CONTENTS

3. Existing Conditions, Impacts and Mitigation 3-1

3.1. Land Use and Land Use Planning 3-1
3.1.1. Affected Environment 3-1
3.1.2. Existing Land Use 3-4
3.1.3. Land Use Planning 3-7
3.1.4. Land Use Impacts 3-15
3.1.5. Measures to Minimize and Mitigate Adverse Land Use Impacts 3-17
3.2. Transportation Service 3-18
3.2.1. Affected Environment 3-18
3.2.2. Transportation Impacts 3-27
3.2.3. Measures to Minimize and Mitigate Adverse Transportation Impacts 3-38
3.3. Residential Development 3-39
3.3.1. Affected Environment 3-39
3.3.2. Residential Development Impacts 3-40
3.3.3. Measures to Minimize and Mitigate Adverse Residential Impacts 3-43
3.4. Commercial and Industrial Development 3-44
3.4.1. Affected Environment 3-44
3.4.2. Commercial and Industrial Property Impacts 3-46
3.4.3. Commercial and Industrial Access Changes 3-48
3.4.4. Measures to Minimize and Mitigate Adverse Commercial and Industrial Impacts. 3-50
3.5. Institutional and Public Services 3-51
3.5.1. Affected Environment 3-51
3.5.2. Institutional and Public Service Impacts 3-53
3.5.3. Measures to Minimize and Mitigate Adverse Institutional and Public Services Impacts 3-53
3.6. Agricultural Resources 3-54
3.6.1. Affected Environment 3-54
3.6.2. Agricultural Resource Impacts 3-57
3.6.3. Measures to Minimize and Mitigate Adverse Agricultural Impacts 3-61
3.7. Utilities 3-62
3.7.1. Affected Environment 3-62
3.7.2. Utility Impacts 3-63
3.7.3. Measures to Minimize and Mitigate Adverse Utility Impacts 3-64
3.8. Socioeconomic Characteristics 3-64
3.8.1. Affected Environment 3-64
3.8.2. Socioeconomic Impacts 3-81

3.8.3. Measures to Minimize and Mitigate Adverse Impacts to Socioeconomic Characteristics 3-86
3.9. Environmental Justice 3-86
3.9.1. Identification of Existing Minority and Low-Income Populations 3-88
3.9.2. Coordination with and Participation of Minority Populations and Low-income Populations 3-90
3.9.3. Identification of Disproportionately High and Adverse Effects on Minority Populations and Low-Income Populations 3-90
3.9.4. Conclusion 3-127
3.10. Visual Character 3-127
3.10.1. Affected Environment 3-127
3.10.2. Visual Character/Aesthetic Impacts 3-133
3.10.3. Mirror Lake Visual Impact Analysis 3-137
3.10.4. Measures to Minimize and Mitigate Adverse Aesthetic Impacts 3-138
3.11. Surface Water 3-139
3.11.1. Affected Environment 3-139
3.11.2. Surface Water Impacts 3-143
3.11.3. Measures to Minimize and Mitigate Adverse Surface Water Impacts 3-147
3.12. Wetlands 3-150
3.12.1. Affected Environment 3-150
3.12.2. Wetland Impacts 3-154
3.12.3. Measures to Mitigate Wetland Impacts 3-157
3.13. Floodplains 3-158
3.13.1. Affected Environment 3-158
3.13.2. Flood Minimization Study 3-161
3.13.3. Floodplain Impacts 3-166
3.13.4. Measures to Minimize and Mitigate Adverse Floodplain Impacts 3-167
3.13.5. Evaluation 3-168
3.14. Groundwater and Water Supply 3-171
3.14.1. Affected Environment 3-171
3.14.2. Groundwater and Water Supply Impacts 3-171
3.14.3. Measures to Minimize and Mitigate Adverse Groundwater Impacts 3-172
3.15. Threatened and Endangered Species 3-172
3.15.1. Affected Environment 3-172
3.15.2. Threatened and Endangered Species Impacts 3-177
3.15.3. Measures to Minimize and Mitigate Adverse Threatened and Endangered Species Impacts 3-178
3.16. Other Natural Resources 3-182
3.16.1. Affected Environment 3-182
3.16.2. Other Natural Resource Impacts 3-185

