APPENDIX C: EARLY COORDINATION

The HNTB Companies
Infrastructure Solutions

111 Monument Circle
Suite 1200
Indianapolis, IN 46204

Telephone (317)636-4682
Facsimile (317) 917-5211
www.hntb.com

November 14, 2019

Kari Carmany-George
Environmental Section Manager, Greenfield District
Indiana Department of Transportation
32 S. Broadway Street
Greenfield, IN 46140

Sample Early Coordination Letter

Via Email: kcarmanygeorge2@indot.in.gov

Re: Early Coordination Letter
Des. No. 1700182
U.S. 31 and SR 135/Thompson Road
Intersection Improvement
Marion County, Indiana

Dear Ms. Carmany-George:

The Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) intend to proceed with a project involving the intersection of U.S. 31 and State Road (SR) 135/Thompson Road in Marion County, Indiana. This letter is part of the early coordination phase of the environmental review process. We request comments from you within your area of expertise regarding any potential environmental or community effects associated with this proposed project. **Please use the above designation number and description in your reply.** We will incorporate your comments into a study of the project's environmental effects.

Project Location: This project is located on U.S. 31, approximately 0.1 mile south of SR 135/Thompson Road to approximately 0.4 mile north or SR 135/Thompson Road, in an urban portion of Marion County. More specifically, the project is located in Section 1, Township 14 North, and Range 3 East and Section 36, Township 15 North, Range 3 East in Perry Township.

Existing Conditions: This section of U.S. 31 is a six-lane divided suburban arterial running north/south that carries 55,550 vehicles per day. The northbound and southbound traffic is divided by center curb. SR 135/Thompson Road is an east/west major collector that carries 14,796 vehicles per day. The interchange at U.S. 31 and I-465 is a semi-directional interchange type with loop ramps servicing I-465 eastbound to U.S. 31 northbound and I-465 westbound to U.S. 31 southbound. Other movements of the interchange are serviced with directional ramps. The intersection of U.S. 31 and S.R 135/Thompson Road is signalized.

Purpose and Need: The need for this project is due to poor level of service (LOS) causing substantial delays in the AM and PM peak periods. Current conditions include substantial queuing on northbound and southbound U.S. 31. The queueing on U.S. 31 southbound results in traffic back-ups to the northbound ramp at the I-465/U.S. 31 interchange. The current LOS for the intersection is unacceptable (LOS E) and traffic operations are projected to continue to deteriorate over time. These conditions are documented in previous studies of this intersection by INDOT Greenfield District in June 2015, INDOT Corridor Development Group in October 2016, as well as the Abbreviated Engineers Report dated September 17, 2019.

In addition, there are insufficient pedestrian facilities. More specifically, pedestrian crosswalks are either non-existent or not clearly delineated at the intersection. The intersection of U.S. 31 and SR 135/Thompson Road currently only accommodates crossing U.S. 31 at the northside of the intersection, with no additional east-west pedestrian facilities.

The purpose of the project is to improve traffic operations and increase pedestrian safety.

Proposed Project: Three alternatives are currently under consideration. All alternatives will provide designated crosswalks and pushbutton activated signals to improve pedestrian safety. Alternatives under consideration include:

1) Conventional intersection with added turn lanes

This alternative would utilize conventional intersection improvements (e.g., added turn lanes and/or increased turn lane lengths) to improve traffic operations. The improvements for U.S. 31 southbound would include adding a second left-turn lane to eastbound SR 135/Thompson Road and a dedicated right-turn lane for traffic wishing to travel west/south SR 135. Improvements to U.S. 31 northbound would include providing an offset left-turn for west/south SR 135. The westbound SR 135/Thompson Road approach would require a second right-turn lane for U.S. 31 northbound. The SR 135 approach was recently improved, and the traffic operations of this intersection leg are acceptable. See attachments for example layout of this alternative.

2) U.S. 31 Northbound/Southbound Displaced Left

This alternative would include displacing the left-turns for both U.S. 31 northbound and U.S. 31 southbound. This requires traffic to turn left in advance of the main intersection at U.S. 31 and SR 135/Thompson Road. U.S. 31 northbound to west/south on SR 135 would turn left 400 feet in advance of the main intersection utilizing a new traffic signal. U.S. 31 southbound to eastbound SR 135/Thompson Road would turn left at Elbert Street (600 feet north of the main intersection) also utilizing a new traffic signal. Each traffic new signal would be coordinated with the main traffic signal to ensure there are no conflicting movements. See attachments for example layout of this alternative.

3) U.S. 31 Northbound Median U-Turn/ U.S. 31 Displaced Left

This alternative is a hybrid of two intersection improvement styles. The configuration would utilize a median U-turn and a displaced left intersection. U.S. 31 SB would utilize a displaced left configuration. This would require traffic to turn left in advance of the main intersection at U.S. 31 and SR 135/Thompson Road. This turning movement would occur at a new signalized intersection at Elbert Street (600 feet north of the U.S. 31 and SR 135/Thompson Road). Traffic would then travel south along U.S. 31 to the signal at SR 135/Thompson Road. After passing through the main traffic signal, traffic would then be able to head east on SR 135/Thompson Road. U.S. 31 northbound traffic wanting to turn left to go west/south on SR 135 would turn right at the U.S. 31/SR 135 intersection and head east on SR 135/Thompson Road. Vehicles that want to go west/south on SR 135 would then navigate a U-turn approximately 600 feet east of the U.S. 31 intersection. After the U-turn, traffic would then proceed through the signal at U.S. 31 to continue west/south on SR 135. See attachments for example layout of this alternative.

Right-of-Way: The project requires the acquisition of temporary and permanent right-of-way. One commercial relocation may be required for construction of Alternative 1 (Conventional Intersection with added turn lanes), and Alternative 2 (U.S. 31 Northbound/Southbound Displaced Left). No relocations would be required for construction of Alternative 3 (U.S. 31 Northbound Median U-Turn/ U.S. 31 Displaced Left). With each alternative, right-of-way amounts are expected to exceed 0.5 acre. Utility

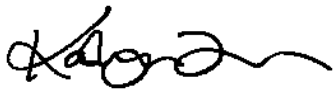
coordination will be undertaken and will verify the location of surrounding utilities for potential relocation.

Maintenance of Traffic (MOT): The MOT plan for this project has not yet been determined.

Surrounding Resources: Land use in the vicinity of the project is primarily commercial and residential. Tree clearing may be required. Lick Creek is present within the project area, flowing from west to east between the eastbound and westbound lanes of I-465. A wetland determination will be performed, and a Waters of the U.S. Report will summarize the findings. The project is located within a floodplain and the Indianapolis Urban Area Boundary (UAB). It is not located within a wellhead protection area.
This project qualifies for the application of the United States Fish and Wildlife Service (USFWS) rangewide programmatic informal consultation for the Indiana bat and northern long-eared bat. Project information form will be provided to USFWS for review separately. The USFWS Information, Planning, and Consultation System (IPaC) will be utilized to determine the project's potential to affect the Indiana bat and northern long-eared bat. A review of the USFWS database on August 5, 2019, did not indicate the presence of endangered bat species in or within 0.5 mile of the project area and the IPaC website did not indicate the presence of the federally endangered species, the rusty patched bumble bee, in or within 0.5 mile of the project area.

Comments Request: You are asked to review this information and provide any comments you may have relative to the anticipated effects of the project on areas which you have jurisdiction or special expertise. Please send your comments to Kate Lucier, of HNTB Corporation, at klucier@HNTB.com or 317-917-5332. Should we not receive your response **within thirty (30) calendar days** from the date of this letter, it will be assumed that your agency feels that there will be no adverse effects incurred as a result of the proposed project. However, should you find that an extension to the response time is necessary; a reasonable amount may be granted upon request.
If you have any questions regarding this matter, please feel free to contact Kate Lucier, of HNTB Corporation, at klucier@hntb.com or 317-917-5332 or Christie Williams, INDOT Project Manager, at chwilliams@indot.in.gov or 317-467-3942. Thank you in advance for your input.
Sincerely,

HNTB Indiana, Inc.



Kate Lucier, PWS
Science Project Manager

Attachments: Figure 1: Project Location Map
Figure 2: Project Area Aerial
Figure 3: USGS 7.5 Minute Topographic Quad Map
Draft Alternative Layouts
Photo Location Map
Project Location Photographs

Attachments were removed to avoid duplication. Graphics can be found in Appendix B of this document.

Cc: Christie Williams, INDOT Project Manager
Josh Cook, HNTB Corporation

Joe Hogsett, City of Indianapolis Mayor
Bryan Roach, Indianapolis Metropolitan Police Department
Debra Jenkins, Marion County Surveyor
Ernest Malone, Indianapolis Fire Department
Daniel Parker, Indianapolis Department of Public Works
Patrick Mapes, Perry Township Schools Superintendent
Dennis Peters, Marion County Emergency Management Director
Donna Price, Floodplain Administrator
Susie Day, Perry Township Trustee
Joseph O'Conner, Marion County Board of Commissioners
Anna Gremling, Indianapolis Metropolitan Planning Organization
Inez Evans, IndyGo
Rickie Clark, Indiana Department of Transportation, Manager of Public Involvement
Kari Carmany-George, INDOT Greenfield District, Environmental Section Manager
Indiana Geological Survey, via webform
Indiana Department of Environmental Management, via webform
Robin McWilliams-Munson, U.S. Fish and Wildlife Service, Field Supervisor
Christie Stanifer, Indiana Department of Natural Resources
Robert Dirks, FHWA – Crawfordsville and Greenfield Districts
Rick Neilson, NRCS State Conservationist
Greg McKay, U.S. Army Corps of Engineers, Louisville District

THIS IS NOT A PERMIT

State of Indiana
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Early Coordination/Environmental Assessment

DNR #: ER-22001 **Request Received:** November 14, 2019

Requestor: HNTB Corporation
Kate Lucier
111 Monument Circle, Suite 1200
Indianapolis, IN 46204

Project: US 31 and SR 135/Thompson Road intersection improvement (3 proposed alternatives); Des #1700182

County/Site info: Marion

The Indiana Department of Natural Resources has reviewed the above referenced project per your request. Our agency offers the following comments for your information and in accordance with the National Environmental Policy Act of 1969.

If our agency has regulatory jurisdiction over the project, the recommendations contained in this letter may become requirements of any permit issued. If we do not have permitting authority, all recommendations are voluntary.

Regulatory Assessment: This proposal may require the formal approval of our agency pursuant to the Flood Control Act (IC 14-28-1) for any proposal to construct, excavate, or fill in or on the floodway of Lick Creek.

Natural Heritage Database: The Natural Heritage Program's data have been checked.
To date, no plant or animal species listed as state or federally threatened, endangered, or rare have been reported to occur in the project vicinity.

Fish & Wildlife Comments: Avoid and minimize impacts to fish, wildlife, and botanical resources to the greatest extent possible, and compensate for impacts. The following are recommendations that address potential impacts identified in the proposed project area:

1) Bank Stabilization & Wildlife Passage:
Any new, replacement, or rehabbed structure over Lick Creek, and any bank stabilization under the structure, should not create conditions that are less favorable for wildlife passage under the structure compared to current conditions. Minimize the use of riprap and use alternative erosion protection materials whenever possible. Riprap must not be placed in the active thalweg channel or placed in the streambed in a manner that precludes fish or aquatic organism passage (riprap must not be placed above the existing streambed elevation). Where riprap must be used, we recommend placing only enough riprap to provide stream bank toe protection, such as from the toe of the bank up to the ordinary high water mark (OHWM). The banks above the OHWM must be restored, stabilized, and revegetated using geotextiles and a mixture of grasses, sedges, wildflowers, shrubs, and trees native to the area and specifically for stream bank/floodway stabilization purposes as soon as possible upon completion.

While hard armoring alone (e.g. riprap or glacial stone) may be needed in certain instances, soft armoring and bioengineering techniques should be considered first. In many instances, one or more methods are necessary to increase the likelihood of vegetation establishment. Combining vegetation with most bank stabilization methods can provide additional bank protection and help reduce impacts upon fish and wildlife. If hard armoring is needed, wildlife passage can be facilitated by using a smooth-surfaced armoring material instead of riprap, such as articulated concrete block mats, fabric-formed concrete mats, or other similar smooth-surfaced material.

Information about bioengineering techniques can be found at http://www.in.gov/legislative/iac/20120404-IR-312120154NRA.xml.pdf. Also, the following is a USDA/NRCS document that outlines many different bioengineering techniques for streambank stabilization: http://directives.sc.egov.usda.gov/17553.wba.

The Division of Fish and Wildlife would like to emphasize the importance of wildlife passage issues and transportation infrastructure projects. The following is a good place to start in terms of resources to consider in the design of stream crossing structures: http://www.fs.fed.us/wildlifecrossings/library/.

2) CORRIDORS Program:
Consider coordinating with the Division of Fish and Wildlife's CORRIDORS (Conservation On Rivers and Roadways Intended to Develop Opportunities for Resources and Species) Program. CORRIDORS helps to develop habitats for grassland-dependent species and foster improved pollinator habitat along roadways and waterways. Program partners include the Indiana Department of Transportation (INDOT), USDA Natural Resources Conservation Service (NRCS), Pheasants Forever and Quail Forever.

The additional measures listed below should be implemented to avoid, minimize, or compensate for impacts to fish, wildlife, and botanical resources:
1. Revegetate all bare and disturbed areas that will not be mowed and maintained with a mixture of grasses, sedges, and wildflowers native to Central Indiana and specifically for stream bank/floodway stabilization purposes as soon as possible upon completion; turf-type grasses (including low-endophyte, friendly endophyte, and endophyte free tall fescue but excluding all other varieties of tall fescue) may be used in regularly mowed areas only.
2. Minimize and contain within the project limits inchannel disturbance and the clearing of trees and brush.
3. Do not work in the waterway from April 1 through June 30 without the prior written approval of the Division of Fish and Wildlife.
4. Do not construct any temporary runarounds, access bridges, causeways, cofferdams, diversions, or pumparounds.
5. Use minimum average 6 inch graded riprap stone extended below the normal water level to provide habitat for aquatic organisms in the voids.
6. Do not use broken concrete as riprap.
7. Underlay the riprap with a bedding layer of well graded aggregate or a geotextile to prevent piping of soil underneath the riprap.
8. Minimize the movement of resuspended bottom sediment from the immediate project area.
9. Do not deposit or allow demolition/construction materials or debris to fall or otherwise enter the waterway.
10. Appropriately designed measures for controlling erosion and sediment must be implemented to prevent sediment from entering the stream or leaving the construction site; maintain these measures until construction is complete and all disturbed areas are stabilized.
11. Seed and protect all disturbed streambanks and slopes not protected by other methods that are 3:1 or steeper with erosion control blankets that are heavy-duty, biodegradable, and net free or that use loose-woven / Leno-woven netting to minimize the entrapment and snaring of small-bodied wildlife such as snakes and turtles (follow manufacturer's recommendations for selection and installation); seed and apply mulch on all other disturbed areas.
12. Plant five trees, at least 2 inches in diameter-at-breast height, for each tree which is removed that is ten inches or greater in diameter-at-breast height.

THIS IS NOT A PERMIT

State of Indiana
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife

Early Coordination/Environmental Assessment

Contact Staff: Christie L. Stanifer, Environ. Coordinator, Fish & Wildlife

Our agency appreciates this opportunity to be of service. Please contact the above staff member at (317) 232-4080 if we can be of further assistance.

Date: December 13, 2019

Christie L. Stanifer
Environ. Coordinator
Division of Fish and Wildlife

Caroline Tegeler

From: Wright, Mary <MWRIGHT@indot.IN.gov>
Sent: Friday, November 15, 2019 7:25 AM
To: Caroline Tegeler
Subject: RE: Early Coordination Letter - US 31 and SR 135/Thompson Road (Des. No. 1700182)

Follow Up Flag: Follow up
Flag Status: Flagged

Early Coordination and Creating a Public Involvement Plan (PIP)

We have received your early coordination notification packet for the above referenced project(s). Our office prefers to be notified at the early coordination stage in order to encourage early and ongoing public involvement aside from the specific legal requirements as outlined in our Public Involvement Manual http://www.in.gov/indot/2366.htm . Seeking the public's understanding of transportation improvement projects early in the project development stage can allow the opportunity for the public to express their concerns, comments, and to seek buy-in. Early coordination is the perfect opportunity to examine the proposed project and its impacts to the community along with the many ways and or tools to inform the public of the improvements and seek engagement. A good public involvement plan, or PIP, should consider the type, scope, impacts, and the level of public awareness that should, or could, be implemented. In other words, although there are cases where no public involvement is legally required, sometimes it is simply the right thing to do in order to keep the public informed.

The public involvement office is always available to provide support and resources to bolster any public involvement activities you may wish to implement or discuss. Please feel free to contact our office anytime should you have any questions or concerns. Thank you for notifying our office about your proposed project. We trust you will not only analyze the appropriate public involvement required, but also consider the opportunity to do go above and beyond those requirements in creating a good PIP.

Rickie Clark, Manager
100 North Senate Avenue, Room N642
Indianapolis, IN 46204
Phone: 317-232-6601
Email: rclark@indot.in.gov

From: Caroline Tegeler [mailto:ctegeler@HNTB.com]
Sent: Thursday, November 14, 2019 12:20 PM
To: Clark, Rickie <RCLARK@indot.IN.gov>
Cc: Wright, Mary <MWRIGHT@indot.IN.gov>
Subject: Early Coordination Letter - US 31 and SR 135/Thompson Road (Des. No. 1700182)

Dear Mr. Clark,

Please see the attached early coordination letter and supporting graphics for the US 31 and SR 135/Thompson Road Intersection Improvement Project (Des. No. 1700182). If you have any questions regarding this project, please feel free to contact me by phone or email.

Caroline Tegeler

From: McWilliams, Robin <robin_mcwilliams@fws.gov>
Sent: Tuesday, November 19, 2019 12:50 PM
To: Caroline Tegeler
Subject: Re: [EXTERNAL] Early Coordination Letter - US 31 and SR 135/Thompson Road (Des. No. 1700182)

Dear Caroline,

This responds to your recent letter, requesting our comments on the aforementioned project.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (l6 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of l969, the Endangered Species Act of l973, and the U. S. Fish and Wildlife Service's Mitigation Policy.

The project is within the range of the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) and should follow the new Indiana bat/northern long-eared bat programmatic consultation process, if applicable (*i.e*. a federal transportation nexus is established). We will review that information once it is received.

Based on a review of the information you provided, the U.S. Fish and Wildlife Service has no objections to the project as currently proposed. However, should new information arise pertaining to project plans or a revised species list be published, it will be necessary for the Federal agency to reinitiate consultation. Standard recommendations are provided below.

We appreciate the opportunity to comment at this early stage of project planning. If project plans change such that fish and wildlife habitat may be affected, please recoordinate with our office as soon as possible. If you have any questions about our recommendations, please call (812) 334-4261 x. 207.

Sincerely,
Robin McWilliams Munson

Standard Recommendations:

1. Do not clear trees or understory vegetation outside the construction zone boundaries. (**This restriction is not related to the "tree clearing" restriction for potential Indiana Bat habitat.)**

2. Restrict below low-water work in streams to placement of culverts, piers, pilings and/or footings, shaping of the spill slopes around the bridge abutments, and placement of riprap.

Culverts should span the active stream channel, should be either embedded or a 3-sided or open-arch culvert, and be installed where practicable on an essentially flat slope. When an open-bottomed culvert or arch is used in a stream, which has a good natural bottom substrate, such as gravel, cobbles and boulders, the existing substrate should be left undisturbed beneath the culvert to provide natural habitat for the aquatic community.

3. Restrict channel work and vegetation clearing to the minimum necessary for installation of the stream crossing structure.

4. Minimize the extent of hard armor (riprap) in bank stabilization by using bioengineering techniques whenever possible. If rip rap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat.

5. Implement temporary erosion and sediment control methods within areas of disturbed soil. All disturbed soil areas upon project completion will be vegetated following INDOT's standard specifications.

6. Avoid all work within the inundated part of the stream channel (in perennial streams and larger intermittent streams) during the fish spawning season (April 1 through June 30), except for work within sealed structures such as caissons or cofferdams that were installed prior to the spawning season. No equipment shall be operated below Ordinary High Water Mark during this time unless the machinery is within the caissons or on the cofferdams.

7. Evaluate wildlife crossings under bridge/culverts projects in appropriate situations. Suitable crossings include flat areas below bridge abutments with suitable ground cover, high water shelves in culverts, amphibian tunnels and diversion fencing.

Robin McWilliams Munson

U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 46403
812-334-4261 x. 207 Fax: 812-334-4273

Monday, Tuesday - 7:30a-3:00p
Wednesday, Thursday - telework 8:30a-3:00p

On Thu, Nov 14, 2019 at 12:28 PM Caroline Tegeler <ctegeler@hntb.com> wrote:

> Dear Ms. McWilliams-Munson,
>
> Please see the attached early coordination letter and supporting graphics for the US 31 and SR 135/Thompson Road Intersection Improvement Project (Des. No. 1700182). If you have any questions regarding this project, please feel free to contact me by phone or email.
>
> Best regards,
>
> **Caroline Tegeler**
>
> Scientist
>
> **Tel** (317)917-5352 **Cell** (765)212-4983 **Email** ctegeler@hntb.com

Susan Harrington

From: Catlin, Bryan F. <Bryan.Catlin@indy.gov>
Sent: Monday, November 25, 2019 11:30 AM
To: Kate Lucier
Cc: Jenkins, Debra S.; Black, Dana; Pangelinan, Robert S.
Subject: Des. No. 1700182 US 31 & SR 135/Thompson Road
Attachments: US31 Thompson.pdf; 14030102.pdf; 15033608.pdf; 15033605.pdf; 15033625.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Kate:

The Marion County Surveyor's Office has two monuments located in the right-of-way of the project area. In addition, there are monuments to the north and east that are just outside the project limits which might be affected if the limits expand. I have attached the tie sheets for the section corner monuments that will be affected for your convenience as well as a drawing showing the general location of the monuments. These monuments will need to be replaced by INDOT under the supervision of our office per IC 8-23-9-24 if they are disturbed. Our office can provide cast iron Harrison monuments to replace the current monuments if you desire.

However, I assume we were notified under the assumption our office is responsible for legal drains. Since Marion County was reorganized under Unigov, the responsibilities for legal drains the Marion County Surveyor's Office once had are now part of the responsibilities of the Indianapolis Department of Public Works. This was apparently included in the Unigov enabling legislation so there would only be one agency responsible for county wide drainage. Any drainage questions should be directed to DPW.

Please feel free to contact me if you have any further questions,

Bryan F. Catlin, PS

Technical Supervisor
Marion County Surveyor's Office
City-County Building
200 East Washington St. Suite 742
Indianapolis, Indiana 46204-3327
Office (317) 327-4150
Fax (317) 327-4146
Bryan.Catlin@indy.gov

Susan Harrington

From: Kate Williams
Sent: Tuesday, December 10, 2019 11:40 PM
To: 'Catlin, Bryan F.'
Cc: Jenkins, Debra S.; Black, Dana; Pangelinan, Robert S.; Hugh Regan; Joshua Cook
Subject: RE: Des. No. 1700182 US 31 & SR 135/Thompson Road

Hi Bryan,

Thank you for your message. I have discussed your concerns regarding the section corner monuments with the project designers. These section corners will be replaced according to Indiana code.

Please let us know if you have any additional questions or concerns regarding this project.

Cheers,

Kate Williams, PWS
Science Project Manager
Environmental Planning
Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

---

From: Catlin, Bryan F. <Bryan.Catlin@indy.gov>
Sent: Monday, November 25, 2019 11:30 AM
To: Kate Lucier <klucier@HNTB.com>
Cc: Jenkins, Debra S. <Debra.Jenkins@indy.gov>; Black, Dana <Dana.Black@indy.gov>; Pangelinan, Robert S. <Robert.Pangelinan@Indy.Gov>
Subject: Des. No. 1700182 US 31 & SR 135/Thompson Road

Dear Kate:

The Marion County Surveyor's Office has two monuments located in the right-of-way of the project area. In addition, there are monuments to the north and east that are just outside the project limits which might be affected if the limits expand. I have attached the tie sheets for the section corner monuments that will be affected for your convenience as well as a drawing showing the general location of the monuments. These monuments will need to be replaced by INDOT under the supervision of our office per IC 8-23-9-24 if they are disturbed. Our office can provide cast iron Harrison monuments to replace the current monuments if you desire.

However, I assume we were notified under the assumption our office is responsible for legal drains. Since Marion County was reorganized under Unigov, the responsibilities for legal drains the Marion County Surveyor's Office once had are now part of the responsibilities of the Indianapolis Department of Public Works. This was apparently included in the Unigov enabling legislation so there would only be one agency responsible for county wide drainage. Any drainage questions should be directed to DPW.

Please feel free to contact me if you have any further questions,

Bryan F. Catlin, PS

Technical Supervisor
Marion County Surveyor's Office
City-County Building
200 East Washington St. Suite 742
Indianapolis, Indiana 46204-3327
Office (317) 327-4150
Fax (317) 327-4146
Bryan.Catlin@indy.gov

December 16, 2019

Katie Lucier, PWS
Science Project Manager
HNTB
111 Monument Circle Suite 1200
Indianapolis, IN 46204

IndyGo Response to Early Coordination Letter – DES. NO. 1700182

US31 & Thompson Road – Lane Reconfiguration & Pedestrian Improvements

Project Location (relative to IndyGo): US 31 in and beyond the project boundaries north/south, as well as the bus stops on S. East Street south of Thompson Road in both directions (bus stop ID 12974 US31/Thompson NB NS & bus stop ID 12941 US31/Thompson SB FS).

Existing Conditions: US 31 is a north/south, six-lane road with one additional Left Turn lane in each direction. The northbound (inbound) bus stop #12974 is nearside of Thompson Road with of a distance of approximately 750' to merge left one lane in order to proceed northbound past the I-465 entrance. The southbound (outbound) bus stop is approximately 30' south of the end of the curb radius farside of Thompson Road requiring buses to merge one lane from the southbound lane of traffic within a distance of approx. 1,500'.

IndyGo Priority & Consideration: IndyGo's main priority would be to maintain ease of north/south-mobility through the area on Route 31, as well as access to the curb lanes south of Thompson Road on US 31 in a proximity to their current locations, with boarding and shelter (or bench) pads and sidewalk connections to the proposed pedestrian improvements. As such IndyGo would not be in favor of Alternative #2 "US 31 NB/SB Displaced Left" as the displaced left turn lane would require removal or relocation of the southbound farside bus stop to a location that would be difficult to reach by foot, as well as spaced too closely to the next southbound bus stop at Powell Street. Of the remaining alternatives (#1 & #3), at this stage it seems that Alternative #1 is the option that appears to have the least impact to bus operations through the area ad allows us to improve the bus stops in the immediate vicinity of their current location.

Ideal Route 31 Operating Lanes:

Approximate Project Boundaries:

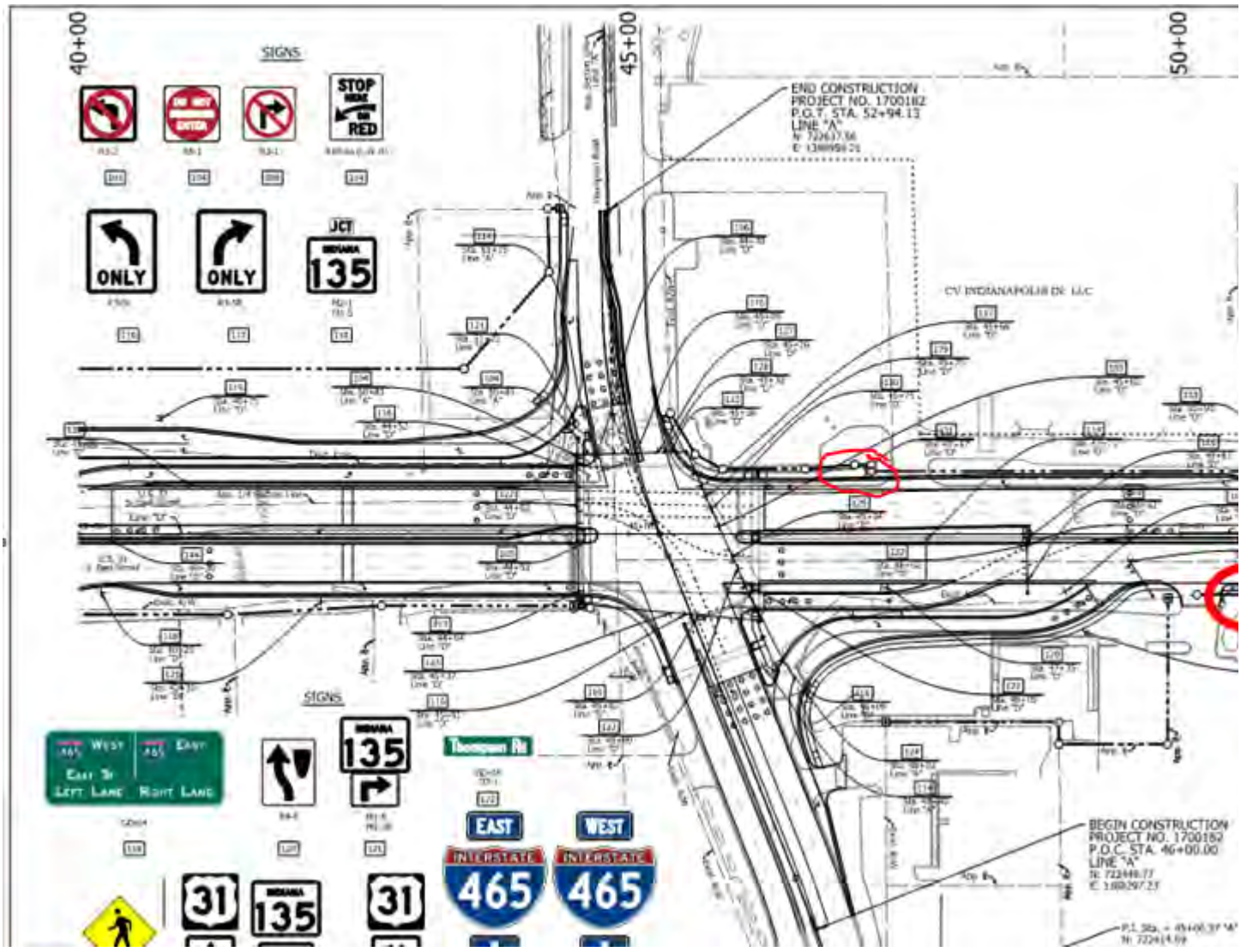
Northbound Bus Stop (ID# 12974):

Southbound Bus Stop (ID# 12941):

Susan Harrington

From: Joshua Cook
Sent: Thursday, April 16, 2020 1:55 PM
To: Ryan Gallagher; Kate Williams
Cc: Hugh Regan; Susan Harrington; Kevin McNally
Subject: RE: US31 & Thompson Rd. Project Early Coord. Letter - Des. No. 1700182

Ryan,
Northbound moves slightly south , about 80', to this new circled location.



Josh Cook, PE
Vice President
Transportation Group Director
Tel (317) 917-5293 **Cell** (317) 417-5340

HNTB CORPORATION
111 Monument Circle Suite 1200, Indianapolis, IN 46204 | www.hntb.com

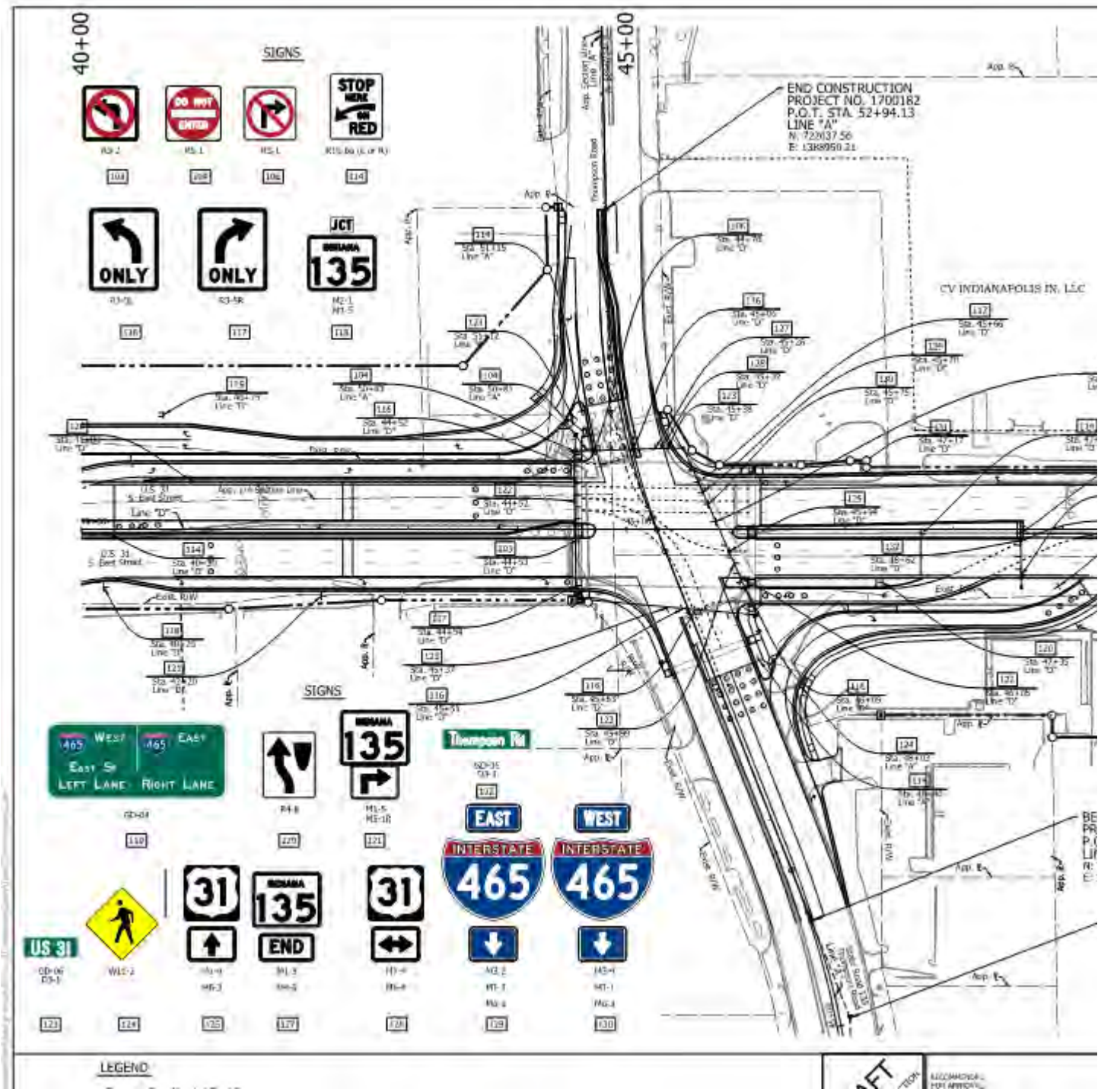
From: Ryan Gallagher <RGallagher@indygo.net>
Sent: Thursday, April 16, 2020 9:48 AM
To: Joshua Cook <jlcook@HNTB.com>; Kate Williams <klwilliams@HNTB.com>
Cc: Hugh Regan <hregan@HNTB.com>; Susan Harrington <sharrington@HNTB.com>; Kevin McNally <kmcnally@indygo.net>
Subject: RE: US31 & Thompson Rd. Project Early Coord. Letter - Des. No. 1700182

Hi Josh & Kate,
Thank you for coordinating with us.
We are open to the relocation of the southbound bus stop to a more safe and accessible placement with a connecting sidewalk to Thompson Road. Does the northbound bus stop need to be moved as well (either slightly or hundreds of feet) or does the current location northbound, nearside of Thompson Rd. work for this project?
It's also worth noting that we have stops at Powell Street in both directions. While we try to provide coverage of bus stops (sometimes more closely spaced where sidewalks and crosswalks are lacking), we are open to greater spacing if we can improve pedestrian safety, accessibility, and amenities. So there may be an opportunity to combine those if it would result in an improvement of the overall pedestrian environment.
We are free to discuss if needed.

Ryan Gallagher
Senior Service Planner
Indianapolis Public Transportation Corporation – IndyGo
317.614.9334
rgallagher@indygo.net

From: Joshua Cook <jlcook@HNTB.com>
Sent: Wednesday, April 15, 2020 1:04 PM
To: Ryan Gallagher <RGallagher@indygo.net>; Kate Williams <klwilliams@HNTB.com>
Cc: Hugh Regan <hregan@HNTB.com>; Susan Harrington <sharrington@HNTB.com>; Kevin McNally <kmcnally@indygo.net>
Subject: RE: US31 & Thompson Rd. Project Early Coord. Letter - Des. No. 1700182

Ryan,
The red circle below indicates the proximity. In speaking with INDOT, they wanted to move the bus stop further south away from the main intersection for safety concerns.
Thanks,
Josh



Josh Cook, PE
Vice President
Transportation Group Director
Tel (317) 917-5293 **Cell** (317) 417-5340

HNTB CORPORATION
111 Monument Circle Suite 1200, Indianapolis, IN 46204 | www.hntb.com

From: Ryan Gallagher <RGallagher@indygo.net>
Sent: Tuesday, April 14, 2020 9:35 PM
To: Kate Williams <klwilliams@HNTB.com>
Cc: Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>; Susan Harrington <sharrington@HNTB.com>;

Kevin McNally <kmcnally@indygo.net>
Subject: RE: US31 & Thompson Rd. Project Early Coord. Letter - Des. No. 1700182

Thank you for the email. Please send any plans you have that indicate where you are interested in relocating the bus stop to and we will evaluate and reply as soon as possible.

All the best,

Ryan Gallagher
Senior Service Planner
Indianapolis Public Transportation Corporation – IndyGo
317.614.9334
rgallagher@indygo.net

From: Kate Williams <klwilliams@HNTB.com>
Sent: Monday, April 13, 2020 1:20 PM
To: Ryan Gallagher <RGallagher@indygo.net>
Cc: Annette Darrow <ADarrow@indygo.net>; Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>; Susan Harrington <sharrington@HNTB.com>
Subject: RE: US31 & Thompson Rd. Project Early Coord. Letter - Des. No. 1700182

Hi Ryan,

I wanted to send you a quick note regarding the position of the southbound US 31 bus stop in the vicinity of the US 31/SR 135 intersection. Subsequent to our December 2019 conversation, a change in design has resulted in the need to move the bus stop approximately 400 feet to the south (near the Comfort Inn driveway) . The current design has also added sidewalk along the southwest side of the intersection to access the stop.

Please let me know if you would like to schedule a brief call to discuss or if you need any further information.
Cheers,

Kate L Williams, PWS
Science Project Manager
Environmental Planning
Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

---

From: Kate Williams
Sent: Wednesday, December 4, 2019 1:51 PM
To: 'Ryan Gallagher' <RGallagher@indygo.net>
Cc: Annette Darrow <ADarrow@indygo.net>; Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>
Subject: RE: US31 & Thompson Rd. Project Early Coord. Letter - Des. No. 1700182

Hi Ryan,

Thank you for your message. Would you have any time tomorrow to have a chat? We are free any time after 10:30am.

We look forward to chatting with you. Please let me know if there is anything you need in the meantime.
Cheers,

Kate Williams, PWS
Science Project Manager
Environmental Planning
Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

From: Ryan Gallagher <RGallagher@indygo.net>
Sent: Tuesday, December 3, 2019 9:17 AM
To: Kate Lucier <klucier@HNTB.com>
Cc: Annette Darrow <ADarrow@indygo.net>
Subject: US31 & Thompson Rd. Project Early Coord. Letter - Des. No. 1700182

Hi Ms. Williams,
We received your letter with the three draft alternatives for the project at US31 & Thompson Road. I am meeting with staff here to review and draft a response by Dec. 19th.
I have a few initial questions that I was hoping to get some clarification on before we comment. Do you have some time for a 10-minute phone call today or tomorrow?
Thanks!

Ryan Gallagher
Senior Service Planner
IndyGo - Indianapolis Public Transportation Corporation
317.614.9334
rgallagher@indygo.net

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

USDA
United States Department of Agriculture

Natural Resources Conservation Service
Indiana State Office
6013 Lakeside Boulevard
Indianapolis, IN 46278
317-290-3200

November 21, 2019

Kate Lucier
HNTB Corporation
111 Monument Circle, Suite 1200
Indianapolis, Indiana 46204

Dear Ms. Lucier:

The proposed project to make intersection improvements at US 31 and State Road 135/Thompson Road in Marion County, Indiana, (Des No 1700182), as referred to in your letter received November 14, 2019, will not cause a conversion of prime farmland.

If you need additional information, please contact John Allen at 317-295-5859.

Sincerely,

JERRY RAYNOR Digitally signed by JERRY RAYNOR
Date: 2019.11.22 13:19:09 -05'00'

JERRY RAYNOR
State Conservationist

Organization and Project Information

Project ID:
Des. ID: Des No 1700182
Project Title: US 31 and SR 45 Intersection Improvement
Name of Organization: HNTB
Requested by: Susan Harrington

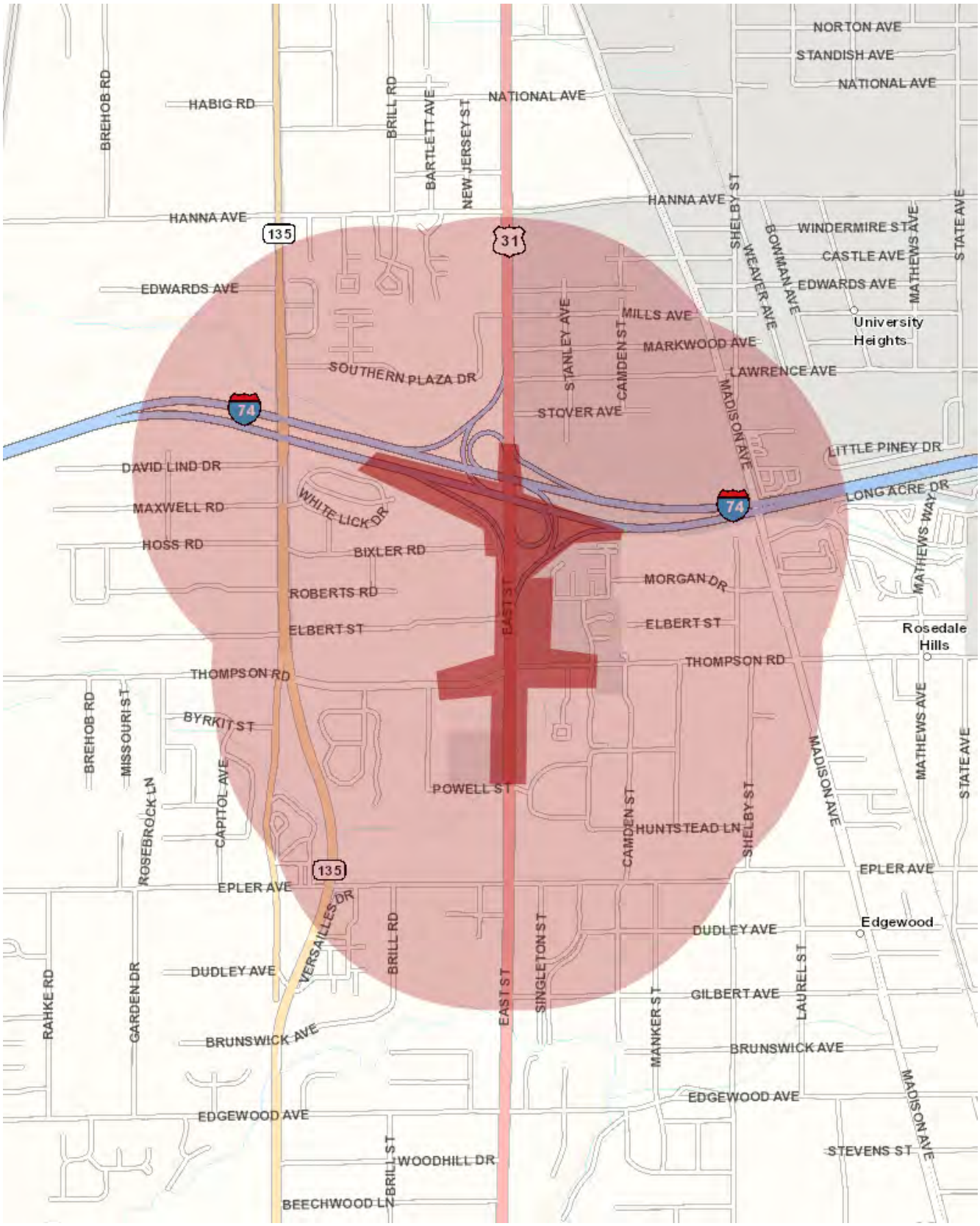
Environmental Assessment Report

1. Geological Hazards:
    - High liquefaction potential
    - Floodway
2. Mineral Resources:
    - Bedrock Resource: Moderate Potential
    - Sand and Gravel Resource: Low Potential
3. Active or abandoned mineral resources extraction sites:
    - None documented in the area

*All map layers from Indiana Map (maps.indiana.edu)

This information was furnished by Indiana Geological Survey
Address: 420 N. Walnut St., Bloomington, IN 47404
Email: IGSEnvir@indiana.edu
Phone: 812 855-7428

Date: February 03, 2020



Metadata:

- https://maps.indiana.edu/metadata/Geology/Seismic_Earthquake_Liquefaction_Potential.html
- https://maps.indiana.edu/metadata/Geology/Industrial_Minerals_Sand_Gravel_Resources.html
- https://maps.indiana.edu/metadata/Hydrology/Floodplains_FIRM.html
- https://maps.indiana.edu/metadata/Geology/Bedrock_Geology.html

Indiana Department of Environmental Management

We Protect Hoosiers and Our Environment.

