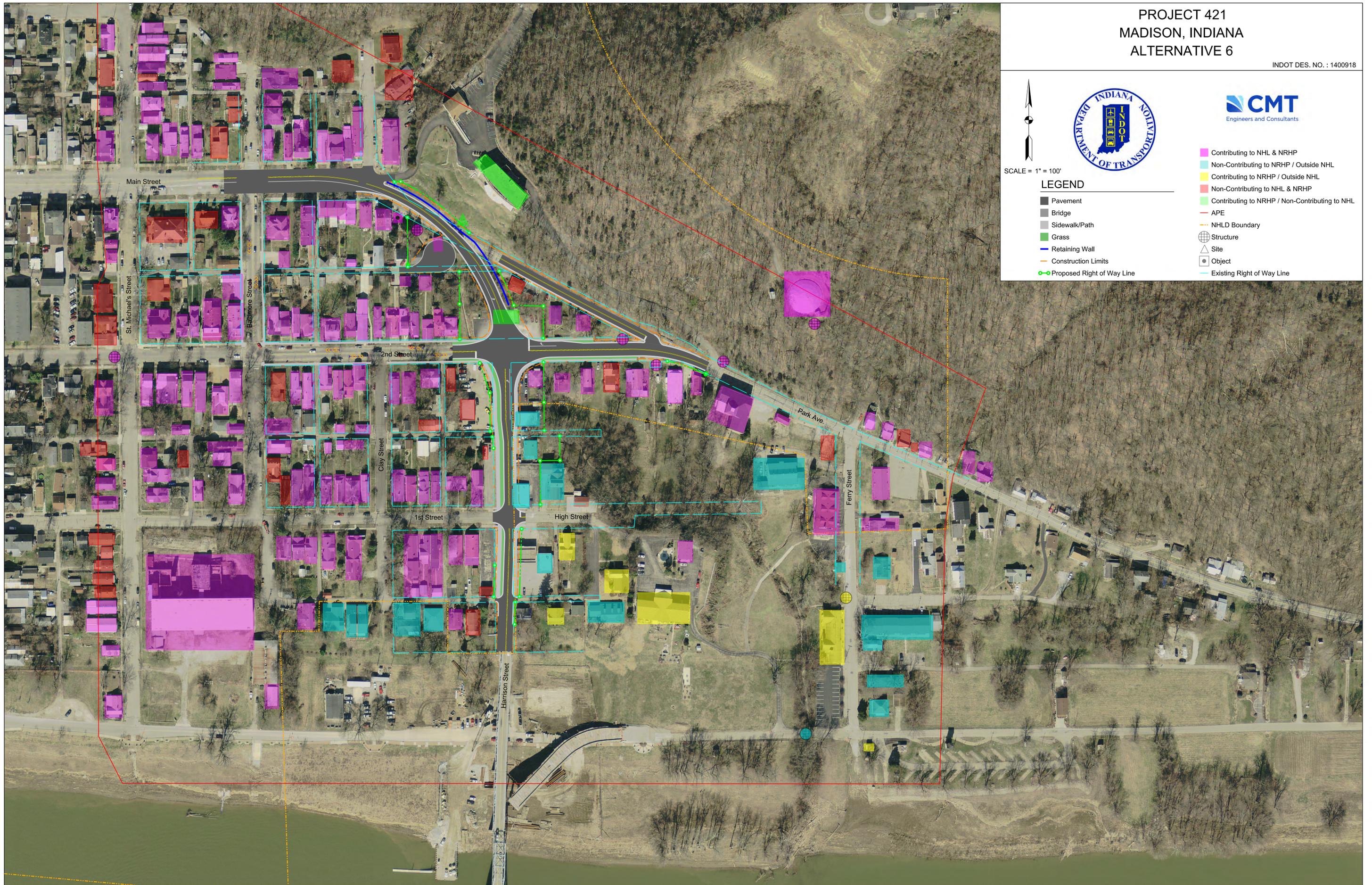
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
| Contributing to NHL & NRHP                     | Non-Contributing to NRHP / Outside NHL |
| Contributing to NRHP / Outside NHL             | Non-Contributing to NHL & NRHP         |
| Contributing to NRHP / Non-Contributing to NHL | APE                                    |
| Pavement                                       | NHLD Boundary                          |
| Bridge   | Structure                              |
| Sidewalk/Path                                  | Site                                   |
| Grass  | Object                                 |
| Retaining Wall                                 | Existing Right of Way Line             |
| Construction Limits                            | Proposed Right of Way Line             |