3.16.3. Measures to Minimize and Mitigate Adverse Natural Resource Impacts 3-187
3.17. Noise 3-188
3.17.1. Affected Environment 3-188
3.17.2. Noise Level Measurements 3-190
3.17.3. Comparison of Field Data vs Modeled Noise Levels 3-191
3.17.4. Noise Impacts 3-192
3.17.5. Measures to Minimize and Mitigate Adverse Noise Impacts 3-196
3.17.6. Summary of Noise Impact Mitigation 3-199
3.18. Air Quality 3-206
3.18.1. Affected Environment 3-206
3.18.2. Mobile Source Air Toxics (MSAT) 3-207
3.18.3. Greenhouse Gases 3-207
3.18.4. Air Quality Impacts 3-208
3.18.5. Measures to Mitigate Air Quality Impacts 3-213
3.19. Hazardous Materials 3-215
3.19.1. Affected Environment 3-215
3.19.2. Hazardous Materials Impacts 3-216
3.19.3. Measures to Minimize and Mitigate Adverse Hazardous Material Impacts 3-216
3.20. Historic Properties 3-216
3.20.1. Affected Environment 3-217
3.20.2. Impacts to Historic Properties 3-217
3.20.3. Section 106 Consultation 3-219
3.21. Archaeological Resources 3-219
3.21.1. Affected Environment 3-219
3.21.2. Impacts to Archaeological Resources 3-220
3.21.3. Section 106 Consultation 3-220
3.22. Cemeteries and Burial Sites 3-220
3.22.1. Affected Environment 3-220
3.22.2. Impacts to Cemeteries and Burial Sites 3-221
3.22.3. Measures to Minimize and Mitigate Adverse Cemetery and Burial Site Impacts 3-222
3.23. Recreational Properties 3-222
3.23.1. Affected Environment 3-222
3.23.2. Impacts to Private Recreational Properties 3-223
3.23.3. Mitigation of Impacts to Private Recreational Resources 3-224
3.24. Construction 3-225
3.24.1. Construction Costs 3-225
3.24.2. Operation and Maintenance Cost 3-226
3.24.3. Construction Employment 3-227
3.24.4. Construction Impacts and Mitigation 3-227

3.25. Indirect Impacts 3-234
3.25.1. Step 1: Scoping, Selecting Activities and Determining Study Area 3-235
3.25.2. Step 2: Inventory the Study Area and Notable Features 3-239
3.25.3. Step 3: Identify Impact Causing Activities of the Proposed Project Alternative 3-241
3.25.4. Step 4 and 5: Analyze the Indirect Effects, and Evaluate Assumptions and Identify Potentially Significant Indirect Effects 3-242
3.25.5. Step 6: Assess Consequences and Identify Mitigation Activities 3-248
3.26. Cumulative Impacts 3-250
3.26.1. Scoping Cumulative Impacts 3-251
3.26.2. Identify Past, Present and Reasonably Foreseeable Future Actions – Step 4 3-255
3.26.3. Describe the Affected Environment and Determine the Environmental Consequences and Potential Mitigation Measures – Steps 5-11 3-261
3.27. Relationship of Local and Short-term Uses versus Long-term Productivity 3-267
3.28. Irreversible and Irretrievable Commitments of Resources 3-268
3.29. Summary of Impacts 3-269

TABLES

Table 3-1: I-39/90/94 Study Corridor Communities 3-1
Table 3-2: Land Use Categories 3-2
Table 3-3: Dane County Regional Land Use and Planning Documents 3-7
Table 3-4: Dane County Community Land Use and Planning Documents 3-8
Table 3-5: Columbia County Community Land Use and Planning Documents 3-13
Table 3-6: Sauk County Community Land Use and Planning Documents 3-14
Table 3-7: Juneau County Community Land Use and Planning Documents 3-15
Table 3-8: Direct Land Use Impacts along I-39/90/94 in Dane, Columbia, Sauk and Juneau Counties 3-17
Table 3-9: Bike and Pedestrian Plans in Dane County 3-22
Table 3-10: Level of Service Comparison – Year 2050 3-29
Table 3-11: Local Road Changes 3-30
Table 3-12: Residential Relocations and Parcel Acquisitions by Alternative 3-41
Table 3-13: Number of Available and Comparable Single-Family Homes 3-43
Table 3-14: Availability of Replacement Housing in DeForest, Sun Prairie, Madison and Marshall 3-43
Table 3-15: Availability of Single-Family Rentals 3-43
Table 3-16: Descriptions of Commercial and Industrial Development at Interchanges 3-44
Table 3-17: Commercial and Industrial Acquisitions and Displacements by Alternative 3-46
Table 3-18: Commercial and Industrial Business Relocations and Parcel Acquisitions by Alternative 3-47
Table 3-19: Commercial and Industrial Business Access Changes 3-49
Table 3-20: Farmland, Agricultural Employment and Economic Activity 3-55
Table 3-21: Summary of Potential Agricultural Land Acquisition by County 3-59