100 North Senate Avenue - Indianapolis, IN 46204
(800) 451-6027 - (317) 232-8603 - www.idem.IN.gov

INDOT
Christine Williams
32 S. Broadway Street
Greenfield , IN 46140
Date

HNTB
Susan Harrington
111 Monument Circle
Indianapolis , IN 46204

To Engineers and Consultants Proposing Roadway Construction Projects:

RE: The Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) intend to proceed with a project involving the intersection of U.S. 31 and State Road (SR) 135/Thompson Road in Marion County, Indiana (Des # 1700182). This project is located on U.S. 31, approximately 0.1 mile south of SR 135/Thompson Road to approximately 0.4 mile north or SR 135/Thompson Road, in an urban portion of Marion County. More specifically, the project is located in Section 1, Township 14 North, and Range 3 East and Section 36, Township 15 North, Range 3 East in Perry Township. The preferred alternative has not yet been selected, but the Abbreviated Engineer's Report recommends a displaced left turn treatment and realignment of the Interstate 465 eastbound exit ramp to southbound US 31.

This letter from the Indiana Department of Environmental Management (IDEM) serves as a standardized response to enquiries inviting IDEM comments on roadway construction, reconstruction, or other improvement projects within existing roadway corridors when the proposed scope of the project is beneath the threshold requiring a formal National Environmental Policy Act-mandated Environmental Assessment or Environmental Impact Statement. As the letter attempts to address all roadway-related environmental topics of potential concern, it is possible that not every topic addressed in the letter will be applicable to your particular roadway project.

For additional information on specific roadway-related topics of interest, please visit the appropriate Web pages cited below, many of which provide contact information for persons within the various program areas who can answer questions not fully addressed in this letter. Also please be mindful that some environmental requirements may be subject to change and so each person intending to include a copy of this letter in their project documentation packet is advised to download the most recently revised version of the letter; found at: http://www.in.gov/idem/5283.htm (http://www.in.gov/idem/5283.htm).

To ensure that all environmentally-related issues are adequately addressed, IDEM recommends that you read this letter in its entirety, and consider each of the following issues as you move forward with the planning of your proposed roadway construction, reconstruction, or improvement project:

WATER AND BIOTIC QUALITY

1. Section 404 of the Clean Water Act requires that you obtain a permit from the U.S. Army Corps of Engineers (USACE) before discharging dredged or fill materials into any wetlands or other waters, such as rivers, lakes, streams, and ditches. Other activities regulated include the relocation, channelization, widening, or other such alteration of a stream, and the mechanical clearing (use of heavy construction equipment) of wetlands. Thus, as a project owner or sponsor, it is your responsibility to ensure that no wetlands are disturbed without the proper permit. Although you may initially refer to the U.S. Fish and Wildlife Service National Wetland Inventory maps as a means of identifying potential areas of concern, please be mindful that those maps do not depict jurisdictional wetlands regulated by the USACE or the Department of Environmental Management. A valid jurisdictional wetlands determination can only be made by the USACE, using the 1987 Wetland Delineation Manual.

   USACE recommends that you have a consultant check to determine whether your project will abut, or lie within, a wetland area. To view a list of consultants that have requested to be included on a list posted by the USACE on their Web site, see USACE Permits and Public Notices (http://www.lrl.usace.army.mil/orf/default.asp) (http://www.lrl.usace.army.mil/orf /default.asp (http://www.lrl.usace.army.mil/orf/default.asp)) and then click on "Information" from the menu on the right-hand side of that page. Their "Consultant List" is the fourth entry down on the "Information" page. Please note that the USACE posts all consultants that request to appear on the list, and that inclusion of any particular consultant on the list does not represent an endorsement of that consultant by the USACE, or by IDEM.

   Much of northern Indiana (Newton, Lake, Porter, LaPorte, St. Joseph, Elkhart, LaGrange, Steuben, and Dekalb counties; large portions of Jasper, Starke, Marshall, Noble, Allen, and Adams counties; and lesser portions of Benton, White, Pulaski, Kosciusko, and Wells counties) is served by the USACE District Office in Detroit (313-226-6812). The central and southern portions of the state (large portions of Benton, White, Pulaski, Kosciosko, and Wells counties; smaller portions of Jasper, Starke, Marshall , Noble, Allen, and Adams counties; and all other Indiana counties located in north-central, central, and southern Indiana) are served by the USACE Louisville District Office (502-315-6733).

   Additional information on contacting these U.S. Army Corps of Engineers (USACE) District Offices, government agencies with jurisdiction over wetlands, and other water quality issues, can be found at http://www.in.gov/idem/4396.htm (http://www.in.gov/idem/4396.htm). IDEM recommends that impacts to wetlands and other water resources be avoided to the fullest extent.

2. In the event a Section 404 wetlands permit is required from the USACE, you also must obtain a Section 401 Water Quality Certification from the IDEM Office of Water Quality Wetlands Program. To learn more about the Wetlands Program, visit: http://www.in.gov/idem/4384.htm (http://www.in.gov/idem/4384.htm).

3. If the USACE determines that a wetland or other water body is isolated and not subject to Clean Water Act regulation, it is still regulated by the state of Indiana . A State Isolated Wetland permit from IDEM's Office of Water Quality (OWQ) is required for any activity that results in the

discharge of dredged or fill materials into isolated wetlands. To learn more about isolated wetlands, contact the OWQ Wetlands Program at 317-233-8488.

4. If your project will involve over a 0.5 acre of wetland impact, stream relocation, or other large-scale alterations to water bodies such as the creation of a dam or a water diversion, you should seek additional input from the OWQ Wetlands Program staff. Consult the Web at: http://www.in.gov/idem/4384.htm (http://www.in.gov/idem/4384.htm) for the appropriate staff contact to further discuss your project.

5. Work within the one-hundred year floodway of a given water body is regulated by the Department of Natural Resources, Division of Water. The Division issues permits for activities regulated under the follow statutes:
    - IC 14-26-2 Lakes Preservation Act 312 IAC 11
    - IC 14-26-5 Lowering of Ten Acre Lakes Act No related code
    - IC 14-28-1 Flood Control Act 310 IAC 6-1
    - IC 14-29-1 Navigable Waterways Act 312 IAC 6
    - IC 14-29-3 Sand and Gravel Permits Act 312 IAC 6
    - IC 14-29-4 Construction of Channels Act No related code

    For information on these Indiana (statutory) Code and Indiana Administrative Code citations, see the DNR Web site at: http://www.in.gov/dnr/water/9451.htm (http://www.in.gov/dnr/water/9451.htm) . Contact the DNR Division of Water at 317-232-4160 for further information.

    The physical disturbance of the stream and riparian vegetation, especially large trees overhanging any affected water bodies should be limited to only that which is absolutely necessary to complete the project. The shade provided by the large overhanging trees helps maintain proper stream temperatures and dissolved oxygen for aquatic life.

6. For projects involving construction activity (which includes clearing, grading, excavation and other land disturbing activities) that result in the disturbance of one (1), or more, acres of total land area, contact the Office of Water Quality – Watershed Planning Branch (317/233-1864) regarding the need for of a Rule 5 Storm Water Runoff Permit. Visit the following Web page
    - http://www.in.gov/idem/4902.htm (http://www.in.gov/idem/4902.htm)

    To obtain, and operate under, a Rule 5 permit you will first need to develop a Construction Plan (http://www.in.gov/idem/4917.htm#constreq (http://www.in.gov/idem/4917.htm#constreq)), and as described in 327 IAC 15-5-6.5 (http://www.in.gov/legislative/iac/T03270/A00150 [PDF] (http://www.in.gov/legislative/iac/T03270/A00150.PDF), pages 16 through 19). Before you may apply for a Rule 5 Permit, or begin construction, you must submit your Construction Plan to your county Soil and Water Conservation District (SWCD) (http://www.in.gov/isda/soil/contacts/map.html (http://www.in.gov/isda/soil/contacts/map.html)).

    Upon receipt of the construction plan, personnel of the SWCD or the Indiana Department of Environmental Management will review the plan to determine if it meets the requirements of 327 IAC 15-5. Plans that are deemed deficient will require re-submittal. If the plan is sufficient you will be notified and instructed to submit the verification to IDEM as part of the Rule 5 Notice of Intent

(NOI) submittal. Once construction begins, staff of the SWCD or Indiana Department of Environmental Management will perform inspections of activities at the site for compliance with the regulation.

Please be mindful that approximately 149 Municipal Separate Storm Sewer System (MS4) areas are now being established by various local governmental entities throughout the state as part of the implementation of Phase II federal storm water requirements. All of these MS4 areas will eventually take responsibility for Construction Plan review, inspection, and enforcement. As these MS4 areas obtain program approval from IDEM, they will be added to a list of MS4 areas posted on the IDEM Website at: http://www.in.gov/idem/4900.htm (http://www.in.gov/idem/4900.htm).

If your project is located in an IDEM-approved MS4 area, please contact the local MS4 program about meeting their storm water requirements. Once the MS4 approves the plan, the NOI can be submitted to IDEM.

Regardless of the size of your project, or which agency you work with to meet storm water requirements, IDEM recommends that appropriate structures and techniques be utilized both during the construction phase, and after completion of the project, to minimize the impacts associated with storm water runoff. The use of appropriate planning and site development and appropriate storm water quality measures are recommended to prevent soil from leaving the construction site during active land disturbance and for post construction water quality concerns. Information and assistance regarding storm water related to construction activities are available from the Soil and Water Conservation District (SWCD) offices in each county or from IDEM.

7. For projects involving impacts to fish and botanical resources, contact the Department of Natural Resources - Division of Fish and Wildlife (317/232-4080) for addition project input.

8. For projects involving water main construction, water main extensions, and new public water supplies, contact the Office of Water Quality - Drinking Water Branch (317-308-3299) regarding the need for permits.

9. For projects involving effluent discharges to waters of the State of Indiana , contact the Office of Water Quality - Permits Branch (317-233-0468) regarding the need for a National Pollutant Discharge Elimination System (NPDES) permit.

10. For projects involving the construction of wastewater facilities and sewer lines, contact the Office of Water Quality - Permits Branch (317-232-8675) regarding the need for permits.

AIR QUALITY

The above-noted project should be designed to minimize any impact on ambient air quality in, or near, the project area. The project must comply with all federal and state air pollution regulations. Consideration should be given to the following:

1. Regarding open burning, and disposing of organic debris generated by land clearing activities; some types of open burning are allowed (http://www.in.gov/idem/4148.htm

(http://www.in.gov/idem/4148.htm)) under specific conditions. You also can seek an open burning variance from IDEM.

However, IDEM generally recommends that you take vegetative wastes to a registered yard waste composting facility or that the waste be chipped or shredded with composting on site (you must register with IDEM if more than 2,000 pounds is to be composted; contact 317/232-0066). The finished compost can then be used as a mulch or soil amendment. You also may bury any vegetative wastes (such as leaves, twigs, branches, limbs, tree trunks and stumps) onsite, although burying large quantities of such material can lead to subsidence problems, later on.

Reasonable precautions must be taken to minimize fugitive dust emissions from construction and demolition activities. For example, wetting the area with water, constructing wind barriers, or treating dusty areas with chemical stabilizers (such as calcium chloride or several other commercial products). Dirt tracked onto paved roads from unpaved areas should be minimized.

Additionally, if construction or demolition is conducted in a wooded area where blackbirds have roosted or abandoned buildings or building sections in which pigeons or bats have roosted for 3-5 years precautionary measures should be taken to avoid an outbreak of histoplasmosis. This disease is caused by the fungus Histoplasma capsulatum, which stems from bird or bat droppings that have accumulated in one area for 3-5 years. The spores from this fungus become airborne when the area is disturbed and can cause infections over an entire community downwind of the site. The area should be wetted down prior to cleanup or demolition of the project site. For more detailed information on histoplasmosis prevention and control, please contact the Acute Disease Control Division of the Indiana State Department of Health at (317) 233-7272.

2. The U.S. EPA and the Surgeon General recommend that people not have long-term exposure to radon at levels above 4 pCi/L. (For a county-by-county map of predicted radon levels in Indiana, visit: http://www.in.gov/idem/4145.htm (http://www.in.gov/idem/4145.htm).)

   The U.S. EPA further recommends that all homes (and apartments within three stories of ground level) be tested for radon. If in-home radon levels are determined to be 4 pCi/L, or higher, EPA recommends a follow-up test. If the second test confirms that radon levels are 4 pCi/L, or higher, EPA recommends the installation of radon-reduction measures. (For a list of qualified radon testers and radon mitigation (or reduction) specialists visit: http://www.in.gov/isdh/regsvcs/radhealth/pdfs/radon_testers_mitigators_list.pdf (http://www.in.gov/isdh/regsvcs/radhealth/pdfs/radon_testers_mitigators_list.pdf).) It also is recommended that radon reduction measures be built into all new homes, particularly in areas like Indiana that have moderate to high predicted radon levels.

   To learn more about radon, radon risks, and ways to reduce exposure visit: http://www.in.gov/isdh/regsvcs/radhealth/radon.htm (http://www.in.gov/isdh/regsvcs/radhealth/radon.htm), http://www.in.gov/idem/4145.htm (http://www.in.gov/idem/4145.htm), or http://www.epa.gov/radon/index.html (http://www.epa.gov/radon/index.html).

3. With respect to asbestos removal: all facilities slated for renovation or demolition (except residential buildings that have (4) four or fewer dwelling units and which will not be used for commercial purposes) must be inspected by an Indiana-licensed asbestos inspector prior to the commencement of any renovation or demolition activities. If regulated asbestos-containing material (RACM) that may become airborne is found, any subsequent demolition, renovation, or asbestos removal activities must be performed in accordance with the proper notification and emission control requirements.

   If no asbestos is found where a renovation activity will occur, or if the renovation involves removal of less than 260 linear feet of RACM off of pipes, less than 160 square feet of RACM off of other facility components, or less than 35 cubic feet of RACM off of all facility components, the owner or operator of the project does not need to notify IDEM before beginning the renovation activity.

   For questions on asbestos demolition and renovation activities, you can also call IDEM's Lead/Asbestos section at 1-888-574-8150.

   However, in all cases where a demolition activity will occur (even if no asbestos is found), the owner or operator must still notify IDEM 10 working days prior to the demolition, using the form found at http://www.in.gov/icpr/webfile/formsdiv/44593.pdf (http://www.in.gov/icpr/webfile/formsdiv/44593.pdf).

   Anyone submitting a renovation/demolition notification form will be billed a notification fee based upon the amount of friable asbestos containing material to be removed or demolished. Projects that involve the removal of more than 2,600 linear feet of friable asbestos containing materials on pipes, or 1,600 square feet or 400 cubic feet of friable asbestos containing material on other facility components, will be billed a fee of $150 per project; projects below these amounts will be billed a fee of $50 per project. All notification remitters will be billed on a quarterly basis.

   For more information about IDEM policy regarding asbestos removal and disposal, visit: http://www.in.gov/idem/4983.htm (http://www.in.gov/idem/4983.htm).

4. With respect to lead-based paint removal: IDEM encourages all efforts to minimize human exposure to lead-based paint chips and dust. IDEM is particularly concerned that young children exposed to lead can suffer from learning disabilities. Although lead-based paint abatement efforts are not mandatory, any abatement that is conducted within housing built before January 1, 1978 , or a child-occupied facility is required to comply with all lead-based paint work practice standards, licensing and notification requirements. For more information about lead-based paint removal visit: http://www.in.gov/isdh/19131.htm (http://www.in.gov/isdh/19131.htm).

5. Ensure that asphalt paving plants are permitted and operate properly. The use of cutback asphalt, or asphalt emulsion containing more than seven percent (7%) oil distillate, is prohibited during the months April through October. See 326 IAC 8-5-2 , Asphalt Paving Rule (http://www.ai.org/legislative/iac/T03260/A00080.PDF (http://www.ai.org/legislative/iac/T03260/A00080.PDF)).

6. If your project involves the construction of a new source of air emissions or the modification of an existing source of air emissions or air pollution control equipment, it will need to be reviewed by

the IDEM Office of Air Quality (OAQ). A registration or permit may be required under 326 IAC 2 (View at: www.ai.org/legislative/iac/t03260/a00020.pdf (http://www.ai.org/legislative/iac/t03260/a00020.pdf).) New sources that use or emit hazardous air pollutants may be subject to Section 112 of the Clean Air Act and corresponding state air regulations governing hazardous air pollutants.

7. For more information on air permits visit: http://www.in.gov/idem/4223.htm (http://www.in.gov/idem/4223.htm), or to initiate the IDEM air permitting process, please contact the Office of Air Quality Permit Reviewer of the Day at (317) 233-0178 or OAMPROD atdem.state.in.us.

LAND QUALITY

In order to maintain compliance with all applicable laws regarding contamination and/or proper waste disposal, IDEM recommends that:

1. If the site is found to contain any areas used to dispose of solid or hazardous waste, you need to contact the Office of Land Quality (OLQ)at 317-308-3103.

2. All solid wastes generated by the project, or removed from the project site, need to be taken to a properly permitted solid waste processing or disposal facility. For more information, visit http://www.in.gov/idem/4998.htm (http://www.in.gov/idem/4998.htm).

3. If any contaminated soils are discovered during this project, they may be subject to disposal as hazardous waste. Please contact the OLQ at 317-308-3103 to obtain information on proper disposal procedures.

4. If PCBs are found at this site, please contact the Industrial Waste Section of OLQ at 317-308-3103 for information regarding management of any PCB wastes from this site.

5. If there are any asbestos disposal issues related to this site, please contact the Industrial Waste Section of OLQ at 317-308-3103 for information regarding the management of asbestos wastes (Asbestos removal is addressed above, under Air Quality).

6. If the project involves the installation or removal of an underground storage tank, or involves contamination from an underground storage tank, you must contact the IDEM Underground Storage Tank program at 317/308-3039. See: http://www.in.gov/idem/4999.htm (http://www.in.gov/idem/4999.htm).

FINAL REMARKS

Should you need to obtain any environmental permits in association with this proposed project, please be mindful that IC 13-15-8 requires that you notify all adjoining property owners and/or occupants within ten days your submittal of each permit application. However, if you are seeking multiple permits, you can still meet the notification requirement with a single notice if all required permit applications are submitted with the same ten day period.

Should the scope of the proposed project be expanded to the extent that a National Environmental Policy Act Environmental Assessment (EA) or Environmental Impact Statement (EIS) is required, IDEM will actively participate in any early interagency coordination review of the project.

Meanwhile, please note that this letter does not constitute a permit, license, endorsement or any other form of approval on the part of the Indiana Department of Environmental Management regarding any project for which a copy of this letter is used. Also note that is it the responsibility of the project engineer or consultant using this letter to ensure that the most current draft of this document, which is located at http://www.in.gov/idem/5284.htm (http://www.in.gov/idem/5284.htm), is used.

Signature(s) of the Applicant

I acknowledge that the following proposed roadway project will be financed in part, or in whole, by public monies.

Project Description

The Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) intend to proceed with a project involving the intersection of U.S. 31 and State Road (SR) 135/Thompson Road in Marion County, Indiana (Des # 1700182). This project is located on U.S. 31, approximately 0.1 mile south of SR 135/Thompson Road to approximately 0.4 mile north or SR 135/Thompson Road, in an urban portion of Marion County. More specifically, the project is located in Section 1, Township 14 North, and Range 3 East and Section 36, Township 15 North, Range 3 East in Perry Township. The preferred alternative has not yet been selected, but the Abbreviated Engineer's Report recommends a displaced left turn treatment and realignment of the Interstate 465 eastbound exit ramp to southbound US 31.

With my signature, I do hereby affirm that I have read the letter from the Indiana Department of Environment that appears directly above. In addition, I understand that in order to complete that project in which I am interested, with a minimum of impact to the environment, I must consider all the issues addressed in the aforementioned letter, and further, that I must obtain any required permits.

Date: Jan 9, 2020

Signature of the INDOT
Project Engineer or Other Responsible Agent

Christine Williams

Date: 1/9/2020

Signature of the
For Hire Consultant Susan Harrington

Susan Harrington

Susan Harrington

From: Kate Williams
Sent: Monday, April 13, 2020 5:03 PM
To: SCHOTT, KIRBY
Cc: Joshua Cook; Susan Harrington
Subject: RE: U.S. 31, S.R. 135 & Thompson Road Project

Hi Kirby,

Thank you for your message. At this time, we do not anticipate the construction schedule to change.

Please let me know if you need any further information.
Cheers,

Kate L Williams, PWS
Science Project Manager
Environmental Planning
Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

From: SCHOTT, KIRBY <kschott@perryschools.org>
Sent: Monday, April 13, 2020 1:25 PM
To: Kate Williams <klwilliams@HNTB.com>
Subject: Re: U.S. 31, S.R. 135 & Thompson Road Project

Thank you for the information. Is there any chance the project start date will move up? With the current situation, there is less traffic everywhere and it might be a good time to get this completed.

Thanks again,

Kirby

Kirby Schott
Director of Facilities
Perry Township Schools
317-504-8612

On Mon, Apr 13, 2020 at 1:18 PM Kate Williams <klwilliams@hntb.com> wrote:

> Dear Mr. Schott,

Thank you for your thoughtful consideration of the Early Coordination letter sent to Perry Township School Corporation. Your response letter dated November 19, 2019 addressed some of your concerns regarding the transportation of students to school via bus. You indicated that Alternative #1 – Conventional Intersection with Added Turn Lanes – would best address your needs. I had previously emailed about the answers to your specific questions, but I wanted to follow up regarding alternative selection.

The project seeks to construct Alternative #3 – Displaced Left Turn Lane – for this project. This option was chosen as the preferred alternative after consideration of the performance of the intersection. This alternative will perform best and result in the fastest movement of traffic through the intersection, therefore reducing travel time for students to and from school via the bussing system.

Please let me know if you have any further questions or concerns regarding this project.

Thank you,

Kate L Williams, PWS

Science Project Manager

Environmental Planning

Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

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From: Kate Williams
Sent: Wednesday, December 11, 2019 5:00 PM
To: 'SCHOTT, KIRBY' <kschott@perryschools.org>
Cc: Patrick Mapes <pmapes@perryschools.org>; PATRICK MURPHY <pmurphy@perryschools.org>; Chris Sampson <csampson@perryschools.org>; Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>; Susan Harrington <sharrington@HNTB.com>
Subject: RE: U.S. 31, S.R. 135 & Thompson Road Project

Mr. Schott,

Thank you for your message. I would also like to thank you for the additional information that you provided about the schedule of the school day for Perry Township schools. I have spoken with the project designer and would like to respond to the questions that you posed in your November 19, 2019 letter. The preferred alternative for this project had not been chosen, but we appreciate your comments about Alternative 1.

Questions:

1. **What is the projected start date for this project?**
    a. The project is expected to being in Spring 2021.
2. **What is the anticipated duration of the project?**

    a. Construction duration will span approximately from Spring 2021 to the end of 2022.
3. **Will access in all directions be provided throughout the project?**

    a. U.S. 31 within the proposed project area is currently 3 lanes in each direction. The MOT for the project will be contained within the existing roadway, reducing traffic to 2 lanes in each direction during construction. There will be no temporary lane construction or detouring traffic.
4. **Is there consideration for evening/weekend work and/or consideration for more extensive work during non-school periods(Fall/Winter/Spring/Summer breaks)?**

    a. At this time are not able to determine the timing of contractor work.
5. **How will this project coincide with INDOT's I-465 Reconfiguration and the I-69 Finish Line projects?**

    a. This intersection improvement project will precede the construction of the I-465 reconfiguration work. Construction of this project is anticipated to occur concurrently with the I-69 finish line project.

Once again, thank you for your comments. Please let me know if you have any additional concerns or questions regarding this project.

Cheers,

Kate Williams, PWS

Science Project Manager

Environmental Planning

Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

From: SCHOTT, KIRBY <kschott@perryschools.org>
Sent: Tuesday, November 19, 2019 3:12 PM
To: Kate Lucier <klucier@HNTB.com>
Cc: Patrick Mapes <pmapes@perryschools.org>; PATRICK MURPHY <pmurphy@perryschools.org>; Chris Sampson <csampson@perryschools.org>
Subject: U.S. 31, S.R. 135 & Thompson Road Project

Ms. Williams,

I am contacting you on behalf of Perry Township Schools and Mr. Pat Mapes, Superintendent, regarding your recent message.

Please reference Designation Number 1700182, U.S. 31 and SR 135/Thompson Road Intersection Improvement. Thank you for providing Perry Township Schools with an opportunity to provide comments and ask questions regarding the impending project. Comments and questions are designated below. Before perusing those, there is some information that may be beneficial for you to have and take into consideration when planning this project. Since Perry Township is a two high school system, the district is loosely divided into east and west halves. We anticipate INDOT's impending I-69 project to hinder school traffic on the west side of the district, and likewise, the traffic on the east side of the district will be affected by the impending I-465 reconfiguration project. This U.S. 31 and SR 135/Thompson Road Intersection Improvement happens to lie very near a "centerline" for Perry Schools. Your consideration of these impending potential obstacles is greatly appreciated.

Comments

While Perry Township Schools vehicles(primarily school buses) use the access to I-465 near that intersection, our primary traffic in that intersection is for both east/west traffic on SR135/Thompson Road and north/south traffic on U.S. 31. With that, it seems Option #1, Conventional Intersection with added turn lanes, will best support our needs to transport kids to our schools. Our school system operates on a three-tier day, which means start times for high school, middle school, and elementary schools are staggered by approximately one hour. This is important to note since it provides little time between bus routes while transporting students. Option #1 seems like it will provide the least amount of delays for the traffic not accessing I-465 and will best fit our needs.

Questions

What is the projected start date for this project?

What is the anticipated duration of the project?

Will access in all directions be provided throughout the project?

Is there consideration for evening/weekend work and/or consideration for more extensive work during non-school periods(Fall/Winter/Spring/Summer breaks)?

How will this project coincide with INDOT's I-465 Reconfiguration and the I-69 Finish Line projects?

Thank you,

Kirby

Kirby Schott

Director of Facilities

Perry Township Schools

317-504-8612

Indiana Department of Environmental Management
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Eric J. Holcomb
Governor

Bruno Pigott
Commissioner

October 23, 2019

66-33
HNTB Corporation
Attention: Tenecia Jones
111 Monument Circle, Suite 1200
Indianapolis, Indiana 46204

Dear Tenecia Jones,

RE: Wellhead Protection Area
Proximity Determination
Des No 1700182
US 31 at Thompson Road
Intersection Improvement Project
Marion County, Indiana

Upon review of the above referenced project site, it has been determined that the proposed project area **is not located within** a Wellhead Protection Area. The information is accurate to the best of our knowledge; however, there are in some cases a few factors that could impact the accuracy of this determination. Some Wellhead Protection Area Delineations have not been submitted, and many have not been approved by this office. In these cases we use a 3,000 foot fixed radius buffer to make the proximity determination. To find the status of a Public Water Supply System's (PWSS's) Wellhead Protection Area Delineation please visit our tracking database at http://www.in.gov/idem/cleanwater/2456.htm and scroll to the bottom of the page.

Note: the Drinking Water Branch has a self service feature which allows one to determine wellhead proximity without submitting the application form. Use the following instructions:

1. Go to http://idemmaps.idem.in.gov/whpa2/
2. Use the search tool located in the upper left hand corner of the application to zoom to your site of interest by way of city, county, or address; or use the mouse to click on the site of interest displayed on the map.
3. Once the site of interest has been located and selected, use the print tool to create a .pdf of a wellhead protection area proximity determination response.

In the future please consider using this self service feature if it is suits your needs.

If you have any additional questions please feel free to contact me at the address above or at (317) 233-9158 and aturnbow@idem.in.gov.

Sincerely,

Alisha Turnbow

Alisha Turnbow,
Environmental Manager
Ground Water Section
Drinking Water Branch
Office of Water Quality

From: Carmanygeorge, Karstin M <KCarmanyGeorge2@indot.IN.gov>
Sent: Monday, August 5, 2019 1:24 PM
To: Gillian Clark
Cc: Susan Harrington; Christine Meador
Subject: RE: USFWS Bat Layer Check - Des. No. 1700182 - US 31 at Thompson Road Marion County

A review of the USFWS GIS database for Indiana bat and Northern long-eared bat roosting, hibernacula and capture sites was conducted for Des 1700182 on August 5, 2019. There are no documented sites within a half mile the project area. Please be sure to review bat inspection reports in BIAS to determine if bats have historically been documented under the bridge and to have an environmental professional perform a bat inspection during the project development process. The USFWS Information for Planning and Conservation (IPaC) website must be consulted and a new project created to obtain an official species list and complete the determination key for the project to determine the applicability of the programmatic consultation. Once the key is complete, the project is ready for INDOT review for completeness and accuracy. Provide the record locator number from the IPaC generated consistency letter to INDOT with a request to review or verify the project.

Thanks,

Kari Carmany-George
Environmental Section Manager, Greenfield District
32 South Broadway
Greenfield, IN 46140
Office: (317) 467-3467
Email: kcarmanygeorge2@indot.in.gov

"Our lives begin to end the day we become silent about things that matter."
— **Martin Luther King Jr.,**

From: Gillian Clark [mailto:gnclark@HNTB.com]
Sent: Monday, July 29, 2019 1:47 PM
To: Carmanygeorge, Karstin M <KCarmanyGeorge2@indot.IN.gov>
Cc: Susan Harrington <sharrington@HNTB.com>; Christine Meador <CMeador@HNTB.com>
Subject: USFWS Bat Layer Check - Des. No. 1700182 - US 31 at Thompson Road Marion County

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Kari –

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Indiana Ecological Services Field Office
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

In Reply Refer To: April 22, 2020
Consultation Code: 03E12000-2019-SLI-1511
Event Code: 03E12000-2020-E-05928
Project Name: US 31 at Thompson Road Intersection Improvement (Des. No. 1700182)

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project “may affect” listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions which will help you

determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all **wind energy projects** and **projects that include installing towers that use guy wires or are over 200 feet in height**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act *(*16 U.S.C. 703 *et seq*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Indiana Ecological Services Field Office
620 South Walker Street
Bloomington, IN 47403-2121
(812) 334-4261

Project Summary

Consultation Code: 03E12000-2019-SLI-1511

Event Code: 03E12000-2020-E-05928

Project Name: US 31 at Thompson Road Intersection Improvement (Des. No. 1700182)

Project Type: TRANSPORTATION

Project Description: The Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) intend to proceed with intersection improvement at the crossing of US 31 at State Road (SR) 135 (Thompson Road) (Des. No. 1700182).

This section of U.S. 31 is a six-lane divided suburban arterial running north/south that carries 55,550 vehicles per day. The northbound and southbound traffic is divided by center curb. SR 135/Thompson Road is an east/west major collector that carries 14,796 vehicles per day. To the north, the interchange at U.S. 31 and I-465 is a semi-directional interchange type with loop ramps servicing I-465 eastbound to U.S. 31 northbound and I-465 westbound to U.S. 31 southbound. Other movements of the interchange are serviced with directional ramps. The intersection of U.S. 31 and S.R 135/Thompson Road is signalized.

A review of the USFWS GIS database for Indiana bat and Northern long-eared bat roosting, hibernacula and capture sites was conducted for Des. No. 1700182 on August 5, 2019. There are no documented sites within a 0.5 mile the project area.

Three alternatives are currently under consideration. All alternatives will provide designated crosswalks and pushbutton activated signals to improve pedestrian safety. Alternatives under consideration include a conventional intersection with added turn lanes, a displaced left turn for US 31 northbound and southbound, and a hybrid design with a U-turn and displaced left at US 31.

Suitable summer habitat is present adjacent to the project area and tree clearing is not anticipated. Construction activities will increase noise above existing traffic/background levels. Temporary lighting may be used during the project; however, changes to permanent lighting will not occur.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.69497836037809N86.14846600557183W

Counties: Marion, IN

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/1/office/31440.pdf	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ Incidental take of the NLEB is not prohibited here. Federal agencies may consult using the 4(d) rule streamlined process. Transportation projects may consult using the programmatic process. See www.fws.gov/midwest/endangered/mammals/nleb/index.html Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Indiana Ecological Services Field Office
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

In Reply Refer To: April 27, 2020
Consultation Code: 03E12000-2019-I-1511
Event Code: 03E12000-2020-E-06060
Project Name: US 31 at Thompson Road Intersection Improvement (Des. No. 1700182)

Subject: Concurrence verification letter for the 'US 31 at Thompson Road Intersection Improvement (Des. No. 1700182)' project under the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request to verify that the **US 31 at Thompson Road Intersection Improvement (Des. No. 1700182)** (Proposed Action) may rely on the concurrence provided in the February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures, and may affect, but is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the threatened Northern long-eared bat (*Myotis septentrionalis*).

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Proposed Action does not meet the criteria for a NLAA determination under the PBO. If we do not notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Proposed Action under the terms of the NLAA concurrence provided in the PBO. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances, Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO.

For Proposed Actions that include bridge/structure removal, replacement, and/or maintenance activities: If your initial bridge/structure assessments failed to detect Indiana bats, but you later detect bats during construction, please submit the Post Assessment Discovery of Bats at Bridge/Structure Form (User Guide Appendix E) to this Service Office. In these instances, potential incidental take of Indiana bats may be exempted provided that the take is reported to the Service.

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or Northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required. If the Proposed Action may affect any other federally-listed or proposed species, and/or any designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please contact this Service Office.

Project Description

The following project name and description was collected in IPaC as part of the endangered species review process.

Name

US 31 at Thompson Road Intersection Improvement (Des. No. 1700182)

Description

The Indiana Department of Transportation (INDOT) and Federal Highway Administration (FHWA) intend to proceed with intersection improvement at the crossing of US 31 at State Road (SR) 135 (Thompson Road) (Des. No. 1700182).

This section of U.S. 31 is a six-lane divided suburban arterial running north/south that carries 55,550 vehicles per day. The northbound and southbound traffic is divided by center curb. SR 135/Thompson Road is an east/west major collector that carries 14,796 vehicles per day. To the north, the interchange at U.S. 31 and I-465 is a semi-directional interchange type with loop ramps servicing I-465 eastbound to U.S. 31 northbound and I-465 westbound to U.S. 31 southbound. Other movements of the interchange are serviced with directional ramps. The intersection of U.S. 31 and S.R 135/Thompson Road is signalized.

A review of the USFWS GIS database for Indiana bat and Northern long-eared bat roosting, hibernacula and capture sites was conducted for Des. No. 1700182 on August 5, 2019. There are no documented sites within a 0.5 mile the project area.

Three alternatives are currently under consideration. All alternatives will provide designated crosswalks and pushbutton activated signals to improve pedestrian safety. Alternatives under consideration include a conventional intersection with added turn lanes, a displaced left turn for US 31 northbound and southbound, and a hybrid design with a U-turn and displaced left at US 31.

Suitable summer habitat is present adjacent to the project area and tree clearing is not anticipated. Construction activities will increase noise above existing traffic/background levels. Temporary lighting may be used during the project; however, changes to permanent lighting will not occur.

Determination Key Result

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the threatened Northern long-eared bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

Qualification Interview

1. Is the project within the range of the Indiana bat[1]?

   [1] See Indiana bat species profile

   Automatically answered
   Yes

2. Is the project within the range of the Northern long-eared bat[1]?

   [1] See Northern long-eared bat species profile

   Automatically answered
   Yes

3. Which Federal Agency is the lead for the action?
   A) Federal Highway Administration (FHWA)

4. Are *all* project activities limited to non-construction[1] activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

   [1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

   No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/ rail surfaces[1]?

   [1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

   No

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum[1]?

   [1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

   No

7. Is the project located **within** a karst area?

   No

8. Is there *any* suitable[1] summer habitat for Indiana Bat or NLEB **within** the project action area[2]? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

   [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

   [2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the national consultation FAQs.

   Yes

9. Will the project remove *any* suitable summer habitat[1] and/or remove/trim any existing trees **within** suitable summer habitat?

   [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

   No

10. Does the project include activities **within documented Indiana bat habitat**[1][2]?

    [1] 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. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

    [2] For the purposes of this key, 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) treed corridors located directly between documented roosting and foraging habitat.

    No

11. Does the project include activities **within documented NLEB habitat**[1][2]?

    [1] 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. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

    [2] For the purposes of this key, 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) treed corridors located directly between documented roosting and foraging habitat.

    No

12. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

    No

13. Does the project include slash pile burning?

    No

14. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

    No

15. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)

    No

16. Will the project involve the use of **temporary** lighting *during* the active season?

    Yes

17. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **temporary** lighting will be used?

    Yes

18. Will the project install new or replace existing **permanent** lighting?

    No

19. Does the project include percussives or other activities (**not including tree removal/ trimming or bridge/structure work**) that will increase noise levels above existing traffic/ background levels?

    Yes

20. Will the activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

21. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

22. Are *all* project activities that are **not associated with** habitat removal, tree removal/ trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives, limited to actions that DO NOT cause any additional stressors to the bat species?

    Examples: lining roadways, unlighted signage , rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

    Yes

23. Will the project raise the road profile **above the tree canopy**?

    No

24. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) consistent with a Not Likely to Adversely Affect determination in this key?

    Automatically answered
    Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the active season within undocumented habitat.

25. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) and/or increase noise levels above existing traffic/background levels consistent with a No Effect determination in this key?

    Automatically answered
    Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the inactive season

26. **General AMM 1**
    Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

    Yes

27. **Lighting AMM 1**
    Will *all* **temporary** lighting be directed away from suitable habitat during the active season?

    Yes

Project Questionnaire

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

   N/A

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

   N/A

Avoidance And Minimization Measures (AMMs)

This determination key result includes the committment to implement the following Avoidance and Minimization Measures (AMMs):

GENERAL AMM 1

Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.

LIGHTING AMM 1

Direct temporary lighting away from suitable habitat during the active season.

Determination Key Description: FHWA, FRA, FTA Programmatic Consultation For Transportation Projects Affecting NLEB Or Indiana Bat

This key was last updated in IPaC on December 02, 2019. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the threatened **Northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects. The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

APPENDIX D: SECTION 106 OF NHPA

Minor Projects PA Project Assessment Form – Category B Projects with Archaeology Work

Date: 9/27/2019

Project Designation Number: 1700182

Route Number: US 31 at SR 135-Thompson Road

Project Description:

The proposed project consists of intersection improvements for US 31 at SR 135/Thompson Road (0.1 miles south of SR 135/Thompson Rd to 0.4 miles north of SR 135/Thompson Rd) in Indianapolis, Indiana. Currently, several options are being discussed, including a traditional intersection improvement where all approaches would be widened to account for additional auxiliary lanes, a median U-Turn treatment, and a displaced Left Turn treatment. The preferred alternative has not yet been selected.L

Feature crossed (if applicable): N/A

Township: Perry Township

City/County: Indianapolis/Marion County

Information reviewed (please check all that apply):

☑ General project location map ☑ USGS map ☑ Aerial photograph ☑ Interim Report

☐ Written description of project area ☑ General project area photos ☑ Soil survey data

☐ Previously completed historic property reports ☑ Previously completed archaeology reports

☑ Bridge Inspection Information

Other (please specify): State Historic Architectural and Archaeological Research Database (SHAARD), GIS, Indiana Historic Buildings, Bridges and Cemeteries Map

Grob, Kaye and Veronica Parsell

2019 Phase Ia Archaeological Records Review and Reconnaissance US 31 at SR 135 – Intersection Improvement with Added Turn Lanes, 0.1 miles south of SR 135/Thompson Rd to 0.4 miles north of SR 135/Thompson Rd, Marion County, Indiana INDOT Des. No. 1700182

Results of the Records Review for Above-Ground Resources:

With regard to above-ground resources, an INDOT Cultural Resources historian who meets the Secretary of the Interior's Professional Qualification Standards as per 36 CFR Part 61 performed a desktop review, checking the Indiana Register of Historic Sites and Structures (State Register) and National Register of Historic Places (National Register) lists for Marion County. No listed resources are located near the project area.

The Indiana Historic Sites and Structures Inventory (IHSSI) was also consulted, via the Indiana State Historic Architectural and Archaeological Research Database (SHAARD) and the Indiana Historic Buildings, Bridges, and Cemeteries (IHBBC) map. No surveyed properties are located adjacent to the project area.

The project occurs along a dense, suburban commercial corridor composed primarily of modern hotels, restaurants and other retail businesses. Residential properties located in the project area include apartment buildings and scattered single-family structures. The single-family residences primarily date to the 1960s and 1970s. They do not have any distinctive architectural characteristics or contribute to any neighborhoods or potential historic districts.

Based on the available information, as summarized above, no above-ground concerns exist.

Archaeology Report Author/Date:

Kaye Grob and Veronica Parsell/August 28, 2019

Summary of Archaeology Investigation Results:
With regard to archaeological resources, the 47.5 project area consists of a mix of residential, commercial, and highway infrastructure along US 31, Thompson Road, and Interstate 465. The majority of the project area is located along the edges of these routes and has been heavily disturbed by the construction of these roads and the surrounding structures, urban hardscape, and parking areas. Much of the work will occur in Udorthents, cut and filled soils, and disturbed soils. These are areas around highways and interchanges where deep cuts have been made in the original land surface and the soil used as fill in lower lying areas or where soil has been removed and used as fill for highway grades. The project area was investigated through a combination of visual inspection and shovel testing at 15 m (49.2 ft) intervals. The interchange of US 31 and Interstate 465 was subjected to visual inspection only, as it has been heavily graded as a result of the construction of the interchange, and is therefore not conducive to intact archaeological deposits. Additionally, portions of it have been previously surveyed for cultural resources. Shovel tests were conducted in all areas that were not impeded by urban hardscape such as asphalt and concrete parking lots, drives, sidewalks, and other urban infrastructure. A total of 183 shovel tests were conducted as a result of the field investigation. Of these, 142 were found to contain disturbed, mixed and graded soils. A typical disturbed shovel test contained mixed soils and gravels and no intact A-horizon was identified beneath the disturbed soils. The portion of the project area on the west side of US 31 that contained intact, negative shovel probes corresponds to the one portion of the project that has not been heavily developed, as evidenced in the historic aerials from 1937 to 2019. According to SHAARD GIS there are no recorded sites within or adjacent to the project and there is little likelihood for archaeological material in this heavily disturbed setting. The report was reviewed by INDOT Cultural Resources personnel who meet the Secretary of the Interior's Professional Qualification Standards as per 36 CFR Part 61. It is our opinion that the report is acceptable, and we concur with the evaluations and recommendations made by Cardno (Grob and Parsell 2019). Therefore, there are no archaeological concerns.

Does the project appear to fall under the Minor Projects PA? yes ☒ no ☐

If yes, please specify category and number (applicable conditions are highlighted):

B.2. Installation of new lighting, signals, signage and other traffic control devices under the following conditions ***[BOTH Condition A, which pertains to Archaeological Resources, and Condition B, which pertains to Above-Ground Resources, must be satisfied]***:

Condition A (Archaeological Resources)

One of the two conditions listed below must be met *(EITHER Condition i or Condition ii must be satisfied)*:

i. Work occurs in previously disturbed soils; *OR*

ii. Work occurs in undisturbed soils and an archaeological investigation conducted by the applicant and reviewed by INDOT Cultural Resources Office determines that no National Register-listed or potentially National Register-eligible archaeological resources are present within the project area. If the archaeological investigation locates National Register-listed or potentially National Register-eligible archaeological resources, then full Section 106 review will be required. Copies of any archaeological reports prepared for the project will be provided to the DHPA and any archaeological site form information will be entered directly into the SHAARD by the applicant. The archaeological reports will also be available for viewing (by Tribes only) on INSCOPE.

