

Appendix H

Air Quality

Indiana Department of Transportation (INDOT)

State Preservatio	n and Loc	al Initiat	ted Proje	ects FY 2020 - 2024														
SPONSOR	CONTR ACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2020	2021	2022	2023	2024
Elkhart County	41652 / 1801612	Init.	IR 1019	Other Type Project (Mi scellaneous)	CR 13 @ NF&S Railroad	Fort Wayne	0	STBG		Local Funds	PE	\$0.00	\$575,000.00	\$425,000.00	\$150,000.00			
				1		1		1	1	Elkhart-Goshen MPO	PE	\$2,300,000.00	\$0.00	\$1,700,000.00	\$600,000.00			
Performance Measur	e Impacted:	Safety								1	1	I						
Elkhart County	41652 / 1801612	A 25	IR 1019	Other Type Project (Mi scellaneous)	CR 13 @ NF&S Railroad	Fort Wayne	0	STBG	\$0.00	Local Funds	PE	\$0.00	-\$575,000.00	(\$425,000.00)	(\$150,000.00)			
	•									Elkhart-Goshen MPO	PE	-\$2,300,000.00	\$0.00	(\$1,700,000.00)	(\$600,000.00)			
Performance Measur	e Impacted:	Safety								1								
Comments:MACOG	20-24TIP Re	s 16-20 R	emove pro	oject from STIP. Delete PE	in FY '20 ACQ Exempt 4/30/2020 T	IP Page uploaded und	er DES 1902	838		4								
Indiana Department of Transportation	41820 / 1701337	Init.	US 33	HMA Overlay, Preventive Maintenance	From 4.57 miles N of SR 15 N Jct (CR 15) to US 20	Fort Wayne	2.498	NHPP		Bridge Construction	CN	\$876,383.20	\$219,095.80	\$1,095,479.00				
										Road Construction	CN	\$1,241,121.60	\$310,280.40	\$1,551,402.00				
Performance Measur	e Impacted:	Pavemen	t Conditior	ı						ĺ								
Indiana Department of Transportation	41821 / 1383237	Init.	US 33	Other Intersection Improvement	9.42 miles N of SR 13 at CR 36/ College Ave	Fort Wayne	.242	NHPP		Road Construction	CN	\$425,505.60	\$106,376.40	\$531,882.00				
				1	1	1		1		Safety Construction	CN	\$1,280,164.00	\$320,041.00	\$1,600,205.00				
Performance Measur	e Impacted:	Safety								1	1							
Indiana Department of Transportation	41822 / 1500839	Init.	US 20	Concrete Pavement Restoration (CPR)	From 2.81 miles W of SR 19 to 3.18 miles W of SR 15	Fort Wayne	11.514	NHPP		Road Construction	CN	\$1,232,584.80	\$308,146.20	\$1,540,731.00				
Performance Measur	e Impacted:	Pavemen	t Condition	1	1		1		1	ĺ	-1	11						
Elkhart	41845 / 1801933	Init.	ST 2350	New Bridge, Other	Hively Avenue, east of Main Street, crossing the Norfolk Southern Railway	Fort Wayne	.42	STBG		Local Funds	RW	\$328,000.00	\$82,000.00		\$410,000.00			
					<u> </u>	•				Local Funds	CN	\$2,942,400.00	\$735,600.00			\$3,678,000.00		
										Local TRAXX program	PE	\$1,252,992.00	\$313,248.00			\$1,566,240.00		
										Local TRAXX program	RW	\$984,000.00	\$246,000.00		\$1,230,000.00			
										Local TRAXX program	CN	\$8,827,200.00	\$2,206,800.00			\$11,034,000.00		
										1	1	11						
Elkhart County	41846 / 1801913	Init.	ST 2731	New Bridge, Other	Sunnyside Ave / Mall Dr at US 33 (Main Street) over Norfolk Southern Railroad	Fort Wayne	.68	STBG		Local Funds	RW	\$1,472,000.00	\$368,000.00		\$1,840,000.00			
										Local Funds	CN	\$6,297,600.00	\$1,574,400.00			\$7,872,000.00		

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*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for information purposes.

Based on December 22, 2021 correspondence with the INDOT LPA Manager of Special Programs, the TIP and STIP are being updated and should match upon approval.

Indiana Department of Transportation (INDOT)

State Freservatio	n and Loc	ai milial	ea Projec	CTS FY 2020 - 2024			_											
SPONSOR	CONTR ACT #/ LEAD	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2020	2021	2022	2023	2024
	DES																	
Elkhart County	41846 / 1801913	Init.	ST 2731	New Bridge, Other	Sunnyside Ave / Mall Dr at US 33 (Main Street) over Norfolk Southern Railroad	Fort Wayne	.68	STBG		Local TRAXX program	PE	\$1,920,000.00	\$480,000.00			\$2,400,000.00		
						•				Local TRAXX program	RW	\$1,328,000.00	\$332,000.00		\$1,660,000.00			
										Local TRAXX program	CN	\$9,942,400.00	\$2,485,600.00			\$12,428,000.00		
L										I								
Elkhart County	41846 / 1801913	A 31	ST 2731	New Bridge Construction	Sunnyside Ave / Mall Dr at US 33 (Main Street) over Norfolk Southern Railroad	Fort Wayne	.68	Safety	\$21,698,782.82	Local Funds	RW	\$878,028.00	\$219,507.00				\$1,097,535.00	
	1			1		1	1	1	1	Local Funds	CN	\$6,283,953.29	\$1,570,988.32				\$7,854,941.62	
										Local TRAXX	PE	\$924,031.09	\$231,007.77		\$1,155,038.87			
										Local TRAXX	CN	\$8,529,978.00	\$2,132,494.50		\$50,000.00		\$10,612,472.50	
										Toll Lease	PE	\$4,570,195.16	\$1,142,548.79		\$3,000,000,00		\$2 712 743 95	
										Amendment Proceeds								
										Toll Lease Amendment Proceeds	RW	\$2,780,422.00	\$695,105.50				\$3,475,527.50	
Performance Measu	e Impacted:	Bridge Co	ndition															
Comments:Add New	Project PE \$	4,155,038	8.87 to FY 2	2021, RW \$3,475,527.50	to FY 2023, CN/CE \$10,612,472.50 to	FY 2023. MACOG Re	solution 28	20 7/8/2020. AQC Exe	empt 7/8/2020.									
Elkhart County	41846 / 1801913	M 34	ST 2731	New Bridge Construction	Sunnyside Ave / Mall Dr at US 33 (Main Street) over Norfolk Southern Railroad	Fort Wayne	.68	Safety	\$36,238,860.17	Local Funds	PE	\$0.00	\$0.00		\$0.00			
		1				1	-1	1		Toll Lease Amendment Proceeds	PE	-\$4,256,692.43	-\$1,064,173.10		(\$2,713,246.87)	\$105,125.28	(\$2,712,743.95)	
			Ne	gative values a	re depicted by both par	entheses and	dashe	s.		Toll Lease Amendment Proceeds	RW	-\$339,601.13	-\$84,900.28		(\$1,660,000.00)	\$151,354.00	\$1,084,144.58	
			Ba	sed on Decemb	per 22, 2021 correspor	dence with th	e INDO	T LPA		Local Funds	RW	-\$959,874.04	-\$239,968.51		(\$1,840,000.00)	\$47,796.00	\$592,361.44	
			Ma sho	ould match upc	al Programs, the TIP an on approval.	d STIP are bei	ing upa	ated and		Local TRAXX program	CN	-\$9,248,956.13	-\$2,312,239.03		(\$50,000.00)	(\$12,428,000.0 0)	\$916,804.83	
										Local Funds	CN	-\$3,145,523.66	-\$786,380.91			(\$7,872,000.00)	\$3,940,095.42	
Performance Measure	e Impacted:	Bridge Co	ndition															
Comments:Moved R	W from FY 2	1 to FY 22	for \$151,3	54 and FY 23 for \$1,084,	144.58, removed PE in FY 22 and FY	21 and increased fund	s in FY 22 t	oy \$105,125.28, moved	all CN to FY 23 an	d increased funds by	y \$916,804.8	3. MACOG modifi	cation letter 8/9/20	21.				
Elkhart County	41953 / 1900465	A 07	IR 4761	Bridge Replacement	Bridge No 312: on CR 142 over Turkey Creek	Fort Wayne	.095	STBG	\$1,606,410.00	Local Funds	PE	\$0.00	\$64,846.20	\$64,846.20				
	1	I		1	1	1		1	1	Local Funds	RW	\$0.00	\$7,537.80				\$7,537.80	
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	Locally Sponsored Projects											
DES	Location	Work Type	Fund Type	Phase	Federal	Match	Total	Estimated to Complete	Fiscal Year			
1702848	CR 40: from SR 19 to CR 7	Road Reconstruction	STBG	CN	\$1,201,448	\$300,362	\$1,501,810	\$1,758,606	2023			
1801913	Sunnyside Ave/ Mall Dr at US 33 (Main St) over NS Railroad	New Bridge	ST STBG	PE	\$1,920,000	\$480,000	\$2,400,000	\$16,488,000	2022			
1801913	Sunnyside Ave/ Mall Dr at US 33 (Main St) over NS Railroad	New Bridge	ST STBG	RW	\$1,328,000	\$332,000	\$1,660,000	\$16,488,000	2021			
1801913	Sunnyside Ave/ Mall Dr at US 33 (Main St) over NS Railroad	New Bridge	ST STBG	CN	\$9,942,400	\$2,485,600	\$12,428,000	\$16,488,000	2022			
1900486	CR 17 Phase I: from CR 142 to CR 38	New Road Construction	STBG	PE	\$2,090,400	\$2,403,960	\$4,494,360	\$25,944,000	2020			
1900486	CR 17 Phase I: from CR 142 to CR 38	New Road Construction	STBG	RW	\$100,000	\$25,000	\$125,000	\$25,944,000	2023			
City of Goshen												
1400715	Wilden Ave from Rock Run Creek to 6th St	Road Reconstruction	STBG	CN	\$4,343,920	\$1,085,980	\$5,429,900	\$5,429,900	2020			
1801613	US 33: from Fairfield to Plymouth Ave	Auxiliary Lanes	CMAQ	PE	\$165,040	\$41,260	\$206,300	\$1,031,450	2020			
1801613	US 33: from Fairfield to Plymouth Ave	Auxiliary Lanes	CMAQ	CN	\$660,160	\$165,040	\$825,200	\$1,031,450	2021			
1900391	Madison St at NS RR, DOT 510039L	Railroad Projection	ST STBG	PE	\$18,000	\$2,000	\$20,000	\$405000	2020			
1900391	Madison St at NS rr, DOT 510039L	Railroad Project	ST STBG	CN	\$346,500	\$38,500	\$385,000	\$405000	2020			
1900739	College Ave from US 33 to NS Railroad Line (East Entrance of parking lot)	Added Travel Lanes	STBG	PE	\$300,000	\$75,000	\$375,000	\$5,107,000	2020			
1900739	College Ave from US 33 to NS Railroad Line (East Entrance of parking lot)	Added Travel Lanes	STBG	RW	\$685,600	\$171,400	\$857,000	\$5,107,000	2022 2023			

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http://www.macog.com/docs/transportation/tip/updates/TIP_MODS.pdf

M35-21	INDOT	2100706	Bridge Deck Overlay	SR 19 SB Bridge over I-90 EB/WB, 9.15 Miles North of US 20	Elkhart	STBG	CN	\$ 1,060,373	\$ 265,093					\$ 1,325,466	Add Project to TIP
M34-21	INDOT	2002007	Bridge Deck Overlay	US 20 over York Road, 1.38 Miles E US 31	St Joesph	NHS	CN	\$ 1,664,820	\$ 416,205		\$ 5,000		\$ 2,076,025		Clerical Error
M33-21	INDOT	2100287	Safety Revision	Statewide Highway/Rail Grade Crossing Safety Action Plan	Various	HSIP	PE	\$ 6,430	\$ 700	\$ 7,130					Add Project to TIP
M32-21	INDOT	2002345	Bridge Deck Overlay	Cleveland/Brick Rd over US 31 SB/NB, 0.44 N I-90	St Joseph	NHS	CN	\$ 1,630,181	\$ 407,545		\$ 5,000	\$ 5,000	\$ 2,027,726		Add project to TIP
M32-21	INDOT	2002345	Bridge Deck Overlay	Cleveland/Brick Rd over US 31 SB/NB, 0.44 N I-90	St Joseph	NHS	PE	\$ 200,000	\$ 50,000	\$ 250,000					Add project to TIP
M32-21	INDOT	2002136	Bridge Deck Overlay	US 20 over Miami Highway, 0.87 E US 31	St Joseph	NHS	CN	\$ 1,664,870	\$ 416,217		\$ 5,000	\$ 5,000	\$ 2,071,087		Add project to TIP
M32-21	INDOT	2002136	Bridge Deck Overlay	US 20 over Miami Highway, 0.87 E US 31	St Joseph	NHS	PE	\$ 240,000	\$ 60,000	\$ 300,000					Add project to TIP
M32-21	INDOT	2002007	Bridge Deck Overlay	US 20 over York Road, 1.38 E US 31	St Joseph	NHS	PE	\$ 200,000	\$ 50,000	\$ 250,000					Decrease Federal Funding by \$440,000
M31-21	Kosciusko County	2000829	Railroad Protection	First Street DOT # 533535W - Upgrade - Norfolk Southern RR	Kosciusko	Local Safety Section 130	CN	\$ 450,000	\$ 50,000	\$ 500,000					Add project to TIP
M30-21	Elkhart County	2100065	New Bridge Construction	Extension and Realignment of CR 13 from Sunnyside Ave to CR 45	Elkhart	Local Funds	CN	\$ -	\$ 1,349,800		\$ 1,349,000				Increase local funding by \$87,100
M29-21	Elkhart County	2001724	New Bridge Construction	County Bridge 150 - Sunnyside Ave over Yellow Creek - Norfolk Southern Railroad	Elkhart	Local Trax	CN	\$ 983,195	\$ 259,304		\$ 1,242,499				Decrease Federal Funding by \$97,192
M28-21	Elkhart County	2001723	New Bridge Construction	County Bridge 151 - Concord Mall Dr over Yellow Creek - Norfolk Southern Railroad	Elkhart	Local Trax	CN	\$ 997,912	\$ 263,186		\$ 1,261,098				Increase Federal Funding by \$21,086
M27-21	Elkhart County	1900836	New Bridge Construction	County Bridge 148 - Sunnyside Ave/ Mall Dr at US 33 over Norfolk Southern Railroad	Elkhart	Local Trax	CN	\$ 3,694,427	\$ 974,354		\$ 4,668,781				Increase Federal Funding by \$42,513
M26-21	Elkhart County	1801913	New Bridge Construction	Sunnyside Ave/ Mall Dr. at US 33 (Main Street) over Norfolk Southern Railroad	Elkhart	Local Trax	CN	\$ 6,266,804	\$ 8,708,133		\$ 14,974,937				Update DES #
M25-21	Elkhart County	1801913	New Bridge Construction	Sunnyside Ave/ Mall Dr. at US 33 (Main Street) over Norfolk Southern Railroad	Elkhart	Local Trax	RW	\$ 4,562,446	\$ 1,440,772	\$ 3,650	\$ 5,999,569				Update DES #

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TIP Administrative Modifications

