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Environmental Assessment

Beck Road Corridor Improvement Project,

Cities of Novi and Wixom

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Environmental Assessment for Beck Road Corridor Improvement Project

South of 9 Mile Road to Pontiac Trail in the cities of Novi and Wixom, Oakland County, Michigan

MDOT Job Number 219309

Prepared by:
AECOM, Great Lakes Inc.
On behalf of the cities of Novi and Wixom

In cooperation with the
U.S. Department of Transportation
Federal Highway Administration
and the
Michigan Department of Transportation

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Comments on this EA should be received within 30 days of the date of publication and should be sent to: Tim Sikma, Director, City of Wixom Department of Public Works, 49045 Pontiac Trail, Wixom, MI 48393.

Revision History

Revision	Revision date	Details

Preface

The cities of Novi and Wixom are proposing the Beck Road Corridor Improvement Project (the Project) to enhance and widen a 5.3-mile segment of Beck Road in Oakland County, Michigan. Beck Road is a minor arterial road connecting communities in Oakland and Wayne Counties with major trunklines such as I-96, M-14, and US-12. The limits of the Project are proposed to extend from approximately 580 feet south of 9 Mile Road in Novi to Pontiac Trail in Wixom.

The National Environmental Policy Act of 1969, as amended (NEPA), requires federal agencies to assess the environmental effects of federal actions prior to making decisions. Agencies that receive federal aid for a project must follow NEPA implementation procedures outlined in various federal regulations to analyze the social, economic, and natural environmental impacts of the project. NEPA regulations also require that the public be informed of the project and that their input be considered when reaching decisions. There are three possible classes of action under NEPA, including:

Class I Actions- Actions that significantly affect the environment require an Environmental Impact Statement (EIS).

Class II Actions- Known as Categorical Exclusions (CEs), Class II Actions do not individually or cumulatively have a significant environmental effect. They are excluded from the requirement to prepare an Environmental Assessment (EA) or EIS.

Class III Actions- Actions for which the significance of impacts is not clearly established and require an EA to determine the significance of impacts.

This Environmental Assessment (EA) has been prepared in accordance with federal regulations and state implementation procedures to analyze environmental impacts of the Project, including sections to address the following:

- The purpose and need for the project,
- A description of the alternatives considered and evaluated,
- Potential impacts of the affected environment,
- A summary of the consultation and coordination that has occurred with the public and governmental agencies, and
- Suggested mitigation measures.

Amongst the alternatives considered, one stood out as best meeting the purpose and need and thus was selected for further evaluation. The Preferred Alternative consists of widening Beck Road to a four-lane boulevard in the southern limits of the Project which is dominated by residential neighborhoods while widening to a five-lane configuration in the more commercialized northern limits. Where potential negative impacts are identified, measures are proposed to minimize and mitigate those impacts to lessen the significance of Project impacts. In addition to studying the impacts of the Preferred Alternative, this EA also evaluates a No-Build Alternative which is a baseline measure that represents the existing condition without any proposed changes or improvements.

Stakeholder involvement began in 2017 with formation of the Beck Road Widening Task Force. Public meetings were held in 2021, 2022, and 2023 to gather additional community input. An additional opportunity for public involvement will occur during the NEPA process in the form of a

public hearing. The public hearing will be held in the middle of the 30-day comment period, which begins with the distribution of this document for general public review and comment as well as various federal, state, and local agencies. If public review and comment support a determination of no significant impact, this EA will be provided to the Michigan Department of Transportation (MDOT) and the Federal Highway Administration (FHWA) with a recommendation that a Finding of No Significant Impact (FONSI) be issued.

This EA was prepared by AECOM Great Lakes, Inc., on behalf of the city of Novi and the city of Wixom, the project sponsors and lead local agencies, in collaboration with MDOT, and in cooperation with FHWA, the lead federal agency.

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List of Acronyms and Abbreviations

Acronym	Definition
AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AOC	Aera of Concern
APA	Authorized Public Agency
ARC	Alliance of Rouge Communities
ARPA	Archaeological Resources Protection Act
BMPs	Best Management Practices
BRWTF	Beck Road Widening Task Force
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEs	Categorical Exclusions
CFR	Code of Federal Regulations
CNE	Common Noise Environment
CWA	Clean Water Act
dBA	A-weighted Decibels
DBH	Diameter at Breast Height
D.O.	Dissolved Oxygen
EA	Environmental Assessment
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EIS	Environmental Impact Statement
EMR	Eastern Massasauga Rattlesnake
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESL	Environmental Study Limits
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
GCR	General Conformity Rule
HAPs	Hazardous Air Pollutants
IPaC	Information for Planning and Consultation
LAP	Local Agency Program

Acronym	Definition
LOS	Level of Service
LRTP	Long Range Transportation Plan
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
MDARD	Michigan Department of Agriculture and Rural Development
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
MiWB	Michigan Wetland Board for Local Transportation Agencies
MNFI	Michigan Natural Features Inventory
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
MS4	Municipal Separate Storm Sewer System
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLEB	Northern long-eared bat
NOC	Notice of Coverage
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NREPA	Michigan Natural Resources and Environmental Protection Act
NRHP	National Register of Historic Places
OSC	Office Service Commercial
OSHA	Occupational Safety and Health Act
OWJ	Official with Jurisdiction
PAHs	Polycyclic Aromatic Hydrocarbons
PASER	Pavement Surface Evaluation and Rating System
PCBs	Polychlorinated Biphenyls
PDR	Purchase of Development Rights Program
PM	Particulate Matter
RCRA	Resource Conservation and Recovery Act
ROW	Right-of-Way
SHPO	State Historic Preservation Office
SIP	State Implementation Plans
SMART	Suburban Mobility Authority for Regional Transportation
SEMCOG	Southeastern Michigan Council of Governments

Acronym	Definition
SESC	Soil Erosion and Sedimentation Controls
TCR	Transportation Conformity Rule
T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
TNM	Traffic Noise Model
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
U.S.	United States
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compound
WQS	Water Quality Standards

Glossary

Area of Concern (AOC): Geographic area designated under the Great Lakes Water Quality Agreement as having significant environmental degradation requiring remedial action.

Best Management Practices (BMPs): Practices that are an effective, practicable means of preventing or reducing impacts resulting from a project.

De minimis Impact: A *de minimis* impact is one that, after taking into account avoidance, minimization, mitigation and enhancement measures, results in no adverse effects to Section 4(f) resources.

Environmental Study Limits (ESL): Project specific geographic area encompassing an approximately 500-foot buffer around the Study Corridor, representing the affected environment for analyzing natural, cultural, and human resources.

Finding of No Significant Impact (FONSI): A public decision document that briefly describes why the project will not have any significant environmental effect and will not require the preparation of an Environmental Impact Statement. It is issued if it is determined that there are no significant impacts associated with the project after completing an Environmental Assessment.

Levels of Service (LOS): A grading system to present the degree of traffic congestion on a roadway on a letter scale from LOS A (best) to LOS F (worst).

No-Build Alternative: Description representing the existing conditions of Beck Road with no proposed changes or improvements.

Preferred Alternative: Project specific transportation improvement proposal involving widening Beck Road to a four-lane boulevard in residential areas and a five-lane configuration in commercial areas, with measures proposed to mitigate identified impacts.

Potential Impact Area: Project specific focused assessment area including construction limits, property to be acquired, and a ten-foot buffer for potential design adjustments, representing the zone where direct impacts from the Preferred Alternative are most likely to occur.

Right-of-Way (ROW): Temporary or permanent land, property, or interest therein acquired for and devoted to transportation purposes, including construction, maintenance, operations, and protection of a facility.

Study Corridor: Project specific 5.3-mile stretch of Beck Road in Oakland County, Michigan, between just north of Pontiac Trail and just south of 9 Mile Road.

Section 4(f) of the USDOT Act of 1966 (Section 4(f)): Establishes the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development.

Total Maximum Daily Load (TMDL): Calculation of the maximum amount of a pollutant that a waterbody can receive while still meeting water quality standards, as required under the Clean Water Act.

Traffic Noise Model (TNM): Software tool developed by the Federal Highway Administration (FHWA) to predict and analyze traffic noise levels and assess noise impacts for transportation projects.

1. Purpose and Need

1.1 Introduction

The cities of Novi and Wixom, in cooperation with the Michigan Department of Transportation (MDOT) and the Federal Highway Administration (FHWA), are proposing the Beck Road Corridor Improvement Project (hereinafter referred to as the Project). This Environmental Assessment (EA) discusses the Project's purpose and need, describes the alternatives considered, and evaluates the potential effects the Project may have on the human and natural environment, while offering potential avoidance, minimization, and mitigation measures to lessen the effects of negative impacts. The EA is being developed in adherence to the regulations set forth in the National Environmental Policy Act (NEPA) of 1969 and associated federal guidance.

This section of the EA provides an overview of the location, existing conditions, purpose, and the need for improvements. The proposed improvements to Beck Road aim to address various transportation challenges by improving traffic flow, enhancing safety for all road users, accommodating pedestrians and bicyclists, and providing a consistent road cross-section.

1.2 Project Description

The Project is focused on upgrading the current transportation conditions to better serve the community's needs. It involves the redesign and potential expansion of Beck Road from south of 9 Mile Road to Pontiac Trail in the cities of Novi and Wixom. The Project aims to implement improvements that better accommodate the existing and projected traffic volumes. Additionally, the Project includes the implementation of infrastructure improvements to prioritize the safety of pedestrians and bicyclists.

1.3 Location and Existing Roadway Description

The Project is located approximately 30 miles northwest of downtown Detroit and encompasses a 5.3-mile stretch of Beck Road, a vital north-south thoroughfare connecting the communities of Novi and Wixom in Oakland County, Michigan. The Study Corridor, defined as the segment of Beck Road between Pontiac Trail to the north and just south of 9 Mile Road to the south, is shown in Figure 1-1. Within the Study Corridor, Beck Road crosses several key routes, including Pontiac Trail, West Road, 12 Mile Road, the I-96 Interchange, Grand River Avenue, 11 Mile Road, 10 Mile Road, and 9 Mile Road. Sidewalks are intermittently present along both sides of the Study Corridor near Pontiac Trail, Grand River Avenue, and some parts between 9 Mile and 12 Mile Roads. An at-grade freight railroad crossing is located approximately 0.3 miles north of West Road.

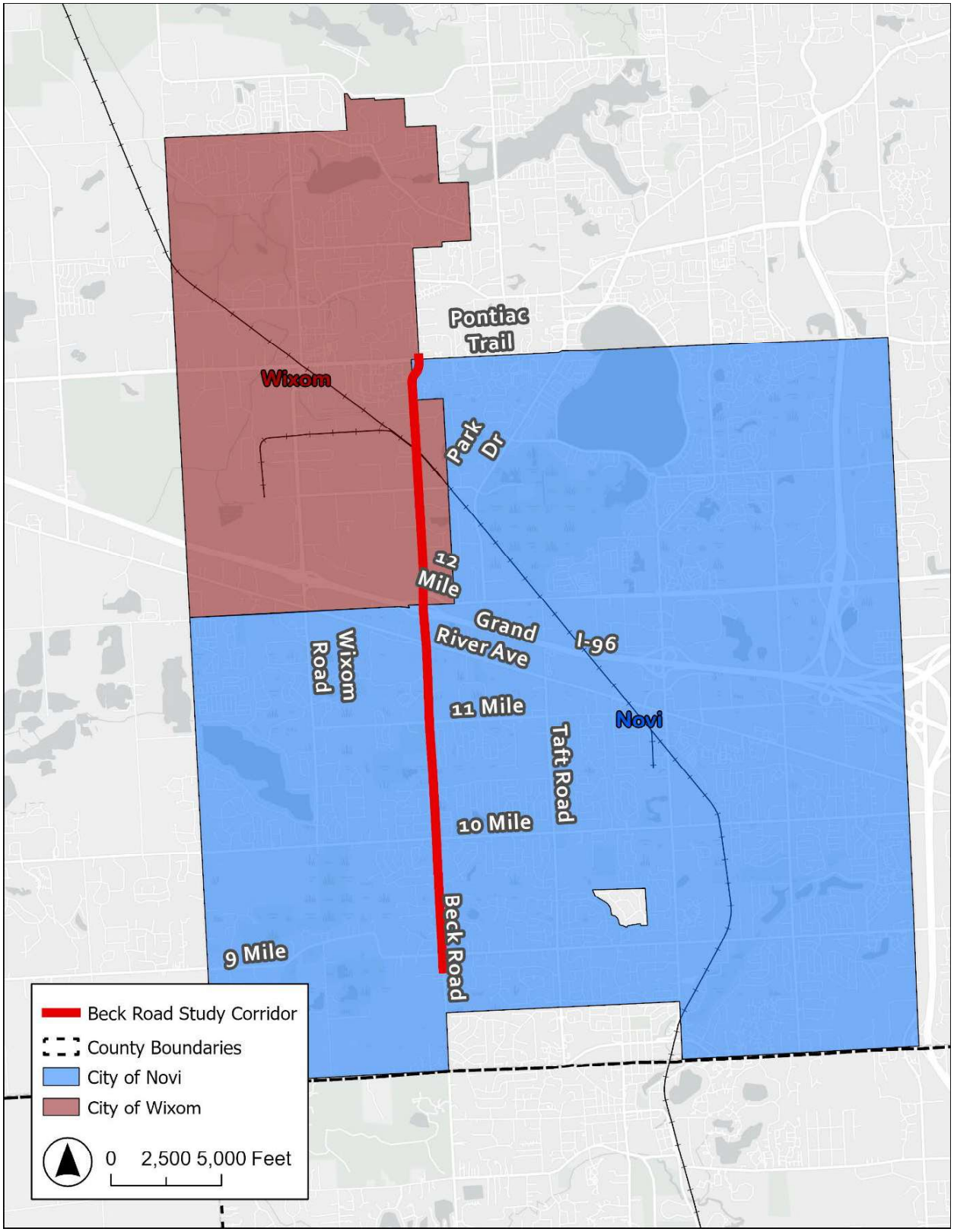

Figure 1-1: Beck Road Corridor Improvement Project Overview

Figure 1-2 illustrates the existing variable lane distribution along Beck Road. In the segment spanning from Pontiac Trail to 12 Mile Road, Beck Road predominantly features three lanes. Near the I-96 interchange, Beck Road adopts a five-lane layout, with certain segments between 12 Mile Road and Grand River Avenue even widening to a six-lane configuration to accommodate various turn lanes. From Grand River Avenue to 11 Mile Road, Beck Road narrows to three lanes, then further narrowing to two lanes from there south to 9 Mile Road.

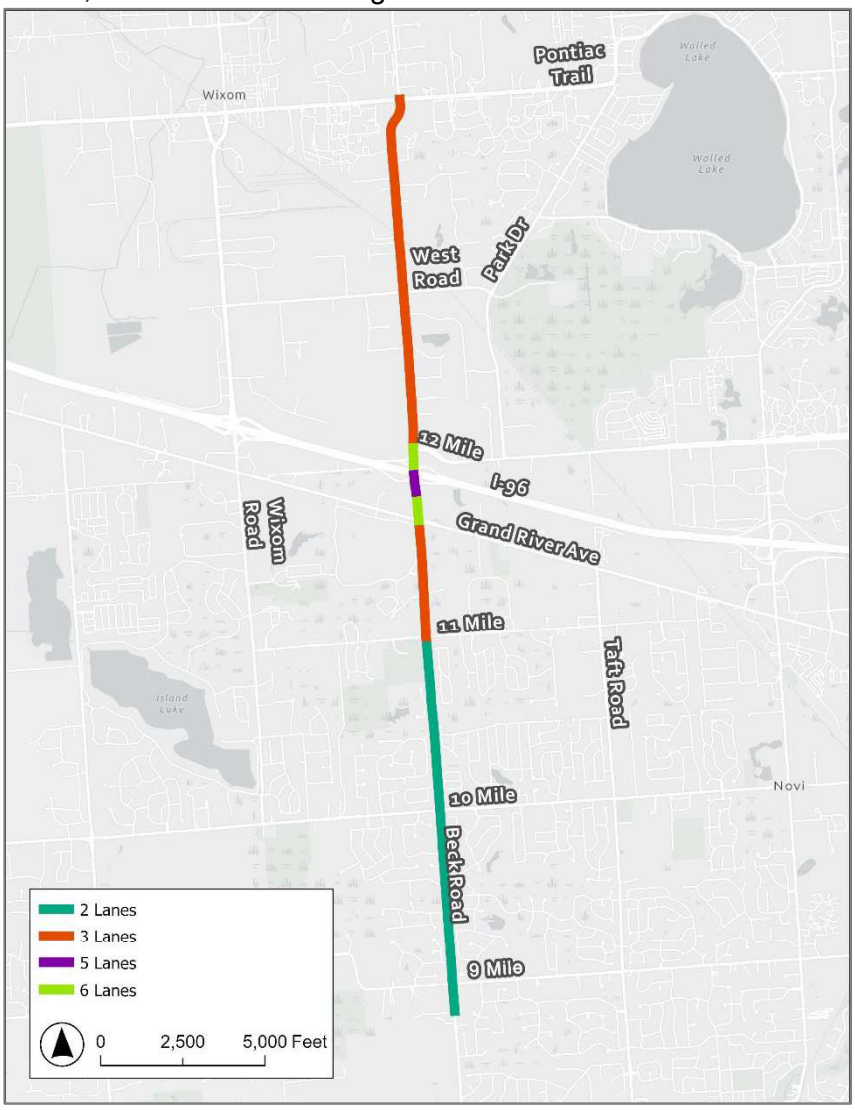

Figure 1-2: Beck Road Existing Lane Configuration

Source- SEMCOG Open Data Portal, 2021

The jurisdiction of Beck Road also changes through the Study Corridor, as shown in Figure 1-3. While the north and south section of Beck Road are under the jurisdictions of the city of Wixom and city of Novi, respectively, the stretch between Grand River Avenue and 12 Mile Road falls under the jurisdiction of the Road Commission for Oakland County. Interstate 96 (I-96) passes under Beck Road and the interchange ramps are under the jurisdiction of MDOT. Additionally, approximately 0.3 miles north of West Road, an at-grade railroad crossing intersects the freight rail tracks owned by CSX Transportation. Currently, this rail line is under lease to Lake State Railroad.

Figure 1-3: Beck Road Jurisdiction

Source- SEMCOG Road Jurisdiction

Beck Road is pivotal in the regional transportation network, serving as a crucial connector with strategic interchanges at M-14 and I-96. The road passes by various residential and commercial properties, Bosco Fields, and Ascension Providence Hospital's Novi Campus. In Wixom, Beck Road hosts a bustling industrial and commercial hub, featuring a wide range of businesses. However, Beck Road currently grapples with traffic congestion and subpar pavement conditions. Additionally, the presence of the CSX at-grade railroad crossing between Pontiac Trail and West Road exacerbates congestion when trains are crossing Beck Road. Beck Road has an inconsistent infrastructure design, with a lack of adequate space at certain intersections, differing cross-sections, occasional right-turning lanes, and incomplete non-motorized facilities.

1.4 Purpose of the Project

The purpose of the Project is multi-faceted. The Project aims to increase the capacity of the Beck Road corridor to meet current needs and cater to the population and economic growth in the area, while enhancing safety by reducing the rate of crashes in the area, including the risk and potential for serious vehicle crashes. The purposes of the Project specifically include:

- Alleviating traffic congestion to better accommodate the existing and projected traffic volumes.
- Improving traffic flow, reducing delays, and enhancing the overall operations of the roadway.
- Enhancing safety for all roadway users by addressing current crash issues at critical intersections.
- Providing safer and more accessible infrastructure for pedestrians and bicyclists.
- Improving the quality of infrastructure and aesthetics along the corridor, particularly in the residential areas of Beck Road.

1.5 Need for the Project

The Project seeks to address several pressing needs that necessitate the corridor improvements. The growth in commercial and residential areas within the Project vicinity has led to higher traffic demands, necessitating an expansion of the road capacity to enhance safety and mobility for both motorized and non-motorized users.

Insufficient Operational Capacity

The peak hour average daily traffic (ADT) along Beck Road ranges from 282 to 2,084 vehicles per hour. Figure 1-4 shows the existing 2023 and future 2045 morning and evening peak hour ADT along the Study Corridor. The existing roadway's capacity does not accommodate current and projected traffic volumes.

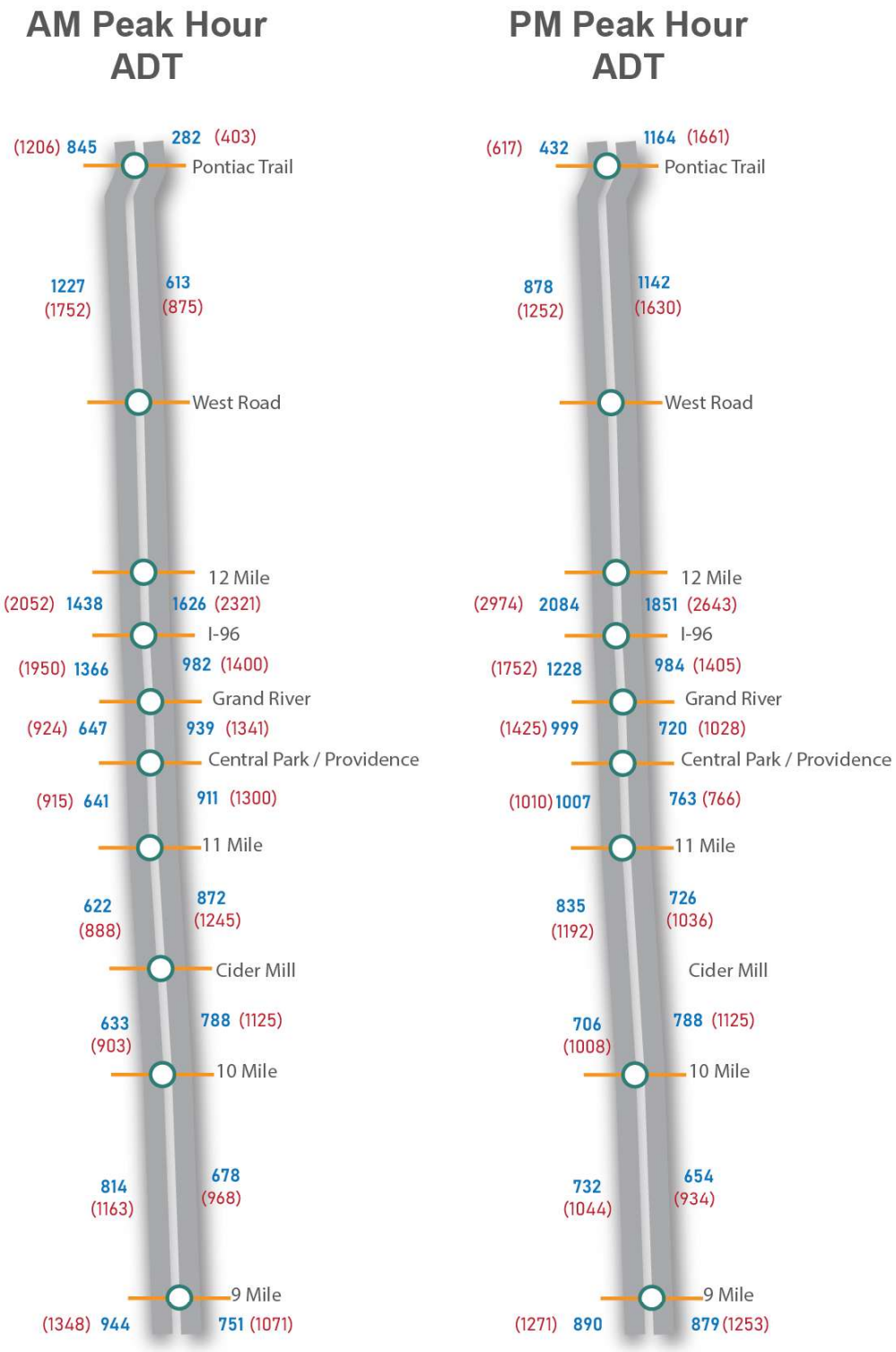

Figure 1-4: AM and PM Peak Hour Traffic Volume for 2023 (existing) and 2045 (projected)

The term “level of service” (LOS) denotes how well (or poorly) a traffic movement operates under given traffic demands, lane configurations, and traffic controls. Each level is determined by the average amount of control delay per vehicle. Control delay is the total delay associated with stopping for a traffic signal or stop sign, and includes four components: deceleration delay, queue move-up time, stopped delay, and final acceleration delay. As shown in Table 1-1, LOS A indicates small average control delays (less than ten seconds per vehicle) whereas LOS F indicates intersection failure, resulting in extensive vehicular queues and long delays (over 80 seconds per vehicle at a signalized intersection). LOS D (or better) is typically considered acceptable performance and low LOS values are tolerable for short periods or during peak-hours when heavier traffic volumes are expected.