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 7

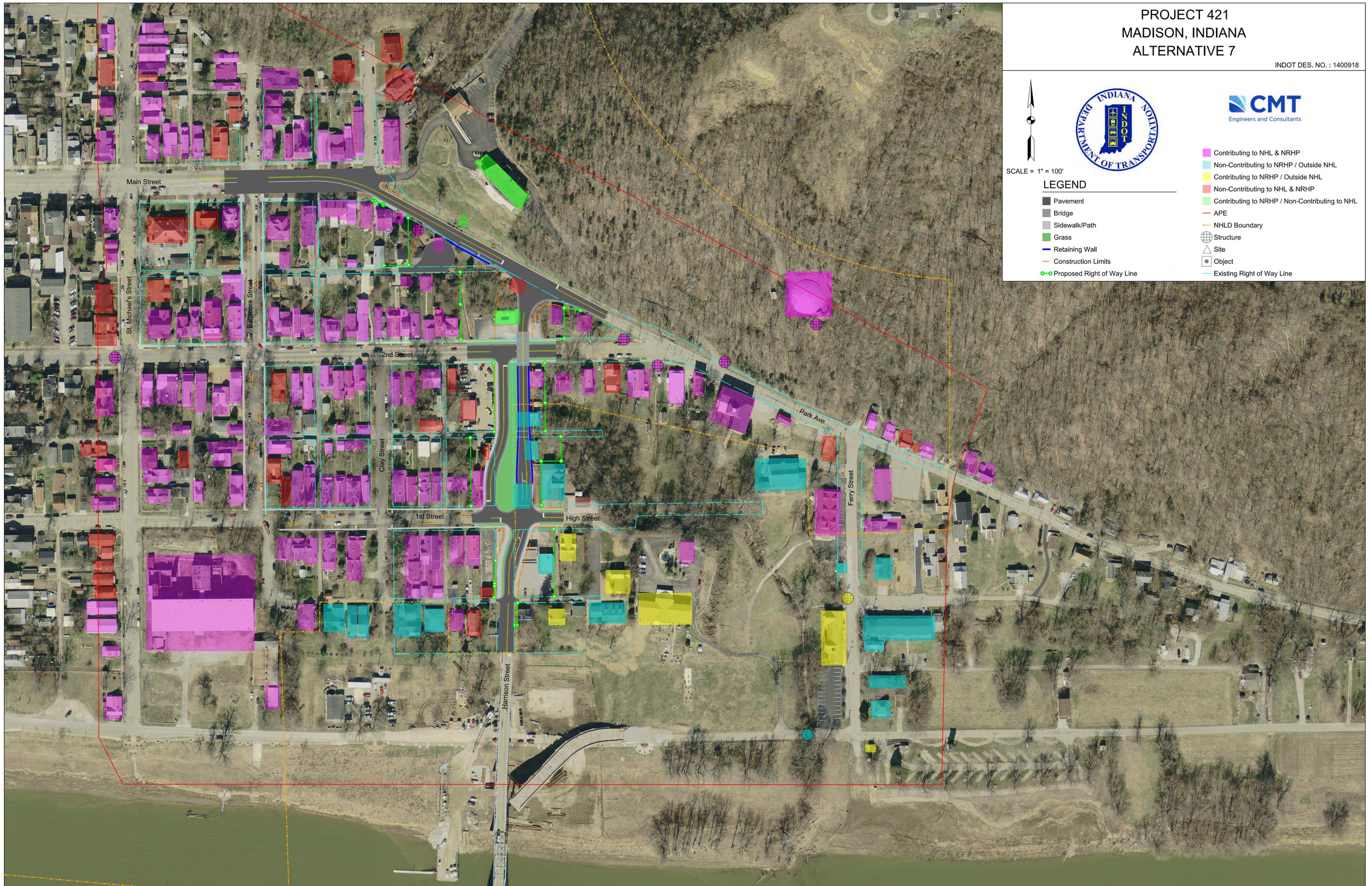
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
| Contributing to NHL & NRHP                     | Non-Contributing to NRHP / Outside NHL |
| Contributing to NRHP / Outside NHL             | Non-Contributing to NHL & NRHP         |
| Contributing to NRHP / Non-Contributing to NHL | APE                                    |
| Pavement                                       | NHLD Boundary                          |
| Bridge   | Structure                              |
| Sidewalk/Path                                  | Site                                   |
| Grass  | Object                                 |
| Retaining Wall                                 | Existing Right of Way Line             |
| Construction Limits                            | Proposed Right of Way Line             |