M24-19	Kosciusko County	1801935	Bridge	CR 1300 N Extension over NS RR and Main St	Kosciusko	Local Trax	RW	\$ 334,796	\$ 83,699	\$ 418,49	5				Change Funding type to State Local Trax
M24-19	Kosciusko County	1801935	Bridge	CR 1300 N Extension over NS RR and Main St	Kosciusko	Local Trax	CN	\$ 4,857,160	\$ 1,214,290		\$ 6,071,450				Change Funding type to State Local Trax
M23-19	Elkhart County	1801913	Bridge	Sunnyside Ave/Mall Dr at US 33 (Main St) over NS Railroad	Elkhart	Local Trax	PE	\$ 1,920,000	\$ 480,000			\$ 2,400,000			Change Funding type to State Local Trax
M23-19	Elkhart County	1801913	Bridge	Sunnyside Ave/Mall Dr at US 33 (Main St) over NS Railroad	Elkhart	Local Trax	RW	\$ 1,328,000	\$ 332,000		\$ 1,660,000				Change Funding type to State Local Trax
M23-19	Elkhart County	1801913	Bridge	Sunnyside Ave/Mall Dr at US 33 (Main St) over NS Railroad	Elkhart	Local Trax	CN	\$ 9,942,400	\$ 2,485,600						Change Funding type to State Local Trax
M22-19	Elkhart	1801933	Brdige	Hively Ave., east of Main St., crossing the NS Railroad	Elkhart	Local Trax	PE	\$ 1,252,922	\$ 313,248			\$ 1,566,240			Change Funding type to State Local Trax
M22-19	Elkhart	1801933	Brdige	Hively Ave., east of Main St., crossing the NS Railroad	Elkhart	Local Trax	RW	\$ 984,000	\$ 246,000		\$ 1,230,000				Change Funding type to State Local Trax
M22-19	Elkhart	1801933	Brdige	Hively Ave., east of Main St., crossing the NS Railroad	Elkhart	Local Trax	CN	\$ 8,827,200	\$ 2,206,800			\$ 11,034,000			Change Funding type to State Local Trax
M21-19	St Joseph County	1400638	Bike/Pedestrian Facilities	Auten Rd Multi-Use path from Laurel Rd to SR933	St. Joseph	TAP	RW	\$ 48,264	\$ 12,066	\$ 60,33)				Move Funding Year to FY 2020
M20-19	St Joseph County	1801613	Auxiliary Lanes	US 33: from Fairfield to Plymouth Ave	Elkhart	CMAQ	CN	\$ 660,160	\$ 165,040				\$ 825,200		Move Funding Year to FY 2023
M19-19	Goshen	1400715	Road Reconstruction (3R/4R Standards)	Wilden Ave. from Rock Run Creek to 6th St	Elkhart	STBG	CN	\$ 4,343,920	\$ 1,085,980			\$ 5,429,900			Move Funding Year from FY 2021 to FY 2022
M18-19	INDOT	VAR	LaPorte Grpd Proj Bridge, Culvert, and Small Structure Preservation	LaPorte District - Various	Marshall and St. Joseph	Various	VAR	\$ 53,203,604	\$ 13,361,001	\$ 30,379,93	\$ 23,017,052	\$ 8,174,991	\$ 3,001,945	\$ 1,148,002	Increase Federal Funding by \$5,317,006
M17-19	INDOT	1700709	ADA Sidewalk Ramp Construction	ADA Curb Ramps Along SR 23 in South Bend (St. Joseph County)	St. Joseph	NHS	CN	\$ -	\$ 278,641			\$ 278,641			Modify CN from FY 20 to FY 22
M17-19	INDOT	1700709	ADA Sidewalk Ramp Construction	ADA Curb Ramps Along SR 23 in South Bend (St. Joseph County)	St. Joseph	NHS	RW	\$ -	\$ 175,000	\$ 175,00)				Modify RW from FY 19 to FY 20
M16-19	INDOT	VAR	LaPorte Grpd Proj Bridge, Culvert, and Small Structure Preservation	LaPorte District - Various	Marshall and St. Joseph	Various	VAR	\$ 47,886,598	\$ 12,031,751	\$ 29,523,53	\$ 22,897,052	\$ 2,505,135		\$ 3,001,945	Increase Federal Funding by \$1,749,188



Appendix I

Noise



Excerpts

TRAFFIC NOISE IMPACT ANALYSIS

Elkhart Local Trax Grade Separation DES. 1801913 [Lead], 1900863, 2001723, and 2001724 Elkhart County, Indiana Prepared For: Indiana Department of Transportation June 3, 2021



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Traffic Noise Impact Analysis: Elkhart Local Trax Grade Separation

i

1.0 Executive Summary

A Traffic Noise Impact Analysis was conducted for the Elkhart Local Trax Grade Separation Project (hereinafter referred to as "Elkhart Local Trax Project") in Elkhart County, Indiana. The project involves eliminating two at-grade crossings (at Sunnyside Avenue/Concord Mall Drive and at County Road 13 (Lewis Street)) and providing a single, grade-separated crossing over Norfolk Southern Railroad (NSRR).

The Federal Highway Administration (FHWA) Traffic Noise Model (TNM) Version 2.5 was used to predict existing and future design year noise levels. Because design year noise levels are predicted to approach or exceed the FHWA Noise Abatement Criteria (NAC), the project has been found to have traffic noise impacts. Based on the Indiana Department of Transportation (INDOT) Traffic Noise Analysis Procedure (2017), noise abatement was considered at all locations in the noise study area where noise impacts were identified under the future build alternative.

Based on the studies thus far accomplished, the State of Indiana has not identified any locations where noise abatement is likely. Noise abatement measures that were studied at these locations were based upon preliminary design costs and design criteria. Noise abatement has not been found to be "feasible and reasonable" because no noise abatement could be implemented that would provide the required noise level reduction. A re-evaluation of the noise analysis will occur during final design. If during final design it has been determined that conditions have changed such that noise abatement is feasible and reasonable, the abatement measures might be provided. The final decision on the installation of any abatement measure(s) will be made upon the completion of the project's final design and the public involvement processes.

The viewpoints of the benefited residents and property owners are a major consideration in determining the reasonableness of highway traffic noise abatement measures for proposed highway construction projects. These viewpoints have been determined and addressed during the environmental phase of project development. The will and desires of the public are an important factor in dealing with the overall problems of highway traffic noise. INDOT will incorporate highway traffic noise consideration in on-going activities for public involvement in the highway program and will reexamine the residents' and property owners' views on the desirability and acceptability of abatement during project development.

2.0 Project History and Background Information

2.1 PURPOSE OF THE TRAFFIC NOISE IMPACT ANALYSIS

The purpose of this Traffic Noise Impact Analysis is to evaluate noise impacts and abatement under the requirements of Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) "Procedures for Abatement of Highway Traffic Noise and Construction Noise" for the Elkhart Local Trax Project. The project involves adding a railroad grade separation on Sunnyside Avenue and County Road (CR) 13 over Norfolk Southern Railroad (NSRR) in Elkhart County, Indiana. The proposed project would eliminate two existing at-grade crossings and provide a single, grade-separated crossing (overpass). This regulation provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with FHWA noise standards.

The INDOT Traffic Noise Analysis Procedure (2017) establishes INDOT policy for implementing 23 CFR 772 in Indiana. The INDOT Traffic Noise Analysis Procedure outlines the requirements for analyzing highway traffic noise. Noise impacts associated with this project will be included in the environmental document to be prepared for this project in compliance with the National Environmental Policy Act (NEPA).

2.2 PROJECT DESCRIPTION

The Indiana Department of Transportation (INDOT), in coordination with Elkhart County, is proposing the Elkhart Local Trax Project located in Elkhart County, Indiana. The project limits begin on US 33 (also known as Lincoln Highway) approximately 0.5 mile south of US 20, and extend southeast to the intersection of US 33 and CR 13. The west to east project limits begin at CR 20/Mishawaka Road at its intersection with Pineridge Parkway, and extends east along Concord Mall Drive and Sunnyside Avenue to CR 13. The noise study area defined for these projects is shown in Figure 1. The project (Des. Nos. 1801913 (Lead), 1900836, 2001723, & 2001724) encompasses US 33, CR 20 (Mishawaka Road), CR 13, Concord Mall Drive, Sunnyside Avenue, Norfolk Southern Railroad, and multiple local streets. The two atgrade railroad crossings within the project limits are located at Sunnyside Avenue/Concord Mall Drive and CR 13. Specifically, this project is located in the Elkhart Quadrangle, in Sections 22, 23, and 26 of Township 37 North, Range 5 East.



3.0 Methodology

3.1 FUNDAMENTALS OF TRAFFIC NOISE

The human ear perceives noise as a form of vibration that causes pressure variations. The ear is sensitive to this variation and perceives it as sound. The intensity of these pressure variations causes the ear to discern different levels of loudness. These pressure differences are commonly measured in decibels (dB).

The dB scale that is audible to the human ear spans about 140 dB. A dB level of zero is barely audible to the human ear while 140 dB is an unrecognizable sound which is painful to the listener. The decibel scale is a logarithmic representation of the actual sound pressure variation. This means that a 26 percent change in energy level only changes the sound level 1 dB. It would be possible for the human ear to detect this difference only in a laboratory. Increasing the energy level 100 percent would result in a 3 dB increase, which would be barely perceptible outdoors. A tripling in sound energy level would result in a clearly noticeable change of 5 dB in the sound level. An increase of ten times the energy level would result in a 10 dB increase in the sound level, which would be perceived as a doubling of the sound level.

The human ear has a non-linear sensitivity to noise. To account for this in noise measurement, electronic weighting scales are used to define the relative loudness of different frequencies. The "A" weighting scale, expressed as dB(A), is widely used in environmental work because it most nearly matches the non-linear nature of human hearing.

The measurement that is most commonly used to express dB(A) levels for traffic noise is the Hourly Equivalent Sound Level $[LA_{eq}(h)]$. The LA_{eq}(h) describes a noise sensitive receptor's cumulative exposure from all noise-producing events over a 1-hour period.

Traffic noise studies for road projects in Indiana are performed in accordance with 23 CFR 772 and INDOT's Traffic Noise Analysis Procedure. There are five main steps comprising traffic noise studies:

- 1. Identify noise sensitive receptors,
- 2. Determine existing ambient peak noise levels,
- 3. Predict future peak noise levels,
- 4. Identify traffic noise impacts, and
- 5. Evaluate mitigation measures for sensitive receptors where traffic noise impacts occur.

Noise levels were predicted for the outdoor human activity areas at each sensitive receptor using the worst traffic conditions likely to occur on a regular basis during the design year. Future noise levels predicted for the project area are included on Table C in Appendix C.

3.2 METHODS FOR IDENTIFYING LAND USES AND SELECTING NOISE MEASUREMENT AND MODELING LOCATIONS

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed project. Land uses in the project area were categorized by land use type, Activity Category as defined in Table 1, and the extent of frequent human use. Although all developed land uses are considered in this analysis, the focus is on locations of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis focuses on locations with defined outdoor activity areas, such as residential backyards and common use areas at recreational facilities.

TABLE 1 – NOISE	ABATEMENT C	RITERIA IN 23	CFR 772
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CATEGORY	LAeq(h)	EVALUATION LOCATION	ACTIVITY DESCRIPTION
А	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
В	67	Exterior	Residential.
C	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structure, radio stations, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structure, radio studios, recording studios, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D, or F.
F	_	_	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	_	_	Undeveloped lands that are not permitted.

Source: 23 CFR 772

3.3 TRAFFIC NOISE LEVEL PREDICTION METHODS

Traffic noise levels were predicted using FHWA TNM 2.5. Traffic noise was evaluated under design year conditions for the Build alternative. The loudest hour traffic volumes, vehicle classification percentages, and traffic speeds under designyear (2043) conditions were developed for input into the traffic noise model. The loudest hour is generally characterized by free-flowing traffic at the highway design speed (i.e., Level of Service [LOS] C or better). Since peak hour traffic in the project area is projected to operate at LOS C or better, peak hour traffic was used in the TNM modeling for this project (Appendix E). Year 2043 projected traffic volumes for this project were provided by INDOT, Elkhart County, and MACOG.

3.4 METHODS FOR IDENTIFYING TRAFFIC NOISE IMPACTS

According to the INDOT Traffic Noise Analysis Procedure, a traffic noise impact occurs when either of the following conditions results at a sensitive receptor:

- The future predicted L_{eq}(h) noise level either approaches (is within 1 dB(A)) or exceeds the NAC shown in Table 1.
- The future predicted L_{eq}(h) noise level substantially exceeds (by 15 or more dB(A)) the existing L_{eq}(h) noise level. Traffic-generated noise level increases of 15 dB(A) or more are typically associated with roadway improvements on a new alignment.

Where traffic noise impacts are identified, noise abatement must be considered for reasonableness and feasibility as required by 23 CFR 772 and the INDOT Traffic Noise Analysis Procedure. Details of this evaluation are provided in Section 4.2.

4.0 Existing Noise Environment

4.1 EXISTING LAND USES

Field investigations were conducted on June 23 and 24, 2020 to identify land uses that could be subject to traffic and construction noise impacts from the proposed project. Single-family residences were identified as Activity Category B. Places of worship, medical facilities, and a recreational trail were identified as Activity Category C. Offices and restaurants were identified as Activity Category E. Retail facilities and undeveloped lands were identified as Activity Categories F and G, respectively.

Noise levels were predicted at Activity Category B, C, and D land uses. Areas of frequent outdoor human activity were identified for the Activity Category B and C uses, and noise levels were predicted at these areas. Activity Category D land uses are areas such as churches, schools, and medical facilities where there is no outdoor human use, or if there is outdoor human use, and external noise abatement measures such as noise barriers are not found to be feasible and reasonable. For these land use areas, interior noise levels were predicted in accordance with FHWA guidance. For the entire project, one receiver was modeled for a single corresponding dwelling unit or area of frequent outdoor use at single-family residences and office land uses.

For parks and trails, the INDOT Traffic Noise Analysis Procedure includes a separate algorithm to translate usage data into an

This document uses the terms "receptor" and "receiver" that are similar but distinct. Receptors represent noise-sensitive locations, such as a backyard or an outdoor seating area at a hotel or restaurant. Receivers are discrete TNM modeling points that represent receptors. A TNM receiver can represent a single receptor or a group of receptors, such as using one TNM receiver to represent a group of residences with similar sound levels.

appropriate number of receptors. This formula is based on converting total usage to equivalent residential units. The number of average daily users is divided by the average number of people per household in Indiana (i.e., 2.52). Table 2 lists the number of receptors assigned to parks and trails. For the institutional land uses in the study area (i.e., churches), the number of receptors assigned was determined by using the FHWA lot-sized based methodology. Under this methodology, the number of receptors was calculated by dividing the size of the parcel within the 500-foot noise study area by the average single-family lot size in the project area. Table 2 summarizes the number of receptors assigned to the institutional land uses.

LAND USE	NUMBER OF DAILY USERS	PERCENTAGE OF FACILITY WITHIN Study Area	NUMBER OF RECEPTORS
MapleHeart Trail ¹	56	13.8%	4
LAND USE	PARCEL SIZE WITHIN NOISE STUDY AREA	AVERAGE SINGLE- FAMILY LOT SIZE	NUMBER OF RECEPTORS
Sunnyside Mennonite Church ²	70,623	12,829	6
Elkhart County Community Church ³	33,585	12,829	3
E6 daily years			

TABLE 2 - NUMBER OF RECEPTORS FOR TRAILS AND INSITUTIONAL LAND USES

 $1\frac{56 \text{ daily users}}{2.52 \text{ people on average}} x 13.8 \text{ Percentage of property within 500 feet} = 3.07 \text{ Number of receptors} per household}$

 $2\frac{70,623 \text{ square feet}}{12,829 \text{ square feet}} = 5.50 \text{ receptors}$

 $3\frac{_{33,585 \ square \ feet}}{_{12,829 \ square \ feet}} = 2.62 \ receptors$

Traffic Noise Impact Analysis: Elkhart Local Trax Grade Separation

4.2 COMMON NOISE ENVIRONMENT (CNE) DESCRIPTIONS

Land uses in the project area have been grouped into a series of numbered Common Noise Environments (CNE) that are identified on exhibits provided in Appendix A.

- CNE B-1 is located along the northeast side of CR 45 and one parcel on the north side of US 33. The area consists
 of single-family residences (Activity Category B).
- CNE B-2 is also located along the northeast side of CR 45, but further removed from CR 45 than CNE B-1. The area consists of single-family residences (Activity Category B).
- CNE B-3 is located south of CR 20 around the CR 20 intersection with Concord Mall Drive. The area consists of single-family residences (Activity Category B).
- CNE B-4 is located south of US 33 between Harding Road and Lewis Street. The area consists of single-family residences (Activity Category B).
- CNE C-1 is located on the west and east sides of the NSRR tracks along US 33. The west area consists of medical facilities, and the east area is the MapleHeart Trail (Activity Category C).
- CNE C-2 is located along CR 20. The area consists of medical facilities and the Concord High School (Activity Category C).
- CNE C-3 is located near the intersection of Sunnyside Avenue and CR 13. The area includes the Elkhart County Community Baptist Church and Sunnyside Mennonite Church (Activity Category C).
- CNE E-1 is located along the north side of US 33. The area consists of restaurants and offices (Activity Category E).
- CNE E-2 is located along the south side of US 33. The area consists of restaurants and offices (Activity Category E).

4.3 NOISE SENSITIVE RECEPTORS AND EXISTING NOISE CONDITIONS

Noise sensitive receptors are those locations where activities that could be affected by increased traffic noise levels occur (e.g., residences, motels/hotels, places of worship, schools, parks, and libraries). Existing noise levels are determined for the most commonly used outdoor living areas at sensitive receptors. For residences, this is typically the backyard or front porch, and for commercial areas it could be a picnic table or bench.

162 receivers were evaluated to represent approximately 169 receptors at residential units and other noise sensitive uses in the project area for analysis as part of the noise study (Appendix A). These receptors include Activity Category B and C land uses.