Table 1-1: Level of Service (LOS) Criteria at Intersections

LOS	Signalized Intersections	Unsignalized Intersections
	Control Delay (sec/veh)	Control Delay (sec/veh)
A	<10	<10
B	10 - 20	10 - 15
C	20 - 35	15 - 25
D	35 - 55	25 - 35
E	55 - 80	35 - 50
F	>80	>50

Source: Highway Capacity Manual

As shown in Table 1-2, the current lane configuration cannot effectively accommodate the current peak hour ADT volume and is currently operating at LOS B to E during peak hours. Three intersections in the morning peak hour and four intersections in the afternoon peak hour on Beck Road currently operate with LOS E, which is considered poor. Because the traffic volumes in 2023 already surpassed the capacity threshold, the projected volumes for 2045 are also expected to exceed the threshold along the Study Corridor. Figure 1-4 indicates how anticipated population and job growth in the cities of Wixom and Novi will contribute to the increased traffic demand at each intersection.

Table 1-2: Existing (2023) Overall Intersection LOS

Signalized Intersection	Weekday AM Peak-hour			Weekday PM Peak-hour		
	LOS	Delay (sec/veh)	V/C Ratio	LOS	Delay (sec/veh)	V/C Ratio
Beck Road / 8 Mile Road	**E**	**73.6**	**1.06**	D	50.2	0.96
Beck Road / 9 Mile Road	B	14.5	0.55	B	14.5	0.52
Beck Road / 10 Mile Road	D	37.1	0.81	**E**	**58.5**	**0.82**
Beck Road / Cider Mill Drive	B	10.3	0.61	A	6.4	0.46
Beck Road / 11 Mile Road	D	36.1	0.75	C	24.3	0.66
Beck Road / Central Park Blvd	B	10.6	0.59	C	20.1	0.63
Beck Road / Grand River Ave	**E**	**57.7**	**0.92**	**E**	**58.2**	**0.95**
Beck Road / I-96 Interchange	D	47.0	0.94	D	38.2	0.69
Beck Rd / 12 Mile Rd	B	16.7	0.82	**E**	**75.9**	**1.09**

Signalized Intersection	Weekday AM Peak-hour			Weekday PM Peak-hour		
	LOS	Delay (sec/veh)	V/C Ratio	LOS	Delay (sec/veh)	V/C Ratio
Beck Rd / West Rd	C	22.0	0.82	C	27.3	0.90
Beck Rd / Pontiac Trail	**E**	**70.3**	**1.11**	**E**	**63.2**	0.94

Source: AECOM, November 2024

High Crash Activity

Traffic crash data for a four-year period from January 1, 2018, to December 31, 2022, was analyzed to identify patterns and trends. Crashes were reviewed at eleven intersections and eight roadway segments along Beck Road from 8 Mile Road to Pontiac Trail. Table 1-3 and Table 1-4 summarize the crashes at these intersections and segments, respectively.

Table 1-3: Beck Road Intersections, Traffic Crash History

Intersections	Total Crashes[1]	Injuries		Crash Rate[2]
		Total	"A" Injury	
8 Mile Road	**132**	35	0	**0.67**
9 Mile Road	**19**	5	1	**0.09**
10 Mile Road	**118**	35	0	**0.59**
Beck Road/ Cider Mill	**11**	3	0	**0.07**
11 Mile Road	**27**	11	0	**0.13**
Providence Dr	**14**	3	0	**0.07**
Grand River Ave	**135**	28	0	**0.42**
EB On & Off Ramps	**74**	16	0	**0.25**
I-96 SPUI	**90**	23	0	**0.29**
WB On & Off Ramps	**88**	25	0	**0.27**
12 Mile Road	**117**	32	4	**0.5**
West Road	**83**	40	2	**0.35**
Pontiac Trail	**121**	14	2	**0.74**

Source: Crash Data - Traffic Crash Analysis Tool 2.0, Transportation Improvement Association
Source: Crash Rates - Crash Analysis Process, SEMCOG, Appendix A, Table 1.4, January 2016
[1]Intersection crashes include those within a 200-foot buffer.
[2]Crashes per million entering vehicles.

Table 1-4: Beck Road Segments, Traffic Crash History

Segment [2]	Length (miles)	Total Crashes	Injuries	
			Total	"A" Injury
8 Mile Road to 9 Mile	0.94	56	16	1
9 Mile Road to 10 Mile	0.95	35	6	0
10 Mile Road to Cider	0.39	29	5	0
Cider Mill Drive to 11	0.5	22	2	0
11 Mile Road to Central Park/	0.31	20	5	0
Central Park/ Providence Parkway to	0.26	21	4	0
Grand River Avenue to	0.22	96	12	0
I-96 to 12 Mile Road	0.09	72	17	0
12 Mile Road to West	0.84	140	24	1
West Road to Pontiac	1.05	182	45	3

Source: Traffic Crash Analysis Tool 2.0, Transportation Improvement Association

[2]All segment crashes are taken from 150 feet north of the southernmost road to 150 feet south of the northernmost road

Total crashes for the five-year period for each of the intersections varied greatly, ranging from 11 to 135 crashes. No fatalities and nine “A” level injury crashes were reported during the five-year period at the studied intersections. “A” level injury crashes include individuals who sustained incapacitating injuries, such as broken limbs or paralysis.

Beck Road segmental crashes ranged between 20 and 182 crashes on eight segments. Amongst the eight segments, zero fatal crashes and five “A” injury crashes were reported during the five years.

Table 1-5 delineates two main categories of crashes: intersection crashes and segment crashes, each with distinct subtypes and corresponding statistics. In intersection crashes, rear-end incidents predominate, constituting 61.3% of all crashes with a total of 623 occurrences. Angle crashes comprise 13.3% of intersection crashes with 135 incidents recorded. Side-swipe (same) and single vehicle crashes also feature prominently, making up 11.1% and 4.9% of the total, respectively. Meanwhile, in segment crashes, rear-end collisions are again the most prevalent, accounting for 62.4% of all crashes, with 419 incidents reported. Angle and side-swipe crashes follow suit, each representing 11.0% and 11.2% of the total, respectively. No crashes involving animals or fixed objects were documented within the segment crashes category.

Table 1-5: Crash Summary by Crash Types on Intersections and Segments

	Types of Crashes	Number of Crashes	Percent of Crashes
Intersection Crashes	**Angle**	135	13.3%
	Backing	13	1.3%
	Head-On	9	0.9%
	Head-On Left Turn	51	5.0%
	Rear End	623	61.3%
	Side-Swipe (Opposite)	9	0.9%
	Side-Swipe (Same)	113	11.1%
	Single Vehicle	49	4.8%
	Other	14	1.4%
	Total	1,016	100.0%
Segment Crashes	**Animal**	0	0.0%
	Fixed Object	0	0.0%
	Misc Single Vehicle	63	9.4%
	Head-On	4	0.6%
	Head-On Left Turn	10	1.5%
	Angle	74	11.0%
	Rear-End	419	62.4%
	Side-Swipe	75	11.2%
	Other	26	3.9%
	Total	671	100.0%

Source: Traffic Crash Analysis Tool 2.0, Transportation Improvement Association

There are opportunities to enhance safety by addressing the prevalent types of crashes and implementing solutions to mitigate them. Rear-end collisions emerged as the primary crash type both at intersections and along road segments. Traffic congestion and backups are significant contributors to the higher occurrence of rear-end crashes. Enhancing traffic flow along the Study Corridor could potentially decrease congestion induced rear-end collisions by expanding throughput capacity.

Incomplete Multi-Modal Network

Inadequate pedestrian and bicyclist infrastructure, such as sidewalk gaps and non-motorized crossing gaps, have compromised the safety of non-motorized road users (Southeast Michigan Council of Governments (SEMCOG) Open Data Portal, 2021). Figure 1-5 shows the gaps in the sidewalk infrastructure along the Study Corridor. There is a significant gap in sidewalk infrastructure between 9 Mile Road and Grand River Avenue. Inconsistent pedestrian and bicyclist infrastructure between Grand River and West Road can also be observed.

Additionally, in 2023 the Suburban Mobility Authority for Regional Transportation (SMART) bus system extended its services to intersect with the Study Corridor north of the I-96 interchange. This increases the need for complete pedestrian infrastructure along the Study Corridor.

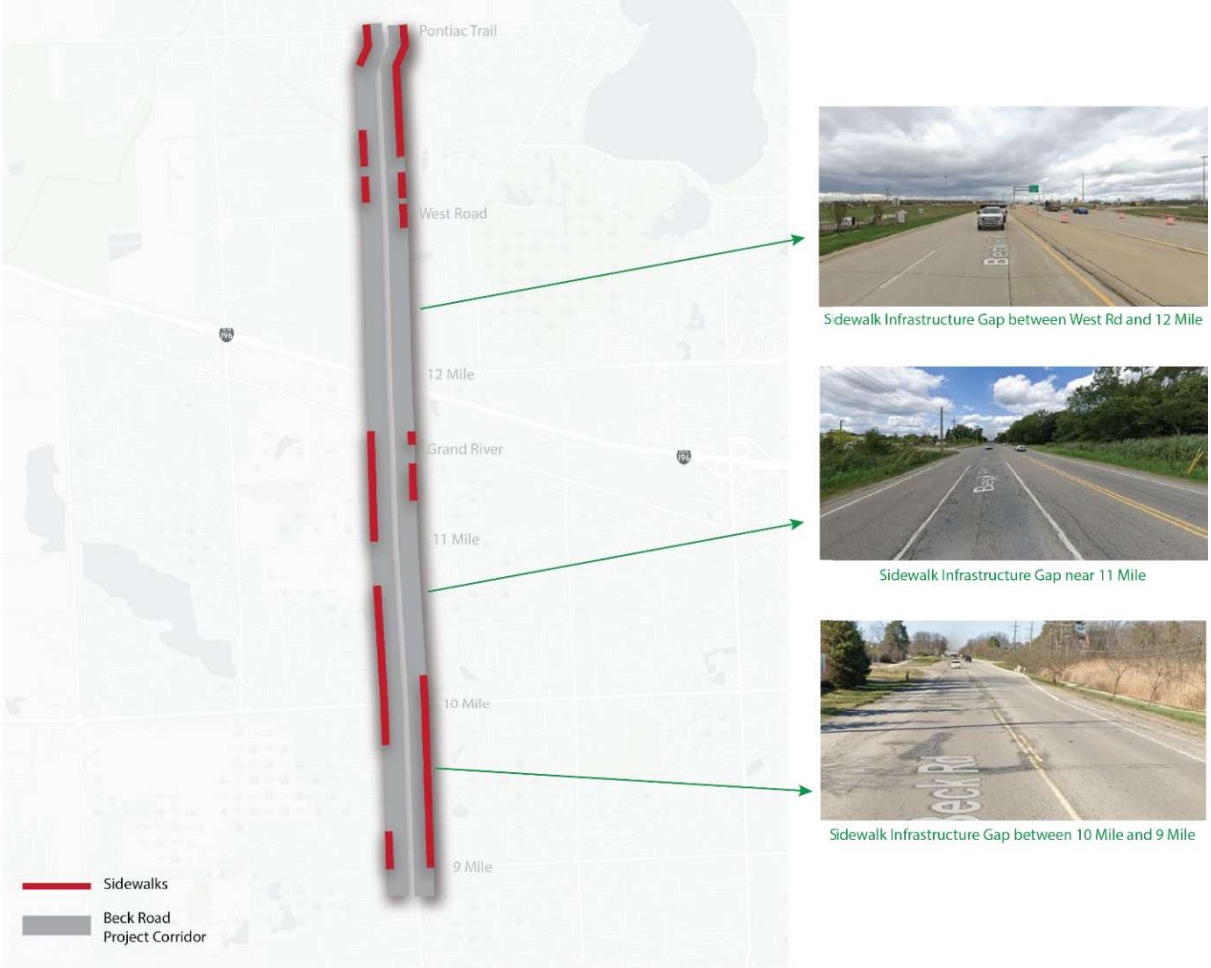

Figure 1-5: Existing Sidewalk Infrastructure

Source- SEMCOG Open Data Portal, 2019

Infrastructure Condition and Aesthetics

Poor pavement conditions add to the road safety concerns of the roadway (SEMCOG Open Data Portal, 2022). The majority of this road section's pavement surface was deemed to be in poor condition, according to the Pavement Surface Evaluation and Rating (PASER) System. This assessment indicates that more than just surface-level repairs are needed. These factors not only affect the driving experience but also pose potential hazards to road users.

Considering the adjacency of the Study Corridor to residential properties, Bosco Fields, and Ascension Providence Hospital's Novi Campus, it is crucial to minimize disruptions to sensitive and aesthetic resources during the Project implementation. Additionally, integrating trees and landscaping into the roadway design is essential not only to enhance the Study Corridor's aesthetic appeal and promote a healthier environment but also to contribute to placemaking, fostering a stronger sense of community. The proposed roadway design must correspond to the needs and desires of residents and landowners directly along the Study Corridor.

By addressing these critical needs, the Project will improve traffic flow, enhance safety, and provide a more sustainable and efficient transportation corridor to benefit the communities in Wixom and Novi.

2. Alternatives Evaluation

2.1 Introduction

Four alternatives were evaluated to address the purpose and need of the project. The alternatives include:

- No-Build which would maintain existing roadway and existing operational conditions along the Study Corridor and would rely on routine maintenance and pavement rehabilitation to keep the roadway operational. This alternative provides a basis of comparison for build alternatives.
- Five-lane configuration with two dedicated lanes in both directions and a center left turn lane throughout the Study Corridor.
- Four-lane boulevard section with two lanes in each direction, a center median, and median crossovers as needed throughout the Study Corridor.
- Hybrid of a five-lane configuration in the northerly portion of the Study Corridor and a four-lane boulevard section in the southerly portion of the Study Corridor.

The three build alternatives included installing continuous sidewalks and bike paths with Americans with Disabilities Act (ADA)-compliant ramps. The sidewalks and bike paths will promote active transportation and improve connectivity for pedestrians and cyclists. All build alternatives include a grade-separated crossing of the CSX Transportation rail tracks located in the city of Wixom. This grade separation will improve the safety and reliability of travel and will include both vehicle lanes and non-motorized facilities. The feasibility of implementing a roundabout at the 11 Mile Road intersection will be explored for all build alternatives in the EA process. Roundabouts have the potential to further improve traffic flow and safety.

2.2 Future Traffic Analysis

In order to evaluate the operational impact of long-term improvements, existing (2023) traffic volumes were grown twenty-two years into the future to the year 2045. Based on the information from SEMCOG, a 1.63% compound annual growth rate was applied to existing (2023) traffic volumes to determine future (2045) traffic volumes. Further detail is provided in Appendix D.

AECOM reviewed the long-term capacity needs of the Study Corridor based on this future (2045) peak-hour traffic volume. Without any long-term improvements (No-Build Alternative), the Study Corridor is expected to experience significant congestion, and the majority of the intersections are expected to perform at LOS F in the morning and afternoon peak hours as shown in Table 2-1**.** Based on the No-Build Alternative analysis, it was found that the Study Corridor will require, at a minimum, an additional lane in each direction throughout the study area to function at LOS D or better. The biggest capacity issues (LOS F) are estimated to be at Grand River Avenue, 10 Mile Road, 12 Mile Road, and Pontiac Trail, and to a lesser extent at the West Road and I-96 ramp intersections during the afternoon peak-hour. Two northbound and two southbound through lanes along Beck Road at all these intersections is estimated to reduce the delay significantly as shown in Table 2-2. Additionally, the proposed build alternatives would include either a center left turn lane or a raised center median to provide left-turning

access to the numerous driveways and intersecting streets located along Beck Road. From a through-capacity standpoint, a five-lane cross-section or a four-lane boulevard is essentially the same and offers little change in LOS.

Table 2-1: Projected (2045) Overall Intersection LOS – No-Build Scenario

Signalized Intersection	Weekday AM Peak-hour			Weekday PM Peak-hour		
	LOS	Delay (sec/veh)	V/C Ratio	LOS	Delay (sec/veh)	V/C Ratio
Beck Road / 8 Mile Road	**F**	**191.3**	**1.44**	**F**	**154.5**	**1.52**
Beck Road / 9 Mile Road	C	20.1	0.79	C	22.7	0.87
Beck Road / 10 Mile Road	**F**	**84.8**	**1.20**	**F**	**132.4**	**1.38**
Beck Road / Cider Mill Drive	B	19.2	0.89	A	8.8	0.67
Beck Road / 11 Mile Road	**E**	**72.2**	**1.11**	**D**	**40.5**	**0.98**
Beck Road / Central Park Blvd	B	15.9	0.87	C	33.6	0.92
Beck Road / Grand River Avenue	**F**	**139.9**	**1.33**	**F**	**167.8**	**1.37**
Beck Road / I-96 Interchange	**F**	**119.5**	**1.39**	**E**	**61.7**	**1.16**
Beck Road / 12 Mile Road	D	38.4	1.14	F	145.6	1.51
Beck Road / West Road	**F**	**84.3**	**1.23**	**F**	**107.8**	**1.50**
Beck Road / Pontiac Trail	**F**	**141.7**	**1.59**	**F**	**161.3**	**1.58**

Source: AECOM, November 2024

Table 2-2: Projected (2045) Overall Intersection LOS- Build Scenario

Signalized Intersection	Weekday AM Peak-hour			Weekday PM Peak-hour		
	LOS	Delay (sec/veh)	V/C Ratio	LOS	Delay (sec/veh)	V/C Ratio
Beck Road / 8 Mile Road	E	67.3	1.14	D	50.8	1.04
Beck Road / 9 Mile Road	B	14.4	0.66	B	16.1	0.64
Beck Road / 10 Mile Road	D	39.9	0.95	E	57.0	1.06
Beck Road / Cider Mill Drive	A	7.7	0.51	A	6.0	0.36
Beck Road / 11 Mile Road	C	32.7	0.71	C	21.5	0.66
Beck Road / Central Park Blvd	A	9.4	0.51	B	15.7	0.53
Beck Road / Grand River Avenue	**F**	**130.6**	**1.29**	**F**	**136.3**	**1.27**
Beck Road / I-96 Interchange	**F**	**120.4**	**1.39**	**E**	**63.5**	**1.16**
Beck Road / 12 Mile Road	B	19.1	0.85	E	63.0	1.09
Beck Road / West Road	C	23.9	0.72	C	26.4	1.16
Beck Road / Pontiac Trail	**F**	**94.2**	**1.28**	**E**	**71.8**	**1.05**

Source: AECOM, November 2024

Widening Beck Road would improve the operation of the signalized intersections along the Study Corridor under future conditions. A summary of the overall intersection LOS values, with recommended long-term capacity improvements in place, is provided in Table 2-2. As shown in Table 2-2 all intersections are projected to operate with an improved LOS compared to a No-Build scenario with some elevated congestion remaining near Grand River Avenue and the I-96 interchange.

2.3 Alternatives Evaluation

No-Build Alternative

The No-Build Alternative would retain the existing two-lane roadway configuration along Beck Road, extending from the Project's southern terminus to 11 Mile Road, and maintain the current variable lane configuration north of 11 Mile Road to the Project's northern terminus. This alternative does not propose any additional sidewalks or changes to existing pedestrian movement. While this option involves maintaining the roadway in its current state, it fails to address crash patterns, existing and anticipated traffic congestion, suboptimal LOS, or the projected operational and safety challenges arising from increased traffic volumes.

Advantages

- Minimal disruption to the existing road infrastructure.
- Lower initial financial investment compared to other alternatives.

Disadvantages

- Fails to address critical safety and congestion issues.
- Does not align with the Project's purpose and need.
- It does not consider improved pedestrian and bicycle connectivity.
- The future traffic analysis demonstrates that it will lead to exacerbated traffic problems in the future. As shown in Table 2-1, the projected LOS for 2045 ranges between D and F from Pontiac Trail to the I-96 Interchange and between B and F from I-96 to the southern Project terminus.
- Does not include grade separation at rail crossing.

Five-Lane Roadway

This alternative proposes the expansion of the current two-lane and three-lane roadway to accommodate five lanes, with two lanes in each direction and a dedicated center left-turn lane throughout the Study Corridor except between Grand River Avenue and 12 Mile Road, which is already five lanes wide (Figure 2-1). This alternative also considers a roundabout at 11 Mile Road. The primary objective is to enhance traffic capacity and reduce congestion, thereby improving overall traffic flow along the Study Corridor. While this option offers several advantages, it also presents certain drawbacks that need to be carefully considered.

