Lead Des 1800082 Appendix G Public Involvement

Note to Reader: this Appendix will be updated to reflect all public involvement documentation after the public involvement process is complete

January 22, 2020 NOTICE OF SURVEY



RE: Project and Survey Notification

US 31 from S Main Street north to Israel Lane

Dear Property Owner:

Our information indicates that you own or occupy property near this proposed road improvement project. CrossRoad Engineers, P.C. will be doing a survey of the project area in the near future. It may be necessary to come onto your property to complete this work. This is allowed by law by Indiana Code IC 8-23-7-26. We will show you identification, if you are available, before coming onto the property. If you have sold this property, or it is occupied by someone else, please let us know the name and address of the new owner or current occupant so we can contact them about the survey.

At this stage we generally do not know exactly what effect, if any, our project may eventually have on your property. As we continue with the development of the project, we will continue to keep property owners and the general public informed on the schedule and project details.

The survey work will include mapping the location of features such as trees, buildings, fences and drives, and obtaining ground elevations. The survey is needed for the proper planning and design of this roadway improvements project. Please be assured of our sincere desire to cause you as little inconvenience as possible during this survey. If you have any questions, please contact me at the phone number or address shown below.

Sincerely yours,

S, W, Cl

George W. Charles II, P. E., L. S.

Vice-President

April 12, 2021 NOTICE OF SURVEY



RE: Project and Survey Notification

US 31 from S Main Street north to Israel Lane

Dear Property Owner:

Our information indicates that you own or occupy property near this proposed road improvement project. CrossRoad Engineers, P.C. will be doing a survey of the project area in the near future. It may be necessary to come onto your property to complete this work. This is allowed by law by Indiana Code IC 8-23-7-26. We will show you identification, if you are available, before coming onto the property. If you have sold this property, or it is occupied by someone else, please let us know the name and address of the new owner or current occupant so we can contact them about the survey.

At this stage we generally do not know exactly what effect, if any, our project may eventually have on your property. As we continue with the development of the project, we will continue to keep property owners and the general public informed on the schedule and project details.

The survey work will include mapping the location of features such as trees, buildings, fences and drives, and obtaining ground elevations. The survey is needed for the proper planning and design of this roadway improvements project. Please be assured of our sincere desire to cause you as little inconvenience as possible during this survey. If you have any questions, please contact me at the phone number or address shown below.

Sincerely yours,

S, W, Cl

George W. Charles II, P. E., L. S.

Vice-President

Redesigning U.S. 31

By Annie Goeller - September 1, 2018

Multiple accidents, including pedestrians struck by vehicles, are prompting a significant change to a major Franklin highway.

The Indiana Department of Transportation and the city are working on a plan that would redesign U.S. 31 through the city, and also add trails and safer pedestrian crossings.

The project is estimated to cost between \$40 million and \$50 million, with the majority of that cost paid by the state.

[sc:text-divider text-divider-title="Story continues below gallery"] Click here to purchase photos from this gallery

Work could begin as soon as 2021 on the project that would eliminate multiple left turns, rerouting traffic to turn around and come back to make a right turn, according to preliminary designs.

The project would make the highway safer for traffic and for pedestrians, which has been a key focus for Franklin Mayor Steve Barnett, he said.

City officials have been pushing for upgrades to the highway to make it safer for pedestrians, who often walk along the shoulders to get to shopping and restaurants from homes in the area.

With that push in mind and a need to rebuild a drainage pipe under the road to help prevent flooding from Canary Ditch, state officials decided to upgrade the road as well, Barnett said.

Preliminary design work recently began, and shows trails on both sides of the highway, along with several left turns eliminated. Instead, traffic would be rerouted to turn around and go back in the other direction to make a right turn into the side street or business.

Other design options are possible, such as added turn lanes, said Hillary Lowther, traffic engineer for the state department of transportation Seymour district.

The overall goal is to make the highway safer for both pedestrians and vehicles, she said.

Currently, U.S. 31 has significant traffic congestion at peak hours, and multiple intersections have high crash rates, Lowther said. By helping traffic move better, that will help reduce accidents, she said.

Westview Drive has had high crash rates for years, which is definitely a concern, Barnett said.

And in his 10 years with city government, multiple pedestrians have also been struck, and some have been killed, which is a major concern, he said. That issue is also important since two Franklin schools are located along the highway, and students walk and bike to school, he said.

"Trails make it much safer for pedestrians, and that is a big concern for me and the city," Barnett said.

The project could begin as soon as 2021, if the state gets a grant it is applying for, and if not, then it would start in 2023, Lowther said.

That would mean that as work was wrapping up on other gateways into the city, including Jefferson and King streets and South Main Street, work would be preparing to start on U.S. 31, Barnett said. In addition to the road work, plans also call for added greenspace and decorative lighting to match other recently redone gateways into the city.

Work would be done in sections, and the highway would not be closed so traffic can continue to get to businesses, Barnett said.

But planning the project will also take a significant amount of time, he said.

"It does take a long time in planning. We have to start planning now for the future. If we don't plan now, then it will never happen," Barnett said.

The project is a partnership between the city and state, Lowther said.

This week, the Franklin Redevelopment Commission approved setting aside \$100,000 for environmental studies and design work. The city will be responsible for about 10 percent of the project costs, and officials are looking at that money coming from the tax-increment financing, or TIF, district set up along U.S. 31 to set aside tax dollars when new businesses are built.

The project is costly, with much of the cost being in buying the land needed since so many businesses have developed along U.S. 31, Lowther said.

Members of the redevelopment commission also want to research the cost of burying utility lines, avoiding above-ground electric lines and a pedestrian bridge to help traffic cross U.S. 31.

[sc:pullout-title pullout-title="At a glance"][sc:pullout-text-begin]

The state is looking at redesigning U.S. 31 through Franklin. Here is a look at what is being considered:

Trails: Walking trails for pedestrians on both sides of the highway

Crosswalks: Safer pedestrian crossings across U.S. 31

Left turns: Designers are looking at ways to limit left turns by instead rerouting traffic in certain areas to turn around, and then turn right into their destination

Improvements: Added greenspace and new street lights to make the highway look similar to other recently redone gateways into the city

	News, straight to your inbox!	×
	Sign up for our FREE Daily Journal Morning Headlines newsletter.	
	email	
	Sign up Now!	
Drainage: A l	arger drainage pipe is planned for Canary Ditch, which runs under	the
nighway, to a	ddress flooding issues on the north side of the city	
sc:pullout-te	ext-end]	
	Annia Caallan	
	Annie Goeller	

INDOT, Franklin to pay for \$48M U.S. 31 project

By Magen Kritsch - January 14, 2020

UPDATED 5 P.M. JAN. 14: U.S. 31 in Franklin is getting a facelift, and the state is footing the bulk of the bill.

The Franklin City Council last week unanimously approved an interlocal agreement between the city and the Indiana Department of Transportation that specifies who will pay for what of a \$48.4 million project that will revamp U.S. 31 in Franklin from South Main Street to Israel Lane.

INDOT pledged \$45.2 million, which will pay for the majority of the project. That money will go toward construction, right-of-way services and acquisition, utility relocation and construction inspections, according to the agreement.

Franklin will pull \$3.2 million from its U.S. 31 tax increment financing — or TIF — district to pay for the engineering costs associated with the project, the agreement said.

TIFs redirect tax dollars in economic development areas to infrastructure improvements in those areas instead of to other public entities that would traditionally split those tax dollars, including police, fire, schools and libraries.

The project includes adding trails on both sides of the highway in an effort to make the city more walker friendly, making drainage improvements and adding J-Turns, which city and state officials hope will make the city's intersections safer, Franklin mayor Steve Barnett said.

J-Turns essentially eliminate left turns at intersections by prompting motorists to turn right, drive a bit, then enter a left-turn lane that would allow them to make a U-Turn. The revamped intersection would eliminate the need for motorists to cross multiple lanes of traffic to make left turns.

Those intersection improvements will hopefully prevent accidents, Barnett said.

"It will be much safer and the traffic flow will move much faster," he said.

U.S. 31 is one of the main north-south corridors through Franklin, and INDOT has identified the portion of U.S. 31 between Columbus and Indianapolis as one of the most dangerous, Barnett said.

"That is their driver behind this, to fix the traffic flow," he said.

City officials agreed to pay the \$3.2 million in engineering fees to allow them a chance to make decisions about what the improvements would look like, such as adding pedestrian trails, Barnett said.

"We have a seat at the table. If we didn't have a seat at the table, we wouldn't have gotten the trails," he said.

The trails on both sides of the highway will likely improve economic development in the area by making the city more pedestrian friendly, Barnett said. INDOT's investment should also help boost the city's economy, he said.

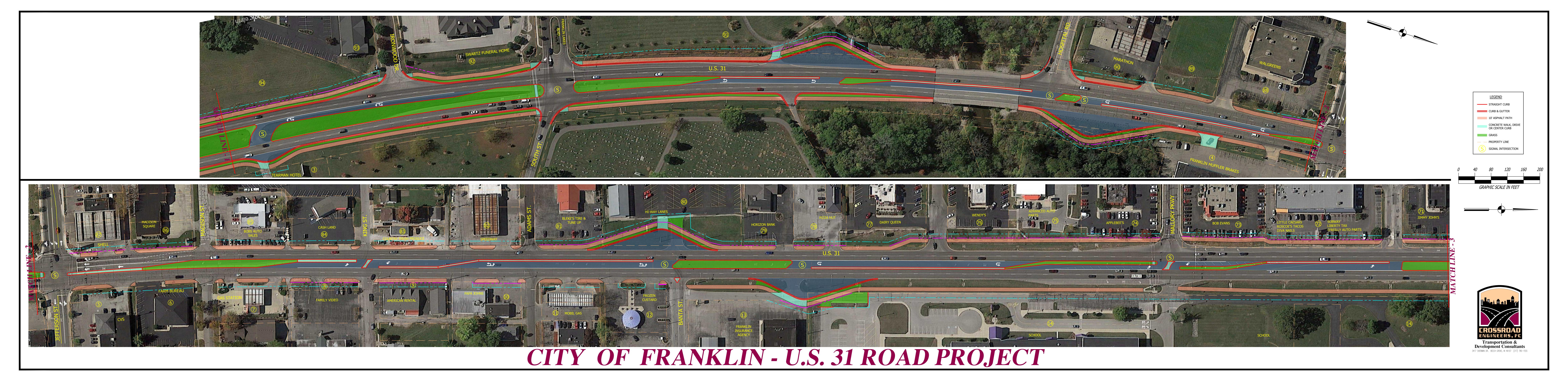
"I think it is an asset to the community to get the state to invest \$45 million into our city," Barnett said.

Construction is expected to start in the fall of 2022. U.S. 31 will be open as a two-lane highway for the duration of the extensive project, he said.

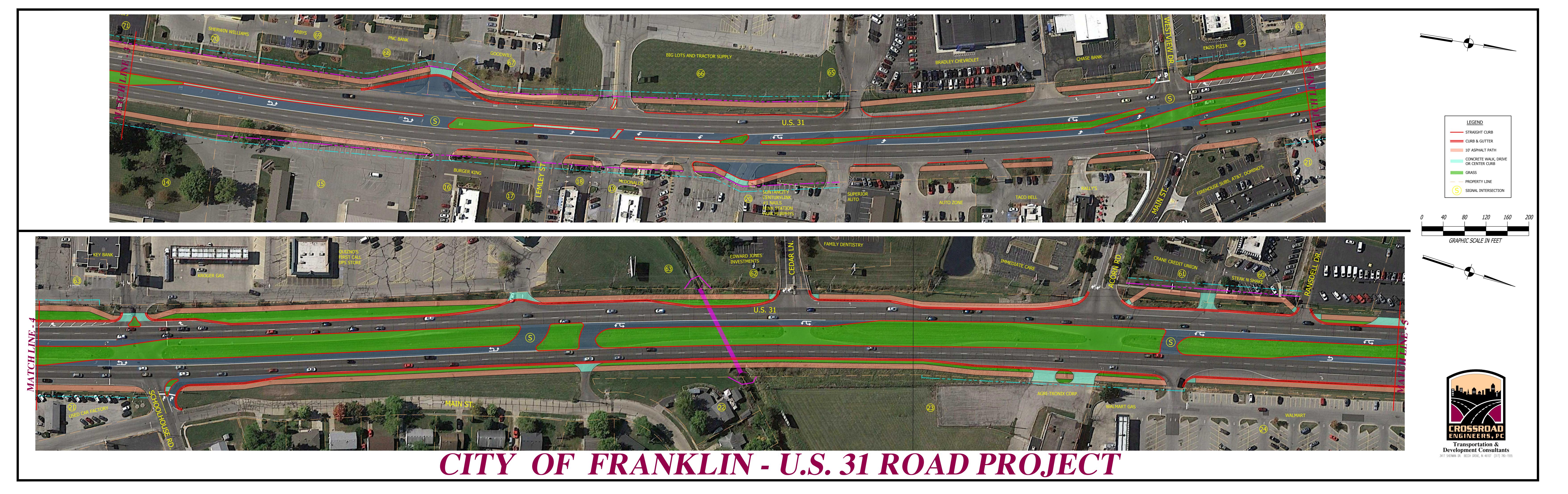
Magen Kritsch



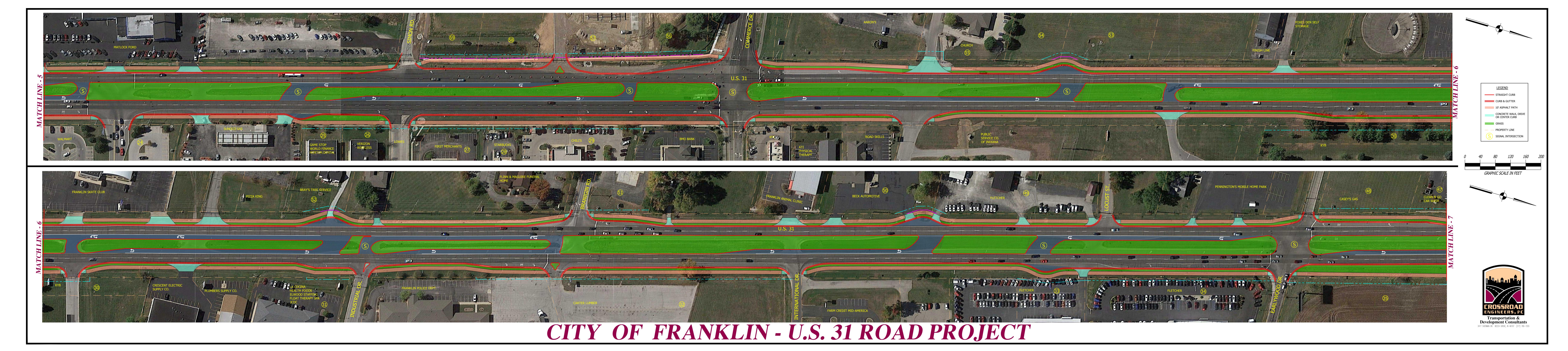
CITY OF FRANKLIN - U.S. 31 ROAD PROJECT



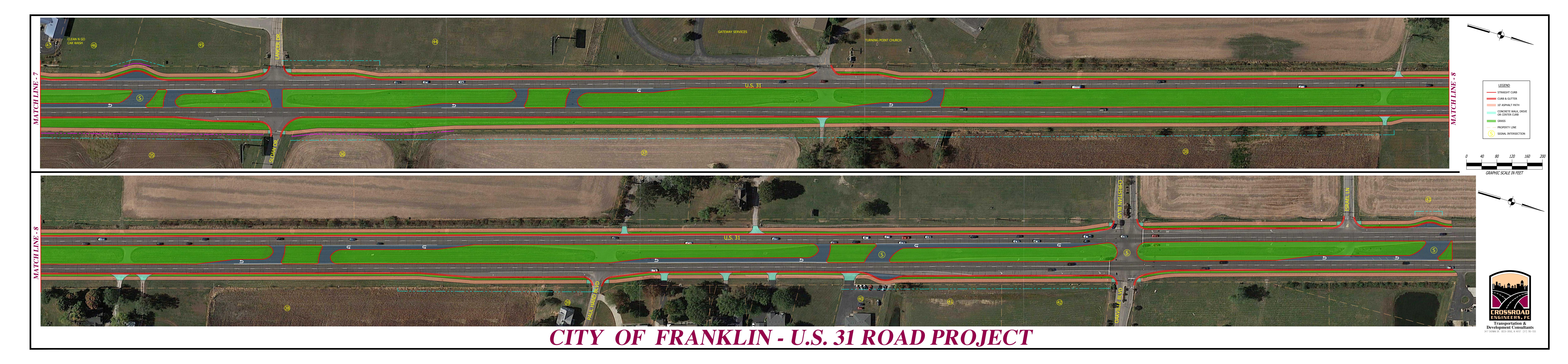
G9



C10



G11



From: Erin Mulryan
To: Ben Briggeman
Subject: RE: Mike Preste

Subject: RE: Mike Prestel Referral

Date: Wednesday, April 20, 2022 8:50:00 AM

Attachments: <u>image001.png</u>

image002.png image003.png image004.png image005.png image006.png image007.png image009.png image010.png image011.png image013.png image014.png image015.png image015.png

image016.png

Hi Ben! Yes, I'm working with our team to complete the environmental and historical studies for the intersection, bridge, and pedestrian improvements along US 31 through Franklin, which is being designed by Crossroad Engineers. One culvert under US 31 will also be replaced as part of the project. The environmental document will be submitted to the Indiana Dept of Transportation (INDOT) for review within the next week. Once the document is released by INDOT for public review, the City and INDOT will host a public hearing, which will present the project, impacts to surrounding resources, and proposed right of way acquisition, and will offer the public the opportunity to provide comments either in person at the hearing during the public comment period or in writing via email or letter. You can also provide comments via phone. All comments will be addressed and included in the final environmental document.

I'll forward your email and contact info to my team so you can be included in the email distribution of the public notice announcing the hearing date and time. I anticipate it to be sometime in June. You'll also receive a hard copy of the notice in the mail. The environmental document and project plans will be available at a public viewing location (likely at the public library in Franklin) and online-that location info will be in the public notice.

Feel free to call or email if you have any questions. Thanks for reaching out!

Erin Mulryan Director of Environmental Services

SJCA Inc.

1028 Virginia Ave, Suite 201 Indianapolis, IN 46203

Tel: 317-566-0629 | Mobile: 317-525-1192



From: Ben Briggeman <ben@beckautomotive.com>

Sent: Tuesday, April 19, 2022 11:07 AM **To:** Erin Mulryan <emulryan@sjcainc.com>

Subject: Mike Prestel Referral

Hi Erin!

I am Katy Prestel's younger brother Benjamin. Mike said that you know all the details of what is going to happen in front of my property at 3070 N Morton Street (US 31) in Franklin. I would be interested in knowing what to expect and a timeline of events if possible?

Any information is appreciated!

Thank you!

Ben Briggeman President Briggeman Beck INC Dba: Beck Automotive 317-736-8800

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Lead Des 1800082 Appendix H STIP and IRTIP



INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue Room N758-Executive Office Indianapolis, Indiana 46204 PHONE: (855) 463-6848

Eric Holcomb, Governor Michael Smith, Commissioner

April 26, 2022

Mr. Jermaine R. Hannon, Division Administrator FHWA Indiana Division 575 North Pennsylvania St., Room 254 Indianapolis, IN 46204

Ms. Kelley Brookins, Regional Administrator FTA Region 5 200 West Adams St. Suite 320 Chicago, IL 60606-5253

Dear Mr. Hannon /Ms. Brookins:

The Indiana Department of Transportation is pleased to submit its Draft FY 2022-2026 Statewide Transportation Improvement Program (STIP) for review and comment by your offices.

Included in the final submitted document is a listing of the state's expansion/preservation and local small urban and rural and rural transit projects. The following Metropolitan Planning Organization TIP's will be included in the FY 2022-2026 STIP by reference, pending FHWA approval in May 2022.

Area Plan Commission of Tippecanoe County (APCTC)	FY 2022-2026
• Version 3/10/2022	
Bloomington-Monroe County Metropolitan Planning Organization (BMCMPO)	FY 2022-2026
• Version 3/11/2022	
Columbus Area Metropolitan Planning Organization (CAMPO)	FY 2022-2026
• Version 3/22/2021	
Delaware-Muncie Metropolitan Plan Commission (DMMPC)	FY 2022-2025
• Version 12/15/2021	
Evansville Metropolitan Planning Organization (EMPO)	FY 2022-2026
• Version 3/10/2022	
Kokomo-Howard County Governmental Coordinating Council (KHCGCC)	FY 2022-2026
• Version 3/10/2022	
Kentuckiana Regional Planning and Development Agency (KIPDA)	FY 2020-2025
• Version 3/29/2022	
Indianapolis Metropolitan Planning Organization (IMPO)	FY 2022-2025
• Version 8/18/2021	
Michiana Area Council of Governments (MACOG)	FY 2022-2026
• Version 3/09/2022	



Madison County Council of Governments (MCCOG)	FY 2022-2026
• Version 7/13/2021	
Northeastern Indiana Regional Coordinating Council (NIRCC)	FY 2022-2026
• Version 3/28/2022	
Northwestern Indiana Regional Planning Commission (NIRPC)	FY 2022-2026
• Version 3/17/2022	
Ohio-Kentucky-Indiana Regional Council of Governments (OKI)	FY 2020-2023
• Version 03/10/2022	
Terre Haute Area Metropolitan Planning Organization (THAMPO)	FY 2020-2024
• Version 08/26/2021	

In addition, INDOT has expanded our public involvement process by taking advantage of virtual meeting techniques and allowing accessibility to online documents, materials, virtual meeting registration, recorded virtual meetings, and comment forms. INDOT also leveraged our planning partner contacts (MPOs, RPOs, LTAP), social media, and notifications sent to local libraries, housing authorities, senior aging centers, and local newspapers across the state.

We greatly appreciate FHWA/FTA support in the development of the STIP 2022-2026 and look forward to working together to achieve our mutual goals. Should you have any questions pertaining to this amendment, please contact Michael McNeil, STIP Specialist at 317-232-0223 or at mmcneil@indot.in.gov.

Sincerely,

Michael Smith, Commissioner

Indiana Department of Transportation

cc: (w/enclosure): FTA

Michelle Allen, FHWA Jeffrey Brooks, INDOT Kristin Brier, INDOT

Kathy Eaton-McKalip, INDOT

Louis Feagans, INDOT Roy Nunnally, INDOT Larry Buckel, INDOT Jay Mitchell, INDOT Jason Casteel, INDOT Michael McNeil, INDOT





Federal Highway Administration

575 N. Pennsylvania St., Rm 254

Indianapolis, IN 46204-1576

Indiana Division

Federal Transit Administration Region V 200 West Adams St., Suite 320 Chicago, IL 60606-5253

June 17, 2022

Mr. Michael Smith Commissioner Indiana Department of Transportation 100 N Senate Ave. N955 Indianapolis, IN 46204

SUBJECT: Indiana FY2022-2026 STIP Approval and Associated Federal Planning Finding

Dear Mr. Smith:

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have completed our review of the FY2022-2026 Indiana Statewide Transportation Improvement Program (INSTIP), which was submitted by the INDOT request letter dated April 27, 2022.