Condition B (Above-Ground Resources)

Work does not occur adjacent to or within a National Register-listed or National Register-eligible district or individual above-ground resource.

B.3. Construction of added travel, turning, or auxiliary lanes (e.g., bicycle, truck climbing, acceleration and deceleration lanes) and shoulder widening under the following conditions ***[BOTH Condition A, which pertains to Archaeological Resources, and Condition B, which pertains to Above-Ground Resources, must be satisfied]***:

Condition A (Archaeological Resources)

One of the two conditions listed below must be met *(EITHER Condition i or Condition ii must be satisfied):*

i. Work occurs in previously disturbed soils; *OR*

ii. Work occurs in undisturbed soils and an archaeological investigation conducted by the applicant and reviewed by INDOT Cultural Resources Office determines that no National Register-listed or potentially National Register-eligible archaeological resources are present within the project area. If the archaeological investigation locates National Register-listed or potentially National Register-eligible archaeological resources, then full Section 106 review will be required. Copies of any archaeological reports prepared for the project will be provided to the DHPA and any archaeological site form information will be entered directly into the SHAARD by the applicant. The archaeological reports will also be available for viewing (by Tribes only) on INSCOPE.

Condition B (Above-Ground Resources)

Work does not occur adjacent to or within a National Register-listed or National Register-eligible district or individual above-ground resource.

If no, please explain:

Additional comments: If any archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, construction in the immediate area of the

find will be stopped, and the INDOT Cultural Resources Section and the Division of Historic Preservation and Archaeology will be notified immediately.

INDOT Cultural Resources staff reviewer(s): Patrick Carpenter and Patricia Jo Korzeniewski

****Be sure to attach this form to the National Environmental Policy Act documentation for this project. Also, the NEPA documentation shall reference and include the description of the specific stipulation in the PA that qualifies the project as exempt from further Section 106 review.*

Please note that this is an excerpt from the complete report.

Phase Ia Archaeological Records Review and Reconnaissance

US 31 at SR 135 Intersection Improvement with Added Turn Lanes, 0.1 miles south of SR 135/Thompson Rd to 0.4 miles north of SR 135/Thompson Rd, Marion County, Indiana

INDOT Des. No. 1700182

Cardno

Document Information

Prepared for	HNTB
Project Name	US 31 at SR 135 Intersection Improvement with Added Turn Lanes, 0.1 miles south of SR 135/Thompson Rd to 0.4 miles north of SR 135/Thompson Rd, Marion County, Indiana
INDOT Des No	1700182
Cardno PN	J192079M01
Date	September 23, 2019

Prepared and Submitted By Kaye Grob and Veronica Parsell

Principal Investigator

Veronica Parsell

Prepared for:

HNTB

HNTB
111 Monument Circle, Ste. 1200, Indianapolis, IN 46204

Prepared by:

Cardno

Cardno
39010 Industrial Boulevard, Indianapolis, Indiana, 46254

INDIANA ARCHAEOLOGICAL SHORT REPORT

State Form 54566 (1-11)

INDIANA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF HISTORIC PRESERVATION
AND ARCHAEOLOGY
402 West Washington Street, Room W274
Indianapolis, Indiana 46204-2739
Telephone Number: (317) 232-1646
Fax Number: (317) 232-0693
E-mail: dhpa@dnr.IN.gov

Where applicable, the use of this form is recommended but not required by the Division of Historic Preservation and Archaeology.

Author: Kaye Grob and Veronica Parsell

Date *(month, day, year):* September 23, 2019

Project Title: Phase Ia Archaeological Records Review and Reconnaissance for the US 31 at SR 135 Intersection Improvement with Added Turn Lanes, 0.1 miles south of SR 135/Thompson Rd to 0.4 miles north of SR 135/Thompson Rd, Marion County, Indiana (Des No 1700182)

PROJECT OVERVIEW

Project Description: Based on our understanding, the proposed project will consist of intersection improvements for US 31 at SR 135/Thompson Road in Indianapolis, Indiana.(Figure 1). Currently, several options are being discussed, including a traditional intersection improvement where all approaches would be widened to account for additional auxiliary lanes, a meadian U-Turn treatment, and a displaced Left Turn treatment. Based on our understanding, the preferred alternative has not yet been selected. Cardno investigated an area measuring 19.2 hectares (ha) (47.5 acres [ac]) to account for all proposed alternatives.

INDOT Designation Number/ Contract Number: 1700182 Project Number:

DHPA Number: Approved DHPA Plan Number:

Prepared For: HNTB

Contact Person: Christine Meador

Address: 111 Monument Circle, Suite 1200

City: Indianapolis State: IN ZIP Code: 46204

Telephone Number: 317-636-4682 E-mail Address: CMeador@HNTB.com

Principal Investigator: Veronica Parsell

Signature: Veronica Parsell

Company/Institution: Cardno, Inc.

Address: 3901 Industrial Boulevard

City: Indianapolis State: IN ZIP Code: 46240

Telephone Number: (317) 388-1982 E-mail Address: veronica.parsell@cardno.com

Visual Walkover ☒ Pedestrian Survey ☐ Shovel Test ☒ Screened ☐ Mesh Size 1/4 inch

Interval 5 m ☐ 10 m ☐ 15 m ☒ Other *(describe below)* ☐

Number of Shovel Test Units Excavated: A total of 183 shovel tests were conducted as a result of the field investigation. Of these, 142 were found to contain disturbed, mixed and graded soils (Figure 8).

Describe Methods**:** The project area was investigated through a combination of visual inspection and shovel testing at 15 m (49.2 ft) intervals. Shovel tests were conducted in all areas that were not impeded by urban hardscape such as asphalt and concrete parking lots, drives, sidewalks, and other urban infrastructure. The interchange of US 31 and Interstate 465 was subjected to visual inspection only, as it has been heavily graded as a result of the construction of the interchange, and is therefore not conducive to intact archaeological deposits. Additionally, portions of it have been previously surveyed for cultural resources.

Pursuant to IDNR-DHPA Guidelines (DNR-DHPA 2008), shovel tests were 30 centimeters (12 inches) in diameter and extended into undisturbed soils or to a maximum depth of 50 centimeters (20 inches). Soils removed from the shovel tests were screened for cultural materials through ¼-inch hardware mesh and immediately backfilled.

Attach photographs documenting disturbances below

Describe Disturbances: Disturbances within the project area were a result of the urban growth in the region. Disturbances included urban hardscape such as sidewalks, asphalt and concrete drives and parking areas, graded roadside gravels resulting from the adjacent road construction, and subsurface utilities throughout the majority of the project area.

Comments: No cultural resources were identified as a result of the field investigation. The majority of the project area was found to be heavily disturbed. A typical disturbed shovel test contained mixed soils and gravels and no intact A-horizon was identified beneath the disturbed soils. Of the 41 excavated shovel tests which exhibited intact soils, a typical soil profile consisted of a 10YR 3/3 silt loam over a 10YR 5/4 silt loam subsoil. The portion of the project area on the west side of US 31 that contained intact, negative shovel probes corresponds to the one portion of the project that has not been heavily developed, as evidenced in the historic aerials from 1937 to 2019.

RESULTS

☐ Archaeological records check has determined that the project area does not have the potential to contain archaeological resources.

☐ Archaeological records check has determined that the project area has the potential to contain archaeological resources.

☒ Phase Ia reconnaissance has located no archaeological resources in the project area.

☐ Phase Ia reconnaissance has identified landforms conducive to buried archaeological deposits.

Actual Area Surveyed hectares: 19.2 acres: 47.5

Comments:

RECOMMENDATION

☐ The archaeological records check has determined that the project area has the potential to contain archaeologic resources and a Phase Ia archaeological reconnaissance is recommended.

☐ The archaeological records check has determined that the project area does not have the potential to contain archaeological resources and no further work is recommended before the project is allowed to proceed.

☒ The Phase Ia archaeological reconnaissance has located no archaeological sites within the project area and it is recommended that the project be allowed to proceed as planned.

APPENDIX E: RED FLAG AND HAZARDOUS MATERIALS

INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204

PHONE: (317) 232-5113
FAX: (317) 233-4929

Eric Holcomb, Governor
Joe McGuinness, Commissioner

Date: December 20, 2019

To: Site Assessment & Management
Environmental Policy Office - Environmental Services Division
Indiana Department of Transportation
100 N Senate Avenue, Room N642
Indianapolis, IN 46204

From: Susan Harrington
HNTB Corporation
111 Monument Circle, Suite 1200
Indianapolis, Indiana 46204
sharrington@hntb.com

Re: RED FLAG INVESTIGATION
DES 1700182, State Project
Intersection Improvement with Added Turn Lanes
US 31 at SR 135/Thompson Road
Marion County, Indiana

PROJECT DESCRIPTION

Brief Description of Project: This project consists of intersection improvement at the crossing of United States (US) 31 at State Road (SR) 135/Thompson Road. The preferred alternative has not yet been selected, but the Abbreviated Engineer's Report recommends a displaced left turn treatment and realignment of the Interstate 465 eastbound exit ramp to southbound US 31.

Bridge and/or Culvert Project: Yes ☐ No ☒ Structure # _____

If this is a bridge project, is the bridge Historical? Yes ☐ No ☐ , Select ☐ Non-Select ☐

(Note: If the project involves a historical bridge, please include the bridge information in the Recommendations Section of the report).

Proposed right of way: Temporary ☒ # Acres TBD, Permanent ☒ # Acres >0.5, Not Applicable ☐

Type of excavation: Excavation in the area of the I-465 off ramp is expected to be up to 5 feet. Excavation along US 31 for construction of additional lanes will be up to 6 feet. Where new lighting or new traffic signals are required, excavation will be up to 16 feet for installation of footings.

Maintenance of traffic: The MOT for the project will be contained within the existing roadway, reducing traffic to two lanes in each direction during construction. There will be no temporary lane construction or detour.

Work in waterway: Yes ☒ No ☐ Below ordinary high water mark: Yes ☐ No ☒

State Project: ☒ LPA: ☐

Any other factors influencing recommendations: The scope of this project is still under development. Several options for intersection improvements are being considered, and the project description and right of way amounts are subject to additional changes. Since the project scope is still under development, it is assumed that work may occur within a

waterway. A Waters of the US Report will be prepared and coordination with INDOT Ecology and Waterway Permitting will occur.

INFRASTRUCTURE TABLE AND SUMMARY

Infrastructure Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
Religious Facilities	**6***	Recreational Facilities	**1**
Airports[1]	**N/A**	Pipelines	**1**
Cemeteries	**1**	Railroads	**1**
Hospitals	**N/A**	Trails	**N/A**
Schools	**2**	Managed Lands	**N/A**

[1]In order to complete the required airport review, a review of public airports within 3.8 miles (20,000 feet) is required.

Explanation:
Religious Facilities*: Although not mapped within the GIS database, six (6) religious facilities are located within the 0.5 mile search radius. The nearest facility, Bethany Lutheran Church, is adjacent to the project area. Coordination with Bethany Lutheran Church will occur.

Cemeteries: One (1) cemetery is located within the 0.5 mile search radius. Round Hill Cemetery is located 0.5 mile southwest of the project area. No impact is expected.

Schools: Two (2) schools are located within the 0.5 mile search radius. The nearest school, William Henry Burkhart Elementary School, is 0.41 mile southwest of the project area. No impact is expected.

Recreational Facilities: One (1) recreational facility is located within the 0.5 mile search radius. William Henry Burkhart Elementary School is 0.41 mile southwest of the project area. No impact is expected.

Pipelines: One (1) pipeline is located within the 0.5 mile search radius. The nearest segment, associated with Citizens Gas & Coke Utility, is located approximately 0.32 mile east of the project area. No impact is expected.

Railroads: One (1) railroad is located within the 0.5 mile search radius. This railroad is located 0.45 mile east of the project area. No impact is expected.

WATER RESOURCES TABLE AND SUMMARY

Water Resources Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
NWI - Points	**N/A**	Canal Routes - Historic	**N/A**
Karst Springs	**N/A**	NWI - Wetlands	**8**
Canal Structures – Historic	**N/A**	Lakes	**3**
NPS NRI Listed	**N/A**	Floodplain - DFIRM	**22**
NWI-Lines	**2**	Cave Entrance Density	**N/A**
IDEM 303d Listed Streams and Lakes (Impaired)	**N/A**	Sinkhole Areas	**N/A**

Rivers and Streams	**4**	Sinking-Stream Basins	**N/A**

Explanation:
NWI – Lines: Two (2) NWI – Line features are located within the 0.5 mile search radius. One NWI-Line feature is located within the project area. A Waters of the U.S. Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Rivers and Streams: Four (4) river and stream segments are located within the 0.5 mile search radius. Two (2) segments, Haueisen Ditch and Lick Creek, are located within the project area. A Waters of the U.S. Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

NWI – Wetlands: Eight (8) wetlands are located within the 0.5 mile search radius. One wetland is located adjacent to the project area. A Waters of the U.S. Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Lakes: Three (3) lakes are located within the 0.5 mile search radius. The nearest lake is located adjacent to the project area. A Waters of the U.S. Report will be prepared and coordination with INDOT ES Ecology and Waterway Permitting will occur.

Floodplain – DFIRM: Twenty-two (22) floodplain polygons are located within the 0.5 mile search radius. The project area is located within one of the floodplain polygons. Coordination with INDOT ES Ecology and Waterway Permitting will occur.

URBANIZED AREA BOUNDARY SUMMARY

Explanation: The project lies within the Indianapolis UAB. Post construction Storm Water Quality Best Management Practices (BMPs) may need to be considered. An early coordination letter with topographic and aerial maps showing the project area should be sent to the Indianapolis MS4 Coordinator at 200 E. Washington St, Indianapolis, IN 46204.

MINING AND MINERAL EXPLORATION TABLE AND SUMMARY

Mining/Mineral Exploration Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
Petroleum Wells	**N/A**	Mineral Resources	**N/A**
Mines – Surface	**N/A**	Mines – Underground	**N/A**

Explanation: No mining and mineral exploration resources were identified within the 0.5 mile search radius.

HAZARDOUS MATERIAL CONCERNS TABLE AND SUMMARY

Hazardous Material Concerns Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
Superfund	**N/A**	Manufactured Gas Plant Sites	**N/A**
RCRA Generator/ TSD	**N/A**	Open Dump Waste Sites	**N/A**
RCRA Corrective Action Sites	**N/A**	Restricted Waste Sites	**N/A**

State Cleanup Sites	**2**	Waste Transfer Stations	**N/A**
Septage Waste Sites	**N/A**	Tire Waste Sites	**N/A**
Underground Storage Tank (UST) Sites	**6**	Confined Feeding Operations (CFO)	**N/A**
Voluntary Remediation Program	**2**	Brownfields	**N/A**
Construction Demolition Waste	**N/A**	Institutional Controls	**3**
Solid Waste Landfill	**N/A**	NPDES Facilities	**N/A**
Infectious/Medical Waste Sites	**N/A**	NPDES Pipe Locations	**1**
Leaking Underground Storage (LUST) Sites	**12**	Notice of Contamination Sites	**N/A**

Explanation:

Leaking Underground Storage Tank (LUST): Twelve (12) LUST Program sites are located within the 0.5 mile search radius. Three (3) sites are located within or adjacent to the project area.

- Johnson Oil Bigfoot #025, 505 E Thompson Road, AI 15900, is located at the southeast corner of Thompson Road and US 31 within the project area. The site is was formerly a gas station and is currently a CVS Pharmacy. The Indiana Department of Environmental Management (IDEM) issued a No Further Action Approval on January 3, 2002. Benzene, toluene, ethylbenzene and xylene (BTEX) was not detected at levels above the maximum contaminant level in any groundwater samples. Methyl tert-butyl ether (MTBE) was detected above IDEM closure objectives in soils borings located closest to Thompson Road. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary.
- Shell Oil Indianapolis, 5250 South East Street, AI 18881, is located within the project area, near the southern terminus of the project. The site is currently redeveloped as a fast food restaurant. During a site investigation prior to the removal of a UST, petroleum hydrocarbons were noted in the soil and groundwater in the area of the former pump island at depths of approximately 6-8 feet. IDEM issued a No Further Action Approval for the site on November 22, 1999. Contamination noted on site did not extend to US 31. However, since the groundwater flow is to the northeast towards the roadway, migration of the contamination is possible. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary.
- Shell Dealer Indianapolis, 514 East Thompson Road, AI 18880, is located at the northeast corner of Thompson Road and US 31 within the project area. The site operated as a gas station from 1968 to 2006, and the UST system was removed in May 2006. Contamination was found and additional excavation of impacted soils occurred in August 2007. Contaminant levels below closure levels for soils were noted on the site at depths greater than 9 feet. Groundwater was noted to flow southwest towards the intersection. IDEM issued a no Further Action letter on February 17, 2011. This site is currently being redeveloped. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary.

Underground Storage Tank (UST): Six (6) UST sites are located within the 0.5 mile search radius. The nearest UST site, associated with Indy Lube Southport Incorporated (AI 21521), is located at 5470 South East Street, 0.17 mile south of the project area. No impact is expected.

State Cleanup: Two (2) State Cleanup sites are located within the 0.5 mile search radius. One site is located within or adjacent to the project area.

- The Former Shoney's site, 5010 South East Street, AI 23155, is located south of Thompson Road on the west side of US 31 within the project area. This site was a participant in the State Cleanup and Voluntary Remediation Program and has a recorded Environmental Restrictive Covenant (ERC). A petroleum release was reported onsite on June 29, 2000, and an Initial Site Characterization Report was submitted to IDEM's State Cleanup Program on

September 7, 2000. The site was accepted into IDEM's Voluntary Remediation Program in 2002. The Remediation Completion Report dated May 8, 2009, indicated that groundwater and soil impacts were below applicable closure levels. On January 5, 2011, this site was provided a Covenant Not to Sue by IDEM's Voluntary Remediation Program after completing the voluntary cleanup at the site. Low levels of contaminants were noted in the groundwater below 8 feet. An ERC was placed on the property on March 31, 2010. The ERC prohibits use of groundwater at the site, but allows excavation and construction activities, if excavated soils are disposed of pursuant to state and federal law. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary. Because there is an ERC on the site, coordination will be conducted with IDEM before further site activities occur.

Voluntary Remediation: Two (2) Voluntary Remediation Program sites are located within the 0.5 mile search radius. One site is located within the project area.

- The Former Shoney's site, 5010 S East Street, AI 23155, is located south of Thompson Road on the west side of US 31 within the project area. This site is also listed as a State Cleanup Site and an Institutional Controls site. See above for more information.

Institutional Controls: Three (3) Institutional Control sites are located within the 0.5 mile search. One (1) site is located within or adjacent to the project area.

- The Former Shoney's site, 5010 S East Street, AI 23155, is located south of Thompson Road on the west side of US 31 within the project area. This site is also listed as a State Cleanup Site and Voluntary Remediation Program site. See above for more information.

NPDES Pipe Locations: One (1) NPDES Pipe Location is within the 0.5 mile search radius. This pipe location, associated with the Indianapolis Belmont and Southport Advanced Water Treatment Plants, is located 0.30 mile east of the project area. No impact is expected.

ECOLOGICAL INFORMATION SUMMARY

The Marion County listing of the Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high quality natural communities is attached with ETR species highlighted. A preliminary review of the Indiana Natural Heritage Database by INDOT Environmental Services did not indicate the presence of ETR species within the 0.5 mile search radius. Coordination with USFWS and IDNR will occur.

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. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects."

An inquiry using the USFWS Information for Planning and Consultation (IPaC) website did not indicate the presence of the federally endangered species, the Rusty Patched Bumble Bee, in or within 0.5 mile of the project area. No impact is expected.

RECOMMENDATIONS SECTION

Include recommendations from each section. If there are no recommendations, please indicate N/A:

INFRASTRUCTURE:
Religious Facilities: One (1) religious facility is located adjacent to the project area. Coordination with Bethany Lutheran Church will occur.

WATER RESOURCES: The presence of the following water resources will require the preparation of a Waters of the U.S. Report and coordination with INDOT ES Ecology and Waterway Permitting:

- One (1) NWI-Line feature is located within the project area.
- Two (2) river and stream segments, Haueisen Ditch and Lick Creek, are located in the project area.
- One (1) wetland is located adjacent to the project area.
- One (1) lake is located adjacent to the project area.

The project area is partially located within a floodplain (coordination only).

URBANIZED AREA BOUNDARY: The project lies within the Indianapolis UAB. Post construction Storm Water Quality Best Management Practices (BMPs) may need to be considered. An early coordination letter with topographic and aerial maps showing the project area should be sent to the Indianapolis MS4 Coordinator at 200 E. Washington St, Indianapolis, IN 46204.

MINING/MINERAL EXPLORATION: N/A

HAZARDOUS MATERIAL CONCERNS:

- Johnson Oil Bigfoot #025, 505 E Thompson Road, AI 15900, is located at the southeast corner of Thompson Road and US 31 within the project area. The site is was formerly a gas station and is currently a CVS Pharmacy. The IDEM issued a No Further Action Approval on January 3, 2002. BTEX was not detected at levels above the maximum contaminant level in any groundwater samples. MTBE was detected above IDEM closure objectives in soils borings located closest to Thompson Road. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary.
- Shell Oil Indianapolis, 5250 South East Street, AI 18881, is located within the project area, near the southern terminus of the project. The site is currently redeveloped as a fast food restaurant. During a site investigation prior to the removal of a UST, petroleum hydrocarbons were noted in the soil and groundwater in the area of the former pump island at depths of approximately 6-8 feet. IDEM issued a No Further Action Approval for the site on November 22, 1999. Contamination noted on site did not extend to US 31. However, since the groundwater flow is to the northeast towards the roadway, migration of the contamination is possible. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary.
- Shell Dealer Indianapolis, 514 East Thompson Road, AI 18880, is located at the northeast corner of Thompson Road and US 31 within the project area. The site operated as a gas station from 1968 to 2006, and the UST system was removed in May 2006. Contamination was found and additional excavation of impacted soils occurred in August 2007. Contaminant levels below closure levels for soils were noted on the site at depths greater than 9 feet. Groundwater was noted to flow southwest towards the intersection. IDEM issued a no Further Action letter on February 17, 2011. This site is currently being redeveloped. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary.
- The Former Shoney's site, 5010 South East Street, AI 23155, is located south of Thompson Road on the west side
- of US 31 within the project area. This site was a participant in the State Cleanup and Voluntary Remediation Program and has a recorded Environmental Restrictive Covenant (ERC). A petroleum release was reported onsite on June 29, 2000, and an Initial Site Characterization Report was submitted to IDEM's State Cleanup Program on September 7, 2000. The site was accepted into IDEM's Voluntary Remediation Program in 2002. The Remediation Completion Report dated May 8, 2009, indicated that groundwater and soil impacts were below applicable closure levels. On January 5, 2011, this site was provided a Covenant Not to Sue by IDEM's Voluntary Remediation Program after completing the voluntary cleanup at the site. Low levels of contaminants were noted in the groundwater below 8 feet. An ERC was placed on the property on March 31, 2010. The ERC prohibits use of groundwater at the site, but allows excavation and construction activities, if excavated soils are disposed of pursuant to state and

federal law. If excavation occurs in this area, contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary. Because there is an ERC on the site, coordination will be conducted with IDEM before further site activities occur.

ECOLOGICAL INFORMATION: Coordination with USFWS and IDNR will occur. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects."

INDOT Environmental Services concurrence: Nicole Fohey-Breting Digitally signed by Nicole Fohey-Breting Date: 2019.12.27 09:04:37 -05'00' (Signature)

Prepared by:
Susan Harrington
HNTB Corporation

Graphics:

A map for each report section with a 0.5 mile search 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:

SITE LOCATION: YES

INFRASTRUCTURE: YES

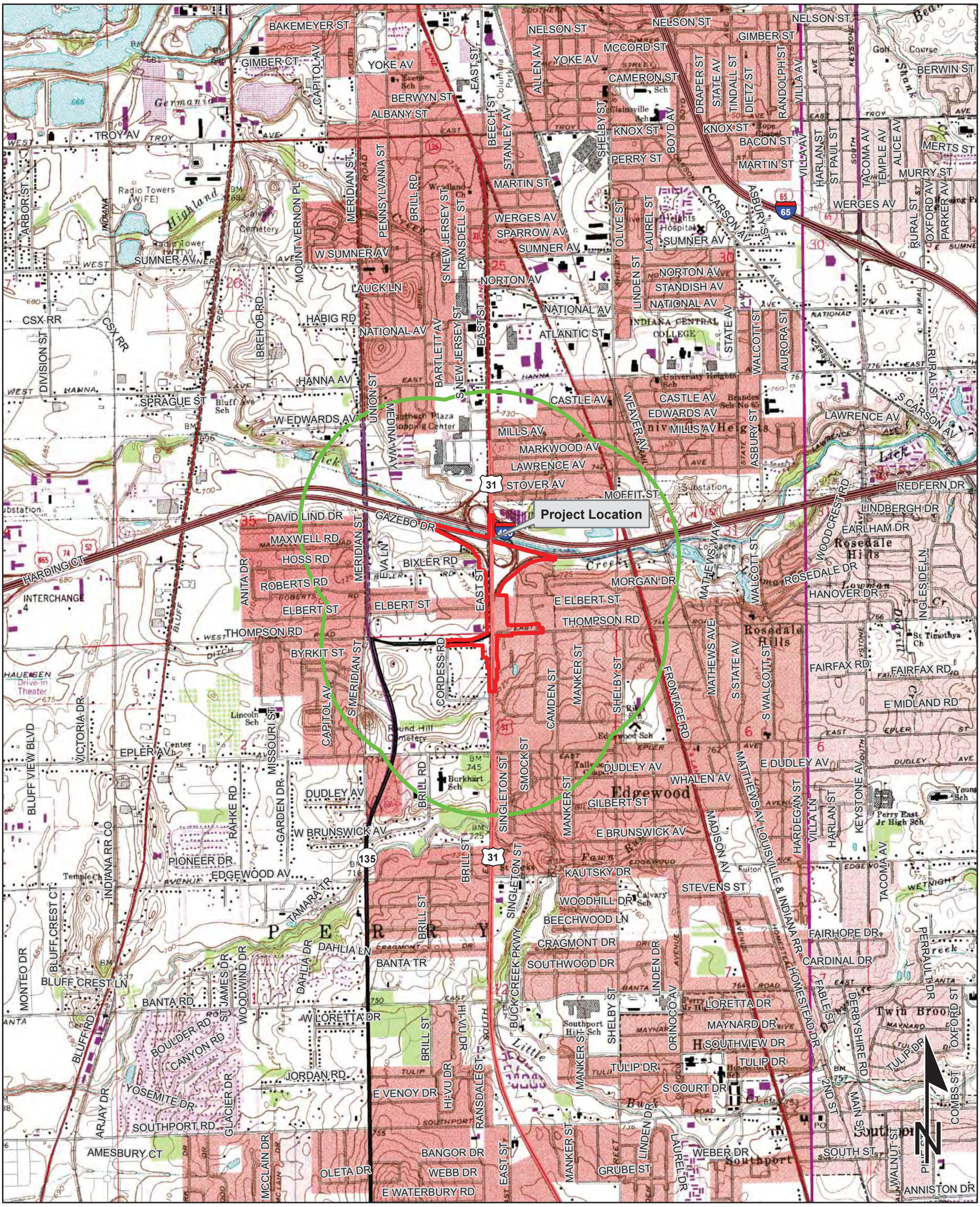
WATER RESOURCES: YES

URBANIZED AREA BOUNDARY: YES

MINING/MINERAL EXPLORATION: N/A

HAZARDOUS MATERIAL CONCERNS: YES

Red Flag Investigation - Site Location
US 31 at Thompson Road
Des. No. 1700182, Intersection Improvement
Marion County, Indiana



0.5 0.25 0 0.5 Miles

Sources:

Non Orthophotography Data - Obtained from the State of Indiana Geographical Information Office Library

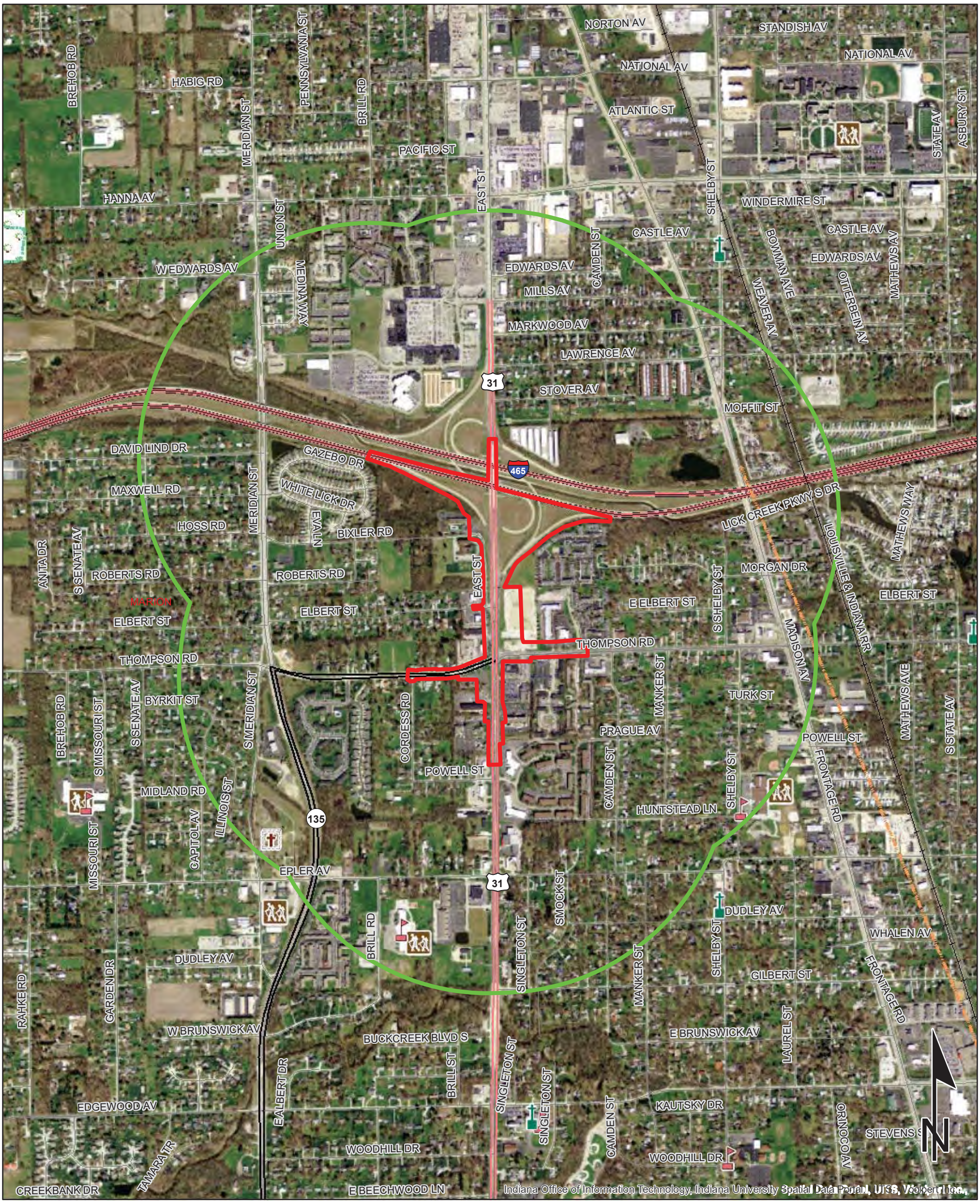
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)

Map Projection: UTM Zone 16 N **Map Datum:** NAD83

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

MAYWOOD AND BEECH GROVE
INDIANA QUADRANGLE
7.5 MINUTE SERIES
(TOPOGRAPHIC)

Red Flag Investigation - Infrastructure
US 31 at Thompson Road
Des. No. 1700182, Intersection Improvement
Marion County, Indiana



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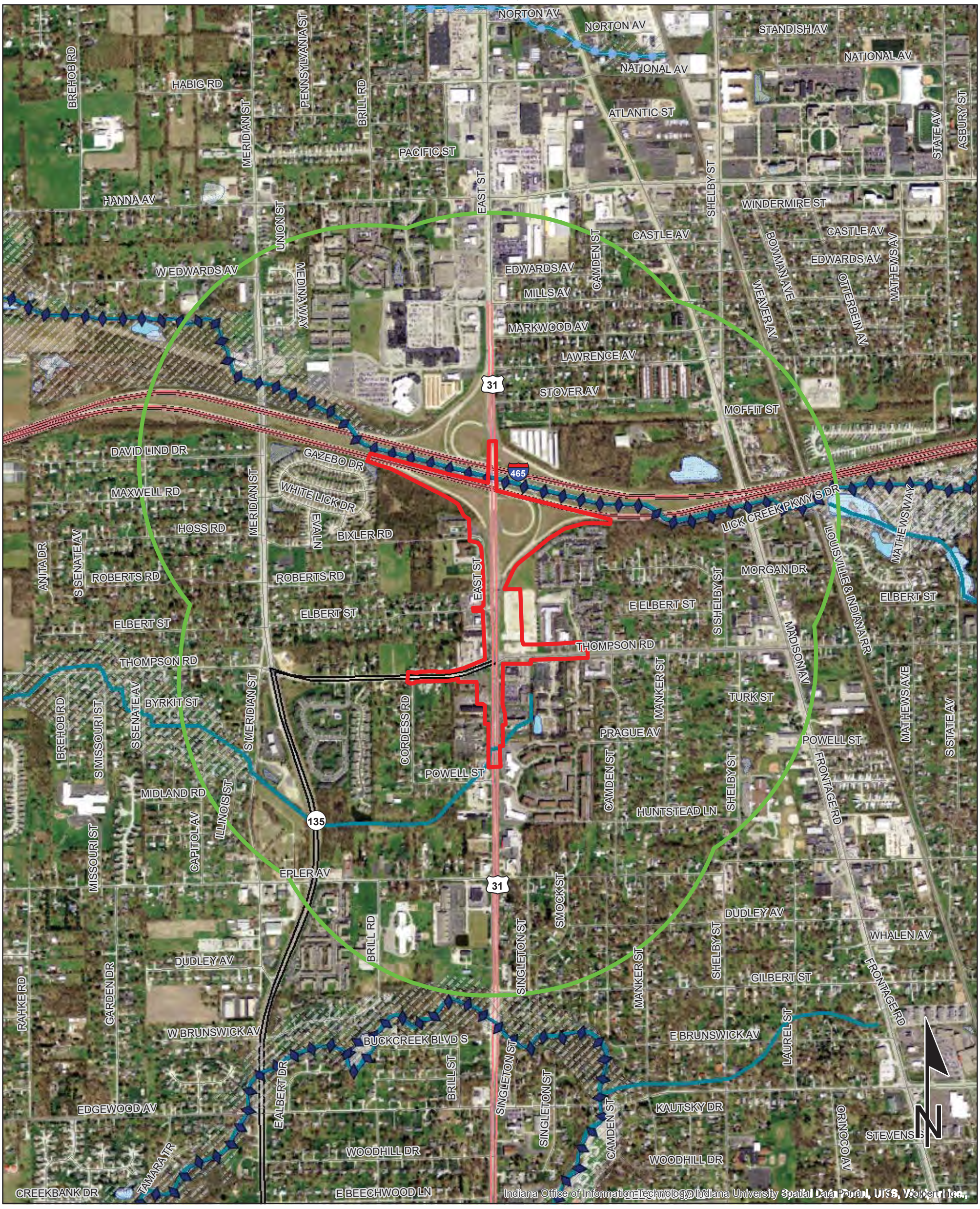
Sources:
Non Orthophotography Data - Obtained from the State of Indiana Geographical Information Office Library
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

- Religious Facility
- Airport
- Cemeteries
- Hospital
- School
- Recreation Facility
- Pipeline
- Railroad
- Trails
- Managed Lands
- County Boundary
- Project Area
- Half Mile Radius
- Toll
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Water Resources
US 31 at Thompson Road
Des. No. 1700182, Intersection Improvement
Marion County, Indiana



0.25 0.125 0 0.25 Miles

Sources:

Non Orthophotography

Data - Obtained from the State of Indiana Geographical Information Office Library

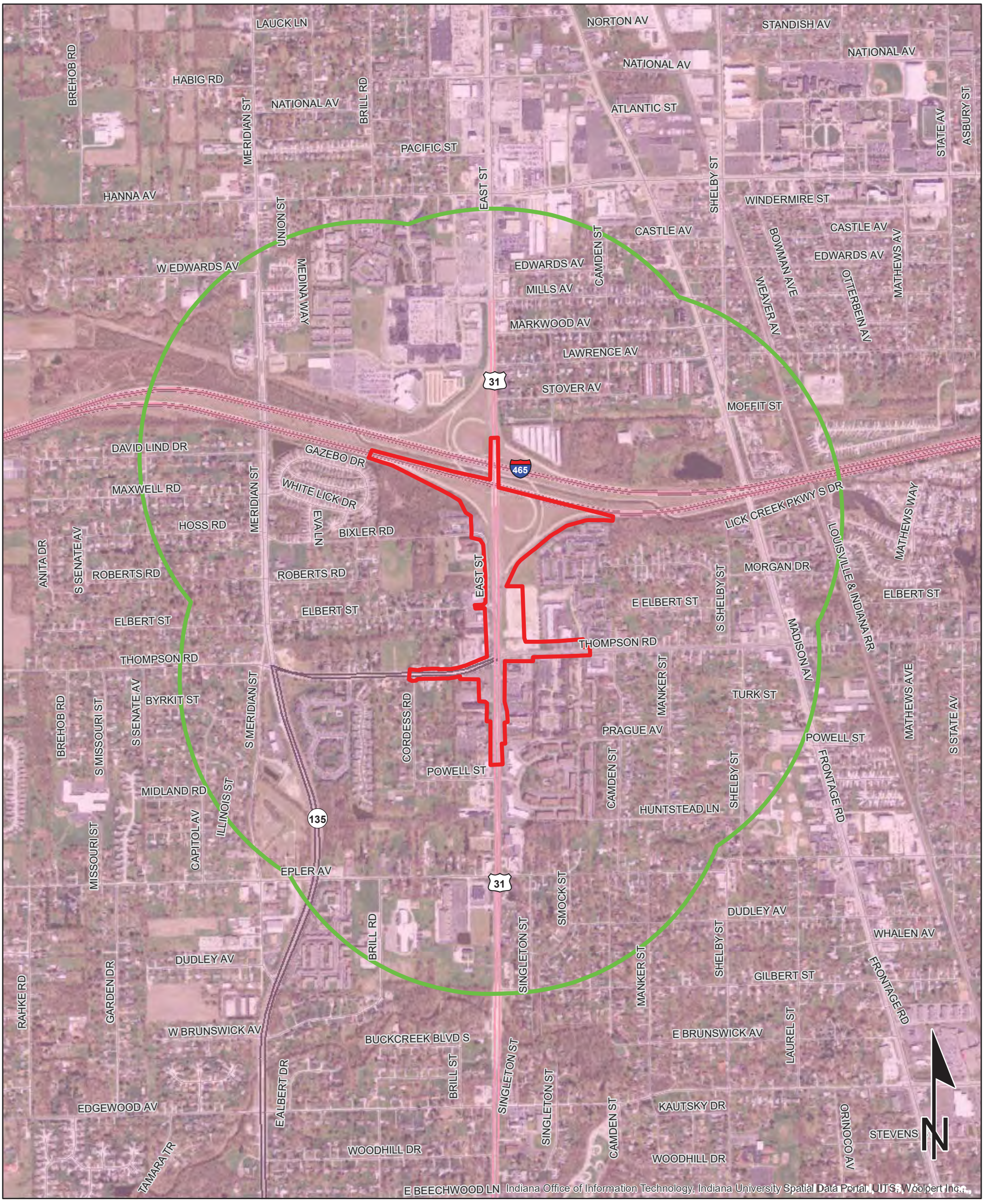
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)

Map Projection: UTM Zone 16 N **Map Datum:** NAD83

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

- NWI - Point
- Karst Spring
- NWI- Line
- Impaired_Stream_Lake
- NPS NRI listed
- River
- Canal Structure - Historic
- Canal Route - Historic
- Wetlands
- Lake
- Floodplain - DFIRM
- Cave Entrance Density
- Sinkhole Area
- Sinking-Stream Basin
- County Boundary
- Project Area
- Half Mile Radius
- Toll
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Urbanized Area Boundary
US 31 at Thompson Road
Des. No. 1700182, Intersection Improvement
Marion County, Indiana



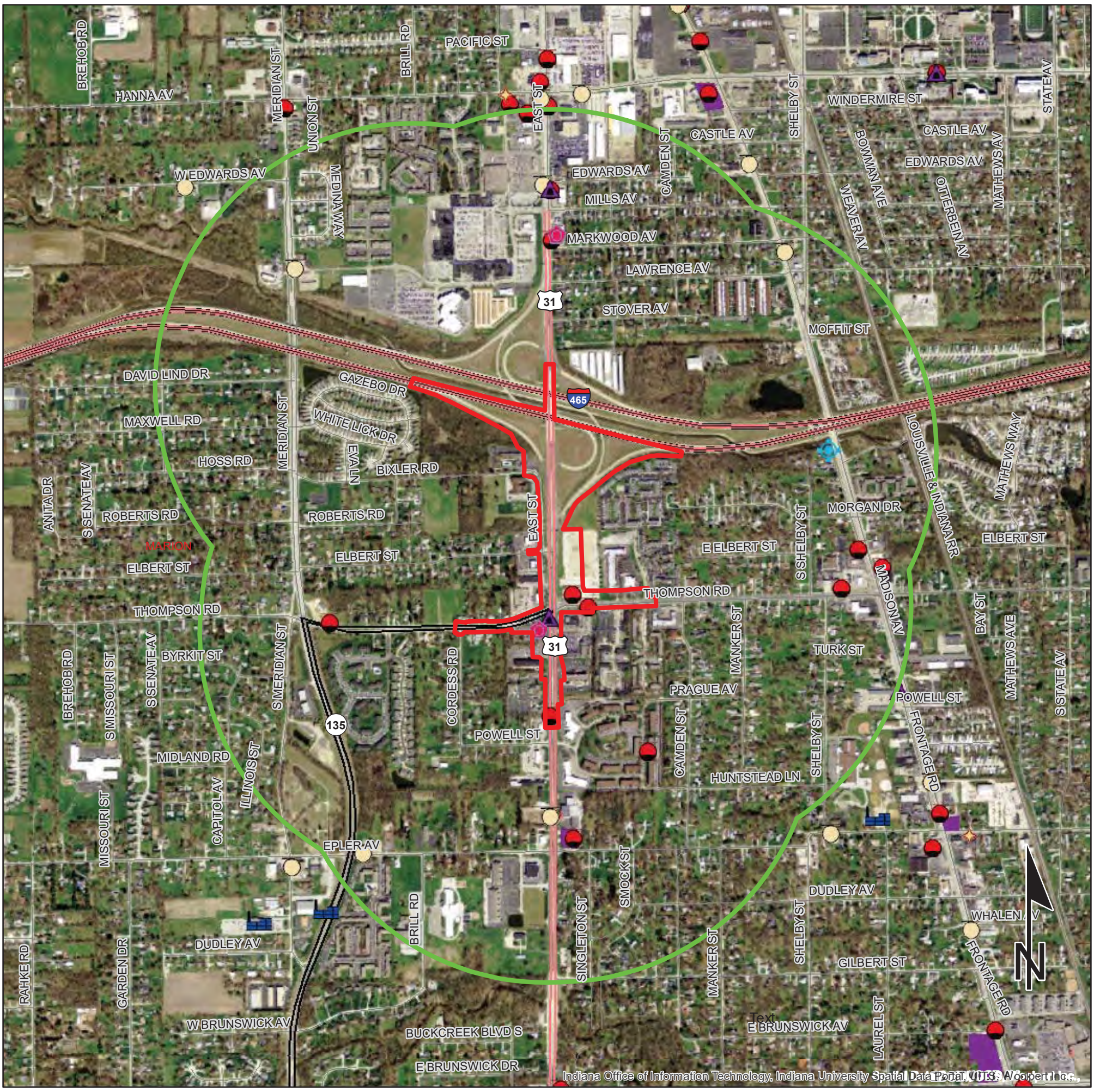
0.25 0.125 0 0.25 Miles

Sources:
Non Orthophotography Data - Obtained from the State of Indiana Geographical Information Office Library
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