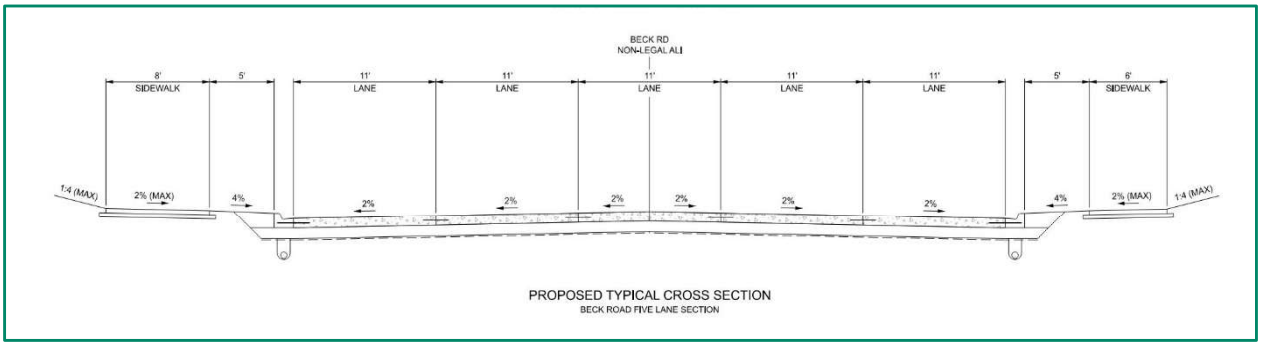

Figure 2-1: Five-Lane Roadway

Advantages

- By providing additional lanes for vehicles, this alternative aims to alleviate congestion and enhance traffic flow, especially during peak hours, and caters to projected commercial and industrial traffic growth between Pontiac Trail and 11 Mile Road.
- The center turning lane would facilitate easier turning movements for large commercial vehicles.
- The inclusion of a center left-turn lane can help mitigate rear-end collisions caused by left-turning vehicles, thus improving overall safety along the roadway.

Disadvantages

- While rear-end collisions may decrease, the presence of a center left-turn lane can introduce new risks, such as head-on and side-swipe collisions, particularly at higher speeds, specifically in the residential areas in the city of Novi.
- Pedestrian and bicycle upgrades are proposed in the form of walk/bike paths on both sides of the roadway where they currently do not exist, however, there may be challenges associated with integrating these facilities seamlessly into the existing infrastructure, including right-of-way (ROW) constraints and potential conflicts with vehicular traffic.
- Widening the roadway to accommodate additional lanes may necessitate significant construction activities, potentially leading to temporary disruptions, detours, and inconvenience for motorists and residents.
- Acquiring additional ROW for the widened roadway and median may pose logistical and financial challenges, requiring negotiations with property owners and potentially impacting adjacent properties.
- Widening the roadway to accommodate additional lanes may necessitate significant construction activities, potentially leading to temporary disruptions, detours, and inconvenience for motorists and residents.

This alternative reduces available space for vegetation and green areas, limiting opportunities for aesthetic improvements. Additionally, the five-lane alternative increases the amount of impervious surface in the Study Corridor, leading to greater runoff and potential negative impacts on water quality.

Four-Lane Boulevard

This alternative proposes widening the existing two-lane and three-lane roadway to accommodate four lanes, with two lanes in each direction, supplemented by a constant-width median throughout the Study Corridor except between Grand River Avenue and 12 Mile Road, which is already five lanes wide (Figure 2-2). This alternative also considers a roundabout at 11 Mile Road. The primary aim is to enhance traffic capacity and flow along the Study Corridor, while also considering pedestrian and bicycle infrastructure improvements. While this option presents several advantages, it is also important to weigh its potential disadvantages.

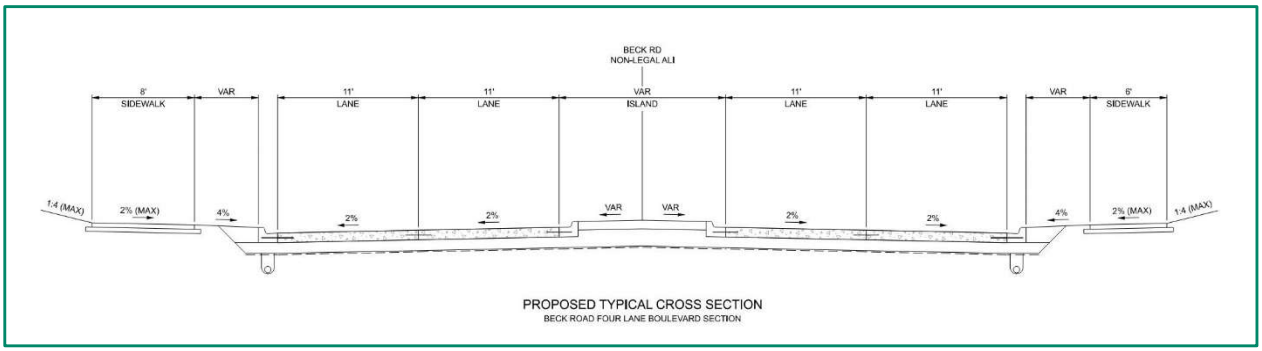

Figure 2-2: Four-Lane Boulevard

Advantages

- By adding two additional lanes, this alternative seeks to alleviate congestion and improve traffic flow, especially during peak hours, enhancing overall mobility and accessibility for motorists.
- The addition of a vegetated median not only enhances safety by providing a separation between opposing traffic lanes but also offers opportunities for aesthetic enhancements, beautifying the roadway and surrounding environment specifically in the residential areas in the city of Novi.

Disadvantages

- Widening the roadway to accommodate additional lanes and a median may necessitate significant construction activities, potentially leading to temporary disruptions, detours, and inconvenience for motorists and residents.
- This alternative compared to the five-lane alternative boulevard may be more restrictive for trucks navigating the Study Corridor without large turning loons, particularly in the industrial and commercial areas in the city of Wixom.
- Acquiring additional ROW for the widened roadway and median may pose logistical and financial challenges, requiring negotiations with property owners and potentially impacting adjacent properties.
- The introduction of a median with vegetation may require ongoing maintenance efforts, including landscaping, irrigation, and weed control, which could incur additional costs for the municipality or relevant authorities.

Hybrid of Five-Lane Roadway and Four-Lane Boulevard

This hybrid alternative proposes a unique approach to address varying traffic demands and urban contexts along the Study Corridor. Table 2-3 reveals there are more commercial and industrial driveways and streets north of 11 Mile Road (in city of Wixom) than south of 11 Mile Road (in city of Novi). Recognizing that the city of Wixom experiences higher traffic volumes and heavy truck traffic due to increased commercial activity, while the city of Novi is characterized by residential neighborhoods, this hybrid solution aims to seamlessly integrate elements of both a five-lane roadway and a four-lane boulevard (Figure 2-3).

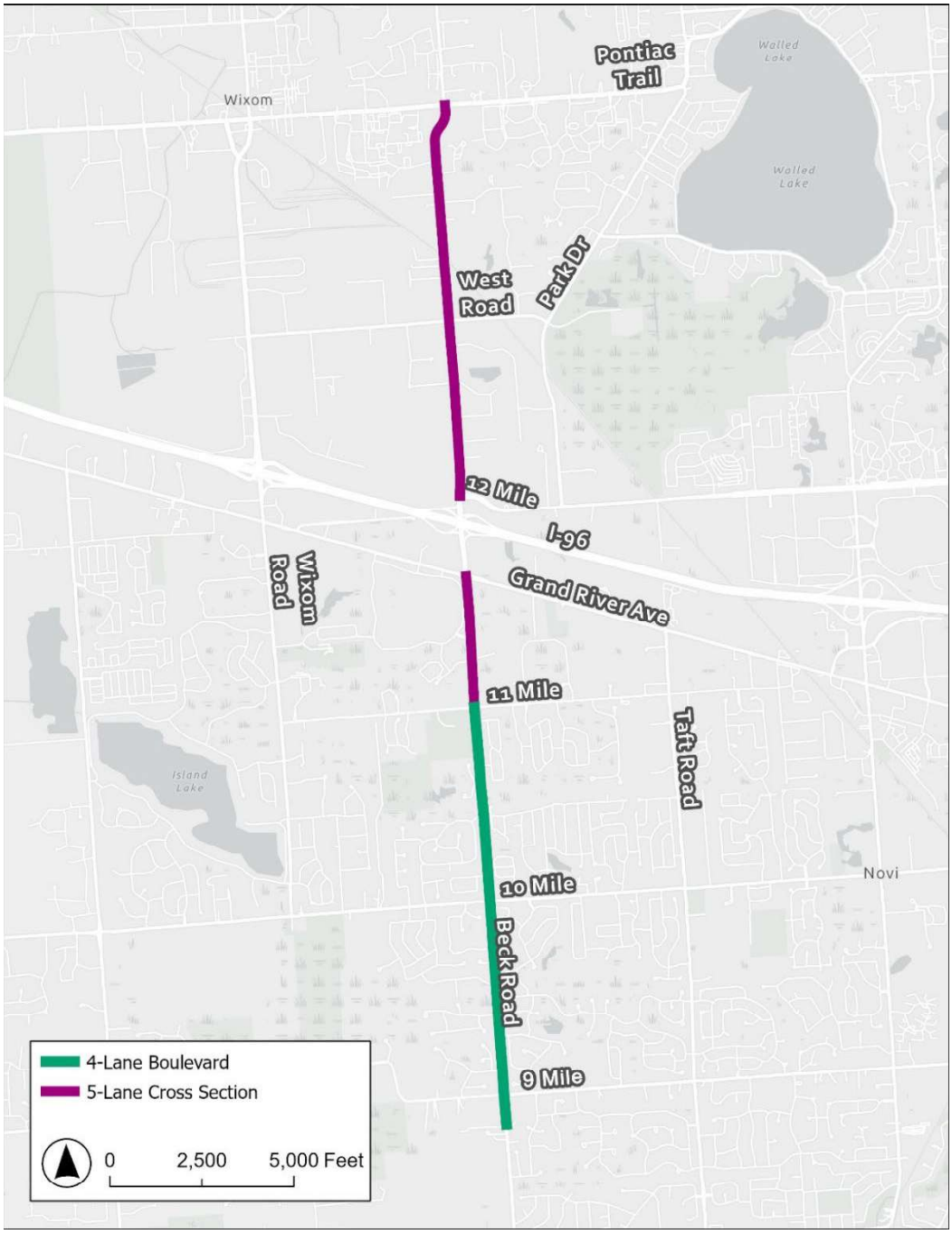

Figure 2-3: Hybrid of Five-Lane Roadway and Four-Lane Boulevard

Table 2-3: Number of Commercial/Industrial Driveways and Streets Along Beck Road

Road Segment	Number of Commercial/Industrial Driveways and Streets
Pontiac Trail to West Road	38
West Road to 12 Mile Road	21
12 Mile Road to I-96 Interchange	0
I-96 Interchange to Grand River Avenue	3
Grand River Avenue to 11 Mile Road	8
11 Mile Road to 10 Mile Road	9
10 Mile Road to 9 Mile Road	12
9 Mile Road to Project South Terminus	2

In areas where traffic congestion and commercial activity are prominent, such as north of 11 Mile Road, the roadway would be widened to accommodate a five-lane configuration, providing increased capacity for vehicular movement, including a dedicated center left turn lane and wider travel lanes to accommodate trucks. Conversely, in sections of Novi (South of 11 Mile Road) where residential neighborhoods prevail, the roadway would transition to a four-lane boulevard design, featuring landscaped medians, pedestrian-friendly amenities, and a reduced number of travel lanes to promote traffic calming and enhance the residential streetscape. This alternative also considers a roundabout at 11 Mile Road.

Advantages

- By integrating elements of both a five-lane roadway and a four-lane boulevard, this hybrid alternative acknowledges and responds to the distinct traffic patterns, adjacent zoning, and land use present north and south of 11 Mile Road.
- The adoption of a five-lane configuration in areas with higher traffic volumes ensures improved traffic flow and reduced congestion and facilitates easier turning movements for large commercial vehicles.
- In residential areas, the incorporation of a four-lane boulevard design prioritizes pedestrian safety and comfort, fosters a sense of community, and enhances the aesthetic appeal of the streetscape through landscaped medians and pedestrian-friendly features.
- The hybrid approach offers flexibility to tailor the roadway design to specific local needs and future growth projections, accommodating evolving transportation demands and land use changes over time.

Disadvantages

- Integrating two distinct roadway designs within the same Study Corridor may introduce logistical challenges during the planning, design, and construction phases, requiring careful coordination and stakeholder engagement to ensure seamless transitions between different segments.
- Managing and maintaining a hybrid roadway with diverse design elements, such as varying lane configurations, medians, and pedestrian amenities, may need additional resources and ongoing maintenance efforts to ensure functionality, safety, and aesthetic appeal over the long term.

Preferred Alternative- Hybrid of Five-Lane Roadway and Four-Lane Boulevard

Based on the evaluation conducted against the criteria outlined in Section 1, the alternatives presented have been systematically compared and assessed. Each alternative was scrutinized based on its ability to fulfill the defined purpose criteria, as detailed in the alternative evaluation matrix (Table 2-4).

Upon the evaluation, it is evident that the hybrid alternative, combining elements of both a five-lane roadway and a four-lane boulevard as well as constructing a roundabout at 11 Mile Road and a grade-separated crossing at the CSX railroad crossing, emerges as the most suitable option for the Project. This is based on a comprehensive analysis, considering factors such as community input, traffic flow, safety, pedestrian amenities, and compatibility with adjacent land uses. By leveraging the advantages of both a five-lane roadway and a four-lane boulevard, this hybrid solution connects the communities of Novi and Wixom by offering flexibility, adaptability, and the capacity to accommodate varying traffic volumes and land use patterns encountered in each city as well as implementing non-motorized and pedestrian infrastructure improvements.

Table 2-4: Alternatives Evaluation Matrix

Purpose and Need Evaluation Criteria	No Build	Five-Lane	Four-Lane Boulevard	Hybrid of Five-Lane Roadway and Four-Lane Boulevard
Alleviate Traffic Congestion	No improvements; congestion exacerbates in the long term	Added lanes alleviate congestion, especially in heavy-traffic areas	Added lanes alleviate congestion, especially in heavy-traffic areas	Added lanes alleviate congestion, especially in heavy-traffic areas
Improve Traffic Flow & Intersection Safety	No improvements	Added lanes and turning lanes enhance traffic flow	Added lanes improve traffic flow but may not accommodate commercial and truck traffic directly accessing the Study Corridor	Hybrid lanes for varied improvements catering to adjacent land use
Enhance Safety and Reduce Crashes	No safety measures	New risks with added lanes, specifically in the residential areas	Median provides safety upgrades to mitigate risks	Tailored safety measures across sections
Provide Pedestrian and Bicycle Infrastructure	No pedestrian and bike improvements	Infrastructure provided, challenging for pedestrians and bicyclists to cross	Infrastructure provided, median provides refuge	Integrated paths address non-motorized needs variably, consistent with adjacent land use
Improve the Aesthetics of the Study Corridor Consistent with the Zoning Character	No aesthetic improvements	Little aesthetic focus	Vegetated median enhances aesthetics	Provides aesthetic treatments to residential segments and customization of aesthetics

Alignment with Project Purpose

Does not meet the evaluation criteria

Meets the evaluation criteria

3. Affected Environment

3.1 Introduction

This section provides a discussion of the natural, cultural, and human resources identified within the Environmental Study Limits (ESL) as seen in the map below, and the potential impacts that would result from the Preferred Alternative as defined in Section 2. The ESL is based on an approximately 500-foot buffer surrounding the Study Corridor. For the purposes of this EA, the affected environment and the ESL represent the same geographic area. For some specific resources described in this section, a separate geographic area has been established for analysis. For example, air quality is determined on a regional basis and is not limited to the ESL.

While the ESL serves as a broader zone for evaluating environmental criteria, an additional focused assessment area was defined. The Potential Impact Area encompasses the construction limits, property to be acquired, and a ten-foot buffer to accommodate potential minor design adjustments and constructability such as grading next to sidewalks. This buffer is where impacts are more likely to occur than within the ESL. Therefore, factors within the Potential Impact Area will be treated as though they will be affected by the Preferred Alternative, while the ESL provides more general environmental context. The boundaries of each are depicted in Figure 3-1.

As noted in Section 2, the No-Build Alternative does not include improvements (regular maintenance only), nor does it meet the purpose and need for the Project. The No-Build Alternative was not carried forward for further study; however, it is retained as a baseline to contrast the impacts of the Preferred Alternative.

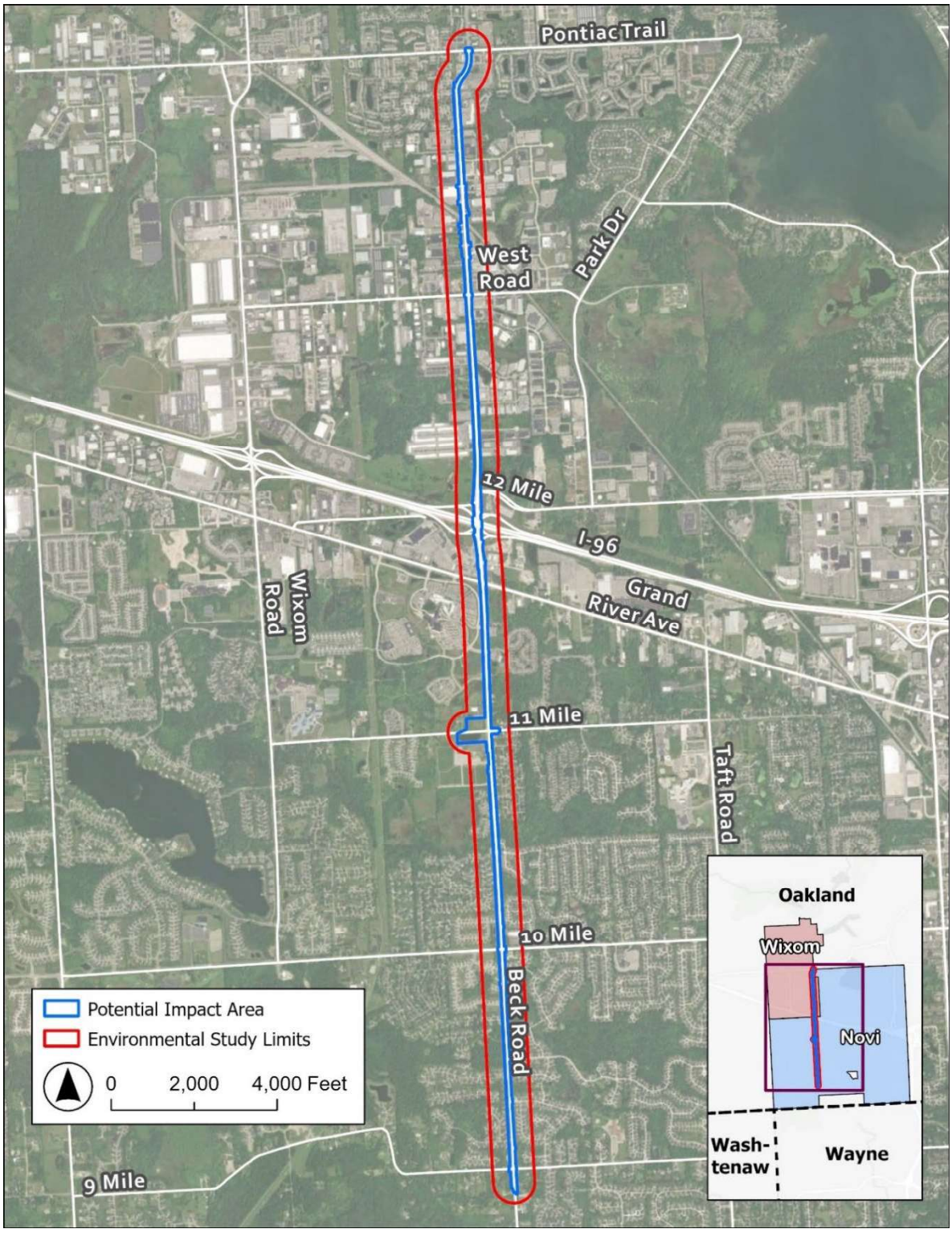

Figure 3-1: Beck Road Corridor Improvement Project Environmental Study Limits

3.2 Topography and Soils

The ESL traverses terrain that is relatively flat to gently rolling, with Beck Road's elevation ranging from approximately 950 to 970 feet above mean sea level (Figure 3-2). Topography significantly influences soil infiltration and erosion, and the gentle slopes of the ESL enhance water infiltration, supporting better soil moisture retention and nutrient availability.

More essential to infiltration is soil texture. Soil data for the Potential Impact Area was obtained from the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service Web Soil Survey. Since construction activities exclusively affect adjacent soil, the study will focus solely on the soil within the Potential Impact Area, (Appendix E). The soils present within approximately 60 feet of either side of the Beck Road centerline are listed in Table 3-1.

Table 3-1: Soil Composition of the Project Potential Impact Area

Map Unit Symbol	Map Unit Name	Acres in Potential Impact Area	Percentage of Potential Impact Area
10B	Marlette sandy loam, 1 to 6 percent slopes	23.9	23.8%
10C	Marlette sandy loam, 6 to 12 percent slopes	2.1	2.1%
11B	Capac sandy loam, 0 to 4 percent slopes	38.3	38.1%
12	Brookston and Colwood loams	1.5	1.5%
13B	Oshtemo-Boyer loamy sands, 0 to 6 percent slopes	3.2	3.2%
17A	Wasepi sandy loam, 0 to 3 percent slopes	0.9	0.9%
18B	Fox sandy loam, till plain, 2 to 6 percent slopes	0.6	0.6%
27	Houghton and Adrian mucks	3.8	3.8%
33	Lenawee silty clay loam, 0 to 1 percent slopes	3.7	3.7%
54A	Matherton sandy loam, 0 to 3 percent slopes	11.0	10.9%
59	Urban land	5.6	5.6%
60B	Urban land-Marlette complex, 0 to 8 percent slopes	1.6	1.6%
69	Thomas muck	2.5	2.5%
BntadB	Blount loam, 0 to 4 percent slopes	0.1	0.1%
W	Water	1.7	1.7%
Totals for Potential Impact Area		**100.5**	**100.0%**

With the exception of water, the ground present on the site is suitable for use as road subgrade. However, special attention should be paid to soil types 12, 27, 33, and 69, as they are commonly associated with wetlands and classified as hydric or predominantly hydric (USDA 2025). These soil types make up approximately 11.5% of the Potential Impact Area. There may be a need to remove and replace these soils with sand to ensure a stable foundation for the road widening. Furthermore, hydric soils typically exhibit lower infiltration rates. While the topography of the Potential Impact Area permits some degree of infiltration, approximately 90% of the soils present may offer poor infiltration. This is evident when utilizing MDOT's Post-Construction Stormwater Control Measure online screening tool and comparing the Hydrologic Soil Groups of soils within the Potential Impact Area. The Natural Resources Conservation Service groups soils with similar runoff potential into four groups. Generally, A and B soils are

associated with good to moderate infiltration resulting in less stormwater runoff, whereas C and D soils typically demonstrate moderate to poor infiltration resulting in more stormwater runoff. The majority of the Potential Impact Area falls within the C-D range of soils and consequently, it is likely that soil infiltration will be low. More information on soil infiltration's effect on water quality can be found in Section 3.14.