Based on our review of the information provided, certifications of the Statewide and Metropolitan transportation planning processes for and within the state of Indiana, and our participation in those transportation planning processes (including planning certification reviews conducted in Transportation Management Areas), FHWA and FTA are jointly approving the FY2022-2026 STIP, including the Metropolitan Planning Organization (MPO) Transportation Improvement Programs (TIPs) directly incorporated into the STIP, subject to the corrective actions identified in the attached Federal Planning Finding (FPF) report. FHWA and FTA consider the projects in the 5th year for informational purposes only, and our approval does not exceed four years per 23 CFR 450.220(c).

FHWA and FTA are required under 23 CFR 450.220(b) to document and issue an FPF in conjunction with the approval of the FY2022-2026 STIP. At a minimum, the FPF verifies that the development of the STIP is consistent with the provisions of both the Statewide and Metropolitan transportation planning requirements. FHWA and FTA find that the Indiana FY2022-2026 STIP substantially meets the transportation planning requirements and are approving the STIP subject to the corrective actions outlined in the FPF. This approval is effective June 17, 2022, and is given with the understanding that an eligibility determination of individual projects for funding must be met, and INDOT must ensure the satisfaction of all administrative and statutory requirements, as well as address the corrective actions outlined in the attached report. FHWA and FTA will continue to partner with INDOT to ensure the previously developed action plan (attached) is implemented to address the corrective actions. If progress is not made in addressing the corrective actions, future amendments to the FY2022-2026 STIP, or adoption of the FY2024-2028 STIP, may not be approved by USDOT.

If you have questions or need additional information concerning our approval and the FPF, please contact Ms. Michelle Allen of the FHWA Indiana Division at (317) 226-7344, or by email at michelle.allen@dot.gov, or Mr. Jason Ciavarella of the FTA Region 5 Office at (312) 353-1653, or by email at jason.ciavarella@dot.gov.

Sincerely,

KELLEY Digitally signed by KELLEY BROOKINS

Date: 2022.06.13
10:08:34 -05'00'

Kelley Brookins Regional Administrator FTA Region V Sincerely,

JERMAINE Digitally signed by JERMAINE R HANNON Date: 2022.06.13
15:57:46-04'00'

Jermaine R. Hannon
Division Administrator
FHWA Indiana Division

cc: (transmitted by e-mail) Louis Feagans, INDOT Roy Nunnally, INDOT Karen Hicks, INDOT

Attachments have been removed for the purposes of this NEPA document.

Note: The IRTIP does not accurately reflect the current project under Des 1800082, and the bridge project under Des 2001610 is missing from the IRTIP. The INDOT PM has been notified that an amendment is needed, and this Appendix will be updated when that amendment is available.

Indianapolis Metropolitan Planning Organization (IMPO) TIP Project List FY 2022 - FY 2026 as of 8/18/2021

					TIP Project List FY 2022 - FY 2026	as of 8/18/20	21									
INDOT	1702943	Greenfield		SR 9	Intersect. Improv. W/ Added Turn Lanes Intersection Improvement	Y CO	ON FY 2021 STPSM	\$25,000	\$20,000	80%	\$0	0%	\$5,000	20%	\$9,414,957	\$9,414,957
					SR 9 at CR 300 N Dist:N/A	CO	ON FY 2022 STPSM	\$1,116,010	\$892,808	80%	\$0	0%	\$223,202	20%	\$9,414,957	\$9,414,957
						PE	E/PL FY 2020 STPSM	\$81,878	\$65,502	80%	\$0	0%	\$16,376	20%	\$9,414,957	\$9,414,957
INDOT	1902063	Greenfield	1		Install Lighting Intersection Lighting L.70 at Install Lighting		OW FY 2021 STPSM	\$40,000	\$32,000	80% 90%	\$0 \$0	0% 0%	\$8,000 \$39,558	20% 10%	\$9,414,957	\$9,414,957
NDOT	1802062	Greenneid			Install Lighting Intersection Lighting I-70 at SR 227, I-74 at London Rd, US 31 at SR 38, and I-65 at Raymond St Dist:N/A	Y	ON FY 2022 HSIP-ST	\$395,576	\$356,018	90%	\$0	0%	\$39,558	10%	\$500,666	\$500,666
							E/PL FY 2020 HSIP-ST	\$105,090	\$94,581		\$0	0%	\$10,509	10%	\$500,666	\$500,666
NDOT	1802071	Greenfield			Signal Project (New/Modernized) Traffic Traffic Signals Modernization Signals Dist:N/A		ON FY 2022 HSIP-ST	\$1,545,000	\$1,236,000		\$0	0%	\$309,000	20%	\$1,555,000	\$1,555,000
INDOT	1900213	Greenfield		I- 65	District Small Structure Project I-65 over , Small Structure Pipe Lining 1.288 N MARION/JOHNSON Dist:N/A		OW FY 2022 HSIP-ST ON FY 2024 NHPP	\$10,000 \$243,000	\$8,000 \$194,000	80% 80%	\$0 \$0	0% 0%	\$2,000 \$49,000	20%	\$1,555,000 \$489,000	\$1,555,000 \$489,000
						RO	OW FY 2022 NHPP	\$20,000	\$18,000	90%	\$0	0%	\$2,000	10%	\$489,000	\$489,000
							OW FY 2023 NHPP	\$20,000	\$16,000		\$0	0%	\$4,000	20%	\$489,000	\$489,000
NDOT	1900221	. Greenfield		I- 74	District Small Structure Project I-74 over 2.398 MI E of I 465 Dist:N/A	Y	ON FY 2024 STPSM	\$211,000	\$168,800	80%	\$0	0%	\$42,200	20%	\$489,000	\$489,000
					2.338 WILL OFF 403 DISC.N/A	RO	OW FY 2023 STPSM	\$15,000	\$12,000	80%	\$0	0%	\$3,000	20%	\$489,000	\$489,000
NDOT	1900223	Greenfield		I- 865	District Small Structure Project I-865 over Small Structure Pipe Lining	Y CO	ON FY 2024 STPSM	\$178,000	\$142,400	80%	\$0	0%	\$35,600	20%	\$198,000	\$198,000
					1.810 MI E of I65 Dist:N/A	D/	OW FY 2022 STPSM	\$20,000	\$16,000	80%	\$0	0%	\$4,000	20%	\$198,000	\$198,000
NDOT	1900247	' Greenfield		Girls School Rd.	District Pavement Project (Non-I) SR 134 HMA Overlay Minor Structural		ON FY 2024 STPSM	\$294,898	\$235,918		\$0	0%	\$58,980	20%	\$294,898	\$294,898
					0.38 mi S of US 136 to US 136 Dist:.38				, ,		·		, ,			, ,
NDOT	1900226	Greenfield		I- 65	District Bridge Project (Rehabilitation) I-65 Scour Protection (Erosion) NB over Big Eagle Creek Dist:N/A	Y CO	ON FY 2024 NHPP	\$603,056	\$542,750	90%	\$0	0%	\$60,306	10%	\$670,062	\$670,062
NDOT	1900227	Greenfield		I- 65	District Bridge Project (Rehabilitation) Scour Protection (Erosion) Dist:N/A	Y CO	ON FY 2024 NHPP	\$335,031	\$268,025	80%	\$0	0%	\$67,006	20%	\$670,062	\$670,062
INDOT	1901481	Greenfield		I- 465	1901481 Concrete Pavement Restoration 1.15 mis of I-70 W junct to 0.77 mi N of I-74 W junct, 1700817 I 465 NB & ramp over US 40 EB/WB (W Jct), 1700818 I 465 SB over US 40 EB/WB (W Jct), 1700819 I 465 NB over CSX RR, 00.25 S US 36, 1700820 I 465 SB over CSX RR, 00.25 S US 36, 1700821 I 465 NB over CSX RR, 00.31 S US 40, 1700822 I 465 SB OVER CSX RR, 00.31 S US 40, 1700822 I 465 NB over Minnesota Street, 00.38 S US 40, 1700824 I 465 SB over Minnesota Street, 00.38 S US 40, 1700839 I 465 W 10TH STREET OVER I- 465 NB/SB, RAMP, 01.05 N US 36, 1700844 I 465 US 36/ROCKVILLE RD OVER I-465 SB/NB, RAMP, 1700848 I 465 WEST HANNA AVENUE OVER I-465 NB/SB, 00.44 S I-70, 1700849 I 465 W 34TH STREET OVER I-465 NB/SB, 00.71 N I-74, 1700850 I 465 W 46TH STREET OVER I-465 NB/SB, 01.81 S I-65, 1700876 I 465 RAMP TO I- 465 SB OVER BIKE PATH, 01.26 N I-65, 1901520 I 465 over I-465 & RAMPS, 0.12 W MERIDIAN ST, 2000481 I 70 over I-70, 01.18 E I-465. Dist:7.37	Y	ON FY 2024 NHPP	\$10,927,587	\$9,138,229	84%	\$0	0%	\$1,789,358	16%	\$11,693,916	\$11,693,916
INDOT	1901524	Greenfield		I- 465	District Bridge Project (Rehabilitation) Bridge Thin Deck Overlay	Y CO	ON FY 2022 NHPP	\$716,000	\$572,800	80%	\$0	0%	\$143,200	20%	\$716,000	\$716,000
					over I-465 EB/WB, 02.54 E SR 431 Dist:N/A											
INDOT	1900173	Greenfield		SR 32	This project is located on SR 32 east of downtown Noblesville in Hamilton County. It is considered a principal arterial west of SR 37 and a minor arterial east of SR 37. The project begins at the signalized intersection with 19th Street and extends east to the intersection of Presley Drive. This facility is a two lane undivided highway that expands and contracts in different directions through the project limits. Dist:.64		ON FY 2024 STPSM	\$2,819,427	\$2,255,542	80%	\$0	0%	\$563,885	20%	\$3,169,427	\$3,169,427
							OW FY 2022 STPSM	\$350,000	\$280,000		\$0	0%	\$70,000	20%	\$3,169,427	\$3,169,427
INDOT	1800082	. Seymour		US 31	Added travel lanes as part of the US 31 intersection improvements. Includes 9 baby des numbers, 1800081, 1900380,1900379,1900363,1800261,1800 259,1800258,1800241,and 1800083. Dist:1.25		ON FY 2023 NHPP	\$16,250,500	\$13,000,400		\$0	0%	\$3,250,100	20%	\$46,004,096	\$46,004,096
							ON FY 2024 NHPP	\$27,693,596	\$22,154,877	80%	\$0	0%	\$5,538,719	20%	\$46,004,096	\$46,004,096
INDOT	1900670	Crawtordsville		SR 32	SR 32 @ 7.26 mi W of US 421 (over Scour Protection (Erosion) Mounts Run) Dist:N/A		ON FY 2022 STPSM	\$76,427	\$61,142		\$0	0%	\$15,285	20%	\$101,427	\$101,427
					/	DI	F/DI EV 2024 CTDCN4	\$20,000	4.0.00		4.5		4	2021	4404 407	\$101,427
							E/PL FY 2021 STPSM E/PL FY 2022 STPSM	\$20,000	\$16,000 \$4,000		\$0 \$0	0% 0%	\$4,000 \$1,000	20% 20%	\$101,427 \$101,427	\$101,427

The status of the "baby des numbers" will be reviewed and this will be updated as needed in an amendment.

Indianapolis Metropolitan Planning Organization (IMPO) TIP Project List FY 2022 - FY 2026 as of 8/18/2021

						TIP Project List FY 2022 - FY 2026	as of 8/18/	2021											
INDOT	1800864	Multiple	various		Camera/Communications/Detection/DMS Replacements in Indianapolis ATMS area - FY 22 Dist:N/A	Its Traffic Management Systems	Υ	CON	FY 2022	IM	\$600,000	\$540,000	90%	\$0	0%	\$60,000	10%	\$600,000	\$600,000
INDOT	1600854	Greenfield	Boone Co., Hamilton Co., Marion Co.	I- 465	ATL on I-465 from 86th Street to US 31; Interchange Modification at I-865 and I- 465 Dist:8.24	Added Travel Lanes	N	CE	FY 2023	NHS	\$7,000,000	\$6,300,000	90%	\$0	0%	\$700,000	10%	\$248,700,000	\$248,700,000
					403 DISC.0.24			CON	FY 2023	NHS	\$225,000,000	\$202,500,000	90%	Ś0	0%	\$22,500,000	10%	\$248,700,000	\$248,700,000
								PE/PL	FY 2019	NHS	\$11,700,000	\$10,530,000	90%	\$0	0%	\$1,170,000	10%	\$248,700,000	\$248,700,000
WID OT	4000070	0 611		co.co	277 1 1 1 1 1 1 1 1 1 1				FY 2021		\$5,000,000	\$4,500,000	90%	\$0 \$0			10%	\$248,700,000	\$248,700,000
INDOT	1800072	Greenfield	Marion Co.	SR 67	2.77 miles south of I-465 at Ameriplex Parkway Dist:N/A	Intersect. Improv. W/ Added Turn Lanes	'	CON	FY 2023	STESIVI	\$4,392,786	\$3,514,229	80%	\$0	0%	\$878,557	20%	\$4,892,786	\$4,892,786
INDOT	1800950	Greenfield	VARIOUS		Various locations with Railroad signal preemptions Dist:N/A	Railroad Work	Y		FY 2022		\$315,721	\$252,577	80%	\$0	0%	, , , , , ,	20%	\$355,721	\$355,721
INDOT	4002052	66-11	Market 6	1.55	155 18	Dilly 10 de atrice 5 dillier	v		FY 2020		\$40,000	\$36,000	90%	\$0 \$0	0%		10%	\$355,721	\$355,721
INDOT	1802053	Greenfield	Marion Co.	I- 65	I-65 at Raymond St Interchange des numbers 1802053, 1702090, 1702093 Dist:N/A	Bike/Pedestrian Facilities	Y	CON	FY 2022	HSIP-SI	\$450,846	\$405,761	90%	\$0	U%	\$45,085	10%	\$450,846	\$450,846
INDOT	1801041	Seymour	Morgan Co.	SR 67	Small structure replacement on SR 67, 5.08 miles N of SR 39 Dist:N/A	Small Structure Replacement	Υ	CE	FY 2024	NHPP	\$18,700	\$14,960	80%	\$0	0%	\$3,740	20%	\$980,072	\$980,072
								CON	FY 2024	NHPP	\$745,491	\$596,393	80%	\$0	0%		20%	\$980,072	\$980,072
									FY 2021		\$20,000	\$16,000	80%	\$0		\$4,000	20%	\$980,072	\$980,072
INDOT	1702395	Multiple	VARIOUS		Statewide TMC Dispatcher Operations contract for FY 22 Dist:N/A	Its Program Contracted Services	Y	PE/PL	FY 2022	STPSM	\$1,500,000	\$1,350,000	90%	\$0	0%	\$150,000	10%	\$1,500,000	\$1,500,000
INDOT	1800649	Seymour	Johnson Co.	I- 65	CCTV/DMS from 1.0 mile south of SR 252 to 3.0 miles north of SR 44 Dist:N/A	Its Communications Systems	Υ	CON	FY 2022	CMAQ-ST	\$1,175,000	\$940,000	80%	\$0	0%	\$235,000	20%	\$1,265,000	\$1,265,000
								PE/PL	FY 2021	CMAQ-ST	\$90,000	\$72,000	80%	\$0	0%	\$18,000	20%	\$1,265,000	\$1,265,000
INDOT	1801060	Multiple	VARIOUS		Statewide O&M fee for CARS (Condition Acquisition & Reporting System) for FY 23	Its Operations And Maintenance Contracts	Y	PE/PL	FY 2023	STP-ST	\$500,000	\$400,000	80%	\$0	0%	\$100,000	20%	\$500,000	\$500,000
INDOT	1000373	Seymour	Johnson Co.	US 31	Dist:N/A	Bridge Replacement, Pipe Arch Or Culvert	Ų.	CON	FY 2023	NILLIDE	\$919,551	\$735,641	80%	śo	0%	\$183,910	20%	\$2,453,878	\$2,453,878
INDOI	1800272	Seymour	Johnson Co.	05 31	31 at Canary Ditch, 1.30 mile N of SR 44. Dist:N/A	Bridge Replacement, Pipe Arch Or Culvert	Y	CON	FY 2023	NHPP	\$919,551	\$735,641	80%	\$0	U%	\$183,910	20%	\$2,453,878	\$2,453,878
									FY 2024		\$1,244,327	\$995,462	80%	\$0	0%		20%	\$2,453,878	\$2,453,878
									FY 2021 FY 2021		\$250,000 \$40,000	\$200,000 \$32,000	80% 80%	\$0 \$0			20%	\$2,453,878 \$2,453,878	\$2,453,878 \$2,453,878
INDOT	1001020	Sevinour	Johnson Co.	SR 135	Small structure replacement on SR 135 in	Small Structure Replacement	Y	CE	FY 2023	NHPP	\$40,000	\$32,000 \$14,160	80%	50	0%	\$8,000	20%	\$2,455,676	9969,333
					Johnson County, 3.43 miles N of SR 144 Dist:N/A						1 , , , , ,	+= -,===		*		43,233		*****	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
									FY 2023		\$718,469	\$574,775	80%	\$0			20%	\$969,333	\$969,333
									FY 2020 FY 2022		\$223,164 \$10,000	\$178,531 \$8,000	80% 80%	\$0 \$0	0%		20% 20%	\$969,333 \$969,333	\$969,333 \$969,333
INDOT	1801058	Multiple	VARIOUS		Software License for Statewide ATMS for FY 22 Dist:N/A	Its Program Contracted Services	Y		FY 2022		\$1,200,000	\$1,080,000	90%	\$0	0%		10%	\$1,200,000	\$1,200,000
INDOT	1800878	Multiple	VARIOUS		Camera/Communications/Detection/DMS Replacements in Indianapolis ATMS area - FY 23 Dist:N/A	Its Traffic Management Systems	Υ	CON	FY 2023	IM	\$400,000	\$360,000	90%	\$0	0%	\$40,000	10%	\$400,000	\$400,000
INDOT	1702396	Multiple	VARIOUS		Statewide O&M fee for CARS (Condition Acquisition & Reporting System) for FY 22 Dist:N/A	Its Operations And Maintenance Contracts	Υ	PE/PL	FY 2022	STP-ST	\$475,000	\$380,000	80%	\$0	0%	\$95,000	20%	\$475,000	\$475,000
INDOT	1800035	Greenfield	Marion Co.	US 36	Add 1 lane each from approx. 3 miles west of 1465 to 1465. Will include intersection improvements and Bridge Widening. Des numbers 1800035, 1800037, 1900340,	Added Travel Lanes	N	CON	FY 2023	STPSM	\$18,406,813	\$14,725,450	80%	\$0	0%	\$3,681,363	20%	\$20,106,813	\$20,106,813
					1900341 Dist:1.5														
INDOT		Greenfield							FY 2022		\$1,700,000	\$1,360,000	80% 90%	\$0 \$0	0%		20%	\$20,106,813	
	100100	German	Marion Co.	I- 465	1800466 1 465 NB over W 86th Street, 3.39 miles N of 1-65 N. Lct., 1800467 1 465 SB over West 86th Street, 3.39 miles N of 1-65 N. Lct., 1800468 1 465 SB over US 136 (Crawfordswile Road), 1800469 1 465 NB over Big Eagle Creek (Trail), 2.45 miles N of US 36 west 15.1, 1800470 1 465 SB over Big Eagle Creek (Trail), 2.57 miles N of US 36 W. Jct., 1800472 1 465 NB W. US 136 V. Jct., 1800472 1 465 NB W. US 136 V. Jct., 1800472 1 465 NB W. US 136 V. Jct., 1800472 1 465 NB W. Jct., 1800473 1 465 NB RAMP9_B-BIG EAGLE CREEK, TRAIL, 2.45 miles N of US 6 W. Jct., 1800479 1 465 NB RAMP over BIG EAGLE CREEK, TRAIL, 2.45 miles N of US 6 W. Jct., 18004801 465 W 38TH 51. over 1-465 NB, SD. Z-RAMPS, 1.23 Miles N of US 6 W. Jct., 1800421 465 SB RAMP 1-74EB to 1-465 NB W. Jct., 1800421 465 SB CM 1-74 W UT., 18004831 1 465 W 215T STREET over 1-465, 0.39 miles N of 1-65 N Jct., 18005901 1 47 Bamp to EB 1-74 over 1-465 (W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-465 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-65 W. Jct., 18005901 1 74 Bamp to EB 1-74 over 1-7	Bridge Deck Overlay			FY 2023		\$6,893,216	\$6,203,895			0%	\$689,321		\$6,893,216	\$6,893,216
INDOT	1702397	Multiple	VARIOUS		Statewide INRIX Traffic Data for FY 22 Dist:N/A	Its Program Contracted Services	Y	PE/PL	FY 2022	STPSM	\$500,000	\$450,000	90%	\$0	0%	\$50,000	10%	\$500,000	\$500,000
INDOT	1801040	Seymour	Morgan Co.	SR 67	District small structure replacement on SR	Small Structure Replacement	Υ	CE	FY 2024	NHPP	\$13,900	\$11,120	80%	\$0	0%	\$2,780	20%	\$777,052	\$777,052
					67 in Morgan County, 5.88 miles N of SR 39. Dist:N/A														

Lead Des 1800082 Appendix I Additional Studies and Information

Indiana Department of Transportation

100 N. Senate Avenue, IGCN Indianapolis, IN 46204

City of Franklin

70 East Monroe Street Franklin IN 46131

Capacity Analysis Memo

US 31 Corridor

August 2017



8790 Purdue Road Indianapolis, IN 46268

1.0 Introduction

This project will evaluate potential intersection types and corridor treatments on US Highway 31 (US 31) in Johnson County from South Main Street to Israel Lane. The proposed study area is in Franklin, Indiana, beginning approximately 1.1 miles south of SR 44/SR 144/Jefferson Street at S. Main Street and extending north to Israel Lane 0.67 miles south of CR E 500 N/Whiteland Road.

The City of Franklin is proposing to reconfigure the US 31 corridor intersections to meet local and regional transportation needs. The design of this new corridor will be completed in a manner that best meets the needs of INDOT, Johnson County, the City of Franklin, and the traveling public. The formal purpose and need for the project will be determined through the NEPA process, but initial components of the purpose and need utilized for this study may include:

- > Reduce **congestion** at intersections along US 31.
- Improve roadway mobility for the US 31 corridor.
- Improve **safety** throughout the roadway network through a more efficient transportation system.
- > Support **non-motorized** modes of transport by developing an accommodation plan to improve non-motorized access to the City of Franklin and Johnson County.

1.1 Existing Conditions

1.1.1 Roadways

The proposed project will directly impact several state and local roads. *Table 1* summarizes existing roadway information within the study area. The study area extends from S. Main Street in the south to Israel Lane in the north. No intersections of concern were within one-quarter mile east or west of the corridor, so no intersections beyond the corridor were analyzed.