- UAB
- County Boundary
- Project Area
- Half Mile Radius
- Toll
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Hazardous Material Concerns
US 31 at Thompson Road
Des. No. 1700182, Intersection Improvement
Marion County, Indiana



- Brownfield
- RCRA Corrective Action Sites
- Confined Feeding Operation
- Notice_Of_Contamination
- Construction/Demolition Site
- Infectious/Medical Waste Site
- Leaking Underground Storage Tank
- Manufactured Gas Plant
- NPDES Facilites
- NPDES Pipe Locations
- Open Dump Waste Site
- RCRA Generator/TSD
- Restricted Waste Site
- Septage Waste Site
- Solid Waste Landfill
- State Cleanup Site
- Superfund
- Tire Waste Site
- Underground Storage Tank
- Voluntary Remediation Program
- Waste Transfer Station
- Institutional Controls
- County Boundary
- Project Area
- Half Mile Radius
- Toll
- Interstate
- State Route
- US Route
- Local Road

0.25 0.125 0 0.25 Miles

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Des No 1700182

Sources:

Non Orthophotography

Data - Obtained from the State of Indiana Geographical Information Office Library

Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)

Map Projection: UTM Zone 16 N **Map Datum:** NAD83

Indiana County Endangered, Threatened and Rare Species List

County: Marion

Species Name	Common Name	FED	STATE	GRANK	SRANK
Mollusk: Bivalvia (Mussels)					
Cyprogenia stegaria	Eastern Fanshell Pearlymussel	LE	SE	G1Q	S1
Epioblasma obliquata perobliqua	White catspaw	LE	SE	G1T1	SX
Epioblasma rangiana	Northern Riffleshell	LE	SE	G2	S1
Epioblasma triquetra	Snuffbox	LE	SE	G3	S1
Fusconaia subrotunda	Longsolid	C	SX	G3	SX
Lampsilis fasciola	Wavyrayed Lampmussel		SSC	G5	S3
Obovaria subrotunda	Round Hickorynut	C	SE	G4	S1
Plethobasus cicatricosus	White Wartyback	LE	SX	G1	SX
Plethobasus cooperianus	Orangefoot Pimpleback	LE	SX	G1	SX
Plethobasus cyphyus	Sheepnose	LE	SE	G3	S1
Pleurobema clava	Clubshell	LE	SE	G1G2	S1
Pleurobema plenum	Rough Pigtoe	LE	SE	G1	S1
Pleurobema rubrum	Pyramid Pigtoe		SX	G2G3	SX
Ptychobranchus fasciolaris	Kidneyshell		SSC	G4G5	S2
Quadrula cylindrica cylindrica	Rabbitsfoot	LT	SE	G3G4T3	S1
Toxolasma lividus	Purple Lilliput	C	SSC	G3Q	S2
Venustaconcha ellipsiformis	Ellipse		SSC	G4	S2
Villosa lienosa	Little Spectaclecase		SSC	G5	S3
Insect: Hymenoptera					
Bombus affinis	Rusty-patched Bumble Bee	LE	SE	G1	S1
Insect: Lepidoptera (Butterflies & Moths)					
Hyperaeschra georgica	A Prominent Moth			G5	S2
Insect: Neuroptera					
Sisyra sp. 1	Indiana Spongilla Fly		ST	GNR	S2
Fish					
Percina evides	Gilt Darter		SE	G4	S1
Amphibian					
Necturus maculosus	Common mudpuppy		SSC	G5	S2
Reptile					
Clemmys guttata	Spotted Turtle	C	SE	G5	S2
Clonophis kirtlandii	Kirtland's Snake		SE	G2	S2
Emydoidea blandingii	Blanding's Turtle	C	SE	G4	S2
Thamnophis butleri	Butler's Garter Snake		SE	G4	S1
Bird					
Aimophila aestivalis	Bachman's Sparrow			G3	SXB
Ardea alba	Great Egret		SSC	G5	S1B
Bartramia longicauda	Upland Sandpiper		SE	G5	S3B
Botaurus lentiginosus	American Bittern		SE	G5	S2B

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: Marion

Species Name	Common Name	FED	STATE	GRANK	SRANK
Buteo platypterus	Broad-winged Hawk		SSC	G5	S3B
Certhia americana	Brown Creeper			G5	S2B
Chordeiles minor	Common Nighthawk		SSC	G5	S4B
Falco peregrinus	Peregrine Falcon		SSC	G4	S2B
Haliaeetus leucocephalus	Bald Eagle		SSC	G5	S2
Helmitheros vermivorus	Worm-eating Warbler		SSC	G5	S3B
Ixobrychus exilis	Least Bittern		SE	G5	S3B
Lanius ludovicianus	Loggerhead Shrike		SE	G4	S3B
Mniotilta varia	Black-and-white Warbler		SSC	G5	S1S2B
Nycticorax nycticorax	Black-crowned Night-heron		SE	G5	S1B
Pandion haliaetus	Osprey		SSC	G5	S1B
Rallus elegans	King Rail		SE	G4	S1B
Setophaga cerulea	Cerulean Warbler		SE	G4	S3B
Setophaga citrina	Hooded Warbler		SSC	G5	S3B
Sitta canadensis	Red-breasted Nuthatch			G5	S1B
Mammal					
Lasiurus borealis	Eastern Red Bat		SSC	G3G4	S4
Myotis lucifugus	Little Brown Bat	C	SE	G3	S2
Myotis septentrionalis	Northern Long Eared Bat	LT	SE	G1G2	S2S3
Myotis sodalis	Indiana Bat	LE	SE	G2	S1
Taxidea taxus	American Badger		SSC	G5	S2
Vascular Plant					
Chelone obliqua var. speciosa	Rose Turtlehead		WL	G4T3	S3
Deschampsia cespitosa	Tufted Hairgrass		SR	G5	S3
Hydrastis canadensis	Golden Seal		WL	G3G4	S3
Juglans cinerea	Butternut		ST	G4	S2
Melanthium virginicum	Virginia Bunchflower		SE	G5	S1
Panax quinquefolius	American Ginseng		WL	G3G4	S3
Poa wolfii	Wolf Bluegrass		SR	G4	S3
Rubus odoratus	Purple Flowering Raspberry		ST	G5	S2
Trifolium stoloniferum	Running Buffalo Clover	LE	SE	G3	S1
High Quality Natural Community					
Forest - flatwoods central till plain	Central Till Plain Flatwoods		SG	G3	S2
Forest - floodplain mesic	Mesic Floodplain Forest		SG	G3?	S1
Forest - floodplain wet	Wet Floodplain Forest		SG	G3?	S3
Forest - floodplain wet-mesic	Wet-mesic Floodplain Forest		SG	G3?	S3
Forest - upland dry-mesic Central Till Plain	Central Till Plain Dry-mesic Upland Forest		SG	GNR	S2
Forest - upland mesic Central Till Plain	Central Till Plain Mesic Upland Forest		SG	GNR	S3

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

APPENDIX F: WATER RESOURCES

Please note that field data sheets were removed from this report to reduce CE document size.

Juliana Clayton
Approved 1/27/20

1 Project Description

1.1 Background

Cardno was contracted to perform a regulated waters delineation, including wetlands and streams, which are located at the US 31 at SR 135 Thompson Road Revision Study Area in Marion County, Indiana (Figure 1). This report identifies the jurisdictional status of the Study Area based on Cardno's best professional understanding and interpretation of the Corps of Engineers' Wetland Delineation Manual and U.S. Army Corps of Engineers' (USACE) guidance documents and regulations. Jurisdictional determinations for other "waters of the U.S." were made based on definitions and guidance found in 33 CFR 328.3, USACE Regulatory Guidance Letters, and the wetland delineation manual.

1.2 Study Area

Latitude, Longitude: 39.6958° N, -86.1486° W

PLSS: Section 01, Township 14 North, Range 03 East
Section 36, Township 15 North, Range 03 East

USGS 7.5 minute Topographic Quadrangle: Maywood (1986)

County: Marion County, Indiana

12-Digit Hydrologic Unit Code: 051202011203 (Lick Creek), 051202011205 (Dollar Hide Creek-White River)

1.3 Project Information

The proposed project includes intersection improvements at US 31 and SR 135/Thompson Road. Several alternatives will be evaluated to determine the action that best meets the purpose and need of the project. The purchase of right-of-way will be required to complete the project. The amount of temporary and permanent right-of-way is dependent on the selected alternative.

1.4 Summary

Field work was performed on May 10, 2019 and updated with a revised study area on July 15, 2019. The total size of the Study Area was approximately 48 acres. The Study Area was maintained highway right-of-way and mature woods. Three wetlands, one stream, two roadside ditches, and no open water areas were delineated during the site investigation.

2 Desktop Reconnaissance

2.1 Available Data Sources

Prior to field work, background information from available data sources was reviewed to establish the probability and potential location of wetlands and regulated waters on the site. These sources include the USFWS's *National Wetland Inventory* (NWI), the USGS's *National*

Hydrography Dataset (NHD), and the NRCS *Soil Survey* for Marion County. These maps help to identify potential wetlands and hydric soil units within the Study Area. The NHD maps are used to identify low-lying areas, historical waterways, drainage patterns, and potential surface waters. LiDAR is also used to identify low-lying areas and drainage patterns.

2.1.1 National Wetland Inventory

The NWI map of the area (Figure 3) identified one wetland complex on site. This NWI polygon corresponds with Wetland 03.

2.1.2 National Hydrography Dataset

The NHD map of the area (Figure 4) identified four NHD lines on site. One was associated with a roadside ditch (Ditch 1), the second was identified as an unnamed tributary (UNT) to Lick Creek, the third was not apparent (as shown in Photos 9 and 10), and the fourth was associated with Wetland 03.

2.1.3 Soil Survey

The NRCS Soil Survey of Marion County identified seven soil series on the site (Figure 4). The following table identifies the soil unit symbol, soil unit name, and whether or not the soil type contains components that meet the hydric soil criteria.

Table 2-2 Soil Summary Table, US 31 at SR 135, Marion County, Indiana, INDOT Des No. 1700182

Symbol	Description	Percent Hydric Inclusions	Hydric
BR	Brookston silty clay loam, 0 to 2 percent slopes	95%	Yes
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	2%	No
MmB2	Miami silt loam, 2 to 6 percent slopes, eroded	5%	No
MmC2	Miami silt loam, 6 to 12 percent slopes, eroded	3%	No
Sn	Sloan silt loam	100%	Yes
Ua	Udorthents, cut and filled	3%	No
Ug	Urban land-Genesee complex	0%	No

2.2 List of Figures

3 Field Reconnaissance

3.1 Field Reconnaissance Methodology

Streams, rivers, watercourse, and ditches within the Study Area were evaluated using the USACE "ordinary high water mark" defined in 33 CFR 328.3(e) and documented.

The investigated proposed study area was analyzed using the methods outlined in the Routine Determination, On-site Inspection Necessary procedure in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual Midwest Region* (US Army Corps of Engineers, 2010). Identification indicator status of plant species utilized the 2016 Midwest Region National Wetland Plant List. Field GIS data was collected using a GPS device with sub-meter accuracy.

The purpose of the field review was to determine the presence of waters of the U.S. within the investigated area. Cardno staff collected data during the field review to appropriately characterize the investigated area and determine the presence or absence of jurisdictional waters. The field investigation area encompassed the area required for construction access and completion of intersection improvement. Select features and areas of interest were photographed throughout the investigated area. A photo location map and selected photographs are included in Attachment B.

The proposed investigated area was analyzed using the methods outlined in the Routine Determination, On-site Inspection Necessary procedure in the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual Midwest Region (US Army Corps of Engineers, 2010). Identification indicator status of plant species utilized the 2016 Midwest Region National Wetland Plant List. Field GIS data was collected using a [GPS device] with sub-meter accuracy.

3.1.1 Site Photographs

Photographs of the site are provided and shown on Figure 7. The photographs are intended to provide representative visual samples of any wetlands or other special features found on the site during the time of the field reconnaissance.

3.1.2 Delineation Data Sheets

Where stations represent a wetland boundary point they are typically presented as paired data points, one each documenting the wetland and upland sides of the wetland boundary. Plant species nomenclature follows the National Wetlands Plant List. For all other plants not listed in the NWPL, nomenclature will follow the USDA's Plants Database. Data point locations are shown on Figure 6. Complete field data sheets from the site investigation are provided in Attachment C.

3.2 Results

A field visit was conducted on May 10 and July 15, 2019 by a qualified Cardno wetland delineator. The survey footprint consisted of the area that had the potential to be impacted based on all possible design scenarios. The area investigated was approximately 48 acres. Delineated features are shown on Figure 6.

3.2.1 Wetlands

Wetland 01 (0.009 acre)

Wetland 01 was a small, emergent wetland located within a drainage swale. Due to low species diversity, small size, and human disturbance, this wetland had a poor qualitative assessment. This wetland was located within a roadside ditch, which drains into Lick Creek. Lick Creek flows into the White River, a Traditional Navigable Water (TNW). Due to this connection, this wetland should be considered to be a "waters of the U.S."

Wetland Data Point

Data Point 01 (dp01)

Dominant vegetation in the vicinity of dp01 included dark-green bulrush (*Scirpus atrovirens*, OBL) and common spike-rush (*Eleocharis palustris*, OBL). The plants at this data point qualified as hydrophytic vegetation, by meeting the Rapid Test for Hydrophytic Vegetation, the Dominance Test, and the Prevalence Index. The soil from 0 to 4 inches had a matrix color of 10YR 4/3 with a texture of sandy loam. The soil from 4 to 12 inches had a matrix soil color of 10YR 3/1 with concentrations in the matrix at 5 percent, with a color of 10YR 4/3, and a texture of clay loam. A soil pit 12-inches deep was sufficient to document hydric soil presence. The soil at the data point was mapped as Udorthents, cut and filled (Ua), and met the Redox Dark Surface (F6) hydric soil criteria. Primary indicators of hydrology included Surface Water (A1), and secondary indicators of hydrology observed included Geomorphic Position (D2) and the FAC-Neutral Test (D5). This data point qualified as a wetland, as it met all three criteria.

Upland Data Point

Data Point 02 (dp02)

Dominant vegetation in the vicinity of dp02 included Kentucky blue grass (*Poa pratensis*, FAC) and king's-cureall (O*enothera biennis*, FACU). In addition, non-dominant vegetation observed included red fescue (*Festuca rubra*, FACU), Canadian thistle (*Cirsium arvense*, FACU), Amur honeysuckle (*Lonicera maackii*, UPL), great mullein (*Verbascum thapsus*, UPL), garden sorrel (*Rumex acetosa*, UPL), and corn gromwell (*Lithospermum arvense*, UPL). The plants at this data point did not qualify as hydrophytic vegetation, by failing the Rapid Test for Hydrophytic Vegetation, the Dominance Test, and the Prevalence Index. The soil from 0 to 3 inches had a matrix soil color of 10YR 3/3 with a texture of clay loam. The soil from 3 to 12 inches had a matrix soil color of 10YR 4/6 with a texture of clay loam. A soil pit 12-inches deep was sufficient to document hydric soil absence. The soil at the data point was mapped as Udorthents, cut and filled (Ua), and did not meet any hydric soil criteria. Primary indicators of hydrology included Surface Water (A1). This data point did not meet wetland criteria because all three wetland criteria were not met.

Upland Data Point

Data Point 03 (dp03)

Dominant vegetation in the vicinity of dp03 included Kentucky blue grass (FAC). In addition, non-dominant vegetation observed included Canadian thistle (FACU), bull thistle (*Cirsium vulgare*, FACU), and English plantain (*Plantago lanceolata*, FACU). The plants at this data point qualified as hydrophytic vegetation by meeting the Dominance Test. The soil from 0 to 10 inches had a matrix soil color of 10YR 4/3 with a texture of silty clay loam. The soil at the data point was mapped

as Udorthents, cut and filled (Ua), and did not meet any hydric soil criteria. Below 10 inches, the substrate consisted of gravel fill. A soil pit 10-inches deep was sufficient to document hydric soil absence. No indicators of hydrology were observed. This data point did not meet wetland criteria.

Upland Data Point

Data Point 04 (dp04)

Dominant vegetation in the vicinity of dp04 included red fescue (FACU). In addition, non-dominant vegetation observed included Johnson grass (*Sorghum halepense*, FACU), white heath American-aster (*Symphyotrichum ericoides*, FACU), and Japanese bristle grass (*Setaria faberi*, FACU). The plants at this data point did not qualify as hydrophytic vegetation, by not meeting the Rapid Test for Hydrophytic Vegetation, the Dominance Test, and the Prevalence Index. The soil at the data point was mapped as Udorthents, cut and filled (Ua). No soil was identified at this location, the data point consisted of fill material and rock/gravel. No indicators of hydrology were observed. This data point did not meet wetland criteria.

Wetland 02 (0.002 acre)

Wetland 02 was a very small emergent wetland located within a depression. Due to low species diversity, small size, and human disturbance, this wetland had a poor qualitative assessment. This wetland eventually drains to an unnamed tributary to Lick Creek. Lick Creek flows into the White River, a Traditional Navigable Water (TNW). Due to this connection, this wetland should be considered to be a “waters of the U.S.”

Wetland Data Point

Data Point 05 (dp05)

Dominant vegetation in the vicinity of dp05 included soft-stem club-rush (*Schoenoplectus tabernaemontani*, OBL). In addition, non-dominant vegetation observed included Canadian thistle (FACU), and curly dock (*Rumex crispus*, FAC). The plants at this data point qualified as hydrophytic vegetation, by meeting the Rapid Test for Hydrophytic Vegetation, the Dominance Test, and the Prevalence Index. The soil from 0 to 3 inches had a matrix soil color of 10YR 3/1 with concentrations in the matrix at 10 percent, with a color of 10YR 3/4, and a texture of clay loam. The soil from 3 to 20 inches had a matrix soil color of 10YR 4/2 with concentrations in the matrix at 10 percent, with a color of 10YR 4/6, and a texture of clay loam. The soil at the data point was mapped as Udorthents, cut and filled (Ua), and met the Depleted Below Dark Surface (A11) and Depleted Matrix (F3) hydric soil criteria. The primary indicator of hydrology observed was Saturation (A3), and the secondary indicator of hydrology, the FAC-Neutral Test (D5). This data point qualified as a wetland.

Upland Data Point

Data Point 06 (dp06)

Dominant vegetation in the vicinity of dp06 included Kentucky blue grass (FAC), and wand panic grass (*Panicum virgatum*, FAC). In addition, non-dominant vegetation observed included red fescue (FACU), eastern daisy fleabane (*Erigeron annuus*, FACU), white panicled American-aster (*Symphyotrichum lanceolatum*, FAC), yellow sweet-clover (*Melilotus officinalis*, FACU), and Canadian thistle (FACU). The plants at this data point qualified as hydrophytic vegetation, by meeting the Dominance Test. The soil from 0 to 3 inches had a matrix soil color of 10YR 4/3 with a texture of clay loam. The soil from 3 to 15 inches had a matrix soil color of 10YR 4/4 with a

texture of clay loam. A soil pit 15-inches deep was sufficient to document hydric soil absence. The soil at the data point was mapped as Udorthents, cut and filled (Ua), and did not meet any hydric soil criteria. No indicators of hydrology were observed. This data point did not meet wetland criteria.

Wetland 03 (0.042 acre)

Wetland 03 was a small, emergent wetland located within a drainage swale. Due to low species diversity, small size, and human disturbance, this wetland had a poor qualitative assessment. This wetland was located within a roadside ditch, which drains into Lick Creek. Lick Creek flows into the White River, a Traditional Navigable Water (TNW). Due to this connection, this wetland should be considered to be a “waters of the U.S.”

Wetland Data Point

Data Point 07 (dp07)

Dominant vegetation in the vicinity of dp07 included broad-leaf cat-tail (*Typha latifolia*, OBL). In addition, non-dominant vegetation observed included Frank's sedge (*Carex frankii*, OBL), white panicled American-aster (FAC), rice cut grass (*Leersia oryzoides*, OBL), and Devil's-pitchfork (*Bidens frondosa*, FACW). The plants at this data point qualified as hydrophytic vegetation, by meeting the Rapid Test for Hydrophytic Vegetation, the Dominance Test, and the Prevalence Index. The soil from 0 to 12 inches had a matrix soil color of 10YR 4/1 with concentrations in the matrix at 10 percent, with a color of 10YR 4/4, and a texture of silty clay loam. A soil pit 12-inches deep was sufficient to document hydric soil presence. The soil at the data point was mapped as Brookston silty clay loam, 0 to 2 percent slopes (Br), and met the Depleted Matrix (F3) hydric soil criteria. Primary indicators of hydrology included Saturation (A3), and secondary indicators of hydrology observed included Drainage Patterns (B10) and the FAC-Neutral Test (D5). This data point qualified as a wetland.

Upland Data Point

Data Point 08 (dp08)

Dominant vegetation in the vicinity of dp08 included Canadian thistle (FACU). In addition, non-dominant vegetation observed included spiny-leaf sow-thistle (*Sonchus asper*, FACU), annual ragweed (*Ambrosia artemisiifolia,* FACU), red fescue (FACU), honeyvine (*Cynanchum laeve*, FAC), black walnut (*Juglans nigra*, FACU), and Kentucky blue grass (FAC). The plants at this data point did not meet hydrophytic vegetation, by not meeting the Rapid Test for Hydrophytic Vegetation, the Dominance Test, and the Prevalence Index. The soil from 0 to 12 inches had a matrix soil color of 10YR 3/2 with a texture of silty clay loam. A soil pit 12-inches deep was sufficient to document hydric soil absence. The soil at the data point was mapped as Brookston silty clay loam, 0 to 2 percent slopes (Br), and did not meet any hydric soil criteria. No indicators of hydrology were observed. This data point did not meet wetland criteria.

Table 3-1 Wetland Data Point Summary Table, US31 at SR135, Marion County, Indiana, INDOT Des No. 1700182

Data Point ID	Hydrophytic Vegetation	Hydric Soils	Wetland Hydrology	Within a Wetland
DP01	Yes	Yes	Yes	Yes
DP02	No	No	No	No
DP03	Yes	No	No	No
DP04	No	No	No	No
DP05	Yes	Yes	Yes	Yes
DP06	Yes	No	No	No
DP07	Yes	Yes	Yes	Yes
DP08	No	No	No	No

Table 4-1 Wetland Summary Table, US 31 at SR 135 Marion County, Indiana, INDOT Des No. 1700182

Name	Photo ID	Lat/ Long	Wetland Type	Quality*	Area (Acres)	Likely Waters of the U.S.
Wetland 01	Photos 2 & 3	39.6959/ -86.1490	PEM	Low	0.009 AC	Yes
Wetland 02	Photos 12 & 13	39.6979/ -86.1464	PEM	Poor	0.002 AC	Yes
Wetland 03	Photos 32 & 33	39.6903/ -86.1486	PEM	Poor	0.042 AC	Yes

3.2.2 Streams

UNT to Lick Creek (704 Linear Feet)

UNT to Lick Creek was an intermittent stream that flowed northeast through the project study area. Both banks had a narrow width (less than five meters) riparian corridor, with the floodplain land use predominantly mature forest or wetland. The stream had low sinuosity, with one S-curve observed within the two hundred foot survey reach. The stream had a flat gradient, with a drop of a half a foot or less every hundred feet. This stream was at base flow conditions at the time of the stream survey. The turbidity levels were not elevated at the time of survey. The dominant substrates were cobble and sand. OHWM width was 3 feet by 0.8 feet. Bank Full width was 6 feet by 1 foot. Top of bank width was 6 feet by 1.2 feet. The maximum pool depth observed was between two and four inches. UNT to Lick Creek flows into White River, a Traditional Navigable Water. Due to this connection, this stream should be considered a "waters of the U.S."

Lick Creek (99 Linear Feet)

Lick Creek was a perennial stream that flowed west through the project study area. Lick Creek was considered to have recent stream modifications, with no recovery from the impacts. Neither bank had a riparian corridor, with the floodplain land use predominantly urban or industrial land. The stream had no sinuosity, with no bends observed within the two hundred foot survey reach.

The stream had a flat gradient, with a drop of a half a foot or less every hundred feet. This stream was at base flow conditions at the time of the stream survey. The turbidity levels were not elevated at the time of survey. The dominant substrates were boulder and gravel. OHWM width was 10 feet by 0.4 feet. Bank Full width was 35 feet by 1 foot. Top of bank width was 80 feet by 8 feet. The maximum pool depth observed was between four and twelve inches. Lick Creek flows into White River, a TNW. Due to this connection, this stream should be considered a "waters of the U.S."

Table 4-2. Stream Summary Table, US 31 at SR 135 Marion County, Indiana, INDOT Des No. 1700182

Water Feature Name	Photo ID	Lat/Long	USGS Blue Line	OHWM Width	OHWM Depth	Substrate	Riffle/Run Presence	Stream Score \ Quality*	Linear Feet	Likely Waters of the U.S.?
UNT to Lick Creek	Photos 16 &17	39.6976, -86.1444	No	3’	0.8’	Cobble & Sand	No	57/ Poor	704	Yes
Lick Creek	Photos 38 & 39	39.6990, -86.1488	Yes	10’	0.4’	Boulder & Gravel	No	56/ Poor	99	Yes

3.2.3 Roadside Ditches

Ditch 1

Ditch 1 was a roadside ditch that flowed north and west towards Lick Creek. Photo Stations 1, 2, 8, and 11 show Ditch 1. Ditch 1 was considered to be an erosional feature in a man-made ditch cut through upland soils. Stream-like characteristics were present along small stretches of the ditch, such as bed or banks, but not for a continuous stretch and consistent with erosional patterns. Spring of 2019 had been exceptionally wet prior to May field work. In our professional opinion, Ditch 1 should not be considered a regulated water because it did not have a continuous OHWM or bed and banks.

Ditch 2

Ditch 2 was a roadside ditch that flowed north and east towards UNT to Lick Creek. Photo Station 14 shows Ditch 2. Ditch 2 was considered to be an erosional feature in a man-made ditch cut through upland soils. Stream-like characteristics were present along small stretches of the ditch, such as bed or banks, but not for a continuous stretch and consistent with erosional patterns. Spring of 2019 had been exceptionally wet prior to May field work. In our professional opinion, Ditch 2 should not be considered a regulated water because it did not have a continuous OHWN or bed and banks.

3.2.4 Open Water

No open water areas were observed in the Study Area.

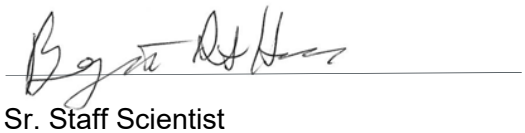
3.3 Conclusion

The survey area was evaluated for the presence or absence of wetlands and waterways. During the spring 2019 field investigation for the US 31/Thompson road intersection improvement project, Cardno did not observe any open water areas within the study area during the field reconnaissance. Cardno delineated three jurisdictional wetlands, two jurisdictional streams, and two roadside ditches within the Study Area. Every effort should be taken to avoid and minimize impacts to wetlands and waterways located within the Study Area. If impacts are necessary, then permitting and mitigation may be required. INDOT Environmental Services Division should be contacted immediately if impacts will occur. The final determination of jurisdictional waters is ultimately made by the USACE. This report is Cardno's best judgment based on the guidelines set forth by USACE.

4 Acknowledgements

This waters determination has been prepared based on the best available information, interpreted in the light of the investigator's training, experience and professional judgement in conformance with the *1987 Corps of Engineers Wetland Delineation Manual*, the appropriate regional supplement, the USACE *Jurisdictional Determination Form Instructional Guidebook*, and other appropriate agency guidelines.

Benjamin Hess, PWS



Sr. Staff Scientist
Cardno

5 List of Attachments

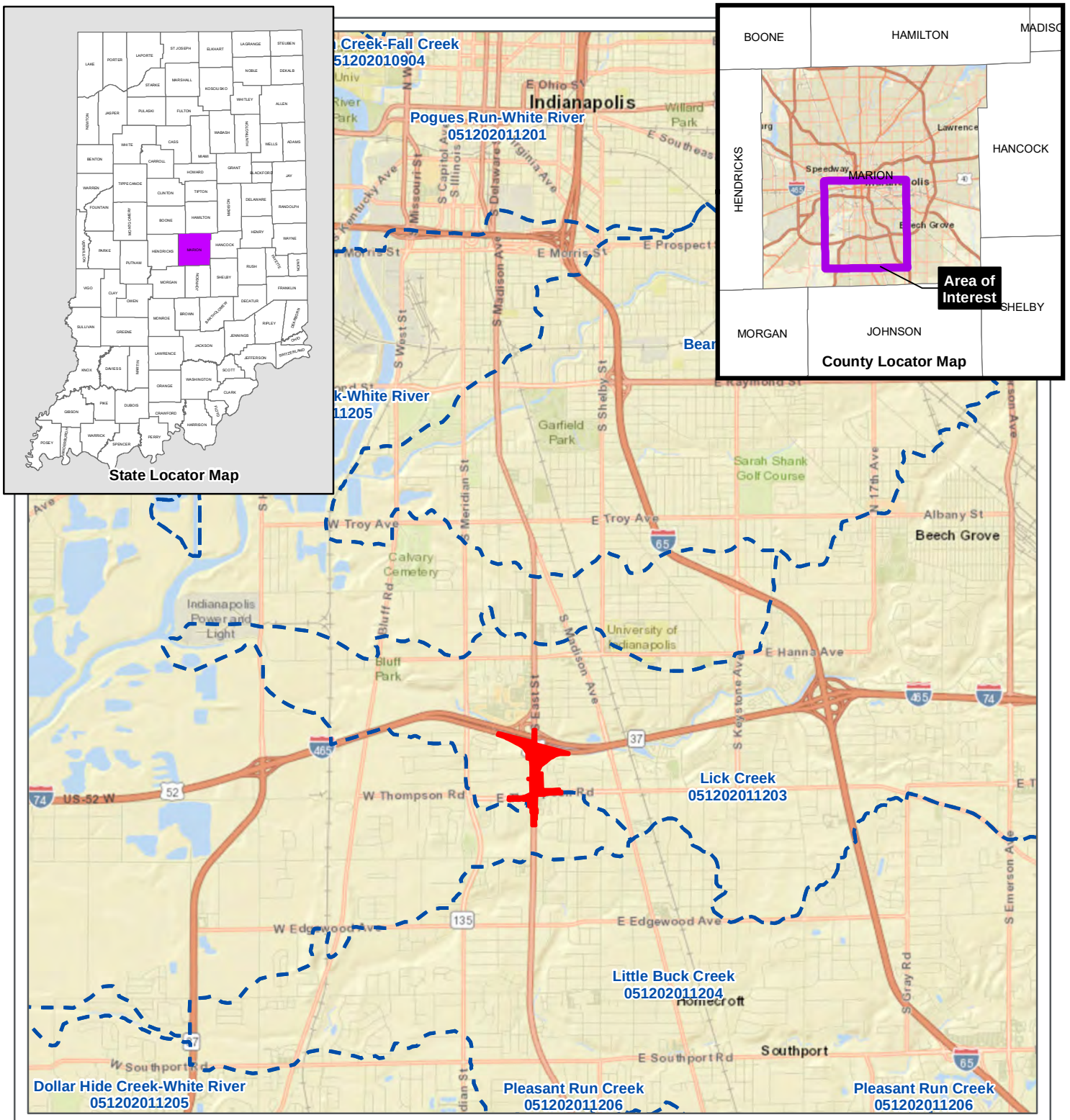
Figures

Site Photographs and Photograph Locations

Wetland Delineation Data Sheets – Midwest Region

Stream Assessment Forms

USACE Jurisdictional Determination Form



N W E S

7.5' Quadrangle: Maywood
T14n R3e Sec1
T15n R3e Sec36
Project No. j192079m01

Figure 1: Study Area
US 31 at SR 135
Thompson Road Revisions
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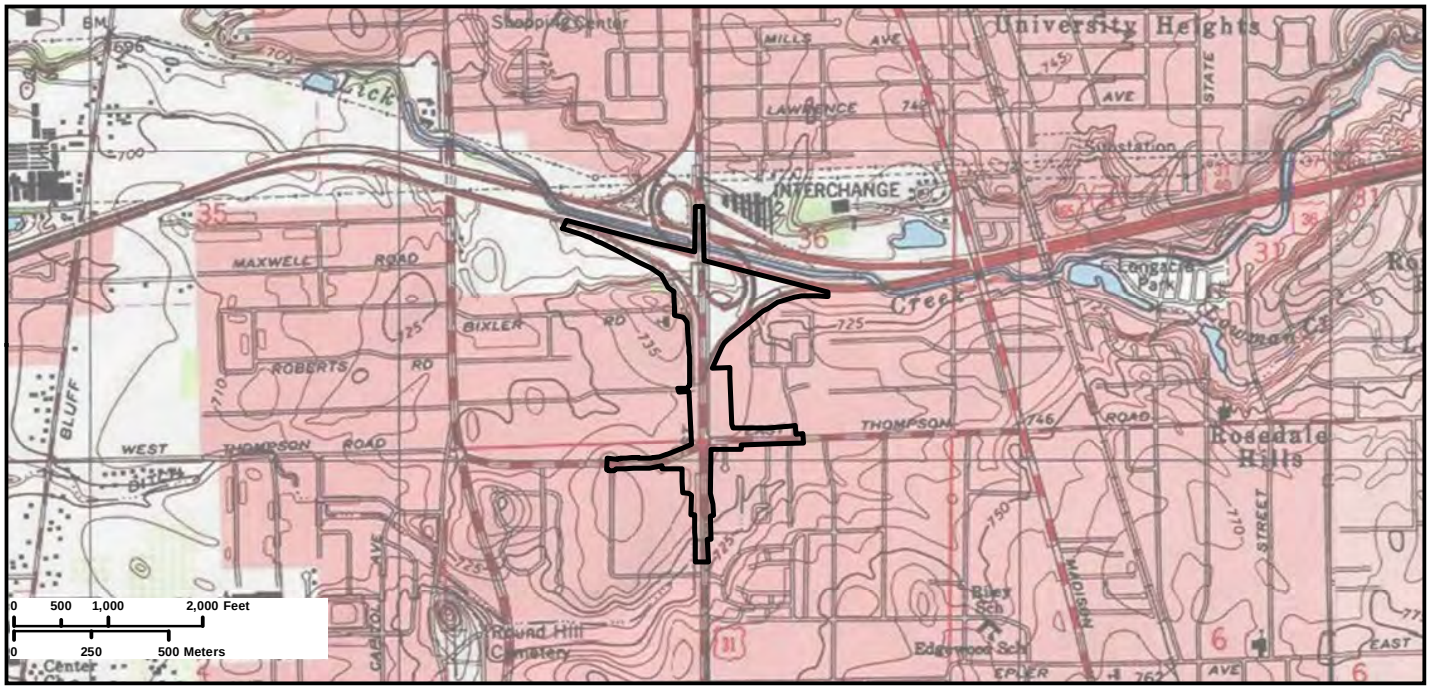

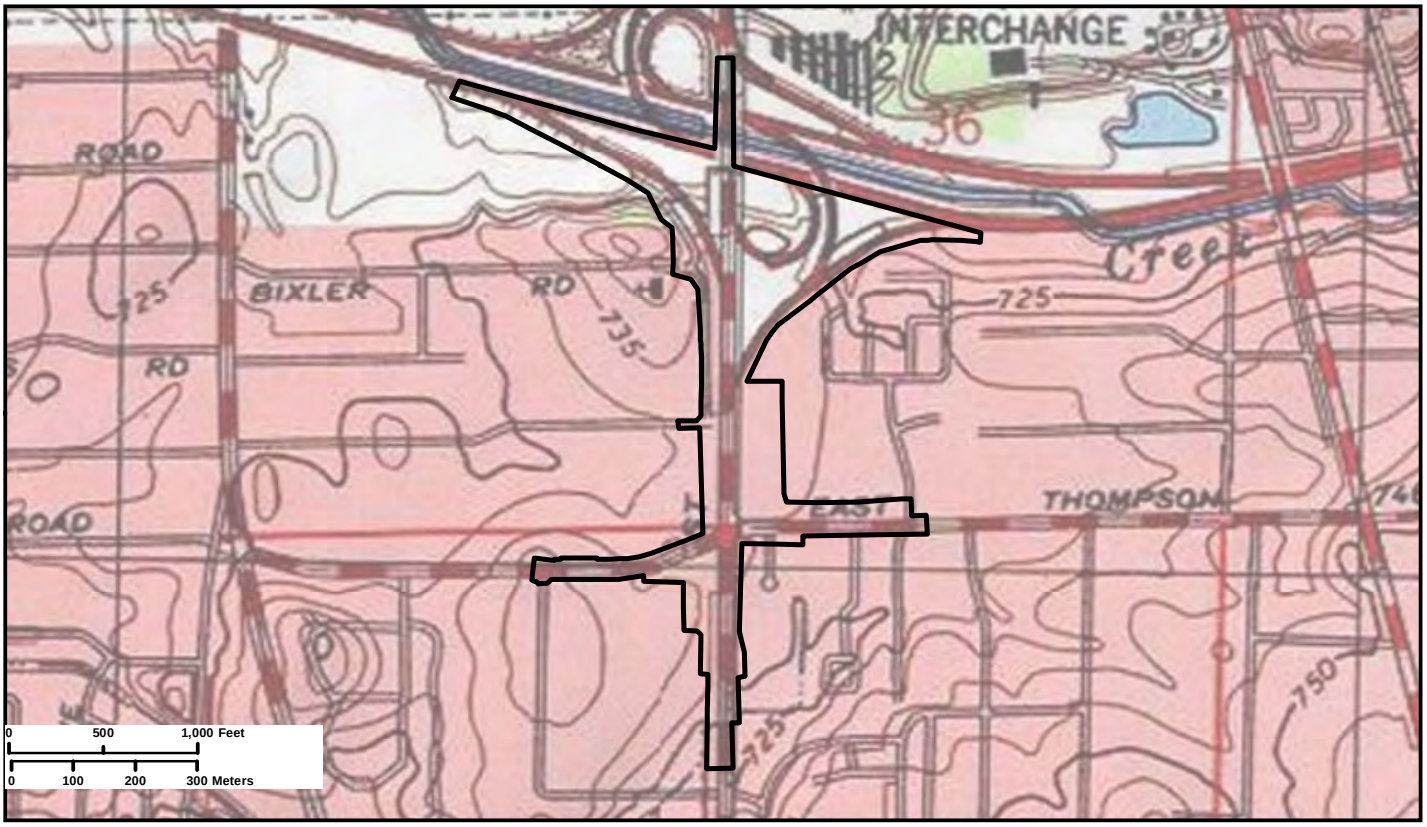

Study Area

N
W E
S

7.5' Quadrangle: Maywood
T14n R3e Sec1
T15n R3e Sec36
Project No. j192079m01

Figure 2: USGS Topographic Quadrangle
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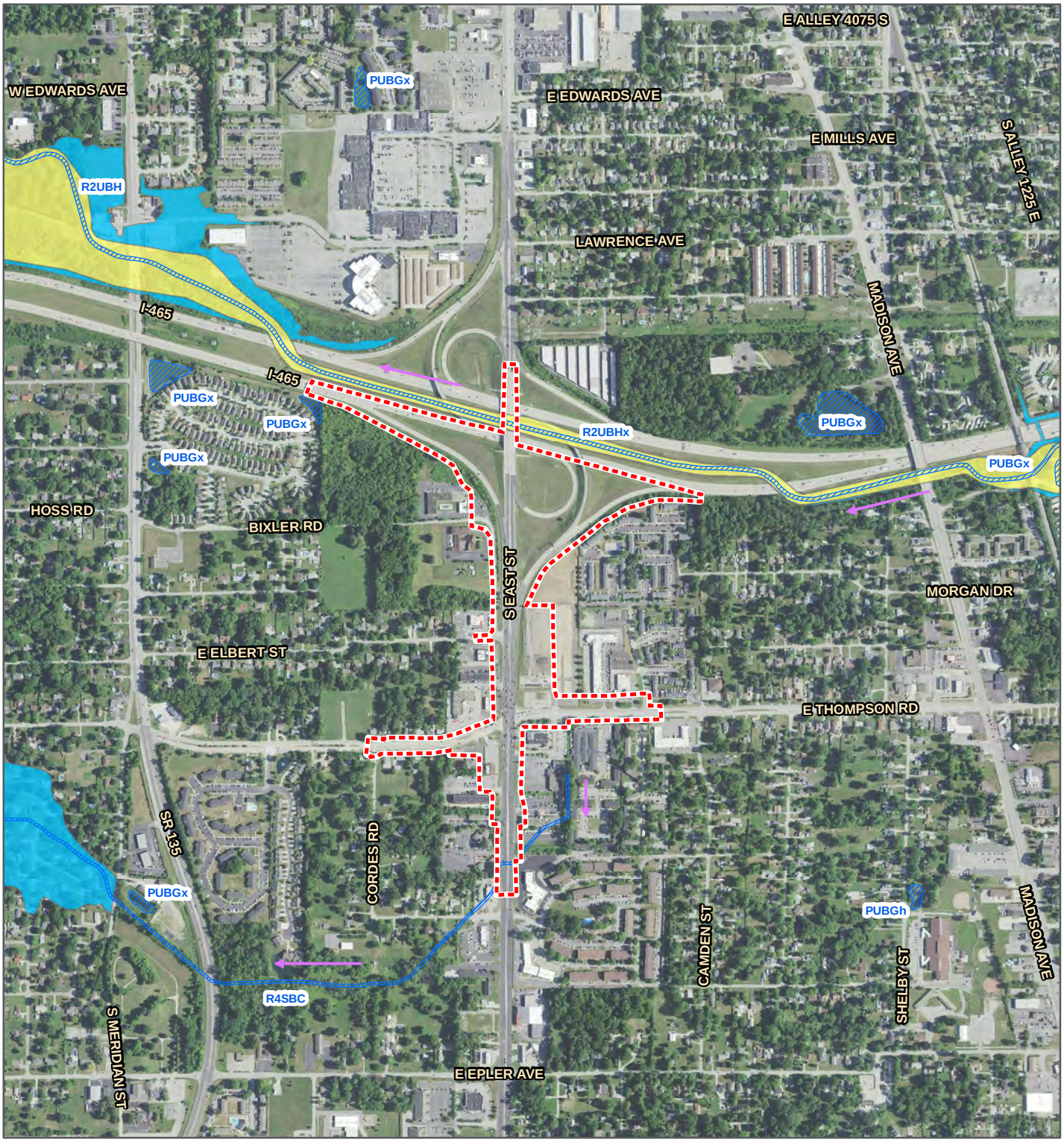

0 500 1,000 Feet
0 100 200 300 Meters

NWI Flow Direction
Study Area
NWI Wetlands (including Riverine)
FEMA Mapped 100-year Floodplain
Regulated Floodway