Impacts

No-Build Alternative

Under the No-Build Alternative, the roadway would remain as-is; therefore, the existing topography and soil would remain unchanged.

Preferred Alternative & Mitigation

Given the relatively flat roadside topography, achieving the Preferred Alternative should require no more than minimal grading. Overall, the anticipated alterations to the soil are not expected to result in any lasting environmental damage if proper soil erosion and sedimentation control measures are employed to discourage rapid erosion during construction.

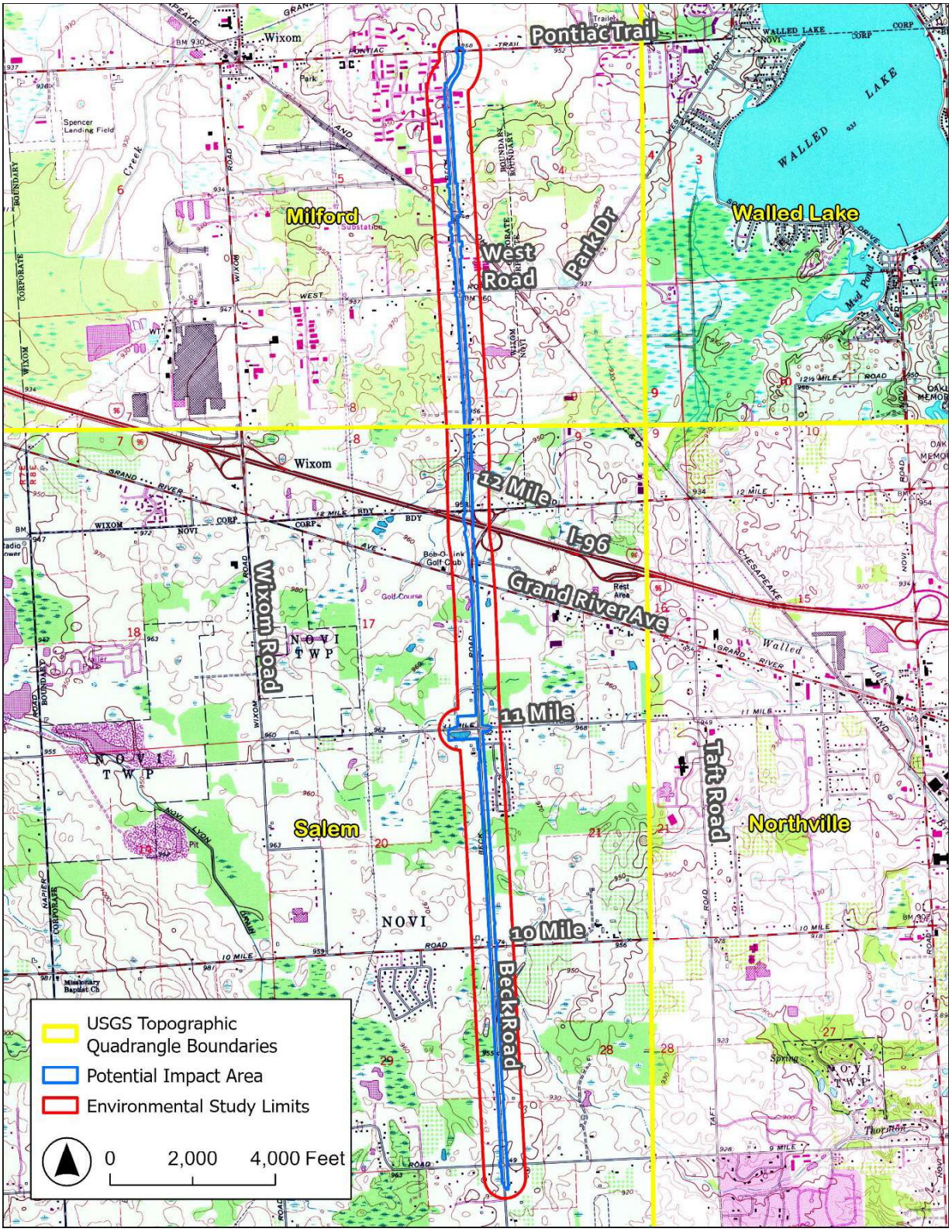

Figure 3-2: USGS Topographic Map

3.3 Land Use

In examining the land use impacts, it's crucial to consider the planning and zoning documents that shape the area's development. Planning and zoning documents adopted for use in the vicinity of the Project include:

- City of Novi 2016 Master Plan Update (2016)
- City of Novi Thoroughfare Master Plan (2016)
- City of Wixom Master Plan (2020)

Existing land uses along the ESL include commercial/office, single family residential, multiple family residential, industrial, railroad, public/institutional, recreation/conservation, vacant, and water. Between Pontiac Trail and 12 Mile Road (mostly city of Wixom), current and future land use is predominantly light industrial with smaller amounts of multiple-family residential, industrial research office, and community commercial. Between 12 Mile Road and 11 Mile Road (city of Novi), current and future land use is predominantly office service commercial, office service technology, and community business with smaller amounts of various residential classifications. In the city of Novi, the City West future land use category at the Grand River Avenue intersection with Beck Road is intended to create a mixed-use commercial entertainment district. The City West land use category aims to create a mixed-use development that is dense, and walkable targeting young professionals and empty nesters. Between 11 Mile Road and the southern Project terminus (city of Novi), current and future land use spanning the area is predominantly single-family residential. Because the Preferred Alternative involves widening an existing road, significant alternation to the above-mentioned land uses is not anticipated.

The city of Novi's Non-Motorized Plan identifies the portion of Beck Road in the city of Novi as a major corridor development for non-motorized improvements. It proposes the addition of pedestrian facilities adjacent to single-family residential areas, including 6- and 8-foot sidewalks. The plan advocates for complete streets for segments of Beck Road near the commercial corridor. The Preferred Alternative will have the positive impact of completing the sidewalk/non-motorized path connectivity along both sides of the road, benefiting abutting land uses such as commercial and residential areas.

Widening Beck Road will accommodate the increased travel demand generated by the future office and commercial land uses in the city of Novi and the future industrial land use in city of Wixom. Beck Road serves not only as a local connector between the city of Wixom and the city of Novi but also plays a significant regional role. Its intersection with Grand River Avenue forms a crucial commercial hub. Moreover, Beck Road connects to I-96, enhancing its regional importance as a key artery facilitating transportation and commerce beyond the immediate vicinity. The city of Novi is using the Zoning Ordinance as a key tool for implementing the Master Plan by amending existing zoning districts and creating new ones to align with the Future Land Use map's categories. The future land use anticipates the evolution of community business (B-2) and Office Service Commercial (OSC) into more intense commercial uses such as industrial, research, and technology. The city of Novi Master Plan recognizes the Grand River Corridor as "influential" and "historic." The widening of Beck Road would enhance the Study Corridor to better accommodate commercial traffic aligning with the city of Wixom's current and future industrial land use. Additional lanes will facilitate increased travel capacity, potentially enhancing the commercial zone's location value. Additionally, the improvement of Beck Road's design and function will foster the economic development of the commercial area connecting the cities of Wixom and Novi.

Impacts

No-Build Alternative

Under the No-Build Alternative, the roadway would remain as-is; therefore, the continuation of existing land uses is anticipated, with no significant alterations to current patterns. This would likely perpetuate existing congestion issues and lack of essential pedestrian infrastructure, potentially impeding access and safety for residents.

Preferred Alternative

The proposed hybrid configuration of the Preferred Alternative integrates a capacity increase for an essential arterial corridor spanning industrial, commercial, and residential land uses. This increase in capacity addresses congestion and completes sidewalk facilities along the residential area in the city of Novi. Despite these benefits, there may be temporary disruptions to land use during construction such as possible conversion of open space for construction material and equipment staging and storage, detours, and access changes impacting traffic flow and accessibility.

3.4 Farmland and Agricultural

The entire Project length falls within the boundaries of the Greater Detroit Urbanized Area. It is also noteworthy that neither of the jurisdictions along the Study Corridor have an agriculture zoning district. Consequently, local zoning regulations hold precedence in governing land use policies and a comprehensive review in accordance with USDA's 7 Code of Federal Regulations (CFR) Part 658 - Farmland Protection Policy Act (FPPA) is not necessary for this Project. It is not necessary to submit a Farmland Conversion Impact Rating form (AD-1006/CPA106) to USDA/Natural Resources Conservation Service (NRCS) for FPPA review.

The Michigan Department of Agriculture and Rural Development's (MDARD) 2023 Annual Equalization Report confirms that no parcels within the ESL are currently enrolled in the Farmland and Open Space Preservation Program (formerly known as PA116), as defined in Part 361 of the Natural Resources and Environmental Protection Act, 1994 Act 451 (NREPA). Furthermore, no parcels in the ESL are participating in a Purchase of Development Rights (PDR) program.

Impacts

The absence of formal agricultural preservation programs in the Project vicinity means that neither the No-Build nor the Preferred Alternative is expected to directly impact farmland and agricultural resources.

3.5 Population and Demographics

Understanding the population dynamics is essential for assessing the present and future needs of the study area. The population projections are based on data from the U.S. Census Bureau and growth projections through 2050 by SEMCOG. Table 3-2 provides a detailed account of population trends and projections from 1990 to 2050 for the city of Novi, the city of Wixom, and Oakland County.

Table 3-2: Population Trends for Project-area Jurisdictions

Region	1990	2000		2010		2020		2050 (projected)	
	Population	Population	Percent Increase 1990-2000	Population	Percent Increase 2000-2010	Population	Percent Increase 2010-2020	Population	Percent Increase 2020-2050
City of Novi	32,998	47,386	43.6%	55,224	16.5%	66,243	20.0%	74,081	11.8%
City of Wixom	8,550	13,263	55.1%	13,498	1.8%	17,193	27.4%	18,524	7.7%
Oakland County	1,083,592	1,194,156	10.2%	1,202,362	0.7%	1,274,395	4.6%	1,387,838	8.9%

Source: https://semcog.org/regional-forecast

In the city of Novi, the population has seen a steady increase from 32,998 in 1990 to 66,243 in 2020. The most substantial growth rate of 43.6% was observed between 1990 and 2000. The population is projected to further increase to 74,081 by 2050, marking an 11.8% increase from 2020. In the city of Wixom, the population grew from 8,550 in 1990 to 17,193 in 2020. The most significant growth of 55.1% occurred between 1990 and 2000. The population is expected to rise to 18,524 by 2050, indicating a 7.7% increase from 2020. For Oakland County, the population rose from 1,083,592 in 1990 to 1,274,395 in 2020. The largest growth rate of 10.2% was seen between 1990 and 2000. The population is projected to reach 1,387,838 by 2050, which is an 8.9% increase from 2020.

Table 3-3: Demographic Details

Demographic Indicators	City of Wixom	City of Novi	Oakland County
Median Age	36.3	42.3	41.7
Bachelor's Degree or Higher	52%	62%	49.5%
Median Household Income	$72,896	$110,588	$92,260
Individuals Below Poverty	8.7%	3.9%	7.7%

Source: U.S. Census Bureau ACS 5 Year Estimates 2017-2022 Table DP03 and Table S1501

Table 3-3 compares selected demographic and economic statistics of the city of Wixom, the city of Novi, and Oakland County. The city of Novi has the highest median age (42.3 years), the highest percentage of residents with a bachelor's degree or higher (62%), and the highest median household income ($110,588) among the three jurisdictions. In contrast, the city of Wixom has the lowest median age (36.3 years), the lowest median household income ($72,896), and the highest poverty rate (8.7%) among the three jurisdictions. Oakland County has a median age of 41.7 years, a percentage of residents with a bachelor's degree or higher of 49.5%, a median household income of $92,260, and a poverty rate of 7.7%. These differences highlight the unique socio-economic contexts of each jurisdiction.

Household characteristics show high rates of renter households and households without access to vehicles, particularly in Census Tracts 1331.01, 1331.02, and 1361.02. Overall, 2.6% of households lack vehicle access, relying on transit, biking, and walking. There is no fixed-route bus service along the corridor, though there are two transit routes that cross the corridor.

The elderly population (over 64) varies from 0% to 26.3%. The proportion of the population reporting any kind of disability varies across census tracts, with percentages ranging from 4.6% to 13.3%. These disabled populations are protected under the ADA.

3.6 Community Impacts

This section examines the potential impacts on communities, such as the displacement of residents or businesses, modifications to surface transportation routes, fragmentation of existing communities, interference with planned developments, and populations with special transportation needs. The displacement of residents or businesses can disrupt lives and livelihoods, necessitating adjustment to new environments. Changes to transportation routes can alter traffic patterns, potentially increasing congestion in some areas while reducing it in others. This can affect commute times, accessibility to services, and overall quality of life. Fragmentation of existing communities can occur when new transportation infrastructure divides neighborhoods, leading to a loss of social cohesion and community identity. Interference with planned developments can hinder economic growth and development plans, affecting future opportunities for residents and businesses. By connecting pedestrian infrastructure, walking and cycling are encouraged. Connected pedestrian infrastructure also benefits individuals and families who rely on transit, walking, and cycling by improving access to education, jobs, and healthcare. Additionally, it relieves congestion, aiding emergency vehicle access to the local population.

Regulatory Context

Several laws are in place to mitigate the community impacts of federal and state projects, ensuring fair treatment, support, and compensation for affected individuals and communities. Many of these laws are also significant when addressing ROW acquisitions and property takes for public projects. These include:

- **Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970**
  Ensures fair treatment and support for individuals and businesses displaced by federal projects, including assistance with relocation.
- **Act 31, Michigan Public Act 1970**
  Provides relocation assistance and financial aid to those displaced due to highway property acquisitions.
- **Act 87, Michigan Public Act 1980**
  Governs eminent domain procedures, including property acquisition, entry, and compensation.
- **Act 227, Michigan Public Act 1972**
  Offers financial assistance and advisory services to individuals displaced from real property or deprived of property rights.
- **Acts 367 and 439, Michigan Public Acts 2006**
  Regulate the acquisition of private property by state agencies and public corporations for public use.

- **The Americans with Disabilities Act (ADA) 1990**
  Prohibits discrimination against individuals with disabilities in employment, education, transportation, and public accommodations.

Impacts

No-Build Alternative

Under the No-Build Alternative the roadway will remain as-is; therefore, no beneficial impacts to the community facilities of the Study Corridor will occur. This alternative would not alleviate traffic congestion and is likely to worsen it over time, slowing emergency vehicle response times. The lack of enhanced pedestrian and cycling infrastructure would continue to pose safety risks and fails to improve connectivity for non-motorized traffic.

Preferred Alternative

The Preferred Alternative tailors the roadway design to specific local needs and future growth projections, accommodating transportation demands and land use changes over time. Curb ramp enhancements will improve accessibility for individuals who are without cars, individuals with mobility disabilities, and those who rely on transit and walking. It enhances the transportation network by connecting pedestrian infrastructure, prioritizing pedestrian safety and comfort, and encouraging non-motorized modes of transport. The boulevard configuration in the residential section of the corridor, with landscaped medians and pedestrian-friendly features, enhances the aesthetic appeal of the streetscape and fosters a sense of community. The five-lane configuration in commercial areas will improve traffic flow and reduce congestion, making it safer, especially in the presence of heavy trucks. This alternative also relieves congestion, which is crucial for emergency vehicles trying to reach the local community.

The Preferred Alternative is not expected to cause any long-term adverse impacts to the community or individuals within the community. Long-term adverse impacts are also not expected to essential community services like schools, churches, and emergency services (police, fire, and ambulance). No business or residential relocations are anticipated because of the Project. The Project will construct sidewalks in areas where they currently do not exist, in compliance with the ADA, providing the opportunity for connectivity.

Permanent impacts include right-of-way (ROW) acquisition and noise impacts. Based on preliminary design and survey work, the Preferred Alternative maximizes the use of existing ROW, thereby only requiring partial takes. Permanent noise impacts are expected along Beck Road, affecting 55 receptors. Four noise walls were evaluated but none met MDOT’s criteria for noise abatement.

Temporary impacts during construction are anticipated including temporary easements to allow for construction and grading, construction noise and vibrations, changes to traffic patterns, and changes to access to places of employment, businesses, and community facilities. A maintenance of traffic plan will be developed as part of the design and construction phases to minimize impacts and assure access to area businesses, residences, and other facilities. Measures will be incorporated to accommodate police, fire, and ambulance services, school districts, and transit providers to minimize disruption of services. These entities will be notified in advance of construction activities. Traffic signs and notices published in the local media will alert the public early about major construction activities that could disrupt the community.

Mitigation

To mitigate temporary impacts incurred during construction, several measures will be implemented to alleviate the inconvenience. The cities of Novi and Wixom will:

- Ensure that the contractor's equipment will be equipped with well-functioning mufflers and portable compressors to meet federal noise-level standards to lessen audio disruption to the community
- The contractor implements adequate dust-control measures during construction to lessen air quality impacts and nuisance dust.
- Provide advance notification to the community of upcoming construction impacts through news releases, social media channels, and website postings.
- Post clear signage in the work zone to enable motorists and pedestrians of clear and safe routes through the construction zone.
- Coordinate with local emergency services and school districts to allow them to plan their routing through the construction zone accordingly.
- Ensure access to Bosco Fields is maintained.

3.7 Economic Impacts

Between Pontiac Trail and 12 Mile Road (mostly in the city of Wixom), current and future land use is predominantly light industrial use with some residential and commercial activity (city of Wixom, 2020). Closer to 12 Mile Road and 11 Mile Road in the city of Novi, the focus shifts to office and commercial spaces with limited residential areas (city of Wixom, 2020). Between 11 Mile Road and the southern Project terminus, current and future land use is predominantly single-family residential.

Jobs are generally concentrated in the light industrial and corridor commercial/office areas in and around the Project area. The median household income for Wixom is $72,896 and for Novi is $110,588 as reported by ACS 5 Year Estimates 2017-2022 (U.S. Census Bureau, 2022). Both jurisdictions have a median household income above Michigan's statewide median of $68,505. Existing property values in the ESL vary widely and are largely dependent on the existing land use.

Impacts

No Build Alternative

Under the No-Build Alternative, the roadway would remain as-is. Therefore, worsening congestion can be expected likely leading to travel delays for roadway users and financial impacts associated with those delays due to longer idling and more time taken to reach destinations.

Preferred Alternative

The Preferred Alternative requires ROW from 78 parcels. The conversion of this land to transportation use will have minimal effects to tax revenues, as all of the required ROW are partial takes with no total takes or relocations. The Preferred Alternative will not result in

permanent impacts and is not anticipated to negatively affect property values along this transportation corridor.

There may be temporary changes to certain local businesses' visibility and accessibility while construction is underway however, detrimental impact on sales tax collections and business are not anticipated.

Mitigation

Throughout construction, efforts will be made to minimize these effects by providing adequate signing to assist customers with navigating to businesses along Beck Road. Business access will be maintained throughout construction. The cities of Novi and Wixom will provide advance notification to the community, including businesses, of upcoming construction impacts through news releases, social media channels, and website postings.

3.8 Transportation Infrastructure Impacts

The Study Corridor features an incomplete multimodal network with no fixed-route public transportation and no bus stops. While there are pedestrian and bike facilities, they are inadequate and incomplete. The residential section in the south has sidewalks and pedestrian crossings. The sidewalk is separated from the roadway by a vegetated buffer zone and planted trees, creating a physical and visual barrier between pedestrians and vehicles. However, pedestrian infrastructure is intermittent and lacks continuity, especially north of the Interstate 96 interchange, where there are no pedestrian facilities or dedicated bicycle lanes. There is no on-street parking along the Study Corridor, and some of the existing curb ramps are not ADA compliant. There is an at-grade railroad crossing between Pontiac Trail and West Road. The commercial section of Beck Road includes several adjacent parking lots for nearby businesses.

Impacts

No-Build Alternative

Under the No-Build Alternative, there would be no impacts to transportation facilities.

Preferred Alternative

The Preferred Alternative includes integrated paths to address non-motorized needs, prioritizing pedestrian safety and comfort. This approach makes the road more inclusive, providing access for all users.

Permanent impacts to adjacent parking are not anticipated. However, access to parking lots and driveways along the Study Corridor may be temporarily affected during construction.

The project aims to address multimodal deficiencies, enhance safety and improve user experience for pedestrians and bicyclists. These improvements would be in the form of ADA-compliant ramp installations and sidewalk connections, resulting in positive impacts on multimodal facilities and pavement conditions. However, some existing facilities will be temporarily impacted during construction.

Mitigation

Throughout construction, efforts will focus on minimizing disruptions and preserving access to businesses and residences. Access to businesses/properties will be maintained throughout construction. During design and construction planning, alternative routes for non-motorized and pedestrian facilities will be implemented, along with detailed traffic management plans and temporary access solutions. Mode-specific detour guidelines, in accordance with *MDOT's Work Zone Safety and Mobility Manual*, will be followed. ADA-compliant routes will be provided where the work zone impacts accessibility. Clear signage and early public communication through local media will inform the community about major construction activities and detours. Coordination with local emergency service providers and school districts will occur to allow them to plan their routing through the construction zone accordingly.

3.9 Right-of-Way and Relocation

Under the Preferred Alternative, no relocations of residences or businesses are anticipated. All proposed ROW impacts are partial takes, some in the form of temporary consent to grade and other ROW needs will be permanent. The road widening will generally require a 120-foot-wide ROW. The existing ROW width varies between the statutory 66-foot easement and 120-foot-wide dedicated ROW, with much of the Potential Impact Area already having the latter. A map showing the potential proposed ROW impacts can be found in Appendix F. The acquisition impacts of the Preferred Alternative will adhere to the federal and state laws listed in Section 3.6.

Impacts

No-Build Alternative

Under the No-Build Alternative, the roadway would remain as-is with no change to the existing ROW conditions.