There were no areas of frequent outdoor human use identified in CNEs E-1 and E-2, and therefore, no noise receptors were modeled in those areas.

4.4 MEASUREMENT PROCEDURES, EQUIPMENT, AND RESULTS

Noise level measurements were taken at six locations within the noise study area. The measurements were conducted using a Larson-Davis SoundExpert LxT sound meter. Each measurement was taken for a 15-minute period. Calibration of the meter was checked before and after field work using a Larson-Davis Model Cal 200 calibrator. When the measurements were taken, meteorological conditions were within the manufacturer's recommended guidelines. Noise measurement field sheets that identify the noise measurement locations are included in Appendix D. The noise level measurements were taken in later morning and afternoon on December 17, 2020. In the early morning the pavement was still damp from snowfall from the previous night. Measurements were taken once the pavement dried. Temperatures ranged from 27 to 31 degrees, wind speeds ranged from 1 to 4 mph, and the skies were typically cloudy.

Table 3 summarizes the results of the existing noise measurements taken.

INIDEE 0					
CNE	ACTIVITY CATEGORY	DURATION (MINUTES)	MEASURED Leq(h)	PREDICTED SOUND LEVEL [dB(A)]	PREDICTED MINUS MEASURED [dB(A)]
B-3	В	15	57.7	57.0	-0.7
B-4	В	15	63.8	61.9	-1.9
C-1	С	15	61.1	59.8	-1.3
C-2	С	15	61.4	61.9	0.5
E-1	E	15	67.7	67.1	-0.6
E-2	E	15	62.8	62.4	-0.4

TABLE 3 – COMPARISON OF MEASURED TO PREDICTED SOUND LEVELS IN THE TNM MODEL

Traffic-generated $L_{eq}(h)$ were predicted using FHWA TNM 2.5, a highway traffic noise prediction model. The model takes into account traffic volumes, vehicle types, vehicle speeds, roadway geometry, and receiver locations to calculate trafficgenerated noise levels. As shown in Table 3, comparing the modeled and measured noise levels using observed traffic counts confirms the applicability of the model to the study area. Predicted traffic noise levels using the traffic counts observed during the measurements are within +/- 3 dB(A) of the measured levels, indicating reasonable correlation. Therefore, this model is validated per 23 CFR 722.11 (d)(2), and no modifications to the model were needed.

5.0 Future Noise Environment and Impacts

5.1 FUTURE NOISE ENVIRONMENT AND IMPACTS

Table C in Appendix C summarizes the traffic noise modeling results for existing and design-year conditions. Results tables from TNM are provided in Appendix F. As described in Section 2.3, these predictions utilize forecasted design hour traffic conditions to ensure a conservative estimate of noise levels for the loudest noise hour. The comparison to existing conditions is included in the analysis to identify traffic noise impacts under 23 CFR 772.

Existing noise levels at the modeled receivers range from 37 to 69 dB(A). Under the build conditions, the predicted noise levels range from 37 to 73 dB(A). All noise impacts were identified in one of the CNEs evaluated, including five modeled receivers that included land use Activity Category C. All noise impacts are a result of the predicted noise level approaching or exceeding the NAC. Predicted noise level increases under the build conditions average approximately 2.4 dB(A) and range up to 10.8 dB(A). No predicted noise level increases exceed 15 dB(A). Predicted noise level reductions under the build conditions average approximately 1.6 dB(A) and range up to 7.9 dB(A). These reductions can be accounted for by changes to traffic patterns and roadway speeds. On CR 45, north of the Sunnyside Ave alignment and no longer cross from US 33 to the west. Along CR 13, speed limits will decrease from 45 mph to 35 mph. Additionally, traffic travelling along CR 13 will shift westward to connect to CR 45, further from Linden Dr.

The five impacted receivers are located within CNE C-1. They include four receivers along MapleHeart Trail and an office building located at 24021 US 33 East, which includes a medical practice.

Since the predicted traffic noise levels for the design-year with proposed build conditions approach or exceed the NAC, traffic noise impacts are predicted to occur within the project area. Therefore, noise abatement must be considered. A discussion of the noise abatement analysis is provided in the following section.

5.2 Noise Abatement Analysis

In accordance with 23 CFR 772, noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures include the following:

- Construction of noise barriers.
- Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- Alteration of horizontal and vertical alignments to avoid impacts.
- Acquisition of real property or interests therein (predominately unimproved property) to serve as a buffer zone to
 preempt development which would be adversely impacted by traffic noise.
- Noise insulation of Activity Category D land use facilities.

Noise barriers placed along roadways on public right-of-way can effectively shield locations from traffic-related noise. A barrier's feasibility is based on its acoustic effectiveness, which depends on the area's geometry, the barrier's configuration, and the effects of other (unblocked) noise sources. Noise barriers are not feasible in the locations where noise impacts have been identified for this project. First, a noise barrier could not be constructed between MapleHeart Trail and CR 45 since the roadway and the trail are only separated by a few feet. Second, at the impacted office building, the predominant noise is from US 33 and not the proposed grade separation. A noise barrier along US 33 is not feasible because the barrier would have to include gaps to allow for the driveway entrances onto this and the adjacent properties. Additionally, it would expand the project scope onto US 33, which is not part of the project's intention. Furthermore, a noise barrier on the proposed grade separation structure would not be prudent due to the wall's hazardous placement inside the 'Zone of Influence.' If a vehicle were to strike the barrier rail or a truck lean over the rail, they would strike the wall's panels which could cause them to be knocked off and fall on pedestrian, vehicular, and train traffic below.

Traffic management measures would not be effective for this project. Traffic management measures that could reduce sound levels include "traffic calming" actions, such as reducing volumes, especially truck volumes, or travel speeds. Such measures would have to be implemented along CR 45 and US 33 and are not consistent with the transportation needs in the area or purpose of the project.

Major alteration of the roadway geometry that would have a substantial effect on predicted noise levels is not feasible. The preferred alternative has been developed to best meet the transportation need of the corridor while minimizing impacts to the immediate area and meeting the purpose of the project. Horizontal geometry changes along CR 45 and US 33 significant enough to affect noise levels at receiver locations would require numerous relocations and is not a practical alternative. Similarly, changes to the vertical geometry that would significantly affect noise levels are not practical through the project area. Thus, any changes to these alignments would be limited and have only minimal effects on sound levels.

Vacant or undeveloped property may be acquired to provide a buffer zone from noise generating facilities. However, there is no vacant land in the study area that, if acquired, would provide effective abatement as a buffer zone.

Insulation of public structures, nonprofit institutions, and other Category D land uses is not applicable for this project, since no impacts have been identified at these land uses. The NAC for Category D land uses is 52 dBA. According to FHWA guidance, interior noise level predictions are computed by subtracting from the predicted exterior levels the noise reduction factors based on building type and window condition. Table 4 lists the predicted interior noise levels for the build alternative. No noise impacts were identified.

TABLE 4 – PREDICTED INTERIOR NOISE LEVELS

CNE	Receiver	Land Use	Building Type-Window Condition	Interior Noise Level Reduction [dB(A)]	Predicted Interior Noise Level [dB(A)]	Impact (51 dB(A) or greater)
C-1	160	Medical Facility	Light Frame – Storm Window	-25	42	No
C-1	161	Medical Facility	Light Frame – Storm Window	-25	35	No
C-2	163	Medical Facility	Light Frame – Storm Window	-25	35	No
C-2	164	Medical Facility	Masonry – Single Glazed	-25	41	No
C-3	D120	Sunnyside Mennonite Church	Masonry – Single Glazed	-25	40	No
C-3	D170	Elkhart County Community Baptist Church	Light Frame – Ordinary Sash (Closed)	-20	47	No

All of the abatement options discussed in this section have been considered for this project. No feasible noise abatement options have been identified.

6.0 Construction Noise

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction.

Table 5 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB(A) at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of approximately 6 dB(A) per doubling of distance.

TABLE 5 – CONSTRUCTION EQUIPMENT NOISE					
EQUIPMENT	MAXIMUM NOISE LEVEL (DB(A) AT 50 FEET)				
Scrapers	89				
Bulldozers	85				
Heavy Trucks	88				
Backhoe	80				
Pneumatic Tools	85				
Concrete Pump	82				

Source: U.S. Environmental Protection Agency 1971.

No adverse noise impacts from construction are anticipated because construction noise would be short-term and intermittent. Measures to minimize the temporary impacts will include requiring equipment to have sound-control devices that are no less effective than those provided on the original equipment and requiring all equipment to be muffled.

7.0 Public Involvement

A copy of the Traffic Noise Impact Analysis will be included in the appendix of the environmental document, and a summary will be included in the noise section of the document. The public will have the opportunity to view and comment on the CE document, including the findings of this report.

8.0 Conclusion and Recommendations

Based on the studies thus far accomplished, the State of Indiana has not identified any locations where noise abatement is likely. Noise abatement measures that were studied at these locations were based upon preliminary design costs and design criteria. Noise abatement has not been found to be "feasible and reasonable" because no noise abatement could be implemented that would provide the required noise level reduction. A re-evaluation of the noise analysis will occur during final design. If during final design it has been determined that conditions have changed such that noise abatement is feasible and reasonable, the abatement measures might be provided. The final decision on the installation of any abatement measure(s) will be made upon the completion of the project's final design and the public involvement processes.

The viewpoints of the benefited residents and property owners are a major consideration in determining the reasonableness of highway traffic noise abatement measures for proposed highway construction projects. These viewpoints have been determined and addressed during the environmental phase of project development. The will and desires of the public are an important factor in dealing with the overall problems of highway traffic noise. INDOT will incorporate highway traffic noise consideration in on-going activities for public involvement in the highway program and will reexamine the residents' and property owners' views on the desirability and acceptability of abatement during project development.

9.0 References

23 CFR 772 (2011). "Procedures for Abatement of Highway Traffic Noise and Construction Noise." Accessed May 30, 2019. <u>https://www.fhwa.dot.gov/legsregs/directives/fapg/cfr0772.htm</u>

INDOT 2017. "Indiana Department of Transportation Traffic Noise Analysis Procedure," Office of Environmental Services. <u>https://www.in.gov/indot/files/2017%20INDOT%20Noise%20Policy.pdf</u>

U.S. Environmental Protection Agency, "Noise from Construction Equipment and Operations, Building Equipment and Home Appliances," NTID300.1, December 31, 1971. <u>https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=9101NN3I.PDF</u>



Appendix I subappendix

Appendix A - Noise Receptor Locations



Des. 1801913

Appendix I



Appendix I subappendix

Appendix D – Noise Measurement Field Data



Veldkamp, Keaton

From:	Miller, Brandon <bramiller1@indot.in.gov></bramiller1@indot.in.gov>		
Sent:	Tuesday, July 13, 2021 8:29 AM		
То:	Veldkamp, Keaton		
Cc:	Ronald Bales; Pakeltis, Anthony; Holder, Jason		
Subject:	[EXTERNAL] Noise Analysis for Elkhart Local Trax Grade Separation, Des 1801913 (lead)		
Follow Up Flag:	Follow up		
Flag Status:	Flagged		

INDOT Environmental Services Division (ESD) has reviewed the noise analysis for the above-referenced project and found it to be technically sufficient. As you are aware, INDOT no longer comments on recommendations provided in noise studies for local agency projects. However, it is our assessment that the study has been completed in accordance with federal guidelines and state policy. Thank you.

Brandon Miller NEPA Team Lead INDOT Environmental Services Division 100 N. Senate Ave., Rm. N758-Environmental Services Indianapolis, IN 46204 New Work Cell Number: (317) 439-7500





Appendix J

Additional Studies

Excerpts

Engineer's Report Local Trax Railroad Grade Separation Sunnyside Ave over NSRR in Elkhart Co. Des. 1801913/1900836 Indiana Department of Transportation



February 2020

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lines run east-west over Yellow Creek, US 33, the railroad, and CR 45 before turning northward toward a power substation.

- Nipsco operates multiple gas lines of varying sizes and pressures. These gas lines run in a northwesterly direction through the mall parking lot, as well as across US 33 and along CR 45, CR 13, and Sunnyside Avenue, with distribution lines serving the commercial and residential areas within the project limits.
- Comcast, Frontier, and Zayo provide cable, telephone, and internet services to all the commercial and residences in the project area.
- Elkhart County sewers are throughout the project area providing services to all commercial and some residential properties.
- Elkhart County water lines exist along US 33, Sunnyside Road, CR 45, and CR 13 with services to all commercial and some residential properties
- American Electric Power distribution lines are aerial and exist along US 33, Sunnyside Road, CR 45, and CR 13 as well as service lines to all properties.

Reimbursement eligibility is primarily based upon utilities owning a property interest in the area of impact. Most utilities appear to be non-reimbursable, other than the AEP transmission lines. Some utilities may be reimbursable on the basis of hardship, specifically Elkhart County water/sewer lines when these lines are located on Elkhart County rights of way and directly impacted by the project. Underground utility facility impacts will be determined after appropriate level utility investigations are performed to determine specific facility attributes and locations of utilities, then compared to more fully developed design of walls, drainage features, bridge foundations, and pavement subgrades.

Section 3: Traffic and Safety

3.1 VEHICULAR AND TRAIN TRAFFIC DATA

The AADT along Sunnyside Avenue is approximately 5,000 vehicles per day, according to a separate report on file with Elkhart County. That report projects an increase to 10,000 vehicles per day, based on removal of two at-grade crossings, and placement of the grade separation as proposed in this report.

Train count data from July 2019 is 90 trains per day, with an even split between daytime and nighttime traffic. The majority of train traffic is freight, but there are also approximately 4 passenger trains per day.

The AADT along US 33 from INDOT's Traffic Count Database System (TCDS) is a two-way count of 24,793 vehicles per day from 2018. The traffic is split 52%/48% in the positive direction. Commercial trucks represent 5% of the traffic. There is no projected growth for this road.

The AADT along CR 45 from INDOT's Traffic Count Database System (TCDS) is a two-way count of 3,248 vehicles per day from 2018. The traffic is split 51%/49% in the positive direction. Commercial trucks represent 8% of the traffic. There is no projected growth for this road.

Potential projected traffic along the local roads has not been performed as a part of this study. Preliminary projections can be referenced in a separate report for this location, on file with Elkhart County. Actual projections will depend on selected alternate and be completed during final design. It is not anticipated that this report would change considerably based on adjustments to projected traffic.

3.2 SAFETY DISCUSSION

Three sets of railroad tracks with multiple local road crossings are present in this area. This location experiences heavy train traffic on a daily basis, causing delays and safety concerns for the traveling public. Crash data from the Federal Railroad Administration (FRA) documents 2 crashes involving a train at the Sunnyside Avenue crossing and 1 crash involving a train at the CR 13 crossing within the last 10 years.

Engineer's Report – DES 1801913 Local Trax Railroad Grade Separation – Sunnyside Ave over NSRR in Elkhart Co.

Sunnyside Avenue and County Road 13 each cross three sets of railroad tracks in the vicinity of Concord Mall. Sunnyside Avenue crosses directly into Concord Mall, attracting more traffic to the intersection. This crossing features Railroad crossing gantries with crossing arms, to alert and protect approaching traffic. CR 13 crosses the tracks in a north-south direction, with only lighted signals, signs, and crossing arms.

Section 4: Alternatives

The project team analyzed a variety of different alternatives in order to determine the most optimized solution. A brief description of each alternative follows.

4.1 NO BUILD ALTERNATIVE

No-Build Alternative: No Change to Existing Condition

The no-build alternative does not address the purpose and need of the project and is therefore eliminated.

4.2 SOUTH ALTERNATIVE

Introduction

This alternative proposes to eliminate the Sunnyside Avenue and CR 13 at-grade crossings and provides a grade separation structure in the vicinity of the existing CR 13 crossing and Mishawaka Road. East-west traffic would follow Mishawaka Road, crossing over US 33, the railroad tracks, and CR 45 before tying down into CR 13 at the Nora St intersection. CR 13 would dead-end at John St, and traffic would be permanently diverted onto CR 45. Connectivity with US 33 and the schools would be maintained as shown in Figure 3.

This alternative directs traffic primarily south of the mall area. Moderate utility impacts and low to moderate overall right of way impacts are anticipated for this alternative, being away from the center of the mall area.

Horizontal Alignment

The proposed design speed for this alignment is 35 mph. The alignment starts at the intersection of Center Drive and Mishawaka Road on the western end. From that point to the east, a radius of 1540' will tie into CR 13 on the east side of the railroad. The new alignment will travel over US 33, the railroad, and CR 45. The new horizontal alignment curve will end at Nora St. The roadway will be designed as a low speed urban street, and no superelevation will be required. See Figure 3 below for the layout of the South Alternative.