N W E S

7.5' Quadrangle:
Maywood
T14n R3e Sec1
T15n R3e Sec36
Project No.
j192079m01

Figure 3: NWI and Flood Hazard
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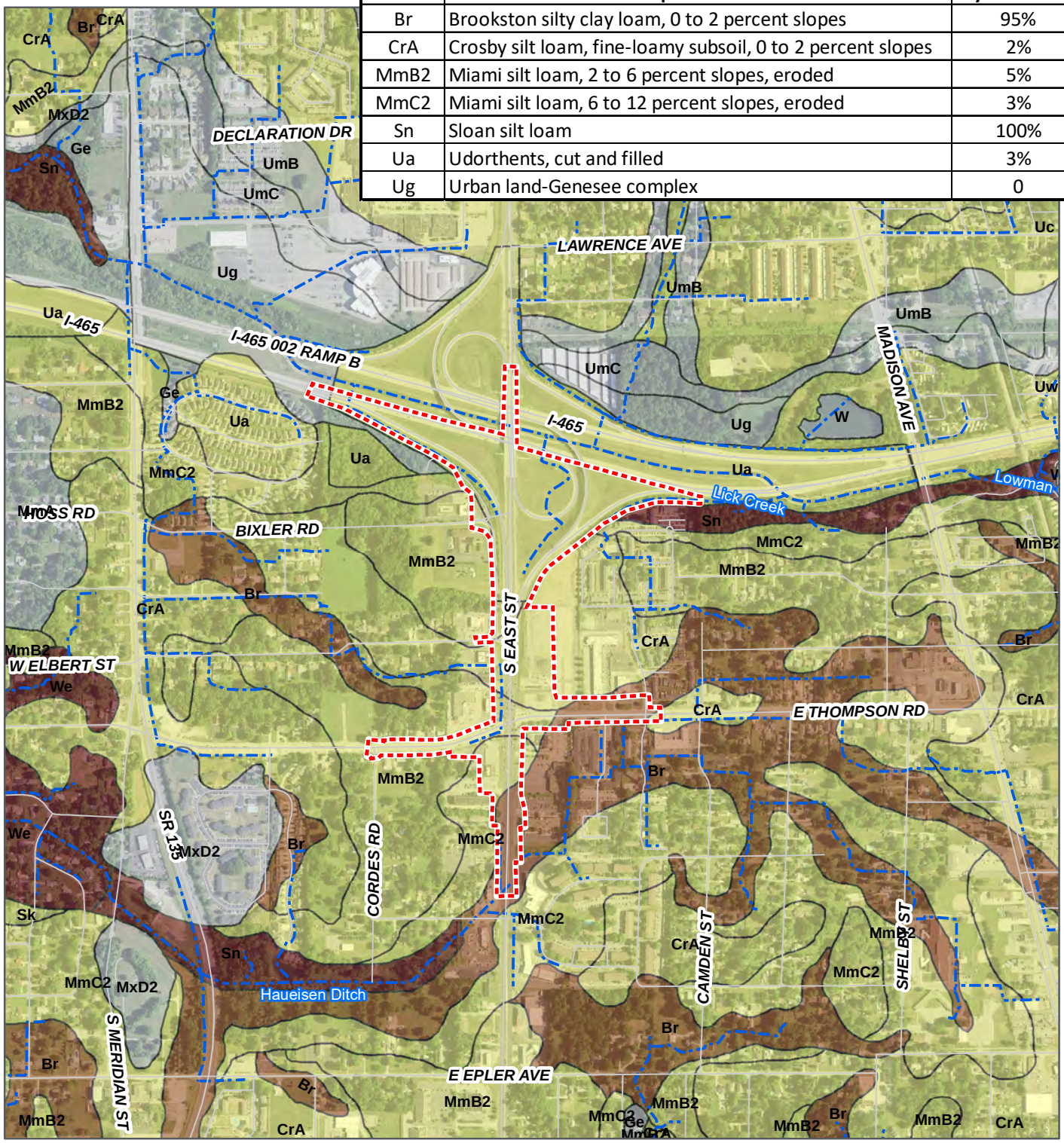
MUSYM	Mapunit Name	Hydric Rating
Br	Brookston silty clay loam, 0 to 2 percent slopes	95%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	2%
MmB2	Miami silt loam, 2 to 6 percent slopes, eroded	5%
MmC2	Miami silt loam, 6 to 12 percent slopes, eroded	3%
Sn	Sloan silt loam	100%
Ua	Udorthents, cut and filled	3%
Ug	Urban land-Genesee complex	0



0 500 1,000 Feet
0 100 200 300 Meters

Study Area
Not Hydric (0%)
Hydric (1-32%)
Hydric (33-65%)
Hydric (66-99%)
Hydric (100%)
NHD Flowline

N W E S

7.5' Quadrangle: Maywood
T14n R3e Sec1
T15n R3e Sec36
Project No. j192079m01

Figure 4: Soil Survey and NHD
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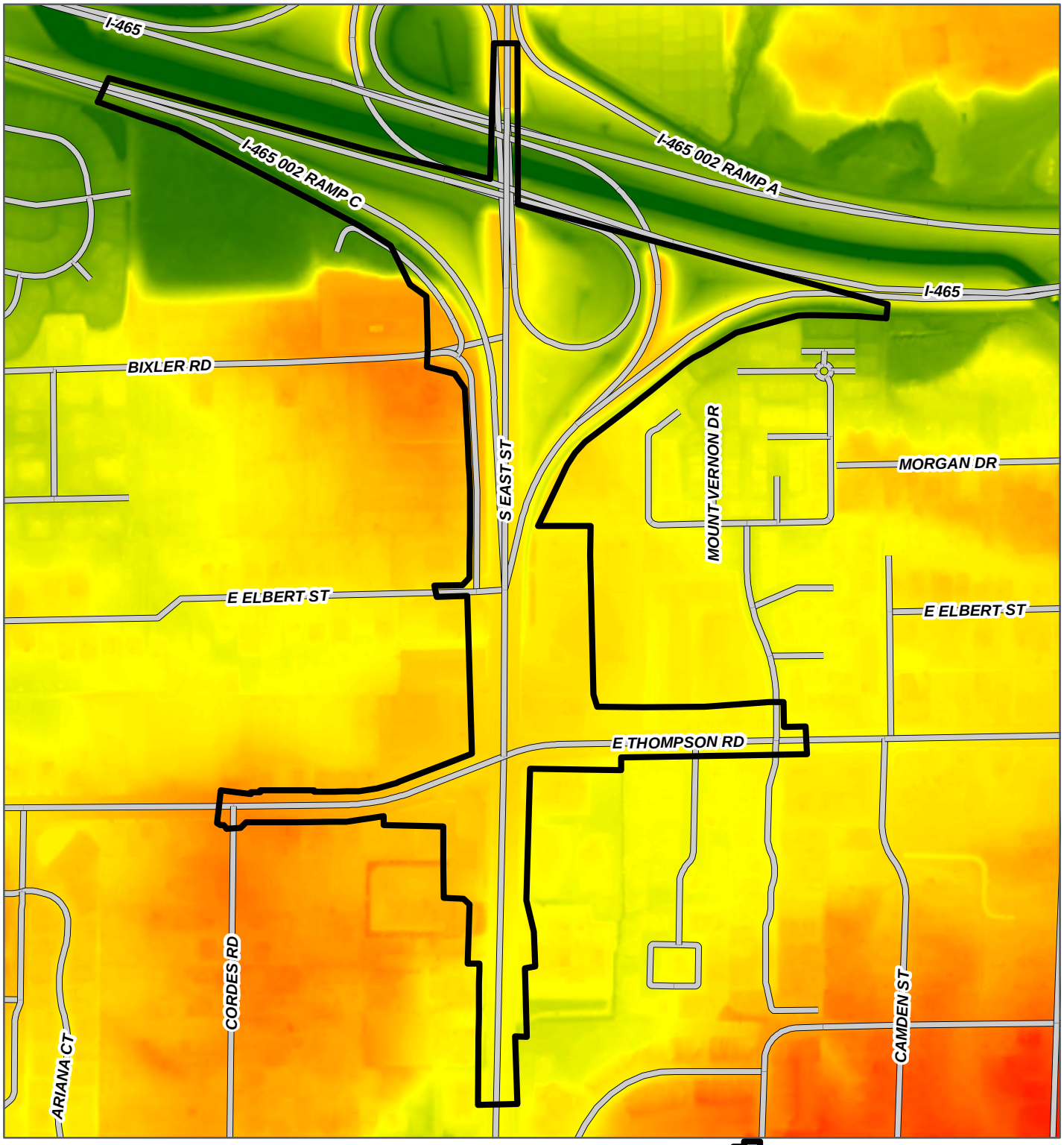

7.5' Quadrangle:
Maywood
T14n R3e Sec1
T15n R3e Sec36
Project No.
j192079m01

Figure 5: LiDAR
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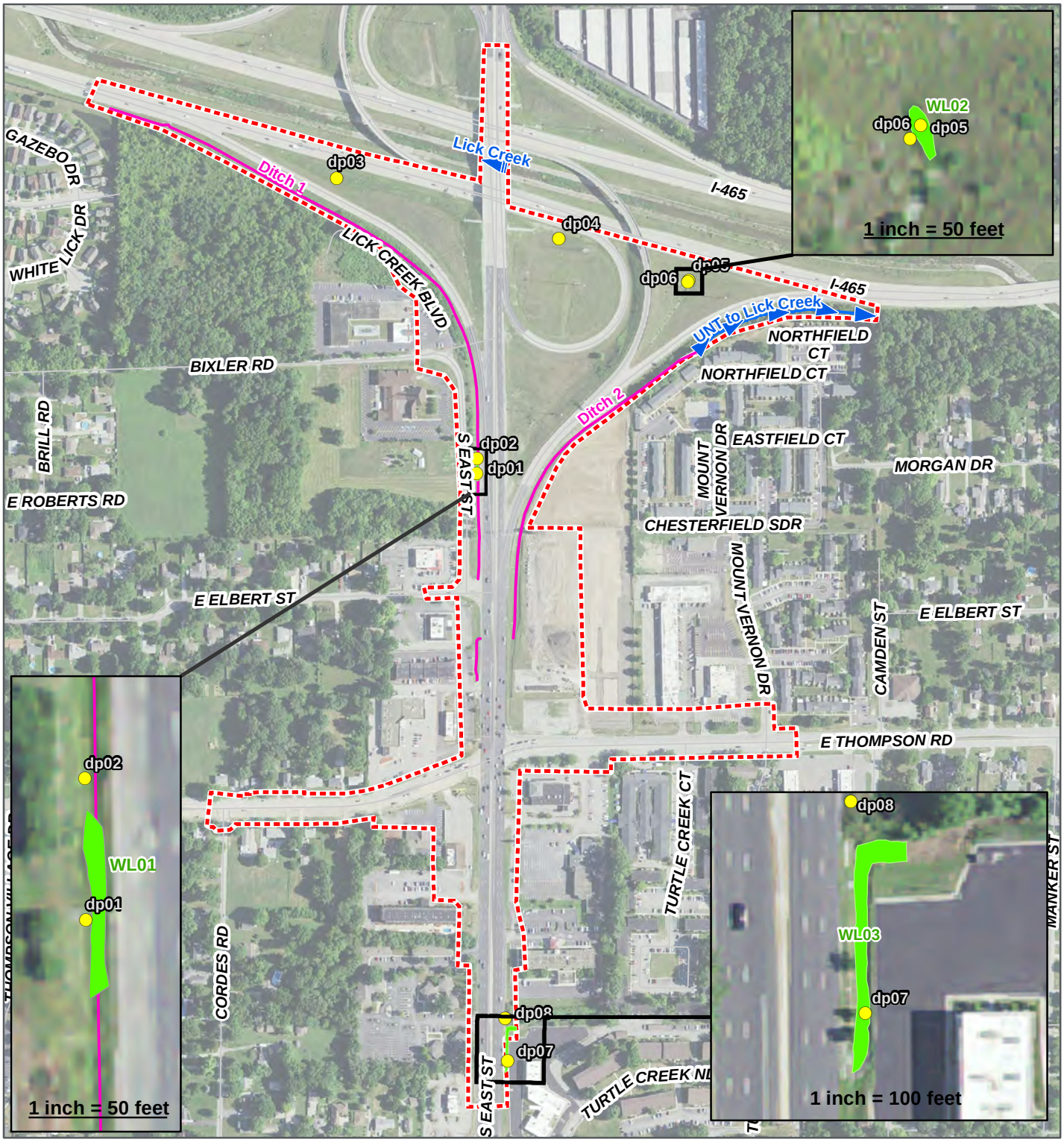

N
W E
S

7.5' Quadrangle:
Maywood
T14n R3e Sec1
T15n R3e Sec36
Project No.
j192079m01

Figure 6: Delineated Features
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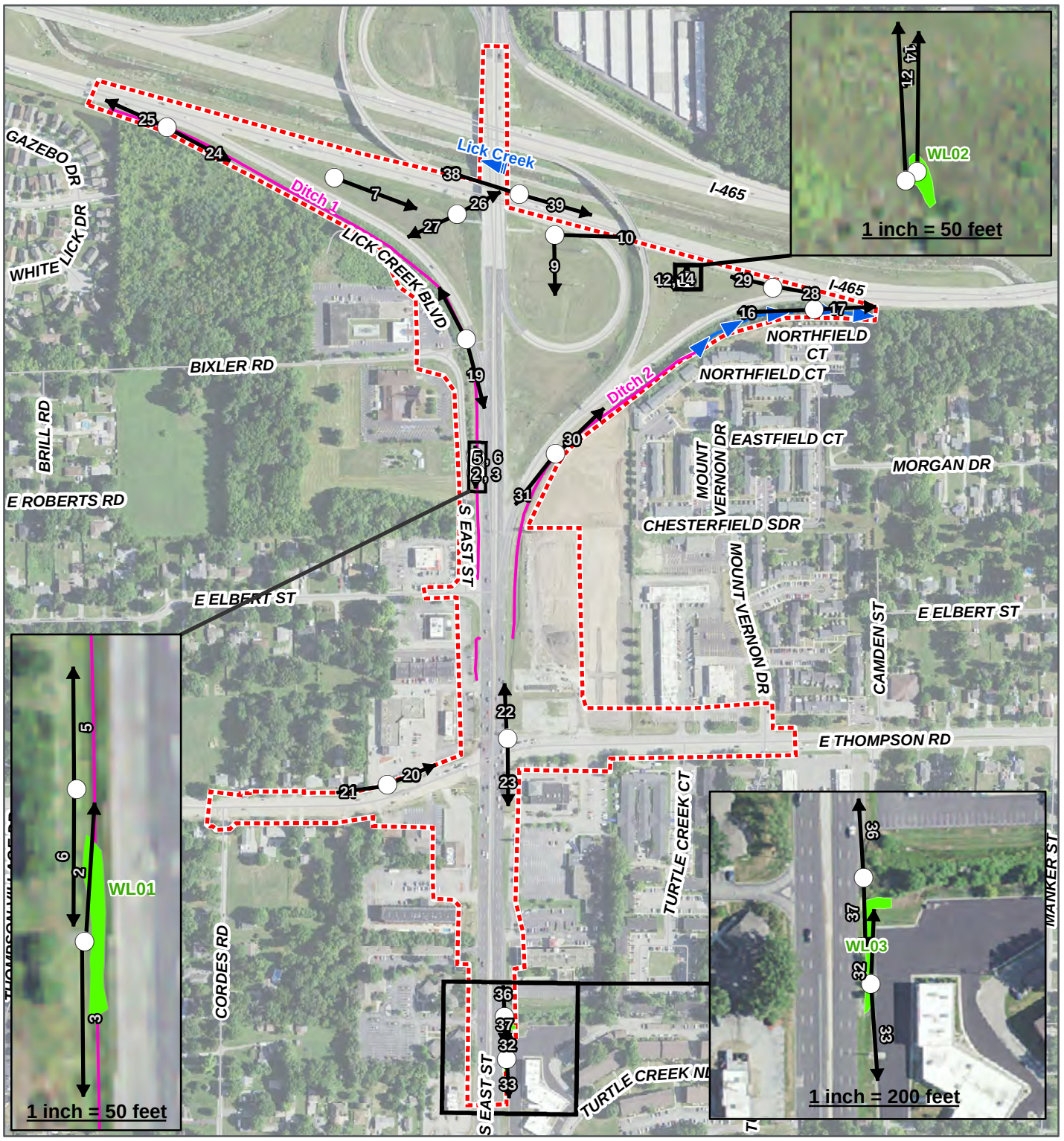

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Figure 7: Photo Orientation
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Saved By: ben.harvey

Photo Station 1. Data Point 01, Soil Profile, Facing Down; depth shown on soil profile sufficient to show hydric soil presence

Photo 2, Data Point 01, Toe of Steep Slope, Facing North (Wetland 01).

Photo 3, Data Point 01, Toe of Steep Slope, Facing South (Wetland 01).

Photo Station 2. Data Point 02, Soil Profile, Facing Down; depth shown on soil profile sufficient to show hydric soil absence

Project Number:
j192079m01

Photos Taken:
May 10, 2019

Site Photographs
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Photo 5, Upland Data Point 02, Steep Slope Above Wetland 01, Facing North.

Photo 6, Upland Data Point 02, Steep Slope Above Wetland 01, Facing South.

Photo 7, Upland Data Point 03, Facing East.

Photo Station 3. Data Point 03, Soil Profile, Facing Down; depth shown on soil profile sufficient to show hydric soil absence

Project Number:
j192079m01

Photos Taken:
May 10, 2019

Site Photographs
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Photo 9, Upland Data Point 04, Facing South.

Photo 10, Upland Data Point 04, Facing East.

No Soil Profile photo is available for Upland Data Point 04, as there was no soil at this location. Therefore, a soil pit was not dug.

Photo 11, Upland Data Point 04, No Soil Profile Photo.

Photo 12, Data Point 05, Facing North (Wetland 02).

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Photo 13, Data Point 05, Soil Profile (Wetland 02), Facing Down; depth shown on soil profile sufficient to show hydric soil presence.

Photo 14, Upland Data Point 06, Facing North.

Photo 15, Upland Data Point 6 Soil Profile, Facing Down; depth shown on soil profile sufficient to show hydric soil absence.

Photo 16, Unnamed Tributary to Lick Creek Facing Upstream.

Project Number:
j192079m01

Photos Taken:
May 10, 2019

Site Photographs
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Photo 17, Unnamed Tributary to Lick Creek Facing Downstream.

Photo 18, Ditch 1, Roadside, Facing Downstream.

Photo 19, Ditch 1, Roadside, Facing Upstream.

Photo 20, Project Limits on East Thompson Road, Facing Northeast.

Project Number:
j192079m01

Photos Taken:
May 10, 2019

Site Photographs
US 31 at SR 135 Thompson Road Revisions
Waters of the U.S. Determination / Wetland Delineation Report
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Photo 21, SR135, Facing West.

Photo 22, SR135, Facing North.

Photo 23, US31, Facing South.

Photo 24, I-465 On Ramp, Facing Southeast.

Project Number:
j192079m01

Photos Taken:
May 10, 2019

Site Photographs
US 31 at SR 135 Thompson Road Revisions
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Photo 25, I-465 On Ramp, Facing Northwest, Located at the end of Ditch 1.

Photo 26, I-465, Facing Northeast.

Photo 27, I-465, Facing Southwest.

Photo 28, I-465 On Ramp and I-465 Facing East.

Project Number:
j192079m01

Photos Taken:
May 10, 2019

Site Photographs
US 31 at SR 135 Thompson Road Revisions
Waters of the U.S. Determination / Wetland Delineation Report
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Photo 29, I-465 On Ramp and I-465 Facing West.

Photo 30, Ditch 2, Roadside, Facing Northeast.

Photo 31, Ditch 2, Roadside, Facing Southwest.

Photo 32, Data Point 7 (Wetland 03), Facing North.

Project Number:
j192079m01

Photos Taken:
Photos 29, 30, 31- May 10, 2019
Photo 32- July 15, 2019

Site Photographs
US 31 at SR 135 Thompson Road Revisions
Waters of the U.S. Determination / Wetland Delineation Report
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Photo 33, Data Point 7 (Wetland 03), Facing South.

Photo 34, DP 7, Soil Profile, Facing Down; depth shown on soil profile sufficient to show hydric soil presence.

Photo 35, Upland DP 8, Soil Profile, Facing Down; depth shown on soil profile sufficient to show hydric soil absence.

Photo 36, Upland Data Point 8, Facing North.

Project Number:
j192079m01

Photos Taken:
July 15, 2019

Site Photographs
US 31 at SR 135 Thompson Road Revisions
Waters of the U.S. Determination / Wetland Delineation Report
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Photo 37, Upland Data Point 8, Facing South.

Photo 38, Lick Creek, Facing West.

Photo 39, Lick Creek, Facing East.

Project Number:
j192079m01

Photos Taken:
July 15, 2019

Site Photographs
US 31 at SR 135 Thompson Road Revisions
Waters of the U.S. Determination / Wetland Delineation Report
DES # 1700182
Marion County, Indiana

Cardno
3901 Industrial Blvd. Indianapolis, IN 46254 USA
Phone (+1) 317-388-1982 Fax (+1) 317-388-1982
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PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 1/7/2020

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:

Christine Williams
Indiana Department of Transportation, Greenfield District
32 S Broadway St.
Greenfield, IN 46140
chwilliams@indot.in.gov

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:

The US 31 at SR 135 Thompson Road Revision (Des No. 1700182) Study Area is located in Marion County, Indiana. The proposed project includes intersection improvements at US 31 and SR 135/Thompson Road. The total size of the Study Area was approximately 48 acres. The Study Area was maintained highway right-of-way and mature woods.

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: Indiana County/parish/borough: Marion City: Indianapolis

Center coordinates of site (lat/long in degree decimal format):

Lat.: 39.6958° N Long.: -86.1486° W

Name of nearest waterbody: Lick Creek

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

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
UNT to Lick Creek	39.6976	-86.1444	704LF	Non-wetland/Stream	Section 404
Lick Creek	39.6990	-86.1488	99LF	Non-wetland/Stream	Section 404
Wetland 01	39.6959	-86.1490	0.009AC	Wetland	Section 404
Wetland 02	39.6979	-86.1464	0.002AC	Wetland	Section 404
Wetland 03	39.6903	-86.1486	0.042AC	Wetland	Section 404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

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 AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) 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) 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) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (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 PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives 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 AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, 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. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

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

- [x] Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- [x] 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:
- [x] U.S. Geological Survey Hydrologic Atlas:
  - [x] USGS NHD data.
  - [x] USGS 8 and 12 digit HUC maps.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: 1:24K, Quad: Maywood 24K
- [x] USDA Natural Resources Conservation Service Soil Survey. Citation: Marion County
- [x] National wetlands inventory map(s). Cite name: Maywood Quad 24K
- [ ] State/Local wetland inventory map(s):
- [x] FEMA/FIRM maps: Click here to enter text.
- [ ] 100-year Floodplain Elevation is:
  (National Geodectic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): Google Earth, October 22, 2018
- [ ] or [x] Other (Name & Date): Site Photos, May 10, 2019 & July 15, 2019
- [ ] Previous determination(s). File no. and date of response letter:
- [ ] Applicable/supporting case law:
- [ ] Applicable/supporting scientific literature:
- [ ] 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.

Date:

Regulatory Specialist

5 NOV 2019

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Susan Harrington

From: Kate Williams
Sent: Monday, February 24, 2020 3:22 PM
To: Susan Harrington
Subject: FW: Permit Determination: Des. 1700182, US 31/ SR 135 Intersection Improvement

FYI

Kate L Williams, PWS
Science Project Manager
Environmental Planning
Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

---

From: Clayton, Juliana <JClayton@indot.IN.gov>
Sent: Monday, February 24, 2020 2:56 PM
To: Kate Williams <klwilliams@HNTB.com>
Cc: Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>; Williams, Christine <ChWilliams@indot.IN.gov>; Couch, Gregory <GCouch@indot.IN.gov>
Subject: RE: Permit Determination: Des. 1700182, US 31/ SR 135 Intersection Improvement

Kate,

I have reviewed the information and based on this the following permits are needed for **Des. number 1700182, RFC 2/24/21** (the designer should confirm all schedules with the Project Manager):

- **Rule 5** based on >1 ac land disturbance. **Please submit *prior* to ES deadline of 8/24/20.**
- **401 / 404 RGP** (use State Form 51937) based on less than 500 linear feet and 0.25 acres of permanent impacts from non-maintenance activities. **Please submit *prior* to ES deadline of 8/24/20.**

*We are providing **preliminary** permit determinations based on the information presented at the time of the request. **If scope and plans change the designer should contact us for a revised determination.** A final permit determination will be done at the time of permit application submittal and/or any changes to the scope of the project.*

If you have questions please feel free to contact me.

Thanks,
Juliana Clayton
Ecology and Waterway Permitting Specialist
100 N Senate Ave N 642
Indianapolis, IN 46204-2216
Phone: 317-232-0240
Email: jclayton@indot.in.gov

From: Kate Williams [mailto:klwilliams@HNTB.com]
Sent: Tuesday, February 18, 2020 1:53 PM
To: Clayton, Juliana <JClayton@indot.IN.gov>
Cc: Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>; Williams, Christine

<ChWilliams@indot.IN.gov>
Subject: RE: Permit Determination: Des. 1700182, US 31/ SR 135 Intersection Improvement

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

Hi Juliana,

Sorry about that. Please see below for the additional information.

Cheers,

Kate L Williams, PWS
Science Project Manager
Environmental Planning
Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

---

From: Clayton, Juliana <JClayton@indot.IN.gov>
Sent: Tuesday, February 18, 2020 12:21 PM
To: Kate Williams <klwilliams@HNTB.com>
Cc: Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>; Williams, Christine <ChWilliams@indot.IN.gov>
Subject: RE: Permit Determination: Des. 1700182, US 31/ SR 135 Intersection Improvement

Kate,

Please answer the question about the Q100 and I'll finish up this permit determination.

Thanks,
Juliana Clayton
Ecology and Waterway Permitting Specialist
100 N Senate Ave N 642
Indianapolis, IN 46204-2216
Phone: 317-232-0240
Email: jclayton@indot.in.gov

From: Kate Williams [mailto:klwilliams@HNTB.com]
Sent: Friday, February 14, 2020 2:57 PM
To: Clayton, Juliana <JClayton@indot.IN.gov>
Cc: Joshua Cook <jlcook@HNTB.com>; Hugh Regan <hregan@HNTB.com>; Williams, Christine <ChWilliams@indot.IN.gov>
Subject: Permit Determination: Des. 1700182, US 31/ SR 135 Intersection Improvement

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

Hi Juliana,

Please see the permit determination questionnaire for the above project. Let me know if you have any questions.

- What kind of structure work is associated with this project (replacement, painting, scour protection, etc.)?
    - The Proposed project includes an intersection modification project at the intersection of SR 135 and US 31. The project will re-configure the intersection to decrease traffic queuing during peak periods. There is no structure work associated with this project.
- What is the estimated total soil disturbance associated with this project in acres? Please provide a number; do not just say "less than 0.9 acres."
    - The proposed soil disturbance is approximately 6.80 Acres
- Will any permanent or temporary work take place below the Q100? If so, is the project considered Rural or Urban? What is the upstream drainage area?
    - There is no work anticipated within streams. No work will take place below the Q100 of any streams. This project is within an urban section of Marion County. There is no calculable upstream drainage area.
- What are the anticipated permanent impacts to any jurisdictional streams (in **linear feet** below ordinary high water mark and in **acres** below ordinary high water mark) and wetlands (acres)?
    - There will be no permanent impacts to streams as a result of this project. Permanent impacts to wetlands will result from traffic sign removal and placement of a 30" drainage trunk line. This will result in 0.0086 acre or 68 linear feet of impact to this wetland.
- What are the anticipated temporary impacts to any jurisdictional streams (in **linear feet** below ordinary high water mark and in **acres** below ordinary high water mark) and wetlands (acres)?
    - N/A
- If riprap is being placed for scour protection, is it just being placed on any existing riprap footprint?
    - N/A
- Will there be any tree clearing?
    - No tree clearing is anticipated as a result of this project.
- Are there any known wildlife concerns (nesting swallows, bats, or ETR species located within 0.5 miles of the project)?
    - None
- Please forward a copy of the project plans for my review, if available.
    - See attached

Kathryn L Williams, PWS
Science Project Manager
Environmental Planning
Tel (317) 636-4682 **Cell** (317) 464-9523 **Direct** (317) 917-5332 **Email** klwilliams@hntb.com

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

APPENDIX G: PUBLIC INVOLVEMENT

HNTB Corporation
The HNTB Companies
Infrastructure Solutions

111 Monument Circle
Suite 1200
Indianapolis, IN 46204

Telephone (317) 636-4682
Facsimile (317) 917-5211
www.hntb.com

June 6, 2019

Sample Notice of Survey Letter

Address Information

Re: Marion County Tax Parcel – #

NOTICE OF SURVEY

Dear Property Owner:

HNTB, on behalf of The Indiana Department of Transportation (INDOT), will perform a survey for the purpose to improve the intersection of US 31 at SR 135/Thompson Road. The preferred alternative is a displaced left turn treatment including re-alignment of the I-465 eastbound exit ramp to US 31 southbound in Marion County, Indiana. A portion of this survey work may be performed on your property in order to provide design engineers information for project design. The survey work will include mapping the location of features such as trees, buildings, fences, drives, ground elevations, etc. The survey is needed for the proper planning and design of this highway project.

At this stage we generally do not know what effect, if any, our project may eventually have on your property. If we determine later that your property is involved, we will contact you with additional information.

Indiana Code 8-23-7-26 allows HNTB, as the authorized employees of INDOT, *Right of Entry* to the project site (including private property) upon proper notification. A copy of a Notice of Survey discussion sheet, as found on INDOT's website (http://www.in.gov/indot/2888.htm), is attached to this letter. Pursuant to Indiana Code 8-23-7-27, this letter serves as written notification that we will be performing the above noted survey in the vicinity of your property on or after June 6, 2019

HNTB employees will show you their identification, if you are available, before coming onto your property.

If you own but are not the tenant of this property (i.e. rental, sharecrop), please inform us so that we may also contact the actual tenant of the property prior to commencement of our work. If you have any questions or concerns regarding our proposed survey work or schedule, please contact the HNTB Project Manager. This contact information is as follows:

Josh Cook, PE
111 Monument Circle, Suite 1200
Indianapolis, IN 46204
(317) 636-4682

Under Indiana Code 8-23-7-28, you have a right to compensation for any damage that occurs to your land or water as a result of the entry or work performed during the entry. To obtain such compensation, you should contact the Fort Wayne District Real Estate Manager; contact information is below. The District Real Estate Manager can provide you with a form to request compensation for damages. Once you fill out this form, you can return it to the District Real Estate Manager for consideration. If you are not satisfied with the compensation that INDOT determines is owed to you, Indiana Code 8-23-7-28 provides the following:

> The amount of damages shall be assessed by the county agricultural extension educator of the county in which the land or water is located and two (2) disinterested residents of the county, one (1) appointed by the aggrieved party and one (1) appointed by the department. A written report of the assessment of damages shall be mailed to the aggrieved party and the department by first class United States mail. If either the department or the aggrieved party is not satisfied with the assessment of damages, either or both may file a petition, not later than fifteen (15) days after receiving the report, in the circuit or superior court of the county in which the land or water is located.

If you have questions regarding the rights and procedures outlined in this letter, please contact the Greenfield District Real Estate Manager. This contact information is as follows:

Josh Betts
32 South Broadway
Greenfield, IN 46140
(855) 463-6848

Thank you in advance for your cooperation in this matter.
Sincerely,
HNTB Corporation

William M. Jones
Supervisory Survey Technician

APPENDIX H: AIR QUALITY

Indiana Department of Transportation (INDOT)
State Preservation and Local Initiated Projects FY 2020 - 2024

SPONSOR	CONTRACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Estimated Cost left to Complete Project*	PROGRAM	PHASE	FEDERAL	MATCH	2020	2021	2022	2023	2024
Indiana Department of Transportation	40869 / 1700182	Init.	US 31	Intersect. Improv. W/ Added Turn Lanes	0.1 miles south of SR 135/Thompson Rd to 0.4 miles north of SR 135/Thompson Rd	Greenfield	.48	STPBG		Mobility ROW	RW	$280,000.00	$70,000.00			$350,000.00		
										Mobility Construction	CN	$3,583,752.80	$895,938.20				$4,479,691.00	
Indiana Department of Transportation	40869 / 1700182	M 05	US 31	Intersect. Improv. W/ Added Turn Lanes	0.1 miles south of SR 135/Thompson Rd to 0.4 miles north of SR 135/Thompson Rd	Greenfield	.48	STBG	$5,550,691.00	Mobility ROW	RW	$0.00	$0.00		$175,000.00	($175,000.00)		
										Mobility Construction	CN	$0.00	$0.00		$4,479,691.00		($4,479,691.00)	
Comments:Advancing CN form 2023 to 2021. FY 2021 $4,079,691																		
Indiana Department of Transportation	40870 / 1700153	Init.	SR 135	Intersect. Improv. W/ Added Turn Lanes	Southport Road	Greenfield	0	NHPP		Mobility ROW	RW	$1,688,000.00	$422,000.00			$2,110,000.00		
										Mobility Construction	CN	$6,669,860.00	$1,667,465.00				$8,337,325.00	
Indiana Department of Transportation	41046 / 1800466	Init.	I 465	Bridge Thin Deck Overlay	NB over W 86th Street, 3.39 miles N of I-65 N. Jct.	Greenfield	0	NHPP		Bridge Construction	CN	$5,751,339.30	$639,037.70		$6,390,377.00			
Indiana Department of Transportation	41089 / 1800771	Init.	US 40	Concrete Pavement Restoration (CPR)	from 3.56 mi W of I-465 to 1.73 mi W of I-465 W leg	Greenfield	1.827	NHPP		Road Construction	CN	$1,876,017.60	$469,004.40		$2,345,022.00			
Indiana Department of Transportation	41101 / 1800764	Init.	US 136	HMA Overlay, Preventive Maintenance	from 3.01 mi W of I-465 (Hendricks/Marion Co Ln) to 1.15 mi W of I-465	Greenfield	1.85	NHPP		Road Construction	CN	$620,639.20	$155,159.80		$775,799.00			
Indiana Department of Transportation	41136 / 1800547	Init.	I 70	Bridge Thin Deck Overlay	0.13 miles E of I-465 W Jct.	Greenfield	0	NHPP		Bridge Construction	CN	$4,291,032.60	$476,781.40		$4,767,814.00			
Indiana Department of Transportation	41139 / 1500793	Init.	I 70	Bridge Deck Overlay	Over CSX WYE TRACKS; 3.88 Miles E I-465	Greenfield	0	NHPP		Bridge Construction	CN	$10,695,567.60	$1,188,396.40		$11,883,964.00			
Indiana Department of Transportation	41156 / 1800393	A 07	I 465	Bridge Deck Overlay	English Ave. over I-465, 0.77 miles N of US 52 (SE side)	Greenfield	0	NHPP	$1,941,165.00	Bridge Consulting	PE	$158,580.00	$17,620.00	$176,200.00				
										Bridge Construction	CN	$1,547,068.50	$171,896.50		$1,718,965.00			
Comments:Adding New Project IRTIP Resolution 19-IMPO-008																		
Indiana Department of Transportation	41159 / 1592559	Init.	I 70	Bridge Painting	Over CSX Wye Tracks, 3.88 miles E of I-465	Greenfield	0	NHPP		Bridge Construction	CN	$3,882,193.20	$431,354.80		$4,313,548.00			
Indiana Department of Transportation	41276 / 1800748	Init.	VA VARI	ITS Traffic Management Systems	Camera/Communications/Detection/DMS Replacements in Indianapolis ATMS area - FY 20	Greenfield	0	NHPP		Statewide Construction	CN	$360,000.00	$40,000.00	$400,000.00				
Beech Grove	41316 / 1801422	Init.	ST 1036	Bike/Pedestrian Facilities	Thompson Road Multi-Use Trail	Greenfield	.6	STPBG		Indianapolis MPO	CN	$410,836.00	$0.00				$410,836.00	
										Local Funds	CN	$0.00	$176,073.00				$176,073.00	
										Local Funds	RW	$0.00	$45,000.00	$25,000.00	$20,000.00			

*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 information purposes.

Planning the Transportation Future for the Indianapolis Region

Project Overview | Funding History | Amendment History

<<Go Back

Intersection Improvement Project with Added Turn Lanes on US-31 and Thompson Rd.(SR-135) (1700182)

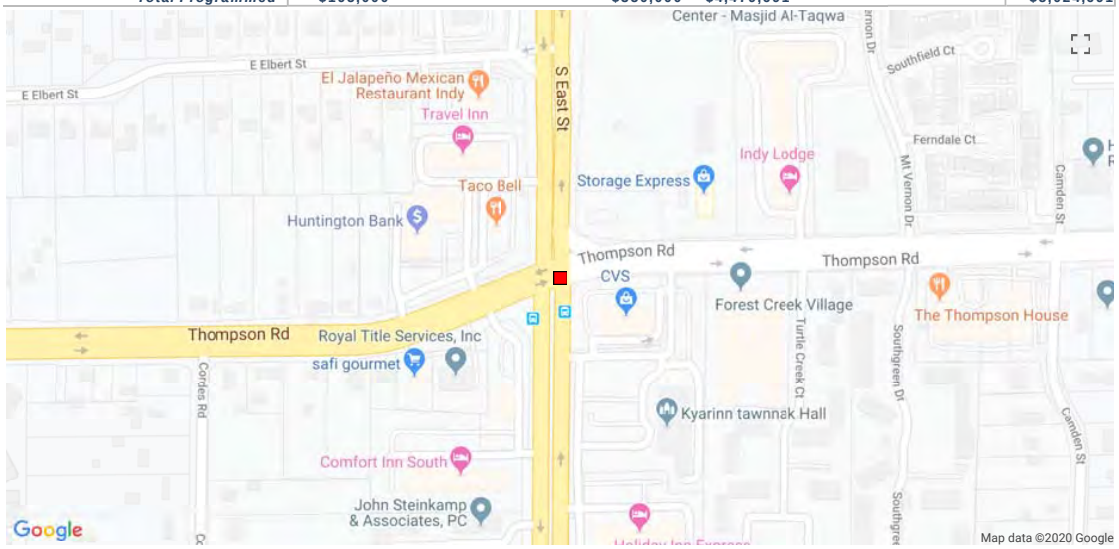
Des Number	1700182	*Amendment*	20-00 TIP	*Exempt Category*	Exempt	*Est Total Project Cost*	$5,024,691
Lead Agency	INDOT	*Contact (ERC)*		*INDOT District*	Greenfield	*County*	Marion Marion Co.
Project Type	Intersect. Improv. W/ Added Turn Lanes	*Letting Date*	DEC/2022	*Functional Classification*	Other Principal Arterial	*Bike/Ped Component(s)*	No

Title Intersection Improvement Project with Added Turn Lanes on US-31 and Thompson Rd.(SR-135)

Limits Nearest Crossstreet: Thompson Rd.

Description Adding turn lanes to accommodate traffic growth in this are and lessen back-ups

Phase	Fund Source	Prior SFY	SFY2020	SFY2021	SFY2022	SFY2023	SFY2024	Future SFY	Total
PE	FEDERAL - State STP	$156,000	-	-	-	-	-	-	$156,000
PE	STATE - Other	$39,000	-	-	-	-	-	-	$39,000
	Total Preliminary Engineering	$195,000	-	-	-	-	-	-	$195,000
RW	FEDERAL - State STP	-	-	-	$280,000	-	-	-	$280,000
RW	STATE - Other	-	-	-	$70,000	-	-	-	$70,000
	Total Right of Way	-	-	-	$350,000	-	-	-	$350,000
CN	FEDERAL - State STP	-	-	-	-	$3,583,753	-	-	$3,583,753
CN	STATE - Other	-	-	-	-	$895,938	-	-	$895,938
	Total Construction	-	-	-	-	$4,479,691	-	-	$4,479,691
	Total Programmed	**$195,000**	**-**	**-**	**$350,000**	**$4,479,691**	**-**	**-**	**$5,024,691**



APPENDIX I: ADDITIONAL STUDIES

Des. No. 1700182

Legend:

Your Selections

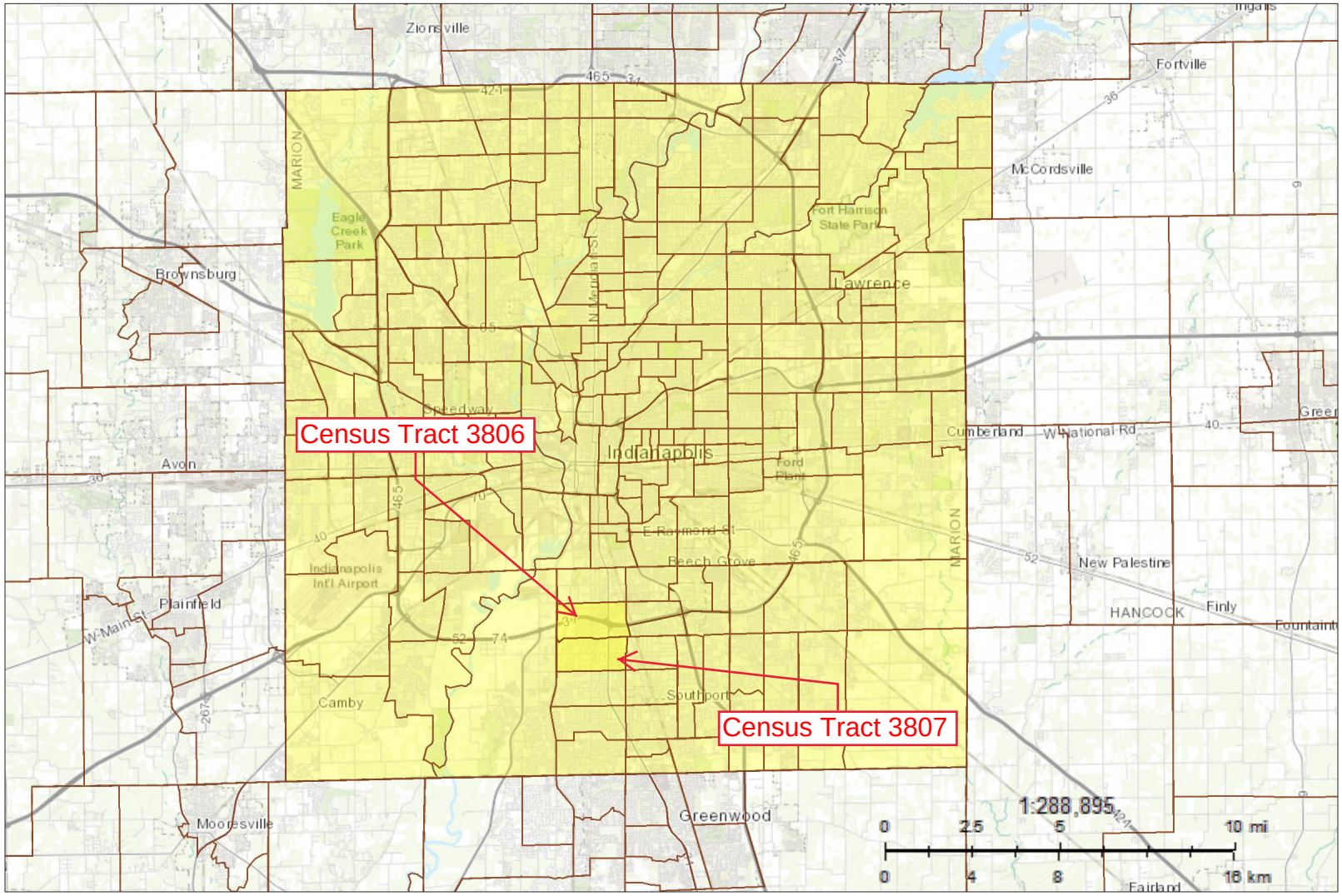
- ☐ 2017 boundaries were used to map 'Your Selections'

Selection Results

No Legend

Boundaries

No Legend



B03002

HISPANIC OR LATINO ORIGIN BY RACE

Universe: Total population
2013-2017 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 Technical 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.

	Marion County, Indiana		Census Tract 3806, Marion County, Indiana		Census Tract 3807, Marion County, Indiana
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Total:	939,964	*****	5,230	+/-652	5,312
Not Hispanic or Latino:	845,355	*****	4,463	+/-634	4,728
White alone	532,896	+/-400	3,618	+/-515	2,539
Black or African American alone	255,912	+/-1,711	543	+/-332	802
American Indian and Alaska Native alone	1,758	+/-394	169	+/-247	0
Asian alone	26,970	+/-490	46	+/-50	1,314
Native Hawaiian and Other Pacific Islander alone	221	+/-88	0	+/-16	18
Some other race alone	2,751	+/-623	0	+/-16	0
Two or more races:	24,847	+/-1,769	87	+/-88	55
Two races including Some other race	523	+/-153	0	+/-16	0
Two races excluding Some other race, and three or more races	24,324	+/-1,785	87	+/-88	55
Hispanic or Latino:	94,609	*****	767	+/-392	584
White alone	56,073	+/-2,061	712	+/-380	424
Black or African American alone	1,824	+/-412	37	+/-43	13
American Indian and Alaska Native alone	648	+/-386	0	+/-16	0
Asian alone	203	+/-148	0	+/-16	0
Native Hawaiian and Other Pacific Islander alone	204	+/-215	0	+/-16	0
Some other race alone	31,645	+/-2,223	18	+/-30	18
Two or more races:	4,012	+/-719	0	+/-16	129
Two races including Some other race	2,155	+/-552	0	+/-16	65
Two races excluding Some other race, and three or more races	1,857	+/-511	0	+/-16	64

	Census Tract 3807, Marion County, Indiana
	Margin of Error
Total:	+/-818
Not Hispanic or Latino:	+/-799
White alone	+/-355
Black or African American alone	+/-623
American Indian and Alaska Native alone	+/-16
Asian alone	+/-694
Native Hawaiian and Other Pacific Islander alone	+/-28
Some other race alone	+/-16
Two or more races:	+/-66
Two races including Some other race	+/-16
Two races excluding Some other race, and three or more races	+/-66
Hispanic or Latino:	+/-380
White alone	+/-350
Black or African American alone	+/-21
American Indian and Alaska Native alone	+/-16
Asian alone	+/-16
Native Hawaiian and Other Pacific Islander alone	+/-16
Some other race alone	+/-32
Two or more races:	+/-132
Two races including Some other race	+/-117
Two races excluding Some other race, and three or more races	+/-91

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.