Preferred Alternative

The Preferred Alternative will use the existing 120-foot-wide dedicated ROW, with any additional needed ROW acquired per federal and state laws. In total, about 14.56 acres of ROW will be needed from 78 parcels to implement the Preferred Alternative. This number is subject to change based on final design requirements. The needed ROW is spread across multiple land use categories, as shown in Table 3-4. A map of the anticipated needed ROW and a list of the associated property addresses is included in Appendix F. Additional grading consents may also be required. Since no parcels will involve a total take or relocation, no mitigation measures are necessary for them. Mitigation measures for the ROW needed from Bosco Fields are addressed in Section 3.17.

Table 3-4: ROW Needs

Land Use	Approximate Acreage Needed
Residential	4.06
Commercial / Industrial	9.51
Public Space	0.99
Total	14.56

3.10 Utilities

Throughout the Potential Impact Area, several typical roadside utilities may be affected including water lines, gas lines, electric lines, telecommunications cables, streetlights, traffic signals, sanitary sewer, storm sewer, cable TV, fiber optic cables, and fire hydrants, all of which may require relocation, protection, or adjustment to accommodate the Project. Proper planning is essential to minimize disruptions and ensure the safe and efficient functioning of these utilities.

Impacts

No-Build Alternative

Under the No-Build Alternative, routine maintenance to ensure the roadway's operation is not expected to affect the existing on-site utilities.

Preferred Alternative

While the extent of utility impacts from the Preferred Alternative is yet to be fully determined, preliminary estimations can be made. It is likely that existing utility poles and electrical lines will necessitate relocation or rerouting, including any attached communications devices. Additionally, the relocation of underground communication systems, such as fiber optic cables, may be necessary. Although the analysis of gas and water service lines is pending, relocation might be required due to stormwater drainage design considerations. Sanitary and water main adjustments are not anticipated in the current project phase, but unforeseen circumstances could prompt utility relocations. The comprehensive scope of these impacts on existing utilities, arising from widening, grading, and excavation activities, will be ascertained and detailed during the Project's design phase.

Mitigation

Prior to the completion of the design, the cities of Novi and Wixom will coordinate with the owners of all public and private utilities that may be impacted by the Preferred Alternative to determine if the facilities will require modification, protection, or relocation due to the widening or grading required. Utility owners with infrastructure located within ROW but outside of an easement will be responsible for relocating any conflicting utilities before construction, unless an agreement is reached with the cities.

Utility modifications will be planned in collaboration with service providers to minimize service interruptions. Additionally, the cities will ensure that impacted utility customers receive advance notice of any scheduled disruptions. Throughout construction, efforts will be made to maintain the services of current utilities, minimizing disruptions for residents and businesses as much as possible.

3.11 Air Quality

This section provides existing air quality conditions and assesses potential air quality impacts of the No-Build Alternative and the Preferred Alternative.

Regulatory Context

National Ambient Air Quality Standards and Attainment Status

As required under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six pollutants for which criteria have been established, referred to as criteria pollutants (40 CFR Part 50):

- Carbon monoxide (CO)
- Nitrogen dioxide (NO2)
- Ozone (O3)
- Particulate matter with diameters up to 10 micrometer (µm) (PM10) and diameters up to 2.5 µm (PM2.5)
- Lead (Pb)
- Sulfur dioxide (SO2).

The CAA requires geographic areas to be designated according to their ability to attain the NAAQS. These areas are categorized for each criteria pollutant as:

- Attainment Area – Area where no exceedance of NAAQS for a specific criteria pollutant has occurred.
- Nonattainment Area – Area where exceedance of NAAQS for a specific criteria pollutant has occurred.
- Maintenance Area – Area that has previously been designated as a non-attainment area but is still in need of efforts to maintain the improved conditions in the future. Most CAA rules for nonattainment areas are still applicable to a maintenance area.

The CAA requires states to develop a general plan to implement, maintain, and enforce the NAAQS, as well as a specific plan to attain the standards for each area designated as nonattainment for a NAAQS. These plans, known as State Implementation Plans (SIP), are developed by state air quality management agencies and are approved by EPA. States are required to update the SIP that demonstrates how a state will regulate or remain in attainment with NAAQS. SIPs are updated regularly and are made available to the public for review and comment.

Federally funded or permitted transportation projects must be consistent with the SIP. It must be demonstrated that the projects do not cause any new air quality violations, make existing conditions worse, or affect attaining a relevant air quality standard or milestone. Known as “Transportation Conformity,” these requirements apply to areas that do not meet NAAQS by linking air quality and transportation planning to protect public health and the environment. There are two sections of CAA conformity regulations that are applicable to Federal actions:

- Transportation projects funded or approved by the Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) are governed by the Transportation Conformity Rule (TCR).
- Non-FHWA/FTA projects or components of an FHWA/FTA transportation project requiring actions by other federal agencies are governed by the General Conformity Rule (GCR). This rule would not apply to this project.

The TCR is enforced on both a regional level and project level. On a regional level, demonstration of regional transportation conformity is through the development of a

Transportation Improvement Program (TIP) which is the responsibility of the metropolitan planning organization (MPO). On a project level, the conformity determination must show that the individual project is included in the TIP to be consistent with the SIP conformity determination (i.e., to be exempt from a regional emissions analysis and to be in compliance with the NAAQS on a local level). Potential localized emission impacts should be addressed through a hot spot analysis for localized nonattainment or maintenance pollutants to demonstrate that such emissions would be in compliance with the NAAQS.

The Project is located in Oakland County, a maintenance area for both O_3 and $PM_{2.5}$ and an attainment area for the remaining criteria pollutants so therefore, the TCR does apply to the Project.

O_3 is a regional pollutant and its regional effects are addressed through the development of the TIP and Long Range Transportation Plan (LRTP) for the area by the designated MPO, in this case, SEMCOG. Compliance with the CAA and 40 CFR 51 and 93 conformity rule must be demonstrated to ensure that the transportation project with its activities will not:

- Cause or contribute to any new violation of any NAAQS;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or any required interim emission reduction or other milestones in any area.

A regional level emissions analysis is not required for the Project if it is included in a current or future TIP that conforms with the SIP and demonstrates regional conformity through SEMCOG.

Within a maintenance area for a localized pollutant, such as $PM_{2.5}$, a localized impact analysis is warranted due to the changes in traffic patterns between the existing condition and the proposed condition. As a result of introducing additional lanes to the existing corridor, localized air quality impacts were assessed for concerned mobile sources of $PM_{2.5}$ under TCR requirements following EPA-provided guidelines and procedures for localized hot spot analysis for concerned pollutants associated with mobile sources including $PM_{2.5}$.

Additional Mobile Source Pollutants of Concerns

In addition to the criteria pollutants, the CAA also lists 187 air toxics, known as hazardous air pollutants (HAPs). Toxic air pollutants include several substances that are known or suspected to cause cancer or other health effects in humans when they are exposed to certain levels of the pollutants. Of the 187 HAPs, 93 have been identified as Mobile Source Air Toxics (MSAT) and nine are considered priority MSAT as shown below.

- Acetaldehyde
- Acrolein
- Benzene
- 1,3-butadiene
- Diesel particulate matter plus diesel exhaust organic gases (diesel PM)
- Ethylbenzene
- Formaldehyde
- Naphthalene
- Polycyclic organic matter

On February 3, 2006, FHWA and EPA issued joint guidance for the assessment of MSAT for highway projects. FHWA subsequently released updated guidance on conducting air toxic analyses on September 30, 2009, December 6, 2012, October 18, 2016, and January 18, 2023. This guidance requires analysis of potential MSAT impacts on a local level as part of the environmental analysis for a transportation project.

Existing Conditions

As discussed previously, Oakland County has been designated attainment for all NAAQS with the exceptions of being designated maintenance for O_3 and $PM_{2.5}$.

Impacts

No-Build Alternative

Although the future No-Build Alternative traffic increases would occur as compared to the existing levels due to natural growth, the vehicle emissions would continue to reduce in the future as a result of federal emissions control programs. Therefore, the air quality conditions under the No-Build Alternative would likely be improved as compared to the existing baseline condition.

Preferred Alternative

Operational Impacts

EPA-developed *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA 2021) was used in assessing potential localized PM impacts. According to this guidance, typical sample projects of air quality concern as defined by 40 CFR §93.123(b)(1)(i), (iii) and (iv) include:

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than a 125,000 annual average daily traffic (AADT) and eight percent or more of such AADT is diesel truck traffic.
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal.
- Expansion of an existing highway or other facility that affects a congested intersection (operated at Level of Service D, E, or F) and has a significant increase in the number of diesel trucks.
- Similar highway projects that involve a significant increase in the number of diesel transit buses and/or diesel trucks.
- A major new bus or intermodal terminal considered to be a "regionally significant project" under 40 CFR § 93.119.
- An existing bus or intermodal terminal that has a large vehicle fleet where the number of diesel buses increases by 50 percent or more, as measured by bus arrivals.

Beck Road is an arterial roadway that does not serve a significant volume of diesel truck traffic. Furthermore, the overall traffic volume along the corridor will be well below the 125,000 AADT threshold during the design year. The Project does not fall into any of the above-listed categories that would have the potential for air quality concern, therefore, a hot-spot analysis is not warranted.

FHWA's guideline for MSAT were used for assessing potential localized impacts. FHWA's *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents* (FHWA 2023) establishes a three-tiered approach to determine the level of MSAT analysis required for the Project:

1) Projects with No Meaningful Potential MSAT Effects such as:
   - Projects qualifying as a categorical exclusion under 23 CFR 771.117;
   - Projects exempt under the federal conformity regulations or 40 CFR §93.126; or
   - Other projects with no meaningful impacts on traffic volumes or vehicle mix.
2) For projects with low potential of MSAT effects (such as those projects where the design year traffic is projected to be less than 140,000 to 150,000 AADT), a qualitative assessment of emissions projections should be conducted.
3) For projects with a high potential of MSAT effects (such as some limited projects that create new capacity or add significant capacity to urban highways, urban arterials, or urban collector-distributor routes with traffic volumes, where the AADT is projected to be in the range of 140,000 to 150,000 or greater by the design year), consultation with FHWA and a quantitative analysis to forecast local-specific emission trends of the MSAT for each alternative would be required.

It is anticipated on a regional level, the traffic improvement within the region affected by the Preferred Alternative will improve regional mobility and reduce peak hour congestion substantially according to the forecasted LOS levels on a local level as compared to the No-Build Alternative at a total of 11 intersections as shown in Tables 2-1 and 2-2 in Section 2. However, the growing local roadway regional traffic is likely to utilize Beck Road due to the proposed additional through lanes. This may result in some increases in overall traffic volume within the Study Corridor resulting in potential adverse impacts to MSAT.

Since the forecasted corridor AADT would be substantially below the 140,000 AADT threshold, the Preferred Alternative falls into the category of projects with "Low Potential MSAT Effects." A qualitative assessment is provided below:

The Preferred Alternative results in a slightly increased exposure to MSAT emissions at certain locations such as immediately adjacent to the corridor. However, as a result of EPA's national control programs that are projected to reduce MSAT emissions, FHWA estimates that even if vehicle miles travelled (VMT) increases by 31 percent from 2020 to 2060 as forecast, a combined reduction of 76 percent in the total annual emissions for the priority MSAT is projected for the same time period. Therefore, emissions within those areas immediately adjacent to the corridor would be lower than they are currently in both the existing and design years. The operational MSAT effects resulting from the Preferred Alternative are expected to be negligible.

In addition to above project-level localized pollutant impact analysis, the Project is included as project #219309 in the *FY2023-2026 SEMCOG TIP* (SEMCOG, 2024), the most recent available as of the time of this writing, with a regional conformity demonstration completed by SEMCOG. Therefore, the Project has satisfied the requirements for air quality including being listed in the approved TIP and in the region's conformity report for O_3 resulting in no significant air quality impacts. In fact, the traffic queuing during peak traffic periods will be substantially reduced even though traffic volume increases and the overall air quality conditions are anticipated to be benefitted under the Preferred Alternative.

Construction Impacts

In contrast to operational activities, construction activities are usually of short duration and produce temporary air quality effects. However, the impacts of construction vehicle and equipment emissions from large-scale construction activities occurring over many years (typically over five years) at a specific local site could cause adverse air quality effects and may need to be quantitatively addressed.

According to CFR 93.123(c)(5), "CO, PM_{10}, and $PM_{2.5}$ hot spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site." The proposed construction activities will not occur at an individual site over five years; therefore, potential air quality impacts from construction activities are considered temporary and a hot spot analysis is not warranted.

Potential Mitigation

No mitigation is warranted under the Preferred Alternative since no significant air quality impacts were predicted based on the assessment described above.

3.12 Noise and Vibration

Legal/Regulatory Context

FHWA noise policy, detailed in 23 CFR 772, sets guidelines for noise studies and abatement for federal-aid highway projects, classifying them into Type I, II, or III projects. The Project is a Type I project due to the addition of new through-traffic lanes. Noise abatement must be considered for Type I projects if a noise analysis predicts a traffic noise impact. *MDOT's Highway Noise Analysis Handbook* provides detailed implementation guidance of 23 CFR 772 for federal-aid highway projects in Michigan.

According to FHWA guidance, there are no specific federal requirements for highway traffic-induced vibrations. Studies by highway agencies indicate that both measured and predicted vibration levels from traffic are below the thresholds for structural damage to buildings. Everyday activities within buildings, such as closing doors or walking, generate higher vibration levels than highway traffic.

Existing Conditions

To better categorize the potential noise impacts and evaluate noise abatement for the Preferred Alternative, all of the potentially impacted noise-sensitive receptors have been organized into Common Noise Environments (CNEs). A CNE is defined as an area containing land uses that share a common highway traffic noise influence. Descriptions of delineated CNEs, including location, primary land use, and type of noise-sensitive receptors can be found in Table 3-5. Figure 3-1 of Appendix G graphically depicts the locations of the CNEs, the characteristics of each Measurement ID can also be found in Appendix A of Appendix G.

Table 3-5: Common Noise Environments

CNE	Location	Land Use & Type of Noise-Sensitive Receptors	Measurement ID
CNE-1	South of West Pontiac Trail, West of Beck Road	Multi-Family Homes	ST-1
CNE-2A	South of Grand River Ave, East of Beck Road	Multi-Family Homes	ST-2
CNE-2B	South of Heritage Drive, West of Beck Road	Day Care Center, Recreational	None
CNE-2C	North of Grand River, West of Beck Road	Day Care Center	None
CNE-3	South of 11 Mile Road, West of Beck Road	Single-Family Homes, Sports fields, playground	ST-3
CNE-4	South of 11 Mile Road, East of Beck Road	Single Family Homes, Commercial	ST-4
CNE-5	South of 10 Mile Road, West of Beck Road	Single-Family Homes, Religious Buildings	LT-1, ST-5
CNE-6	South of 10 Mile Road, East of Beck Road	Single-Family Homes	None
CNE-7	South of 9 Mile Road, West of Beck Road	Single-Family Homes	None
CNE-8	South of 9 Mile Road, East of Beck Road	Single-Family Homes	ST-6

Noise measurements were conducted for the Project between August 16 and August 17, 2022, to provide information for noise model validation, including one long-term and six short-term noise measurements. The predicted noise levels for each CNE in the existing conditions are provided in Table . For more detailed information regarding the traffic noise analysis see Appendix G.

Impacts

No Build Alternative

Under the No Build Alternative, no changes to the existing road configuration would be implemented and therefore it can be inferred that noise impacts would increase over time as the roadway traffic levels increase. No impacts due to vibration are anticipated.

Preferred Alternative

The Project noise analysis included a total of six short-term measurement locations and 233 predicted representative noise levels for 232 dwelling units in the project area. The Project was split into ten separate CNEs for noise impact analysis within the study area.

Noise Abatement Criteria (NAC) are guidelines set by FHWA to determine when noise mitigation measures are needed for highway projects. They establish acceptable noise levels for different land uses. If predicted noise levels exceed these criteria, measures need to be implemented to reduce the impact. Seven of the of the ten CNEs contained receptors with predicted future noise levels approaching or exceeding MDOT's NAC as seen in Table 3-6.

Table 3-6: Summary of Predicted Noise Levels by CNE

CNE	No. of Modeled Receptors	Total Dwelling Units	Predicted Noise Level (Range), Leq (1h)		Total Number of Future Noise Impacted Units		
			Existing	Future Build	Approach or Exceed NAC	Significant Increase	Total Impacted Dwelling Units
CNE-1	86	172	35-64	38-71	12	0	24
CNE-2A	26	26	48-63	53-66	1	0	1
CNE-2B	3	3	50-58	51-60	0	0	0
CNE-2C	2	2	46-53	49-56	0	0	0
CNE-3	62	62	43-67	46-69	6	0	6
CNE-4	115	115	42-66	44-69	23	0	23
CNE-5	51	51	48-67	50-69	2	0	2
CNE-6	81	81	42-65	46-68	10	0	10
CNE-7	28	28	33-64	34-66	1	0	1
CNE-8	87	87	37-64	39-65	0	0	0

Noise abatement was considered for each CNE with identified noise impacts. Initially, noise abatement was checked for feasibility (minimum 5 dBA (A-weighted decibels) reduction achievable for at least 75% of impacted receptors and free of access restrictions, safety and constructability issues, etc.). If abatement was determined to be feasible, the abatement was analyzed for cost-effectiveness and other reasonableness factors. For impacted receptors meeting feasibility requirements, preliminary barrier designs were evaluated using FHWA Traffic Noise Model (TNM) version 2.5. If the abatement was found to be both reasonable and feasible, it would be recommended for inclusion in the Project pending a polling of viewpoints from benefited receptors. The details of the barrier analysis including determinations of feasibility and reasonableness are included in Table 3-7.

Table 3-7: Barrier Analysis Results

Barrier ID	Number of Attenuated Locations					Cost	Cost Per Benefitted Unit	Feasible	Reasonable	Recommended
	≥ 10 dBA	≥ 7 dBA		≥ 5 dBA (Benefitted Receptors)						
		#	% of Benefit	#	% of Impacts					
Wall-1	1	2	33%	6	33%	$422,955	$70,493	No	No	No
Wall 3a	0	2	67%	3	52%	$189,000	$63,000	No	No	No
Wall 3b	0	0	0%	3	48%	$201,600	$67,200	No	No	No
Wall 4	1	3	75%	4	50%	$225,180	$75,060	No	No	No
Wall 6	1	6	100%	6	75%	$492,048	$82,008	Yes	No	No

Note:
1) MDOT policy requires that reasonable and feasible noise walls must be constructable, provide at least 10 dBA noise reduction at one impacted receptor, at least 7 dBA noise reduction for at-least 50% of benefited receptors, at least 5 dBA noise reduction for at least 75% of impacted receptors, and be constructed at an estimated cost of no more than $56,428 per benefited receptor.
2) Wall costs reported here are based on wall area in square feet as calculated by TNM times MDOT unit cost of $45.00/square foot.
3) Table does not include results for areas where noise barriers were considered not feasible for access or safety considerations.

Construction Noise and Vibration

Neither FHWA nor MDOT identify specific construction noise impact criteria. In addition, the detailed information necessary to predict actual construction noise levels (construction schedules, phasing, equipment lists, laydown areas, etc.) has not yet been determined. However, for this project, it is anticipated that pile driving, and some nighttime construction work will be required. It is recognized that areas adjacent to the road ROW and other construction areas (such as staging areas and laydown sites) can temporarily be exposed to high levels of noise during peak construction periods. It is reasonable to assume that the same CNEs identified for potential traffic noise impacts could also be exposed to construction noise. The effect of the noise on the local area can be reduced if the hours and days of construction activity are limited to less sensitive time periods. The project construction standard noise specifications help minimize the effects of construction noise.

Automobiles, trucks, and buses do not typically generate enough vibration to be a concern, except under specific situations such as deteriorated or irregular pavement adjacent to sensitive locations. Studies to assess the impact of operational traffic induced vibrations have shown that both measured and predicted vibration levels are less than any known criteria for structural damage to buildings. Normal living activities within a building have been shown to create greater levels of vibration than road traffic.

Mitigation

Based on the analysis, highway traffic noise abatement will not be installed for the Project. The analyzed noise abatement measures were based on preliminary roadway design and costs for noise abatement. If roadway designs substantially change during final design, noise abatement measures may be re-evaluated.

In terms of impacts to future compatible land use planning, FHWA and MDOT policy specify that local officials should be provided appropriate information to assist in the process, especially regarding the planning and development of undeveloped lands near the proposed project ROW. Table 3-8 below provides potential noise impact distances from the roadway pavement for future developments on undeveloped lands.

Table 3-8: Noise Impact Distances for Undeveloped Lands

Project Roadway	Distance from the Edge of Pavement (Feet)	
	71 dBA	66 dBA
Beck Road	78	136

To mitigate, minimize and avoid the impacts of construction noise during project implementation, a series of activities will be considered for implementation. These activities include special provisions and best practices which may be incorporated into the construction contract.

- Inform the public about high noise activities (e.g., pile drivers) or nighttime construction.
- Truck noise must not exceed 88 dBA at 50 feet.
- No construction within 1,000 feet and no pile driving/blasting within 3,000 feet of homes on Sundays, holidays, or outside approved hours without approval of the city of Novi or the city of Wixom.
- Equipment must have effective sound-control devices and no unmuffled exhaust.

- Use “smart alarms” or spotters outside approved hours.
- Have portable noise meters for spot checks, with a trained operator.
- Equipment must meet EPA noise standards.
- Mitigate noise from rock crushing/screening within 3,000 feet of homes with material stockpiles or other approved methods.

If a specific noise impact complaint is received during construction of the project, the contractor may be required to implement one or more of the following noise abatement measures, as directed by the construction project manager:

- Locate stationary construction equipment as far from nearby noise-sensitive properties as feasible.
- Shut off idling equipment.
- Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
- Notify nearby residents whenever extremely noisy work will be occurring.
- Install temporary or portable acoustic barriers around stationary construction noise sources.
- Operate electrically powered equipment using line voltage power or solar power.

3.13 Wetlands

This section assesses potential Preferred Alternative related impacts to wetlands. Additional information regarding wetland resources can be found in the Wetland Resources Technical Memorandum, available in the Appendix H.

Legal/Regulatory Context

- E.O. 11990 directs federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the values of wetlands during federally assisted construction projects.
- Section 404 of the Clean Water Act of 1972 (CWA), as amended, regulates the discharge of dredged or fill material into waters of the U.S. including wetlands. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has been delegated authority to administer Section 404 for most areas of the state, including all of the ESL.
- Part 303 of NREPA, as amended, provides for the protection of Michigan’s wetlands. Wetlands greater than five acres, wetlands connected to a surface water, and wetlands within 500 feet of a surface water are subject to regulation. EGLE may require compensatory wetland mitigation for unavoidable wetland impacts.