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 8

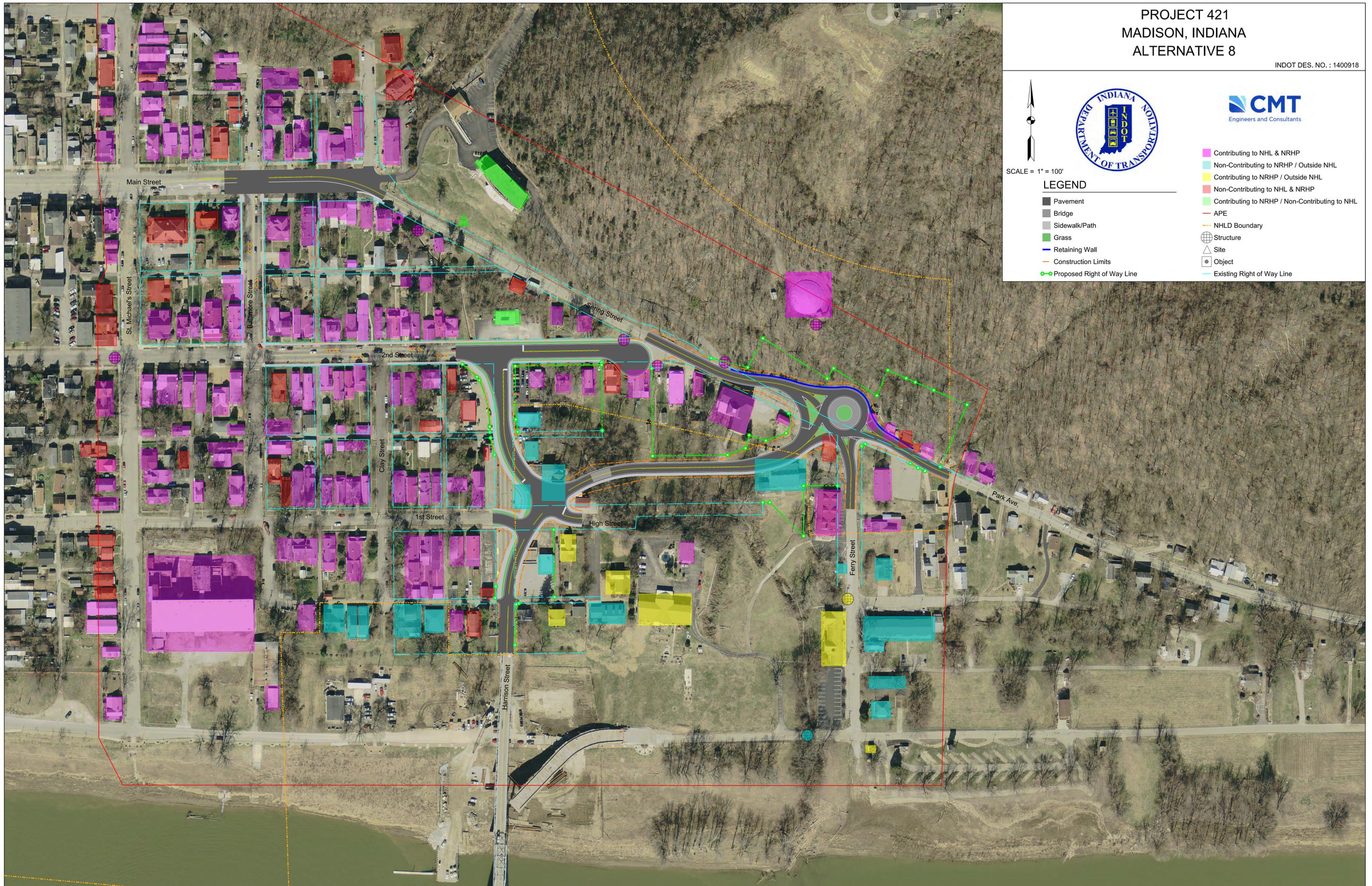
INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
|  | Contributing to NHL & NRHP                     |
|  | Non-Contributing to NRHP / Outside NHL         |
|  | Contributing to NRHP / Outside NHL             |
|  | Non-Contributing to NHL & NRHP                 |
|  | Contributing to NRHP / Non-Contributing to NHL |
|  | APE  |
|  | NHLD Boundary                                  |
|  | Structure                                      |
|  | Site   |
|  | Object   |
|  | Proposed Right of Way Line                     |
|  | Existing Right of Way Line                     |
|  | Pavement                                       |
|  | Bridge   |
|  | Sidewalk/Path                                  |
|  | Grass  |
|  | Retaining Wall                                 |
|  | Construction Limits                            |



PROJECT 421  
MADISON, INDIANA  
ALTERNATIVE 9

INDOT DES. NO. : 1400918



SCALE = 1" = 100'

LEGEND

- |  |  |
|--|--|
|  | Contributing to NHL & NRHP                     |
|  | Non-Contributing to NRHP / Outside NHL         |
|  | Contributing to NRHP / Outside NHL             |
|  | Non-Contributing to NHL & NRHP                 |
|  | Contributing to NRHP / Non-Contributing to NHL |
|  | APE  |
|  | NHLD Boundary                                  |
|  | Structure                                      |
|  | Site   |
|  | Object   |
|  | Existing Right of Way Line                     |
|  | Proposed Right of Way Line                     |
|  | Pavement                                       |
|  | Bridge   |
|  | Sidewalk/Path                                  |
|  | Grass  |
|  | Retaining Wall                                 |
|  | Construction Limits                            |