Table 3-22: Population Counts by Location....3-64
Table 3-23: Population Projections by Location....3-65
Table 3-24: Number of Households by Location....3-66
Table 3-25: Number of Households – Projections by Location....3-67
Table 3-26: Percentage of People Under 18 or 65 and Older....3-68
Table 3-27: Disability Status by Location....3-69
Table 3-28: Median Household Income and Families Below Poverty Threshold by Location....3-70
Table 3-29: Household Means of Transportation....3-73
Table 3-30: Population by Race and Ethnicity....3-75
Table 3-31: Language Spoken at Home by Location....3-78
Table 3-32: Educational Attainment of the Population 25 Years and Over....3-79
Table 3-33: Impacts to Property Tax Revenues*....3-85
Table 3-34: Minority and Low-Income Populations within 1,000 Feet of Study Corridor....3-89
Table 3-35: Summary of Potential Effects, Mitigation and Adverse Effect Analysis....3-92
Table 3-36: Impacted Receptors Benefiting from Feasible and Reasonable Noise Barriers in Minority Areas....3-116
Table 3-37: Impacted Receptors Benefiting from Feasible and Reasonable Noise Barriers in Poverty Areas....3-116
Table 3-38: Environmental Justice Related Resources Considered for Potential Project Encroachment....3-125
Table 3-39: Increase in Impervious Surface Compared to Existing Condition....3-145
Table 3-40: Estimated Stream Impacts....3-146
Table 3-41: Wetlands Along the I-39/90/94 Study Corridor....3-151
Table 3-42: Summary of Significance of Wetland Functional Values....3-152
Table 3-43: Wetland Impact by County....3-154
Table 3-44: Wetland Impact by Alternative....3-155
Table 3-45: Summary of Significance of Wetland Impacts....3-156
Table 3-46: Flood Minimization Options Summary....3-163
Table 3-47: Residences and Business Experiencing a Change in 100-Year Flood Elevation....3-164
Table 3-48: Summary of Floodplain Minimization Coordination....3-166
Table 3-49: Floodplain Filling Impacts per Alternative....3-167
Table 3-50: Federally Listed Species....3-173
Table 3-51: Federally Threatened and Endangered Species Effect Determinations....3-177
Table 3-52: Notable Environmental Resources....3-184
Table 3-53: Juneau County Estimated Preferred Alternatives Upland Habitat Impacts....3-186
Table 3-54: Sauk County Estimated Preferred Alternatives Upland Habitat Impacts....3-186
Table 3-55: Columbia County Estimated Preferred Alternatives Upland Habitat Impacts....3-187
Table 3-56: Dane County Estimated Preferred Alternatives Upland Habitat Impacts....3-187
Table 3-57: Measurement Site Descriptions and Measured Noise Levels....3-191
Table 3-58: Comparison of Measured and Modeled Noise Levels....3-192

Table 3-59: Noise Level Criteria for Considering Barriers 3-193
Table 3-60: Total Receiver and Receptor Impact Counts – Number of Receptor Units Impacted 3-194
Table 3-61: Acoustical Mitigation- Noise Barrier Locations Analyzed in the South Section 3-200
Table 3-62: Acoustical Mitigation – Noise Barrier Locations Analyzed in the North Section.....3-204
Table 3-63: Annualize Lifecycle GHG Emissions 2030-2060 (Mt CO_2e/Year).....3-210
Table 3-64: Annualized GHG Emissions Equivalency for the Emissions Increases from Build Alternatives (Compared to No-*Build* Alternative) 3-211
Table 3-65: Social Cost of Greenhouse Gases for Emissions in 2030 (2020 Dollars) 3-212
Table 3-66: Social Cost of Greenhouse Gases for Emissions in 2060 (2020 Dollars) 3-212
Table 3-67: Cumulative Social Cost in 2030 to 2060 (2020 Dollars) and Comparisons to No Build Alternative.....3-212
Table 3-68: Sites of Environmental Concern by County.....3-215
Table 3-69: Above-Ground Properties Listed In or Eligible for the NRHP 3-217
Table 3-70: Summary of Historic Properties, Impacts and Effects.....3-218
Table 3-71: Preliminary Cost Estimate Table.....3-225
Table 3-72: Construction Noise/Distance Relationships 3-228
Table 3-73: Assessing the Potential for Project-Influenced Land Use Change.....3-243
Table 3-74: Resources Considered for Encroachment-Alteration Impacts 3-245
Table 3-75: Notable Past, Present and Reasonably Foreseeable Future Actions.....3-255
Table 3-76: Farmland Trends.....3-262
Table 3-77: Impact Summary Table.....3-269