Table 1: Existing Facility Information

Facility	Functional Classification	Number of Primary Lanes	2017 AADT	Speed Limit
US 31	Principal Arterial	4	31,479	40 – 55 mph
S. Main St.	Minor Arterial	2	501	40 mph
Nineveh Rd.	Major Collector	2	2,968	35 mph
South St.	Major Collector	2	4,722	30 mph
Hospital Rd.	Major Collector	2	2,945	40 mph
Jefferson St.	Principal Arterial	2	8,038	30 mph
Banta St.	Major Collector	2	991	25 mph
Westview Dr./N.	Major Collector/Minor			
Main Street	Arterial	2	10,101	20-30 mph
Commerce Dr.	Major Collector	2	6,598	40 mph
Earlywood Dr.	Major Collector	2	4,775	30 mph
All other project				
area roads	Local Street	2	138 – 4,216	25 - 40 mph

<u>US Highway 31 -</u> US Highway 31 is classified as a principle arterial by INDOT. US 31 travels north-south, connecting Spanish Fort, Alabama with Mackinaw City, Michigan. From south to north, the speed limit at the South end of the project is 55 mph. The posted speed switches from 55 mph to 45 mph between S. Main Street and Nineveh Road. The speed limit decreases to 40 mph south of Hospital Road. The speed limit remains 40 through Franklin until it is increased to 50 mph north of the Walmart entrance. The whole corridor has four twelve-foot lanes, two northbound lanes and two southbound lanes. Most of the corridor has a 30 to 40-foot median. The section from South St. to Lemley St. does not have a raised median, but does have a seventeen-foot two-way left-turn lane (TWLTL).

<u>S. Main Street</u> – S. Main Street is classified as a minor arterial by Johnson County. Main Street travels mostly north-south. The posted speed limit is 40 mph and S. Main Street creates a T-intersection at US 31. There is one travel lane in each direction on S. Main Street.

<u>Nineveh Rd</u> - Nineveh Road is classified as a major collector by Johnson County. Nineveh Road travels mostly north-south through Franklin. The speed limit of this road is 25 mph east of US 31 and 35 mph west of US 31. There is one lane in each direction on both sides of US 31.

<u>South Street</u> - South Street is classified as a major collector by Johnson County. To the west of US 31, South Street transitions to a local road and is called Franklin-Lakes Boulevard. South Street travels east-west through Franklin. There is one lane in each direction. The speed limit of this road is 30 mph.

<u>Hospital Road</u> - Hospital Road is classified as a major collector by Johnson County. Hospital Road travels east-west through Franklin and comes to a t-intersection on the west side of US 31. There is one travel lane in each direction. The posted speed limit is 40 mph.

<u>SR 44 / SR 144 -</u> SR 44 and SR 144 are also known as Jefferson Street between US 31 and I-65 and is under local jurisdiction. This road is classified as a principal arterial by the Indiana Department of Transportation. SR 144 travels east-west between Mooresville, IN and Franklin, IN. SR 44 travels east-west between Martinsville, IN and the Indiana/Ohio state line east of Liberty, IN. This major arterial has a posted speed limit of 30 mph at its intersection with US 31. This road has one lane in each direction.

<u>Banta Street</u> - Banta Street is classified as a major collector by Johnson County. There is one travel lane in each direction. The posted speed limit of Banta St is 25 mph. This road only approaches US 31 from the East and travels east-west through Franklin from US 31 to Main Street.

<u>Westview Drive/N. Main Street</u> - Main Street is classified as a minor arterial and Westview Drive is classified a major collector by Johnson County. Main Street travels mostly north-south and Westview Drive travels mostly east-west, but turns south to form the north approach of the SR 44/SR 144 intersection. The posted speed limit is 20 mph on N. Main Street and 30 mph on Westview Drive. For both roadways, there is one travel lane in each direction.

<u>Commerce Drive</u> - Commerce Drive is classified as a major collector by Johnson County. This road travels east-west through Franklin. A pedestrian path west of US 31 on the north side of Commerce connects to the high school. There is one travel lane in each direction.

<u>Earlywood Drive</u> - Earlywood Drive (CR E 300 N) is classified as a major collector by Johnson County. This road travels east-west through Franklin, predominantly between US 31 and I-65. Earlywood Drive connects multiple industrial properties to US 31. There is one travel lane in each direction.

1.1.2 Intersections

The impacts of the proposed project to through and local traffic will be studied, including the impacts to a few major intersections. *Figure 1* and *Figure 2* show all of the intersections studied in this analysis. A brief description and an aerial view of each major intersection is provided after *Figure 1* and *Figure 2*.



Figure 1: Study Area Intersections

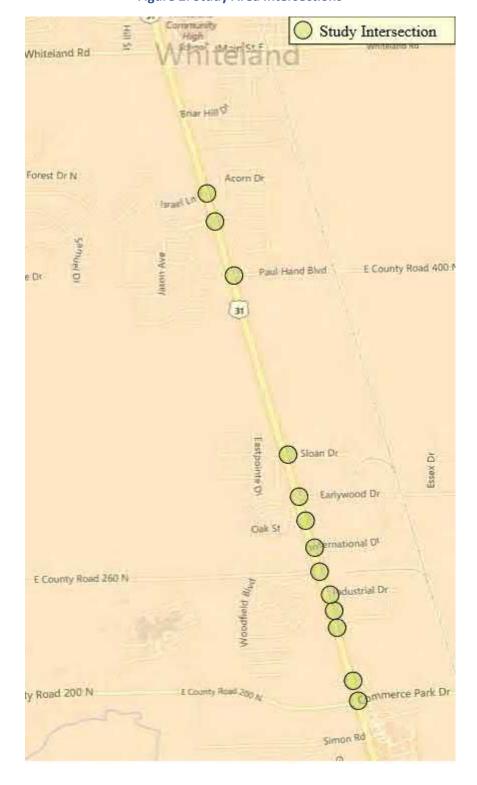


Figure 2: Study Area Intersections

<u>US 31 at Nineveh</u> - This existing four-legged intersection is signal-controlled. The northbound and southbound approaches have 2 lanes in each direction. The eastbound and westbound approaches have one lane in each direction. The northbound and southbound approaches have a left turn lane and right turn lane. There is a significant skew to the intersection of approximately 28°.



<u>US 31 at South</u> - This existing four-legged intersection is signal-controlled. The northbound and southbound approaches have 2 lanes in each direction. The eastbound and westbound approaches have one lane in each direction. Left turn lanes exist on the southbound, northbound, and eastbound approaches. The southbound approach also has a right turn lane. The westbound approach intersects US 31 at approximately a 22-degree skew.



<u>US 31 at Hospital</u> - This existing intersection is three-legged with stop control on the westbound approach. The north and southbound approaches have 2 lanes in each direction. The eastbound approach has one lane in each direction, and the eastbound lane transitions to one left turn lane and one right turn lane. The southbound approach has a right turn lane and the northbound approach has a left turn lane.



<u>US 31 at Jefferson</u> - This existing intersection is four-legged and signal-controlled. The north and southbound approaches have 2 through lanes in each direction. East and westbound approaches have one through lane in each direction. All approaches have a dedicated left turn lane and the westbound approach also has a dedicated right turn lane (currently under construction).

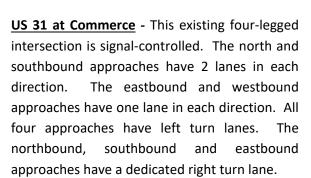


Pedestrian accommodations are present on each corner. No on street parking is available.

<u>US 31 at Mallory</u> - This existing four-legged intersection is signal-controlled. The northbound and southbound approaches have 2 lanes in each direction. The eastbound and westbound approaches have one lane in each direction. A left-turn lane is present on the eastbound, northbound, and southbound approaches. A right turn lane is present on the northbound and southbound approaches. Crosswalks are present across the northbound and eastbound approaches.



<u>US 31 at Westview</u> - This existing intersection is four-legged and signal-controlled. The north and southbound approaches have 2 lanes in each direction. There is a left turn lane on the southbound, northbound, and eastbound approaches. The northbound and westbound approaches have dedicated right turn lanes. The east approach intersects at approximately a 20-degree skew.







1.2 Build Alternatives

Through discussion with the City of Franklin and INDOT, a proposed alternative was developed for the corridor that was confirmed through a screening process. Three alternatives were analyzed: the No Build, Build and Enhanced Build scenarios.

The Build alternative recommends a combination of median U-turn (MUT) intersections be implemented along the corridor. Additionally, a raised median would be added from the South

Street intersection north to the Westview Drive / N. Main Street intersection. Figures showing the proposed design may be found in *Appendix A*. Some minor adjustments were included in the analysis to improve operations and are recommended to be included in the final design. Several U-turn locations were signalized to provide acceptable gaps in oncoming traffic and/or accommodate high U-turn volumes.

Also in *Appendix A* is an additional alternative that modified the design of some intersections from the Build scenario that is called the Enhanced Build scenario. Compared to the original design, the proposed design would be modified as noted for the following intersections:

- RCUT at Nineveh Rd.
- Signalized green T at S. Main St.
- Partial RCUT at Hospital Road
- Hybrid Boulevard Left at Jefferson Street
- RCUT at Mallory Parkway
- RCUT at Westview Drive/N. Main Street
- RCUT at Christian Blvd./Oakville Blvd.

This list of modification is not all-inclusive. A few other minor geometric changes were made at some intersections that can be seen in *Appendix A*. The previously-mentioned adjustments to the proposed are recommended for inclusion in the final design. This will provide a consistent treatment through the entirety of the Franklin city limits along US 31.

2.0 Operational Analysis

2.1 Methodology

This project will use multiple measures of effectiveness (MOEs) to analyze and select the appropriate solution. The MOEs that will be used in the analysis include:

- Level-of-Service (LOS)
- Delay

Queue Length

- Arterial Speed
- Corridor Travel Time
- Crash Reduction

Through discussion with INDOT and the City of Franklin, a Build scenario was developed. An Enhanced Build scenario was developed that better managed some higher-volume movements in the corridor. A No Build scenario will also be analyzed to serve as a baseline performance level. The proposed designs are shown in *Appendix A*. The analyses include the existing conditions based on counts conducted in 2017. Future analyses will include the anticipated construction year (2023) and the design year (2043). For each analysis, the morning (AM) and evening (PM) peak hours will be analyzed.

2.2 Traffic Data

The traffic counts used for this analysis were provided by INDOT. MioVision cameras were used to conduct the 24-hour counts within late February to early March. Functional Classifications were collected from the interactive Functional Classification Map. Lane and posted speed limit information were found using Google Maps. Existing signal timing plans were provided by INDOT.

2.3 Operational Analysis

A detailed operational analysis was conducted using multiple traffic modeling software programs. Synchro (Version 10.0.0.181) was used to develop an initial network layout and to develop signal timing parameters. The capacity analysis was conducted using VISSIM microsimulation software (Version 9.00-07). The purpose of this model was to analyze the entire study area as a whole and quantify the impacts that each element in the network may have on the rest of the network. The most recent Highway Capacity Manual (HCM), HCM 6, was utilized for minimum gap and headway values for all minor street unsignalized movements and major street unsignalized left and U-turns, as well as LOS thresholds.

2.3.1 Level-Of-Service and Delay

Level-of-service is a common measure of effectiveness for traffic operations at an intersection and is based on intersection delay. The full summary tables for all scenarios may be found in *Appendix B*. The LOS for each intersection for the No Build, Build and Enhanced Build scenarios are presented in *Table 2* and the corresponding intersection delay is presented in *Table 3*. The LOS and delay for the proposed U-turns are provided in *Appendix B*.

Table 2: US 31 Intersection Level-of-Service

	Intersection Level-Of-Service													
Intersection	20 Exis		2043 Bu	3 No ild	2043	Build		nhanced iild	Build Int. Control	Enhanced Build Int. Cntl.				
	AM	PM	AM	PM	AM	PM	AM	PM						
S. Main Street	С	F	Е	F	D	F*	Α	Α	Stop Control	Signalized				
Nineveh Road/CR S 200 E	В	В	С	В	С	Е	Α	Α	RCUT	Signalized				
Ironwood Drive	Α	Α	Α	Α	Α	Α	В	В	Stop Control	Stop Control				
Franklin Lakes Blvd./South St.	В	С	D	С	Е	F	Α	В	Boulevard Left	Signalized				
Hospital Road	D	D	F	F	F*	F*	В	В	Stop Control	Signalized				
Jefferson Street/SR 44/SR 144	С	С	D	Е	D	D	В	С	Boulevard Left	Signalized				
Madison Street	В	В	В	Е	F*	F*	С	D	Stop Control	Stop Control				
King Street	F	F	F	F	D	С	D	F*	J-turn	Stop Control				
Adams Street	D	F	F	F	F*	F*	D	F*	Stop Control	Stop Control				
Banta Street	Е	F	F	F	С	В	Α	Α	RCUT	Signalized				
Kohl's Entrance	С	F	D	F	F*	F*	С	E*	Stop Control	Stop Control				
Mallory Parkway	В	В	В	С	В	Е	Α	В	Boulevard Left	Signalized				
Kroger Entrance	В	В	В	С	С	F*	С	D	Stop Control	Stop Control				
Lemley Street	В	В	С	D	D	С	E*	С	Stop Control	Stop Control				
Tractor Supply/McDonalds	В	С	В	Е	С	D	С	D	J-turn	Stop Control				
Westview Drive/N. Main Street	С	D	Е	F	С	С	В	С	RCUT	Signalized				
Schoolhouse Road	Α	В	В	F	F*	F*	С	D	Stop Control	Stop Control				
Cedar Lane	С	D	С	F	F*	F*	F*	F*	Stop Control	Stop Control				
Acorn Road	Е	F	F	F	D	F*	E*	F*	Stop Control	Stop Control				
Walmart Entrance	Α	В	Α	F	Α	С	В	С	Stop Control	Signalized				
Simon Road	С	D	Е	F	F*	F*	D	F*	Stop Control	Stop Control				
Commerce Drive	С	С	С	Е	В	В	Α	В	Boulevard Left	Signalized				
Utilities Drive	С	В	С	F	С	В	В	С	Stop Control	Stop Control				
KYB South	С	D	D	F	С	С	С	F*	Stop Control	Stop Control				
KYB North	В	С	В	D	С	D	С	F*	Stop Control	Stop Control				
Industrial Drive	С	D	D	F	С	D	В	В	J-Turn	Signalized				
Branigin Road	Α	Α	В	С	F*	F*	Α	Α	Stop Control	Signalized				
International Drive	В	D	С	F	F*	E*	F*	F*	Stop Control	Stop Control				
Locust Street	С	С	С	F	С	С	С	С	Stop Control	Stop Control				
Earlywood Drive/CR E 300 N	В	В	В	D	Α	В	В	В	Boulevard Left	Signalized				
Sloan Drive/Lancer Drive	В	С	С	D	С	С	С	D	Stop Control	Stop Control				
Paul Hand Boulevard	С	С	С	D	В	С	В	D	Stop Control	Stop Control				
Christian Blvd/Oakville Blvd	В	В	В	В	Α	Α	В	Α	Boulevard Left	Signalized				
Israel Lane	В	В	В	С	В	В	В	В	Stop Control	Stop Control				

^{*}LOS is for stop-controlled side road approaches only. Mainline LOS at these intersections is LOS A.

Table 3: US 31 Average Intersection Delay

Intersection Delay (s/veh)												
Intersection	2017 E	xisting	2043 N	lo Build	2043	Build		inhanced uild				
	AM	PM	AM	PM	AM	PM	AM	PM				
S. Main Street	24.73	53.91	38.60	266.73	33.13	257.84	0.39	1.23				
Nineveh Road	12.84	11.78	21.97	15.53	28.24	71.02	8.58	6.77				
Ironwood Drive	8.74	8.02	8.30	8.39	7.69	8.43	12.42	11.81				
Franklin Lakes Blvd./South St.	19.54	20.09	43.90	34.97	66.03	105.00	9.28	10.16				
Hospital Road	25.98	30.04	138.29	250.28	122.58	118.69	13.61	13.49				
Jefferson Street	28.05	32.96	49.34	55.36	52.76	51.77	18.71	21.13				
Madison Street	11.55	13.79	14.51	38.79	77.13	58.36	17.74	28.61				
King Street	196.37	193.71	970.03	722.82	37.31	32.81	34.18	182.15				
Adams Street	33.29	82.90	84.96	378.77	957.43	1352.97	29.47	100.60				
Banta Street	36.87	367.99	134.93	919.33	20.09	18.88	4.87	5.22				
Kohl's Entrance	16.98	78.16	26.47	585.27	122.41	1454.18	17.40	37.93				
Mallory Parkway	12.13	12.37	14.72	29.61	13.38	67.95	9.98	13.23				
Kroger Entrance	10.06	12.51	11.70	18.43	16.45	471.60	15.27	30.17				
Lemley Street	11.87	12.65	20.31	29.79	29.85	16.25	37.20	24.57				
Tractor Supply/McDonalds Entrance	12.17	18.42	14.76	47.93	15.18	27.74	22.62	33.73				
Westview Drive/N. Main Street	30.26	35.65	61.42	106.36	20.84	28.59	16.69	21.57				
Schoolhouse Road	7.03	16.88	10.14	109.11	78.63	1555.07	15.19	25.27				
Cedar Lane	17.79	26.08	21.29	4432.24	165.92	61.42	100.52	456.98				
Acorn Road	39.70	63.41	117.32	914.87	33.00	267.36	39.03	203.21				
Walmart Entrance	5.22	10.17	6.45	93.54	3.92	23.43	14.64	24.22				
Simon Road	22.57	26.34	36.67	306.17	446.78	278.80	32.08	163.30				
Commerce Drive	25.64	25.68	31.67	67.36	13.68	15.53	9.28	10.59				
Utilities Drive	18.03	12.34	22.21	200.84	16.18	13.64	14.44	23.01				
KYB South	22.82	29.71	29.37	480.53	15.30	22.40	18.23	51.09				
KYB North	11.82	15.19	14.40	30.62	18.92	29.08	23.46	55.58				
Industrial Drive	20.76	29.92	28.50	321.56	20.03	25.74	17.79	10.94				
Branigin Road	7.66	5.58	14.07	27.70	508.83	300.12	6.80	5.88				
International Drive	14.78	25.07	22.92	68.37	72.55	38.86	51.79	151.08				
Locust Street	16.23	20.62	19.85	166.71	16.73	23.20	18.58	21.13				
Earlywood Drive	11.41	12.97	15.86	40.14	9.13	13.96	10.91	17.52				
Sloan Drive/Lancer Drive	13.64	15.97	18.13	32.14	18.79	21.91	24.17	34.11				
Paul Hand Boulevard	15.20	20.38	22.02	27.44	10.20	18.63	14.42	30.98				
Christian Blvd/Oakville Blvd	10.44	10.57	13.52	13.10	7.87	3.20	13.77	8.94				
Israel Lane	10.82	14.79	14.43	18.59	12.06	14.05	13.85	14.59				

The results in both *Table 2* and *Table 3* show degraded traffic operations by the design year for the No Build scenario. Delay, LOS and arterial progression corridor-wide deteriorate by the design year in the No Build scenario. The Enhanced Build scenario does indicate failing LOS at some intersections for the side streets in the design year, but it does show significant reductions in delay at a majority of the side streets with failing LOS in the No Build scenario. To remedy these locations, minor adjustments may be desirable. Minor adjustments may include, but are not limited to, extending median turn lanes and/or adjusting intersection configurations.

2.3.2 Arterial Speed and Corridor Travel Time

Arterial speed and corridor travel time can both be good indicators of how well a corridor's signal system is coordinated. Without any traffic signals or delays from other traffic in the corridor, a vehicle could traverse the US 31 corridor in 7 minutes. Comparatively, as seen in *Table 4*, the existing northbound and southbound travel times are approximately 9.5 minutes during the AM peak and 10 minutes for the PM peak. Traffic signals and vehicle interactions are currently adding approximately 2.5-3 minutes of travel time for either direction through the corridor.

Table 4: US 31 Travel Time and Speed

	2017 Existing	2023 No Build	2023 Build	2023 Enhanced Build	2043 No Build	2043 Build	2043 Enhanced Build
AM Northbound Avg. Travel Time (min/veh)	9.55	9.7	8.82	9.66	10.65	14.85	10.25
AM Southbound Avg. Travel Time (min/veh)	9.5	9.85	8.43	9.54	10.68	11.8	9.95
PM Northbound Avg. Travel Time (min/veh)	10.01	9.96	19.28	10.38	15.61	17.65	11.51
PM Southbound Avg. Travel Time (min/veh)	10.35	10.35	15.98	9.95	22.45	18.64	11.29
AM Northbound Avg. Travel Speed (mph)	34.6	34.1	37.5	34.2	31	22.3	32.3
AM Southbound Avg. Travel Speed (mph)	34.9	33.6	39.3	34.7	31	28.1	32.5
PM Northbound Avg. Travel Speed (mph)	33.1	33.2	17.1	31.8	21.2	18.7	28.7
PM Southbound Avg. Travel Speed (mph)	32.0	32.0	20.7	33.3	14.8	17.8	29.3

Table 4 shows that the corridor average travel time is less in the Enhanced Build scenario compared to the No Build scenario. Compared to existing travel times, there is an increase between 24 seconds – 1.5 minutes in travel time for the Enhanced Build scenario, but the increase is significantly less than the No Build by the year 2043. As would be expected with a slight increase in travel time, average travel speed slightly decreases in the design year. Evening peak travel speeds are significantly improved over the design year No Build scenario, though. The southbound PM peak average travel speed is nearly twice as fast in the Enhanced Build scenario versus the No Build.

It should be noted that some of the increase in corridor travel time and decrease in average travel speed is attributable to an adjustment to posted speed limits for some sections of US 31. Per INDOT design standards, 45 MPH is the maximum design speed for a curbed facility, and curbs are proposed for the length of the corridor. Therefore, US 31 segments where the existing posted speed limit is greater than 45 MPH were reduced to 45 MPH in the build scenarios. The reduced speed limit is assumed to slightly increase predicted travel time and slightly decrease predicted travel speed for these segments in the build scenarios.

2.3.3 Queue Length

Another measure of effectiveness for the corridor is queue length. Because of the significant amount of delay shown in *Table 3*, queues will be significant at multiple intersections. Average and maximum queue lengths may be seen in *Appendix B*. The letters "L", "T", "R" and "U" in the queue titles correspond to left, through, right and U-turn movements, respectively. Because of the number of intersections within the study area, there are many queue lengths to report.

Based on the results in *Appendix B*, the existing average queue lengths are generally less than 200 feet. By the design year, queues in the No Build scenario reflect the increased delay seen in the network. Multiple side streets experience average queues over 500 feet long, indicating vehicles struggle to find adequate gaps in mainline traffic. Mainline queues at some of the signalized intersections, such as Mallory Parkway and Westview Drive/N. Main Street, extend over 800 feet, blocking access to auxiliary lane turn bays.