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Estimates of urban and rural populations, 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, 2013-2017 American Community Survey 5-Year Estimates

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.
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B17001

POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE

Universe: Population for whom poverty status is determined
2013-2017 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 Technical 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.

	Marion County, Indiana		Census Tract 3806, Marion County, Indiana		Census Tract 3807, Marion County, Indiana
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Total:	920,904	+/-910	5,213	+/-641	5,201
Income in the past 12 months below poverty level:	182,317	+/-4,766	975	+/-446	1,522
Male:	81,417	+/-2,612	317	+/-172	768
Under 5 years	10,906	+/-836	59	+/-73	62
5 years	1,932	+/-352	0	+/-16	54
6 to 11 years	12,115	+/-856	0	+/-16	192
12 to 14 years	5,315	+/-629	23	+/-34	53
15 years	1,525	+/-307	28	+/-43	0
16 and 17 years	3,066	+/-458	0	+/-16	0
18 to 24 years	9,579	+/-768	84	+/-83	126
25 to 34 years	10,555	+/-815	16	+/-30	56
35 to 44 years	8,093	+/-706	39	+/-63	70
45 to 54 years	8,115	+/-668	22	+/-36	76
55 to 64 years	6,497	+/-568	1	+/-2	65
65 to 74 years	2,342	+/-364	45	+/-53	14
75 years and over	1,377	+/-229	0	+/-16	0
Female:	100,900	+/-2,977	658	+/-373	754
Under 5 years	10,761	+/-787	79	+/-99	75
5 years	1,958	+/-346	0	+/-16	0
6 to 11 years	11,052	+/-768	54	+/-62	260
12 to 14 years	5,023	+/-661	0	+/-16	0
15 years	1,463	+/-264	0	+/-16	30
16 and 17 years	2,476	+/-332	26	+/-40	0
18 to 24 years	14,007	+/-870	119	+/-74	51
25 to 34 years	17,397	+/-982	130	+/-154	161
35 to 44 years	12,289	+/-818	62	+/-57	118
45 to 54 years	9,528	+/-624	135	+/-112	0
55 to 64 years	7,866	+/-600	22	+/-37	17
65 to 74 years	3,843	+/-484	31	+/-35	27
75 years and over	3,237	+/-355	0	+/-16	15
Income in the past 12 months at or above poverty level:	738,587	+/-4,754	4,238	+/-634	3,679
Male:	361,527	+/-2,762	2,025	+/-406	1,804

	Marion County, Indiana		Census Tract 3806, Marion County, Indiana		Census Tract 3807, Marion County, Indiana
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Under 5 years	23,934	+/-850	184	+/-153	70
5 years	4,574	+/-519	28	+/-44	12
6 to 11 years	27,210	+/-1,218	188	+/-86	172
12 to 14 years	12,589	+/-784	136	+/-106	0
15 years	4,895	+/-473	16	+/-27	0
16 and 17 years	8,361	+/-477	17	+/-30	38
18 to 24 years	32,218	+/-810	135	+/-92	290
25 to 34 years	63,019	+/-819	464	+/-269	314
35 to 44 years	50,000	+/-725	129	+/-83	161
45 to 54 years	48,439	+/-688	419	+/-184	236
55 to 64 years	45,485	+/-559	185	+/-110	272
65 to 74 years	25,521	+/-409	109	+/-90	146
75 years and over	15,282	+/-251	15	+/-25	93
Female:	377,060	+/-2,950	2,213	+/-359	1,875
Under 5 years	22,399	+/-782	203	+/-129	53
5 years	4,267	+/-605	0	+/-16	0
6 to 11 years	25,485	+/-976	121	+/-74	31
12 to 14 years	13,151	+/-976	61	+/-63	21
15 years	4,671	+/-412	16	+/-25	14
16 and 17 years	8,921	+/-498	42	+/-50	26
18 to 24 years	29,459	+/-927	215	+/-156	187
25 to 34 years	62,735	+/-991	308	+/-139	333
35 to 44 years	49,099	+/-813	290	+/-111	233
45 to 54 years	51,358	+/-639	312	+/-130	226
55 to 64 years	50,772	+/-606	189	+/-104	440
65 to 74 years	30,670	+/-494	274	+/-114	135
75 years and over	24,073	+/-367	182	+/-120	176

	Census Tract 3807, Marion County, Indiana
	Margin of Error
Total:	+/-813
Income in the past 12 months below poverty level:	+/-677
Male:	+/-334
Under 5 years	+/-91
5 years	+/-83
6 to 11 years	+/-164
12 to 14 years	+/-58
15 years	+/-16
16 and 17 years	+/-16
18 to 24 years	+/-112
25 to 34 years	+/-71
35 to 44 years	+/-75
45 to 54 years	+/-101
55 to 64 years	+/-85
65 to 74 years	+/-22
75 years and over	+/-16
Female:	+/-472
Under 5 years	+/-92
5 years	+/-16
6 to 11 years	+/-303
12 to 14 years	+/-16
15 years	+/-52
16 and 17 years	+/-16
18 to 24 years	+/-57
25 to 34 years	+/-149
35 to 44 years	+/-98
45 to 54 years	+/-16
55 to 64 years	+/-28
65 to 74 years	+/-31
75 years and over	+/-24
Income in the past 12 months at or above poverty level:	+/-598
Male:	+/-386
Under 5 years	+/-95
5 years	+/-22
6 to 11 years	+/-235
12 to 14 years	+/-16
15 years	+/-16
16 and 17 years	+/-36
18 to 24 years	+/-160
25 to 34 years	+/-143
35 to 44 years	+/-110
45 to 54 years	+/-98
55 to 64 years	+/-92
65 to 74 years	+/-68
75 years and over	+/-65
Female:	+/-310
Under 5 years	+/-54
5 years	+/-16
6 to 11 years	+/-51
12 to 14 years	+/-40
15 years	+/-24
16 and 17 years	+/-41
18 to 24 years	+/-140
25 to 34 years	+/-133
35 to 44 years	+/-143
45 to 54 years	+/-127
55 to 64 years	+/-117
65 to 74 years	+/-93

	Census Tract 3807, Marion County, Indiana
	Margin of Error
75 years and over	+/-68

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.

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Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

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8. An '(X)' means that the estimate is not applicable or not available.

Susan Harrington

From: Bales, Ronald <rbales@indot.IN.gov>
Sent: Monday, December 9, 2019 9:12 AM
To: Caroline Tegeler
Cc: Susan Harrington; Kate Williams; Miller, Brandon
Subject: RE: Des. No. 1700182 - US 31 and SR 135/Thompson Rd. Intersection Improvement Project - Environmental Justice Opinion Request
Attachments: EJ Map 1700182.pdf; EJ Map 1700182.pdf; Project Maps 1700182.pdf; EJ Minority B03002.pdf; EJ Povery B17001.pdf

INDOT-Environmental Services Division (ESD) has reviewed the project information along with the Environmental Justice (EJ) Analysis for the above referenced project. The project would right-of-way, may require one commercial relocation, would not disrupt community cohesion or create a physical barrier. The project would improve operation of the intersection and to provide improved safety for pedestrian movement at the intersection. Currently there are no pedestrian facilities within the vicinity of the project area but apparent foot traffic paths are visible to the east of the project area. With the information provided, INDOT-ESD would not consider the impacts associated with this project as causing a disproportionately high and adverse effect on minority and/or low incomes populations of EJ concern relative to non EJ populations in accordance with the provisions of Executive Order 12898 and FHWA Order 6640.23a. No further EJ Analysis is required.

Ron Bales
INDOT-Environmental Services Division
Office: (317) 234-4916
Email: rbales@indot.in.gov

From: Caroline Tegeler [mailto:ctegeler@HNTB.com]
Sent: Thursday, October 31, 2019 9:56 AM
To: Bales, Ronald <rbales@indot.IN.gov>
Cc: Susan Harrington <sharrington@HNTB.com>; Kate Lucier <klucier@HNTB.com>
Subject: Des. No. 1700182 – US 31 and SR 135/Thompson Rd. Intersection Improvement Project – Environmental Justice Opinion Request

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Dear Mr. Bales,

The following information pertains to the Environmental Justice portion of the proposed US 31 and SR 135/Thompson Rd. project in Marion County, Indiana (Des. No. 1700182). We believe that the while the census data indicates that a portion of the project will take place within an AC that exhibits a low-income population and a minority population, the scope of the project will not have a disproportionate effect on the minority population. We seek your concurrence with this opinion or further instruction on how to proceed. Please see the information below and attachments for supporting details and data.

Project Information:

1800048	1800048	Marion	Eagle Creek Park, Nature Preserve, and Peace Learn
1800072	1800072	Marion	Martin Luther King Park
1800088	1800088	Marion	Eagle Creek Park, Nature Preserve, and Peace Learn
1800114	1800114	Marion	Eagle Creek Golf Course
1800167	1800167	Marion	Eagle Creek Park, Nature Preserve, and Peace Learn
1800185	1800185	Marion	German Church & 30th St Park
1800222	1800222	Marion	Southwestway Park
1800245	1800245	Marion	Lawrence Community Park
1800247	1800247	Marion	Ft. Harrison S.P. Dog Park (old--Fall Creek Park)
1800307	1800307	Marion	Washington Park
1800307	1800307	Marion	16TH AND FRANKLIN PARK (GREENE PARK)
1800330	1800330	Marion	Riverside Park, Aquatic Center
1800369	1800369M	Marion	Ft. Harrison S.P. Dog Park (old--Fall Creek Park)
1800384	1800384	Marion	Sarah T. Bolton Park
1800401	1800401A	Marion	Eagle Creek Firing Range
1800401	1800401B	Marion	Eagle Crest
1800401	1800401	Marion	Cancer Park
1800401	1800401.2	Marion	Starling Nature Sanctuary at Eagle Creek
1800401	1800401.2	Marion	Wish Park
1800401	1800401	Marion	Cancer Park
1800401	1800401	Marion	Krannert Park
1800404	1800404	Marion	Major Taylor Velodrome & Lake Sullivan
1800459	1800459	Marion	Fall Creek Parkway, Fall Creek Corridor Ph.III
1800467	1800467	Marion	Hartman Park/Beech Grove Little League
1800478	1800478	Marion	Oaklandon Play Park
1800505	1800505	Marion	Fall Creek Parkway, Fall Creek Corridor Ph.III
1800541	1800541	Marion	Southwestway Park
1800600	1800600	Marion	Southport Park
1800617	1800617	Marion	Fort Benjamin Harrison Civic Plaza
1800635	1800635	Marion	Leonard Park
1800328	1800328	Various*	Heritage program
1800594	1800594	Various*	Brown County State Park and Versailles State Park
1800611	1800611	Various*	Whitewater Memorial State Park/Salamonie Reservoir
1800626	1800626	Various*	Brown County S.P., Indiana Dunes S.P. and Cataract Falls SRA

Abbreviated Engineer's Assessment

US 31 and SR 135/Thompson Road Intersection Improvements

INDOT Greenfield District
Marion County, IN
DES No: 1700182

September 17, 2019

Prepared For
INDOT Greenfield District
Contact: Christine Williams

Prepared By
HNTB Corporation
111 Monument Circle, Suite 1200
Indianapolis, IN 46204
Phone (317) 636-4682
Contact: Josh Cook, PE

Approved: _____ Date:_____
Josh Cook
HNTB, Project Manager

Approved: _____ Date:_____
Christine Williams
INDOT, Project Manager

Approved: _____ Date:_____
Amy Groff
INDOT, System Asset Manager

Approved: _____ Date:_____
Luis Laracuente
INDOT, District Traffic Engineer

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FIGURES

APPENDICES

A. INDOT Technical Memorandum
B. Alternative 1 Conceptual Layout
C. Alternative 2 Conceptual Layout
D. Alternative 3 Conceptual Layout
E. Traffic Analysis
F. Cost Estimates

1 PROJECT LOCATION

The intersection at US 31 (RP 107.43 to RP 107.92) and SR 135/Thompson Road (RP 131.346 to RP 131.456) is a signalized intersection on the southside of Indianapolis, Indiana. US 31 is a six-lane divided suburban arterial running northbound/southbound that carries 55,550 vehicles per day. The north and southbound traffic is divided by center curb. SR 135/Thompson Road is an east/west major collector that carries 14,796 vehicles per day. The nearby interchanges/intersections include:

- I-465/US 31 interchange 800 feet north.
- Unsignalized intersection at US 31 and Powel Street/Turtle Creek Drive is 1,400 feet south
- Signalized intersection at US 31 and Epler Avenue is 2,500 feet south.
- Unsignalized intersection of SR 135 and Cordes Road is 775' west
- Signalized intersection of Thompson Road and Madison Avenue is 3,370 feet east. (Numerous drives and public road approaches exist along this stretch.

2 PURPOSE AND NEED

The intersection is experiencing significant delays in the PM peak period for US 31 Southbound. The delay is such that the queue for the southbound left turn backs up into the I-465 and US 31 interchange. The need for the project is improve the traffic operations and safety of the intersection. This project has been previously studied by the INDOT Corridor Development Group, refer to **Appendix A** for the Technical Memorandum. The recommendation from the report was a hybrid displaced-left/median U-turn treatment. This Abbreviate Engineer's Report examines the alternatives in the memorandum considering new commercial development in the northwest quadrant that occurred after the completion of memorandum.

3 ALTERNATIVES CONSIDERED

The Technical Memorandum considered a traditional intersection improvement, median U-turn and displaced left treatments. The recommendation from the memorandum was a hybrid displaced left/median U-turn treatment. Due to new commercial development in the northwest quadrant the memorandum alternatives would be reexamined to consider the traffic operations, safety, impacts and cost. The alternatives considered as a part of this report include a hybrid US 31 NB Median U-turn/US 31 SB Displaced Left, US 31 NB/SB Displaced Left and a Conventional Intersection with Added Turn Lanes.

Alternative 1 - Conventional Intersection with Added Turn Lanes – This alternative utilizes conventional intersection improvements, (i.e. added turn lanes or increase turn lane lengths). The improvements for US 31 SB include adding a second left-turn lane to WB Thompson Road and a dedicated right-turn lane for west/south SR 135. US 31 NB improvement includes provided an offset left-turn for west/south SR 135. The Thompson Road approach requires a second right-turn lane for US 31 NB. The SR 135 approach was recently improved, and the approach is adequate. See **Appendix B** for the conceptual layout.

Alternative 2 - US 31 NB/SB Displaced Left – This intersection includes displacing the left-turns for both US 31 NB and US 31 SB. This requires traffic to turn left in advance of the main intersection at US 31 and SR 135/Thompson Road. US 31 NB to west/south on SR 135 turns left 400 feet in advance of the main intersection utilizing a new signal. US 31 SB to east Thompson Road will turn left at Elbert Street (600 feet north of the main intersection) also utilizing a new signal. Each new signal will be coordinated with

the main signal to ensure there are no conflicting movements. The overall configuration for this type of intersection is illustrated in **Figure 1**. See **Appendix C** for the conceptual layout.

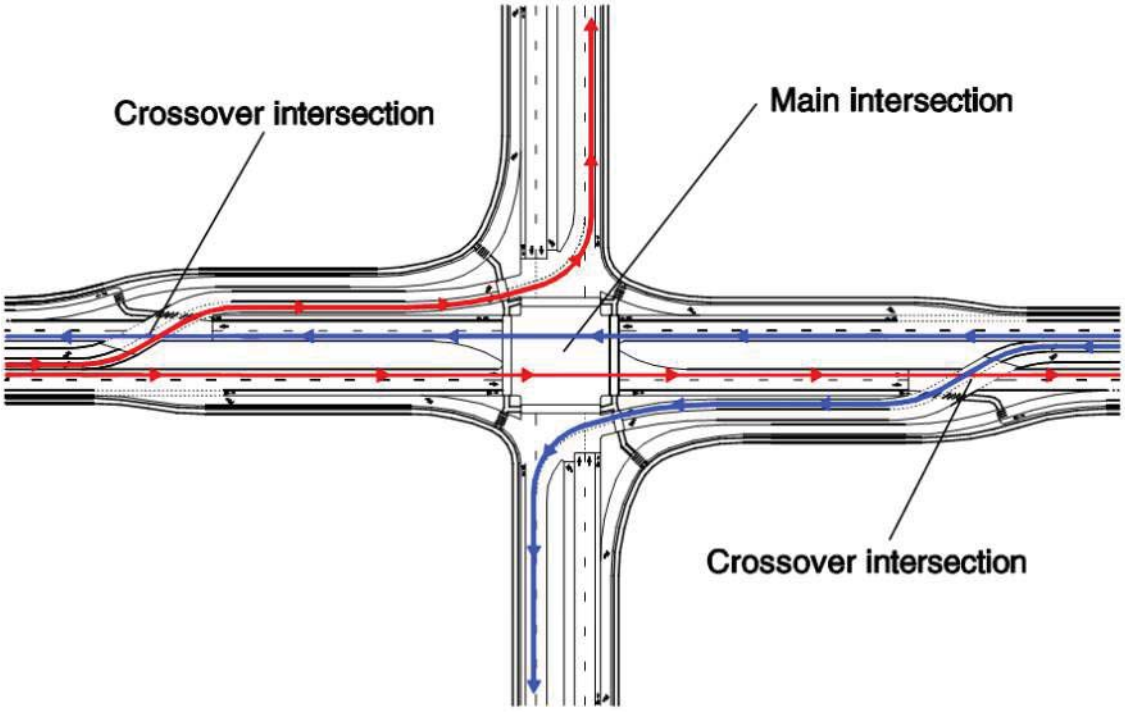


Figure 1 - Displaced-Left Intersection

Alternative 3 - Hybrid US 31 NB Median U-turn/US 31 SB Displaced Left – This alternative is a hybrid of two intersection improvement styles. The configuration utilizes a median U-turn and a displaced left intersection. US 31 SB will utilize a displaced-left configuration. This requires traffic to turn left in advance of the main intersection at US 31 and SR 135/Thompson Road. US 31 SB traffic heading east on Thompson Road will now turn left across US 31 at a new signalized intersection at Elbert Street (600 feet north of the US 31 and SR135/Thompson Road). Traffic will then travel south along US 31 to the signal at SR 135/Thompson Road. Through this signal, traffic will then be able to head east on Thompson Road. This is illustrated in blue on **Figure 1**.

US 31 NB traffic wanting to turn left to go west/south on SR 135 will turn right at the US 31/SR 135 intersection and head east on Thompson Road. The vehicles that want to go west/south on SR 135 will then navigate a U-turn approximately 600 feet east of the US 31 intersection. After the U-turn traffic will then proceed through the signal at US 31 to continue west/south on SR 135. This is illustrated in **Figure 2**.

The traffic operation benefit of this configuration is that it eliminates the left-turn phase for US 31 NB and SB traffic. The elimination of this phase improves the operations of the main intersection allowing more green time for the north/south movements. See **Appendix D** for the conceptual layout.

Figure 2- Example of Median U-turn

4 TRAFFIC OPERATIONS

The alternatives were evaluated with 2045 forecasted traffic. The analysis was performed using Synchro software and SimTraffic which use Highway Capacity Manual methodologies. At the US31 & Thompson Road intersection, each alternative was developed to achieve LOS D or better for all key turning movements. In addition to level of service, SimTraffic was used to analyze queueing. The 95th percentile queues for each approach to US31 and Thompson Road intersection are listed in **Table 1**. An extended set of key traffic metrics are available in **Appendix E**.

Table 1: Maximum 2045 Queue Lengths Per Approach at US31 & Thompson Road

	Alternative 1 Conventional	Alternative 2 – Displaced-Left Intersection	Alternative 3 – Hybrid Displaced Left / Median U-Turn
Northbound	**582 ft**	**450 ft**	472 ft
Southbound	**344 ft**	269 ft	**266 ft**
Eastbound	**306 ft**	**277 ft**	283 ft
Westbound	**210 ft***	**101 ft**	112 ft
Total	**1,442 ft**	**1,097 ft**	1,133 ft

Red indicates the longest queue and green indicates the shorter queues.
*Synchro-estimated queue. The SimTraffic queue is abnormally high due to poor lane utilization caused by the limitations of the SimTraffic software. A more thorough analysis should be reviewed in VISSIM or TransModeler should this alternative be selected.

Table 1 above is color coordinated based on queue impact, where red indicates the worst maximum queue for that approach between the alternatives, and green indicates the best maximum queue per approach. Despite the conventional intersection having similar LOS results to the other two alternatives, it has the most significant queues. The conventional intersection is expected to see the longest queues on all approaches compared with the other two alternatives. The dual displaced-left alternative

generally experiences the shortest queues amongst the three alternatives, however the hybrid displaced left/median U-turn alternative nearly matches it.

The eastbound I-465 to US31 southbound ramp reconfiguration is the same for all 3 alternatives. All movements at this intersection operate at LOS C or better in the design year.

5 IMPACTS OF ALTERNATIVES (PERMITS, RIGHT OF WAY, UTILITY)

Environmental/Permits - A Red Flag Investigation was completed and noted three sites that may be affected and have had spills or contamination noted on site. These include the Johnson Oil Bigfoot #025 located at 505 E Thompson Road in the southeast corner of Thompson Road and US 31; Shell Dealer Indianapolis located at 514 East Thompson Road in the northeast corner of Thompson Road and US 31; and the Former Shoney's site located at 5010 S East Street south of Thompson Road on the west side of US 31 within the project area. Low levels of contaminates were noted in the groundwater or soils on these sites below 8 feet. If excavation occurs in this area at depths greater than 8 feet contamination may be encountered and proper handling, removal, and disposal of soil and/or groundwater will be necessary.

A Waters of the US Report has been prepared. Three wetlands, two streams, two roadside ditches, and no open water were identified during the field reconnaissance. The three emergent wetlands are 0.009 acre, 0.002 acre and 0.04 acre in size. The two streams identified are an UNT to Lick Creek and Lick Creek. Every effort should be taken to avoid and minimize impacts to wetlands and waterways located within the Study Area. If impacts are necessary, then permitting and mitigation may be required.

Based on preliminary design, it is anticipated that impacts to 0.009 acre of emergent wetland may be unavoidable. A Section 401 Water Quality Certification from the Indiana Department of Environmental Management and Section 404 Permit from the US Army Corps of Engineers will be required. It is anticipated this project will meet the requirements for the Indiana Regional General Permit. This project will also require a Rule 5 Sediment and Erosion Control permit as more than 1 acre of land disturbing activities will occur.

No historic or archaeological resources will be impacted by this project. A MPPA Category B determination has been requested.

Right-of-Way – Each alternative has right-of-way impacts to surrounding businesses. The impacts can be summarized as the total number of properties, impacts, total acquisitions and total relocations.

Table 2-Right-of-Way Impacts

Right-of-Way Impacts			
	Property Impacts	Total Acquisitions	Relocations
Alternative 1 – Conventional Intersection with Added Turn Lanes	12	2	1
Alternative 2 – US 31 NB/SB Displaced Left	11	2	1
Alternative 3 – Hybrid US 31 NB Median U-turn/US 31 SB Displaced Left	**12**	**0**	0

Per visual inspection of above ground utilities, and discussions with utility owners at the intersections, there are impacts to both above ground and below ground utilities. The utilities can be summarized as:

- Electrical and other distributions lines exist along US 31 southbound from Elbert Street continuing south throughout the project. These distribution lines will require relocation in each alternative.
- Electrical and other distributions lines exist along East Thompson/West SR 135 south throughout the project. These distribution lines will require relocation in each alternative, but the extend of relocation varies per alternative. The Hybrid US 31 NB Median U-turn/US 31-SB Displaced Left has more impacts to these utilities when compared to the other two alternatives
- AT&T has an existing vault and boxes in the southwest quadrant of the intersection of US 31 and SR 135/Thompson Road. Each alternative impacts the vault and boxes. Without knowing the specific details of the vault, it is difficult to determine if the Hybrid US 31 NB Median U-turn/US-31 SB Displaced Left will have impact. The other two alternatives will impact the vault. For the purposes of this report, it has been assumed that all three alternatives will have impact and require relocation of the vault.
- Underground utilities, gas, sewer, storm sewer and water will be impacted by the project. These utilities are located on the westside of US 31 and north side of SR 135/Thompson Road. Each alternative will impact these utilities, but the extend of relocation varies with each.

The anticipated cost for utility relocation can be seen in the Cost of Alternatives in the next section of this report.

6 COST OF ALTERNATIVES

The construction cost for each intersection alternative was prepared using planning-level cost methods. The estimated cost includes construction, utilities and right-of-way acquisition cost. Each alternative is summarized in the following tables. Refer to **Appendix F** for the full cost estimate.

Table 3-Cost Estimates

Total Year of Expenditure Project Cost Summary

	Alternative 1 – Conventional Intersection with Added Turn Lanes	Alternative 2 – US 31 N/SB Displaced Left	Alternative 3 – Hybrid US 31 NB Medain U-turn/US 31 Displaced Left
Construction	**$5,300,000**	**$4,990,000**	**$4,570,000**
Right of Way:	**$1,501,000**	**$1,151,000**	**$1,921,000**
Utilities:	**$800,000**	**$720,000**	**$800,000**
	$7,601,000	**$6,861,000**	**$7,291,000**

Note: All three alternatives include a $1,090,000 for the realignment of the I-465 EB Off-Ramp to US 31 SB.

7 SELECTED ALTERNATIVES

The traffic operations of both Alternative 2 and 3 are very similar with Alternative 2 having a slight advantage when measuring the total queue lengths for the movements. Alternative 2 construction cost is slightly more than Alternative 3, it has less right-of-way and utility impacts resulting in less overall cost. Additionally, Alternative 2 presents a configuration in which is consistent for all drivers. For instance, both US 31 NB and SB utilize the same left-turn movement through the displaced left-turns. Alternative 3 utilizes two different approaches by utilizing a displaced left-turn for US 31 SB and using a median -turn type treatment for US 31 NB. As such, Alternative 2 – US 31 NB/SB Displaced Left is recommended as the selected alternative.

8 MOT DURING CONSTRUCTION

The maintenance of traffic of all three alternatives is similar and will follow the following phasing:

Phase 1 construction will occur on the east and west side of US 31, by closing the outside lanes closest to the construction. This will reduce the through lanes on US 31 NB and SB down to 2-lanes. (Alternative would be to complete construction at night, minimum of 1 lane in each direction will be maintained). SR 135/Thompson Rd will have an outside lane closure and will maintain 1 lane in each direction.

Phase 2 construction will occur within the median of US 31, by closing the inside lanes, closest to the construction. This will reduce the through lanes on US 31 NB and SB down to 2-lanes. (Alternative would be to complete construction at night, minimum of 1 lane in each direction will be maintained). SR 135/Thompson Rd will have inside lane closures and will maintain 1 lane in each direction.

Phase 3 construction will complete the remainder of punch list (utilities, drainage, etc.) and will open traffic to new configuration.

9 LOCAL AND OTHER EXPECTED COORDINATION

Coordination with key stakeholders, including the City of Indianapolis, Indianapolis Metropolitan Planning Organization and public information meetings are anticipated.

10 CHANGES TO THIS ENGINEER'S REPORT

Greenfield District Technical Services and Capital Program Management shall be consulted if deviation from the proposal is determined to be necessary during a later phase of project development. The person changes shall route a memo detailing the changes including justification for the change and the estimated cost difference to the Greenfield District System Asset Manager, District Traffic Engineer, and Project Manager for concurrence.

INTER-DEPARTMENT COMMUNICATION
AN INTERNAL, INDOT COMMUNICATION
TRAFFIC ENGINEERING DIVISION
CORRIDOR DEVELOPMENT OFFICE
16 FEBRUARY 2017

TECHNICAL ENGINEERING REVIEW

TRAFFIC REVIEW & COST DATA

To: Luis Laracuente, Traffic Engineer
Greenfield District

Thru: Paul Schmidt, Manager
Corridor Development Office

From: Daniel McCoy and Jeremy VanVleet
Corridor Development Office

Re: Review of Improvement Options for US 31 at SR 135/Thompson Road

This document is in response to a request from the Greenfield District to review the US 31 at SR 135/Thompson Road intersection improvement project proposal and assess further improvement concepts. The concepts, described in detail below, include roadway and intersection improvements as well as access management strategies. This memo summarizes relevant findings to date.

This report represents efforts of initial sketch-plan review and not exhaustive and comprehensive engineering or environmental analysis. Costs generated from this effort are preliminary, not refined estimates. Cost estimates are in October 2016 dollars.

BACKGROUND

The subject intersection was originally programed for an intersection improvement project with the intent to add auxiliary lanes on multiple approaches. In depth analysis was completed by a consultant after the project was funded. The scope at that time was determined to be inadequate so other options were evaluated. The scoping consultant landed on the option of a two sided north-south Median U-Turn treatment. When the project was taken forward to design, the design consultant had misgivings about the treatment and completed further evaluation at the request of the Greenfield District. At this time, the Corridor Development Office also began review of the consultant work and analysis of the intersection. The options' feasibility regarding traffic operations, right of way impacts and cost are discussed herein. A 0.50% per year growth rate was used to evaluate design year traffic.

IMPROVEMENT OPTIONS

Three options are discussed for addressing the US 31 at SR 135/Thompson Road intersection on the Southside of Indianapolis. Cost estimates are in October 2016 dollars.

See attached drawing(s) as reference.

Traditional Intersection Improvement

The proposal is to widen all intersection approaches to account for additional auxiliary lanes. The north approach, southbound direction of travel, would be expanded to include a double left turn movement and a dedicated right turn lane. On the south approach, northbound direction of travel, a dedicated right turn lane would be added. The modifications to the north approach would require 24' of additional pavement in the cross section plus a taper of the 3 basic travel lanes to accommodate the double left at the intersection. This would almost certainly result in the right of way acquisition of the Taco Bell in the northwest quadrant due to the impact on an entire row of parking in their lot.

The west approach, eastbound direction of travel, would be expanded to include a double left turn movement and a dedicated right turn lane. On the east approach, westbound direction of travel, the cross section would be expanded to include a double right turn movement. These modifications would involve right of way acquisition but likely no relocations.

Traffic operations at the intersection are improved with these modifications but not to an acceptable level of service and not in a cost conscious manner. There are multiple movements near or at capacity with volume to capacity ratios around 1.0. Additionally, excessive queuing exists for the major northbound flow in the AM peak and the major southbound flow in the PM peak. Other movements of note are the eastbound to northbound left turn and the southbound to eastbound left turn. These movements put a strain on the intersection with not enough green time to go around.

The preliminary cost estimate is as follows.

Construction & Utility	PE & Environmental	Right of Way	Total
$3,900,000	$85,000	$450,000	**$4,435,000***

*Cost does not include right of way. Does include $1.7 million to re-align EB exit ramp.

Median U-Turn Treatment

The project proposal from the scoping consultant was to construct a two-sided Median U-Turn treatment. In theory, this treatment would free up green time by removing mainline left turning vehicles from the intersection. The Median U-Turn treatment works well at intersections with high volumes of through traffic and comparatively low volumes of turning traffic. However, since the southbound to eastbound left turn movement is high volume in the PM peak hour, a U-Turn movement is problematic. Green time that is saved by removal of the left turn phase is taken when those diverted vehicles pass through the intersection twice. The result is only minor improvement.

There is also a risk of the high volume southbound to eastbound left turn movement queuing back through the main intersection. For this particular site, loon placement is also a difficult balance with

driveway access. Additionally, there is not a good location for the north U-Turn loon due to the volume of traffic exiting I-465 coupled with access concerns along the west side of the north approach. The consultant proposed handling the northbound to westbound left turn through a loon on the east approach with a right turn, then a U-Turn and through movement to head west. This movement does work well since the north to west left turn volume is fairly low. The concept is used as a variation in the Displaced Left Turn option discussed below.

Traffic operations are improved over existing conditions but overall, the intersection still experiences high stress for the Median U-Turn treatment. There are multiple movements near or at capacity with volume to capacity ratios around 1.0. Excessive queuing also occurs with the dominant peak hour movements.

The preliminary cost estimate is as follows (as provided by Janssen and Spaans Engineering in 2015).

Construction & Utility	PE & Environmental	Right of Way	Total
$1,150,000	$85,000	$250,000	**$1,485,000***

*Does not include $1.7 million to re-align EB exit ramp.

Displaced Left Turn Treatment

The proposal is to construct a displaced left turn treatment for the southbound to eastbound left turn movement. The original reasoning behind the concept is that the high volume PM peak hour southbound to eastbound left turn movement would be able to make a much easier movement geometrically. This will lead to better intersection flow overall whereas a U-Turn movement for high traffic volumes would be slow and cumbersome. In order to produce the best efficiency at the main traffic signal, the northbound to westbound left turn would also need to be displaced even though the volume is much lower.

The west approach, eastbound direction of travel, would be expanded to include a double left turn lane and a dedicated right turn movement. This will allow greater efficiency for the high volume left turn movement in the AM peak hour. On the south approach, northbound direction of travel, the proposal is to add a dedicated right turn lane. As is typical with the Displaced Left Turn treatment, the westbound to northbound right turn will bypass the intersection in the northeast quadrant and rejoin north of the intersection.

The displaced left turn concept has right of way benefits as well. The northeast quadrant is currently an empty lot after the hotel was razed a few years ago. The northbound to westbound left turn movement could be executed using a loon on the east approach instead of a standard displaced left turn in the southwest quadrant. Doing the movement in this way would avoid acquisition of the 8 Lucky Buffet. The purchase of strip right of way will be necessary on the east side of the south approach, and both sides of all other approaches.

Another aspect of this option is to re-align the I-465 eastbound exit ramp to US 31 southbound. The ramp currently joins high speed and free flow which introduces safety concerns with weaving to east Thompson Road as well as the quick approach to the traffic signal at SR 135/Thompson Road. The

exit ramp would be brought to a T-intersection and new traffic signal to control the movement for improved safety and mobility.

Traffic operations in the design year are improved to LOS D or better for all movements at US 31 intersections with SR 135/Thompson Road, Elbert Street/Displaced Left and I-465 Eastbound Exit in both the AM and PM peak hours for the Displaced Left Turn treatment. By removing the mainline left turn phase from the main intersection and allowing the southbound left turn movement to occur with the through movement there is increased green time for other movements near capacity. It will be imperative that the US 31 at SR 135/Thompson Road traffic signal be interconnected with the Elbert Street/Displaced Left traffic signal as well as the I-465 eastbound exit ramp traffic signal to correctly synchronize traffic as it travels through the system. Even with this intersection treatment the major US 31 through movements will remain near capacity but will experience reduced queuing and improved mobility.

The preliminary cost estimate is as follows.

Construction & Utility	PE & Environmental	Right of Way	Total
$3,900,000	$85,000	$350,000	**$4,335,000***

*Does include $1.7 million to re-align EB exit ramp.

OTHER DISCUSSION
In the vicinity of the intersection there are many driveways for businesses and residential areas. Although some access changes are proposed, at least partial service will be maintained for all driveways. This intersection treatment will be new for the area so there will be a learning curve for travelers. More public outreach will likely be necessary than with typical intersection improvements. Overhead, lane assignment signing will be paramount on the I-465 exit ramp and US 31.

PROVISIONAL RECOMMENDATION
The recommendation is to proceed with development of the Displaced Left Turn treatment at US 31 and SR 135/Thompson Road and to re-align the end of the I-465 eastbound exit ramp to improve safety and mobility within the intersection influence area.

Please contact the Corridor Development Office should you have questions or need additional information.

Attachments:
Drawing

Technical Memorandum Alternative

SR 135

Elbert St.

I-465

Install Dual Left Turn Lanes for EB SR 135

Re-align Eastbound Exit Ramp

Install Signal for Displaced Left Turn and WB Right Turn

Existing Sign Structure to be Replaced

Install Traffic Signal at Ramp Terminal

Provide Loons for SB Left Turn and for NB Left U-Turn

Install Traffic Signal at Location for the U-Turn

Comfort Inn

Office

Royal Tile

Offices

8 Lucky Buffet

Strip Mall

Taco Bell

Travel Inn

El Jalapeno

Bob Evans

Holiday Inn Express

CVS

Knights of Columbus

Apartments

Vacant Lot

Indy Lodge

Red Lobster

Thompson Rd.

US 31

185'

300'

75'

200'

200'

190'

485'

300'

235'

200'

640'

0 100 500

Conceptual Drawing
Not For Design

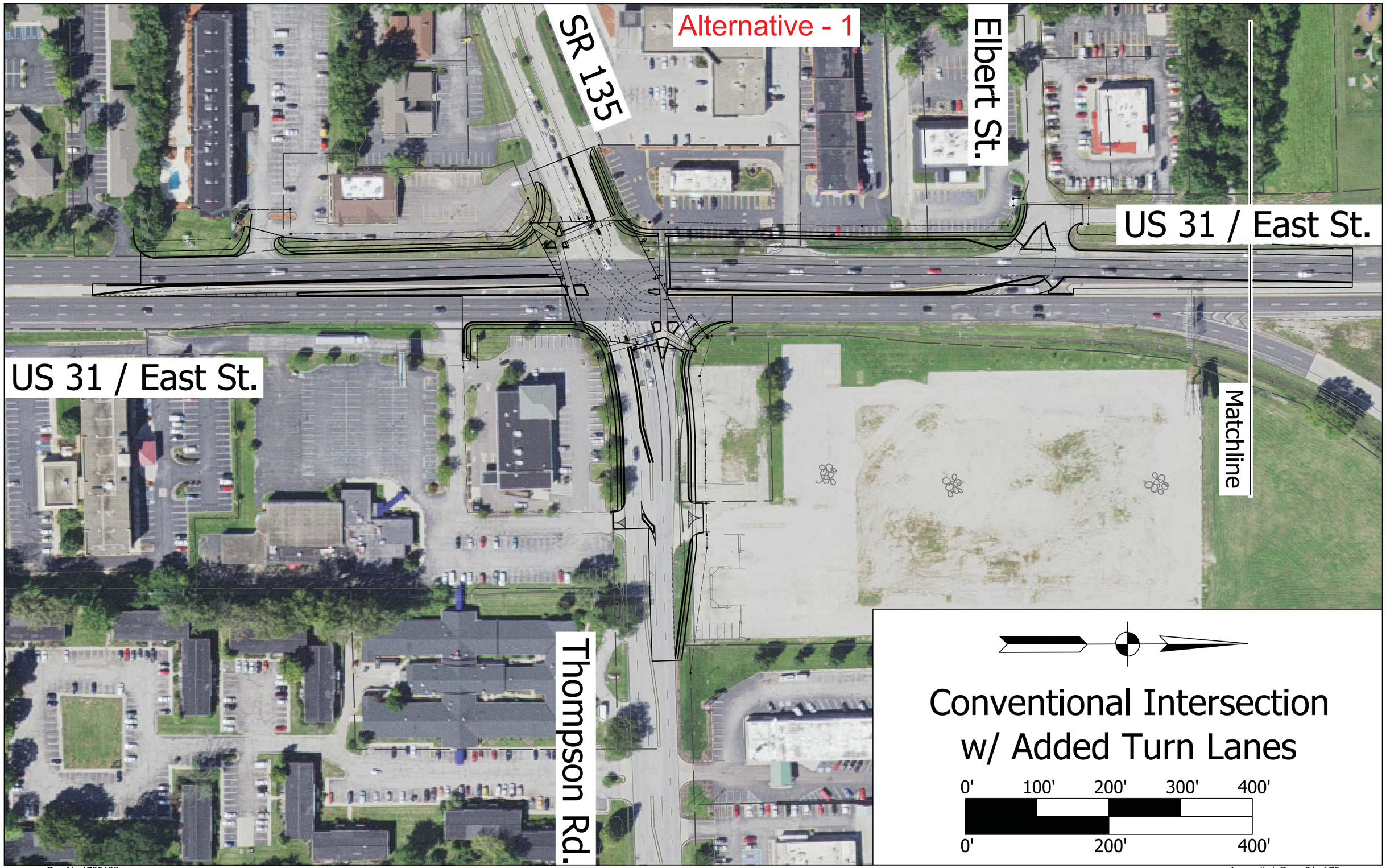
Preliminary Drawing

INDIANA DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING DIVISION
CORRIDOR DEVELOPMENT OFFICE

SITE MAP

US 31 at SR 135 / Thompson Road

SCALE	STRUCTURE NO.		
N/A	N/A		
DES. NO.	PROJECT NO.	DATE	PAGE
N/A	N/A	10-6-2016	N/A


Alternative - 1
SR 135
Elbert St.
US 31 / East St.
US 31 / East St.
Matchline
Thompson Rd.
Conventional Intersection
w/ Added Turn Lanes
0'
100'
200'
300'
400'
0'
200'
400'

Alternative - 1

Bixler Rd.

I-465 EB Exit to US 31 SB

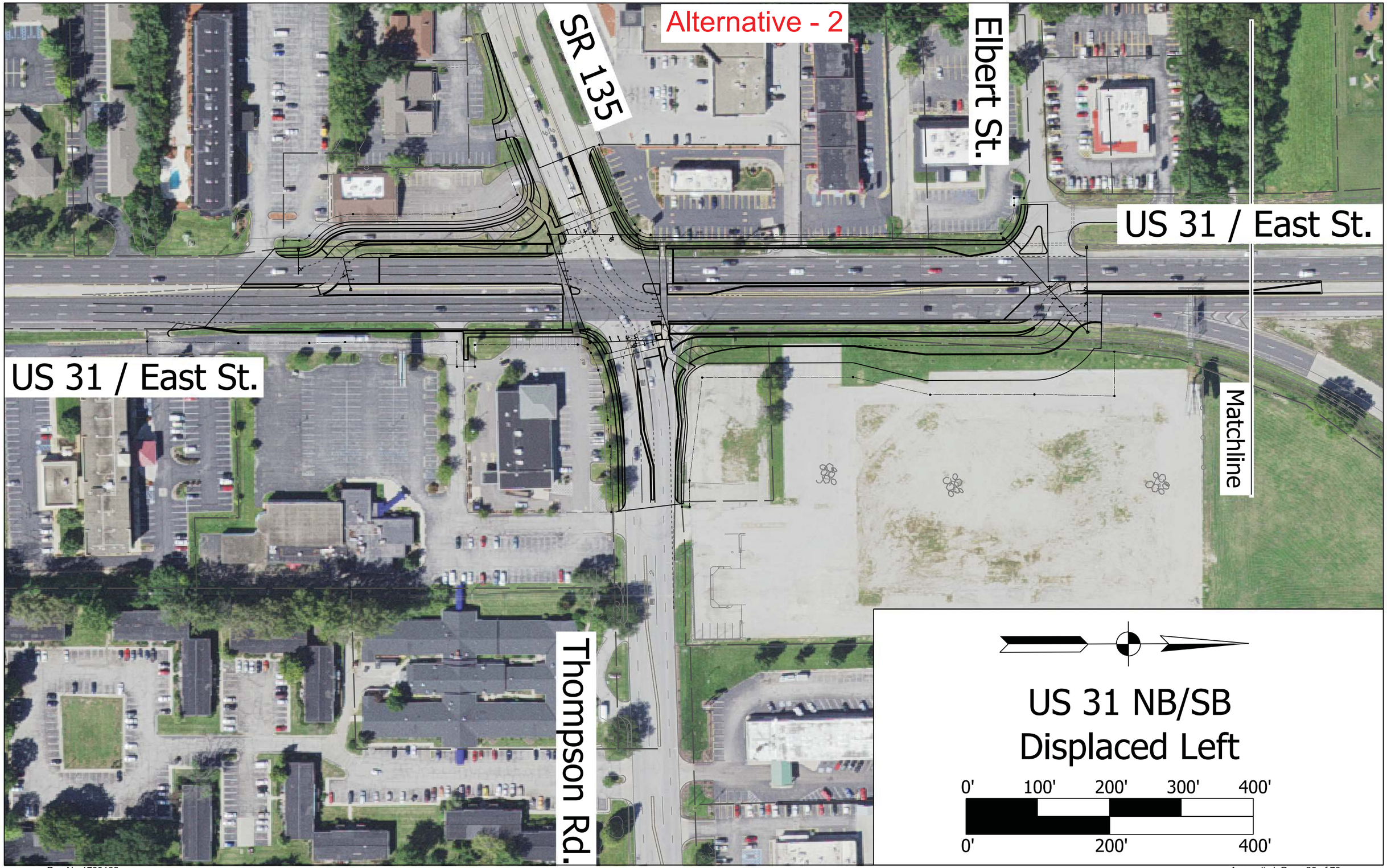
US 31 / East St.