Existing Conditions

Fifty-five wetlands were identified through a wetland delineation and in coordination with EGLE. Three types of palustrine wetlands were identified onsite, according to the Cowardin

classification methodology: forested, scrub-shrub, and emergent. The delineated wetlands are primarily influenced by precipitation and groundwater. Some of the wetlands appear to be incidental to development or the construction of roadside ditches intended to drain moisture away from roadways. Nevertheless, regardless of their condition, all wetlands offer valuable functions and benefits such as wildlife habitat, flood control, and absorption of excess water during periods of heavy rainfall. Additionally, they function as natural water filters, removing excess nutrients, pollutants, and sediments before they reach surface waters.

An EGLE representative determined that of the 55 delineated wetlands, only 26 are subject to Part 303 regulation. The remaining wetlands are either exempt from regulation, meaning that Project activities can occur within them without requiring a Part 303 permit, or are classified as non-regulated. Non-regulated wetlands include smaller, isolated wetlands or those that form in roadside or utility ditches designed for drainage, which are typically not part of a larger wetland ecosystem and are not recognized for their ecological significance.

Conservation easements are legal agreements between a landowner and a conservation organization or government agency, such as EGLE, that restrict certain types of development or land use on a property in order to protect its natural, scenic, or cultural resources. These easements are sometimes a condition of an EGLE permit and are typically used to preserve open space, wildlife habitat, farmland, forests, wetlands, or other valuable ecological features. According to EGLE open data source, EGLE holds seven conservation easements to protect previous wetland mitigation sites for developments that abut the Potential Impact Area. The city of Novi also holds seven distinct conservation easements that intersect the Potential Impact Area as seen in the city of Novi's Conservation Easements Open Data. Conservation easements granted to EGLE are held in perpetuity, meaning disturbance is not allowed without a release of the easement. EGLE generally does not release conservation easements so the Project design will be done in such a way as to avoid impacting the conservation easements.

Impacts

No-Build Alternative

Under the No-Build Alternative, wetlands will remain on-site. It is likely that, over time, the quality of the wetlands will decrease due to their proximity to anthropogenic activity.

Preferred Alternative

The Preferred Alternative has the potential to impact up to 2.681 acres of wetlands regulated by Part 303 and 0.995 acres of non-regulated or exempt wetland that is subject to mitigation requirements under E.O. 11990, as shown in Table 3-9.

Table 3-9: Potential Wetland Impacts

Wetland Type	Potential Impact Area (Acres)
Emergent	2.408
Scrub-Shrub	0.089
Forested	1.179
Total Potential Impact Area	**3.676**

Mitigation

Efforts to avoid and minimize wetland impacts will be considered as part of the final design activities including steepened fill embankments, minor alignment shifts and utilizing boardwalks for non-motorized crossings of wetlands. Where wetland impacts are unavoidable, a Part 303 permit will be necessary which will stipulate required wetland mitigation. Wetland mitigation details will be finalized as part of the permitting process but replacement ratios of 1.5:1 (i.e.one acre of impact requires 1.5 acres of mitigation credits) for impacts to scrub-shrub and emergent wetlands and 2:1 for impacts to forested wetlands are expected. Due to the expected replacement ratios, compliance with E.O. 11990 “no net loss” requirements will also be fulfilled. Wetland mitigation credits will be acquired from the Michigan Wetland Board for Local Transportation Agencies (MiWB). If mitigation acreage is not available through the MiWB at the time of permit application, the cities of Novi and Wixom will seek alternative wetland mitigation opportunities to fulfil the Part 303 permit requirements and replace the lost functions and values that result from the Preferred Alternative.

3.14 Water Resources

This section assesses potential Preferred Alternative related impacts to water resources. Additional information regarding water resources can be found in the Water Resources Technical Memorandum, available in the Appendix I.

Legal/Regulatory Context

- The CWA regulates pollutant and other discharges into waters of the United States (U.S.) and provides for water quality standards (WQS) in surface waters. It is unlawful to discharge pollutants from a point source into surface waters without a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES program is administered by EGLE in the state of Michigan, which includes a Municipal Separate Storm Sewer System (MS4) program to reduce the discharge of pollutants to surface waters.
- Part 31 of NREPA provides regulatory protection of water resources at the state level, including implementation of WQS, NPDES, and MS4. Additionally, Part 31 provides floodplain regulatory authority to EGLE.
- Part 301 of NREPA provides regulatory protection of the State of Michigan’s inland lakes and streams, including activities such as dredge and fill operations and construction of bridges and culverts that cross streams.
- Part 91 of NREPA addresses soil erosion and sedimentation control (SESC) to safeguard Michigan's land and water resources, and adjacent properties.

Existing Conditions

Surface Water

The Project straddles the boundary of the Detroit River and Huron River watersheds and intersects three streams: the Novi Lyon Branch No. 1 Drain, an unnamed tributary to the Novi Lyon Branch No. 1 Drain, and an unnamed tributary to Thornton Creek. All three exhibit intermittent flows, flowing seasonally or after rainfall or snowmelt events. There are no lakes present in the studied area though Walled Lake lies approximately 1.5 miles east of the intersection of Beck Road and Pontiac Trail.

Floodplains

Federal Emergency Management Agency (FEMA) mapping documents two streams traversed by the Project that have mapped floodplains. Part 31 floodplain rules regulate floodplains of rivers, streams, or drains with a drainage area of two square miles or more. None of the Project stream crossings have a contributing drainage area of two square miles or larger and therefore, a permit is not required under Part 31 for alterations within floodplains of watercourses.

Water Quality/MS4

The study area is within an urbanized zone with most stormwater generated on Beck Road being conveyed by a combination of enclosed storm sewer systems and open-channel conveyance systems. Novi and Wixom each hold individual MS4 permits that require the development, implementation, and enforcement of stormwater management programs under NPDES, including adherence to post-construction performance standards for water quality and channel protection. Additionally, MDOT and the Road Commission for Oakland County each hold their own MS4 permits. These permits may be applicable to the Project for the pedestrian connectivity that will occur between Grand River Avenue and 12 Mile Road.

Portions of the Project fall within watersheds that have total maximum daily loads (TMDLs) in place for the following: dissolved Oxygen (D.O.), sediment and biota, phosphorus, polychlorinated biphenyls (PCBs), and *Escherichia coli*. Surface transportation projects are not significant contributors of PCBs and *E. coli* and therefore the TMDLs for these will not be addressed in this document. Those TMDLs that are relevant to the Project include:

- The Norton Creek D.O. TMDL
- Rouge River Sediment TMDL
- Strawberry Lake phosphorus TMDL
- Kent Lake phosphorus TMDL

A portion of the Project also falls within the Rouge River Area of Concern (AOC), designated under the Great Lakes Water Quality Agreement of 1987. Sediment and water contamination affect fish and wildlife habitat and populations as well as recreational opportunities within the Rouge River watershed. Contaminants within the watershed include heavy metals, PCBs, Polycyclic Aromatic Hydrocarbons (PAHs), mercury, oil, and grease. Remedial Action Plan priorities developed for the Rouge River AOC include elimination of combined sewer overflows, nonpoint source pollution control, industrial discharge pretreatment, and contaminated sediment cleanup.

Impacts

No-Build Alternative

Under the No-Build Alternative, it is probable that water quality would remain consistent with existing conditions, though modest improvements may occur due to implementation of stormwater management plans required by MS4 permits.

Preferred Alternative

The Preferred Alternative will not cause a significant negative impact to any of the streams that intersect the Potential Impact Area if EGLE recommendations are followed.

The Preferred Alternative will result in a slight increase of impervious surfaces that will elevate runoff volume and flow rates from the roadway, escalating sediment loads to surface waters if left untreated. Such changes can provoke heightened erosion and sedimentation. Sedimentation, by clouding water and reducing light penetration, disrupts aquatic ecosystems, impairs habitat quality, and interferes with the natural balance of aquatic life, thus deteriorating water quality.

Mitigation

Surface Water

Impacts to streams will require a Part 301 permit from EGLE. Measures to avoid, minimize, and mitigate any impacts will be implemented during final design activities and determined through the permitting process with EGLE. In-stream work will be restricted from May 1st through June 30th to protect fish spawning. Furthermore, all stream crossing culvert replacements will be designed such that they do not restrict flow and are not perched, thereby allowing free passage of aquatic organisms. Additionally, stream crossing culverts that are replaced during construction will be designed to span the bankfull width of the stream and align with the upstream and downstream channel.

Water Quality/MS4

To meet the goals of the Rouge River Watershed Management Plan and TMDLs within the Project area, stormwater will be treated for a minimum of 80% total suspended solids (TSS) removal using appropriate best management practices (BMPs) before it enters any surface waters. Additionally, TSS will not exceed 80 mg/L to comply with the performance standards outlined in the cities' MS4 permits. BMPs will be implemented to mitigate flow rates and reduce volume, thereby minimizing potential erosion concerns and subsequent sedimentation.

Soil Erosion and Sedimentation Control During Construction

Their primary objective will be to ensure that sedimentation does not exacerbate existing issues in local watersheds or extend beyond the designated ROW. This will be accomplished through the implementation of both temporary and permanent SESC measures in accordance with requirements of EGLE, the city of Novi, and the city of Wixom.

Within the city of Novi, the contractor must adhere with the city's approved operating procedures in accordance with their Part 91 Authorized Public Agency (APA) status. These measures are prescribed standards aimed at preventing erosion and sedimentation and must be included in the design plans.

Within the city of Wixom, a Part 91 permit will be necessary. All SESC plans for this stretch of work must comply with the requirements outlined in this permit. Detailed design plans will be developed, specifying the erosion controls and their respective locations.

3.15 Threatened and Endangered Species

Legal/Regulatory Context

Federal Law

The Endangered Species Act (ESA) of 1973 serves as the cornerstone for the protection of threatened and endangered (T&E) species in the U.S. Administered by the U.S. Fish and Wildlife Service (USFWS), the ESA aims to prevent species extinction by prohibiting unauthorized activities that harm listed species or their critical habitats. Under the ESA, both federal and non-federal entities must ensure that their actions do not jeopardize the continued existence of any species listed as T&E or result in the destruction or adverse modification of designated critical habitat. This process is categorized through a federal effect determination. Federal effect determination refers to the potential impact a proposed project or action may have on federally protected resources, including species listed under the ESA and delineated critical habitats. The lead federal agency for the Project, FHWA, is responsible for determining the Project's effect on all of these resources.

State Law

In Michigan, species protection is further reinforced by NREPA, specifically under Part 365 – Endangered Species Protection. This state-level legislation provides legal protections for T&E species within Michigan, complementing federal efforts by offering additional safeguards for state-listed species and their habitats. The Michigan Department of Natural Resources (MDNR) oversees enforcement of Part 365, ensuring that proposed activities are evaluated for their potential impacts on state-protected species and habitats. Similarly to MBTA, Part 365 aims to ensure that unauthorized “take” doesn’t occur to state listed T&E species. A "no-take" determination indicates that a proposed project will not result in these impacts, meaning the species and its habitat will remain unaffected.

Methods

USFWS’s Environmental Conservation Online System – Information for Planning and Consultation Species List

A search was conducted for the Project utilizing USFWS’s Environmental Conservation Online System - Information for Planning and Consultation (IPaC) originally on March 18, 2021, and subsequently updated on November 14, 2024. This search generated an Official Species List, which identifies federally threatened, endangered, proposed, candidate, and conservation concern species that may occur within the project area. Additionally, an IPaC All Species Michigan Determination Key was executed on November 14, 2024, to assist in determining the potential impacts and federal effect determination on each listed species within the Potential Impact Area. Both the species list and determination key can be found in Appendix L.

EGLE’s Transportation Service Request – T&E Species Map/Data Review

A Transportation Service Request – T&E Species Map/Data Review (Preliminary Desktop Review), which involves querying EGLE's databases to identify potential T&E species that could be affected by transportation projects, was requested from EGLE for the Project on March 22, 2021. The request was updated on May 4, 2023. EGLE provided letter responses dated April 7, 2021, and May 22, 2023, found in Appendix L, summarizing the results of the database search for the following concerns within 500-feet of the Project location:

- Historical occurrences of state-listed T&E and special concern species within the Michigan Natural Features Inventory (MNFI) database
- Tier 1 Eastern massasauga rattlesnake (EMR) designated habitat
- Michigan Mussel Protocol Group 1/Group 2 (state) and Group 3 (federal) T&E Mussels

Michigan State University's Michigan Natural Features Inventory Database

While the Transportation Service Request – T&E Species Map/Data Review scanned the MNFI database, MNFI was also contracted to perform a Rare Species Review of the Project area (see Appendix L). On September 28, 2023, the MNFI conducted a review to assess the presence of current and historical T&E plant species. This review provided a detailed list of federally listed T&E species, state listed T&E species, and state special concern species within a 1.5-mile buffer of the Project. State special concern species are not legally protected in Michigan and because of this, they will not be addressed in this EA. Additionally, MNFI designates species recorded more than 40 years ago as historic and not currently relevant to the surveyed area. As a result, historic listed species are also excluded from this EA.

Results

Several species were identified across more than one of the three screening methods. For instance, EMR was noted in both the IPaC report and the MNFI review because it is a federal and state listed threatened species. Table 3-10 provides a list of the modern and legally protected species that may occur in the vicinity of the Project. No critical habitats occur in the ESL.

Table 3-10: Screening Results for Protected Species

Common Name	Scientific Name	Federal Listing	State Listing
Indiana bat	*Myotis sodalis*	Endangered	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Endangered	Threatened
Tricolored bat	*Perimyotis subflavus*	Proposed Endangered	Threatened
EMR	*Sistrurus catenatus*	Threatened	Threatened
Monarch butterfly	*Danaus plexippus*	Proposed Threatened	Not Listed
Whooping crane	*Grus americana*	Experimental Population, Non-Essential	Not Listed
Redside dace	*Clinostomus elongatus*	Not Listed	Endangered

Note: Special concern and historic species are not included

Impacts

No-Build Alternative

Under the No-Build Alternative, the roadway would remain as-is and, consequently, would not impact the habitat or current ecology of any protected species.

Preferred Alternative

There will be no significant impacts to T&E species if the measures identified in the mitigation section are implemented. The Preferred Alternative May Affect but is Not Likely to Adversely Affect northern long-eared bat (NLEB), Indiana bat, and monarch butterfly. The Preferred Alternative will result in No Effect to tricolored bat, EMR, and whooping crane. Impacts to redside dace can be avoided so No Take is expected.

Bats

In Michigan's lower peninsula, the NLEB and Indiana bat are considered potentially present wherever suitable habitat exists, defined as trees with a diameter at breast height (DBH) of 3 inches or greater for NLEB and 5 inches or greater for Indiana bat. The tricolored bat, a proposed federally endangered species, may also occur within the Project area. Although the tricolored bat does not yet have the full legal protections of the ESA, federal agencies are still required to ensure their actions do not jeopardize its existence.

The Project area does not contain culverts suitable for bat roosting, defined by the USFWS as those exceeding four feet in height and 50 feet in length. Additionally, there are no known hibernacula, such as caves or mines, within the ESL and no permanent lighting is planned which could disrupt bat feeding and roosting patterns. However, these bat species commonly roost in trees during the summer months, and the planned tree removal for the Project may impact suitable habitat. As a result, the IPaC All Species Michigan Determination Key concluded a determination of Not Likely to Adversely Affect for the NLEB and Indiana bat, and No Effect for the tricolored bat.

EMR

EGLE's database search did not indicate any occurrences of EMR habitat in the Project area. Although the Project lies within EMR's known range, it is outside Tier 1 and Tier 2 habitat, areas considered more likely to host the species. With no critical habitats identified near the Project, no significant impacts to the EMR are anticipated.

Initially, the IPaC All Species Michigan Determination Key concluded a May Affect determination due to the Project impacting over one acre of wetland. However, consultation with USFWS concluded that the Project does not contain suitable habitat for the EMR, warranting a No Effect determination (see Appendix J for correspondence).

Monarch Butterfly

In late 2024, USFWS proposed listing monarch butterfly as a federally threatened species under the ESA. While the species has not yet received full legal protections, federal agencies must ensure that their actions do not jeopardize its existence.

The Project will convert naturalized habitat along the Beck Road corridor that may be suitable for monarch's use. However, this conversion will occur on the fringe of these naturalized habitats and will not jeopardize monarch populations. Therefore, the Project May Affect but is Not Likely to Adversely Affect this species. If and when monarch is listed as a threatened species, the IPaC All Species Michigan Determination Key will likely need to be updated to reflect updated USFWS guidance.

Whooping Crane

Whooping crane is designated as a nonessential experimental population, which is treated as a T&E species only when found within a National Wildlife Refuge or National Park. Since no such

areas are located within the ESL, the Project will not impact Whooping cranes resulting in No Effect to this species.

Redside Dace

The redside dace has an element occurrence within 1.5 miles of the Potential Impact Area with estimated good viability. According to the MNFI species profile, redside dace inhabits small, moderate- to high-gradient streams with ample shade from overhanging vegetation, abundant coarse woody debris, and clean, rocky substrates. They spawn in rocky riffles and utilize pools outside the breeding season. Mitigation measures can be implemented to avoid impacts to the species if they are present in the vicinity so No Take is expected.

Mitigation

The Preferred Alternative will result in no significant impacts to all T&E species by implementing the mitigation measures listed below.

Bats

To avoid potential impacts to tree-roosting bats, all tree clearing activities will be conducted during the bat inactive season (October 1 to April 14), as recommended by USFWS. This practice also aligns with *MDOT's Special Provision for Tree Removal and Clearing (20TM202-A395-02)*. These measures make it highly unlikely that the Preferred Alternative will negatively impact listed bat species.

EMR

Despite USFWS concurring that a "No Effect" determination is appropriate, BMPs will be implemented to mitigate potential impacts due to EMR's broad range across Michigan. BMPs will include using wildlife-friendly erosion control materials to avoid entanglement risks and requiring construction crews to watch MDNR's educational video, "60-Second Snakes: The Eastern Massasauga Rattlesnake," before starting work. These mitigation measures are outlined in *MDOT's Special Provision for Eastern Massasauga Rattlesnake (20SP-107F-01)*.

Redside Dace

Avoidance measures include restricting in-water work, such as culvert replacement, from May 1 to June 30 to prevent disruption during the fish spawning season. Minimization efforts will involve the use bypass channels or bypass pumping to maintain stream flow and reduce habitat disturbance during culvert construction. Additionally, vegetation will be reestablished to stabilize the work area and prevent siltation into streams. To prevent long-term impacts, stream crossings will be designed to facilitate the free passage of aquatic organisms in accordance with EGLE culvert design recommendations.

3.16 Vegetation and Wildlife

Legal/Regulatory Context

The Migratory Bird Treaty Act (MBTA) of 1918, administered by USFWS, protects over 1,000 species of migratory birds by prohibiting the unauthorized "take". A "take" determination refers to actions that may harm, harass, or kill a legally protected species, or significantly modify its habitat. For birds, this includes protection of nests and eggs. This law implements international

agreements to conserve migratory bird populations and applies even to species not listed under the ESA. Projects or activities that could impact migratory birds must incorporate mitigation measures to avoid violating the MBTA and ensure the continued protection of these species and their habitats.

There are no other statutory or regulatory requirements applicable to the Preferred Alternative for general vegetation and wildlife.

Existing Conditions

The northern two miles of the five-mile Study Corridor are predominantly industrial and commercial, while the southern three miles transition into increasingly suburban areas. In this southern portion, the landscape comprises fragmented deciduous woodlots, wetlands, and housing developments. While no formal field study has been conducted to document species presence, general habitat characteristics along with the species lists from the wetland delineation allow for an informed estimation of expected flora and fauna within the ESL. The primary natural habitat groups in undeveloped areas include upland forests and lowland wetlands. The vegetation in these areas is likely composed of species typical of temperate deciduous forests and wetlands, supporting a variety of plants adapted to hydrologically dynamic conditions. Invasive species, including Phragmites, common buckthorn, purple loosestrife, black locust, Canada thistle, and Eurasian watermilfoil, were identified during the wetland delineation. Due to the anthropogenic influences on the ESL, additional common invasive species such as autumn olive, tree-of-heaven, and spotted knapweed may also be present.

A wildlife survey was not performed however, the IPaC official species list provides a probability of presence summary for migratory birds most likely to be present and breeding in the project area. This summary identified 20 migratory bird species, along with their probability of presence and breeding season. To further refine this assessment, the Rapid Avian Information Locator (RAIL) was consulted which identified 65 MBTA-protected species that utilize trees for nesting (see full list in Appendix Q).

Impacts

No-Build Alternative

Under the No-Build Alternative, vegetation and wildlife would remain in current conditions.

Preferred Alternative

The Preferred Alternative results in widening the current paved road surface, which varies from 30 feet to 40 feet wide, up to approximately 55 feet wide through much of the corridor. This widening will primarily impact manicured lawns and lightly managed green space but will also include impacts to fragmented forestland and wetland. To assess potential impacts on adjacent quality forested habitat, defined as tree stands greater than 0.5 acres, a geospatial analysis using aerial imagery and onsite observations was performed. The results indicate that approximately 0.73 acres of quality forested habitat may be impacted by the Project. As noted in Section 3.13, up to 3.676 acres of wetland impact also may occur.

As previously mentioned, there are no critical habitats for T&E species designated by USFWS within the ESL, so no direct impacts to such habitats are anticipated. The primary concern regarding vegetation and wildlife is the potential for the project to facilitate the spread of invasive species. To address this, mitigation measures will be implemented to prevent further spread of invasive plants.

Adverse impacts to migratory birds protected under the MBTA must be avoided in a manner similar to T&E species. Construction activities will avoid disturbing migratory birds and their active nests, defined as those containing eggs or chicks. Aside from bald eagle, which has no known nesting sites in the vicinity of the Project, none of these species were documented as using trees for nesting before April 22. The construction schedule will be developed to prevent tree removals during nesting seasons, thereby avoiding impacts. With no impacts anticipated, “No Take” of migratory birds will occur.

Mitigation

Several best management practices will be implemented during construction to limit the spread of invasive plant species such as phragmites. When construction activities occur in established stands of invasive species, the contractor will be required to thoroughly clean construction equipment of all plant material before moving it elsewhere. Additionally, all excess spoils generated from these areas will not be moved elsewhere onsite but will be disposed of in a landfill. Furthermore, any vegetation temporarily disturbed by the project will be restored to establish well growing turf, thereby limiting the opportunity for invasive plant species to become established.