In the 2043 design year, the Enhanced Build scenario does not have any average queues that extend greater than 500 feet. Some U-turn locations do experience long maximum queues, but they do not degrade mainline operations because they clear within one signal cycle. The U-turn for southbound traffic south of Westview Drive is one example of the queue clearing in a single cycle. Other U-turn locations may require a signal in the future condition to prevent the queue from spilling back into mainline traffic. The U-turn south of Cedar Lane for southbound traffic is one movement that may queue into through traffic in the future. As time passes, these locations would need to be monitored.

There are instances in the Build scenario where 2043 queues are less than 2023 queues. Franklin Lakes Blvd. and Jefferson Street are a couple examples of this occurring. There are a couple reasons for this. The first reason is the stochastic nature of VISSIM, which randomly

inserts traffic into the network. Differences in the distribution of vehicles entering the network across the evaluation period could cause queue results to be significantly different. The second reason is the propagation of congestion in the network. Compared to 2023, the congestion in the 2043 Build scenario that brought the network to a standstill likely began further north than in the 2023 simulation, which allowed intersections further south such as Jefferson Street to be able to operate more effectively, resulting in shorter queues. Analyzing the queues against the entire network still shows breakdowns in traffic operations in the Build scenario, which are alleviated in the Enhanced Build scenario.

2.3.4 Crash Reduction

The final measure of effectiveness for the corridor is crash reduction. A *Safety Improvements Memo* was developed to document the expected safety improvements in the corridor based on the proposed design. By the design year, it is estimated that a 24.4% crash reduction will be seen throughout the corridor. For additional details, please see the *Safety Improvements Memo*.

3.0 Summary and Recommendations

3.1 No Build (Not Recommended)

Based on the measure of effectiveness (MOE) results, the No Build scenario is not recommended. Vehicles have trouble finding adequate gaps in traffic to conduct their turning movements and long queues form that extend back to upstream intersections. The congestion propagates throughout the network, causing operations at numerous intersections to break down. The existing US 31 corridor will not provide for efficient movement of traffic and motorists will experience long delays in the design year. This is represented by the number of intersections experiencing LOS F in the No Build scenario.

3.2 Build (Not Recommended)

Based on the MOE results, the initial Build scenario is not recommended. Vehicles have trouble finding adequate gaps in traffic to conduct their turning movements. The relocation of left turns to the proposed U-turn locations creates some high-volume U-turn movements that queue back into through travel lanes. The queueing past the provided turn bay lengths slows through traffic, which causes queues to back up and block other intersections and U-turn movements, breaking down traffic operations in the corridor. While several intersections have improved operations, the corridor still experiences heavy congestion in certain segments.

3.3 Enhanced Build (Recommended)

The Enhanced Build scenario is recommended as it addresses the high U-turn volume locations and some other high-volume movements. This scenario provides significant improvements for all the MOEs over the No Build scenario. As this project focused on improved US 31 operations,

minor street performance was a secondary goal, and some did not see significantly improved performance.

A few critical modifications were needed to the Build scenario. One critical location was the intersection of Hospital Road. Projected northbound left turns are over 300 in the peak hour, which in the Build scenario had been relocated to a U-turn at Banta Street along with U-turning traffic for four other intersections. This intersection was converted to a partial RCUT intersection, allowing the heavy US 31 left turn movement to occur at Hospital Road. There was concern that traffic wanting to turn left from northbound US 31 at Jefferson Street would detour to Hospital Road with this configuration. A sensitivity analysis showed the Hospital Road intersection could still operate at an acceptable LOS with all of the US 31 northbound left turns from Jefferson Street relocated to Hospital Road. The Jefferson Street eastbound left turn volume is projected to have approximately 500 vehicles making that movement in the PM peak in the design year, so dual eastbound left turn lanes were implemented for a partial boulevard left configuration. The intersection with Westview drive experiences high left-turn volumes on all approaches, so an RCUT configuration was selected to lessen U-turn volumes and improve safety.

A goal was to not over-signalize the corridor, as that would negatively impact corridor travel times and speeds. Some U-turn locations need to be evaluated in more depth before final design to confirm signal warrants. Removing any of these signals could improve corridor travel times and speeds more, but would penalize U-turn traffic. Overall, the major intersections see improved performance and the corridor will see similar levels of operation out to the design year.

4.0 Future Work/Coordination

A few intersections will require further coordination/discussion to finalize the intersection type or some of the geometric features that are more detailed than the current planning level of the project. Those locations and topics are discussed hereafter to provide documentation of the discussion to-date.

Two existing signalized intersections were analyzed with a MUT configuration that require additional analysis prior to final design. Those intersections were US 31 at South Street/Franklin Lakes Boulevard and US 31 at Christian Boulevard/Oakville Boulevard. The MUT configuration for low minor street through volumes might lead to motorists disregarding the no left turn restriction at the intersection. The RCUT or J-turn configuration would place a physical barrier minimizing the likelihood of disregarding the restriction. Further investigation will be needed during the design phase to confirm the final design. The RCUT or J-turn configuration was not analyzed at the Franklin Lakes/South Street intersection because further coordination with the City and INDOT is needed.

At the intersection of US 31 and Westview Drive/Main Street, a RCUT intersection type is proposed. This configuration will force Westview Dr. and Main St. left and through traffic to

utilize a U-turn downstream. A City of Franklin fire station is approximately 350 feet east of the intersection. Further coordination as to how best accommodate fire trucks using US 31 southbound on emergency calls is needed. One suggestion mentioned during the planning meetings was brick pavers in the center directional island that grass could grow between and around. This would allow fire trucks to be able to easily traverse the island while giving the allusion to other motorists that the island was composed of just sod/grass.

The Enhanced Build alternative removed all left turns from the Walmart main entrance, which is signalized currently. It was noted that the INDOT district may prefer to allow left turns into the Walmart entrance. Further coordination is needed to finalize the intersection geometry for this intersection.

Indiana Department of Transportation

100 N Senate Ave, IGCN Indianapolis, IN 46204

City of Franklin

70 East Monroe Street Franklin IN 46131

Safety Countermeasures Memo

US 31 Corridor

June 2017



8790 Purdue Road Indianapolis, IN 46268

1.0 Introduction

This project will evaluate potential intersection types and corridor treatments on US Highway 31 (US 31) in Johnson County from South Main Street to Israel Lane. The proposed study area is located in Franklin, Indiana, beginning approximately 1.1 miles south of SR 44/SR 144/Jefferson Street at S. Main Street and extending north to Israel Lane 0.67 miles south of CR E 500 N/Whiteland Road.

The City of Franklin is proposing to reconfigure the US 31 corridor intersections to meet local and regional transportation needs. The design of this new corridor will be completed in a manner that best meets the needs of INDOT, Johnson County, the City of Franklin, and the traveling public. The formal purpose and need for the project will be determined through the NEPA process, but initial components of the purpose and need utilized for this study may include:

- Reduce congestion at intersections along US 31.
- > Improve roadway mobility for the US 31 corridor.
- Improve **safety** throughout the roadway network through a more efficient transportation system.
- > Support **non-motorized** modes of transport by developing an accommodation plan to improve non-motorized access to the City of Franklin and Johnson County.

1.1 Existing Conditions

<u>US Highway 31-</u> US Highway 31 is classified as a principle arterial by INDOT. From south to north, the speed limit at the south end of the project is 55 mph. The posted speed switches from 55 mph to 45 mph between S. Main Street and Nineveh Road. The speed limit decreases to 40 mph south of Hospital Road. The speed limit remains 40 through Franklin until it is increased to 50 mph north of the Walmart entrance. The whole corridor has four lanes, two northbound lanes and two southbound lanes. Most of the corridor has a 30 to 40-foot median. The section from South St. to Lemley St. does not have a raised median, but does have a two-way left-turn lane (TWLTL). There are 34 intersections within the study limits. Of these 34 intersections, seven are major collectors, two are minor arterials, and one is a principle arterial. Eleven intersections are signalized, the rest are two-way stop-controlled (TWSC) on the minor street.



Figure 1 – Corridor Through Franklin

2.0 Crash History

Crash history data was obtained from the ARIES database by INDOT. The crash history includes reports from the Franklin Police Department, the Johnson County Sheriff and the Indiana State Police. Crash records were pulled for a three-year time period to average out spikes and/or dips in the number of crashes in the corridor. The crash data provided used in this analysis is from a

period between 2014 and 2016. The types of crashes that occurred in the corridor can be found in Table 1.

Table 1- Types of Collisions in Corridor

Crash Type	Backing Crash	Head On	Left Turn	Opposite Direction Sideswipe	Other - Explain in Narrative	Rear End	Right Angle	Right Turn	Ran Off Road	Same Direction Sideswipe	Total
Crashes 2014-2016	14	8	75	5	5	379	100	14	25	70	697

As seen in **Table 1**, the most frequent crash type was rear end crashes by a large margin. The high number of rear end crashes may be due to congestion along the US 31 corridor. Safety recommendations will need to focus heavily on reducing the number of rear end crashes occurring in the corridor. The next most frequent crash types were right-angle and left turn crashes. These crashes typically occur in intersections and have a higher probability of causing injury. Implementing intersection alternatives that limit these dangerous impacts is crucial to improving corridor safety for US 31 through Franklin.

Table 2 tallies the different severities of crashes along the US 31 corridor. The levels of severity are fatal, injury, and property damage. Injury crashes are separated into two categories: incapacitating and non-incapacitating. An incapacitating injury is a non-fatal injury that prevents the injured person from walking, driving or normally continuing the activities the person was capable of performing before the injury occurred. Hospitalization is usually required. A non-incapacitating injury is an injury, other than a fatal or incapacitating injury, which is evident to the officer at the scene of the crash and may require medical treatment, but hospitalization is usually not required. Two fatalities occurred in the corridor in recent history, but they are not included in *Table 2* because they occurred during 2013, which is outside the analysis period. The first fatality occurred because of a left turn crash between a motor vehicle and a moped at the intersection of Banta Street and US 31. The second fatality resulted from the collision of a motor vehicle with a pedestrian crossing US 31 near the intersection of Acorn Road and US 31. These crashes will be noted so that countermeasures might be considered to help prevent future incidents at these locations.

Table 2- Collision Severity

Intersection	Fatal	Injury	Property Damage	Total
Acorn Rd	0	8	21	29
Adams St	0	6	11	17
Banta St	0	3	10	13
Branigin Rd	0	3	20	23
Cedar Ln	0	2	1	3
Christian Blvd-Oakville Blvd	0	8	18	26
Commerce Dr	0	9	26	35
Earlywood Dr	0	14	31	45
Hospital Rd	0	6	16	22
Industrial Dr	0	1	6	7
International	0	1	12	13
Ironwood Dr	0	0	0	0
Israel Ln	0	2	2	4
Jefferson St	0	6	37	43
King St	0	1	8	9
Kohls Ent	0	0	1	1
Kroger Dr	0	2	2	4
KYB North	0	0	4	4
KYB South	0	0	3	3
Lancer Dr-Sloan Dr	0	2	5	7
Lemley St	0	3	11	14
Locust St	0	0	0	0
Madison St	0	1	4	5
S Main St	0	0	5	5
Mallory Pkwy	0	11	16	27
Nineveh Rd	0	4	7	11
Paul Hand Rd	0	0	1	1
Schoolhouse Rd	0	13	48	61
Simon Rd	0	14	23	37
South St - Franklin Lakes Blvd	0	3	10	13
Tractor Supply - McDonalds	0	0	2	2
Utilities Dr -Blank	0	0	1	1
Walmart Entrance	0	6	40	46
Westview Dr - Main St	0	13	69	82
US 31 Segments	0	14	70	84
Total	0	156	541	697

Table 2 lists the severity of the collisions reported within the corridor. These 3 years saw no fatalities, 156 injuries, and 541 crashes involving property damage. The intersections with the most crashes are Commerce Dr., Earlywood Dr., Jefferson St., Schoolhouse Rd., Simon Rd., the main Walmart entrance, and Westview Dr. These intersections have some of the highest intersecting volumes so higher crash frequencies can be expected. These same intersections are where a significant percentage of the injuries occurred. Corridor treatments will be sought that emphasize improvements at these high-risk locations as well as the rest of the corridor.

Many of the intersections experiencing high numbers of crashes have been identified within the past two years by INDOT on the Network Screening lists as having indices of crash costs (Icc) that are above nominal levels for those types of intersections. The intersections within the study limits that have been recently identified in the screening lists include:

Acorn Road

Adams Street

Banta Street

Earlywood Drive

Hospital Road

Schoolhouse Road

Simon Road

Westview Drive

The higher crash rates might be due to both operational and human factors. Corridor speeds may be decreasing and resulting in impatient and aggressive drivers, causing them to accept too small of gaps or make risky decisions. Construction outside the corridor could have caused drivers to change routes and utilize US 31, increasing traffic volumes which increases exposure in the corridor. Deficiencies in existing infrastructure could also be contributing to the high crash rates. Many of the traffic signal heads do not have back plates and may be difficult to see at times. Other signals do not have one signal head per lane on all approaches, which may reduce their visibility along with lacking back plates. With failing to yield the right of way and distracted driving being two of the most common cited causes of crashes in this corridor, current driving habits are likely a major factor in the crash history. Electronic device usage during driving has become more prevalent and resulted in more drivers not being focused on traffic while driving.

The proposed project seeks to address several the factors cited in the crash reports. The intersection designs proposed to be implemented in the corridor restrict turning movements at the intersections that should reduce the occurrence of right angle and left turn crashes. Aggressive driving may be tempered through the corridor by improving progression, reducing the urgency felt by motorists. Improved progression should also reduce rear end crashes by reducing queue lengths and keeping traffic moving. Signal head backplates and additional signal heads will be added with the project, improving signal visibility, which should reduce instances of disregarding traffic signals and failing to yield the right of way.

One of the intersections that has been previously identified in INDOT's network screening (Simon Road) has been actively programmed for a safety project. The project will close the median opening at Simon Road on US 31, which is consistent with what is planned for that location within

this project. Coordination should occur with the designer of the Simon Road project as the US 31 corridor project is further developed.

3.0 HSM Analysis

The 2010 Highway Safety Manual (HSM) 1st Edition was used to analyze the intersection conditions and crash history using the safety performance function (SPF) for urban and suburban arterials. Models have been developed that utilize the SPFs presented in the HSM to predict fatal, injury, and property damaging crashes. Geometric and site characteristics needed for the analysis were derived from aerial images.

3.1 Model Calibration

After site and geometric conditions were input, the analysis predictions did not closely match observed crash history. Therefore, calibration factors were developed to improve the accuracy of the HSM prediction. These factors were developed for the corridor's segments, signalized intersections, and stop controlled intersections. For each category, the total predicted crash frequency and the total observed crash frequency were summed. The observed crash total was divided by the HSM predicted total to develop calibration factors of 0.8 for segments, 3.4 for signalized intersections, and 1.8 for unsignalized intersections. The data for these calculations can be found in Table 3.

Table 3 - Calibration Factor Calculations

	Average Observed Crashes	Predicted Total Crashes	Calibration Factor
Signalized Intersections	137.3	40.8	3.4
Unsignalized Intersections	67.0	36.8	1.8
US 31 Segments	28.0	33.9	0.8

The calibration factors modify the results of the SPFs to better match local conditions. Once calibrated, the HSM model was compared against observed crash history to confirm they present similar results. The frequency of crashes predicted by the HSM and the observed number of crashes for the corridor are displayed in Table 4. The difference between the calibrated HSM model and observed crash history is shown in Table 5.

Table 4 - HSM Existing Crash History Analysis

Uncalibrated HSM Crashes Predicted (crashes/year)	Calibrated HSM Crashes Predicted (crashes/year)	Crashes Observed (crashes/year)
114.1	236.5	232.3

Table 5 – Calibrated HSM Crash Predictions

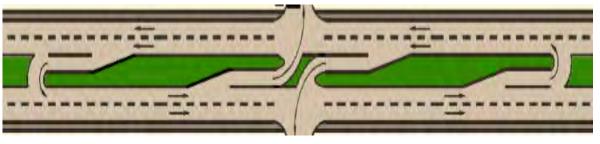
	Average Observed Crashes	Calibrated HSM	% Difference
Signalized Intersections	137.3	138.7	1%
Unsignalized Intersections	67.0	66.2	1%
US 31 Segments	28.0	27.1	3%

The calibrated model crash predictions are within 1.8% of the observed crash history. When broken out, both intersection types are modeled within 1.0% of the observed crash data and segments are modeled within 3.0%. Once calibrated, the HSM model was used to extrapolate future crash expectancy.

3.2 Crash Analysis

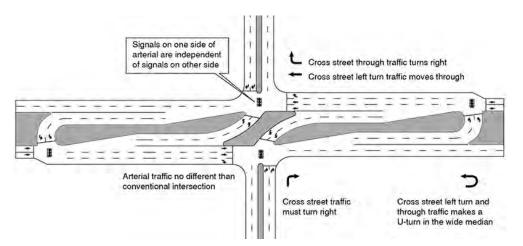
To improve the safety of the corridor, intersection modifications have been proposed. Those improvements include a large median separating northbound and southbound traffic along the length of the corridor. Throughout the corridor, median U-turn (MUT) intersection variations are proposed to be installed, including J-turns, boulevard lefts, and restricted-crossing U-turns (RCUTs). The proposed corridor configuration may be seen in *Appendix A*. The J-turn is demonstrated in *Figure 2*, below. This design eliminates minor street left turn and through movements at the main intersection. Minor street left turns and through movements are accommodated by downstream median cuts that permit U-turns. The main intersection is unsignalized. The RCUT intersection is the signalized version of the J-turn and may be seen in *Figure 3*.

Figure 2- J-Turn Intersection



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Figure 3- RCUT Intersection



Boulevard left intersections are another MUT variation. Unlike the RCUT and J-turn, the boulevard left prohibits all left turns at the main intersection, but does allow all through movements. Left turns must be conducted using a downstream U-turn, like the RCUT and J-turn intersections. *Figure 4* displays an example of a boulevard left.

● Crossing
● Merging
○ Diverging
➤ Vehicle Paths

Figure 4 – Boulevard Left Intersection

Reduction of left-turns throughout the corridor should eliminate many of the right-angle and turning crashes that occur within the corridor, particularly at minor road approaches where left turning traffic must find a gap in both directions of the major road traffic. To modify the HSM model for build conditions, crash modification factors (CMFs) were researched for conversion to J-turn, RCUT, Green T, and Median U-turn (MUT) intersections. CMFs were found on FHWA's Crash Modification Factor Clearinghouse website or in FHWA study reports and may be found in *Appendix B*. For converting a two-way stop-control (TWSC) intersection to a J-turn, a crash modification factor of 0.652 was found. This CMF indicates a reduction in crashes. This CMF, while developed for rural locations, was selected to be more conservative because the project is in a suburban/urban area. Other CMFs showed significantly more reduction in crashes for rural areas and no highly reliable CMFs were available for installing J-turns in suburban/urban areas.

Most of the signalized intersections along the corridor are proposed to be replaced with median U-turn or RCUT intersections. Median U-turns eliminate all left turns in the intersections themselves. Similar to J-turns, left turns for both major and minor streets are accommodated by downstream median cuts that permit U-turns. For converting a signalized intersection to a MUT, a CMF of 0.84 was used. Some signalized intersections were proposed to be converted to RCUT intersections. RCUT intersections permit major street left turns at the main intersection, but minor street left-turn and through movements must make a right-turn and utilize a downstream U-turn median cut. A CMF of 0.78 was selected for converting a signalized intersection to an RCUT.

The addition of a median throughout the corridor would likely cause a reduction in crashes along the US 31 segments; however, the U-turn locations along the segments might negate the benefits of the medians. Medians would reduce the number of conflict points in the corridor, but U-turns dispersed throughout the segments would introduce new opportunities for crashes by adding some conflict points. Because of the uncertainty of the net result of the U-turns and medians, no crash reduction was included along the corridor segments.

A secondary Enhanced Build alternative was developed that modified the treatment at certain intersections based on the capacity analysis of the corridor. Additionally, a MUT intersection was proposed at Nineveh Road and a green T intersection at S. Main Street in this alternative. This would provide a consistent corridor treatment throughout US 31 through the City of Franklin. The revised corridor configuration may be seen in *Appendix A*.

A green T-intersection, or continuous green T, is a signalized T intersection that channelizes the major street and minor street left turns. The minor street left turn is channelized into an acceleration lane or added lane to provide a free-flow merge or addition to the major road traffic stream. An example of a green T intersection is shown in *Figure 5*.

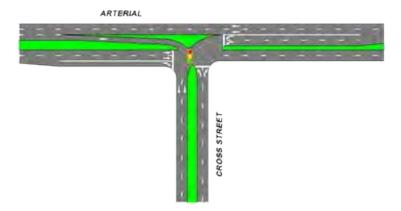


Figure 5 - Green T Intersection

The proposed corridor design was used to develop crash predictions for 2023 and 2043 for both the Build and Enhanced Build alternatives. AADT predictions were provided by INDOT for the

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Corridor Safety Study

June 2017 Revised August 2017 Revised October 2017 construction (2023) and design (2043) years. The J-turn, RCUT, Green T, and MUT CMFs were applied based on the proposed corridor design. As previously stated, no reduction factors were applied to the US 31 segments due to the introduction of U-turn movements. The HSM crash predictions are shown in *Table 6*. Current AADT volumes were extrapolated using a 1.2% growth rate provided by INDOT to develop construction and design year volumes.

Table 6 – HSM Crash Predictions

	Fatal and Injury (crashes/year)	Property Damage (Crashes/year)	Total (crashes/year)
2023 Build	69	136	205
2023 No Build	87	167	254
2023 Enhanced Build	66	130	196
2043 Build	90	173	263
2043 No Build	115	217	332
2043 Enhanced Build	86	165	251
% Reduction Between 2043 Build and No-Build	21.7%	20.3%	20.8%
% Reduction Between 2043 Enhanced Build and No-Build	25.2%	24.0%	24.4%

The HSM was used to extrapolate crash predictions for the construction year (2023) and the design year (2043). Table 6 displays the crash predictions calculated using the HSM. The Build alternative would see an estimated 20.8% decrease in crashes through the corridor. The Enhanced Build alternative is estimated to reduce total crashes by 24.4%. The injury and fatality rate reductions account for a significant portion of the overall reduction. In the 2043 Enhanced Build, there is predicted to be 29 fewer injury/fatal crashes than the No Build, four fewer than the 2043 Build alternative. The full HSM analysis results may be seen in *Appendix C*.

4.0 RoadHat

In addition to the HSM safety analysis, a RoadHat safety audit was conducted using the RoadHat 3.0 program. The additional analysis was done to provide safety analysis results in a format that could be used for project ranking when applying for funding. Five intersections along the corridor were analyzed to provide a good representation of the safety improvements along the corridor. Crash modification factors were applied to the crash history for each intersection to develop the design year crashes. *Table 7* has the existing, construction and design year No Build, Build, and Enhanced Build Index of Crash Frequency (I_{CF}) and Index of Crash Cost (I_{CC}) values. The I_{CC} values were developed using 2013 dollars.