Typical Section

The typical section of the new roadway will be two 12' lanes with curb and gutter on both sides. A 5' grass buffer will separate the 5' sidewalks from each curb and gutter. Retaining walls will be built as necessary; otherwise, 3:1 slopes will be used behind the sidewalks. See **Figure 2** for the roadway Typical Section.

Direct Mall impacts are minimal in this alternative, as the overpass directs traffic around the south side of the mall to Mishawaka Avenue. The design will avoid adverse impacts to the school and gas station. However, the alternative does require business and residential relocations. See Table 2 section 5.2 for the Alternatives Right of Way.



Figure 3: South Alternative

4.3 NORTH ALTERNATIVE 1

Introduction

This alternative proposes to eliminate the Sunnyside Avenue and CR 13 at-grade crossings, providing a grade separation structure to the north of Concord Mall. Traffic would follow Concordia Court around the north side of the mall, crossing over Yellow Creek, US 33, the railroad tracks, and CR 45 before tying down into CR 13 150' north of the Elkhart Public Library. Connectivity with US 33 would be maintained as shown in Figure 4.

This alternative directs traffic primarily north of the mall area. Utility impacts will be high for this alternative, but right of way impacts will be lower, being away from the heart of the mall area. The proposed bridge is long relative to the other alternatives.

Horizontal Alignment

This alignment is divided into two areas. On the west side, the new alignment runs north/south along Concordia Court. It follows along the existing alignment adjacent to Concord Mall's parking lot. It does not encroach onto the parking lot. When the alignment reaches the north corner of the parking lot, the road turns to the east. The curve in this corner will be 25 mph. As it heads east, the design speed increases to 35 mph. The alignment runs parallel to the outer mall road but does not encroach onto it. The road then will bridge over Yellow Creek, US 33, the railroad, and CR 45. It continues east through the open field and ties into CR 13 north of the library. The alignment will be designed as a low speed urban street, and superelevation will not be required. See Figure 4 below for the layout of North Alternative 1.

Typical Section

The typical section of the new roadway will be two 12' lanes with curb and gutter on both sides. A 5' grass buffer will separate the 5' sidewalks from each curb and gutter. Retaining walls will be built as necessary; otherwise, 3:1 slopes will be used behind the sidewalks. See Figure 2 in Section 4.2 for the Typical Section.

Intersections

The new alignment will intersect with Mishawaka Road on the south end of the alignment, west of Concord Mall. All driveways on Concordia Court will tie into the new road. A new driveway will be added from the mall to the new road. A new intersection will also be made with Minuteman Drive that runs east/west from the new alignment, west of the mall. A new road will connect US 33 across from the mall entrance on the north side of the mall. East of the railroad, there are no connections or driveways until the alignment intersects with CR 13.

Profile

The new alignment's profile will have a maximum grade of 4.99% and tie into existing ground on either end of the project.

Bridges

A new 5-span steel bridge will be constructed in a horizontal curve and will provide grade-separated access across Yellow Creek, US 33, the railroad, and CR 45. Vertical clearance over the railroad will be a minimum of 23'. Vertical clearance over US 33 will be a minimum of 16.5' and over CR 45 will be a minimum of 14.5'. Hydraulic waterway opening requirements will be met for Yellow Creek. The bridge out-to-out coping width will be 43'-6" with a 28'-0" clear roadway width and 6'-7" sidewalks. The bridge typical section will be similar to the roadway, including two 12' travel lanes, sidewalks on both sides, and Type PS-1 pedestrian bridge rail. See Figure 10 in Section 5.1 for the bridge typical section. Wall Piers are anticipated to meet AREMA code, and MSE wall abutments will be used to reduce bridge spans.

Reference section 5.1 for additional bridge information.

Utilities

The utility impacts for this alternative are relatively high. Impacts to AEP Transmission lines are required with this alternative. This would involve approximately two transmission towers and require purchase of replacement AEP right of way. Additionally, gas lines, power distribution lines, and residential service connections would likely require relocation along the roadway. Communication lines attached to power poles will also require relocation.

Numerous water and sewer lines exist within the project. Well and septic system impacts will need to be understood and evaluated further. These may be addressed in Right of Way acquisition as a cost to cure.

Right of Way

The impacts to Right of Way for this alternative include a moderate number of business relocations and low number of residential relocations. However, the total permanent Right of Way area is high.

Direct Mall impacts are minimal in this alternative, as the overpass directs traffic around the north side of the mall to Mishawaka Avenue. See Table 2 in section 5.2 for the Right of Way impacts related to this Alternative. This alternative does require acquisition of AEP properties and will require acquisition of replacement property.



Figure 4: North Alternative 1

4.4 NORTH ALTERNATIVE 2

Introduction

North Alternative 2 is similar to North Alternative 1, except access is provided via Concord Mall's outer loop road rather than via Concordia Court. Sunnyside Avenue and CR 13 at-grade crossings would be eliminated, and traffic would tie down to CR 13 in the same location as North Alternative 1.

This alternative directs traffic primarily north of the mall area. Utility impacts are high, similar to North Alternative 1. Right of way impacts to residences are lower than North Alternative 1 but are still high overall due to the need to purchase right of way through the field north of Florence Avenue.

Horizontal Alignment

This alignment is divided into two areas. On the west side, the new alignment runs north/south, parallel to Concordia Court. The alignment in this area will be 25 mph. The alignment uses the existing Concordia Court until the first curve of the existing road. Then, it follows along the existing outer road to the mall. It continues along the outer road of the mall, makes a right turn in the northwest corner of the mall, and then runs east/west. It then will bridge over Yellow Creek, US 33, the railroad, and CR 45. It continues to the east where it runs along the middle of the empty field until it intersects with CR 13, just north of the library. The east/west portion of the new alignment will be 35 mph. The new road will be designed as a low speed urban street, and no superelevation is required. See Figure 5 below for the layout of North Alternative 2.

Typical Section

The typical section of the new roadway will be two 12' lanes with curb and gutter on both sides. A 5' grass buffer will separate the 5' sidewalks from each curb and gutter. Retaining walls will be built as necessary; otherwise, 3:1 slopes will be used behind the sidewalks. See Figure 2 for the Typical Section.

Intersections

The new alignment will intersect with Mishawaka Road on the south end of the alignment, west of Concord Mall. Concordia Court will dead end before the last bend in the road before it gets to Mishawaka Road. The driveways on Concordia Court will have no access to the new road. The mall will get a new access road that ties in on the north/south portion of the road. There will be a connection to US 33 north of the mall. No connections to the new road will be on the east side of the railroad.

Profile

The new alignment's profile will have a maximum grade of 4.99% and tie into existing ground on either end of the project.

Bridges

A new 5-span steel bridge will be constructed in a horizontal curve and will provide grade-separated access across Yellow Creek, US 33, the railroad, and CR 45. Vertical clearance over the railroad will be a minimum of 23'. Vertical clearance over US 33 will be a minimum of 16.5' and over CR 45 will be a minimum of 14.5'. Hydraulic waterway opening requirements will be met for Yellow Creek. The bridge out-to-out coping width will be 43'-6" with a 28'-0" clear roadway width and 6'-7" sidewalks. The bridge typical section will be similar to the roadway, including two 12' travel lanes, sidewalks on both sides, and Type PS-1 pedestrian bridge rail. See Figure 10 in Section 5.1 for the bridge typical section. Wall Piers are anticipated to meet AREMA code, and MSE wall abutments will be used to reduce bridge spans.

Reference section 5.1 for additional bridge information.

Utilities

The utility impacts for this alternative are relatively high. Impacts to AEP Transmission lines are required with this alternative. This would involve approximately two transmission towers and require purchase of replacement AEP right of way. Additionally, gas lines, power distribution lines, and residential service connections would likely require relocation along the roadway. Fiber optic lines attached to power poles will also require relocation. Buried communication lines may be impacted as well.

Underground utility facility impacts will be determined after full utility investigations are performed to determine specific facility attributes and locations of utilities, then compared to more fully developed design of walls, drainage features, bridge foundations, and pavement subgrades. Well and septic system impacts will need to be understood and evaluated further. These may be addressed in Right of Way acquisition as a cost to cure. Utilities do not appear to be reimbursable other than the AEP Transmission lines.

Right of Way

The impacts to Right of Way for this alternative include no business relocations and a low number of residential relocations. However, the total permanent Right of Way area is high. This alternative does require acquisition of AEP properties and will require acquisition of replacement property.

Direct Mall impacts are moderate in this alternative, as the overpass directs traffic into the existing parking lot. Multiple parking lots will be lost. Lot access points will be provided north and west of the mall. See Table 2 in section 5.2 for the Right of Way impacts related to this Alternative.



Figure 5: North Alternative 2

Engineer's Report – DES 1801913 Local Trax Railroad Grade Separation – Sunnyside Ave over NSRR in Elkhart Co.

Appendix J

4.5 CENTRAL ALTERNATIVE 1

Introduction

This alternative proposes to replace the Sunnyside Avenue and CR 13 at-grade crossings with one grade separation structure. Sunnyside Avenue would be realigned slightly to the south to tie into Mishawaka Rd and replace most of Concord Mall Drive. The new roadway alignment would include two new bridges that cross over Yellow Creek, US 33, the railroad tracks, and CR 45 before tying down into Sunnyside Ave at the Kendall St intersection. Connectivity with US 33 would be maintained with the addition of a connector road and a third new bridge as shown in Figure 6.

This alternative directs traffic primarily through the middle of the commercial mall area. This alternative would propose reduced utility impacts and relocations, while increasing the number of Right of Way relocations required.

Horizontal Alignment

The west side of the alignment ties into Mishawaka Road across from Pineridge Parkway. The alignment follows Concord Mall Drive starting at Mishawaka Road. When it gets to the existing first curve, it starts to veer off to the north of the existing Concord Mall Drive. The alignment then turns to the east as it crosses over US 33, the railroad, and CR 45. The alignment then uses the alignment of the existing Sunnyside Avenue and ends at CR 13. The design speed for this alignment is 35 mph and will be designed as a low speed urban street; therefore, no superelevation is required. See Figure 6 below for the layout of Central Alternative 1.

Typical Section

The typical section of the new roadway will be two 12' lanes with curb and gutter on both sides. A 5' grass buffer will separate the 5' sidewalks from each curb and gutter. Retaining walls will be built as necessary; otherwise, 3:1 slopes will be used behind the sidewalks. See Figure 2 for the Typical Section.

Intersections

The new alignment will intersect with Mishawaka Road on the south end of the alignment, at the existing location of Concord Mall Drive. On the east side, the new alignment will intersect with CR 13 where the existing Sunnyside Avenue intersects. Many driveways will be reconstructed on Sunnyside Avenue to tie into the new alignment. Helen Street will now curve towards the west onto the existing Sunnyside Avenue to intersect with CR 45. Amy Avenue and Kendall Street, north and south, will be dead ends with a cul-de-sac. West of the railroad, a new mall entrance will be constructed at a similar location to the existing entrance. A new intersection will be constructed with Center Drive and Chase Bank. A new connector road will be constructed just west of Yellow Creek that will intersect with US 33 north of the existing Concord Mall Drive intersection.

Profile

The new alignment's profile will have a maximum grade of 4.99% and tie into existing ground on either end of the project.

Bridges

A new 3-span concrete bridge will be constructed in a horizontal curve and will provide grade-separated access across US 33, the railroad, and CR 45. Vertical clearance over the railroad will be a minimum of 23'. Vertical clearance over US 33 will be a minimum of 16.5' and over CR 45 will be a minimum of 14.5'. Two bridges over Yellow Creek will also be required, one carrying the mainline and one carrying the connection to US 33. Hydraulic waterway opening requirements will be met for the structures on Yellow Creek. The bridge out-to-out coping width will be 43'-6" with a 28'-0" clear

Engineer's Report – DES 1801913 Local Trax Railroad Grade Separation – Sunnyside Ave over NSRR in Elkhart Co.



Figure 6: Central Alternative 1

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4.6 CENTRAL ALTERNATIVE 2

Introduction

Central Alternative 2 also replaces the Sunnyside Avenue and CR 13 at-grade crossings with a grade separation structure by extending Sunnyside Ave west to intersect with Mishawaka Rd. However, Central Alternative 2 maintains Concord Mall Drive and its access to businesses in the area and uses this route to maintain connectivity to US 33 without requiring another bridge over Yellow Creek.

This alternative directs traffic primarily through the middle of the commercial mall area. This alternative would propose reduced right of way impacts and relocations, while increasing the number of utility relocations required. It would also result in a roadway that is closer to the mall building than may be desired.

Horizontal Alignment

The west side of the alignment ties into Mishawaka Road across from Pineridge Parkway. The alignment follows Concord Mall Drive starting at Mishawaka Road, then veers north of Concord Mall Drive to bridge over US 33, the railroad, and CR 45. It continues east along Sunnyside Avenue and ends at the intersection of CR 13. The design speed of the road will be 35 mph. See Figure 7 below for the layout of Central Alternative 2.

Typical Section

The typical section of the new roadway will be two 12' lanes with curb and gutter on both sides. A 5' grass buffer will separate the 5' sidewalks from each curb and gutter. Retaining walls will be built as necessary; otherwise, 3:1 slopes will be used behind the sidewalks. See Figure 2 for the Typical Section.

Intersections

The new alignment will intersect with Mishawaka Road on the south end of the alignment, at the existing location of Concord Mall Drive. Concord Mall Drive will now intersect the new alignment in the vacant lot north of the Dunlap Dental Services, cross behind the Chase Bank, and curve through the parking lot on the southwest corner of Yellow Creek and Concord Mall Drive to connect into the existing bridge over Yellow Creek. The existing bridge and signal along Concord Mall Drive will be maintained. Center Drive will now have an intersection with the new Concord Mall Drive south of the Chase Bank. At the east end, the new alignment will intersect with CR 13 where the existing Sunnyside Avenue intersects. Many driveways will be reconstructed on Sunnyside Avenue to tie into the new alignment. Amy Avenue and Kendall Street, north and south, will terminate in cul-de-sacs. West of the railroad, a new mall entrance will be constructed at a similar location to the existing entrance.

Profile

The new alignment's profile will have a maximum grade of 4.99% and tie into existing ground on either end of the project.

Bridges

A new 3-span concrete bridge will be constructed in a horizontal curve and will provide grade-separated access across US 33, the railroad, and CR 45. Vertical clearance over the railroad will be a minimum of 23'. Vertical clearance over US 33 will be a minimum of 16.5' and over CR 45 will be a minimum of 14.5'. A new, single-span bridge will carry the mainline over Yellow Creek and will be sized according to hydraulic waterway opening and backwater needs for the creek. Additionally, the existing bridge over Yellow Creek on Concord Mall Drive will remain and be rehabilitated as needed.

The bridge out-to-out coping width will be 43'-6" with a 28'-0" clear roadway width and 6'-7" sidewalks. The bridge typical section will be similar to the roadway, including two 12' travel lanes, sidewalks on both sides, and Type PS-1 pedestrian



Figure 7: Central Alternative 2

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4.7 CENTRAL ALTERNATIVE 3

Introduction

Central Alternative 3 eliminates the Sunnyside Avenue and CR 13 at-grade crossings and provides a grade separation structure slightly south, connecting to Sunnyside Avenue. A roundabout would be installed just southeast of the existing Concord Mall Drive and Center Road intersection. This roundabout will maintain access to Mishawaka Rd, Center Rd, and Concord Mall Drive for connectivity to US 33, while providing a new alignment to cross over the railroad tracks, and tie in to Sunnyside Street, east of CR 45.

This alternative directs traffic primarily through the middle of the commercial mall area. It proposes similar utility impacts as Central Alternative 2, and moderate right of way impacts to accommodate the new roundabout.

Horizontal Alignment

The west side of the alignment ties into Mishawaka Road across from Pineridge Parkway. The alignment follows Concord Mall Drive starting at Mishawaka Road. At the existing intersection with Central Drive, a roundabout will be placed. East of the roundabout, there will be two roads. The northern road will reuse the existing bridge over Yellow Creek that then intersects with US 33. The southern road goes east through the parking lot on the southwest corner of Yellow Creek and Concord Mall Drive, and will bridge over Yellow Creek, US 33, the railroad, and CR 45. It continues east along Sunnyside Avenue and ends at the intersection of CR 13. The design speed of the road will be 35 mph and the maximum fastest path of the roundabout will be 25 mph. See Figure 8 below for the layout of Central Alternative 3.

Typical Section

The typical section of the new roadway will be two 12' lanes with curb and gutter on both sides. A 5' grass buffer will separate the 5' sidewalks from each curb and gutter. Retaining walls will be built as necessary; otherwise, 3:1 slopes will be used behind the sidewalks. See Figure 2 for the Typical Section.