The tree removals associated with the Project are not expected to significantly impact migratory birds. However, due to the number of species identified by the RAIL tool with unspecified breeding periods, mitigation measures for tree removal are necessary. Consultation with the MDOT Local Agency Program (LAP) T&E Species Specialist, led to the determination that the best practice for this region of Michigan is to restrict tree removal from April 1 to September 30. Consequently, the bat tree-clearing restriction period (April 15 to September 30) will be extended by two weeks to enhance protection for migratory bird species. Additionally, the Preferred Alternative will implement *MDOT's Special Provision for Migratory Bird Protection (20SP-107B-01)* to mitigate potential impacts from other construction activities, such as soil stockpile grading, to prevent disturbances to migratory birds and their nests.

3.17 Recreational Properties and Section 4(f)

Legal/Regulatory Context

Section 4(f) of the 1966 Department of Transportation Act stipulates that publicly owned land from a park, recreational area, or wildlife/waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance, may not be utilized for transportation projects unless: (1) there is no feasible and prudent alternative to the use of such land, and (2) the proposed project incorporates all possible planning to minimize harm.

Temporary Occupancy

A temporary occupancy involves the short-term use of Section 4(f) property, which does not result in permanent damage to the activities, features, or attributes that qualify the property for Section 4(f) protection. A temporary use impact can be deemed acceptable if the following conditions are met:

- The duration of the impact must be temporary, lasting less than the project's construction period, with no land ownership changes.
- The scope of work must be minor, with minimal changes to the Section 4(f) property in both nature and magnitude.

- No permanent adverse physical impacts or interference with the property's protected activities, features, or attributes, on either a temporary or permanent basis.
- The land must be fully restored to at least its pre-project condition.
- The Official(s) with Jurisdiction (OWJ) over the property must agree to the above conditions.

De Minimis Impact

A *de minimis* impact involves the acquisition and use of a Section 4(f) property in a way that is minor and causes no adverse effect on the activities, features, or attributes qualifying the property for Section 4(f) protection. A *de minimis* determination for parks, recreation areas, or refuges can be made if the following criteria are met:

- The transportation use, along with impact avoidance, minimization, and mitigation measures, does not adversely affect the activities, features, or attributes of the Section 4(f) property for its intended purpose.
- The public has been given an opportunity to review and comment on the project's effects on the protected activities, features, or attributes.
- The OWJ over the property, after considering public comments and FHWA's intent to make the de minimis finding, provide written concurrence that the project will not adversely affect the property's qualifying characteristics.

Affected Adjacent Section 4(f) Properties

Bosco Fields

See Figure 3-5 for a view of properties protected by Section 4(f) within the ESL. The Project's Potential Impact Area will intersect with Bosco Fields, a city of Novi active recreational property, located on the west side of Beck Road just south of 11 Mile Road. Bosco Fields, comprising over 30 acres of land, was opened in 2022 and has been maintained as a public park, open for use by the general public. The property includes multi-purpose sport, athletic, and recreational fields with related amenities. It also includes parking areas and can be accessed from Beck Road and 11 Mile Road. Currently, the property features 13 soccer fields, along with a small water park known as Jessica's Splashpad as well as seasonal restrooms, both added to Bosco Fields in 2024.

ITC Corridor Trail

The Project's Potential Impact Area will intersect the ITC Corridor Trail, a joint effort between the city of Novi and ITC Holdings Corp. One of the northern trailheads is located on the west side of Beck Road, just north of Heritage Drive. This 4.8-mile trail, designated for non-motorized vehicles, features paved asphalt surfaces and boardwalks, linking ITC Community Sports Park and Wildlife Woods Park. In addition to recreational use, the trail's primary goal is to connect local parks and facilitate safe, non-motorized travel between neighboring communities.

Recreational Properties Not Protected by Section 4(f)

Ataturk Park is located adjacent to the ESL, however, this park is not afforded protection under the law because it is not publicly owned, rather it is under the jurisdiction of the Turkish American Cultural Association of Michigan (TACAM) in Wixom.

Impacts

No-Build Alternative

Under the No-Build Alternative, no change would be made to the existing public recreational 4(f) properties and there would be no impact to the resources.

Preferred Alternative

The preferred alternative includes the minor, or *de minimis*, use of the city of Novi's Bosco Fields. The Preferred Alternative's use of the Section 4(f) property will not adversely affect its protected activities, features, or attributes of the property for its intended purpose. ROW (approximately 0.99 acres) will be required along the east side of the property to accommodate for the roadway widening as well as a widened loon along the shoulder to accommodate turning movements associated with a median U-turn. The area to be disturbed is not used for active recreation, but rather open space consisting of a public sidewalk and an undeveloped grassy area. The existing sidewalk will now be incorporated into the roadway ROW although it will be shifted slightly to the west around the new turning loon. Access to Bosco Fields will be maintained during construction. It is anticipated the landscaped berm providing a visual and physical separation between the sidewalk and the soccer fields will remain during and after construction.

Public Involvement

The public hearing will afford the public an opportunity to review and comment on the Preferred Alternative's minor use of Bosco Fields. The community will have an opportunity to express concerns, offer feedback, and gain a clearer understanding of the Project. It is anticipated that no concerns regarding the *de minimis* impact will be raised during this meeting because the proposed impacts to Bosco Fields are minor and the area to be impacted is not actively used for recreation uses.

Official with Jurisdiction Concurrence

The city of Novi, Director of Parks, Recreation and Cultural Services has been informed of the proposed minor use and has expressed support. Following the public hearing, the OWJ will be informed of any public feedback, detailing any concerns that arise. After resolution of those concerns, the OWJ will provide written concurrence, confirming the use of the property is minor and the project will not adversely affect Bosco Fields for its intended purpose. If additional mitigation measures are required based upon public input, those measures will also be documented in this correspondence.

Mitigation

To support restoration efforts, enhancement plantings will be strategically placed along the eastern edge of Bosco Fields if deemed necessary. While final plans will determine their need and locations, potential options include a tree buffer between the proposed turning loon and Jessica's Splashpad to provide privacy, reduce perception of noise, and serve as a visual screen. Additionally, as mitigation during construction, access will be maintained to Bosco Fields and the ITC Corridor Regional Trail and its associated trailhead. Overall, these measures support the conclusion that no activities, features or attributes of adjacent public recreational properties will be lost as a result of the Project.

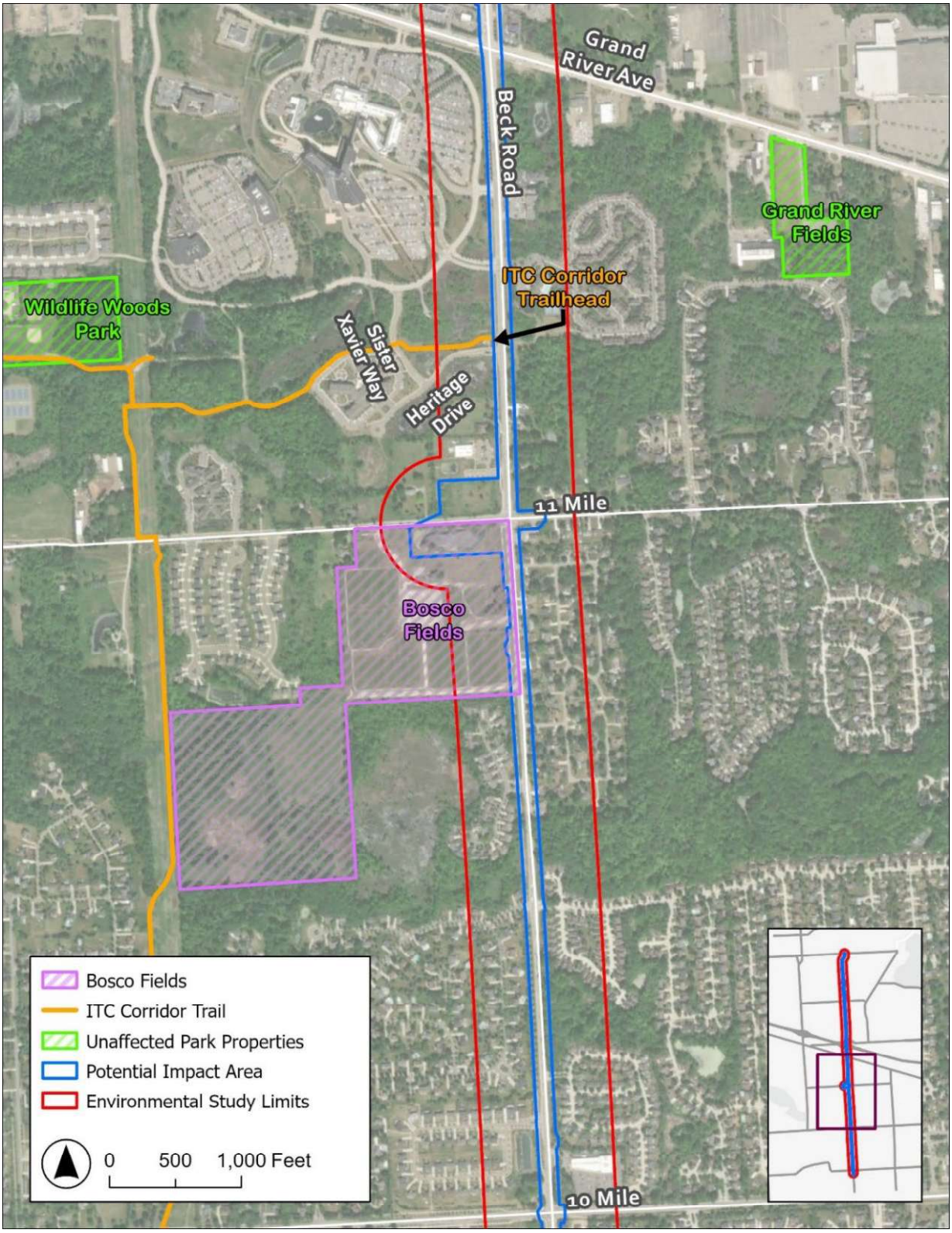

Figure 3-3: Adjacent 4(f) Public Use Properties

3.18 Historic Resources

Legal/Regulatory Context

This section describes specific steps taken to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 United States Code [USC] 300101 et seq.), which requires federal agencies to consider the effects of their activities and programs on historic properties, and its implementing regulations in 36 Code of Federal Regulations (CFR) Part 800. Although a separate federal law from NEPA, compliance with Section 106 is summarized within the appropriate NEPA document, which is the EA for this project.

Steps taken to document compliance of the Preferred Alternative with the requirements of Section 106 consist of the development of an Area of Potential Effects (APE), the identification of historic properties in the APE, and the assessment of the project's impact on cultural resources by qualified professionals. The APE is a geographic area in which a project may directly or indirectly cause changes in the character or use of historic properties or archaeological resources.

The cities of Novi and Wixom, in consultation with MDOT Cultural Resources Specialists, established the APE for aboveground and archaeological studies; the Project APE is defined later in this section under existing conditions. Historic properties are defined as architectural and archaeological resources that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Historic properties may include buildings, sites, districts, structures, or other objects. Under Section 106, potential adverse effects on historic properties are assessed under the criteria of adverse effect (36 CFR 800.5[a]).

In addition to Section 106, historic properties are protected under Section 4(f) of the USDOT Act of 1966 (Section 4[f]). See Section 3.17 for a discussion of Section 4(f). Section 4(f) protection of historic properties, called historic sites in the law, primarily relates to the permanent or temporary incorporation of land into a transportation facility. The Section 106 studies and determination of effect findings are important components in evaluating a Section 4(f) use of a historic site.

Additionally, the Archaeological Resources Protection Act (ARPA) of 1979 prohibits unauthorized excavation, removal, or damage to archaeological resources located on public and Indian lands. ARPA helps ensure that valuable cultural resources are preserved and protected for future generations. The Native American Graves Protection and Repatriation Act (NAGPRA) also plays a role in cultural resource protection by governing the repatriation of human remains and cultural items to lineal descendants and culturally affiliated tribes.

Existing Conditions

Archaeological Resources

The area in which a project would have the potential to impact eligible or potentially eligible archaeological sites constitutes the archaeological APE. The archaeological APE consists of the existing and proposed ROW where ground disturbing construction activities may occur, as well as all temporary easements for grading and access. For this project, it is synonymous with the Potential Impact Area, as shown in Figure 3-1. According to files held by the Michigan State Historic Preservation Office (SHPO), no previously recorded archaeological sites have been identified within 0.5 miles of the APE, nor are there any properties listed in the NRHP. The vast majority of the APE, both historically and in the modern era, has been subjected to significant ground disturbance and poses little potential to harbor archaeological resources. However, 23 areas were identified that were not clearly disturbed by past activities.

A Phase I archaeological survey of the APE was conducted in December of 2024. The survey consisted of ground surface reconnaissance and excavation of shovel test pits within the 23 areas that were not clearly disturbed by past activities. A total of 204 STPs were excavated, the majority of which exhibited disturbed profiles. Artifacts were located within two areas resulting in one new archaeological site (20OK561) and one isolated find. Site 20OK561 dates from 1872-1909 and represents a scatter of historic artifacts related to the Morse school house. As a result of past road construction and demolition of the former schoolhouse, only a low density of artifacts remain and they do not retain substantive archaeological integrity. The site is recommended as not eligible for inclusion under Criterion D in the NRHP as it lacks integrity and future information potential.

Tribal Coordination

MDOT sent early coordination letters to the seven federally listed sovereign nations with interest in Oakland County, Michigan on September 11, 2024, on behalf of the cities of Novi and Wixom. The letters sought comments regarding any possible environmental effects of the Project and any available information regarding potential cultural resources in the project area so they could be considered through this EA. The early coordination letters included a topographic quadrangle map, aerial map, and project area activity map showing the location of the project area. The letters sought comments regarding any possible environmental effects of the Project and any available information regarding cultural resources in the project area so they could be considered through this EA. An early coordination letter was sent to the following Tribal Nations:

- Forest County Potawatomi
- Lac Vieux Desert Band of Lake Superior Chippewa Indians
- Miami Tribe of Oklahoma
- Nottawaseppi Huron Band of the Potawatomi
- Pokagon Band of Potawatomi Indians
- Saginaw Chippewa Tribe of Michigan
- Shawnee Tribe

Responses were received from five Tribal Nations including the Miami Tribe of Oklahoma, the Shawnee Tribe, the Forest County Potawatomi Community, the Pokagon Band of Potawatomi Indians, and the Saginaw Chippewa Indian Tribe of Michigan. The Tribal Nations responded that if inadvertent finds are discovered during the course of the project, to contact them for further consultation. The Saginaw Chippewa Indian Tribe of Michigan requested that an inadvertent discovery plan be created for the project during construction. The Forest County Potawatomi Community and the Miami Tribe of Oklahoma requested to be a consulting party through Section 106.

Aboveground Historic Resources

The aboveground historic property APE is defined as the proposed limits of disturbance and a buffer along the Study Corridor, including properties adjacent to the Beck Road ROW, where improvements will be made to account for potential visual, auditory, or atmospheric impacts. For this project, it is synonymous with the Environmental Study Limits, as shown in Figure 3-1.

An aboveground historic resources survey conducted of the APE identified 26 potential historic properties for NRHP evaluation that were more than 40 years old in the survey area. Of the 26 properties, two structures located at 23893 Beck Road and one structure at 29250 Beck Road

were further evaluated for potential NRHP eligibility. The NRHP evaluation concluded that none of the resources are eligible for NRHP listing and are not considered historic properties (Table 3-11). A summary of the aboveground historic resources survey is provided in Appendix N.

Table 3-11: Summary of Aboveground Historic Properties in the APE

Address	Architectural Style	Built Date	NRHP Evaluation
23893 Beck Rd Novi MI, 48374	Gothic Revival	1875	Not Eligible
23893 Beck Rd Novi MI, 48374	Ranch	1951	Not Eligible
29250 Beck Rd Wixom MI, 48393	Greek Revival	1857-1872	Not Eligible

Impacts

No-Build Alternative

The No-Build Alternative would not result in any alteration to aboveground historic resources, their settings, or archaeological resources. This alternative would result in no impact on historic properties.

Preferred Alternative

No NRHP-eligible archaeological or aboveground historic properties were identified in the respective survey areas; therefore, the Preferred Alternative would not impact historic properties. Further, the Preferred Alternative will not impact historic sites protected under Section 4(f).

Determination of Effect

MDOT Cultural Resources Specialists that meet the professional qualifications defined in the Secretary of the Interior's Professional Qualifications Standards in the fields of archaeology and architectural history made a Determination of Effect that no historic properties will be affected. MDOT requested written concurrence from the SHPO on February 25, 2025. The results are provided in Appendix O.

Mitigation

No mitigation for impacts to historic properties is required. However, to address concerns received from the Saginaw Chippewa Indian Tribe of Michigan, a project-specific inadvertent discovery plan will be created to establish a protocol to follow should unanticipated archaeological resources be encountered during construction.

3.19 Contaminated Sites

Due to the significant amount of information regarding potentially contaminated sites within the ESL, a Contaminated Properties Technical Memorandum was prepared for the Project. This memorandum provides a comprehensive review of the site and the potentially contaminated properties that could negatively impact the Project. For the complete technical memorandum, please refer to Appendix K.

Legal/Regulatory Context

Federal Law

At the federal level, regulations governing hazardous materials and contaminated sites aim to protect both human health and the environment. Key legislation includes the Resource Conservation and Recovery Act (RCRA), which provides the framework for managing hazardous and non-hazardous solid waste, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, which enables EPA to respond to hazardous substance releases and establish liability for responsible parties. The Toxic Substances Control Act (TSCA) gives EPA authority to regulate chemicals that pose risks to health or the environment, while the Occupational Safety and Health Act (OSHA), administered by the Occupational Safety and Health Administration, ensures workers are protected from hazardous materials exposure. Together, these federal laws create a comprehensive system for managing hazardous substances, contaminated sites, and workplace safety.

State Law

In Michigan, state-level regulations complement federal efforts to address contamination. Part 201 of NREPA, 1994 PA 451, as amended, governs the identification, investigation, and remediation of contaminated sites through a risk-based approach to cleanup, ensuring public health, safety, and environmental protection. Administered by EGLE, Part 201 works alongside Parts 211 and 213 of NREPA, which regulate underground storage tanks (UST) and leaking underground storage tanks (LUST). These provisions require UST owners and operators to prevent, detect, and respond to leaks of petroleum and other hazardous substances. Part 213 specifically outlines cleanup procedures to meet state environmental standards. Through these regulations, Michigan safeguards its land and water resources while holding responsible parties accountable for environmental cleanups.

Existing Conditions

According to EGLE's RIDE Mapper and EPA's NEPAssist Tool, 42 sites within the ESL warranted further investigation. Of these, 34 parcels encroached on the Potential Impact Area, prompting an assessment of contamination risks during construction. Only five of the 34 sites were found to have more than a low potential for contamination.

Impacts

No-Build Alternative

Under the No-Build Alternative, existing contaminated properties would remain unchanged. Additionally, new contaminated properties could potentially emerge within the ESL.

Preferred Alternative

The Preferred Alternative could be affected by the potential contaminated properties listed in Table 3-12. These are not all the potentially contaminated sites within the Potential Impact Area, but only those with documented soil or groundwater contamination and anticipated ROW needed for the Preferred Alternative.

Table 3-12: Potential Impacts of Known and Potentially Contaminated Sites to the Preferred Alternative

Site Name & Address	Impacts to the Preferred Alternative
NLB Corp/Nick's Auto Repair Inc. 29830 Beck Road	-Permanent ROW will be necessary from the parcel. -Grading, excavation up to 6 feet below ground surface, and storm sewer installation are anticipated on and adjacent to the parcel.
Nordson Corp./Adept Plastic Finishing Inc. 28775 Beck Road	- Permanent ROW will be necessary from the parcel. -Grading, excavation up to 6 feet below ground surface, and storm sewer installation are anticipated adjacent to the parcel.
American Sunroof Corp 30369 Beck Road	-Permanent ROW will be necessary from the parcel. -Grading, excavation up to 6 feet below ground surface, and storm sewer installation are anticipated on and adjacent to the parcel.
Ward's Super Service (vacant) 47277 Grand River Ave & 26900 Beck Road	-No ROW anticipated -Grading, excavation up to 1 foot below ground surface for sidewalk is possible adjacent to parcel.
Speedway LLC #2367 47395 W Pontiac Trail	-No ROW anticipated. -Grading, excavation up to 6 feet below ground surface, and storm sewer installation are possible adjacent to the parcel.

Mitigation

While it is not anticipated that the Preferred Alternative will encounter dangerous levels of contamination, the proximity of several known and potentially contaminated sites within the Project's Potential Impact Area necessitates the implementation of mitigation measures to protect workers. Soil and groundwater will be tested during preliminary engineering in locations where construction activities may encounter contaminated materials or where ROW is required from identified properties. If contamination is discovered, coordination with EGLE or EPA may be necessary. A plan to safely manage, contain, or remove contaminated materials will be formulated. This may involve excavation, treatment of contaminated soils, or implementing containment measures. Contaminated soil or materials may need to be transported to a licensed hazardous waste disposal facility or treated on-site, depending on regulatory requirements*. MDOT's Special Provision for Non-Hazardous Contaminated Material Handling and Disposal* will be included in the Project proposal. Estimated excavation quantities subject to this special provision will be determined during final design. A full list of recommendations for consideration during final design is provided in the Contaminated Properties Technical Memorandum, provided in Appendix K.

3.20 Indirect and Cumulative Impacts

The previous sections primarily considered direct impacts that would result from construction of the Preferred Alternative. This section discusses the Preferred Alternative's potential indirect effects and cumulative impacts, which are impacts not directly related to construction. Indirect effects are impacts on the environment from the proposed project; however, the effects occur at a later time or in an area that is farther removed in distance from the project. Indirect effects must be "reasonably foreseeable," or highly likely to occur because of the project. Cumulative impacts are effects on the community or natural environment that occur from adding the impacts of one project along with other past, present and "reasonably foreseeable" future projects. When

added together, minor impacts from several different and somewhat small projects could result in a greater impact on the community and natural environment.

Indirect Effects

The Beck Road corridor is substantially developed in the existing condition within the ESL. Remaining green space is predominantly under conservation easement, wetland, or zoned Commercial. Land use, development, and transportation patterns will likely continue in a similar manner with both the Build and No-Build scenarios. While the Preferred Alternative reduces traffic congestion, improves traffic flow, and enhances safety for all users, the roadway improvements should not contribute to any additional development or additional environmental impacts beyond the direct Project impacts.

Cumulative Impacts

The Beck Road corridor has experienced significant development over the past recent decades. Aerial imagery from the 1970s reflects the surrounding area as predominantly green space, being a mix of natural settings and agricultural lands. Beginning in the 1980s, residential and commercial development began, continuing through each subsequent decade up to the current state. When combined with that past development, the impacts resulting from the Preferred Alternative may further degrade the surrounding natural resources if appropriate mitigation is not implemented. However, implementation of the Preferred Alternative is not expected to directly spur any additional development that would negatively affect the surrounding natural resources.