Matchline

I-465 EB to US 31 SB Ramp Reconfiguration

0' 100' 200' 300' 400'

0' 200' 400'


Alternative - 2
SR 135
Elbert St.
US 31 / East St.
US 31 / East St.
Matchline
Thompson Rd.
US 31 NB/SB
Displaced Left
0'
100'
200'
300'
400'
0'
200'
400'

Alternative - 2

Bixler Rd.

I-465 EB Exit to US 31 SB

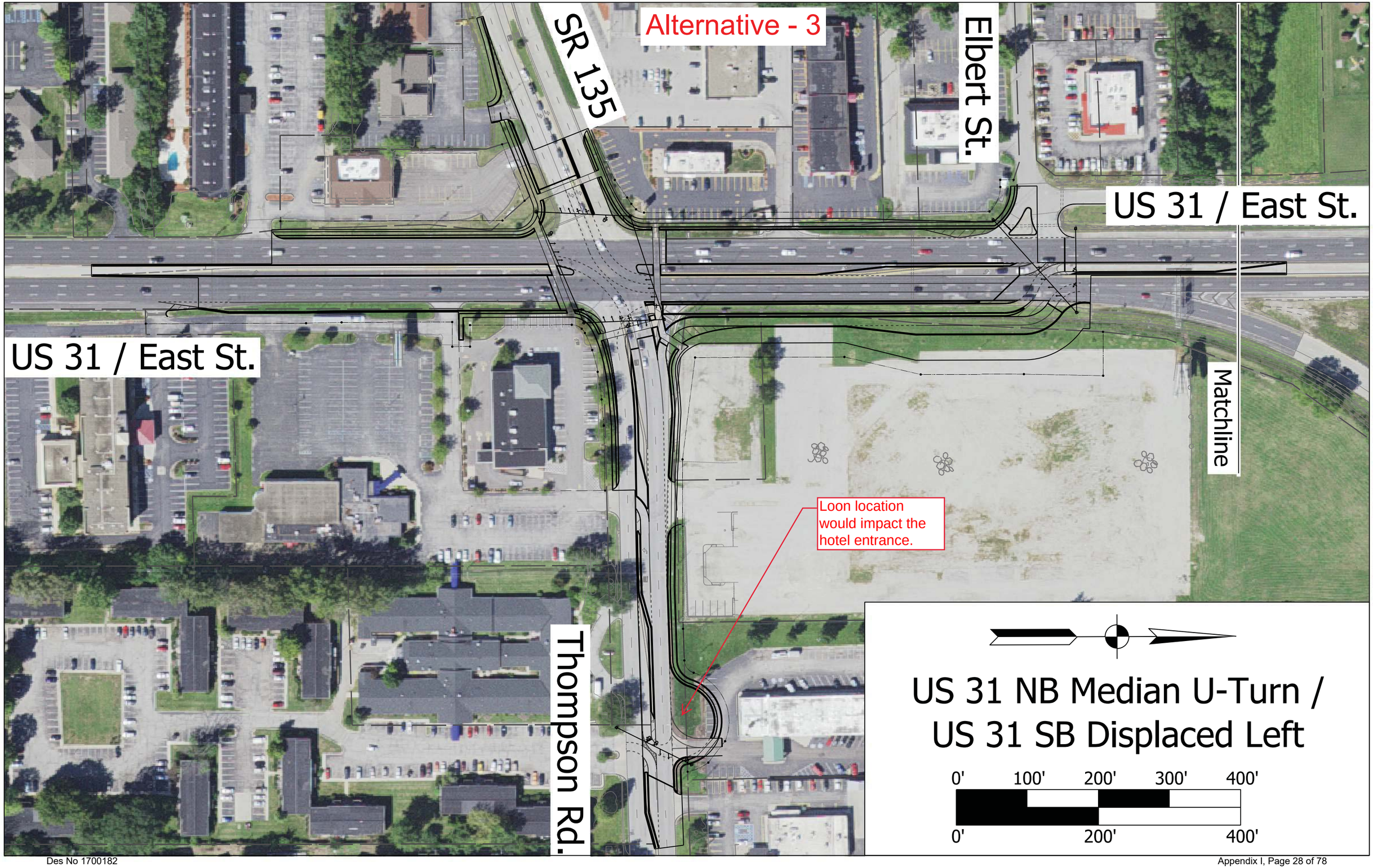
US 31 / East St.

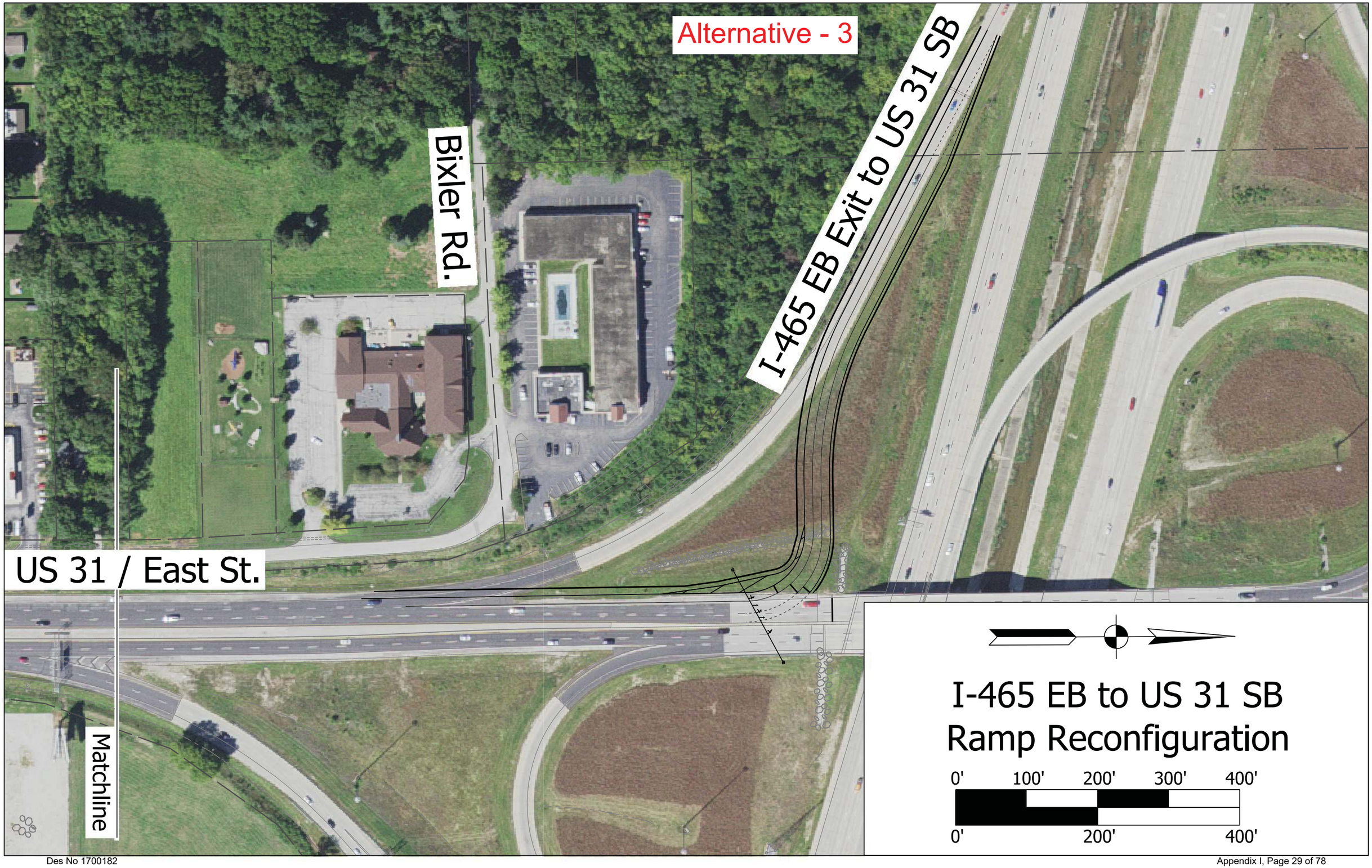
Matchline

I-465 EB to US 31 SB Ramp Reconfiguration

0' 100' 200' 300' 400'

0' 200' 400'


Alternative - 3
SR 135
Elbert St.
US 31 / East St.
US 31 / East St.
Matchline
Loon location would impact the hotel entrance.
Thompson Rd.
US 31 NB Median U-Turn /
US 31 SB Displaced Left
0'
100'
200'
300'
400'
0'
200'
400'


Alternative - 3
Bixler Rd.
I-465 EB Exit to US 31 SB
US 31 / East St.
Matchline
I-465 EB to US 31 SB
Ramp Reconfiguration
0'
100'
200'
300'
400'
0'
200'
400'

2045 Median U-Turn NB, Displaced Left SB

Intersection	Peak Hour		Northbound			Eastbound						Southbound			SWB	Westbound				NWB
			TH	RT	RT2	U-Turn	LT2	LT	TH	RT	RT2	LT	TH	RT	LT2	LT	TH	RT	RT2	RT
US 31 & North Displaced Left & Elbert St.		Lanes	3	-	-	-	-	-	-	-	1	1	3>	0	-	-	-	-	-	2
	AM	Volume	2186	0	-	-	-	0	0	0	5	192	1089	5	-	0	0	0	-	368
		Delay	2.5	-	-	-	-	-	-	-	0	53.7	0.1	-	-	-	-	-	-	52.3
		LOS	A	-	-	-	-	-	-	-	A	D	A	-	-	-	-	-	-	D
		95% Queue (ft)*	281	-	-	-	-	-	-	-	0	211	55	-	-	-	-	-	-	178
		Approach Delay		2.5				-					8.1		-			-		52.3
		Approach LOS		A				-					A		-			-		D
		Intersection Delay	9.1																	
		Intersection LOS	A																	
	PM	Volume	1472	0	-	-	-	0	0	0	5	232	2130	5	-	0	0	0	-	333
		Delay	1.3	-	-	-	-	-	-	-	0	50.6	0.3	-	-	-	-	-	-	37.8
		LOS	A	-	-	-	-	-	-	-	A	D	A	-	-	-	-	-	-	D
		95% Queue (ft)*	92	-	-	-	-	-	-	-	0	217	112	-	-	-	-	-	-	147
		Approach Delay		1.3				-					5.2		-			-		37.8
		Approach LOS		A				-					A		-			-		D
		Intersection Delay	6.4																	
		Intersection LOS	A																	
US 31 & SR 135/Thompson Rd		Lanes	3	-	1	-	2	-	2	1	-	-	3	1	1	1	2	-	1	-
	AM	Volume	1708	0	39	-	478	0	94	8	-	0	976	118	192	47	58	0	368	-
		Delay	22.1	-	11.1	-	47.4	-	50.7	0.1	-	-	15.9	2.6	32.8	25	50	-	0.5	-
		LOS	C	-	B	-	D	-	D	A	-	-	B	A	C	C	D	-	A	-
		95% Queue (ft)*	472	-	34	-	283	-	73	31	-	-	187	13	210	66	70	-	0	-
		Approach Delay		21.9				47.3					14.5		32.8			9		-
		Approach LOS		C				D					B		C			A		-
		Intersection Delay	22.5																	
		Intersection LOS	C																	
	PM	Volume	1233	0	130	-	239	0	134	40	-	0	1879	256	232	83	170	0	333	-
		Delay	14	-	13.7	-	47.8	-	48.4	0.9	-	-	16.7	2.2	25	27.4	46.1	-	0.4	-
		LOS	B	-	B	-	D	-	D	A	-	-	B	A	C	C	D	-	A	-
		95% Queue (ft)*	255	-	90	-	197	-	102	59	-	-	266	19	202	91	112	-	0	-
		Approach Delay		14				43.5					14.9		25			17.5		-
		Approach LOS		B				D					B		C			B		-
		Intersection Delay	18																	
		Intersection LOS	B																	
U-Turn & Thompson Rd		Lanes	-	1	-	0	-	<1	2>	0	-	-	-	1	-	-	2>	0	-	-
	AM	Volume	0	10	-	11	-	5	314	5	-	0	0	10	-	0	462	5	-	-
		Delay	-	0	-	-	-	35.6	0.1	-	-	-	-	0	-	-	0.9	-	-	-
		LOS	-	A	-	-	-	D	A	-	-	-	-	A	-	-	A	-	-	-
		95% Queue (ft)*	-	7	-		45		0		-	-	-	11	-	-	26		-	-
		Approach Delay		4.7				1.7					3.9		-			0.9		-
		Approach LOS		A				A					A		-			A		-
		Intersection Delay	1.2																	
		Intersection LOS	A																	
	PM	Volume	0	10	-	38	-	5	458	5	-	0	0	10	-	0	548	5	-	-
		Delay	-	0	-	-	-	51	0.1	-	-	-	-	0	-	-	1.6	-	-	-
		LOS	-	A	-	-	-	D	A	-	-	-	-	A	-	-	A	-	-	-
		95% Queue (ft)*	-	9	-		76		34		-	-	-	7	-	-	49		-	-
		Approach Delay		0.1				4.4					2.5		-			1.6		-
		Approach LOS		A				A					A		-			A		-
		Intersection Delay	2.9																	
		Intersection LOS	A																	

*Queues as reported by SimTraffic. Storage lengths in intersection configuration are based on Synchro Reported 95% queue lengths

2045 NB/SB Displaced Left

Intersection	Peak Hour		Northbound				NEB	Eastbound				SEB	Southbound				SWB	Westbound			NWB
			LT	TH	RT	RT2	LT2	LT2	LT	TH	RT2	RT	LT	TH	RT	RT2	LT2	LT2	TH	RT2	RT
US 31 & North Displaced Left & Elbert St.		Lanes	-	3	-	-	-	-	-	-	1	-	1	3>	0	-	-	-	-	-	2
	AM	Volume	0	2186	0	-	-	-	0	0	5	-	192	1089	5	-	-	-	0	-	368
		Delay	-	2.5	-	-	-	-	-	-	0	-	54.9	0.1	-	-	-	-	-	-	52.2
		LOS	-	A	-	-	-	-	-	-	A	-	D	A	-	-	-	-	-	-	D
		95% Queue (ft)*	0	459	-	-	-	-	-	-		-	176	64		-	-	-	-	-	270
		Approach Delay		2.5			-		-			-		8.3			-		-		52.2
		Approach LOS		A			-		-			-		A			-		-		D
		Intersection Delay	9.2																		
		Intersection LOS	A																		
	PM	Volume	5	1472	0	-	-	-	0	0	5	-	232	2130	5	-	-	-	0	-	333
		Delay	3.2	5.6	-	-	-	-	-	-	0	-	53.9	0.3	-	-	-	-	-	-	47.3
		LOS	A	A	-	-	-	-	-	-	A	-	D	A	-	-	-	-	-	-	D
		95% Queue (ft)*	40	267	-	-	-	-	-	-	0	-	218	86		-	-	-	-	-	253
		Approach Delay		5.6			-		-			-		5.6			-		-		47.3
		Approach LOS		A			-		-			-		A			-		-		D
		Intersection Delay	8.9																		
		Intersection LOS	A																		
US 31 & SR 135/Thompson Rd		Lanes	-	3	-	1	1	2	-	2	1	-	-	3	-	1	1	1	2	1	-
	AM	Volume	0	1708	0	28	11	478	0	94	8	-	0	976	0	118	192	47	47	368	-
		Delay	-	21.3	-	10.8	28	47.1	-	50.7	0	-	-	16.4	-	14.8	33.2	25.5	50.6	0.4	-
		LOS	-	C	-	B	C	D	-	D	A	-	-	B	-	B	C	C	D	A	-
		95% Queue (ft)*	-	450	-	69	15	277	-	57	0	-	-	181	-	42	183	68	45	0	-
		Approach Delay		21.1			28		47			-		16.3			33.2		8.1		-
		Approach LOS		C			C		D			-		B			C		A		-
		Intersection Delay	22.6																		
		Intersection LOS	C																		
	PM	Volume	0	1233	0	92	38	239	0	134	40	-	0	1879	0	256	232	83	132	333	-
		Delay	-	13.9	-	13.1	0.2	47.2	-	48.4	0	-	-	18	-	30.4	12.9	29.8	48.3	0.3	-
		LOS	-	B	-	B	A	D	-	D	A	-	-	B	-	C	B	C	D	A	-
		95% Queue (ft)*	-	241	-	42	4	181	-	92	0	-	-	269	-	137	133	88	101	0	-
		Approach Delay		13.9			0.2		43.1			-		19.5			12.9		16.3		-
		Approach LOS		B			A		D			-		B			B		B		-
		Intersection Delay	19.1																		
		Intersection LOS	B																		
US 31 & South Displaced Left		Lanes	1	3	-	-	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-
	AM	Volume	11	1736	0	-	-	-	0	0	-	8	0	1023	0	-	-	-	0	-	-
		Delay	56.8	0.2	-	-	-	-	-	-	-	0.2	-	0.1	-	-	-	-	-	-	-
		LOS	E	A	-	-	-	-	-	-	-	A	-	A	-	-	-	-	-	-	-
		95% Queue (ft)*	35	138	-	-	-	-	-	-	-	24	-	48	-	-	-	-	-	-	-
		Approach Delay		0.6			-		-			0.3		0.1			-		-		-
		Approach LOS		A			-		-			A		A			-		-		-
		Intersection Delay	0.4																		
		Intersection LOS	A																		
	PM	Volume	38	1325	0	-	-	-	0	0	-	40	0	1962	0	-	-	-	0	-	-
		Delay	54.3	0.1	-	-	-	-	-	-	-	26.5	-	0.6	-	-	-	-	-	-	-
		LOS	D	A	-	-	-	-	-	-	-	C	-	A	-	-	-	-	-	-	-
		95% Queue (ft)*	68	45	-	-	-	-	-	-	-	52	-	40	-	-	-	-	-	-	-
		Approach Delay		1.6			-		-			26.5		0.6			-		-		-
		Approach LOS		A			-		-			C		A			-		-		-
		Intersection Delay	1.3																		
		Intersection LOS	A																		

*Queues as reported by SimTraffic. Storage lengths in intersection configuration are based on Synchro Reported 95% queue lengths

2045 Conventional with Added Turn Lanes

Intersection	Peak Hour		Level of Service per Movement by Approach											
			Northbound			Eastbound			Southbound			Westbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
US31 / S. East St & Thompson Rd		Lanes	1	3>	0	2	2>	0	2	3	1	1	2	2
	AM	Volume	11	1708	28	478	94	8	192	976	118	47	47	368
		Delay	51.5	27.8	-	50.5	30.8	-	50.3	11.8	2.6	31.9	47.6	44.9
		LOS	D	C	-	D	C	-	D	B	A	C	D	D
		95% Queue (ft)*	79	582		306	74		156	176	49	61	932	376
		Approach Delay	27.9			47			16.7			43.9		
		Approach LOS	C			D			B			D		
		Intersection Delay	28.9											
		Intersection LOS	C											
	PM	Volume	38	1233	92	239	134	40	232	1879	256	83	132	333
		Delay	50.6	21.3	-	48.7	26.5	-	41.3	18.1	6.1	27.4	38.5	26.5
		LOS	D	C	-	D	C	-	D	B	A	C	D	C
		95% Queue (ft)*	43	246		189	88		216	344	153	83	115	260
		Approach Delay	22.1			39.4			19.1			29.6		
		Approach LOS	C			D			B			C		
		Intersection Delay	23											
		Intersection LOS	C											

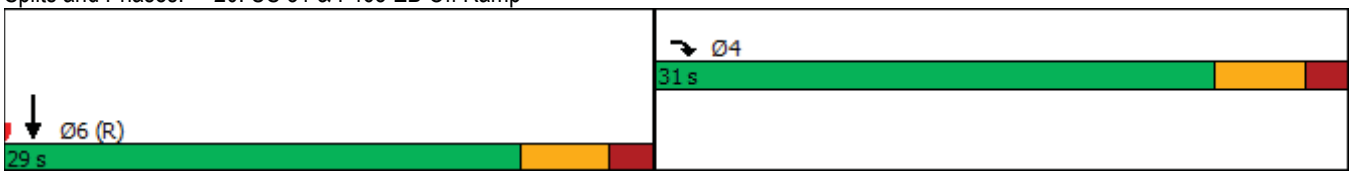
*Queues as reported by SimTraffic. Storage lengths in intersection configuration are based on Synchro Reported 95% queue lengths

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	683	0	430	711	0
Future Volume (vph)	0	683	0	430	711	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3575	0	3539	5085	0
Flt Permitted						
Satd. Flow (perm)	0	3575	0	3539	5085	0
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	45	
Link Distance (ft)	569			653	341	
Travel Time (s)	8.6			9.9	5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	742	0	467	773	0
Turn Type		Prot		NA	NA	
Protected Phases		4		Free	6	
Permitted Phases						
Detector Phase		4			6	
Switch Phase						
Minimum Initial (s)		4.0			10.0	
Minimum Split (s)		13.0			22.0	
Total Split (s)		31.0			29.0	
Total Split (%)		51.7%			48.3%	
Yellow Time (s)		4.0			4.0	
All-Red Time (s)		2.0			2.0	
Lost Time Adjust (s)		0.0			0.0	
Total Lost Time (s)		6.0			6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		None			C-Max	
Act Effct Green (s)		18.0		60.0	30.0	
Actuated g/C Ratio		0.30		1.00	0.50	
v/c Ratio		0.69		0.13	0.30	
Control Delay		21.8		0.1	9.9	
Queue Delay		0.0		0.0	0.0	
Total Delay		21.8		0.1	9.9	
LOS		C		A	A	
Approach Delay	21.8			0.1	9.9	
Approach LOS	C			A	A	
Queue Length 50th (ft)		103		0	55	
Queue Length 95th (ft)		128		0	92	
Internal Link Dist (ft)	489			573	261	
Turn Bay Length (ft)						
Base Capacity (vph)		1489		3539	2540	
Starvation Cap Reductn		0		0	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Reduced v/c Ratio		0.50		0.13	0.30	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 39.7%		ICU Level of Service A	
Analysis Period (min) 15			

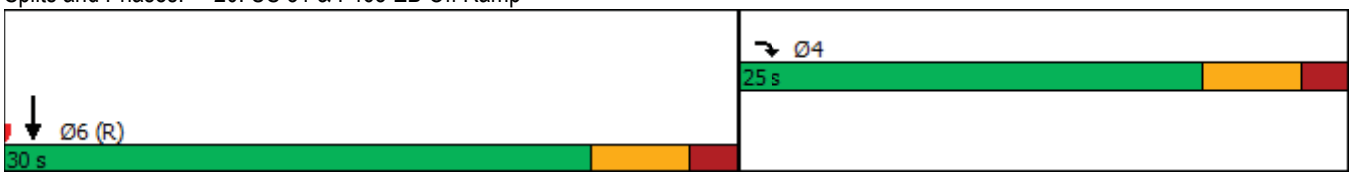
Splits and Phases: 20: US 31 & I-465 EB Off Ramp



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	899	0	494	1732	0
Future Volume (vph)	0	899	0	494	1732	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3610	0	3539	5085	0
Flt Permitted						
Satd. Flow (perm)	0	3610	0	3539	5085	0
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	45	
Link Distance (ft)	585			685	341	
Travel Time (s)	8.9			10.4	5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	977	0	537	1883	0
Turn Type		Prot		NA	NA	
Protected Phases		4		Free	6	
Permitted Phases						
Detector Phase		4			6	
Switch Phase						
Minimum Initial (s)		7.0			10.0	
Minimum Split (s)		13.0			22.0	
Total Split (s)		25.0			30.0	
Total Split (%)		45.5%			54.5%	
Yellow Time (s)		4.0			4.0	
All-Red Time (s)		2.0			2.0	
Lost Time Adjust (s)		0.0			0.0	
Total Lost Time (s)		6.0			6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		None			C-Max	
Act Effct Green (s)		18.2		55.0	24.8	
Actuated g/C Ratio		0.33		1.00	0.45	
v/c Ratio		0.82		0.15	0.82	
Control Delay		23.7		0.1	17.6	
Queue Delay		0.0		0.0	0.0	
Total Delay		23.7		0.1	17.6	
LOS		C		A	B	
Approach Delay	23.7			0.1	17.6	
Approach LOS	C			A	B	
Queue Length 50th (ft)		122		0	190	
Queue Length 95th (ft)		#177		0	249	
Internal Link Dist (ft)	505			605	261	
Turn Bay Length (ft)						
Base Capacity (vph)		1247		3539	2294	
Starvation Cap Reductn		0		0	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.78		0.15	0.82	

Intersection Summary		
Area Type:	Other	
Cycle Length: 55		
Actuated Cycle Length: 55		
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.82		
Intersection Signal Delay: 16.6	Intersection LOS: B	
Intersection Capacity Utilization 64.4%	ICU Level of Service C	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 20: US 31 & I-465 EB Off Ramp

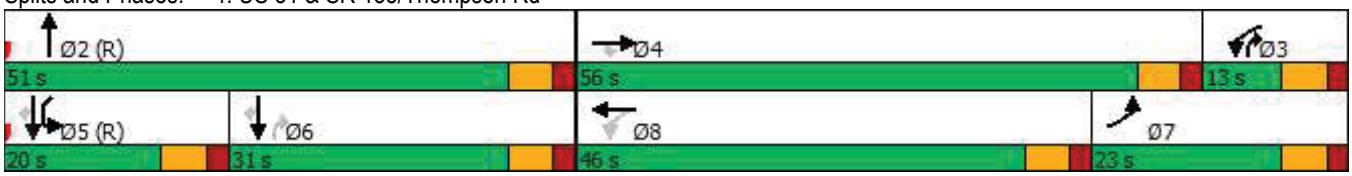


Lane Group	EBL2	EBT	EBR	WBL	WBT	WBR2	NBT	NBR2	SBT	SBR	SWL2	Ø6
Lane Configurations												
Traffic Volume (vph)	478	94	8	47	58	368	1708	39	976	118	192	
Future Volume (vph)	478	94	8	47	58	368	1708	39	976	118	192	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)			150	100						300		
Storage Lanes			1	1						1		
Taper Length (ft)				100								
Satd. Flow (prot)	3433	3539	1455	1736	3406	1553	4803	1615	5036	1524	1719	
Flt Permitted	0.950			0.688							0.950	
Satd. Flow (perm)	3433	3539	1455	1257	3406	1553	4803	1615	5036	1524	1719	
Right Turn on Red			Yes			No		No		Yes		
Satd. Flow (RTOR)			136							136		
Link Speed (mph)		40			40		45		45			
Link Distance (ft)		863			529		612		592			
Travel Time (s)		14.7			9.0		9.3		9.0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	2%	2%	11%	4%	6%	4%	8%	0%	3%	6%	5%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	520	102	9	51	63	400	1857	42	1061	128	209	
Turn Type	Prot	NA	Perm	pm+pt	NA	Free	NA	custom	NA	Perm	Prot	
Protected Phases	7	4		3	8		2	3	5 6		5	6
Permitted Phases			4	8		Free		6		5 6		
Detector Phase	7	4	4	3	8		2	3	5 6	5 6	5	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		12.0	7.0			7.0	12.0
Minimum Split (s)	13.0	47.0	47.0	13.0	46.0		18.0	13.0			13.0	31.0
Total Split (s)	23.0	56.0	56.0	13.0	46.0		51.0	13.0			20.0	31.0
Total Split (%)	19.2%	46.7%	46.7%	10.8%	38.3%		42.5%	10.8%			16.7%	26%
Maximum Green (s)	17.0	50.0	50.0	7.0	40.0		45.0	7.0			14.0	25.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0			6.0	
Lead/Lag	Lag	Lead	Lead	Lag	Lead			Lag			Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode	None	None	None	None	None		C-Max	None			C-Max	Max
Walk Time (s)		5.0	5.0		6.0							4.0
Flash Dont Walk (s)		36.0	36.0		34.0							21.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)	27.0	15.2	15.2	32.5	12.0	120.0	66.6	47.9	66.6	66.6	35.6	
Actuated g/C Ratio	0.22	0.13	0.13	0.27	0.10	1.00	0.56	0.40	0.56	0.56	0.30	
v/c Ratio	0.67	0.23	0.03	0.12	0.19	0.26	0.70	0.07	0.38	0.14	0.41	
Control Delay	47.4	50.7	0.1	25.3	50.3	0.5	22.1	11.1	15.9	2.6	32.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	47.4	50.7	0.1	25.3	50.3	0.5	22.1	11.1	15.9	2.6	32.8	
LOS	D	D	A	C	D	A	C	B	B	A	C	
Approach Delay		47.3			9.1		21.9		14.5			
Approach LOS		D			A		C		B			

Lane Group	EBL2	EBT	EBR	WBL	WBT	WBR2	NBT	NBR2	SBT	SBR	SWL2	Ø6
Queue Length 50th (ft)	192	38	0	26	24	0	387	12	171	1	174	
Queue Length 95th (ft)	248	68	0	53	47	0	460	25	212	36	254	
Internal Link Dist (ft)		783			449		532		512			
Turn Bay Length (ft)	300		150	100				300		300		
Base Capacity (vph)	773	1474	685	431	1135	1553	2664	643	2793	905	509	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.67	0.07	0.01	0.12	0.06	0.26	0.70	0.07	0.38	0.14	0.41	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 5:SBSW, Start of Green, Master Intersection			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 22.5		Intersection LOS: C	
Intersection Capacity Utilization 77.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: US 31 & SR 135/Thompson Rd

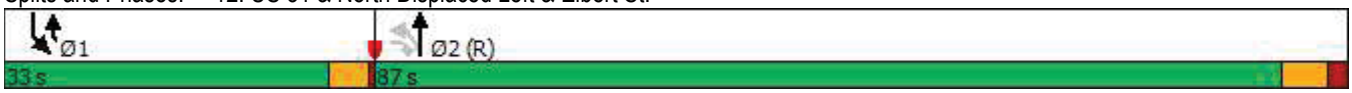


Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations											
Traffic Volume (vph)	0	0	5	0	2186	0	192	1089	5	0	368
Future Volume (vph)	0	0	5	0	2186	0	192	1089	5	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		50		0	200		0	0	0
Storage Lanes	0	1		1		0	1		0	0	2
Taper Length (ft)	100			100			100			100	
Satd. Flow (prot)	0	0	1611	1863	5085	0	1719	5080	0	0	2682
Flt Permitted							0.950				
Satd. Flow (perm)	0	0	1611	1863	5085	0	1719	5080	0	0	2682
Right Turn on Red			Yes			Yes			Yes		Yes
Satd. Flow (RTOR)			233								27
Link Speed (mph)	30				45			45		45	
Link Distance (ft)	539				592			491		300	
Travel Time (s)	12.3				9.0			7.4		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	2%	2%	2%	6%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	5	0	2376	0	209	1189	0	0	400
Turn Type			Perm	Perm	NA		Prot	NA			Over
Protected Phases					2		1	Free			1
Permitted Phases			2	2							
Detector Phase			2	2	2		1				1
Switch Phase											
Minimum Initial (s)			12.0	12.0	12.0		4.0				4.0
Minimum Split (s)			18.0	18.0	18.0		8.0				8.0
Total Split (s)			87.0	87.0	87.0		33.0				33.0
Total Split (%)			72.5%	72.5%	72.5%		27.5%				27.5%
Maximum Green (s)			81.0	81.0	81.0		29.0				29.0
Yellow Time (s)			4.0	4.0	4.0		3.5				3.5
All-Red Time (s)			2.0	2.0	2.0		0.5				0.5
Lost Time Adjust (s)			0.0	0.0	0.0		0.0				0.0
Total Lost Time (s)			6.0	6.0	6.0		4.0				4.0
Lead/Lag			Lag	Lag	Lag		Lead				Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes				Yes
Vehicle Extension (s)			3.0	3.0	3.0		3.0				3.0
Recall Mode			C-Max	C-Max	C-Max		None				None
Act Effct Green (s)			87.8		87.8		22.2	120.0			22.2
Actuated g/C Ratio			0.73		0.73		0.18	1.00			0.18
v/c Ratio			0.00		0.64		0.66	0.23			0.77
Control Delay			0.0		2.4		53.7	0.1			52.5
Queue Delay			0.0		0.0		0.0	0.0			0.0
Total Delay			0.0		2.5		53.7	0.1			52.5
LOS			A		A		D	A			D
Approach Delay					2.5			8.1		52.5	
Approach LOS					A			A		D	
Queue Length 50th (ft)			0		58		152	0			159
Queue Length 95th (ft)			0		141		202	0			206
Internal Link Dist (ft)	459				512			411		220	

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Turn Bay Length (ft)							200				
Base Capacity (vph)			1241		3721		415	5080			668
Starvation Cap Reductn			0		110		0	0			0
Spillback Cap Reductn			0		0		0	0			0
Storage Cap Reductn			0		0		0	0			0
Reduced v/c Ratio			0.00		0.66		0.50	0.23			0.60

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 93 (78%), Referenced to phase 2:NBTL, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 63.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 12: US 31 & North Displaced Left & Elbert St.



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	11	0	314	0	0	462	0	0	0	0	0	0
Future Volume (vph)	11	0	314	0	0	462	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		100		0	300		0	0		0	0	
Storage Lanes		1		0	0		0	0		0	0	
Taper Length (ft)		100			100			100			100	
Satd. Flow (prot)	1770	0	3539	0	0	3539	0	0	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	1770	0	3539	0	0	3539	0	0	0	0	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)												
Link Speed (mph)			30			45			45			45
Link Distance (ft)			529			632			471			444
Travel Time (s)			12.0			9.6			7.1			6.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	0	341	0	0	502	0	0	0	0	0	0
Turn Type	Prot		NA			NA						
Protected Phases	7		Free			8						
Permitted Phases												
Detector Phase	7					8						
Switch Phase												
Minimum Initial (s)	4.0					4.0						
Minimum Split (s)	8.0					20.0						
Total Split (s)	23.0					97.0						
Total Split (%)	19.2%					80.8%						
Maximum Green (s)	19.0					93.0						
Yellow Time (s)	3.5					3.5						
All-Red Time (s)	0.5					0.5						
Lost Time Adjust (s)	0.0					0.0						
Total Lost Time (s)	4.0					4.0						
Lead/Lag	Lead					Lag						
Lead-Lag Optimize?	Yes					Yes						
Vehicle Extension (s)	3.0					3.0						
Recall Mode	None					C-Max						
Walk Time (s)						5.0						
Flash Dont Walk (s)						11.0						
Pedestrian Calls (#/hr)						0						
Act Effct Green (s)	6.4		120.0			113.9						
Actuated g/C Ratio	0.05		1.00			0.95						
v/c Ratio	0.13		0.10			0.15						
Control Delay	34.8		0.1			0.7						
Queue Delay	0.0		0.0			0.0						
Total Delay	34.8		0.1			0.7						
LOS	C		A			A						
Approach Delay			1.3			0.7						
Approach LOS			A			A						
Queue Length 50th (ft)	8		0			0						

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 95th (ft)	m18		0			27						
Internal Link Dist (ft)			449			552			391			364
Turn Bay Length (ft)	100											
Base Capacity (vph)	280		3539			3358						
Starvation Cap Reductn	0		0			0						
Spillback Cap Reductn	0		0			0						
Storage Cap Reductn	0		0			0						
Reduced v/c Ratio	0.04		0.10			0.15						

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 32 (27%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.15			
Intersection Signal Delay: 0.9		Intersection LOS: A	
Intersection Capacity Utilization 16.1%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: U-Turn & Thompson Rd

Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	<	<	T	T	R	L	T	T	T	T	T	>
Maximum Queue (ft)	271	310	90	84	49	90	92	58	487	476	430	44
Average Queue (ft)	150	202	29	31	7	26	28	5	326	299	216	10
95th Queue (ft)	262	283	68	73	31	66	70	28	472	454	389	34
Link Distance (ft)			794	794			426	426	513	513	513	
Upstream Blk Time (%)									0	0	0	
Queuing Penalty (veh)									0	0	0	
Storage Bay Dist (ft)	300	300			150	100						300
Storage Blk Time (%)	0	0				0	0				1	
Queuing Penalty (veh)	0	0				0	0				0	

Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	SB	SB	SB	SB	SW	B5
Directions Served	T	T	T	R	<	T
Maximum Queue (ft)	195	180	141	29	204	113
Average Queue (ft)	116	103	66	2	122	10
95th Queue (ft)	187	173	134	13	210	54
Link Distance (ft)	397	397	397		137	165
Upstream Blk Time (%)					8	0
Queuing Penalty (veh)					16	0
Storage Bay Dist (ft)				300		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 12: US 31 & North Displaced Left & Elbert St.

Movement	NB	NB	NB	SB	SB	NW	NW	B5
Directions Served	T	T	T	L	T	R	R	T
Maximum Queue (ft)	345	350	316	253	67	217	189	36
Average Queue (ft)	105	124	41	123	4	105	98	2
95th Queue (ft)	257	281	173	211	55	178	170	17
Link Distance (ft)	397	397	397		429	165	165	137
Upstream Blk Time (%)	0	0	0			1	1	
Queuing Penalty (veh)	0	0	0			3	2	
Storage Bay Dist (ft)				200				
Storage Blk Time (%)	14			2	0			
Queuing Penalty (veh)	0			6	0			

Intersection: 30: U-Turn & Thompson Rd

Movement	EB	WB	WB	NB	SB
Directions Served	UL	T	TR	R	R
Maximum Queue (ft)	52	22	43	14	18
Average Queue (ft)	18	2	5	1	2
95th Queue (ft)	45	13	26	7	11
Link Distance (ft)		603	603	425	385
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

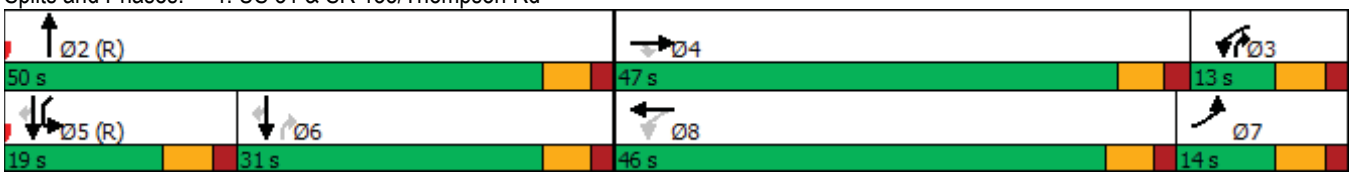
Network wide Queuing Penalty: 28

Lane Group	EBL2	EBT	EBR	WBL	WBT	WBR2	NBT	NBR2	SBT	SBR	SWL2	Ø6
Lane Configurations												
Traffic Volume (vph)	239	134	40	83	170	333	1233	130	1879	256	232	
Future Volume (vph)	239	134	40	83	170	333	1233	130	1879	256	232	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)			150	100						300		
Storage Lanes			1	1						1		
Taper Length (ft)				100								
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	5085	1615	5085	1583	1770	
Flt Permitted	0.950			0.659							0.950	
Satd. Flow (perm)	3433	3539	1583	1228	3539	1583	5085	1615	5085	1583	1770	
Right Turn on Red			Yes			No		No		Yes		
Satd. Flow (RTOR)			149							264		
Link Speed (mph)		40			40		45		45			
Link Distance (ft)		863			533		612		592			
Travel Time (s)		14.7			9.1		9.3		9.0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	0%	2%	2%	2%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	260	146	43	90	185	362	1340	141	2042	278	252	
Turn Type	Prot	NA	Perm	pm+pt	NA	Free	NA	custom	NA	Perm	Prot	
Protected Phases	7	4		3	8		2	3	5 6		5	6
Permitted Phases			4	8		Free		6		5 6		
Detector Phase	7	4	4	3	8		2	3	5 6	5 6	5	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		12.0	7.0			7.0	12.0
Minimum Split (s)	13.0	47.0	47.0	13.0	46.0		18.0	13.0			13.0	31.0
Total Split (s)	14.0	47.0	47.0	13.0	46.0		50.0	13.0			19.0	31.0
Total Split (%)	12.7%	42.7%	42.7%	11.8%	41.8%		45.5%	11.8%			17.3%	28%
Maximum Green (s)	8.0	41.0	41.0	7.0	40.0		44.0	7.0			13.0	25.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0			6.0	
Lead/Lag	Lag	Lead	Lead	Lag	Lead			Lag			Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode	None	None	None	None	None		C-Max	None			C-Max	Max
Walk Time (s)		5.0	5.0		6.0							4.0
Flash Dont Walk (s)		36.0	36.0		34.0							21.0
Pedestrian Calls (#/hr)		0	0		0							0
Act Effct Green (s)	15.8	12.1	12.1	28.7	12.5	110.0	63.7	41.2	63.7	63.7	32.7	
Actuated g/C Ratio	0.14	0.11	0.11	0.26	0.11	1.00	0.58	0.37	0.58	0.58	0.30	
v/c Ratio	0.53	0.37	0.14	0.23	0.46	0.23	0.46	0.23	0.69	0.27	0.48	
Control Delay	47.8	48.4	0.9	27.5	46.3	0.4	14.0	13.7	16.5	2.2	25.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	
Total Delay	47.8	48.4	0.9	27.5	46.3	0.4	14.0	13.7	16.7	2.2	25.0	
LOS	D	D	A	C	D	A	B	B	B	A	C	
Approach Delay		43.5			17.6		14.0		14.9			
Approach LOS		D			B		B		B			

Lane Group	EBL2	EBT	EBR	WBL	WBT	WBR2	NBT	NBR2	SBT	SBR	SWL2	Ø6
Queue Length 50th (ft)	89	51	0	40	57	0	182	42	343	4	193	
Queue Length 95th (ft)	129	83	0	69	85	0	238	66	354	60	276	
Internal Link Dist (ft)		783			453		532		512			
Turn Bay Length (ft)	300		150	100				300		300		
Base Capacity (vph)	492	1319	683	400	1286	1583	2944	604	2944	1027	526	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	187	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.53	0.11	0.06	0.23	0.14	0.23	0.46	0.23	0.74	0.27	0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBT and 5:SBSW, Start of Green, Master Intersection			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 84.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: US 31 & SR 135/Thompson Rd



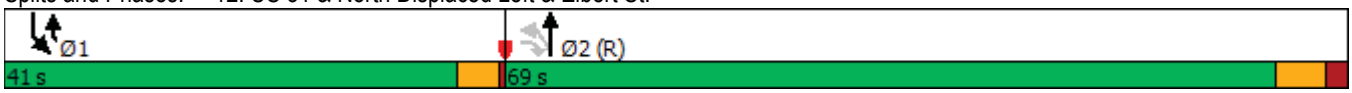
Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations											
Traffic Volume (vph)	0	0	5	5	1472	0	232	2130	5	0	333
Future Volume (vph)	0	0	5	5	1472	0	232	2130	5	0	333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		50		0	200		0	0	0
Storage Lanes	0	1		1		0	1		0	0	2
Taper Length (ft)	100			100			100			100	
Satd. Flow (prot)	0	0	1611	1770	5085	0	1770	5085	0	0	2733
Flt Permitted				0.950			0.950				
Satd. Flow (perm)	0	0	1611	1770	5085	0	1770	5085	0	0	2733
Right Turn on Red			Yes			Yes			Yes		Yes
Satd. Flow (RTOR)			49								43
Link Speed (mph)	30				45			45		45	
Link Distance (ft)	539				592			459		300	
Travel Time (s)	12.3				9.0			7.0		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	5	5	1600	0	252	2320	0	0	362
Turn Type			Perm	Perm	NA		Prot	NA			Over
Protected Phases					2		1	Free			1
Permitted Phases			2	2							
Detector Phase			2	2	2		1				1
Switch Phase											
Minimum Initial (s)			12.0	12.0	12.0		4.0				4.0
Minimum Split (s)			18.0	18.0	18.0		8.0				8.0
Total Split (s)			69.0	69.0	69.0		41.0				41.0
Total Split (%)			62.7%	62.7%	62.7%		37.3%				37.3%
Maximum Green (s)			63.0	63.0	63.0		37.0				37.0
Yellow Time (s)			4.0	4.0	4.0		3.5				3.5
All-Red Time (s)			2.0	2.0	2.0		0.5				0.5
Lost Time Adjust (s)			0.0	0.0	0.0		0.0				0.0
Total Lost Time (s)			6.0	6.0	6.0		4.0				4.0
Lead/Lag			Lag	Lag	Lag		Lead				Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes				Yes
Vehicle Extension (s)			3.0	3.0	3.0		3.0				3.0
Recall Mode			C-Max	C-Max	C-Max		None				None
Act Effct Green (s)			78.8	78.8	78.8		21.2	110.0			21.2
Actuated g/C Ratio			0.72	0.72	0.72		0.19	1.00			0.19
v/c Ratio			0.00	0.00	0.44		0.74	0.46			0.64
Control Delay			0.0	1.0	1.3		50.6	0.3			38.1
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0
Total Delay			0.0	1.0	1.3		50.6	0.3			38.1
LOS			A	A	A		D	A			D
Approach Delay					1.3			5.2		38.1	
Approach LOS					A			A		D	
Queue Length 50th (ft)			0	1	33		169	0			95
Queue Length 95th (ft)			0	m1	78		197	0			120
Internal Link Dist (ft)	459				512			379		220	

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Turn Bay Length (ft)				50			200				
Base Capacity (vph)			1167	1267	3640		595	5085			947
Starvation Cap Reductn			0	0	140		0	0			0
Spillback Cap Reductn			0	0	0		0	0			0
Storage Cap Reductn			0	0	0		0	0			0
Reduced v/c Ratio			0.00	0.00	0.46		0.42	0.46			0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 100 (91%), Referenced to phase 2:NBTL, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 6.4		Intersection LOS: A	
Intersection Capacity Utilization 59.6%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: US 31 & North Displaced Left & Elbert St.