Intersections

The new alignment will intersect with Mishawaka Road on the south end of the alignment, at the existing location of Concord Mall Drive. On the east side, the new alignment will intersect with CR 13 where the existing Nora Street intersects. Many driveways will be reconstructed on Nora Street to tie into the new alignment. Amy Avenue and Kendall Street, north and south, will cul-de-sac at the new alignment. West of the railroad, a new mall entrance will be constructed at a similar location to the existing entrance. A new intersection will be constructed with Center Drive. A new connector road will be constructed just west of Yellow Creek that will reuse the existing bridge and signalized intersection of Concord Mall Drive and US 33.

Profile

The new alignment's profile will have a maximum grade of 4.99% and tie into existing ground on either end of the project.

Bridges

A new 4-span concrete bridge will be constructed to provide a grade-separated access across US 33, the railroad, and CR 45. Vertical clearance over the railroad will be a minimum of 23'. Vertical clearance over US 33 will be a minimum of 16.5' and over CR 45 will be a minimum of 14.5'. A second, single span bridge over Yellow Creek will also be required. Hydraulic waterway opening requirements will be met for Yellow Creek. The existing bridge over Yellow Creek on Concord Mall Drive will remain and be rehabilitated as needed. The bridge out-to-out coping width will be 43'-6" with a 28'-0" clear roadway width. The bridge typical section will be similar to the roadway, including two 12' travel lanes, 6' sidewalks



Figure 8: Central Alternative 3

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4.8 CENTRAL ALTERNATIVE 4

Introduction

Central Alternative 4 eliminates the Sunnyside Avenue and CR 13 at-grade crossings and provides a grade separation structure one block to the south of Sunnyside Avenue. A roundabout would be installed just south of the existing Concord Mall Drive and Center Road intersection. This roundabout will maintain access to Mishawaka Rd, Center Rd, and Concord Mall Drive for connectivity to US 33, while providing a new alignment to cross over the railroad tracks, and tie in to Nora Street, east of CR 45.

This alternative directs traffic primarily through the middle of the commercial mall area. This alternative would propose similar utility impacts as Central Alternative 2 but would involve higher right of way impacts to accommodate the new roundabout.

Horizontal Alignment

The west side of the alignment ties into Mishawaka Road across from Pineridge Parkway. The alignment follows Concord Mall Drive starting at Mishawaka Road. At the existing intersection with Central Drive, a roundabout will be placed. East of the roundabout, there will be two roads. The northern road will reuse the existing bridge over Yellow Creek that then intersects with US 33. The southern road goes east through the parking lot on the southwest corner of Yellow Creek and Concord Mall Drive, and will bridge over Yellow Creek, US 33, the railroad, and CR 45. It continues east along Sunnyside Avenue and ends at the intersection of CR 13. The design speed of the road will be 35 mph and the maximum fastest path of the roundabout will be 25 mph. See Figure 9 below for the layout of Central Alternative 4.

Typical Section

The typical section of the new roadway will be two 12' lanes with curb and gutter on both sides. A 5' grass buffer will separate the 5' sidewalks from each curb and gutter. Retaining walls will be built as necessary; otherwise, 3:1 slopes will be used behind the sidewalks. See Figure 2 for the Typical Section.

Intersections

The new alignment will intersect with Mishawaka Road on the south end of the alignment, at the existing location of Concord Mall Drive. On the east side, the new alignment will intersect with CR 13 where the existing Nora Street intersects. Many driveways will be reconstructed on Nora Street to tie into the new alignment. Amy Avenue and Kendall Street, north and south, will cul-de-sac at the new alignment. West of the railroad, a new mall entrance will be constructed at a similar location to the existing entrance. A new intersection will be constructed with Center Drive. A new connector road will be constructed just west of Yellow Creek that will reuse the existing bridge and signalized intersection of Concord Mall Drive and US 33.

Profile

The new alignment's profile will have a maximum grade of 4.99% and tie into existing ground on either end of the project.

Bridges

A new 3-span steel bridge will be constructed in a horizontal curve and will provide grade-separated access across US 33, the railroad, and CR 45. Vertical clearance over the railroad will be a minimum of 23'. Vertical clearance over US 33 will be a minimum of 16.5' and over CR 45 will be a minimum of 14.5'. A second, single span bridge over Yellow Creek will also be required. Hydraulic waterway opening requirements will be met for Yellow Creek. The existing bridge over Yellow Creek on Concord Mall Drive will remain and be rehabilitated as needed. The bridge out-to-out coping width will be 43'-6" with a 28'-0" clear roadway width. The bridge typical section will be similar to the roadway, including two 12' travel lanes,



Figure 9: Central Alternative 4

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ALTERNATIVE	South	North 1	North 2	Central 1	Central 2	Central 3	Central 4
No. of Spans	6	5	5	3	3	4	3
	123'	141'	130.5'	144'	143'	117'	177'
	125'	178'	160'	153'	154'	60'	180'
	130'	178'	160'	99'	105'	134.5'	99'
Span Lengths	125'	175'	160'			83.5'	
	125'	140'	140.75'				
	72'						
Beam Type	Concrete Hybrid Bulb-T	Steel Plate Girder	Steel Plate Girder	Concrete Hybrid Bulb-T	Concrete Hybrid Bulb-T	Concrete Hybrid Bulb-T	Steel Plate Girder
Beam Depth	60"	71.5"	66"	78"	78"	60"	76"
Bridges over	1 @75' Span	NA	NA	1@75' Span	1 @75' Span	1 @75' Span	1 @75' Span
Yellow Ck				1@ 110' Span	1 rehab	1 rehab	1 rehab

Table 1: Summary of Bridge Alternatives

Cost estimates were compiled for each of these alternatives and placed in **Table 4**. The more costly bridges are the 5span steel bridges in the North 1 and North 2 Alternatives. The 6-span concrete beam bridge in the South Alternative is a moderately priced bridge option because it utilizes concrete beams. The 3-Span Central 4 Alternative has the longest spans of the central options and required a steel beam bridge, making this option significantly more expensive than the other three Central options. Shorter 3-span concrete bridges warranted for the Central 1 & 2 Alternatives were the most cost-effective bridges.

5.2 RIGHT OF WAY, ENVIRONMENTAL, AND OTHER IMPACTS

Right of Way (ROW)

ROW impacts and the associated costs are an important consideration in alternatives analysis. As design progresses, the actual area of acquisition will be determined and the true impact to the individual parcels will be established. The determinations of access to the parcel, damages to the remainder of the parcel, and other appraisal considerations will be made at that time. Relocation costs vary greatly and can only be determined after a professional relocation agent and appraiser determines personal or real property along with many other factors.

The following represents a ROW cost comparison between the various alternatives in the study. The numbers reflect a very preliminary determination of the assessed values and the amount of property assumed to be acquired for each alignment. Because a large portion of this project is in a highly commercialized area, ROW Acquisition costs will require in-depth appraisals. The values do not take into consideration any of the damages and other appraisal factors necessary for accurate ROW appraising. For example, the values do not take into consideration for loss of parking or a vacated business property versus an established business. The cost impacts for loss of parking will require a professional appraiser's review of municipal requirements, property owner, and tenant agreements. The values also do not take into

consideration the ROW Acquisition service fees for the parcels. Considerations were made for the area of property projected as a necessary acquisition versus the assessed value of the parcel.

It must be noted that the residences along Sunnyside and Nora are assumed to be on well and septic systems. Any impacts to these facilities are not assumed in the report and will not be determined until the appropriate level of engineering and research of the locations and county records has taken place. The final number of permanent and temporary acquisitions for any alternative will be determined based upon actual title research and final engineering.

Each of the alternatives have right of way impacts to consider, except for the No-Build Alternative. The comparison between each of the alternatives is shown below in **Table 2**.

	TOTAL COMMERCIAL (# OF PARCELS)	TOTAL RESIDENTIAL(# OF PARCELS)	PARTIAL COMMERCIAL (# OF PARCELS)	PARTIAL RESIDENTIAL (# OF PARCELS)	PERMANENT ROW (ACRES)
NO BUILD	0	0	0	0	0
SOUTH	2	11	9	7	8.6
NORTH 1	2	1	4	4	22.2
NORTH 2	0	1	6	3	23.9
CENTRAL 1	2	8	10	21	7.7
CENTRAL 2	3	4	13	27	8.5
CENTRAL 3	3	4	5	20	10.2
CENTRAL 4	4	10	4	24	12.1

Table 2: Right of Way Acquisition Comparison

As shown in **Table 2**, alternatives have varying levels of impact to businesses and residences. It was considered that the Central alternative alignments could be shifted south of Sunnyside Avenue and Nora Street to reduce the number of partial impacts to the surrounding residential areas. However, doing this would increase the number of total takes on the south side of Sunnyside Avenue and Nora Street. Costs would be increased, requiring relocations of residents and a church. Primary business impacts for each alternative are as follows:

The South alternative primarily impacts the following businesses:

- Key Bank
- Marathon Gas Station
- Music and Dance building

Central 1 business impacts primarily include:

- Teacher Credit Union (closed)
- Ossip building
- Concord Mall
 - Loss of 100-150 parking spaces
 - Loss of 2 parking lot access drives

Central 2 business impacts primarily include:

- Chase Bank
- Teacher Credit Union
- Ossip building
- Parking lot in the southwest corner of Yellow Creek and Concord Mall Drive

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	South	North 1	North 2	Central 1	Central 2	Central 3	Central 4
Road Items	\$6,330,000	\$3,740,000	\$3,750,000	\$3,940,000	\$4,150,000	\$4,820,000	\$4,150,000
Bridge Items	\$6,110,000	\$8,590,000	\$7,970,000	\$6,070,000	\$4,960,000	\$4,880,000	\$7,130,000
Utilities ¹	\$250,000	\$1,750,000	\$1,750,000	\$300,000	\$300,000	\$350,000	\$350,000
Contingency (30%)	\$3,807,000	\$4,224,000	\$4,041,000	\$3,093,000	\$2,823,000	\$3,015,000	\$3,489,000
Construction Total	\$16,497,000	\$18,304,000	\$17,511,000	\$13,403,000	\$12,233,000	\$13,065,000	\$15,119,000
Preliminary Engineering (15% ⁴)	\$2,474,550	\$2,745,600	\$2,626,650	\$2,010,450	\$1,834,950	\$1,959,750	\$2,267,850
Construction Observation (15%)	\$2,474,550	\$2,745,600	\$2,626,650	\$2,010,450	\$1,834,950	\$1,959,750	\$2,267,850
Right-Of-Way ^(2,3)	\$3,780,907	\$2,724,210	\$1,442,030 ²	\$4,274,946 <mark>2</mark>	\$6,615,129	\$5,140,873	\$6,879,285
RR Flagging	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000
INFLATION (3 Yrs.)	\$3,193,647	\$3,355,022	\$3,066,202	\$2,753,107	\$2,855,394	\$2,806,365	\$3,356,842
TOTAL	\$28,770,654	\$30,224,432	\$27,622,532 ²	\$24,801,953 ²	\$25,723,423	\$25,281,738	\$30,240,827

Table 4: Cost Estimate Comparison

1 – A parametric cost for reimbursable utilities is attributed to each alternative for general budgeting purposes. For the North alternatives, utilities are impacted, and the estimate reflects a ballpark number from the utility.

2 – Parking space values and related impacts could be substantial and were not assessed in this report. North 2 and Central 1 present the greatest parking impacts. These can vary significantly based on the individual property, its lessees, lease agreements, and other factors.

3 – ROW costs are approximated, based on assessed parcel values, and are subject to specific appraisal considerations pertinent to the parcel at the time of acquisition.

4 – ROW Acquisition fees not included in PE.

5.5 DECISION MATRIX

The alternatives were analyzed for roadway and bridge design and construction costs, potential utility relocations, and right of way acquisition costs. See Appendix A, where each alternative is broken down between multiple comparison criteria. This figure can be used as a quick reference for the primary benefits and detriments to each alternative, as well as gain an over-arching idea of the volume of positive or negative aspects inherent with each.

Section 6: Recommendations

6.1 SUMMARY OF ANALYSIS

Each alternative was evaluated for feasibility, construction cost, and environmental, utility, and right of way impacts. Additional factors were considered as shown in the decision matrix.

The **North 1 and 2** alternatives provided a grade separation structure away from the busy Concord Mall business corridor and impacted the least residential parcels, but long-span bridges and expensive utility relocations made these the most expensive options, eliminating them from consideration.

The **South** alternative required the longest bridge and the most extensive roadway and retaining wall work, making this another undesirably high-cost option.

Each of the **Central Alternatives** provided a different way to accommodate the businesses and traffic in the Concord Mall Drive area while providing a grade separated structure to replace the Sunnyside Avenue and CR 13 railroad crossings.



INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue Room N758-ES Indianapolis, Indiana 46204 Eric Holcomb, Governor Joe McGuinness, Commissioner

June 15, 2021

Ms. Suzanne M. Weirick Elkhart County Commissioners 117 North Second Street Goshen, IN 46526

Re: Proposed *Temporary Occupancy* at Mapleheart Trail Des. No. 1801913 (Lead), Elkhart Local Trax Grade Separation Project, Sunnyside Avenue, County Road (CR) 13, and Norfolk Southern Railroad (NSRR), Elkhart County, Indiana

Dear Ms. Weirick,

The Indiana Department of Transportation (INDOT), in coordination with Elkhart County, is planning a proposed Local Trax Railroad Grade Separation project, at Sunnyside Avenue, CR 13, and Norfolk Southern Railroad (NSRR) in Elkhart County (hereinafter referred to as "Elkhart Local Trax Project"). An early coordination letter was sent to you on August 17, 2020 with preliminary information about the project. We did not receive a response to the early coordination letter from your organization.

The Mapleheart Trail is located within the project area along the south side of CR 45 (see attached graphics). Two at-grade crossings will be replaced by a new overpass bridge that will span over CR 45, Mapleheart Trail, NSRR, and US 33 (Main Street).

Section 4(f) of the U.S. Department of Transportation Act of 1966 prohibits the use of certain public and historic lands for federally funded transportation projects unless there is no feasible and reasonable alternative. The law applies to significant publicly owned parks, recreation areas, wildlife / waterfowl refuges, and National Register of Historic Places eligible or listed historic properties. Lands subject to this law are considered Section 4(f) resources.

According to FHWA¹,

Section 4(f) would apply to a publicly owned, shared use path or similar facility (or portion thereof) designated or functioning primarily for recreation, unless the official(s) with jurisdiction determines that it is not significant for such purpose. During early consultation, it should be determined whether or not a management plan exists that addresses the primary purpose of the facility in question.

- The trail is publicly owned by Elkhart County
- The trail is listed as a "Park Site," and is discussed under "Recreation" in the *Elkhart County Parks & Recreation Master Plan (2019-2023)*²

Based on its public ownership, local significance, and its designation as a facility primarily functioning for recreation, the Mapleheart Trail is a Section 4(f) resource. Based on an email we received on June 14, 2021 from Ms. Ronda DeCaire, Director of Elkhart County Parks and Recreation, the Mapleheart Trail is owned by the Elkhart County Commissioners. Therefore, we are reaching out to you as the "Official with Jurisdiction" (OWJ) for the trail. An OWJ is "the officials of the agency or agencies that own or administer the property in question and who are empowered to represent the agency on matters related to the property"¹.

Proposed Impacts

Avoiding impacts to the trail is not feasible because the trail is within the project area. Impacts have been minimized throughout the design and only temporary, short-term impacts are proposed. The trail will be impacted in four areas (see attached graphics):

<u>www.in.gov/dot/</u>

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¹ Section 4(f) Policy Paper, FHWA, Source: <u>https://www.environment.fhwa.dot.gov/legislation/section4f/4fpolicy.pdf</u>

² Source: <u>https://elkhartcountyparks.org/wp-content/uploads/2019/04/Elkhart-County-Parks-MPU-2019-2023-DRAFT.pdf</u>

Area #1: Existing Intersection of Sunnyside Avenue and CR45/Mapleheart Trail

This at-grade crossing will be removed, and the existing four-legged intersection will be reconfigured into a three-way stopcontrolled intersection.

- The existing crosswalk over Sunnyside Avenue will be replaced with an asphalt trail matching the existing trail. The grass-strip buffer will also be perpetuated.
- Existing pavement southwest of the trail will be removed and replaced with vegetative cover.
- Railroad crossing signals will be removed.
- There will be no change to the existing crosswalks over CR 45.
- Short-term closure of the trail, no more than month total (for all areas), will be required for construction (Firm Commitment).

Area #2: New Sunnyside Avenue Bridge over CR 45/Mapleheart Trail, NSRR, and US 33

The new overpass bridge will span CR 45 and the trail about 380 feet southeast of the current intersection of CR 45/Mapleheart Trail and Sunnyside Avenue (Area #1).