Table 7 - RoadHat Crash Index Predictions

US 31 Intersection	Index	Hospital Road	Jefferson Street	Westview Drive/N. Main Street	Schoolhouse Road	Commerce Drive
2017 Eviation	I _{CF}	3.34	0.67	1.99	1.81	0.42
2017 Existing	I _{cc}	1.95	0.4	3.08	2.51	2.21
2023 No	I _{CF}	3.37	0.62	2.02	1.87	0.46
Build	I _{cc}	1.95	0.35	3.21	2.68	2.39
2023 Build	I _{CF}	2.29	0.34	1.54	0.71	0.17
2023 Bulla	Icc	1.52	0.2	2.84	1.8	1.8
2023	I _{CF}	0.19	0.34	1.05	0.71	0.17
Enhanced Build	I _{cc}	1.02	0.2	2.43	1.8	1.8
2043 No	I _{CF}	3.76	0.59	2.07	1.91	0.48
Build	I _{cc}	2.26	0.3	3.43	2.82	2.51
2042 Duild	I _{CF}	2.54	0.31	1.58	0.73	0.18
2043 Build	I _{CC}	1.74	0.14	3.02	1.88	1.88
2043	I _{CF}	0.27	0.31	1.07	0.73	0.18
Enhanced Build	I _{cc}	1.23	0.14	2.59	1.88	1.88

The results in *Table 7* confirm the results from the HSM analysis. The improvements to the US 31 corridor provide significant reductions in the Index of Crash Frequency at all five intersections. I_{CF} values decreased between 0.28-3.49 while I_{CC} values saw a more moderate decrease of 0.16-1.13 between the No Build and Enhanced Build alternatives. The Enhanced Build alternative results were the same or better than the Build alternative. The full RoadHat results may be found in *Appendix D*.

5.0 Summary and Recommendations

Based on the results of the HSM analysis, it is recommended that a combination of median U-turn configurations proposed in the Enhanced Build alternative be implemented along the US 31 corridor in Franklin. The combination of J-turns, RCUTs, boulevard lefts and green T intersections will improve the safety of the corridor significantly based on HSM and RoadHat predictive analyses. The HSM predicts a 24.4% reduction in corridor crashes by 2043, and intersection I_{CF}

values are expected to decrease between 0.16-1.13 between the No Build and Enhanced Build alternatives. Additional safety improvements might also be realized with the improved traffic operations from the proposed design.

Compared to the Build alternative, the Enhanced Build alternative should be modified at a few intersections. Due to the positive results of this safety study and the capacity analysis, the following adjustments to the proposed are recommended in the Enhanced Build alternative:

- RCUT at Nineveh Rd.
- signalized green T at S. Main St.
- partial RCUT at Hospital Road
- a hybrid Boulevard Left at Jefferson Street
- RCUT at Mallory Parkway
- RCUT at Westview Drive/N. Main Street
- RCUT at Christian Blvd./Oakville Blvd.

The modifications listed above provide capacity as well as additional safety benefits to the corridor. By 2043, the Enhanced Build alternative will reduce the crash frequency of the corridor by an estimated 71 crashes compared to the No Build according to the HSM. Busy intersections such as Westview Dr. and Schoolhouse Rd. will see significant improvements in I_{CF} values, indicating improved safety at the US 31 intersections in Franklin. The recommended design to provide the analyzed safety benefits may be seen in *Appendix A*.

Indiana Department of Transportation

100 North Senate Avenue, IGCN Indianapolis, IN 46204

City of Franklin

70 East Monroe Street Franklin IN 46131

Intersection Alternatives Memo

US 31 Corridor

June 2017



8790 Purdue Road Indianapolis, IN 46268

1.0 Introduction

This project will evaluate potential intersection types and corridor treatments on US Highway 31 (US 31) in Johnson County from South Main Street to Israel Lane. The proposed study area is located in Franklin, Indiana, beginning approximately 1.1 miles south of SR 44/SR 144/Jefferson Street at S. Main Street and extending north to Israel Lane 0.67 miles south of CR E 500 N/Whiteland Road.

The City of Franklin is proposing to reconfigure the US 31 corridor intersections in order to meet local and regional transportation needs. The design of this new corridor will be completed in a manner that best meets the needs of INDOT, Johnson County, the City of Franklin, and the traveling public. The formal purpose and need for the project will be determined through the NEPA process, but initial components of the purpose and need utilized for this study may include:

- > Reduce **congestion** at intersections along US 31.
- Improve roadway mobility for the US 31 corridor.
- > Improve **safety** throughout the roadway network through a more efficient transportation system.
- > Support **non-motorized** modes of transport by developing an accommodation plan to improve non-motorized access to the City of Franklin and Johnson County.

1.1 Existing Conditions

<u>US Highway 31-</u> US Highway 31 is classified as a principle arterial by INDOT. From south to north, the speed limit at the south end of the project is 55 mph. The posted speed switches from 55 mph to 45 mph between S. Main Street and Nineveh Road. The speed limit decreases to 40 mph south of Hospital Road. The speed limit remains 40 through Franklin until it is increased to 50 mph north of the Walmart entrance. The whole corridor has 4 lanes, 2 Northbound lanes and two southbound lanes. Most of the corridor has a 30 to 40-foot median. The section from South St. to Lemley St. does not have a raised median, but does have a two-way left-turn lane (TWLTL). There are 34 intersections along the corridor. Of these 34 intersections, seven are major collectors, two are minor arterials, and one is a principle arterial. Eleven intersections are signalized, the rest are two-way stop-controlled (TWSC) on the minor street.



Figure 1 – Corridor Through Franklin

2.0 Intersection Design Methodology

The corridor of US 31 through Franklin, IN consists of signalized and stop-controlled intersections. The purpose of this memo is to analyze alternative intersection designs for implementation into the US 31 corridor to improve mobility and safety. The INDOT Intersection Decision Guide (IDG) and FHWA's Capacity Analysis for the Planning of Junctions (CAP-X) software were used for the decision-making process.

FHWA's CAP-X software is a spreadsheet-based tool to assist with intersection configuration development during early planning stages of a project. The software requires minimal inputs to determine which intersections should be further analyzed.

The alternative intersection types analyzed are as follows:

- Conventional Intersection
- Median U-turn Intersection
- Roundabout Intersection
- Displaced Left-Turn Intersection
- Jug-Handle Intersection
- Offset "T" Intersection
- Green "T" Intersection
- Quadrant Roadway Intersection
- Grade Separation Intersection
- No Build

For more information on each intersection type, please see the INDOT IDG. The initial screening in the IDG is done via four yes/no questions in a flowchart. The intersection type must pass all four questions for that alternative to be considered viable. The intersection would then go on to a secondary assessment. This memo will focus on the initial screening.

The first assessment question, "Is it feasible and reasonable given site and geometric characteristics, notably right of way constraints, sheer nature of the junction (3 vs. 4 legs), and presence or absence of median potential?". The analysis for this criterion was done using aerial images and engineering judgment. The need for some right-of-way acquisition did not eliminate an alternative, but significant right-of-way needs in developed areas did.

The second question asks, "Is there a reasonable expectation that it will address essential project intent (remedy the core problem, be it traffic safety or traffic mobility), and does it do so in a manner in balance with the scale of the problem?". Determining the effectiveness of the alternative solution was done by CAP-X software. Major and minor road information were entered into the software. The effectiveness of the alternatives is displayed in *Appendix A*.

The third question is, "Does it likely improve or preserve existing state of performance relative to traffic safety (for all modes, including pedestrians), irrespective of essential project intent, be it mobility or safety?" The analysis for this criterion was done using information in the INDOT IDG.

The final question is written as, "Is it feasible and reasonable with respect to all other factors:

- Initial capital and recurring costs
- Stakeholders, customers
- Project development time
- Continuity, uniformity
- Environmental impacts
- Utility impacts"

The Question Four analysis was done using a subjective, high-level analysis. Information derived from aerial images and past project experiences were used as the basis for most of the decision making. A high-level Red Flag Investigation was also done to identify some potential environmental concerns. Some of the results of the red flag investigation are described below. Additional information may be found in *Appendix B*.

NWI-Wetlands – Eighteen wetlands are located within 0.5 miles of the project. One of these wetlands crosses the project and may be impacted.

Floodplain-FIRM — Two floodplains are located within 0.5 miles of the project. One of the identified floodplains crosses the project at two locations. Both floodplains may be impacted by the project.

Rivers and Streams – Three rivers/streams are located within 0.5 miles of the project. Two of these streams cross the project. These streams may be impacted.

Underground Storage Tanks (UST) – Thirty-five underground storage tanks are located within 0.5 miles of the project. Eighteen of the underground storage tanks are located near the limits of the project. Of the tanks within the project limits, ten are leaking. The project may impact some of the USTs.

3.0 Intersection Design Analysis

For the analysis, the four questions were applied one at a time for each intersection type at each intersection in the project corridor. For each question, if the design met the question criteria, it was given a "yes" and proceeded to the next question. If the design received a "no", the analysis for that design at the particular intersection ended. At the fourth question, if a design received a yes, it was deemed a feasible design for that intersection. The full results of the analysis are presented in *Table 1*.

Conventional Intersction (Boulevard) Displaced Left (signilized or Michigan Left, J Roundabout Turn Intersection ntersection (nea Offset "T Intersection unsignilized) turn, RCUT) Intersection Intersection (Overpass) Intersection Intersection Q1 Q2 Q3 Q4 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 01 02 03 04 es Yes Yes Adams St Yes Yes Yes Yes Yes Yes Banta St Branigin Rd Yes Christian Blvd-Oakville Blvd Yes es Yes Yes Yes Yes Yes Yes Yes Yes Earlywood Dr /es Yes /es Yes Yes Yes Industrial Dr Yes Yes Yes Yes Yes Yes International Dr Yes Yes Yes es Yes Ironwood Dr Yes Yes Yes Yes Yes Yes Israel Ln Yes Jefferson St Yes Yes Yes Yes King St Yes Yes Yes Kohls Ent es Yes Yes Kroger Dr Yes KYB North res Yes KYB South Yes Yes Yes Yes Yes Yes Lancer Dr-Sloan D es Yes Yes Yes Yes Yes Lemley St res Yes Yes res Yes Madison St Yes Yes Yes es Yes Yes Yes Yes Yes Mallory Pkwy Yes No Nineveh Rd Yes es Yes Yes Yes Yes Yes Yes Yes Yes Yes es Yes Yes Paul Hand Rd Yes Simon Rd South St - Franklin Lakes Blvd Yes ractor Supply - McDonalds /es Yes Yes Yes estview Dr - Main St

Table 1- Results of Initial Screening

The alternatives screening in *Table 1* confirms the feasibility of the proposed design that would install median U-turns throughout the corridor. Median U-turns pass the initial screening in all but one intersection. Roundabout intersections were also found to be feasible at many corridor intersections. Roundabouts may require more right of way acquisition than the MUTs because the U-turn locations can be moved along the corridor to lessen impacts. Green "T" intersections were also deemed feasible at several three-legged intersections. All three intersection types need or accommodate medians, which would be present in this corridor. These intersection designs could be incorporated into the same corridor.

4.0 Summary and Recommendations

The intersection design analysis confirms the feasibility of the proposed corridor design. Median Uturns are feasible throughout a majority of the entire corridor and would provide a continuous intersection treatment throughout. Green T intersections could be implemented with the MUTs at T-intersections but could not be implemented corridor-wide. Roundabouts could also provide a consistent corridor treatment. While roundabouts are feasible, they are not recommended for this corridor for the following reasons:

A main goal of this project is improved progression on the US 31 corridor through Franklin.
 Traffic would be forced to slow at each roundabout, slowing corridor progression and increasing corridor travel time.

- 2. Roundabouts interspersed with MUTs would prevent the progression of platoons along the US 31 corridor and would break up platoons arriving at downstream signals, lowering the signal efficiency.
- 3. US 31 is an alternate route for I-65 when events on I-65 require lane or full closures of the interstate. Providing quicker progression through the corridor would lessen the impact of interstate traffic detouring to US 31 when I-65 is congested or impassable.

Median U-Turn configurations are recommended for the US 31 corridor. Nineveh Road is recommended for inclusion in the study as a median U-turn design, similar to the proposed design for the rest of the corridor. This may provide additional travel time improvements and would provide a consistent treatment on US 31 through the Franklin city limits. A green T intersection is recommended for analysis at S. Main Street where there is a significant minor street left turn volume. Safety and capacity analyses were conducted, and the results may be found in the US 31 Capacity Analysis Memo and the US 31 Safety Countermeasures Memo. The memos confirmed MUTs to be an effective corridor design. Refer to those reports for the recommended design at each intersection.

PROVEN SAFETY COUNTERMEASURE:

Reduced Left-Turn Conflict Intersections









FHWA Safety Program





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Reduced Left-Turn Conflict Intersections



What is it?

Generally, reduced left-turn conflict intersections are geometric designs that lessen the number or severity of potential vehicle-to-vehicle conflicts associated with left-turn movements. Two of these highly effective intersection designs are included in this FHWA Proven Safety Countermeasure—the **restricted crossing U-turn (RCUT)** and the **median U-turn (MUT)**. In addition to modifying conflict points, these designs simplify driver decisions, reduce intersection congestion and delay, and minimize the potential for related crashes. For the RCUT and the MUT, the main intersection and the designated U-turn locations may be signalized or unsignalized.

Restricted Crossing U-turn

(Also known as: J-Turn, Synchronized Street, Superstreet)

The RCUT intersection design modifies the direct left-turn and through movements that drivers make from cross-street approaches. In an RCUT design, cross-street vehicles make a right turn followed by a U-turn at a designated location before continuing in the desired direction.



Source: Bolton & Menk, Inc

Median U-turn

(Also known as: Michigan Left, Express Left, ThrU-Turn, Boulevard Left)

The MUT intersection design modifies direct left turns from either (or both) the major and minor approaches. Vehicles proceed through the targeted main intersection, make a U-turn a



Source: FHW

short distance down the road, then make a right turn at the targeted main intersection. Left-turning traffic on the minor approach can also be directed to make a right turn at the main intersection followed by a U-turn at a designated location.



"It is estimated that **10** to **20** reduced-conflict intersections can be **built for the cost of**

ONE interchange. We are treating as many intersections as possible, being effective with taxpayer dollars and, most important, saving lives with every installation."

Minnesota DOT

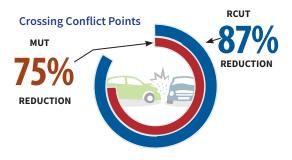
What are the Benefits?

Safety

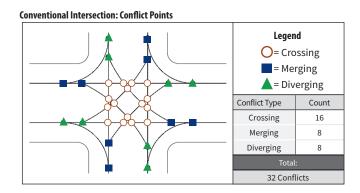
The underlying reason for the proven safety of the RCUT and MUT intersection designs is the reduction of conflict points—in particular, crossing conflict points.

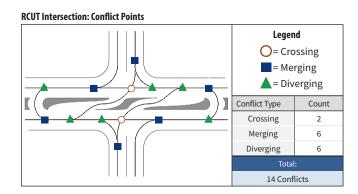
Each crossing conflict point increases the opportunity for right-angle crashes (also called T-bone crashes) to occur, which often result in severe injuries or fatalities.

Compared to traditional intersection designs, the RCUT and MUT intersection designs reduce the number of crossing conflict points by 87 percent and 75 percent, respectively.

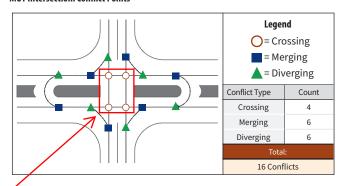


With this dramatic lessening in potential conflict points, the reduced left-turn conflict intersection strategy is proving its worth as States are increasingly implementing—and realizing the safety benefits of—RCUT and MUT designs.





MUT Intersection: Conflict Points



In Des 1800082, the MUT intersections where all left turns are restricted will not have these conflict points.



The following table highlights several RCUT implementations and study results.

MARYLAND	MINNESOTA	MISSOURI	NORTH CAROLINA
9 RCUT intersections along US 15 and US 2011	8 RCUT intersections ³	5 RCUT intersections along US 634	93 RCUT intersections ^{5,6}
44% reduction in total crashes	 100% reduction in fatal and serious injury right- angle crashes 	■ 35% reduction in total crashes	• 59% reduction in total crashes
RCUT at US 301 and MD-313² ■ 92% crash reduction over a 10-year period ■ 100% reduction in right- angle collisions and fatal and injury crashes	 77% reduction in all severity right-angle crashes 50% reduction in injury crashes 	54% reduction in fatal and injury crashes	 71% reduction in fatal and injury crashes The study also showed that these crash reductions remained consistent over a range of intersection volumes

- USDOT, FHWA, Field Evaluation of a Restricted Crossing U-Turn Intersection, FHWA-HRT-11-067 (June 2012). Available at: https://www.fhwa.dot.gov/publications/research/safety/hsis/11067/11067.pdf.
- Hochstein, J., T. Maze, T. Welch, "The J-turn Intersection Design Concept Basics," September, 2008. Available at: https://transportation.ky.gov/Congestion-Toolbox/Documents/J-Turn%20101.pdf.
- Minnesota Department of Transportation, A Study of the Traffic Safety at Reduced Conflict Intersections in Minnesota (May 2017). Available at: http://www.dot.state.mn.us/roadwork/rci/docs/trafficsafetyatrcistudy.pdf.
- Edara, P., C. Sun, and S. Breslow. "Evaluation of J-turn Intersection Design Performance in Missouri." Missouri Department of Transportation, December 2013.
- 5 Simpson, C., Safety Effectiveness of Un-Signalized Synchronized Street Intersections. North Carolina: North Carolina Department of Transportation, July 2016. Available at: https://connect.ncdot.gov/resources/safety/Safety%20Evaluation%20Completed%20Projects/ Unsignalized%20Synchronized%20Street%20Presentation%202016.pdf.
- ⁶ North Carolina Department of Transportation, NCDOT Traffic Safety Unit Programs, Synchronized Streets Evaluation. Available at: https://connect.ncdot.gov/resources/safety/TrafficSafetyResources/Unsignalized%20Synchronized%20Streets.pdf.

Michigan Department of Transportation (MDOT) is a pioneer on MUT installations. The MDOT website reports that, on roadways where Michigan Lefts were implemented, overall crashes were reduced by 30 to 60 percent. The greatest reductions are rear-end and head-on crashes during left turns (a 60 to 90 percent reduction), and in right-angle crashes (60 percent reduction).



Source: @2018 Google Map data, https://goo.gl/maps/DnhC4PJpu4L2

MUT intersection at US 24 and W. Warren Avenue in Dearborn Heights, Michigan.

¹ Michigan Department of Transportation, "Michigan Lefts." last modified n.d., Available at https://www.michigan.gov/mdot/0,4616,7-151-9615 44557-161777—,00.html. Last accessed October 2, 2018.

3



Traffic Flow

The RCUT and MUT designs can reduce travel times and congestion as well as improve overall traffic flow.

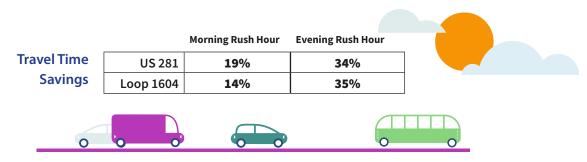
Implementation of an MUT design can improve intersection throughput by 20 to 50 percent compared to direct left-turn configurations.*



*FHWA, Median U-turn Intersection, FHWA-SA-14-042, (Washington, DC: 2014)

Source: FHWA

Texas used the RCUT design (called Superstreet in Texas) on US 281 North and Loop 1604 West. Each corridor has yielded travel time reductions in both the morning and evening peak times.²



According to the US 281 traffic study completed for the Alamo Regional Mobility Authority, the RCUT design can reduce fuel consumption by 1.1 million gallons annually for the corridor.³



Texas A&M Transportation Institute, Mobility Investment Priorities, Strategies, Superstreets. Available at: https://mobility.tamu.edu/mip/strategies-pdfs/system-modification/technical-summary/superstreets-4-pg.pdf.

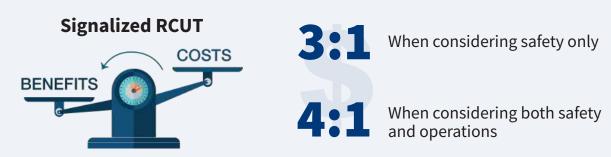
³ Alamo Regional Mobility Authority, Proposed U.S. Highway 281 Superstreet Traffic Study (June 2009).



Many agencies use the unsignalized RCUT design for their rural four-lane divided highways to improve safety. But in areas with higher volumes, signalized RCUTs and MUTs can also increase capacity and improve traffic efficiency.

- A signalized RCUT provides great flexibility in traffic signal timing to accommodate unbalanced traffic flow, because it allows for unique cycle lengths in each major street direction.
- A signalized MUT intersection can particularly improve traffic flow for the through movements on the major street by reducing the number of signal phases (from four to two) and shortening the overall signal cycle length. This can provide more "walk" time for pedestrians to cross the intersection, as well as more frequent crossing opportunities on an hourly basis.

Overall, reduced left-turn conflict intersections are often comparable in cost to an equivalent conventional design. When compared to a full, grade-separated interchange, RCUTs and MUTs cost much less while still meeting traffic demand, having fewer right-of-way impacts, and being faster to construct.



Source: Safety Evaluation of Signalized Restricted Crossing U-Turn Intersections, FHWA-HRT-17-082.



Source: @2018 Google Map Data, https://goo.gl/maps/8sML3WGT3v12

RCUT intersection at US 169 and Dodd Road in Traverse Township, Minnesota.

5



What Do I Need To Know To Implement RCUTs and MUTs?

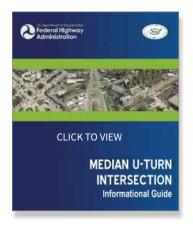
Design and User Considerations

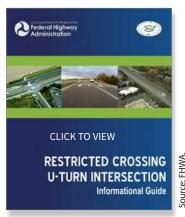
Some of the basic elements agencies will need to consider when implementing RCUT and MUT intersections include acceleration/auxiliary lanes, crossover spacing, median width, signing and pavement marking, and accommodations for large trucks, pedestrians, bicycles, emergency vehicles, and transit.

Signing, pavement marking, and geometric design are especially important for the success of RCUTs and MUTs. Providing sufficient guidance and direction to motorists reduces the chance of driver error and discourages prohibited turns.

The RCUT and MUT designs are adaptable and useful not only as a corridor treatment, but also as a treatment for single intersections. In addition, the designs can support community mobility and safety goals for both pedestrians and bicyclists.

FHWA has developed comprehensive informational guides for both RCUTs and MUTs. The guides provide multiple design options for accommodating pedestrians, bicyclists, and transit. Transportation practitioners looking to learn more about detailed design elements and overall guidance should refer to these publications.





FHWA Informational Guides for RCUT and MUT Intersections.



Source: MoDOT, https://flic.kr/p/8YT2t5.

Extra pavement or loons may be necessary at the U-turn location to accommodate large vehicles where narrow medians are present.



Source: North Carolina DOT.