The cumulative effects of past development, combined with the population growth of the area, has resulted in a congested roadway with insufficient capacity. Looking at the future, the reduced congestion, improved capacity, and connectivity provided by the Preferred Alternative, combined with the previously widened sections of Beck Road through the I-96 interchange, along with other factors, could have the cumulative effect of improving the quality of life and livability within the ESL.

3.21 Construction Permits

Several permits will be required from regulatory agencies before construction activities begin including:

- Michigan Department of Environmental, Great Lakes, and Energy
  - Part 303 Wetland Permit
  - Part 301 Inland Lakes and Streams Permit
  - NPDES Notice of Coverage (NOC)
- Oakland County Water Resources Commissioner
  - Soil Erosion and Sedimentation Control Permit
- Michigan Department of Transportation
  - Right-of-Way Permit

The cities of Novi and Wixom will obtain these permits prior to construction. Where appropriate, permit conditions will be included in the appropriate construction specifications to ensure they are followed during construction of the Preferred Alternative.

3.22 Effects and Mitigation Summary

A summary of the mitigation measures that are needed for the Preferred Alternative can be found in Table 3-13. Additionally, a “Green Sheet” is provided in Appendix A to provide greater detail of mitigation commitments that must be implemented and followed as the Project moves into final design and subsequent construction. The “Green Sheet” serves as a concise reference for project stakeholders by outlining key mitigation measures and commitments necessary to minimize environmental and community impacts during construction. An updated “Green Sheet” will be included in the FONSI, with mitigation commitments tracked and potentially modified throughout the design, ROW acquisition, construction, and maintenance phases of the Preferred Alternative.

Table 3-13: Project Mitigation Summary Table

Resource Category	Preferred Alternative Effects	Preferred Alternative Mitigation
Topography & Soils	No impacts.	None required.
Land Use	Benefit: Completing the sidewalk/non-motorized path connectivity along both sides of the road, benefiting abutting land uses such as commercial and residential areas. Integrates a capacity increase for an essential arterial corridor spanning industrial, commercial, and residential land uses, addressing congestion in the corridor.	None required.
Farmland & Agriculture	No impacts.	None required.
Population & Demographics	No impacts.	None required.

Resource Category	Preferred Alternative Effects	Preferred Alternative Mitigation
Community	Impact: Temporary community disruption during construction; potential temporary and permanent ROW acquisitions. Benefit: Improved pedestrian accessibility encouraging walking and cycling and providing additional mobility options. Landscaped medians enhance aesthetic appeal of the streetscape and fosters a sense of community. Project will improve traffic flow and reduce congestion, making it safer, especially in the presence of heavy trucks. Also relieves congestion, which is crucial for emergency services.	Coordinate with local service providers to limit traffic disruption; proper signage; require construction equipment to have mufflers; require portable compressors that meet noise-level standards; and require adequate dust control measures. Traffic signage and media notices will alert the public of major construction activities and traffic disruptions.
Economic	Impact: Temporary construction impacts to local businesses' visibility and accessibility.	Preserve business access.
Transportation Infrastructure	Impact: Temporary disruption to parking lots, driveways, and sidewalks during construction. Benefit: Providing connectivity of non-motorized infrastructure and greater access to users including ADA sidewalk upgrades.	Preserve business and residence access; develop traffic management plan; and provide mode-specific detours in accordance with MDOT's Work Zone Safety and Mobility Manual and ADA guidelines.
ROW & Relocation	Impact: Acquisition of ~14.56 acres of permanent ROW from 78 parcels; consents to grade may be needed.	The cities will provide just compensation for property needed for transportation purposes, paying fair market value for acquired property rights.
Utilities	Impact: Likely relocation, protection, and adjustment to above and belowground utilities.	Maintain utility services & minimize disruptions for residents and businesses.
Air Quality	No impacts.	None required.

Resource Category	Preferred Alternative Effects	Preferred Alternative Mitigation
Noise Analysis	Impact: Temporary noise during construction. Also, although 55 receptors will be impacted, they do not meet MDOT's criteria for feasibleness and reasonableness.	None. Noise mitigation was determined not to meet MDOT criteria for feasibleness and reasonableness. However, best practices may be incorporated into the construction contract.
Wetlands	Impact: Up to 2.681 acres of regulated wetlands & 0.995 acres of non-regulated or exempt wetland.	~4.488 acres of wetland mitigation credits will be acquired from the Michigan Wetland Board for Local Transportation Agencies and avoid wetland conservation easements.
Water Resources	Impact: Three streams will be impacted. Water quality impacts are not anticipated due to implementation of stormwater BMPs.	Impacts to streams will require a Part 301 permit which will include additional mitigation measures to protect the streams; post-construction BMPs will be provided to the maximum extent practicable to treat stormwater runoff for both water quality and channel protection; effective SESC measures will be implemented during construction.
Threatened & Endangered Species	Impact: Determination of "May Affect, but Not Likely to Adversely Affect" northern long-eared bat, Indiana bat, and monarch butterfly and "No Effect" to eastern massasauga rattlesnake and tricolored bat. No take of redside dace.	Tree cutting must occur between October 1 and April 14; wildlife-friendly erosion controls will be implemented to protect reptiles and amphibian species; in-water work will be restricted between May 1 and June 30. If any T&E species are observed, work will cease immediately, & the proper contacts will be notified.
Vegetation & Wildlife	Impact: Invasive species may be encountered during construction. No significant impacts to migratory birds.	A special provision will be included in the design package to treat and limit the spread of invasive species during construction activities; vegetation will be established to discourage invasive species establishment; the contractor will manage soil stockpiles to discourage cliff-nesting birds; and tree cutting will occur between October 1 and March 31 to protect migratory bird nesting seasons.

Resource Category	Preferred Alternative Effects	Preferred Alternative Mitigation
Recreational Properties/ Section 4(f)	Impact: *De minimis* impact of 0.99 acres of passive use property at Bosco Fields.	Preserve Park and Trail access during construction. Landscaping will be considered along the Bosco Fields eastern edge.
Historic Resources	No impacts.	An inadvertent discovery plan will be developed to define the protocol for addressing unanticipated archaeological resources should they be discovered during construction.
Contaminated Sites	Impact: Five known or potentially contaminated sites were identified that pose medium risk to the Project within the ESL.	Soil and groundwater testing will be performed adjacent to the potentially contaminated sites that may be disturbed during construction. *MDOT's Special Provision for Non-Hazardous Contaminated Material Handling and Disposal* will be included in the Project, with estimated excavation quantities.
Indirect & Cumulative Impacts	No impacts.	None required.

4. Public Involvement, Agency Coordination, and Consultation

This section summarizes the public involvement, coordination with other agencies, and official consultation led by MDOT and overseen by FHWA that has occurred as a part of this EA and how it influenced the Project.

4.1 Stakeholder Coordination

The Beck Road Widening Task Force (BRWTF) was formed in 2017. Originally a brainchild of the Wixom Mayor and City Council, it has since expanded to include representatives of multiple agencies, business leaders, and technical experts with an interest in the Beck Road corridor. The group is committed to seeing a longstanding goal of the community come to fruition by gathering information, exploring possible funding sources, and to see the Project become a reality. In essence, the BRWTF is the visionary behind the Project. The group played a key part in securing funding for the first phase of widening and continues to push for additional funding for future phases.

4.2 Public Involvement

The BRWTF maintains a public website (www.becktothefuture.org/) to support public involvement and provide Project information to interested citizens. The website includes survey opportunities for individuals to provide comments that the BRWTF will consider as the Project develops. The website will be available throughout the NEPA process to provide updates and collect public feedback. The cities of Novi and Wixom will continue to engage the public beyond the EA and into the final design and construction phases of the Project.

In addition to the project website, three public meetings were held to engage the public on May 26, 2021, February 1, 2022, and May 3, 2023. The initial public meeting was hosted virtually on Zoom on May 26, 2021. About 25 participants had the opportunity to learn about the project context and description, Purpose and Need, and potential solutions. Participants shared concerns about potential impacts on adjacent properties, safety issues, and road design and traffic operations, such as too many access points, inconsistent turn lanes, and signals.

An online survey was open from May 25 to June 16, 2021, collecting 302 responses from the public. According to the responses, most survey participants lived in adjacent communities and traveled on Beck Road to access nearby facilities. The main concerns were traffic volume, noise, poor pavement conditions, and difficulties navigating to destinations while accommodating other modes of transportation such as rail, freight, pedestrians, and bicyclists. Participants expressed a desire to see these issues addressed in the improvements to Beck Road.

The second public meeting was held in person at the Novi Police Training Center on February 1, 2022. A total of 77 people attended, including 66 residents, two business representatives, County Commissioner Gwen Markham, former Mayor of Wixom Kevin Hinkley, an Echo Valley Civic Association representative, and council members from the cities of Wixom and Novi. Attendees viewed exhibits displaying a preliminary five-lane cross section and a four-lane

boulevard cross section of Beck Road and adjacent parcel boundaries. Information about the project description, location, and schedule was posted on boards in the meeting room, along with a link and QR code to the online public survey.

The online survey was open from January 29 to April 29, 2022, and collected 391 responses. According to the responses, most respondents regularly drive along Beck Road and live in Novi. For all preference questions, respondents who liked or disliked an element of the project tended to do so strongly. Respondents were nearly evenly split on the overall proposed improvements for Beck Road, with slightly more respondents liking them than disliking them. The most liked project elements were the proposed walking and biking paths and the bridge over the railroad tracks. The most disliked elements were the five-lane concept and the proposed roundabouts.

On May 3, 2023, a third public meeting was held at the Novi Firearms Training Center. Approximately 50 people, most of whom are local residents, attended the meeting. Exhibits depicting the four-lane boulevard alternative and the five-lane cross section alternative were displayed for attendees and project team members were present to answer questions. A slide deck included updated project limits from Pontiac Trail to south of 9 Mile Road, renderings and cross-section drawings with specific design elements of five-lanes, medians, and roundabouts, as well as a bridge over the railroad tracks and walking and biking paths. The meeting also presented results of the public survey, traffic analysis, noise study, project schedule, and funding opportunities. An online comment form, publicized during the meeting, collected five responses which expressed concerns about quality of life, potentially increased traffic and noise, and a preference for the boulevard and median design.

4.3 Agency Coordination and Consultation

Input on the Project was solicited from several federal, state, and local agencies to gather feedback and approvals for different aspects of the Project via a letter and project update that was sent out on August 1, 2024, to the agencies listed in Table 4-1. Responses were received from two agencies, provided in Appendix L, with a summary of responses provided below.

- U.S. Environmental Protection Agency:
  - EPA will not provide comments due to staffing constraints.
- Road Commission for Oakland County:
  - RCOC does not have any documented institutional controls in the project area.
  - RCOC owns the portion of Beck Road that crosses I-96 between Grand River Avenue and 12 Mile Road.

Table 4-1: Solicited Agencies for Coordination

Federal Agencies	State & Local Agencies
U.S. Department of the Interior – Regions 3 (Great Lakes) & 4 (Mississippi Basin)	Michigan Department of Agriculture and Rural Development
U.S. Department of the Interior, National Park Service – Regions 3, 4, 5	Michigan Department of Civil Rights
U.S. Department of Interior, Fish and Wildlife Service	Michigan Department of Health and Human Services
U.S. Coast Guard. Ninth District	Michigan Department of Natural Resources
U.S. Environmental Protection Agency – Region 5	Michigan Department of Transportation
U.S. Army Corps of Engineers – Detroit District	Michigan Department of Environment, Great Lakes, and Energy, Water Resources Division – Transportation
U.S. Department of Agriculture – Farm Service Agency	Michigan State Historic Preservation Office (SHPO)
U.S. Department of Agriculture – Natural Resources Conservation Service	Michigan State Housing Development Authority
U.S. Department of Housing & Urban Development	Road Commission for Oakland County
Federal Emergency Management Agency	City of Novi - Parks, Recreation and Cultural Services
Federal Aviation Administration	City of Wixom - Community Services/Parks & Recreation
Federal Transit Administration – Region V Office	Southeast Michigan Council of Governments (SEMCOG)
Federal Highway Administration – Michigan Division	-
Advisory Council on Historic Preservation	-

Additional coordination occurred with certain agencies to address specific topics. AECOM submitted a Voluntary Transportation Preliminary Review Request to EGLE on September 15, 2023, to solicit input from EGLE regarding the natural resources in the vicinity of the Project and understand the regulatory requirements. A field meeting was subsequently held to field-verify the presence of wetlands and stream identified during a prior wetland delineation. The results of

the field meeting are discussed further in Section 3, with EGLE's subsequent response provided in Appendix L. AECOM also submitted a service request to EGLE to obtain a listing of T&E species that may be present in the vicinity of the project on March 22, 2021. A response was received on April 7, 2021, with an update provided on May 22, 2023. The results of this correspondence are discussed in Section 3, with the correspondence provided in Appendix L.

AECOM requested a rare species review of the Project vicinity from the MNFI on September 6, 2023. A response was received on September 29, 2023, provided in Appendix L, and discussed in Section 3.15 of this EA.

AECOM has submitted multiple requests to USFWS for a list of federally T&E species that may occur near, or be affected by, the Project. The results of the most recent request were provided in a letter on November 14, 2024. A consistency letter was provided the same day outlining the effects determination based on answers submitted through the Michigan Determination Key. Due to a preliminary "may affect" determination to a threatened species, email correspondence with USFWS personnel occurred to satisfy the Section 7 consultation requirements. Further discussion of the Section 7 consultation is provided in Section 3 of this EA, with all correspondence provided in Appendix L.

On behalf of the FHWA, MDOT coordinated with seven federally listed sovereign Nations with interest in Oakland County, Michigan as discussed in Section 3.18. Of these, five Tribal Nations requested further consultation if inadvertent finds are discovered during construction. MDOT made a Determination of Effect that no historic properties will be affected. Written concurrence was received from the SHPO to fulfill Section 106 consultation requirements. See Appendix O for further information on this topic.

4.4 Next Steps

This EA will be available for public review for a 30-day period once it is finalized. A public hearing will take place in the middle of the 30-day comment period to allow an additional opportunity for the public to ask questions and provide feedback. If public review and comment support a determination of no significant impact, this EA will be provided to MDOT and FHWA with a recommendation that a FONSI be issued. If FHWA signs the FONSI, the Project will move into the development phase to begin final design, real estate acquisition, utility relocation, and ultimately construction.

5. List of Sources

Alliance of Rouge Communities. (2012, July). *Rouge River watershed management plan*. Retrieved from https://www.allianceofrougecommunities.com/login.html

Avian Knowledge Network. (2025). *Rapid Avian Information Locator (RAIL)*. Retrieved from https://data.pointblue.org/apps/rail/

City of Novi. (2024). *Bosco Fields*. Retrieved from https://www.cityofnovi.org/parks/parks-and-recreation-facilities/parks-list/bosco-fields/

City of Novi. (2016). *City of Novi 2016 Master Plan Update*. Retrieved from https://cityofnovi.org/media/timbabna/2016masterplanupdatedraft.pdf

City of Novi. (2023). *Active Mobility Plan*. Retrieved from https://cityofnovi.org/media/ciihpuqp/230207executivesummary.pdf

City of Novi. (2016). *City of Novi Thoroughfare Master Plan*. Retrieved from https://cityofnovi.org/media/fiylp3f0/tmpdraft1606.pdf

City of Novi. (2024). *ITC Corridor Trail*. Retrieved from https://www.cityofnovi.org/parks/parks-and-recreation-facilities/parks-list/itc-corridor-trail/

City of Novi. (2024). *Map gallery*. Retrieved from https://cityofnovi.org/community/map-gallery/

City of Novi. (2024). *Rouge River Watershed Goal Poster*. Retrieved from https://www.cityofnovi.org/media/im1lds0p/rougeposter.pdf

City of Novi Community Development Department. (2023). Conservation easements throughout the City of Novi [Feature layer]. City of Novi. Retrieved from https://www.arcgis.com/home/item.html?id=e38434408ab54631888a3cc89effb83b

City of Wixom. (2020). City of Wixom Master Plan. Retrieved from https://www.wixomgov.org/home/showpublisheddocument/9406/637557180556200000

Crash Data - *Traffic Crash Analysis Tool 2.0*. (n.d.). Transportation Improvement Association.

Crash Rates - Crash Analysis Process, SEMCOG, Appendix A, Table 1.4. (2016, January).

EGLE Admin. (2023). *EGLE conservation easements dataset* [Feature layer]. Michigan Department of Environment, Great Lakes, and Energy. Retrieved from https://gis-michigan.opendata.arcgis.com/datasets/egle::egle-conservation-easements/explore?location=42.483475%2C-83.512705%2C15.14

Federal Emergency Management Agency. (2024, March 28). *Flood data viewers and geospatial data*. Retrieved from https://www.fema.gov/flood-maps/national-flood-hazard-layer

Federal Geographic Data Committee. (2013). *Classification of wetlands and deepwater habitats of the United States* (FGDC–STD-004-2013, 2nd ed.). Wetlands Subcommittee. Adapted from Cowardin, Carter, Golet, and LaRoe (1979). Retrieved from https://www.fws.gov/media/classification-wetlands-and-deepwater-habitats-united-states

Michigan Department of Environment, Great Lakes, and Energy. (n.d.). *RIDE Mapper*. Retrieved from https://www.michigan.gov/egle/maps-data/ride-mapper

Michigan Department of Environment, Great Lakes, and Energy. (n.d.). *Total Maximum Daily Loads (TMDLs)*. Retrieved from https://www.michigan.gov/egle/about/organization/water-resources/tmdls

Michigan Department of Transportation. (2011). Highway Noise Analysis and Abatement Handbook. Retrieved from: https://www.michigan.gov/documents/mdot/MDOT_HighwayNoiseAnalysis_and_AbatementHandbook_358156_7.pdf

Michigan Department of Transportation. (2024). *MDOT Environmental Services Section PC-BMP Screening Tool* [GIS tool]. Retrieved from https://mdot.maps.arcgis.com/apps/webappviewer/index.html?id=7cbbc8af64a64f2ab25c0ce93c3c3715

Michigan Natural Features Inventory. (2024). *Vegetation circa 1800*. Retrieved from https://mnfi.anr.msu.edu/resources/vegetation-circa-1800

Office of the Federal Register. (2016, August 15). *Executive Order 11990—Protection of wetlands*. Retrieved from https://www.archives.gov/federal-register/codification/executive-order/11990.html

SEMCOG. (2022). *Pavement Condition. SEMCOG Open Data Portal*. Retrieved from https://data.semcog.org/

SEMCOG. (2023). *Regional Forecast*. Retrieved from https://semcog.org/regional-forecast

SEMCOG. (2022). *Roads. SEMCOG Open Data Portal*. Retrieved from https://data.semcog.org/

SEMCOG. (2022). *Road Jurisdiction*. Retrieved from https://maps.semcog.org/roadjurisdiction/

SEMCOG. (2022). *Sidewalks and Crosswalks. SEMCOG Open Data Portal*. Retrieved from https://data.semcog.org/

Transportation Research Board. (2016). *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis*. National Academies Press

U.S. Census Bureau. (2022). *ACS 5-Year Estimates 2017-2022 Table DP03 and Table S1501*.

U.S. Census Bureau. (2022). *Table S1810: Disability Characteristics* (American Community Survey 5-Year Estimates).

U.S. Census Bureau. (2023). *Table DP04: Selected Housing Characteristics and Table B25044: Tenure by Vehicles Available* (American Community Survey 5-Year Estimates).

U.S. Department of Agriculture. (2025). *Hydric soils rating by map unit. Soil Data Access*. Retrieved from https://www.nrcs.usda.gov/publications/Hydric%20Soils%20Rating%20by%20Map%20Unit%205%20class.html

U.S. Department of Agriculture Natural Resources Conservation Service. (2019, July 31). *Web Soil Survey Home*. Retrieved from https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm?TARGET_APP=Web_Soil_Survey_application_aw2d3xryo1zrfzmnjsvbe2s5

U.S. Department of Transportation Federal Highway Administration. (n.d.). *Environmental review toolkit: Section 4(f) tutorial*. Retrieved from https://www.environment.fhwa.dot.gov/env_topics/4f_tutorial/default.aspx

U.S. Environmental Protection Agency. (2024, October 11). *NEPAssist*. Retrieved from https://www.epa.gov/nepa/nepassist

U.S. Fish & Wildlife Service. (2025). *Avoidance and minimization measures: Transportation*. Retrieved from https://www.fws.gov/story/avoidance-and-minimization-measures-transportation

U.S. Fish & Wildlife Service. (2025). *Avoiding and minimizing incidental take of migratory birds*. Retrieved from https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

U.S. Fish & Wildlife Service. (2024). *IPaC Information for Planning and Consulting*. Retrieved from https://ipac.ecosphere.fws.gov/

U.S. Fish & Wildlife Service. (n.d.). *Migratory Bird Treaty Act of 1918*. Retrieved from https://www.fws.gov/law/migratory-bird-treaty-act-1918#:~:text=The%20Migratory%20Bird%20Treaty%20Act%20(MBTA)%20prohibits%20the%20take%20(,U.S.%20Fish%20and%20Wildlife%20Service.

U.S. Fish & Wildlife Service. (2024). *National Wetlands Inventory*. Retrieved from https://www.fws.gov/program/national-wetlands-inventory

U.S. Geological Survey. (1969). *Milford, Michigan 7.5' x 7.5' topographic map*. National Geospatial Program. Retrieved from https://www.usgs.gov/programs/national-geospatial-program/historical-topographic-maps-preserving-past

U.S. Geological Survey. (1969). *Northville, Michigan 7.5' x 7.5' topographic map*. National Geospatial Program. Retrieved from https://www.usgs.gov/programs/national-geospatial-program/historical-topographic-maps-preserving-past

U.S. Geological Survey. (1980). *Salem, Michigan 7.5' x 7.5' topographic map* (originally published 1969, updated 1980). National Geospatial Program. Retrieved from https://www.usgs.gov/programs/national-geospatial-program/historical-topographic-maps-preserving-past

U.S. Geological Survey. (2024). Topographic Maps by National Geospatial Program. Retrieved from https://www.usgs.gov/programs/national-geospatial-program/topographic-maps

U.S. Geological Survey. (1969). *Walled Lake, Michigan 7.5' x 7.5' topographic map*. National Geospatial Program. Retrieved from https://www.usgs.gov/programs/national-geospatial-program/historical-topographic-maps-preserving-past

Western Michigan University Michigan Geological Survey. (n.d.). *Physiographic map of Michigan* [Feature layer]. https://www.esrs.wmich.edu/mgs/physiographicMap/