- The contractor will be required to keep the trail open as much as safely feasible during construction. Temporary cribbing/scaffolding will be used to keep the trail open. (Firm Commitment)
- Short-term closure of the trail, no more than one month total (for all areas), will be required to set concrete beams over the trail (Firm Commitment)
- No other impacts are proposed at this location.

Area #3: New Three-Way Intersection of CR 13 and CR 45/Mapleheart Trail

The new intersection of CR 45/Mapleheart Trail and CR 13 is proposed about 420 feet northwest of the current intersection (Area #4). The existing irregular four-way stop-controlled intersection will be replaced by a three-way, 90-degree type, stop-controlled intersection.

- New curb ramp connections across CR 45 will be installed
- No other impacts to the trail are proposed at this location

Area #4: Existing Four-Way Intersection of CR 13 and CR 45/Mapleheart Trail

This four-way intersection will be reconfigured to eliminate the at-grade crossing south of the trail.

- The existing crosswalk over CR 13 will be replaced with an asphalt trail matching the existing trail. The grass-strip buffer will also be perpetuated.
- Existing pavement south of the trail will be removed and replaced with vegetative cover.
- Railroad crossing signals will be removed.
- There will be no change to the existing crosswalks over CR 45.
- Short-term closure of the trail, no more than month total (for all areas), will be required for construction (Firm Commitment)

Per the referenced FHWA policy paper, for public parks and trails, a temporary occupancy will not constitute a Section 4(f) use when all of the conditions listed in 23 CFR 774.13(d) are satisfied:

1) Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;

The contractor will be required to keep the trail open to users, except for one month total (for all areas), and there will be no change in ownership.

2) Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal;

The scope of work related to the trail (described above), is limited to activities required to maintain and restore the facility.

3) There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;

The trail will remain open to users throughout most of construction, and there will be no permanent impacts to the activities, features, or attributes of the trail.

4) The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project; and

The trail will be fully restored as described above.

5) There must be documented agreement of the OWJ over the Section 4(f) resource regarding the above conditions. *Please document concurrence by signing below.*

The above list applies to the project because the occupancy will be temporary with no change in ownership, the scope of work is minor, there will be no permanent impacts, the project will not interfere with the activities, features, or attributes of the park, and the land will be fully restored upon completion. Therefore, INDOT respectfully requests your signature below to document your concurrence.

Please let us know within fourteen (14) business days if you have any questions or concerns about this matter. I can be reached at <u>juliet.port@parsons.com</u> or 317-965-3816. Thank you in advance for your input.

Sincerely,

Juliest Post

Juliet Port, LPG Principal Environmental Planner Parsons

Concurrence:

Suzanne M. Weirick, President, Elkhart County Commissioners

TWE 21, 2021

Date

Attachments

Project Location Map Aerial Photographs Photographs Preliminary Project Plans (Excerpts)

CC: Charles McKenzie, Elkhart County Engineering INDOT File











Photo 1 – View of Mapleheart Trail facing southeast (6-24-20).



Photo 2 – View of Mapleheart Trail facing northwest (6-24-20).



Photo 3 – View from Mapleheart Trail of the intersection of CR 45 and Sunnyside facing east. (6-24-20).



Photo 4 – View of Mapleheart Trail and the intersection of Sunnyside Avenue and and CR 45, facing southeast (6-24-2020).

Des. 1801913





Photo 5 – View of CR 45 facing north. Mapleheart trail is on the left and the intersection with CR 13 is in the background (10-21-2020).



Photo 7 – View of the CR 45 and CR 13 intersection facing southeast along Mapleheart Trail (06-23-20).



Photo 6 – View facing northwest of Mapleheart Trail (10-21-20).



Photo 8 – View facing south of the intersection of CR 13 and CR 45. Crosswalks for Mapleheart Trail are visible in the background (10-21-2020).

PROJECT	DESIGNATION
1801913	1801913
CONTRACT	
B-41846	

DESIGNATION

1900836

2001723

2001724

2100065

1801913

INDIANA DEPARTMENT OF TRANSPORTATION						
	IND IANA					
TYPE ad/Traffic						
Bridge						
Bridge						
Bridge						
Roadway		S				

Note to Reviewer: Project Split and Addition of new Des No. 2100065 is Being Coordinated with INDOT and County. Plan Split will be Finalized for Next Submittal

County Bridge 151 - Concord Mall Drive over Yellow Creek

County Bridge 150 - Sunnyside Avenue over Yellow Creek

Sunnyside Avenue/County Road 13 Re-Alignment

KIN PROJECT INFORMATION PROJECT DESCRIPTION

County Bridge 148 - Sunnyside Avenue/Mall Drive at US 33 over Norfolk Southern Railroad

Sunnyside Avenue/ Mall Drive at US 33 (Main Street) over Norfolk Southern Railroad

Road/Tr

Brida

Bridge

Roadway

STREET) OVER NORFOLK SOUTHERN RAILROAD 1801913 P.E. 1801913 R/W 1801913 CONST.

ROAD PLANS Mapleheart Trail

Excerpts showing



PROJECT NO.



	TO BE USED WITH THESE F	PLANS	20		
PHONE NUMBER		DES	SIGNAT	TON	
			8019	13	
DATE	SURVEY BOOK		SHEET	5	
		1	of	270	
	CONTRACT	F	ROJEC	л	
DATE	B-41846	1	1801913		

Stage 2

March 11, 2021

INDIANA DEPARTMENT OF TRANSPORTATION

Sta 1022+29 12 Line "PR-A"







TRAFFI	C DATA	
A.A.D.T.	(2023)	9000 V.P.E
A.A.D.T.	(2043)	9900 V.P.E
D.H.V	(2043)	1190 V.P.H
DIRECTIONAL DIST	RIBUTION	52% (SE
TRUCKS		3% A.A.D.1
		1% D.H.\
DESIGN	DATA	1% D.H.V
DESIGN DESIGN SPEED	DATA	1% D.H.\ 35 M.P.I
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DESIGN SPEED PROJECT DESIGN C FUNCTIONAL CLAS: RURAL/URBAN	DATA CRITERIA SIFICATION	1% D.H.\ 35 M.P.I 4R (NON-FREEWA- LOCAL AGENCY COLLECTO URBAN (SUBURBAN
DESIGN SPEED PROJECT DESIGN C FUNCTIONAL CLAS: RURAL/URBAN TERRAIN	DATA CRITERIA SIFICATION	1% D.H. ¹ 35 M.P. 4R (NON-FREEWA LOCAL AGENCY COLLECTO URBAN (SUBURBAI LEVI



BRIDGE LENGTH Elkh	art County No. 148:	0.077	MI.
ROADWAY LENGTH:		0.566	MI.
TOTAL LENGTH:		0.663 *	MI.
MAX. GRADE		4.90	%

* Total length includes the bridge length of County Bridge No. 150.

INDIANA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS DATED 2020 TO BE USED WITH THESE PLANS.

		BRI	DGE	FILE
217-616-1000		Elkhart Coun	ty B	ridge No. 148
PHONE NUMBER		DES	IGNA	TION
		19	9008	36
DATE	SURVEY BOOK	5	HEET	S
DATE	ELECTRONIC	1	of	15
	CONTRACT	P	ROJE	CT
DATE	B-41846	18	3019	13













320+00		
520100		
	Line	e "E" to be Constructed
INDIANA	HORIZONTAL SCALE 1" = 2'	BRIDGE FILE N/A
UF TRANSPORTATION	VERTICAL SCALE N/A	DESIGNATION 1801913
45 & CR 13 W CORNER	SURVEY BOOK ELECTRONIC	SHEETS 106 of 270
RAMP DETAIL	B-41846	1801913





TNIDIANIA	HORIZONTAL SCALE	BRIDGE FILE		
INDIANA T OF TRANSPORTATION	1" = 2'	N/A		
	VERTICAL SCALE	DES	IGNAT.	ION
	N/A	1801913		.3
2 13 & CR 45	SURVEY BOOK	SHEETS		;
	ELECTRONIC	108 of 270		270
	CONTRACT	PROJECT		Г
B RAMP DETAIL	B-41846	1801913		

	Note to Reviewer: Re-Alignment of CR13 was not Originally Scoped. Additional Survey for CR13 Re-Alignment is Forthcoming. Plans and Design to be Updated Accordingly for Next Submittal		CR 45	
	Area #3			
		Elev. 774.55		Elev. 774.64
			<u></u> 10.00'	-
		Elev. 774.57		Elev. 774.66
			Tiered Perpendicular	
Buffer or Other Non-Walkable Surface R Curb Ramp	TS Turning Space Ex. Existing Slope or Elevation [CS] Clear Space T.C. Top of Curb PC Pedestrian Clear Space B.C. Bottom of Curb F Sidewalk (1) Curb Concrete, B	n C Inlet Protection	RECOMMENDED FOR APPROVAL	NGINEER DATE DEPARTMENT
Detectable Warning Surface	e FS Flared Side 2 Return Curb		CHECKED:CWB CHECKED	: CWB CURB

Ø Line "E" to be Constructed HORIZONTAL SCALE 1" = 2' VERTICAL SCALE N/A SURVEY BOOK ELECTRONIC CONTRACT B-41846
 BRIDGE FILE

 N/A

 DESIGNATION

 1801913

 SHEETS

 109
 of

 270

 PROJECT

 1801913
 INDIANA F OF TRANSPORTATION R 45 & CR 13 SE CORNER B RAMP DETAIL







From:Port, JulietSent:Tuesday, June 15, 2021 3:11 PMTo:'Charles McKenzie'Subject:RE: [EXTERNAL] Re: request RE: Elkhart Local Trax Project and Mapleheart Trail

On Tue, Jun 15, 2021 at 2:38 PM Ronda DeCaire <<u>rdecaire@elkhartcounty.com</u>> wrote:

As I have mentioned before, the Elkhart County Park & Recreation Board does not physically own the MapleHeart Trail (we only help to keep the trail clean by sweeping and assist with its marketing, but we have no authorization or agreement for anything else).

The MapleHeart Trail is owned by the Elkhart County Commissioners.

[signature] Ronda DeCaire, CPRP • DIRECTOR Elkhart County Parks • 211 W. Lincoln Avenue • Goshen, IN 46526 <u>rdecaire@elkhartcounty.com</u><mailto:<u>rdecaire@elkhartcounty.com</u>> • 574.535.6458 • FACEBOOK<<u>http://www.facebook.com/ElkhartCountyParks/[facebook.com]</u>>

[Nam photo with krista]<<u>http://www.elkhartcountyparks.org/ [elkhartcountyparks.org]</u>>

From: Port, Juliet <<u>Juliet.Port@parsons.com</u>>

Sent: Tuesday, June 15, 2021 2:19 PM

To: Ronda DeCaire <<u>rdecaire@elkhartcounty.com</u>>; Bernard Cunningham <<u>BCunningham@elkhartcounty.com</u>> Cc: Charlie McKenzie <<u>cmckenzie@elkcohwy.org</u>>; Porter, Sean <<u>Sean.Porter@parsons.com</u>>; Lee, Alexander <<u>Alexander.Lee@parsons.com</u>>

Subject: request RE: Elkhart Local Trax Project and Mapleheart Trail

Ms. Decaire, We are following-up on this request for Concurrence (via signature) on behalf of the Indiana Dept. of Transportation (INDOT) and Elkhart County highway department. Please review the Caution! This message was sent from outside your organization.

Allow sender<<u>https://mail-cloudstation-us-west-2.prod.hydra.sophos.com/mail/api/xgemail/smart-banner/95eb905df3704d7d7f24023809b29a85 [mail-cloudstation-us-west-2.prod.hydra.sophos.com]</u>> | Block sender<<u>https://mail-cloudstation-us-west-2.prod.hydra.sophos.com/mail/api/xgemail/smart-banner/df6098ec800303483f3f7c504dacca7e [mail-cloudstation-us-west-2.prod.hydra.sophos.com]></u>

sophospsmartbannerend

Ms. Decaire,

We are following-up on this request for Concurrence (via signature) on behalf of the Indiana Dept. of Transportation (INDOT) and Elkhart County highway department. Please review the attached letter and if you concur with our findings, please sign and return the 3rd page.

Please do not hesitate to contact us with any questions or requests. We appreciate your attention to this matter.

Thank you, Juliet Port From: Port, Juliet Sent: Monday, May 24, 2021 2:52 PM To: <u>rdecaire@elkhartcounty.com</u><mailto:<u>rdecaire@elkhartcounty.com</u>>; <u>bcunningham@elkhartcounty.com</u><mailto:<u>bcunningham@elkhartcounty.com</u>> Cc: Charles McKenzie <<u>cmckenzie@elkcohwy.org</u><mailto:<u>cmckenzie@elkcohwy.org</u>>>; Porter, Sean <<u>Sean.Porter@parsons.com</u><mailto:<u>Sean.Porter@parsons.com</u>>>; Lee, Alexander <<u>Alexander.Lee@parsons.com</u><mailto:<u>Alexander.Lee@parsons.com</u>>> Subject: Elkhart Local Trax Project and Mapleheart Trail

Request for Signature: letter regarding Proposed Temporary Occupancy of Mapleheart Trail Elkhart Local Trax Project Des. No. 1801913

Ms. Decaire,

We are sending you the attached letter on behalf of the Indiana Department of Transportation (INDOT). Please do not hesitate to contact us with any questions or concerns.

We appreciate your attention to this matter. Thank you,

Juliet Port, LPG Principal Environmental Planner 101 W Ohio, Suite 2121 Indianapolis, IN 46204 juliet.port@parsons.com<mailto:juliet.port@parsons.com>

Orange Line East





Source: http://interurbantrolley.com/routes.html



el autobús. Informe al conductor que está utilizando el portabicicletas antes de abordar y cuando se baje.

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

ProjectNumber SubProjectCode	County	Property
1800054 1800054	Elkhart	Oxbow County Park
1800064 1800064	Elkhart	Stauffer Park, Derksen Park & McCormicks Creek G.C.
1800074 1800074	Elkhart	Oxbow County Park
1800099 1800099	Elkhart	Stauffer Park, Derksen Park & McCormicks Creek G.C.
1800257 1800257A	Elkhart	Elliott Park
1800257 1800257B	Elkhart	Lundquist Bicentennial Park
1800257 1800257C	Elkhart	Pinewood Park
1800283 1800283	Elkhart	High Dive Park
1800310 1800310	Elkhart	McNaughton Park
1800337 1800337	Elkhart	Stauffer Park, Derksen Park & McCormicks Creek G.C.
1800339 1800339	Elkhart	Shoup-Parsons Woods Park
1800340 1800340	Elkhart	Reith Park
1800354 1800354	Elkhart	Pierre Moran Park
1800441 1800441	Elkhart	High Dive Park
1800450 1800450	Elkhart	Stauffer Park, Derksen Park & McCormicks Creek G.C.
1800470 1800470	Elkhart	Studebaker Park
1800542 1800542	Elkhart	Boot Lake Nature Preserve
1800554 1800554	Elkhart	Cobus Creek County Park
1800628 1800628	Elkhart	Corson Riverwoods County Park
1800631 1800631	Elkhart	South Park

Source: <u>https://www.in.gov/indot/files/IN</u> <u>LWCF</u> <u>sites</u> <u>by</u> <u>county.xlsx</u>



July 22, 2021

Environmental Justice (EJ) Analysis Elkhart Local Trax Grade Separation Elkhart County Des. No. 1801913 (Lead)

Introduction

The Indiana Department of Transportation (INDOT), in coordination with Elkhart County, is planning a Local Trax Railroad Grade Separation project, at Sunnyside Avenue, County Road (CR) 13, and Norfolk Southern Railroad (NSRR) in Elkhart County (hereinafter referred to as "Elkhart Local Trax Project"). The project is located in an unincorporated area known as Dunlap. The western portion of the project area lies within the City of Elkhart. West and south of the railroad, the project area consists of a mixture of vacant and occupied commercial properties. North and east of the railroad, the project area is primarily residential, with churches at the intersection of Sunnyside Avenue and CR 13. Adjacent properties include Concord Mall, at the northwest corner of Concord Mall Drive and US 33, and the Concord High School /Concord Intermediate School campus, at the southwest corner of CR 20/Mishawaka Road and US 33.

The proposed project would eliminate the two at-grade crossings and provide a single, grade-separated crossing. Several alternatives are under consideration. The current recommended alternative would include a grade-separated crossing at Sunnyside Avenue, and a roundabout near the existing Concord Mall Drive and Center Drive intersection (see Attachments, page 5).