Providing sufficient guidance and direction to motorists reduces the chance of driver error.



Public Outreach and Education

Public meetings are now commonplace for most transportation projects, but outreach becomes more important when implementing an unconventional intersection, especially in an area that has not experienced an RCUT or MUT design.

One common concern from the public is often related to the "perceived" extra travel time they think will occur by using the u-turn designs. Most

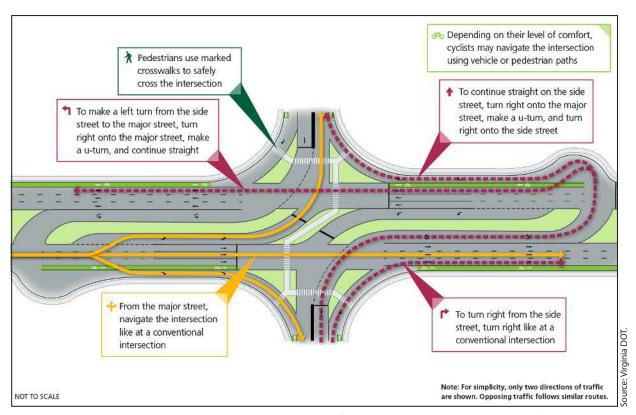
"In Missouri, converting from two-way stop-controlled intersections to RCUT intersections **cut the average wait time in half.**"

Source: Evaluation of J-turn Intersection

Design Performance in Missouri

implementations have demonstrated that travel time actually improves, and the resulting safety benefits that the RCUT and MUT intersections offer are substantial.

To help address public concerns and explain the benefits of the designs, FHWA provides multiple case studies, fact sheets, brochures, and videos to help support State and local transportation agencies in their communication and education efforts. Many State DOTs have also developed their own materials; for example, Virginia DOT developed an Innovative Intersections and Interchanges website that features valuable information for the public on RCUTs and MUTs, as well as other designs.



Graphic that shows how to navigate an RCUT (available on Virginia DOT's website): http://www.virginiadot.org/info/innovative_intersections_and_interchanges/rcut.asp.

7



What Else Can I Learn from Others?

Exceptional Outreach and Education in Utah

When Utah DOT (UDOT) decided to implement the ThrU Turn—the first MUT in the western United States—the agency knew that public education and outreach needed to be a priority. UDOT developed numerous materials to help stakeholders understand the reduced left-turn



Source: UDOT

conflict concept and how it will improve safety, reduce congestion, and support the economy. UDOT representatives visited businesses along the targeted corridors multiple times to explain the new design, provide information, and answer questions. The agency also hosted public meetings to provide opportunities to learn about the project, express concerns, and ask questions. To reach even more people, UDOT arranged for the ThrU Turn design informational videos to show at local theaters prior to the main feature. UDOT's ThrU Turn Intersection videos are available on UDOT's YouTube channel.

Reducing Left Turns in Orange Beach, Alabama

From 2012 to 2014, Highway 182 in Orange Beach experienced 227 total crashes, 49 injury crashes, and 4 fatalities – 50 percent of the fatalities were pedestrians. Alabama DOT (ALDOT) found that more than 70 percent of the crashes in this area involved left-turning traffic. To address these safety concerns, in 2016, ALDOT started a phased-construction roadway project on Highway 182 that included

adding signalized median u-turns, redesigning intersections to restrict left-turn movements, and installing additional pedestrian crosswalks. With this reduced left-turn conflict intersection project, ALDOT sought to balance the needs of pedestrians, bicyclists, and motorists. While safety is the primary benefit, the project also allowed the City of Orange Beach to add landscaping to the medians, improving the overall aesthetics of the corridor, which is important for this vacation-destination city.



Reduced left-turn conflict intersections can be designed to safely accommodate pedestrians and bicyclists, as shown in this preliminary concept graphic from Alabama DOT.

For More Information:

■ FHWA's Office of Safety U-Turn-based Intersections Website

ce: Alabama DOT

For More Information:

https://safety.fhwa.dot.gov/provencountermeasures/

FHWA Office of Safety





Bridge Inspection Report

031-41-07875 US 31 over YOUNGS CREEK



Inspection Date: 10/21/2020

Inspected By: Jessica Waggoner

Inspection Type(s): Routine

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Inspection Date: 10/21/2020 Facility Carried: US 31

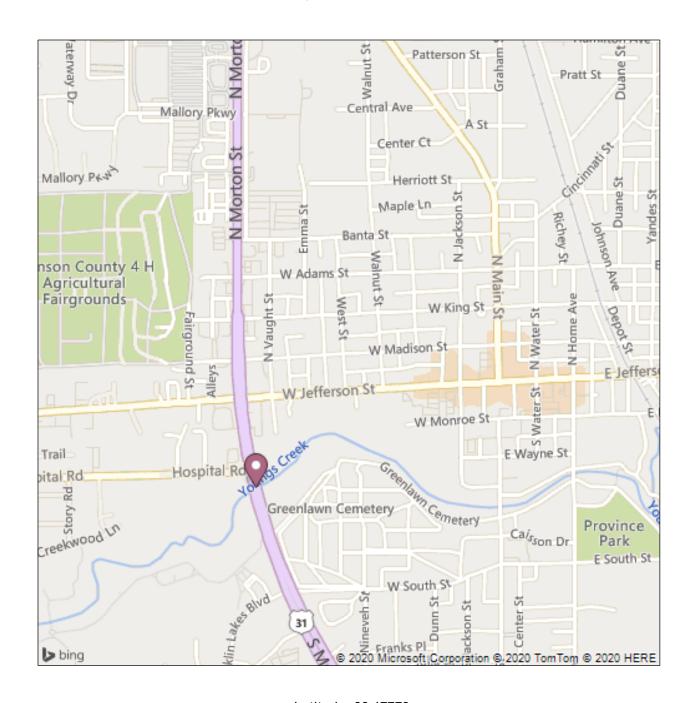
Bridge Inspection Report



Latitude: 39.47773 Longitude: -86.06361

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report



Latitude: 39.47773 Longitude: -86.06361

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report

The bridge was built in 1998 under Contract R-22852, Des # 9247461.

The bridge is to receive a thin deck overlay under Contract B-42083, Des # 1900702, due to let on 9/15/2021.

Overall the structure is in good condition.

There is a deficiency for drain cleaning.

Changed Item 104 HIGHWAY SYSTEM OF THE INVENTORY ROUTE from 1 - Structure/Route is on NHS to 0 - Structure/Route is NOT on NHS and deleted the elements from the asset values due to updates to the NHS map. The elements and quantities can be found in previous reports. (Chris Everman 5/11/2018)

Inspection Date: 10/21/2020 Facility Carried: **US 31**

Bridge Inspection Report

IDENTIFICATION

(1) STATE CODE: 185 - Indiana

009390 (8) STRUCTURE:

(5 A-B-C-D-E) INV. ROUTE: 1 - 2 - 1 - 00031 - 0

(2) HIGHWAY AGENCY 05 - Seymour

DISTRICT:

(3) COUNTY CODE: 041 - JOHNSON

(4) PLACE CODE: **25450 - FRANKLIN**

(6) FEATURES INTERSECTED: YOUNGS CREEK

(7) FACILITY CARRIED: **US 31**

00.15 S SR 44 (9) LOCATION:

(11) MILEPOINT: 0010.640 (12) BASE HIGHWAY NETWORK: 0

(13A) INVENTORY ROUTE:

(13B) SUBROUTE NUMBER:

(16) LATITUDE: 39.47773

(17) LONGITUDE: -86.06361

(98) BORDER

A) STATE NAME:

B) PERCENT %

(99) BORDER BRIDGE STRUCT.

NO:

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE, MAIN:

A) KIND OF 6 - Prestressed concrete

MATERIAL/DESIGN: continuous

02 - Stringer/Multi-B) TYPE OF DESIGN/CONSTR:

beam or Girder

(44) STRUCTURE TYPE, APPROACH SPANS:

A) KIND OF 0 - Other

MATERIAL/DESIGN:

B) TYPE OF DESIGN/CONSTR: 00 - Other (45) NUMBER OF SPANS IN MAIN 003

UNIT:

(46) NUMBER OF APPROACH 0000

SPANS:

(107) DECK STRUCTURE TYPE: 1 - Concrete Cast-in-

Place

(108) WEARING SURFACE/PROT

SYS:

A) WEARING SURFACE: 1 - Monolithic Concrete

> (concurrently placed with structural deck)

B) DECK MEMBRANE: 0 - None

C) DECK PROTECTION: 1 - Epoxy Coated

Reinforcing

AGE OF SERVICE

(27) YEAR BUILT: 1998

(106) YEAR RECONSTRUCTED: 0000

(42) TYPE OF SERVICE:

A) ON BRIDGE: 1 - Highway

B) UNDER BRIDGE: 5 - Waterway (28) LANES:

A) ON BRIDGE: 05

B) UNDER BRIDGE: 00

(29) AVERAGE DAILY TRAFFIC: 013625

(30) YEAR OF AVERAGE DAILY 2004

TRAFFIC:

TRAFFIC:

(109) AVERAGE DAILY TRUCK

05

%

(19) BYPASS DETOUR LENGTH: 001

MI

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report

GEOMETRIC DATA

(48) LENGTH OF MAX SPAN:	0049.2	FT	(35) STRUCTURE FLARED:	0 - No	flare
(49) STRUCTURE LENGTH:	00143.0	FT	(10) INV RTE, MIN VERT CLEARANCE:	99.99	FT
(50) CURB/SIDEWALK WIDTHS:			·		
A) LEFT	00.0	FT	(47) TOT HORIZ CLEARANCE:	045.5	
B) RIGHT:	00.0	FT	(53) VERT CLEAR OVER BR RDWY: (54) MIN VERTICAL	99.99	FT
(51) BRDG RDWY WIDTH CURB- TO-CURB:	080.3	FT	UNDERCLEARANCE: A) REFERENCE FEATURE:	N	
(52) DECK WIDTH, OUT-TO-OUT:	086.2	FT	B) MIN VERT UNDERCLEAR: (55) LATERAL UNDERCLEARANCE	0	FT
(32) APPROACH ROADWAY	080.0	FT	RIGHT:		
(33) BRIDGE MEDIAN:	2 - Close barrier)	ed median (no	A) REFERENCE FEATURE: B) MIN LATERAL UNDERCLEAR:	N 000.0	FT
(34) SKEW:	15	DEG	(56) MIN LATERAL UNDERCLEAR ON LEFT:	00.0	FT

INSPECTIONS

(90) INSPECTION DATE: (92) CRITICAL FEATURE	10/21/2020	(91) DESIGNATED INSPECTION FREQUENCY:	24	MONTHS
INSPECTION: A) FRACTURE CRITICAL REQUIRED/FREQUENCY:	N	(93) CRITICAL FEATURE INSPECTION DATE: A) FRACTURE CRITICAL DATE:		
B) UNDERWATER INSPECTION REQUIRED/FREQUENCY: C) OTHER SPECIAL INSPECTION	N N	B) UNDERWATER INSP DATE: C) OTHER SPECIAL INSP DATE:		
REQUIRED/FREQUENCY:				

CONDITION

(58) DECK:	7 - Good Condition (some minor problems)	(60) SUBSTRUCTURE:	7 - Good Condition (some minor
(58.01) WEARING SURFACE:	7 - Good Condition		problems)
(59) SUPERSTRUCTURE:	8 - Very Good Condition (no problems noted)	(61) CHANNEL/CHANNEL PROTECTION:	8 - Banks are protected
		(62) CULVERTS:	N - Not Applicable

CONDITION COMMENTS

(58) DECK: 7 - Good Condition (some minor problems)

Comments:

Light cracking in parapet walls with 8' spacing.

There is a minor amount of chipping at the joints.

(58.01) WEARING SURFACE: 7 - Good Condition

Comments:

The wearing surface is monolithic with the deck.

There is some minor cracking in the wearing surface. There is a minor amount of chipping at the joints.

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report

(59) SUPERSTRUCTURE: 8 - Very Good Condition (no problems noted)

Comments:

The superstructure is in good condition.

(60) SUBSTRUCTURE: 7 - Good Condition (some minor problems)

Comments:

Rip rap missing on the east side of Abutment #1, between beams #6 and 7 at Abutment #1, and between beams #3 and 4 of Abutment #4 (possibly due to being moved). There are minor cracks in the wing walls.

(61) CHANNEL/CHANNEL 8 - Banks are protected

PROTECTION

Comments:

The channel protection is in good condition. There is minor drift on the west side of Span C.

(62) CULVERTS: N - Not Applicable

Comments:

LOAD RATING AND POSTING

(31) DESIGN LOAD:	5 - HS 20	(66) INVENTORY RATING:	33	
(70) BRIDGE POSTING	5 - Equal to or above	(65) INVENTORY RATING METHOD: 1 - Load Factor (LF)		
	legal loads	(66B) INVENTORY RATING (H):	24	
(41) STRUCTURE	A - Open	(66C) TONS POSTED :		
OPEN/POSTED/CLOSED:	STED/CLOSED: (66D) DATE POSTED/CLOS			
(64) OPERATING RATING:	55	(00-,		
(63) OPERATING RATING METHOD:	1 - Load Factor (LF)			

APPRAISAL

SUFFICIENCY RATING:	97.4	(36) TRAFFIC SAFETY FEATURE:	
STATUS:	0	36A) BRIDGE RAILINGS:	1
(67) STRUCTURAL EVALUATION	ON: 7	36B) TRANSITIONS:	1
(68) DECK GEOMETRY:	9	36C) APPROACH GUARDRAIL:	1
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL:	N	36D) APPROACH GUARDRAIL ENDS:	1

(71) WATERWAY ADEQUACY: 8 - Bridge Above Approaches

Comments:

(72) APPROACH ROADWAY ALIGNMENT: 8 - Equal to present desirable criteria

Comments:

(113) SCOUR CRITICAL BRIDGES: 8 - Stable for scour conditions

Comments:

Inspection Date: 10/21/2020 Facility Carried: **US 31**

Bridge Inspection Report

CLASSIFICATION

(20) TOLL: 3 - On Free Road (21) MAINT. RESPONSIBILITY: 01 - State Highway Agency

(22) OWNER: 01 - State Highway (26) FUNCTIONAL CLASS OF 14 - Urban - Other **Principal Arterial**

Agency INVENTORY RTE:

(37) HISTORICAL SIGNIFICANCE: 5 - Not eligible Not a STRAHNET route (100) STRAHNET HIGHWAY: (101) PARALLEL STRUCTURE: N - No parallel structure

(102) DIRECTION OF TRAFFIC: 2-way traffic (103) TEMPORARY STRUCTURE:

(104) HIGHWAY SYSTEM OF 0 - Structure/Route is

(105) FEDERAL LANDS 0-Not Applicable **INVENTORY ROUTE:** NOT on NHS HIGHWAYS: (110) DESIGNATED NATIONAL Inventory route on

(112) NBIS BRIDGE LENGTH: Yes NETWORK: **National Truck Network**

NAVIGATION DATA

(38) NAVIGATION CONTROL: 0 - No navigation (39) NAVIGATION VERTICAL CLEAR: 000.0

control on waterway (116) MINIMUM NAVIGATION VERT. FT (bridge permit not CLEARANCE, VERT. LIFT BRIDGE: required)

(111) PIER OR ABUTMENT (40) NAV HORIZONTAL CLEARANCE: 0000.0 FT PROTECTION:

PROPOSED IMPROVEMENTS

(95) ROADWAY IMPROVEMENT COST: \$ 000000 (75A) TYPE OF WORK:

(75B) WORK DONE BY: (96) TOTAL PROJECT COST: \$ 000000

(76) LENGTH OF IMPROVEMENT: 00000.0 FT (97) YR OF IMPROVEMENT COST EST: (94) BRIDGE IMPROVEMENT \$ 000000

(114) FUTURE AVG DAILY TRAFFIC: 019535 COST: (115) YR OF FUTURE ADT: 2033

Miscellaneous Asset Data

009390

Asset Management

Load Rating	<u>2:</u>		
	load or the structural condition of the primary load abers changed since the last inspection?	No	
Extended Fr	equency:	Subm	nittal Date:
Inspector:			
INDOT Revie	wer:		
This bridge has	been accepted into the Extended Frequency Program.	Appro	oval Date:
Joints:	* Indicate location, type, and rating of lowest rated jo	int.	
Mid-Section	В		6
Comments:			
Terminal Joi Comments:	nts: *Rating of lowest rated terminal joint.	7	
Concrete Slo	ppewall: *Rating of lowest rated slopewall.	N	
Comments:			
Bearings:	* Indicate type, and rating of lowest rated bearing.		
2 - Elastmerio	8		
Comments:			

<u>Approach Slabs:</u> * Indicate if present & condition rating.

1 - Approach Slabs

7 - Good condition, minor cracking, wide spacing

Comments:

North and south approaches have angular, transverse and longitudinal cracks.

Paint: * Indicate if paint present , year paint	nted & condition rating.	
N - No Paint	Not Rated	
Comments:		
Endangered Species: * If yes, add one pe	hoto to the dropdown field	
Bats: seen or heard under structure? *	N - N	lo evidence of bats
Birds/swallows/nests seen? Empty nests pr	esent? * N - N	lo Birds and/or Nests Visi
BRIDGE Cul	vert Geometry:	
Barrel Leng	th:	
Height:		
Width:		

LOAD RATING - BRADIN Load Rating Date:

22-OCT-07

National Bridge Inventory (NBI):

(66B) INVENTORY RATING (H): 24 (31) DESIGN LOAD: 5

(65) INVENTORY RATING METHOD: 1 (70) BRIDGE POSTING: 5

(66) INVENTORY RATING: 33 (41) STRUCTURE OPEN/POSTED/CLOSED: A

(63) OPERATING RATING METHOD: 1 (66C) TONS POSTED:

(64) OPERATING RATING: 55 (66D) DATE POSTED/CLOSED:

Posting Configurations:

Emergency Vehicles: 5-Axles:

EV2: LEGAL RF: 2.26 AASHTO TYPE 3S2: LEGAL RF: 2.086

EV3: LEGAL RF: 1.528 SU5: LEGAL RF: 1.712

TOLL ROAD LOADING NO. 1: ROUTINE PERMIT RF:

<u>2-Axles:</u> <u>6+-Axles:</u>

H2o-44: LEGAL RF: 2.064 AASHTO TYPE 3-3: LEGAL RF: 2.221

ALTERNATE MILITARY: LEGAL RF: 1.923 LANE TYPE: LEGAL RF:

3-Axles: SU6: LEGAL RF: 1.629

HS20: LEGAL RF: 1.536 SPECIAL TOLL ROAD TRUCK: ROUTINE PERMIT RF:

AASHTO TYPE 3: LEGAL RF: 2.101 SU7: LEGAL RF: 1.569

4-Axles: MICHIGAN TRAIN TRUCK NO. 5: ROUTINE PERMIT RF:

SU4: LEGAL RF: 1.822 MICHIGAN TRAIN TRUCK NO. 8: ROUTINE PERMIT RF:

TOLL ROAD LOADING NO. 2: ROUTINE PERMIT RF:

Other Configurations: SUPERLOAD-11 AXLES: SPECIAL PERMIT RF: .988

H20-44: DESIGN RF: 1.236 SUPERLOAD-13 AXLES: SPECIAL PERMIT RF: 1.058

NRL: LEGAL RF: 1.549 SUPERLOAD-14 AXLES: SPECIAL PERMIT RF: .7777

SUPERLOAD-19 AXLES (152.5T): SPECIAL PERMIT RF: 1.044

SUPERLOAD-19 AXLES (240.045T): SPECIAL PERMIT RF: .805

Bridge Inspection Report

031-41-03534 US 31 over CANARY DITCH



Inspection Date: 10/21/2020

Inspected By: Jessica Waggoner

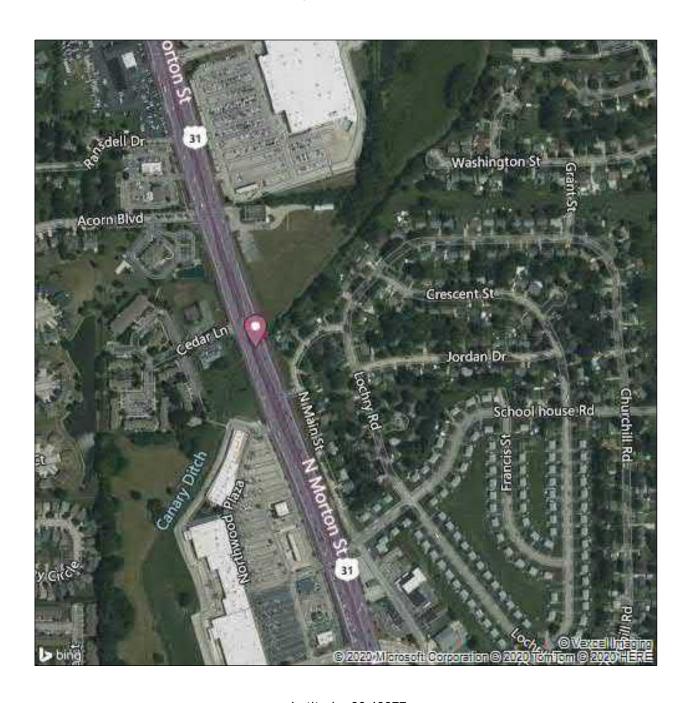
Inspection Type(s): Routine

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Inspection Date: 10/21/2020 Facility Carried: US 31

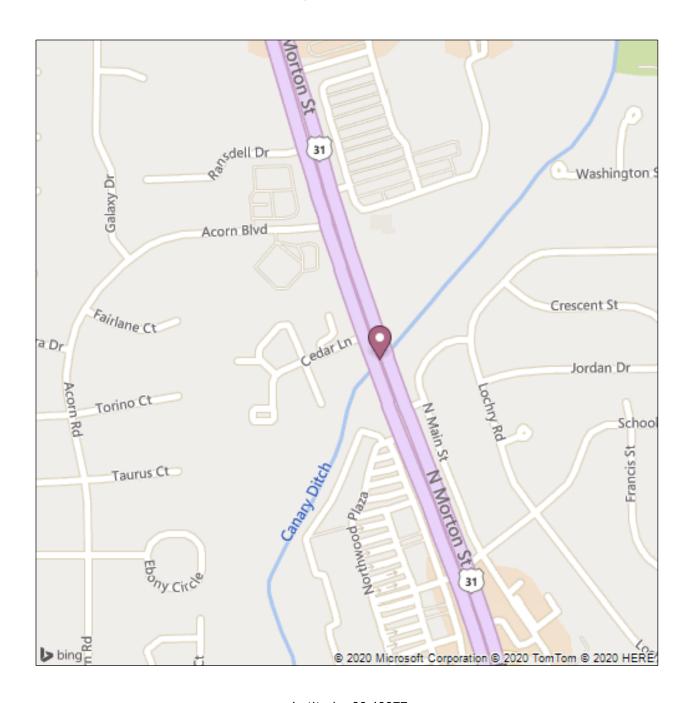
Bridge Inspection Report



Latitude: 39.49877 Longitude: -86.06703

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report



Latitude: 39.49877 Longitude: -86.06703

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report

The bridge was built in 1946 under Contract R-2686.