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	38	0	458	0	0	548	0	0	0	0	0	0
Future Volume (vph)	38	0	458	0	0	548	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		100		0	0		0	0		0	0	
Storage Lanes		1		0	0		0	0		0	0	
Taper Length (ft)		100			100			100			100	
Satd. Flow (prot)	1770	0	3539	0	0	3539	0	0	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	1770	0	3539	0	0	3539	0	0	0	0	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)												
Link Speed (mph)			30			45			45			45
Link Distance (ft)			533			730			439			473
Travel Time (s)			12.1			11.1			6.7			7.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	0	498	0	0	596	0	0	0	0	0	0
Turn Type	Prot		NA			NA						
Protected Phases	7		Free			8						
Permitted Phases												
Detector Phase	7					8						
Switch Phase												
Minimum Initial (s)	4.0					4.0						
Minimum Split (s)	8.0					20.0						
Total Split (s)	28.0					82.0						
Total Split (%)	25.5%					74.5%						
Maximum Green (s)	24.0					78.0						
Yellow Time (s)	3.5					3.5						
All-Red Time (s)	0.5					0.5						
Lost Time Adjust (s)	0.0					0.0						
Total Lost Time (s)	4.0					4.0						
Lead/Lag	Lead					Lag						
Lead-Lag Optimize?	Yes					Yes						
Vehicle Extension (s)	3.0					3.0						
Recall Mode	None					C-Max						
Walk Time (s)						5.0						
Flash Dont Walk (s)						11.0						
Pedestrian Calls (#/hr)						0						
Act Effct Green (s)	8.0		110.0			99.6						
Actuated g/C Ratio	0.07		1.00			0.91						
v/c Ratio	0.32		0.14			0.19						
Control Delay	49.9		0.1			1.3						
Queue Delay	0.0		0.0			0.0						
Total Delay	49.9		0.1			1.3						
LOS	D		A			A						
Approach Delay			3.9			1.3						
Approach LOS			A			A						
Queue Length 50th (ft)	28		0			25						

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 95th (ft)	m60		0			43						
Internal Link Dist (ft)			453			650			359			393
Turn Bay Length (ft)	100											
Base Capacity (vph)	386		3539			3205						
Starvation Cap Reductn	0		0			0						
Spillback Cap Reductn	0		0			0						
Storage Cap Reductn	0		0			0						
Reduced v/c Ratio	0.11		0.14			0.19						

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 58 (53%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.32			
Intersection Signal Delay: 2.5		Intersection LOS: A	
Intersection Capacity Utilization 25.1%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: U-Turn & Thompson Rd

Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	<	<	T	T	R	L	T	T	T	T	T	>
Maximum Queue (ft)	189	218	129	85	75	118	129	100	266	273	242	136
Average Queue (ft)	57	125	55	29	25	46	60	32	177	147	72	35
95th Queue (ft)	154	197	102	68	59	91	112	86	255	242	182	90
Link Distance (ft)			794	794			428	428	513	513	513	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300	300			150	100						300
Storage Blk Time (%)						1	3					
Queuing Penalty (veh)						1	2					

Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	SB	SB	SB	SB	SW	B5
Directions Served	T	T	T	R	<	T
Maximum Queue (ft)	290	290	260	31	193	85
Average Queue (ft)	174	167	138	5	118	8
95th Queue (ft)	266	259	233	19	202	49
Link Distance (ft)	397	397	397		136	165
Upstream Blk Time (%)					6	0
Queuing Penalty (veh)					13	0
Storage Bay Dist (ft)				300		
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Intersection: 12: US 31 & North Displaced Left & Elbert St.

Movement	NB	NB	NB	SB	SB	NW	NW
Directions Served	T	T	T	L	T	R	R
Maximum Queue (ft)	107	151	33	259	237	175	168
Average Queue (ft)	16	27	2	138	17	85	79
95th Queue (ft)	68	92	18	217	112	147	143
Link Distance (ft)	397	397	397		398	165	165
Upstream Blk Time (%)						0	0
Queuing Penalty (veh)						1	0
Storage Bay Dist (ft)				200			
Storage Blk Time (%)	1			2	0		
Queuing Penalty (veh)	0			17	0		

Intersection: 30: U-Turn & Thompson Rd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	UL	T	T	TR	R	R
Maximum Queue (ft)	92	17	61	72	19	14
Average Queue (ft)	37	1	8	15	1	1
95th Queue (ft)	76	12	34	49	9	7
Link Distance (ft)		428	702	702	393	412
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	1	0				

Network Summary

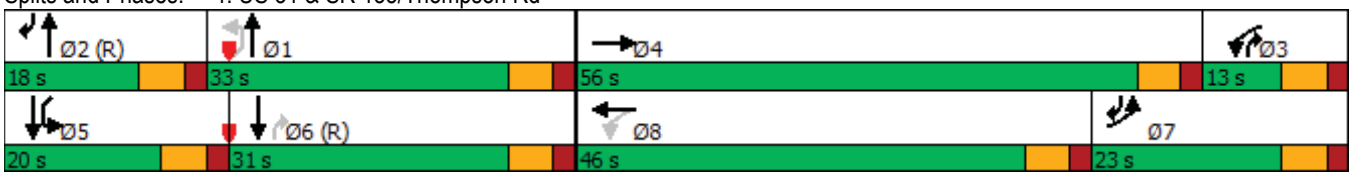
Network wide Queuing Penalty: 35

Lane Group	EBL2	EBT	EBR2	WBL2	WBT	WBR2	NBT	NBR2	SBT	SBR2	NEL2	SWL2
Lane Configurations												
Traffic Volume (vph)	478	94	8	47	47	368	1708	28	976	118	11	192
Future Volume (vph)	478	94	8	47	47	368	1708	28	976	118	11	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)												
Storage Lanes												
Taper Length (ft)												
Satd. Flow (prot)	3433	3539	1455	1736	3406	1553	5085	1583	5036	1524	1671	1719
Flt Permitted	0.950			0.688							0.950	0.950
Satd. Flow (perm)	3433	3539	1455	1257	3406	1553	5085	1583	5036	1524	1671	1719
Right Turn on Red			Yes			No		No		No		
Satd. Flow (RTOR)			245									
Link Speed (mph)		40			40		45		45			
Link Distance (ft)		863			971		612		592			
Travel Time (s)		14.7			16.6		9.3		9.0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	11%	4%	6%	4%	2%	2%	3%	6%	8%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	520	102	9	51	51	400	1857	30	1061	128	12	209
Turn Type	Prot	NA	Free	pm+pt	NA	Free	NA	custom	NA	custom	D.Pm	Prot
Protected Phases	7	4		3	8		1 2	3	5 6	2 7		5
Permitted Phases			Free	8		Free		6			1	
Detector Phase	7	4		3	8		1 2	3	5 6	2 7	1	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0			7.0			12.0	12.0
Minimum Split (s)	13.0	47.0		13.0	46.0			13.0			31.0	18.0
Total Split (s)	23.0	56.0		13.0	46.0			13.0			33.0	20.0
Total Split (%)	19.2%	46.7%		10.8%	38.3%			10.8%			27.5%	16.7%
Maximum Green (s)	17.0	50.0		7.0	40.0			7.0			27.0	14.0
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0			2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Lead/Lag	Lag	Lead		Lag	Lead			Lag			Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Recall Mode	None	None		None	None			None			Max	Max
Walk Time (s)		5.0			6.0						4.0	
Flash Dont Walk (s)		36.0			34.0						21.0	
Pedestrian Calls (#/hr)		0			0						0	
Act Effct Green (s)	27.2	15.2	120.0	32.6	12.0	120.0	66.4	48.0	66.4	66.6	27.0	35.4
Actuated g/C Ratio	0.23	0.13	1.00	0.27	0.10	1.00	0.55	0.40	0.55	0.56	0.22	0.30
v/c Ratio	0.67	0.23	0.01	0.12	0.15	0.26	0.66	0.05	0.38	0.15	0.03	0.41
Control Delay	47.1	50.7	0.0	25.5	50.6	0.4	21.2	10.8	16.4	14.8	28.0	33.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	50.7	0.0	25.5	50.6	0.4	21.3	10.8	16.4	14.8	28.0	33.2
LOS	D	D	A	C	D	A	C	B	B	B	C	C
Approach Delay		47.0			8.1		21.1		16.3			
Approach LOS		D			A		C		B			

Lane Group	EBL2	EBT	EBR2	WBL2	WBT	WBR2	NBT	NBR2	SBT	SBR2	NEL2	SWL2
Queue Length 50th (ft)	192	38	0	25	19	0	374	8	172	50	11	174
Queue Length 95th (ft)	246	68	0	52	40	0	450	19	215	85	33	254
Internal Link Dist (ft)		783			891		532		512			
Turn Bay Length (ft)	300		150	150		100		50		300		
Base Capacity (vph)	778	1474	1455	433	1135	1553	2813	633	2786	846	375	507
Starvation Cap Reductn	0	0	0	0	0	0	208	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.07	0.01	0.12	0.04	0.26	0.71	0.05	0.38	0.15	0.03	0.41

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 22.6		Intersection LOS: C	
Intersection Capacity Utilization 76.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: US 31 & SR 135/Thompson Rd



Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	11	1736	1023	0	0	8
Future Volume (vph)	11	1736	1023	0	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1671	5085	5085	0	0	1481
Flt Permitted	0.950					
Satd. Flow (perm)	1671	5085	5085	0	0	1481
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						180
Link Speed (mph)		45	45		45	
Link Distance (ft)		707	612		347	
Travel Time (s)		10.7	9.3		5.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	2%	2%	2%	2%	11%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	1887	1112	0	0	9
Turn Type	Prot	NA	NA			Over
Protected Phases	5	Free	6			5
Permitted Phases						
Detector Phase	5		6			5
Switch Phase						
Minimum Initial (s)	4.0		4.0			4.0
Minimum Split (s)	8.0		20.0			8.0
Total Split (s)	19.0		101.0			19.0
Total Split (%)	15.8%		84.2%			15.8%
Maximum Green (s)	15.0		97.0			15.0
Yellow Time (s)	3.5		3.5			3.5
All-Red Time (s)	0.5		0.5			0.5
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	4.0		4.0			4.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0		3.0			3.0
Recall Mode	None		C-Max			None
Walk Time (s)			5.0			
Flash Dont Walk (s)			11.0			
Pedestrian Calls (#/hr)			0			
Act Effct Green (s)	6.5	120.0	113.8			6.5
Actuated g/C Ratio	0.05	1.00	0.95			0.05
v/c Ratio	0.13	0.37	0.23			0.04
Control Delay	56.8	0.2	0.1			0.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	56.8	0.2	0.1			0.2
LOS	E	A	A			A
Approach Delay		0.6	0.1		0.3	
Approach LOS		A	A		A	

Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Queue Length 50th (ft)	9	0	0			0
Queue Length 95th (ft)	29	0	1			0
Internal Link Dist (ft)		627	532		267	
Turn Bay Length (ft)	100					
Base Capacity (vph)	208	5085	4822			342
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.06	0.37	0.23			0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2: and 6:SBT, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 0.4		Intersection LOS: A	
Intersection Capacity Utilization 36.9%		ICU Level of Service A	
Analysis Period (min) 15			

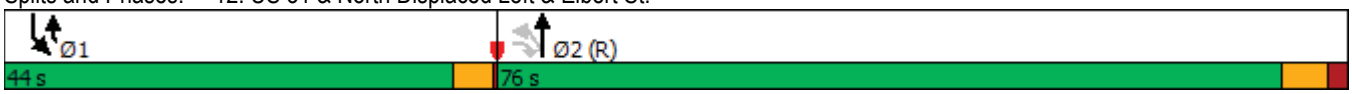
Splits and Phases: 9: US 31 & South Displaced Left

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations											
Traffic Volume (vph)	0	0	5	0	2186	0	192	1089	5	0	368
Future Volume (vph)	0	0	5	0	2186	0	192	1089	5	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100		0	200		0	0	0
Storage Lanes	0	1		1		0	1		0	0	2
Taper Length (ft)	100			100			100			100	
Satd. Flow (prot)	0	0	1611	1863	5085	0	1719	5031	0	0	2733
Flt Permitted							0.950				
Satd. Flow (perm)	0	0	1611	1863	5085	0	1719	5031	0	0	2733
Right Turn on Red			Yes			Yes			Yes		Yes
Satd. Flow (RTOR)			233								27
Link Speed (mph)	30				45			45		45	
Link Distance (ft)	539				592			491		300	
Travel Time (s)	12.3				9.0			7.4		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	3%	2%	2%	4%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	5	0	2376	0	209	1189	0	0	400
Turn Type			Perm	Perm	NA		Prot	NA			Over
Protected Phases					2		1	Free			1
Permitted Phases			2	2							
Detector Phase			2	2	2		1				1
Switch Phase											
Minimum Initial (s)			12.0	12.0	12.0		4.0				4.0
Minimum Split (s)			22.0	22.0	22.0		8.0				8.0
Total Split (s)			76.0	76.0	76.0		44.0				44.0
Total Split (%)			63.3%	63.3%	63.3%		36.7%				36.7%
Maximum Green (s)			70.0	70.0	70.0		40.0				40.0
Yellow Time (s)			4.0	4.0	4.0		3.5				3.5
All-Red Time (s)			2.0	2.0	2.0		0.5				0.5
Lost Time Adjust (s)			0.0	0.0	0.0		0.0				0.0
Total Lost Time (s)			6.0	6.0	6.0		4.0				4.0
Lead/Lag			Lag	Lag	Lag		Lead				Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes				Yes
Vehicle Extension (s)			3.0	3.0	3.0		3.0				3.0
Recall Mode			C-Max	C-Max	C-Max		None				None
Walk Time (s)			5.0	5.0	5.0						
Flash Dont Walk (s)			11.0	11.0	11.0						
Pedestrian Calls (#/hr)			0	0	0						
Act Effct Green (s)			87.8		87.8		22.2	120.0			22.2
Actuated g/C Ratio			0.73		0.73		0.18	1.00			0.18
v/c Ratio			0.00		0.64		0.66	0.24			0.76
Control Delay			0.0		2.5		54.9	0.1			52.2
Queue Delay			0.0		0.0		0.0	0.0			0.0
Total Delay			0.0		2.5		54.9	0.1			52.2
LOS			A		A		D	A			D
Approach Delay					2.5			8.3		52.2	
Approach LOS					A			A		D	

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Queue Length 50th (ft)			0		58		152	0			157
Queue Length 95th (ft)			0		145		219	0			203
Internal Link Dist (ft)	459				512			411		220	
Turn Bay Length (ft)							200				
Base Capacity (vph)			1241		3720		573	5031			929
Starvation Cap Reductn			0		9		0	0			0
Spillback Cap Reductn			0		0		0	0			0
Storage Cap Reductn			0		0		0	0			0
Reduced v/c Ratio			0.00		0.64		0.36	0.24			0.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 84 (70%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 9.2		Intersection LOS: A	
Intersection Capacity Utilization 63.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 12: US 31 & North Displaced Left & Elbert St.



Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	<	<	T	T	<	T	T	T	T	T	>	T
Maximum Queue (ft)	279	321	64	80	90	58	19	416	424	396	150	210
Average Queue (ft)	147	191	18	23	28	18	2	308	285	215	10	107
95th Queue (ft)	247	277	47	57	68	45	10	450	445	385	69	181
Link Distance (ft)			793	793		896	896	404	404	404		397
Upstream Blk Time (%)								2	1	0		
Queuing Penalty (veh)								13	6	1		
Storage Bay Dist (ft)	300	300			150						50	
Storage Blk Time (%)	0	1								16	0	
Queuing Penalty (veh)	0	0								4	0	

Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	SB	SB	SB	NE	SW	B5
Directions Served	T	T	>	<	<	T
Maximum Queue (ft)	197	150	69	27	192	67
Average Queue (ft)	97	62	11	3	96	4
95th Queue (ft)	171	129	42	15	183	28
Link Distance (ft)	397	397		186	138	165
Upstream Blk Time (%)					4	
Queuing Penalty (veh)					8	
Storage Bay Dist (ft)			300			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 9: US 31 & South Displaced Left

Movement	NB	NB	NB	NB	SB	SB	SB	SE
Directions Served	L	T	T	T	T	T	T	R
Maximum Queue (ft)	52	168	146	57	83	82	75	51
Average Queue (ft)	10	32	16	3	6	7	6	4
95th Queue (ft)	35	138	92	37	42	48	41	24
Link Distance (ft)		691	691	691	404	404	404	204
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100							
Storage Blk Time (%)		3						
Queuing Penalty (veh)		0						

Intersection: 12: US 31 & North Displaced Left & Elbert St.

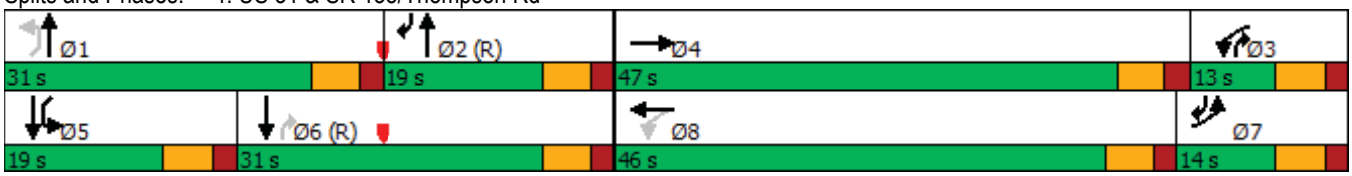
Movement	NB	NB	NB	SB	SB	NW	NW	B5
Directions Served	T	T	T	L	T	R	R	T
Maximum Queue (ft)	419	425	415	209	80	254	165	208
Average Queue (ft)	292	307	174	103	6	189	81	38
95th Queue (ft)	450	459	419	176	64	270	199	138
Link Distance (ft)	397	397	397		429	165	165	138
Upstream Blk Time (%)	1	2	1			22	1	2
Queuing Penalty (veh)	9	14	7			41	2	7
Storage Bay Dist (ft)				200				
Storage Blk Time (%)	30			0	0			
Queuing Penalty (veh)	0			1	0			

Lane Group	EBL2	EBT	EBR2	WBL2	WBT	WBR2	NBT	NBR2	SBT	SBR2	NEL2	SWL2
Lane Configurations												
Traffic Volume (vph)	239	134	40	83	132	333	1233	92	1879	256	38	232
Future Volume (vph)	239	134	40	83	132	333	1233	92	1879	256	38	232
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)												
Storage Lanes												
Taper Length (ft)												
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	5085	1583	5085	1583	1752	1770
Flt Permitted	0.950			0.659							0.950	0.950
Satd. Flow (perm)	3433	3539	1583	1228	3539	1583	5085	1583	5085	1583	1752	1770
Right Turn on Red			Yes			No		No		No		
Satd. Flow (RTOR)			268									
Link Speed (mph)		40			40		45		45			
Link Distance (ft)		863			971		612		592			
Travel Time (s)		14.7			16.6		9.3		9.0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	260	146	43	90	143	362	1340	100	2042	278	41	252
Turn Type	Prot	NA	Free	pm+pt	NA	Free	NA	custom	NA	custom	D.Pm	Prot
Protected Phases	7	4		3	8		1 2	3	5 6	2 7		5
Permitted Phases			Free	8		Free		6			1	
Detector Phase	7	4		3	8		1 2	3	5 6	2 7	1	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0			7.0			12.0	12.0
Minimum Split (s)	13.0	47.0		13.0	46.0			13.0			31.0	18.0
Total Split (s)	14.0	47.0		13.0	46.0			13.0			31.0	19.0
Total Split (%)	12.7%	42.7%		11.8%	41.8%			11.8%			28.2%	17.3%
Maximum Green (s)	8.0	41.0		7.0	40.0			7.0			25.0	13.0
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0			2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Lead/Lag	Lag	Lead		Lag	Lead			Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes				
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Recall Mode	None	None		None	None			None			Max	Max
Walk Time (s)		5.0			6.0						4.0	
Flash Dont Walk (s)		36.0			34.0						21.0	
Pedestrian Calls (#/hr)		0			0						0	
Act Effct Green (s)	16.1	12.1	110.0	28.2	12.1	110.0	63.8	41.1	63.8	29.1	44.8	32.8
Actuated g/C Ratio	0.15	0.11	1.00	0.26	0.11	1.00	0.58	0.37	0.58	0.26	0.41	0.30
v/c Ratio	0.52	0.37	0.03	0.23	0.37	0.23	0.45	0.17	0.69	0.67	0.06	0.48
Control Delay	47.2	48.4	0.0	29.8	48.3	0.3	13.9	13.1	17.9	30.4	0.2	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	47.2	48.4	0.0	29.8	48.3	0.3	13.9	13.1	18.0	30.4	0.2	12.9
LOS	D	D	A	C	D	A	B	B	B	C	A	B
Approach Delay		43.1			16.3		13.9		19.5			
Approach LOS		D			B		B		B			

Lane Group	EBL2	EBT	EBR2	WBL2	WBT	WBR2	NBT	NBR2	SBT	SBR2	NEL2	SWL2
Queue Length 50th (ft)	89	51	0	46	50	0	182	29	343	121	1	188
Queue Length 95th (ft)	126	83	0	82	82	0	238	49	434	173	0	276
Internal Link Dist (ft)		783			891		532		512			
Turn Bay Length (ft)	300		150	150		100		50		300		
Base Capacity (vph)	501	1319	1583	393	1286	1583	2950	590	2950	418	713	528
Starvation Cap Reductn	0	0	0	0	0	0	0	0	188	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.11	0.03	0.23	0.11	0.23	0.45	0.17	0.74	0.67	0.06	0.48

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 83.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: US 31 & SR 135/Thompson Rd



Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	38	1325	1962	0	0	40
Future Volume (vph)	38	1325	1962	0	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	100				100	
Satd. Flow (prot)	1752	5085	5085	0	0	1611
Flt Permitted	0.950					
Satd. Flow (perm)	1752	5085	5085	0	0	1611
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						32
Link Speed (mph)		45	45		45	
Link Distance (ft)		707	612		347	
Travel Time (s)		10.7	9.3		5.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	1440	2133	0	0	43
Turn Type	Prot	NA	NA			Over
Protected Phases	5	Free	6			5
Permitted Phases						
Detector Phase	5		6			5
Switch Phase						
Minimum Initial (s)	4.0		4.0			4.0
Minimum Split (s)	8.0		8.0			8.0
Total Split (s)	16.0		94.0			16.0
Total Split (%)	14.5%		85.5%			14.5%
Maximum Green (s)	12.0		90.0			12.0
Yellow Time (s)	3.5		3.5			3.5
All-Red Time (s)	0.5		0.5			0.5
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	4.0		4.0			4.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0		3.0			3.0
Recall Mode	None		C-Max			None
Act Effct Green (s)	8.0	110.0	96.7			8.0
Actuated g/C Ratio	0.07	1.00	0.88			0.07
v/c Ratio	0.32	0.28	0.48			0.29
Control Delay	54.3	0.1	0.4			26.5
Queue Delay	0.0	0.0	0.2			0.0
Total Delay	54.3	0.1	0.6			26.5
LOS	D	A	A			C
Approach Delay		1.6	0.6		26.5	
Approach LOS		A	A		C	
Queue Length 50th (ft)	28	0	2			7
Queue Length 95th (ft)	62	0	3			42
Internal Link Dist (ft)		627	532		267	

Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Turn Bay Length (ft)	100					
Base Capacity (vph)	191	5085	4468			204
Starvation Cap Reductn	0	0	1243			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.21	0.28	0.66			0.21

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 71 (65%), Referenced to phase 2: and 6:SBT, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 1.3		Intersection LOS: A	
Intersection Capacity Utilization 47.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: US 31 & South Displaced Left

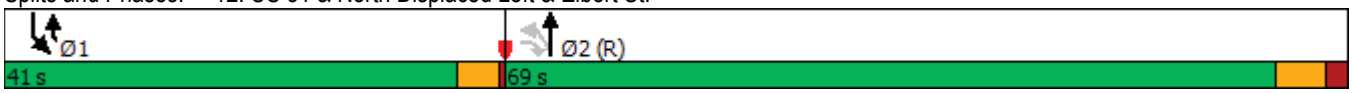
Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations											
Traffic Volume (vph)	0	0	5	5	1472	0	232	2130	5	0	333
Future Volume (vph)	0	0	5	5	1472	0	232	2130	5	0	333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100		0	200		0	0	0
Storage Lanes	0	1		1		0	1		0	0	2
Taper Length (ft)	100			100			100			100	
Satd. Flow (prot)	0	0	1611	1770	5085	0	1770	5085	0	0	2733
Flt Permitted				0.950			0.950				
Satd. Flow (perm)	0	0	1611	1770	5085	0	1770	5085	0	0	2733
Right Turn on Red			Yes			Yes			Yes		No
Satd. Flow (RTOR)			49								
Link Speed (mph)	30				45			45		45	
Link Distance (ft)	539				592			459		300	
Travel Time (s)	12.3				9.0			7.0		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	5	5	1600	0	252	2320	0	0	362
Turn Type			Perm	Perm	NA		Prot	NA			Over
Protected Phases					2		1	Free			1
Permitted Phases			2	2							
Detector Phase			2	2	2		1				1
Switch Phase											
Minimum Initial (s)			12.0	12.0	12.0		4.0				4.0
Minimum Split (s)			18.0	18.0	18.0		8.0				8.0
Total Split (s)			69.0	69.0	69.0		41.0				41.0
Total Split (%)			62.7%	62.7%	62.7%		37.3%				37.3%
Maximum Green (s)			63.0	63.0	63.0		37.0				37.0
Yellow Time (s)			4.0	4.0	4.0		3.5				3.5
All-Red Time (s)			2.0	2.0	2.0		0.5				0.5
Lost Time Adjust (s)			0.0	0.0	0.0		0.0				0.0
Total Lost Time (s)			6.0	6.0	6.0		4.0				4.0
Lead/Lag			Lag	Lag	Lag		Lead				Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes				Yes
Vehicle Extension (s)			3.0	3.0	3.0		3.0				3.0
Recall Mode			C-Max	C-Max	C-Max		None				None
Act Effct Green (s)			78.7	78.7	78.7		21.3	110.0			21.3
Actuated g/C Ratio			0.72	0.72	0.72		0.19	1.00			0.19
v/c Ratio			0.00	0.00	0.44		0.73	0.46			0.68
Control Delay			0.0	3.2	5.5		53.9	0.3			47.3
Queue Delay			0.0	0.0	0.1		0.0	0.0			0.0
Total Delay			0.0	3.2	5.6		53.9	0.3			47.3
LOS			A	A	A		D	A			D
Approach Delay					5.6			5.6		47.3	
Approach LOS					A			A		D	
Queue Length 50th (ft)			0	1	73		169	0			136
Queue Length 95th (ft)			0	m1	355		236	0			175
Internal Link Dist (ft)	459				512			379		220	

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Turn Bay Length (ft)				100			200				
Base Capacity (vph)			1165	1265	3636		595	5085			919
Starvation Cap Reductn			0	0	646		0	0			0
Spillback Cap Reductn			0	0	0		0	12			0
Storage Cap Reductn			0	0	0		0	0			0
Reduced v/c Ratio			0.00	0.00	0.54		0.42	0.46			0.39

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 81 (74%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 59.6%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: US 31 & North Displaced Left & Elbert St.



Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	<	<	T	T	<	T	T	T	T	T	>	T
Maximum Queue (ft)	161	195	114	94	108	118	88	264	253	174	72	304
Average Queue (ft)	56	117	45	24	41	54	13	152	120	55	10	173
95th Queue (ft)	146	181	92	64	88	101	48	241	209	135	42	269
Link Distance (ft)			793	793		896	896	404	404	404		397
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300	300			150						50	
Storage Blk Time (%)						0	0			1	2	
Queuing Penalty (veh)						0	0			1	7	

Intersection: 4: US 31 & SR 135/Thompson Rd

Movement	SB	SB	SB	NE	SW	B5
Directions Served	T	T	>	<	<	T
Maximum Queue (ft)	298	308	181	7	175	24
Average Queue (ft)	170	141	65	0	44	1
95th Queue (ft)	266	248	137	4	133	17
Link Distance (ft)	397	397		186	138	165
Upstream Blk Time (%)		0			1	
Queuing Penalty (veh)		0			2	
Storage Bay Dist (ft)			300			
Storage Blk Time (%)		0				
Queuing Penalty (veh)		0				

Intersection: 9: US 31 & South Displaced Left

Movement	NB	NB	SB	SB	SB	SE
Directions Served	L	T	T	T	T	R
Maximum Queue (ft)	88	93	44	69	58	62
Average Queue (ft)	30	6	5	8	4	16
95th Queue (ft)	68	45	28	40	28	52
Link Distance (ft)		691	404	404	404	204
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	1	0				

Intersection: 12: US 31 & North Displaced Left & Elbert St.

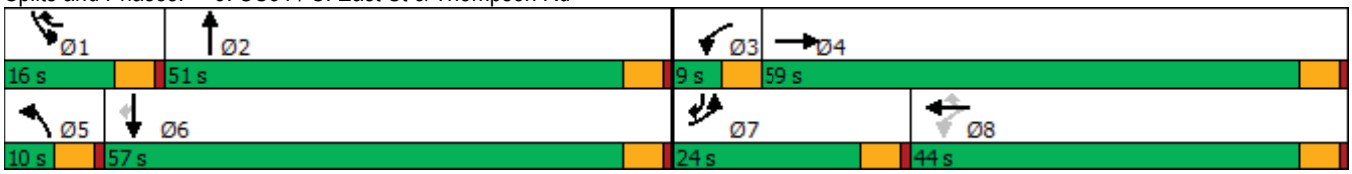
Movement	NB	NB	NB	NB	SB	SB	NW	NW	B5
Directions Served	L	T	T	T	L	T	R	R	T
Maximum Queue (ft)	82	272	297	216	247	180	235	165	124
Average Queue (ft)	3	118	126	31	125	11	160	51	17
95th Queue (ft)	40	233	267	126	218	86	253	151	75
Link Distance (ft)		397	397	397		398	165	165	138
Upstream Blk Time (%)							13	0	0
Queuing Penalty (veh)							21	0	1
Storage Bay Dist (ft)	100				200				
Storage Blk Time (%)		6			2	0			
Queuing Penalty (veh)		0			13	0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	478	94	8	47	47	368	11	1708	28	192	976	118
Future Volume (vph)	478	94	8	47	47	368	11	1708	28	192	976	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	90		210	425		50	265		50
Storage Lanes	2		0	1		2	1		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3433	3472	0	1736	3406	2733	1671	5075	0	3335	5036	1524
Flt Permitted	0.950			0.702			0.950			0.950		
Satd. Flow (perm)	3433	3472	0	1282	3406	2733	1671	5075	0	3335	5036	1524
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)		8						2				
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		967			967			1966			752	
Travel Time (s)		14.7			14.7			29.8			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	11%	4%	6%	4%	8%	2%	2%	5%	3%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	520	111	0	51	51	400	12	1887	0	209	1061	128
Turn Type	Prot	NA		pm+pt	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases				8		8						6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	39.0		9.0	44.0	10.0	10.0	29.0		10.0	30.0	10.0
Total Split (s)	24.0	59.0		9.0	44.0	16.0	10.0	51.0		16.0	57.0	24.0
Total Split (%)	17.8%	43.7%		6.7%	32.6%	11.9%	7.4%	37.8%		11.9%	42.2%	17.8%
Maximum Green (s)	19.0	54.0		5.0	39.0	11.0	5.0	46.0		11.0	52.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		0.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		4.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Walk Time (s)		5.0			5.0			4.0			4.0	
Flash Dont Walk (s)		29.0			34.0			20.0			21.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	19.0	21.6		11.5	6.9	20.6	5.0	46.1		11.0	60.2	85.4
Actuated g/C Ratio	0.19	0.21		0.11	0.07	0.20	0.05	0.46		0.11	0.60	0.85
v/c Ratio	0.80	0.15		0.30	0.22	0.72	0.14	0.81		0.57	0.35	0.10
Control Delay	50.5	30.8		31.9	47.6	44.9	51.5	27.8		50.3	11.8	2.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	50.5	30.8		31.9	47.6	44.9	51.5	27.8		50.3	11.8	2.6
LOS	D	C		C	D	D	D	C		D	B	A
Approach Delay		47.0			43.9			27.9			16.7	
Approach LOS		D			D			C			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	170	28		24	16	136	8	388		68	119	11
Queue Length 95th (ft)	#254	53		52	36	193	27	467		108	193	39
Internal Link Dist (ft)		887			887			1886			672	
Turn Bay Length (ft)	350			90		210	425			265		50
Base Capacity (vph)	648	1867		168	1320	559	83	2322		364	3008	1290
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.80	0.06		0.30	0.04	0.72	0.14	0.81		0.57	0.35	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 100.8			
Natural Cycle: 135			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 28.9		Intersection LOS: C	
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: US31 / S. East St & Thompson Rd



Intersection: 3: US31 / S. East St & Thompson Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	T	T	R	R	L	T	T
Maximum Queue (ft)	309	342	68	84	76	354	774	310	260	136	611	606
Average Queue (ft)	178	218	24	34	27	49	359	261	196	7	385	376
95th Queue (ft)	274	306	54	74	61	199	932	376	361	79	582	581
Link Distance (ft)			862	862		882	882				1868	1868
Upstream Blk Time (%)							11					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)	350	350			90			210	210	425		
Storage Blk Time (%)	0	0			0	2		55	18		10	
Queuing Penalty (veh)	0	0			0	1		13	4		1	

Intersection: 3: US31 / S. East St & Thompson Rd

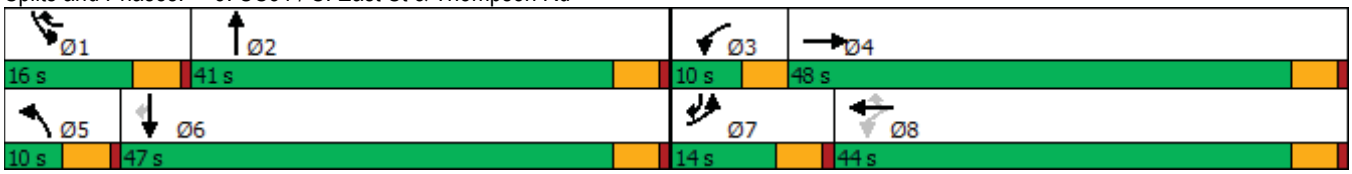
Movement	NB	SB	SB	SB	SB	SB	SB
Directions Served	TR	L	L	T	T	T	R
Maximum Queue (ft)	560	138	177	196	199	136	62
Average Queue (ft)	317	67	101	114	105	64	17
95th Queue (ft)	556	129	156	176	172	132	49
Link Distance (ft)	1868			669	669	669	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		265	265				50
Storage Blk Time (%)						8	1
Queuing Penalty (veh)						10	4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	134	40	83	132	333	38	1233	92	232	1879	256
Future Volume (vph)	239	134	40	83	132	333	38	1233	92	232	1879	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	90		210	425		50	265		50
Storage Lanes	2		0	1		2	1		0	2		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	3433	3419	0	1770	3539	2787	1752	5034	0	3433	5085	1583
Flt Permitted	0.950			0.633			0.950			0.950		
Satd. Flow (perm)	3433	3419	0	1179	3539	2787	1752	5034	0	3433	5085	1583
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)		38						11				
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		967			967			1966			752	
Travel Time (s)		14.7			14.7			29.8			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	260	189	0	90	143	362	41	1440	0	252	2042	278
Turn Type	Prot	NA		pm+pt	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases				8		8						6
Detector Phase	7	4		3	8	1	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	39.0		9.0	44.0	10.0	10.0	29.0		10.0	30.0	10.0
Total Split (s)	14.0	48.0		10.0	44.0	16.0	10.0	41.0		16.0	47.0	14.0
Total Split (%)	12.2%	41.7%		8.7%	38.3%	13.9%	8.7%	35.7%		13.9%	40.9%	12.2%
Maximum Green (s)	9.0	43.0		6.0	39.0	11.0	5.0	36.0		11.0	42.0	9.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		0.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		4.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	None
Walk Time (s)		5.0			5.0			4.0			4.0	
Flash Dont Walk (s)		29.0			34.0			20.0			21.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	9.0	14.8		15.8	8.8	24.2	5.0	36.0		10.5	45.6	59.6
Actuated g/C Ratio	0.11	0.18		0.19	0.10	0.29	0.06	0.43		0.12	0.54	0.71
v/c Ratio	0.71	0.30		0.34	0.39	0.45	0.40	0.67		0.59	0.74	0.25
Control Delay	48.7	26.5		27.4	38.5	26.5	50.6	21.3		41.3	18.1	6.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	48.7	26.5		27.4	38.5	26.5	50.6	21.3		41.3	18.1	6.1
LOS	D	C		C	D	C	D	C		D	B	A
Approach Delay		39.4			29.6			22.1			19.1	
Approach LOS		D			C			C			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	70	37		36	38	88	22	217		65	319	53
Queue Length 95th (ft)	#124	68		72	66	132	55	280		106	405	96
Internal Link Dist (ft)		887			887			1886			672	
Turn Bay Length (ft)	350			90		210	425			265		50
Base Capacity (vph)	366	1764		262	1638	818	103	2157		448	2752	1120
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.71	0.11		0.34	0.09	0.44	0.40	0.67		0.56	0.74	0.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 84.3			
Natural Cycle: 115			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 23.0		Intersection LOS: C	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: US31 / S. East St & Thompson Rd

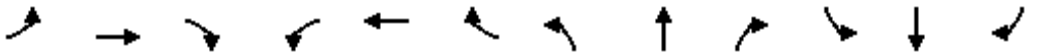


Intersection: 3: US31 / S. East St & Thompson Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	T	T	R	R	L	T	T
Maximum Queue (ft)	169	212	108	116	98	150	131	256	229	59	256	258
Average Queue (ft)	63	121	46	41	42	65	25	139	37	13	179	158
95th Queue (ft)	158	189	88	88	83	115	76	260	165	43	246	241
Link Distance (ft)			862	862		882	882				1868	1868
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350	350			90			210	210	425		
Storage Blk Time (%)					2	5		4	0			
Queuing Penalty (veh)					2	4		2	0			

Intersection: 3: US31 / S. East St & Thompson Rd

Movement	NB	SB	SB	SB	SB	SB	SB
Directions Served	TR	L	L	T	T	T	R
Maximum Queue (ft)	224	158	307	381	360	314	150
Average Queue (ft)	87	69	118	239	212	153	70
95th Queue (ft)	186	137	216	344	313	262	153
Link Distance (ft)	1868			669	669	669	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		265	265				50
Storage Blk Time (%)			0	4		21	7
Queuing Penalty (veh)			0	9		53	46



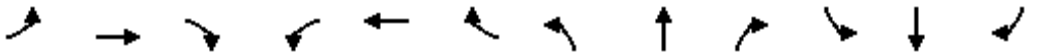
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	478	94	8	47	47	368	11	1708	28	192	976	118
Future Volume (vph)	478	94	8	47	47	368	11	1708	28	192	976	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		0	110		100	425		0	265		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.91	0.91	0.95	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.996				0.850		0.998			0.984	
Flt Protected	0.950	0.966		0.950			0.950			0.950		
Satd. Flow (prot)	1610	3255	0	1736	3406	1553	1671	5075	0	1719	4940	0
Flt Permitted	0.950	0.691		0.950			0.950			0.950		
Satd. Flow (perm)	1610	2328	0	1736	3406	1553	1671	5075	0	1719	4940	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				218		3			26	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		967			967			1966			752	
Travel Time (s)		14.7			14.7			29.8			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	11%	4%	6%	4%	8%	2%	2%	5%	3%	6%
Adj. Flow (vph)	520	102	9	51	51	400	12	1857	30	209	1061	128
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	260	371	0	51	51	400	12	1887	0	209	1189	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			16			17			17	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		32			16			30			36	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8						
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	23.0	23.0	10.0	10.0		10.0	10.0	
Total Split (s)	20.0	33.0		10.0	23.0	23.0	10.0	40.0		17.0	47.0	
Total Split (%)	20.0%	33.0%		10.0%	23.0%	23.0%	10.0%	40.0%		17.0%	47.0%	
Maximum Green (s)	16.0	28.0		6.0	18.0	18.0	5.0	35.0		12.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					11.0	11.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	16.0	37.7		5.9	17.7	17.7	5.1	35.0		12.3	50.3	
Actuated g/C Ratio	0.16	0.38		0.06	0.18	0.18	0.05	0.35		0.12	0.50	
v/c Ratio	1.01	1.02dl		0.50	0.08	0.88	0.14	1.06		0.99	0.48	
Control Delay	102.6	26.4		62.7	34.8	40.2	49.4	72.1		105.7	17.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	102.6	26.4		62.7	34.8	40.2	49.4	72.1		105.7	17.2	
LOS	F	C		E	C	D	D	E		F	B	
Approach Delay		57.8			41.9			72.0			30.4	
Approach LOS		E			D			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 53.4		Intersection LOS: D	
Intersection Capacity Utilization 82.2%		ICU Level of Service E	
Analysis Period (min) 15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: US31 / S. East St & Thompson Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	134	40	83	132	333	38	1233	92	232	1879	256
Future Volume (vph)	239	134	40	83	132	333	38	1233	92	232	1879	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	130		0	110		100	425		0	265		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.91	0.91	0.95	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.979				0.850		0.990			0.982	
Flt Protected	0.950	0.982		0.950			0.950			0.950		
Satd. Flow (prot)	1610	3259	0	1770	3539	1583	1752	5034	0	1770	4994	0
Flt Permitted	0.950	0.716		0.950			0.950			0.950		
Satd. Flow (perm)	1610	2376	0	1770	3539	1583	1752	5034	0	1770	4994	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				269		14			34	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		967			967			1966			752	
Travel Time (s)		14.7			14.7			29.8			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	260	146	43	90	143	362	41	1340	100	252	2042	278
Shared Lane Traffic (%)	43%											
Lane Group Flow (vph)	148	301	0	90	143	362	41	1440	0	252	2320	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			16			17			17	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		32			16			30			36	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						8						
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	23.0	23.0	10.0	10.0		10.0	10.0	
Total Split (s)	13.0	25.0		11.0	23.0	23.0	10.0	33.0		21.0	44.0	
Total Split (%)	14.4%	27.8%		12.2%	25.6%	25.6%	11.1%	36.7%		23.3%	48.9%	
Maximum Green (s)	9.0	20.0		7.0	18.0	18.0	5.0	28.0		16.0	39.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					11.0	11.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	9.0	23.5		6.9	12.9	12.9	6.2	32.9		16.2	47.3	
Actuated g/C Ratio	0.10	0.26		0.08	0.14	0.14	0.07	0.37		0.18	0.53	
v/c Ratio	0.92	0.75		0.67	0.28	0.79	0.34	0.78		0.79	0.88	
Control Delay	95.2	35.3		65.1	34.8	23.4	48.4	29.9		54.7	26.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	95.2	35.3		65.1	34.8	23.4	48.4	29.9		54.7	26.1	
LOS	F	D		E	C	C	D	C		D	C	
Approach Delay		55.0			32.5			30.4			28.9	
Approach LOS		E			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: US31 / S. East St & Thompson Rd