Purpose and Need: Elkhart County proposes a grade separation project located on Sunnyside Avenue, Concord Mall Drive, and County Road (CR) 13 over Norfolk Southern Railroad (NSRR) in Elkhart County, Indiana (hereinafter referred to as "Elkhart Local Trax Project"). The need for the project stems from safety and mobility issues for motorists, pedestrians, bicyclists, and trains at the two subject at-grade railroad crossings, the Sunnyside Avenue crossing and the CR 13 crossing. Trains typically run through these crossings 80 to 90 times a day1. Furthermore, the trains regularly stop on the tracks, restricting traffic for extended periods of time and delaying emergency vehicle access to the communities north of the tracks. Existing crash data indicates a high rate of crashes for these types of crossings. Since 1987, there have been seven train/vehicle accidents, including one fatality at Sunnyside Avenue. Since 1976, there have been nine train/vehicle accidents, including two fatalities, at the CR 13 crossing. Furthermore, from 2016 to 2019, the intersections of US 33/Main Street and Sunnyside Avenue, CR 45 and Sunnyside Avenue, and the Sunnyside Avenue Railroad Crossing in the state, the CR 13 Crossing and the Sunnyside Avenue Crossing are ranked by rail-highway conflict associated to them. Of the 5,700 public crossings in the state, the CR 13 Crossing and the Sunnyside Avenue, CR 45 and Sunnyside Avenue, CR 13 and 112th worst, respectively1. Furthermore, the area generally lacks pedestrian facilities. There are no sidewalks along Sunnyside Avenue, CR 13, nor Concord Mall Drive. The purpose of this project is to reduce the exposure of motorists and pedestrians to rail traffic, and to increase mobility in this area of Elkhart County.

Under Federal Highway Administration (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 (ROW). The project will require two commercial relocations and three residential relocations, as well as 13.83 acres of permanent new ROW and approximately 0.91 acre of temporary ROW. Therefore, an EJ Analysis is required.

Identification of EJ Populations

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 Elkhart County (see Attachments, page 1). The community that overlaps the project area is called the affected community (AC). In this project, the ACs are the following Census Track (CT) Block Groups (CTBGs): Block 1, CT 21.01 (AC-1), Block 2, CT 21.01 (AC-2), Block 2, CT 20 (AC-3), Block 1, CT 20 (AC-4) (see Attachments, page 2 and 5).

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 Census.gov 2019 American Community Survey (ACS) 5-year Estimates was obtained

¹ Source: Engineer's Report – Sunnyside Avenue over NSRR in Elkhart Co. February 2020


from the <u>census.gov</u> website on June 21, 2021. The data collected for minority and low-income populations within the AC are summarized in the below table.

Table 1: Minority and Low-Income Data (2019 ACS 5-Year Estimates)								
	COC Elkhart	AC-1	AC-2	AC-3	AC-4			
	County							
Percent Minority	25.2	42.2	17.4	39.2	14.9			
125% of COC	31.5	AC > 125% COC	AC < 125% COC	AC > 125% COC	AC < 125% COC			
EJ Population of Concern?		Yes	No	Yes	No			
Percent Low-Income	12.4	16.3	4.2	19.2	4.1			
125% of COC	15.5	AC > 125% COC	AC < 125% COC	AC > 125% COC	AC < 125% COC			
EJ Population of Concern?		Yes	No	Yes	No			

Source: census.gov

AC-1 has a percent minority of 42.2, which is below 50% but is above the 125% COC threshold. Therefore, AC-1 does contain a minority population of EJ concern. AC-1 has a percent low-income of 16.3, which is below 50% and is above the 125% COC threshold. Therefore, AC-1 does contain a low-income population of EJ concern.

AC-2 has a percent minority of 17.4, which is below 50% and is below the 125% COC threshold. Therefore, AC-2 does not contain a minority population of EJ concern. AC-2 has a percent low-income of 4.2, which is below 50% and is below the 125% COC threshold. Therefore, AC-2 does not contain a low-income population of EJ concern.

AC-3 has a percent minority of 39.2, which is below 50% but is above the 125% COC threshold. Therefore, AC-3 does contain a minority population of EJ concern. AC-3 has a percent low-income of 19.2, which is below 50% but is above the 125% COC threshold. Therefore, AC-3 does contain a low-income population of EJ concern.

AC-4 has a percent minority of 14.9, which is below 50% and is below the 125% COC threshold. Therefore, AC-4 does not contain a minority population of EJ concern. AC-4 has a percent low-income of 4.1, which is below 50% and is below the 125% COC threshold. Therefore, AC-4 does not contain a low-income population of EJ concern.

The census data sheets, map, and calculations can be found in the attachments.

The US Department of Housing and Urban Development (HUD) Resource Locator (<u>https://resources.hud.gov/</u>) was researched to identify potential EJ resources and/or populations (Attachments, page 6). No resources were identified within the four ACs associated with this project. The nearest resource is Ashton Pines Apartments, 4353 Balsam Fir Lane, located approximately 0.75 mile southeast of the project area. No impacts are expected.

Impact Analysis

ROW and Relocations: The proposed ROW and relocation impacts per AC are summarized in the following table.

Table 2: Summary of Impacts per AC								
AC / EJ Population?	Permanent ROW	Temporary ROW	Relocations / Type	Other ROW (non-relocations)				
	(Acres) / Type(s)	(Acres) /Type(s)						
AC-1 / Yes	8.93 commercial	0.06 commercial	2 vacant commercial	Strips from 9 commercial parcels				
AC-2 / No	4.17 residential	0.51 residential	3 residential	4 unimproved residential parcels				
	0.14 commercial	0.08 commercial						
	0.18 religious	0.15 religious		Strips from 14 residential parcels, 2				
				religious' facilities, and 5 commercial				
				parcels				
AC-3 / Yes	0.00	0.07 residential	None	Strips from 8 residential parcels				
AC-4 / No	0.01 residential	0.04 residential	None	Strips from 1 residential parcel and 1				
	0.40 commercial			commercial parcel				

Within AC-1, which does contain EJ populations, the proposed relocations consist of two vacant commercial properties: a strip center that contained a grocery store, its parking lot, and a former automotive service garage property. This area is proposed for the new roundabout, a storm water basin, and the new bridges: County Bridge 150, Sunnyside Avenue over Yellow Creek; County Road 151, Concord Mall Drive over Yellow Creek; and County Bridge 148, the new Sunnyside Avenue bypass over US 33/NSRR (see Attachments, page 5). Additionally, strips of ROW from commercial properties are required within AC-1. The proposed ROW acquisition within AC-3, which also contains EJ populations, is limited to strips from residential properties along the east side of CR 13 where a sidewalk is being added, as well as driveways that need to be reconstructed to tie into the improved roadway. No relocations are proposed within AC-3.



Within AC-2, which does not contain EJ populations, the proposed relocations consist of three occupied residential properties. Additionally, acquisition of four unimproved residential parcels, and strips of ROW from residential, commercial, and religious properties are proposed. Work in this area will include the eastern side of the new bypass bridge (County Bridge 148), widening of Sunnyside Avenue and CR 13 to include sidewalks, intersection improvements at Sunnyside Avenue/CR 13 and CR 13/CR 45, and several storm water basins. Within AC-4, which also does not contain EJ populations, ROW impacts are limited to strips from a commercial parcel and a residential parcel. No relocations are proposed within AC-4.

<u>Maintenance of Traffic (MOT)</u>: The proposed MOT will include full roadway closures and detours will be provided. The detours are each less than two miles in length. The proposed detour within AC-1 will utilize CR 20 (Principal Arterial), Concord Mall Drive (Urban Collector), and US 33 (Principal Arterial). The detours within AC-2 through AC-4 will utilize CR 13, an Urban Collector located within all three ACs, as well as CR 45 (Urban Collector), and Cole Street - the only Local Road proposed for detours, which is located within AC-2 only. Access for all residences and businesses will be maintained throughout construction. Design of the MOT is ongoing. The Traffic Management Plan will include input from the project sponsor, Elkhart County, and meetings with stakeholders including emergency services, Interurban Trolley and Concord Community Schools, to ensure impacts to the public transit, schools, and community events are minimized. Therefore, the proposed MOT is not anticipated to disproportionately impact EJ populations.

<u>Changes in Traffic Patterns:</u> The proposed closure of two at-grade crossings (AC-1 and AC-2), construction of a new bypass bridge (AC-1 and AC-2) and roundabout (AC-1), and associated changes to local roads (e.g., cul-de-sacs and extended drives) (AC-1 to AC-4) will alter traffic patterns and change how the community and emergency vehicles access area residences, schools, and businesses. These changes are discussed further below.

Within AC-1, the proposed roundabout intersection for Concord Mall Drive, Center Drive, and the realigned Sunnyside Avenue in the western commercial area will alter how area businesses, schools, and neighborhoods are accessed. The roundabout is designed to accommodate emergency vehicles and buses. All adjoining properties will retain access, including the Concord Community Schools bus facility driveway with CR 13. CR 13 will terminate at a cul-de-sac east of this driveway and south of NSRR, which is designed to accommodate turning school buses.

Within the eastern residential area (AC-2 to AC-4), the realignment of CR 13 at CR 45 should improve sight distances and driver expectancy. The proposed changes to the existing grid of local roads within the eastern residential area includes:

- The existing Sunnyside Avenue east of CR 45 will terminate in a cul-de-sac near Amy Avenue;
- Amy Avenue will terminate at Nora Street;
- Kendall Street will terminate at cul-de-sacs north and south of the new alignment;
- John Street will terminate in a cul-de-sac west of CR 13; and,
- Linden Drive will be extended to connect with the new CR 13 alignment.

These changes in access are not expected to negatively impact community cohesion because access to all surrounding properties will be provided and there will still be an existing grid within the residential area (albeit reduced).

The proposed closure of the at-grade crossings over NSRR at Sunnyside Avenue and CR 13 will increase mobility and reduce the exposure of motorists and pedestrians to rail traffic. Increases in mobility include the elimination of queueing issues and delays associated with the 80 to 90 average daily railroad crossings and associated train stoppages (see Purpose and Need). Similarly, emergency vehicle response times should improve due to the elimination of train crossing delays and stoppages.

Furthermore, mobility and safety for pedestrians and bicyclists will be increased by the addition of sidewalks and pedestrian crossings along the realigned Sunnyside Avenue, Concord Mall Drive, and CR 13 (AC-1 through AC-4). The added pedestrian facilities will connect with existing sidewalks along US 33/Main Street and CR 20/Mishawaka Road, as well as the Mapleheart Trail (along CR 45), and the Interurban Trolley transit stop at the Concord Mall. This will improve pedestrian access to area businesses and transit, as well as the Concord Highschool and Intermediate School campus.

Public involvement and resource agency coordination activities conducted to-date, including the August 2020 public informational "virtual" meeting (webinar) and in-person open house, did not identify impacts to EJ populations of concern (see Attachments, pages 7 and 8). Feedback about the proposed project from area businesses, primarily located within AC-2, has been positive.

Conclusions

Public Comment log intentionally omitted, refer to Appendix G.

As stated in the Introduction, the purpose of this project is to improve safety and mobility in this area of Elkhart County. Removing the at-grade crossings and providing new pedestrian facilities will benefit the community by addressing the safety and mobility issues outlined above. The impacts within ACs identified as containing EJ populations (AC-1 and AC-3) are limited to vacant commercial properties and strips of ROW. The impacts within ACs identified as not containing EJ populations (AC-2 and AC-4) include three residential properties, four unimproved residential parcels, and strips of ROW from residential, commercial, and religious parcels. The proposed changes in traffic patterns primarily impact a commercial area within AC-1, as well as commercial and residential areas within AC-2. Based on this analysis, there does not appear to be disproportionately high and adverse impacts to EJ populations in or near the project area.

EJ Analysis, Elkhart Local Trax, Des. 1801913 June 21, 2021 Source: <u>Census. gov</u>

https://data.census.gov/ceduci/mapText=803002&g=0500000US18039&mode=selection&tid=ACSDT1Y2019.803002&vintage=2019&dayer=VT_2019_050_00_PY_D1 ₹<u>1</u> Not syncing 8 Ð 10 🔜 SiriusXM 🟠 PWeb Home 🧳 Google Maps 🍺 INDOT ENV 💪 Google 📳 IN MAP 🦉 IPaC 📗 ITAP 🏠 I-69 ORX 😁 Dict. 🧿 ShareFile 🧮 BIAST 😻 USFWS: Bats 🕒 Appsetra 🖒 INSCOPE 🔰 IDEM Starmwater N... Cther favorites Q Search GES COUNTY SELECTION MAP R DOWNLOAD Geographies: County ✓ Year: 2019 B 11 Taste (\times) Notes Select Clear Geos IN BY ity Sarvey 2014, 2013, Approximate project area LAGRANGE ST. JOSEPH COC LEGEND YEAR: 2019 Selected Geographies ÷ is and Economy -

Community of Comparison (COC) Map: Elkhart County

Affected Communities (ACs) Map: Census Tract (CT) Block Groups (CTBGs) Block 1, CT 21.01 (AC-1), Block 2, CT 21.01 (AC-2), Block 2, CT 20 (AC-3), Block 1, CT 20 (AC-4)



	Q Search							
ALL TABLES MAPS PAGES								
1 Results FILTER DOWNLOAD POVERTY STATUS OF INDIVIDUALS	POVERTY STATUS OF INDIVIDUALS IN THE PAST 1 Survey/Program: American Community Survey TableID: 617021	NGEMENT Product: 2019: ACS 5-Year Estimates Detailed Tables Universe: Population for whom poverty status is determined.						
IN THE PAST 12 MONTHS BY	COC		AC-4 AC-3		AC-1	AC-2		
LIVING ARKANGEMENT Survey/Program: American Community Survey		Elkhart County, Indiana	Block Group 1, Census Tract 2_	Block Group 2, Census Tract 2.	Block Group 1, Census Tract 2	Block Group 2, Census Tract 2		
Years: 2019, 2018, 2017, 2016, 2015, 2014, 2013,	Label	Estimate	Estimate	Estimate	Estimate	Estimate		
2012, 2011, 2010	✓ Total:	200,909	1,810	1,834	3,799	683		
Table: 617021	> Income in the past 12 months below poverty level.	24,885	74	352	621	29		
	Income in the past 12 months at or above poverty level.	176,024	1,736	1,482	3,178	654		
	COC: Percent Lo 24885/20 125% (12.	ow Income 00909 = 12.4 .4 X 1.25) = 15.5	AC-4 Percent Low Income 74/1810 = 4.1	AC-3 Percent Low Income 352/1834 = 19.2 ·	AC-1 Percent Low Income 621/3799 = 16.3	AC-2 Percent Low Income 29/683 = 4.2		

	Q Search							
GES								
ER DOWNLOAD	HISPANIC OR LATINO ORIGIN BY R Survey/Program: American Community Surve TableID: 803002	ACE	Product: 2019: ACS 5-Year Estimates Detailed Tables v					
SIN DY			COC	AC-4	AC-3	AC-1	AC-2	
nity Survey			Elkhart County, Indiana	Block Group 1, Census Tract 2	Block Group 2, Census Tract 2	Block Group 1, Census Tract 2	Block Group 2, Census Tract 2	
,2014,2013,	Label		Estimate	Estimate	Estimate	Estimate	Estimate	
	V Total:		204,558	1,867	1,834	3,811	700	
	✓ Not Hispanic or Latino:		171,975	1,625	1,453	2,714	649	
	White alone		152,973	1,589	1,116	2,203	578	
	Black or African American alone		11,054	0	117	419	21	
	American Indian and Alaska Native alo	ne	288	9	22	0	0	
	Asian alone		2,147	0	58	0	0	
	Native Hawaiian and Other Pacific Islan	ider alone	109	0	0	0	0	
	Some other race alone		395	0	0	0	0	
	> Two or more races:		5,009	27	140	92	50	
	> Hispanic or Latino:		32,583	242	381	1,097	51	
	COC: Percent Minority (204588-152973)/204588 = 2		(3)/204588 = 25.2 25) = 31 5	AC-4 Percent Minority (1867-1589)/1867 = 14.9	AC-3 Percent Minority (1834-1116)/1834 = 39.2	AC-1 Percent Minority (3811-2203)/3811 -= 42.2	AC-2 Percent Minority (700-578)/700 = 17.4	



Des. 1801913

Appendix J

Elkhart Local Trax Grade Separation Elkhart County, Indiana Affected Communities (AC)

Page J-53

HUD Resource Location Map

- C Q https://resources.hud.gov//#

4

0 13 6 1 1



Port, Juliet

From:	Fair, Terri <tfair@indot.in.gov></tfair@indot.in.gov>
Sent:	Thursday, July 22, 2021 1:14 PM
То:	Port, Juliet
Cc:	Ronald Bales; Miller, Brandon
Subject:	[EXTERNAL] EJ Memo Elkhart Local Trax 1801913 for review
Attachments:	MEM ElkhartTrax EJ Analysis 202010722.pdf

INDOT-Environmental Services Division (ESD) has reviewed the project information along with the Environmental Justice (EJ) Analysis for the above referenced project. With the information provided, the project may require right-ofway. There may be relocations. With the information provided, the relocations would not disrupt community cohesion or create a physical barrier. 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. No further EJ Analysis is required.