The bridge is in SPMS for replacement under Contract B-41480, Des # 1800272, due to let on 10/13/2022.

The bridge is in fair condition.

Inspection Date: 10/21/2020 Facility Carried: **US 31**

Bridge Inspection Report

IDENTIFICATION

(1) STATE CODE: 185 - Indiana

009400 (8) STRUCTURE:

(5 A-B-C-D-E) INV. ROUTE: 1 - 2 - 1 - 00031 - 0

(2) HIGHWAY AGENCY 05 - Seymour

DISTRICT:

(3) COUNTY CODE: 041 - JOHNSON

(4) PLACE CODE: **25450 - FRANKLIN**

(6) FEATURES INTERSECTED: **CANARY DITCH**

(7) FACILITY CARRIED: **US 31**

01.30 N SR 44 (9) LOCATION:

(11) MILEPOINT: 0012.090 (12) BASE HIGHWAY NETWORK: 0

(13A) INVENTORY ROUTE:

(13B) SUBROUTE NUMBER:

(16) LATITUDE: 39.49877 (17) LONGITUDE: -86.06703

(98) BORDER

A) STATE NAME:

B) PERCENT %

(99) BORDER BRIDGE STRUCT.

NO:

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE, MAIN:

A) KIND OF 1 - Concrete

MATERIAL/DESIGN:

B) TYPE OF DESIGN/CONSTR: 19 - Culvert (includes

frame culverts)

(44) STRUCTURE TYPE, APPROACH SPANS:

A) KIND OF 0 - Other

MATERIAL/DESIGN:

B) TYPE OF DESIGN/CONSTR: 00 - Other (45) NUMBER OF SPANS IN MAIN 001

UNIT:

(46) NUMBER OF APPROACH 0000

SPANS:

(107) DECK STRUCTURE TYPE: N - Not Applicable

(108) WEARING SURFACE/PROT

SYS:

A) WEARING SURFACE: N - NA

B) DECK MEMBRANE: N - NA

C) DECK PROTECTION: N-NA

AGE OF SERVICE

(27) YEAR BUILT: 1946

(106) YEAR RECONSTRUCTED: 0000

(42) TYPE OF SERVICE:

A) ON BRIDGE: 1 - Highway

B) UNDER BRIDGE: 5 - Waterway (28) LANES:

A) ON BRIDGE: 04

B) UNDER BRIDGE: 00

(29) AVERAGE DAILY TRAFFIC: 026617 2004

(30) YEAR OF AVERAGE DAILY

TRAFFIC:

(109) AVERAGE DAILY TRUCK 05 %

TRAFFIC:

(19) BYPASS DETOUR LENGTH: 007 MI

Inspection Date: 10/21/2020 Facility Carried: **US 31**

Bridge Inspection Report

GEOMETRIC DATA

(48) LENGTH OF MAX SPAN: 0025.0 FT FT

00028.0 (49) STRUCTURE LENGTH:

(50) CURB/SIDEWALK WIDTHS: 00.0 A) LEFT \mathbf{FT}

B) RIGHT: 00.0 FT

(51) BRDG RDWY WIDTH CURB- 068.0 FT TO-CURB:

(52) DECK WIDTH, OUT-TO-OUT: 123.0 \mathbf{FT}

(32) APPROACH ROADWAY 116.0 FT

(33) BRIDGE MEDIAN: 2 - Closed median (no barrier)

DEG (34) SKEW: 25

(35) STRUCTURE FLARED:

(10) INV RTE, MIN VERT 99.99 FT

CLEARANCE:

(47) TOT HORIZ CLEARANCE: 040.0 FT

(53) VERT CLEAR OVER BR RDWY: 99.99 FT

(54) MIN VERTICAL **UNDERCLEARANCE:**

A) REFERENCE FEATURE: N

0 FT B) MIN VERT UNDERCLEAR:

(55) LATERAL UNDERCLEARANCE RIGHT:

A) REFERENCE FEATURE: N

B) MIN LATERAL UNDERCLEAR: 000.0 FT

(56) MIN LATERAL UNDERCLEAR FT ON LEFT:

INSPECTIONS

(90) INSPECTION DATE: 10/21/2020

(92) CRITICAL FEATURE

INSPECTION:

A) FRACTURE CRITICAL N REQUIRED/FREQUENCY:

B) UNDERWATER INSPECTION N

REQUIRED/FREQUENCY:

C) OTHER SPECIAL INSPECTION

REQUIRED/FREQUENCY:

(91) DESIGNATED INSPECTION

FREQUENCY:

(93) CRITICAL FEATURE **INSPECTION DATE:**

A) FRACTURE CRITICAL DATE:

B) UNDERWATER INSP DATE:

C) OTHER SPECIAL INSP DATE:

CONDITION

(58) DECK: N - Not Applicable

N

(58.01) WEARING SURFACE: N - Not Applicable

(59) SUPERSTRUCTURE: N - Not Applicable (60) SUBSTRUCTURE:

N - Not Applicable

24 MONTHS

0 - No flare

(61) CHANNEL/CHANNEL

PROTECTION:

7 - Bank protection needs minor repairs

(62) CULVERTS: 5 - Moderate to

major deterioration

CONDITION COMMENTS

N - Not Applicable (58) DECK:

Comments:

(58.01) WEARING SURFACE: N - Not Applicable

Comments:

The wearing surface is in good condition.

(59) SUPERSTRUCTURE: N - Not Applicable

Comments:

(60) SUBSTRUCTURE: N - Not Applicable

Comments:

Spread footings, NO piles, set clay

Page 7 of 32

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report

(61) CHANNEL/CHANNEL 7 - Bank protection needs minor repairs PROTECTION

Comments:

The banks are steep but well vegetated.

There was no drift at the time of inspection.

The channel bottom is soft.

There is erosion in the northwest ditch around the telephone pole.

(62) CULVERTS: 5 - Moderate to major deterioration

Comments:

The barrel appears to have been repaired in the past. These repairs are holding.

Several cracks with efflorescence on lower portion of the barrel. Staining at the weep holes.

There is a 1' X 3" spall at the south spring line about 20' from the east arch ring. There is spalling with an area of approximately 2' X 25' at the north spring line half way through the structure. There is a 2' X 3' spall with exposed rebar in the top of the arch 50' from the west end of the structure. There is a 3' X 5' area of spalling at the north spring line 20' from the west end of the structure. Headwalls are spalling, cracking, and have efflorescence. Wingwalls have cracking with efflorescence and staining. There is scaling along the west headwall and spandrel wall and 10' of scaling and spalling on the east headwall. There is some cracking and spalling with exposed rebar at the construction joints.

LOAD RATING AND POSTING

LUAD KATING AND I U	SIING			
(31) DESIGN LOAD:	5 - HS 20	(66) INVENTORY RATING:	38	
(70) BRIDGE POSTING	5 - Equal to or above	(65) INVENTORY RATING METHOD: 1 - Load Factor (LF)		
	legal loads	(66B) INVENTORY RATING (H):	22	
(41) STRUCTURE	A - Open	(66C) TONS POSTED :		
OPEN/POSTED/CLOSED:		(66D) DATE POSTED/CLOSED:		
(64) OPERATING RATING:	65	(602) 211121 63122/ 626322		
(63) OPERATING RATING METHOD:	1 - Load Factor (LF)			

APPRAISAL

SUFFICIENCY RATING:	73.0	(36) TRAFFIC SAFETY FEATURE:	
STATUS:	0	36A) BRIDGE RAILINGS:	N
(67) STRUCTURAL EVALUATION	J: 5	36B) TRANSITIONS:	N
(68) DECK GEOMETRY:	9	36C) APPROACH GUARDRAIL:	0
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL:	N	36D) APPROACH GUARDRAIL ENDS:	0

(71) WATERWAY ADEQUACY: 6 - Occasional Overtopping of Approaches - Insignificant Delays

Comments:

(72) APPROACH ROADWAY ALIGNMENT: 8 - Equal to present desirable criteria

Comments:

(113) SCOUR CRITICAL BRIDGES: 5 - Scour within limits of footing or piles

Comments:

Inspection Date: 10/21/2020 Facility Carried: US 31

Bridge Inspection Report

CLASSIFICATION

(20) TOLL: 3 - On Free Road (21) MAINT. RESPONSIBILITY: 01 - State Highway

(22) OWNER:

On - State Highway

(26) FUNCTIONAL CLASS OF 14 - Urban - Other

Agency (26) FUNCTIONAL CLASS OF INVENTORY RTE:

(37) HISTORICAL SIGNIFICANCE: 5 - Not eligible

\$ 000000

(101) PARALLEL STRUCTURE: N - No parallel structure (100) STRAHNET HIGHWAY: Not a STRAHNET route

(103) TEMPORARY STRUCTURE: (102) DIRECTION OF TRAFFIC: 2-way traffic

(104) HIGHWAY SYSTEM OF **0 - Structure/Route is**

(105) FEDERAL LANDS **0-Not Applicable** INVENTORY ROUTE: **NOT on NHS**HIGHWAYS:

(112) NBIS BRIDGE LENGTH: Yes (110) DESIGNATED NATIONAL Inventory route not on NETWORK: network

NAVIGATION DATA

(38) NAVIGATION CONTROL: **0 - No navigation** (39) NAVIGATION VERTICAL CLEAR: **000.0 FT**

control on waterway (bridge permit not required) (116) MINIMUM NAVIGATION VERT. FT CLEARANCE, VERT. LIFT BRIDGE:

Principal Arterial

(111) PIER OR ABUTMENT
PROTECTION:

(40) NAV HORIZONTAL CLEARANCE: **0000.0 FT**

PROPOSED IMPROVEMENTS

(94) BRIDGE IMPROVEMENT

(75A) TYPE OF WORK: (95) ROADWAY IMPROVEMENT COST: \$ 000000

(75B) WORK DONE BY: (96) TOTAL PROJECT COST: \$ 000000

(76) LENGTH OF IMPROVEMENT: **00000.0 FT**(97) YR OF IMPROVEMENT COST EST:

COST: (114) FUTURE AVG DAILY TRAFFIC: 039614 (115) YR OF FUTURE ADT: 2031

Miscellaneous Asset Data

009400

Asset Management

Load Rating 2:			
	he structural condition of the primary load nged since the last inspection?	No	
Extended Frequency	<u>:</u>	Subr	mittal Date:
Inspector:			
INDOT Reviewer:			
This bridge has been according	epted into the Extended Frequency Program.	Appr	oval Date:
Joints: * Indicat	e location, type, and rating of lowest rated join	nt.	
No Joints Present	N - ONLY to remove other value that is no longer present.		N - ONLY to remove othe value that is no longer present.
Comments:	·		
Terminal Joints: Comments:	*Rating of lowest rated terminal joint.	N	
Concrete Slopewall:	*Rating of lowest rated slopewall.	N	
Comments:			
Bearings: * Indicate	type, and rating of lowest rated bearing.		
N - No Bearing(s)			
Comments:			

<u>Approach Slabs:</u> * Indicate if present & condition rating.

N - No Approach Slabs

Comments:	
Paint: * Indicate if paint present , y	ear painted & condition rating.
N - No Paint	Not Rated
Comments:	
Endangered Species: * If yes, ad	d one photo to the dropdown field
Bats: seen or heard under structure	? * N
Birds/swallows/nests seen? Empty i	nests present? * N

BRIDGE Culvert Geometry:

Barrel Length: 134.7

Height: 9 Width: 25

LOAD RATING - BRADIN

Load Rating Date: 13-OCT-11

National Bridge Inventory (NBI):

(66B) INVENTORY RATING (H): 22 (31) DESIGN LOAD: 5

(65) INVENTORY RATING METHOD: 1 (70) BRIDGE POSTING: 5

(66) INVENTORY RATING: 38 (41) STRUCTURE OPEN/POSTED/CLOSED: A

(63) OPERATING RATING METHOD: 1 (66C) TONS POSTED:

(64) OPERATING RATING: 65 (66D) DATE POSTED/CLOSED:

Posting Configurations:

Emergency Vehicles: 5-Axles:

EV2: LEGAL RF: AASHTO TYPE 3S2: LEGAL RF: 3.543

EV3: LEGAL RF: SU5: LEGAL RF: 5.653

TOLL ROAD LOADING NO. 1: ROUTINE PERMIT RF:

<u>2-Axles:</u> <u>6+-Axles:</u>

H2o-44: LEGAL RF: AASHTO TYPE 3-3: LEGAL RF: 2.717

ALTERNATE MILITARY: LEGAL RF: LANE TYPE: LEGAL RF:

3-Axles: SU6: LEGAL RF: 6.081

HS20: LEGAL RF: 1.833 SPECIAL TOLL ROAD TRUCK: ROUTINE PERMIT RF:

AASHTO TYPE 3: LEGAL RF: 2.055 SU7: LEGAL RF: 6.081

4-Axles: MICHIGAN TRAIN TRUCK NO. 5: ROUTINE PERMIT RF:

SU4: LEGAL RF: 4.037 MICHIGAN TRAIN TRUCK NO. 8: ROUTINE PERMIT RF:

TOLL ROAD LOADING NO. 2: ROUTINE PERMIT RF:

Other Configurations: SUPERLOAD-11 AXLES: SPECIAL PERMIT RF:

H2o-44: DESIGN RF: 1.1 SUPERLOAD-13 AXLES: SPECIAL PERMIT RF:

NRL: LEGAL RF: 6.657 SUPERLOAD-14 AXLES: SPECIAL PERMIT RF:

SUPERLOAD-19 AXLES (152.5T): SPECIAL PERMIT RF:

SUPERLOAD-19 AXLES (240.045T): SPECIAL PERMIT RF:

Culvert Inspection Report

CV 031-041-094.74 US 31 over



Inspection Date: 09/23/2021

Inspected By: Jessica Waggoner

Inspection Type(s): Culvert

Inspector: Jessica Waggoner Structure Number: 93006677
Inspection Date: 09/23/2021 Facility Carried: US 31

Culvert Inspection Report

Executive Summary

Unable to access at time of insepction.

Structure Number: CV 031-041-094.74 Inspector: Waggoner, Jessic

(27) Year Built:

(91) Inspection Frequency:

0000

36

Large Culvert Inspection Report

(8) Asset Code: 93006677

CV 031-041-094.74 (90) Inspection Date: 09/23/2021 Asset Name:

OLD Culvert ID: 31-41-94.74

Team Assignment: 05 Additional Treatment Exists

Identification

(2) Highway Agency District: 05 (3) County Code: 041

Sub District: 5300 Ramp ID:

Adjacent to Roadway (42B) Type of Service (Under): 5

(7) Facility Carried: US 31 (6) Features Intersected:

(9) Location: N Barth. Co (9.01) Location Additional Description:

(16) Latitude: 39.527702 -86.078468 (11) Milepoint: (17) Longitude: 14.29

Classification:

02 (104) Highway System of the Inventory Route: 1 (26) Functional Classification of Inventory Route:

Geometric Data

Culvert: Kind of Material: Min Est Fill Cover (ft): 1. Concrete Culvert: Type of Structure: 19. 4 Sided 1.00

Box Culvert

Culvert: Max. Horizontal Opening (ft.): 4.00 Culvert: Max. Vertical Opening (ft.): 3.00 (34) Skew:

Original Culvert Shape: Box Barrel Length (ft.): 120.0

Measurement Remarks:

Structure Additional Description:

Reinforced Concrete Box

Openings:

Opening Opening Opening Opening Direction Direction Latitude Longitude Latitude Longitude

1. 3. 2. 4.

Openings Comments:

Follow Up Required:

**If checked, please

Water describe for follow up:

Endangered Species

Bats: seen or heard under structure? * N - No

evidence of bats

Birds/swallows/nests seen? Empty nests present?

N - No Birds and/or Nests

Visi

* If yes, add one photo to the dropdown field

General Condition Ratings

(36A) Bridge Railings: (36C) Approach Guardrail: Ν Ν (36B) Transitions: Ν (36D) Approach Guardrail Ends: Ν

Culvert:

6 (62) Culvert - Rating:

(62) Culvert Rating Comments: There is spalling with exposed rebar on the east headwall. There is a bend in the box under the

northbound lanes.

Deck:

Ν (58) Deck:

(58a) Deck Comments:

Superstructure:

(59) Superstructure: Ν

(59.01) Superstructure

Comments:

Substructure:

(60) Substructure: Ν

(60.01) Substructure Spalling on east headwall with exposed rebar. Comments:

5 CV-Headwall/Anchor Rating

Ν CV-Wingwalls Rating

Channel:

7 (61) Channel and Channel

Protection:

(61.01) Channel and Channel

Protection Comments:

Water in channels.

Bank Erosion Rating: 8 7 **Drift/Sediment Rating** Channel Alignment Rating 8

Check this box if culvert has OBSTRUCTED flow

Describe Obstruction:

Overtopping Frequency:

Overtopping Frequency

Comments:



INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue Room N758-ES Indianapolis, Indiana 46204 PHONE: (855) 463-6848 (855) INDOT4U Eric Holcomb, Governor Joe McGuinness, Commissioner

February 4, 2022

Chip Orner City of Franklin Parks & Recreation Dept. 396 Branigan Blvd Franklin, IN 46131

Re: United States (US) 31 Roadway Improvement (Des. No. 1800082- lead) and Bridge Rehabilitation (Des. No. 2001610) in the City of Franklin, IN.

Mr. Orner,

The Indiana Department of Transportation (INDOT), the Federal Highway Administration (FHWA), and the City of Franklin are developing plans for a roadway improvement, culvert replacement, and bridge rehabilitation project. The proposed undertaking is on US 31, beginning approximately 1.05 miles south of SR 44/SR 144, near the US 31/Main Street intersection, and extending north to Israel Lane, approximately 4.35 miles north of SR 44/SR 144 in the City of Franklin, Johnson County, Indiana. It is within Pleasant and Franklin townships, Greenwood and Franklin United States Geological Survey (USGS) Topographic Quadrangles, Sections 3, 11, 12, 14, 23, 27, 28, and 34, Township 12 North, Range 4 East.

Project Description

INDOT has identified the need to address traffic congestion at intersections along US 31 within the identified project area. Also, the need for improved non-motorized transportation and pedestrian access arises due to limited amounts of existing infrastructure throughout the project corridor and the need to meet the City of Franklin's goal of improving and expanding its sidewalk and recreational trail system. The roadway improvement project (Des. No. 1800082) proposes construction of a combination of reduced conflict intersections (RCIs), median U-turn, green T, restricted crossing U-turn, and boulevard left intersection styles throughout the project corridor. Also, the project proposes to install traffic loons in conjunction with median U-turns at various points throughout the project corridor (a traffic loon is pavement that is constructed outside of normal traffic lanes to allow for larger vehicles to safely make a U-turn on a divided roadway). Improvements to non-motorized transportation access will occur by updating and extending sidewalks, installing 10-foot-wide paved trails parallel to both sides of US 31, and installing pedestrian crossing infrastructure at some intersections. The rehabilitation of the existing bridge over Youngs Creek (Bridge No. 031-41-07875 northbound and southbound, Des. No. 2001610) proposes widening the bridge to accommodate new multi-use trails on both sides of US 31.

Section 4(f) Definition of Use of Section 4(f) Property

Section 4(f) of the U.S. Department of Transportation Act of 1966, 49 USC 303 (c) was established to protect publicly owned parks, recreational areas (including recreational trails), wildlife and waterfowl refuges, or public and private historical sites against transportation conversions. A use of Section 4(f) property occurs when land is permanently incorporated into a transportation facility; there is a temporary occupancy of land

that is adverse in terms of the Section 4(f) statute's preservationist purpose; or there is a constructive use of Section 4(f) property.

Section 4(f) Resources

The project area of the roadway improvement project (Des. No. 1800082) intersects with four existing trails: the Simon Road Trail along the north side of Simon Road; Franklin Community High School Trail along Commerce Drive; the Historic Franklin Greenway Trail Phase 4 along State Road (SR) 44/Jefferson Street; and the Historic Franklin Greenway Trail Phase 3 along Main Street. The Historic Franklin Greenway Trail Phase 2 crosses under the bridge rehabilitation project over Youngs Creek (Bridge No. 031-41-07875 northbound and southbound, Des. No. 2001610). All four existing trails are considered Section 4(f) resources.

Temporary closures of the Simon Road Trail; Franklin Community High School Trail; the Historic Franklin Greenway Trail Phase 4; and the Historic Franklin Greenway Trail Phase 3 will be necessary to construct the connections of the proposed trails along the east and west sides of US 31 that are part of the roadway project (Des. No. 1800082). These four existing trails will not be affected by the bridge rehabilitation project (Des. No. 2001610). The Historic Franklin Greenway Trail Phase 2 that travels under the bridge carrying US 31 over Young's Creek will also be temporarily closed to rehabilitate the bridge but will not be affected by the roadway project (Des. No. 1800082).

There are two proposed shared use paths (trails) shown in the February 2020 Bicycle and Pedestrian Way Master Plan (found at: https://www.franklin.in.gov/department/division.php?structureid=63) along Branigan Road and Paul Hand Boulevard that will likely be managed by the City of Franklin Parks and Recreation Department. The current design of the roadway project (Des. No. 1800082) will not prevent the future construction of these two planned trails, and no impacts will occur as a result of the proposed bridge rehabilitation project (Des. No. 2001610).

There is also one planned trail, the Nineveh Road Corridor Trail, which is planned along Nineveh Road (County Road (CR) 200 E.), on the west side of US 31 approximately 0.37 mile north of the US 31/Main Street intersection and adjacent to the project area. This planned trail is under the ownership and management of the Johnson County Plan Commission. The current design of the roadway project (Des. No. 1800082) will not prevent the future construction of the planned Nineveh Road Corridor trail, and no impacts will occur as a result of the proposed bridge rehabilitation project (Des. No. 2001610).

The proposed trails along US 31 in this project, the proposed trails along Branigan Road and Paul Hand Boulevard, the five existing trails discussed in this letter, and the planned Nineveh Road Corridor Trail are all identified as proposed pedestrian and bicycle facilities in the February 2020 Bicycle and Pedestrian Way Master Plan.

Exceptions to Use of a Section 4(f) Resource

Section 4(f) of the U.S. Department of Transportation Act of 1966 defines use of a Section 4(f) resource as:

- 1) Land is permanently incorporated into a transportation facility such as through permanent acquisition of property or a permanent easement on a property protected by Section 4(f) for maintenance or other transportation related purposes;
- 2) Temporary occupancy of a property for a construction related purpose. The property is not permanently incorporated into a transportation facility but the activity is considered to be adverse in terms of the preservation purpose of Section 4(f); and/or
- 3) Constructive use. A constructive use involves no actual physical use of the Section 4(f) property via permanent incorporation of land or a temporary occupancy of land into a transportation facility. A constructive use occurs when the proximity impacts of a proposed project adjacent to, or nearby, a

Section 4(f) property result in substantial impairment to the property's activities, features, or attributes that qualify the property for protection under Section 4(f).

23 Code of Federal Regulations (CFR) 774.13 of the U.S. Dept of Transportation Act refers to exceptions to the requirements for Section 4(f) approval. These exceptions include 23 CFR 774.13(g), which are transportation enhancement activities, transportation alternatives projects, and mitigation activities, where:

- 1) The use of the Section 4(f) property is solely for the purpose of preserving or enhancing an activity, feature, or attribute that qualifies the property for Section 4(f) protection; and
- 2) The official(s) with jurisdiction over the Section 4(f) resource agrees in writing to paragraph (g)(1) of this section (above)

The proposed roadway project (Des. No. 1800082) will enhance the activities, features, and attributes of the Simon Road Trail; the Franklin Community High School Trail; the Historic Franklin Greenway Trail Phase 4; and the Historic Franklin Greenway Trail Phase 3, by constructing connections between the proposed trails and the existing trails as well as construction of Americans with Disabilities Act (ADA) compliant ramps and new marked street crossings, thus improving the overall connectivity of the Franklin's bicycle and pedestrian system (Condition #1 above). The US 31 bridge rehabilitation project over Youngs Creek (Des. No. 2001610) will widen the bridge to accommodate the proposed trails on the east and west sides of US 31. The bridge project will enhance the Historic Greenway Trail Phase 2 by providing the City of Franklin with opportunities to provide future connections between the Historic Greenway Trail Phase 2 and the proposed trails in the project, thus providing additional improvements to overall City of Franklin trail connectivity.

INDOT believes the proposed roadway and bridge rehabilitation projects along US 31 meet the above criteria for Exceptions for transportation enhancement activities as outlined above in 23 CFR 774.13(g).

By signing below, the City of Franklin concurs that the projects meet the criteria for Exceptions as outlined above.

Please return the signed concurrence to us. With this concurrence, we can conclude the Section 4(f) review for the project. We appreciate your help.

If you have any questions regarding this matter, please feel free to contact INDOT Project Manager Terry Summers at (812) 524-3749.

Note: The Historic Greenway Trail, Phase 2 passing under the US 31 over Youngs Creek bridge will remain open during construction. At the time this letter was drafted, it was believed that the trail would be closed temporarily during construction.

Sincerely,

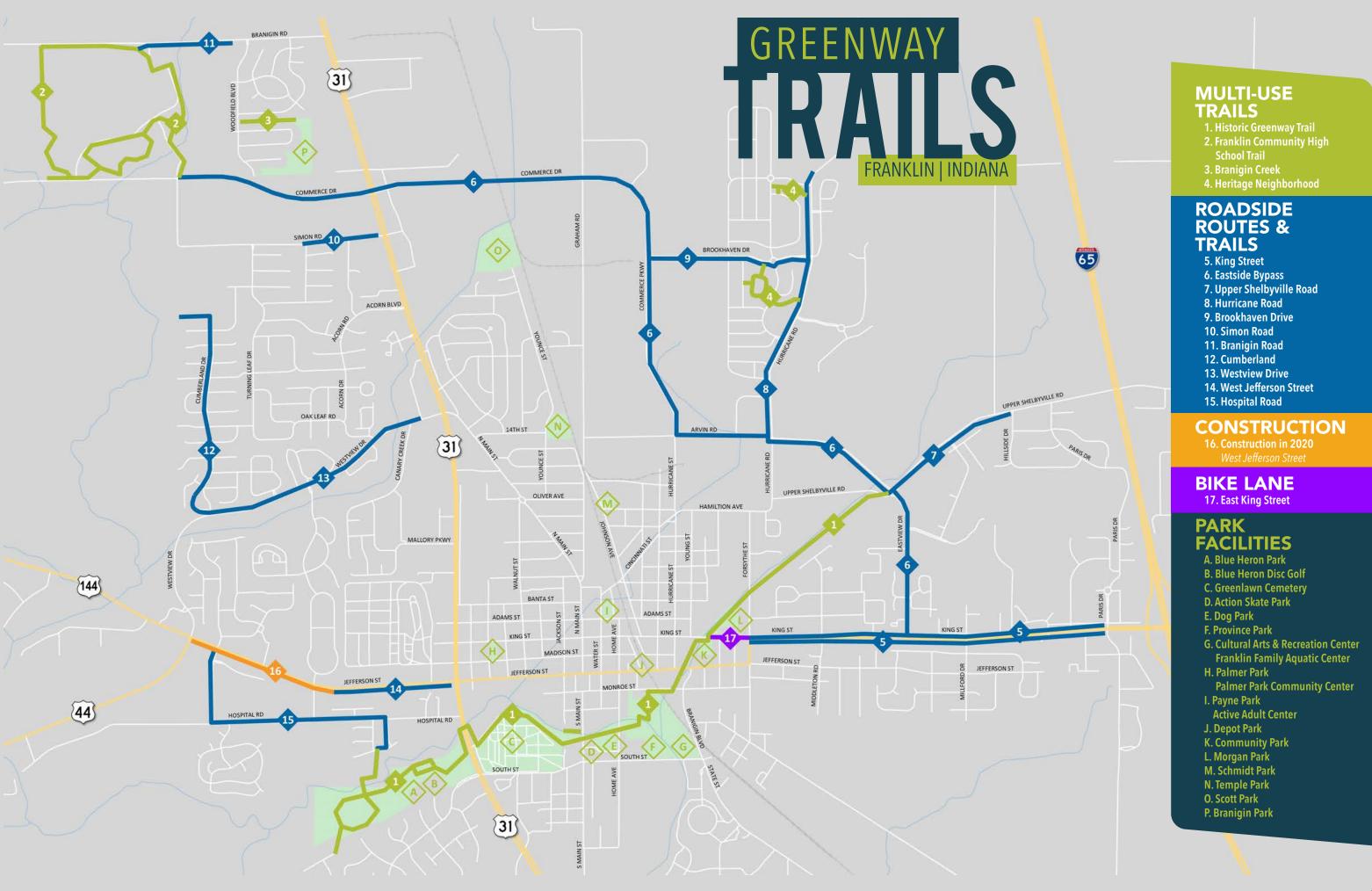
Erin Mulapan
Erin Mulryan, SJCA Inc.

Project Consultant

I/We concur with each of the stated findings above regarding the 4(f) Franklin Community High School Trail; the Historic Franklin Greenway Trail Phase 4; the Historic Franklin Greenway Trail Phase 3; and the Historic Franklin Greenway Trail Phase 2. I/We are officials with jurisdiction over the trails.

Chip Orner, Director- City of Franklin Parks & Recreation Dept.

Date 2/11/2022



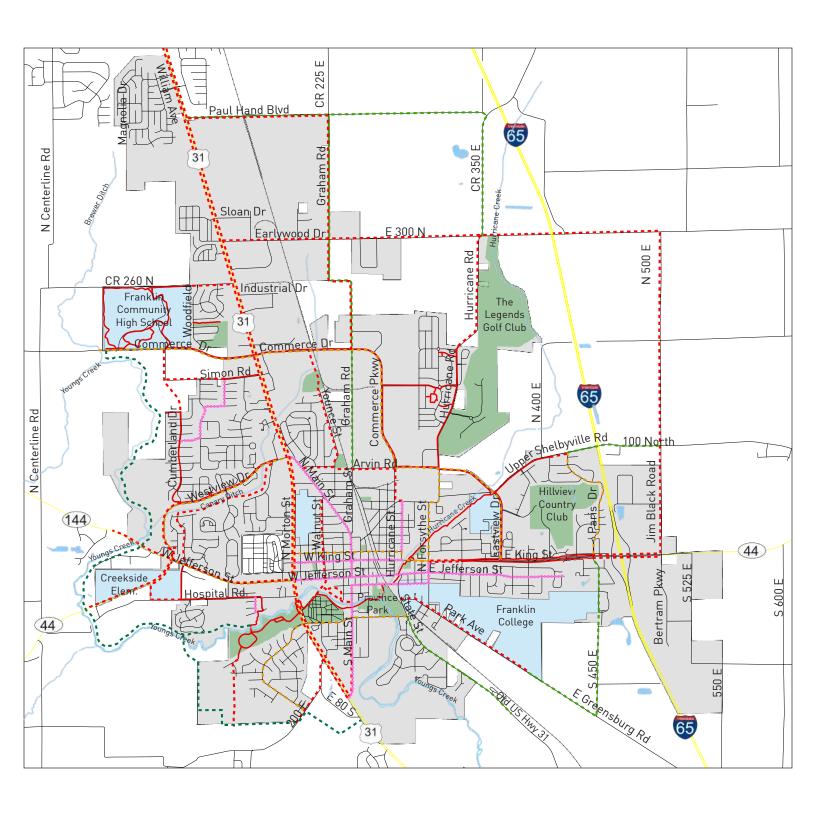


FIGURE 15
PROPOSED
BICYCLE
FACILITIES
(CITYWIDE)

PROPOSED --- Proposed Shared-Use Path --- Proposed Bicycle Lane --- Proposed Greenway --- Proposed Shared Lane --- Proposed Bike Route EXISTING Existing Shared-Use Path Existing Bicycle Lane



Land and Water Conservation Fund (LWCF) County Property List for Indiana (Last Updated July 2020)

ProjectNumber	SubProjectCode	County	Property
1800148	1800148	Johnson	Tot Park, New Whiteland Park
1800369	1800369B.10	Johnson	Independence Park
1800369	1800369B	Johnson	Johnson Co. Park/Hoosier Horse Park

^{*}Park names may have changed. If acquisition of publically owned land or impacts to publically owned land is anticipated, coordination with IDNR, Division of Outdoor Recreation, should occur.

US 31 Roadway Improvement (Des. No. 1800082- lead), Culvert Replacement (Des. No. 1800272), and Bridge Rehabilitation (Des. No. 2001610) City of Franklin, Pleasant and Franklin Townships, Johnson Co. December 9, 2021

Project Description

Under Des. No. 1800082 (lead), the proposed project encompasses the roadway improvement for the entire length of the project, which begins approximately 800 feet south of South Main Street and extends north approximately 5.59 miles to Israel Lane. The proposed project will use a combination of reduced conflict intersections (RCIs), median U-turn, green T, restricted crossing U-turn, and boulevard left intersection styles throughout the project corridor. Also, the project proposes to install traffic loons in conjunction with median U-turns at various points throughout the project corridor. (A traffic loon is pavement that is constructed outside of normal traffic lanes to allow for larger vehicles to safely make a U-turn on a divided roadway.) Improvements to non-motorized transportation access will occur by updating and extending sidewalks, installing 10-foot-wide paved trails parallel to both sides of US 31, and installing pedestrian crossing infrastructure at some intersections.

Under Des. No. 1800272, the project proposes to replace the culvert (Structure Number 031-41-03534) that carries Canary Creek under US 31. Under Des. No. 2001610, the project proposes to rehabilitate the bridge that carries US 31 over Youngs Creek (Structure Numbers 031-41-07875 NBL & SBL) in order to accommodate the proposed trails on the outside.

At this time, the maintenance of traffic (MOT) plan will involve a combination of detours and phased construction to allow access to all businesses, residences, and facilities on US 31. At this time, the MOT plan proposes five phases of construction from Fall of 2022 to Fall of 2024 to minimize the impacts to access as well as impacts to travel to and through the City of Franklin.

EJ Analysis

Under FHWA Order 6640.23A, FHWA and the project sponsor, as a recipient of funding from FHWA, are responsible to ensure that their programs, policies, and activities do not have a disproportionately high and adverse effect on minority or low-income populations. Per the current INDOT Categorical Exclusion Manual, an Environmental Justice (EJ) Analysis is required for any project that has two or more relocations or 0.5 acre of additional permanent right-of-way. Both temporary and permanent right-of-way are anticipated for the undertaking: 10.3 acres temporary and 3.3 acres permanent. No business or residential relocations will occur. Therefore, an EJ Analysis is required.

Potential EJ impacts are detected by locating minority and low-income populations relative to a reference population to determine if populations of EJ concern exists and whether there could be disproportionately high and adverse impacts to them. The reference population may be a county, city or town and is called the community of comparison (COC). In this project, the COC is Johnson County. The community that overlaps the project area is called the affected community (AC). In this project, the AC is the City of Franklin. An AC has a population of concern for EJ if the population is more than 50% minority or low-income or if the low-income or minority population is 125% of the COC. Data from the 2019 American Community Survey (ACS) 5-year estimates was obtained from the US Census Bureau Website https://data.census.gov/cedsci/advanced on November 8, 2021 by SJCA Inc. The data collected for minority and low-income populations within the AC are summarized in the below table:

	COC – Johnson County, Indiana	AC – City of Franklin, Indiana
Percent Low-Income	7.4 %	10.0 %
125% of COC	9.3 %	AC > 125% COC
EJ Population of Concern		Yes
Percent Minority	11.0 %	6.6 %
125% of COC	13.8 %	AC < 125% COC
EJ Population of Concern		No

The AC, the City of Franklin, has a percent low-income of 10.0% which is below 50% and is above the 125% COC threshold of 9.3%. Therefore, the AC contains low-income populations of EJ concern.

The AC, the City of Franklin, has a percent minority of 6.6% which is below 50% and is below the 125% COC threshold of 13.8%. Therefore, the AC does not contain minority populations of EJ concern.

The project will result in positive community-wide impacts in the form of improved traffic flow and pedestrian/bicycle connectivity to existing trails and sidewalk networks, regardless of minority or income status. The maintenance of traffic will impact all travelers regardless of income or ethnicity and will not impact EJ populations more than any other population. Once complete, the project will maintain access to all businesses and residences on both sides of the US 31 roadway using a combination of RCIs, median U-turn, green T, restricted crossing U-turn, and boulevard left intersection styles. Traffic turning into businesses will use the proposed turning configurations, which are different from existing conditions, but access to businesses and residences will not be denied. The EJ analysis conducted for this project was forwarded to INDOT ESD on November 8, 2021. INDOT ESD responded on December 10, 2021, stating that "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-income populations of EJ concern relative to non-EJ populations in accordance with the provisions of Executive Order 12898 and FHWA Order 6640.23a."

Note: The anticipated ROW amounts changed following the completion of the EJ Analysis. The current anticipated ROW amounts are 6.37 acres temporary and 6.8 acres permanent. The change in the total amount of ROW was not substantial; therefore, the impacts to low-income and minority populations remains the same.

Environmental Justice Analysis for US 31 Roadway, Culvert, & Bridge Improvements (Des 1800082- lead; Des. 1800272; Des. 2001610)

		COC	AC1
			City of Franklin, Johnson
		Johnson County, Indiana	County, Indiana
	LOW-INCOME		
B 17001001	Population for whom poverty status is determined: Total	150,832	23,851
B 17001002	Population for whom poverty status is determined:Income in past 12 months below poverty	11,196	2,396
	Percent Low-Income	7.4%	10.0%
	125 Percent of COC	9.3%	AC>125% COC
	Potential Low-Income EJ Impact?		Yes
	MINORITY		
B 03002001	Total population: Total	153,716	25,106
B 03002002	Total population: Not Hispanic or Latino	148,218	24,388
B 03002003	Total population: Not Hispanic or Latino; White alone	136,803	23,447
B 03002004	Total population: Not Hispanic or Latino; Black or African American alone	3,664	266
B 03002005	Total population: Not Hispanic or Latino; American Indian and Alaska Native alone	178	C
B 03002006	Total population: Not Hispanic or Latino; Asian alone	5,192	193
B 03002007	Total population: Not Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	27	C
B 03002008	Total population: Not Hispanic or Latino; Some other race alone	375	67
B 03002009	Total population: Not Hispanic or Latino; Two or more races	1,979	415
B 03002010	Total population: Hispanic or Latino	5,498	718
B 03002011	Total population: Hispanic or Latino; White alone	3,119	499
B 03002012	Total population: Hispanic or Latino; Black or African American alone	137	C
B 03002013	Total population: Hispanic or Latino; American Indian and Alaska Native alone	28	C
B 03002014	Total population: Hispanic or Latino; Asian alone	0	C
B 03002015	Total population: Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	18	
B 03002016	Total population: Hispanic or Latino; Some other race alone	1,662	181
B 03002017	Total population: Hispanic or Latino; Two or more races	534	38
	Number Non-White/Minority (P007001-P007003)	16,913	1,659
	Percent Non-White/Minority	11.0%	6.6%
	125 Percent of COC	13.8%	AC<125% COC
	Potential Minority EJ Impact?	10.070	No No
		+	

HISPANIC OR LATINO ORIGIN BY RACE

Survey/Program: American Community Survey

TableID: B03002

Product: 2019: ACS 5-Year Estimates Detailed Tables

Universe: Total population

	Johnson County, Indiana		Franklin city, Indiana	
Label	Estimate	Margin of Error	Estimate	Margin of Error
✓ Total:	153,716	****	25,106	±527
➤ Not Hispanic or Latino:	148,218	****	24,388	±653
White alone	136,803	±199	23,447	±685
Black or African American alone	3,664	±327	266	±124
American Indian and Alaska Native alone	178	±189	0	±22
Asian alone	5,192	±232	193	±152
Native Hawaiian and Other Pacific Islander alone	27	±32	0	±22
Some other race alone	375	±211	67	±46
➤ Two or more races:	1,979	±517	415	±286
Two races including Some other race	49	±64	0	±22
Two races excluding Some other race, and three or more races	1,930	±512	415	±286
➤ Hispanic or Latino:	5,498	****	718	±335
White alone	3,119	±762	499	±284
Black or African American alone	137	±173	0	±22
American Indian and Alaska Native alone	28	±33	0	±22
Asian alone	0	±28	0	±22
Native Hawaiian and Other Pacific Islander alone	18	±29	0	±22
Some other race alone	1,662	±683	181	±138
➤ Two or more races:	534	±282	38	±62
Two races including Some other race	438	±271	38	±62
Two races excluding Some other race, and three or more races	96	±87	0	±22

POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE

Survey/Program: American Community Survey

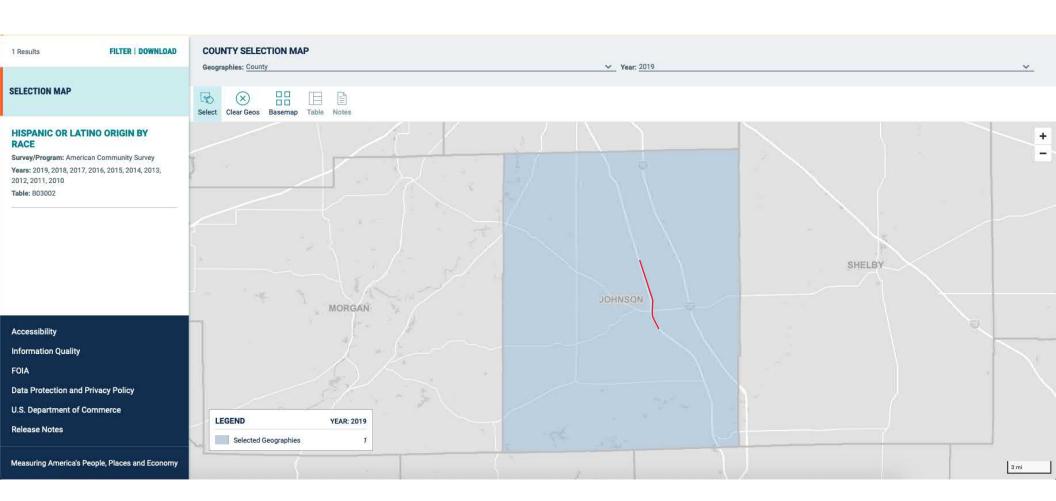
TableID: B17001

Product: 2019: ACS 5-Year Estimates Detailed Tables

Universe: Population for whom poverty status is determined

	Johnson County, Indiana		Franklin city, Indiana		
Label	Estimate	Margin of Error	Estimate	Margin of Error	
✓ Total:	150,832	±377	23,851	±596	
✓ Income in the past 12 months below poverty level:	11,196	±1,355	2,396	±668	
➤ Male:	5,139	±722	1,128	±365	
Under 5 years	570	±203	103	±61	
5 years	119	±88	57	±58	
6 to 11 years	862	±306	366	±232	
12 to 14 years	183	±91	43	±42	
15 years	124	±94	65	±72	
16 and 17 years	150	±92	76	±70	
18 to 24 years	654	±185	120	±80	
25 to 34 years	587	±230	50	±43	
35 to 44 years	446	±182	67	±46	
45 to 54 years	448	±150	32	±35	
55 to 64 years	631	±236	91	±73	
65 to 74 years	248	±106	38	±31	
75 years and over	117	±54	20	±25	
➤ Female:	6,057	±878	1,268	±352	
Under 5 years	332	±165	18	±28	
5 years	152	±97	44	±53	
6 to 11 years	635	±225	154	±98	
12 to 14 years	364	±133	44	±41	
15 years	85	±88	48	±37	
16 and 17 years	227	±124	89	±72	

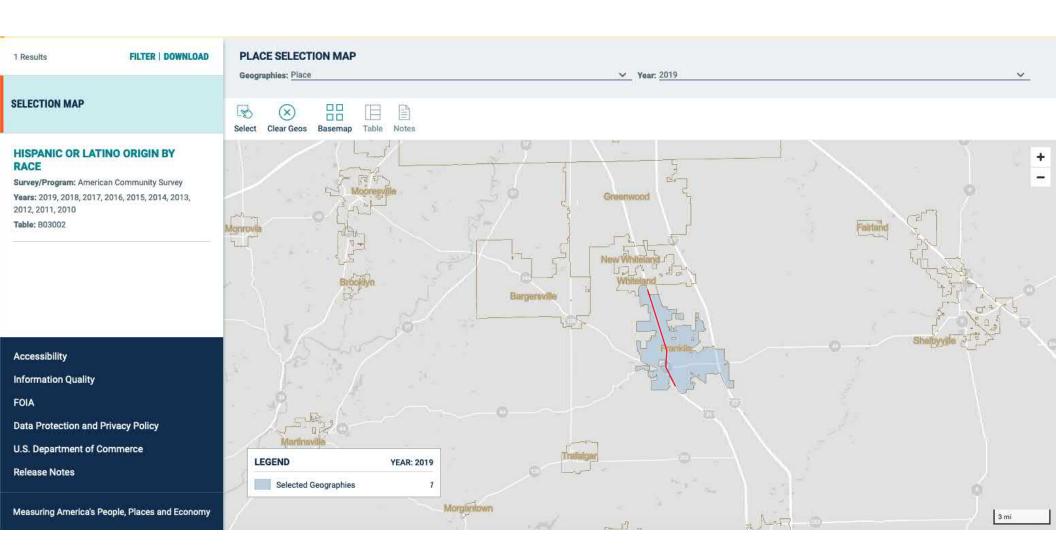
US 31 Roadway Improvement, Culvert Replacement, & Bridge Rehabilitation Project, Des. 1800082, 1800272, 2001610 City of Franklin, Johnson Co., IN



----- Project Alignment

US 31 Roadway Improvement, Culvert Replacement, & Bridge Rehabilitation Project, Des. 1800082, 1800272, 2001610

City of Franklin, Johnson Co., IN



— Project alignment