1

Date	From:	То:	Method of Conta	act Requ	lest	Respon	se		
						utilities	utilities sent record drawings of locat		f locations and
7	7/1/2019 Kenny	All utilities	email	Initia	tial Project notice facility		ility attributes,		
				sent	sent all utilities notices of SUE				
7/	10/2020 SAM Utility Locating	All utilities	emails	inves	tigations to come	no respo	onses ant	ticipated	
7/	/31/2020 Kenny	All utilities	email	Verif	ication notice	Utilities depicted were ma	Utilities replied as to whether our projected their locations correctly, revision were made and sent again		our project plans :ly, revisions
10/	/28/2020 Kenny	All utilities		Prelii	minary Field Check/Virtual	utilities most uti	attendec lities res	l to hear proje ponded with a	ct updates nalysis of
3/	/19/2021 Kenny	All utilities	email	Conf	lict Analysis Request	probable	e impact	s to their facili	ties
5	5/6/2021 Kenny	All utilities	email	reser	nt Conflict Analysis Request	received	d more responses		
5/	/25/2021 Kenny /10/2021 Kenny	All utilities All utilities	email site visit	Requ On si Meet	est Work Plans te utility meeting ting to discuss obtaining Testho	utilities are asked to develop relocation pl responses due in 120 days per 105 IAC 13 met on site and viewed critical locations v AEP, NiSource gas, Frontier, City of Elkhar		elocation plans, 105 IAC 13. locations with y of Elkhart	
				obtai	in specific horizontal and vertica	al			
7	7/2/2021 Kenny	INDOT	virtual	infor	mation	in proce	SS		
List of U	tility Contacts					·			
	AEP Transmission	Electric	Joshua	Adams	850 Tech Center Dr.	Gahanna	ОН	43251	
	AEP Distribution	Indiana Michigan	FTrevor	Stanley	110 East Wayne Street	Fort Wayne	IN	46802	
	Comcast	Cable TV	Will	Morris	1600 W Fountain Dr	Bloomington	IN	47404	
	Elkhart Cnty Sewer	Sanitary Sewer	Kris	Krueger	117 North Second Street	Goshen	IN	46526	
	Elkhart Public Utilities	Water	Tory	Irwin	1201 S. Nappanee St.	Elkhart	IN	46516	
	Frontier Communications	Communication	Joe	Sarll	8001 West Jefferson Blvd	Fort Wayne	IN	46804	
	Intercarrier Networks	Communication	Alex	Herald	3424 Corwin Rd	Williamston	MI	48895	
	Job 8 Llc	Communication	David	Barksdale	800 Woodlands Parkway	Ridgeland	MS	39157	
	MCI	Communication	Chris	Fowler	730 West Henry St	Indianapolis	IN	46225	
	NIPSCO Gas	Gas	Michelle	Wyatt	801 East 86th Avenue	Merrillville	IN	46410	
	Uniti Fiber	Communication	David	Dwyer					
	Windstream	Communication	Mark	Mills	5020 Smythe Dr	Evansville	IN	47715	
	Zayo Bandwith	Communication	Waylon	Higgins	9209 Castlegate Dr	Indianapolis	IN	46256	
	Concord Mall	Private							
	US Signal Company	Communication	Ryan	Miedema	201 Ionia Ave SW	Grand Rapids	MI	49503	

Appendix J

Note To Reviewer: In this report, DES 2001723 is referred to as "Bridge C"



Structure Size and Type Report Excerpts

Local Trax Railroad Grade Separation – Sunnyside Ave. over NSRR in Elkhart Co.

Des. Nos.: 1900386, 2001723, & 2001724 New Structure Nos.: Elkhart County Bridges 148, 151, & 150 Contract No. B-41846 Project No. 1801913

July 6, 2020



Excerpts

beams is longer than that of prestressed concrete beams. Additionally, the maintenance costs are higher than that of concrete beams.

Figures 402-5A and 402-8B list other structure types that could be used for new structures. The structure types that were not considered are listed below and were eliminated by engineering judgement and the IDM.

- 1. Continuous Reinforced Slab: Not recommended for spans greater than 45' per IDM Fig. 402- 5A.
- 2. <u>Post Tensioned Bulb-Tee Beams</u>: This option was eliminated by engineering judgement with regards to economic and structural efficiency when compared to hybrid buld-tee beams.
- 3. Post-Tension Concrete Slab: Not recommended for span lengths greater than 80' per IDM Fig. 402-5A.
- 4. **<u>Rolled Steel Beam</u>** This option was eliminated by engineering judgement with regards to economic and structural efficiency when compared to built-up plate girder.
- 5. <u>Composite Steel Box Girders</u>: These are rarely used and are not recommended by the IDM because of all the steel components and the high life cycle costs required.

Given that Sunnyside Ave. will be a new alignment, no MOT will be necessary and therefore will allow for quicker construction and eliminating undesirable phase joints and temporary widening. Additionally, this will provide safety for construction personnel.

Bridge C: Concord Mall Dr. over Yellow Creek

The pros and cons of each alternate were compared to determine the most cost-effective solution, while striving to meet the design constraints of this particular location. We took into consideration the freeboard requirement per IDM 203-3.02(03) with respect to Yellow Creek when arriving at the proposed span length. Backwater played a significant role in structure sizing, requiring that the opening be large enough to meet both INDOT and IDNR requirements for a new bridge at this location.

<u>Alternative C1</u> proposes a full replacement, three-span bridge over Yellow Creek utilizing a continuous reinforced concrete slab. A slab provides a minimum structure depth when compared to hybrid bulb-tee and rolled steel beams. This alternative is not as efficient in terms of time of construction due to the need for falsework to set the forms for the slab; however, alternative C1 is the most economical for both construction and life cycle costs.

<u>Alternative C2</u> proposes a full replacement, single-span bridge over Yellow Creek utilizing prestressed concrete hybrid bulbtee beams. In order to provide the required 1' of freeboard, the vertical profile will need to be raised 12" resulting in additional approach roadway costs, as well as incidental impacts to adjacent commercial driveways.

<u>Alternative C3</u> proposes a superstructure replacement utilizing rolled steel beams. Despite having a similar total structure depth to that of the reinforced concrete slab, the cost to construct the rolled steel beams is higher than that of a prestressed concrete beam. Additionally, the lead time required to fabricate the beams is longer than that of prestressed concrete. For the purposes of the superstructure replacement, minimizing the weight of the load placed onto the salvaged pier and end bent piles was vital for the determination of the replacement configuration. It was determined that prestressed concrete beams with an 8" deck would impart an increased load onto the piers and end bents when compared to the existing adjacent box beam structure. The proposed steel beam alternative with deck resulted in a 9% reduction in loading at the pier compared to the existing structure. Therefore, the salavaged pier and end bent piles will be adequate in supporting the new superstructure. This steel would be painted with the INDOT 3-coat paint system, which will require additional maintenance over the structure lifetime.

Figures 402-5A and 402-8B list other structure types that could be used for new structures. The structure types that were not considered are listed below and were eliminated by engineering judgement and the IDM.



BRIDGE C CONCORD MALL DR. OVER YELLOW CREEK

The major items affecting the cost of the structures were computed for the three structures. For calculations of these costs, see Appendix E.

Alternative Comparison Summary

	ALTERNATIVE C1	ALTERNATIVE C2	ALTERNATIVE C3
STRUCTURE TYPE	Continuous Reinforced Concrete Slab (Three-span with Integral Bents)	Composite Hybrid Bulb Tee Beams (One-span with Integral Bents)	Rehabilitation: Composite Rolled Steel Beams (Two-span with Integral Bents)
TRAFFIC LANES	Three 12'-0" travel lanes	Three 12'-0" travel lanes	Three 12'-0" travel lanes
	2'-0" shoulders	2'-0" shoulders	2'-0" shoulders
DESIGN TRUCK	HL-93	HL-93	HL-93
STRUCTURE WIDTH	55'-6"	55'-6"	55'-6"
NUMBER OF BEAMS	N/A	6	11
STRUCTURE DEPTH (APPROX.)	2'-0"	4′-5″	2'-8"
TYPE OF ABUTMENT	Integral Bents on Piles	Integral Bents on Piles	Integral Bents on Piles
TYPE OF PIERS	Integral Cap on Encased Piles	N/A	Integral Cap on Existing Piles
COMPARATIVE CONSTRUCTION COST (BRIDGE ONLY)	\$1,073,435	\$1,046,832	\$1,052,096
CONSTRUCTABILITY	Continuous concrete slabs are more labor intensive to construct.	Precast beams make this structure relatively simple to construct.	Rolled steel beams will be relatively simple to construct for a single span structure.
MAINTENANCE	Continuous concrete slabs are durable to the elements	Precast hybrid bulb-tee beams are durable to the elements.	Steel beams are susceptible to corrosion in the elements. Scheduled painting and/or cleaning require more upkeep than concrete options.
SPEED OF CONSTRUCTION	Continuous concrete slabs require more in-field construction time to construct the necessary form work.	Precast beams typically require less in-field construction time.	Lead time for steel beam fabrication is often greater than concrete beam fabrication.

Life Cycle Cost Analysis

In order to get the true cost of each alternative, life cycle costs must be analyzed. The net present value can then be calculated. Each alternative's net present value cost is summarized below. For calculations of these costs, see Appendix E.

	CONSTRUCTION ESTIMATE	NET PRESENT VALUE (NPV)
ALTERNATIVE C1: CONTINUOUS REINFORCED CONCRETE SLAB	\$1,073,435	\$1,359,862
ALTERNATIVE C2: PRESTRESSED CONC. HYBRID BULB-TEE BEAMS	\$1,046,832	\$1,383,259
ALTERNATIVE C3: SUPERSTRUCTRE REPLACEMENT: ROLLED STEEL BEAMS	\$1,052,096	\$1,474,946







TRAFFIC OPERATIONS ANALYSIS REPORT

Local Trax Railroad Grade Separation Sunnyside Avenue over Norfolk Southern Railroad Elkhart County, Indiana

Des. 1801913/1900836 Indiana Department of Transportation

December 2020

FINAL



INTRODUCTION

The Local Trax project is located in Dunlap, Elkhart County, Indiana. The project (Des. No. 1801913 & 1900836) encompasses US 33, County Road (CR) 20 (Mishawaka Rd), CR 13, CR 45, Concord Mall Drive, Sunnyside Avenue, Norfolk Southern Railroad, and multiple local streets. The two at-grade railroad crossings within the project limits are located on Sunnyside Avenue at US 33 and CR 13 between US 33 and CR 45. A new grade-separated bridge over US 33, the Norfolk Southern Railroad tracks, and CR 45 is proposed to replace the two aforementioned at-grade crossings.

Parsons is completing traffic operations analysis in support of the roadway design for the proposed grade separation. The primary purpose of this traffic analysis is to determine the number and length of turn lanes needed and appropriate traffic control (i.e. signalized, all-way stop control, or two-way stop control) at key intersections by analyzing conditions in the design year. Therefore, the focus of the analysis is on the build conditions of the preferred alternative.

TRAFFIC DATA

Existing Traffic Volumes

Twelve-hour manual turning movement counts were originally collected for the feasibility study¹ in 2017. The following four intersections were counted:

- US 33 & CR 20
- US 33 & CR 13
- CR 13 & CR 45
- CR 13 & Linden Drive

The traffic analysis in the original feasibility study was focused on the CR 13 crossing. The current design provides a grade-separated crossing that replaces both the CR 13 and Sunnyside Avenue at-grade crossings. Therefore, to expand the analysis for the preferred alternative, more traffic volumes were collected. INDOT provided a 24-hour turning movement count at US 33 and Sunnyside Avenue/Concord Mall Drive from 2017. Michiana Area Council of Governments (MACOG) collected additional 24-hour turning movement counts at the following intersections during August 2020:

- US 33 & Sunnyside Avenue/Concord Mall Drive
- Sunnyside Avenue & CR 13
- Concord Mall Drive and Center Drive
- CR 20 and Concord Mall Drive
- CR 20 and Center Drive
- CR 20 and Minuteman Way

The most recent counts were collected during the current season that has been affected by the COVID-19 pandemic. Recent traffic data has shown that traffic patterns have been greatly reduced since March 2020. The MACOG traffic counts were postponed a couple of weeks to correspond with the second week of school being back in session for the fall semester (albeit on a modified schedule with about half of the students attending on a given day). To quantify the reduction in 2020 counts, the 2020 counts at US 33 and Sunnyside Avenue/Concord Mall Drive were compared to the 2017 counts at the same intersection. The comparison showed that the 2020 counts were 29 percent lower in the AM

¹ Final Report County Road 13/County Road 20 Grade Separation Feasibility Study, Des # 1801612, 2018



peak hour, 11 percent lower in the PM peak hour, and 20 percent lower for the daily count. Therefore, to use the 2020 counts along with the 2017 counts, the 2020 counts were factored up by these percentages. Figure 1 shows the existing traffic counts used for this analysis. The raw traffic counts are shown in Appendix A.

Forecast Traffic Volumes

Traffic volumes were forecast for construction year 2023 and design year 2043. The original feasibility study from 2018 utilized a 0.5% annual growth rate for the future year traffic. MACOG used their regional travel demand model to evaluate future daily volumes on major roadways within the study area with and without the grade separation project (Build and No-Build). MACOG forecast a daily volume of 9,935 for the proposed grade-separated crossing and approved the use of the 0.5% annual growth rate.

The 0.5% annual growth rate was applied to the existing peak-hour turning movement volumes to derive the 2023 construction year and 2043 design year No-Build traffic volumes. Figure 2 shows the 2043 No-Build traffic volumes. The forecast peak-hour crossings for the proposed grade-separated crossing were then redistributed through the modified Build street network to determine the 2023 construction year and 2043 design year Build traffic volumes. The redistribution was accomplished by rerouting trips from the two current grade crossings to the proposed grade-separated crossing. Figure 3 shows the 2043 Build traffic volumes.



TRAFFIC OPERATIONS ANALYSIS

2043 Build

Traffic operations analyses were performed at the study intersections to assess turning lane and storage length requirements for the roadway design. The forecast 2043 Build turning movements were analyzed for the proposed roadway network under the Build scenario. Synchro (version 10) was used to analyze the signalized and stop-controlled intersections and Sidra (version 8) was used to analyze the roundabout at the new connection to the proposed grade-separated facility of Sunnyside Avenue over the Norfolk Southern railroad tracks. Particular attention was given to the projected queue lengths at each intersection. These analyses were used to determine the number and length of turn lanes at each intersection.

The results of the Build analyses can be seen in Table 1. All intersections operate at LOS C or better in 2043. The CR 13 & Sunnyside intersection shows an average delay of 25.0 seconds per vehicle, which is comfortably in the LOS C range. The proposed one-lane roundabout operates at LOS A in both the AM and PM peak hours. The intersection of CR 20 and Center Drive will be converted to a right-in/right-out intersection. At the intersection of CR 13 and Sunnyside Avenue, a left-turn lane will be added to the eastbound approach to accommodate the additional traffic that will access the new overpass. A northbound left turn lane on CR13 with protected/permitted phasing will also be added to accommodate that increased traffic volume, increase operational efficiency and capacity, and improve safety. The results of the queuing analyses have been communicated with the design team so that adequate storage lengths will be provided in the design where necessary. Details of the 2043 Build analyses can be found in Appendix B.

	A	M	РМ	
Movement	LOS	Delay (s/veh)	LOS	Delay (s/veh)
US 33 @ Concord Mall Dr	В	19.5	В	14.5
Overpass @ Center Dr (Roundabout)	А	6.2	А	7.2
CR 13 @ Sunnyside Ave	В	18.5	С	25.0
*CR 45 @ Sunnyside Ave	А	0.7	В	12.1
*CR 13 @ CR 45	А	8.9	В	15.0
CR 13 @ US 33	А	8.0	С	20.3
CR 20 @ Concord Mall Dr	В	19.7	В	19.4
*CR 20 @ Center Dr	А	0.2	В	10.8
CR 20 @ Minuteman Way	В	10.4	В	19.8
CR 20 @ US 33	В	19.9	С	25.0

TABLE 1 – CAPACITY ANALYSIS SUMMARY – 2043 BUILD

*Unsignalized intersection - worst movement reported