FIGURES

Figure 3-1: Civil Divisions Map 3-3
Figure 3-2: Existing Land Use: Dane County 3-5
Figure 3-3: Existing Land Use: Columbia, Sauk and Juneau Counties.....3-6
Figure 3-4: City of Madison Growth Priority Areas Map.....3-9
Figure 3-5: City of Madison Neighborhood Plan Boundaries.....3-11
Figure 3-6: City of Madison Bus Rapid Transit Routes 3-18
Figure 3-7: Existing Park and Ride Lots 3-20
Figure 3-8: Dane County Existing Bicycle Facilities 3-23
Figure 3-9: Existing and Missing Sidewalks in Study Corridor.....3-24
Figure 3-10: Pedestrian Improvement Needs.....3-25
Figure 3-11: Columbia County Bicycle Loop Map 3-26
Figure 3-12: City of Madison Priority Bicycle/Pedestrian Crossings along I-39/90/94 3-36
Figure 3-13: Ice Age Trail Schepp Road Detour.....3-37
Figure 3-14: Ice Age Trail County H and 60th Street Detours 3-38

Figure 3-15: Agricultural Enterprise Areas 3-56
Figure 3-16: Drainage Districts 3-57
Figure 3-17: Potentially Severed Farm at the Milwaukee Street Interchange 3-60
Figure 3-18: Median Household Income in Study Corridor Counties 3-71
Figure 3-19: Percent of Families Below Poverty Threshold in Study Corridor 3-72
Figure 3-20: Percent Minority Populationsin Study Corridor Counties 3-77
Figure 3-21: Proposed New Right of Way and Minority Population – Dane/Columbia Counties 3-111
Figure 3-22: Proposed New Right of Way and Percent of Families Below Poverty – Dane/Columbia Counties 3-112
Figure 3-23: Proposed New Right of Way and Minority Population – Columbia, Sauk, Juneau Counties ... 3-113
Figure 3-24: Proposed New Right of Way and Percent of Families Below Poverty – Columbia, Sauk, Juneau Counties 3-114
Figure 3-25: Noise Barriers and Minority Populations – Dane/Columbia Counties 3-117
Figure 3-26: Noise Barriers and Percent of Families Below Poverty – Dane/Columbia Counties 3-118
Figure 3-27: Noise Barriers and Minority Population – Columbia, Sauk, Juneau Counties 3-119
Figure 3-28: Noise Barriers and Percent of Families Below Poverty – Columbia, Sauk, Juneau Counties ... 3-120
Figure 3-29: View of I-39/90/94 from High Crossing Boulevard 3-129
Figure 3-30: View of I-39 from Cascade Mountain Road 3-129
Figure 3-31: View of I-39 South of the WIS 33 Interchange 3-130
Figure 3-32: View of I-90/94 from Baraboo River Waterfowl Production Area 3-130
Figure 3-33: View of I-90/94 from Pine Island State Wildlife Area 3-131
Figure 3-34: View of I-90/94 in the Wisconsin Dells 3-131
Figure 3-35: View of I-90/94 From Xanadu Road 3-132
Figure 3-36: View of I-90/94 Bridge over Mirror Lake 3-132
Figure 3-37: View toward I-90/94 from Rocky Arbor State Park 3-133
Figure 3-38: Location of Increased Interstate Elevation 3-134
Figure 3-39: Watersheds, Waterways, Waterbodies and Floodplains 3-140
Figure 3-40: Characteristics of a Floodplain 3-159
Figure 3-41 FEMA Regulatory Flood Mapping for Columbia and Sauk Counties 3-160
Figure 3-42: Dane County Environmental Corridors 3-183
Figure 3-43: Summary of Evaluated Noise Barriers 3-198
Figure 3-44: Burials Recommended for Monitoring During Construction 3-221
Figure 3-45: Indirect Impacts Study Area Dane County 3-237
Figure 3-46: Indirect Impacts Study Area Columbia, Sauk and Juneau Counties 3-238
Figure 3-47: Cumulative Impacts Study Area: Dane County 3-253
Figure 3-48: Cumulative Impacts Study Area: Columbia, Sauk and Juneau Counties 3-254

3. Existing Conditions, Impacts and Mitigation

This section presents background information about regional and local planning, the built environment, socioeconomic characteristics and trends, archaeological and historical resources, public use land, and the natural environment in the study corridor. Potential impacts of the recommended preferred alternatives, as well as alternatives recommended for further study are identified and differences, if any, between the alternatives are discussed. A comparison of the different impacts between the alternatives is in Table 3-1. Conceptual measures to minimize and mitigate adverse impacts that cannot be avoided are also included for each potentially affected resource. A summary of these mitigation measures is included in Appendix C.

3.1. Land Use and Land Use Planning

3.1.1. Affected Environment

The I-39/90/94 study corridor is located in Dane, Columbia, Sauk and Juneau counties. Dane County is largely more urbanized (which includes the Madison metropolitan area) compared to other counties in the study corridor. The Wisconsin Dells is a major tourist destination in Sauk County. Communities adjacent to the study corridor are listed in Table 3-1 and shown in Figure 3-1.

Table 3-1: I-39/90/94 Study Corridor Communities

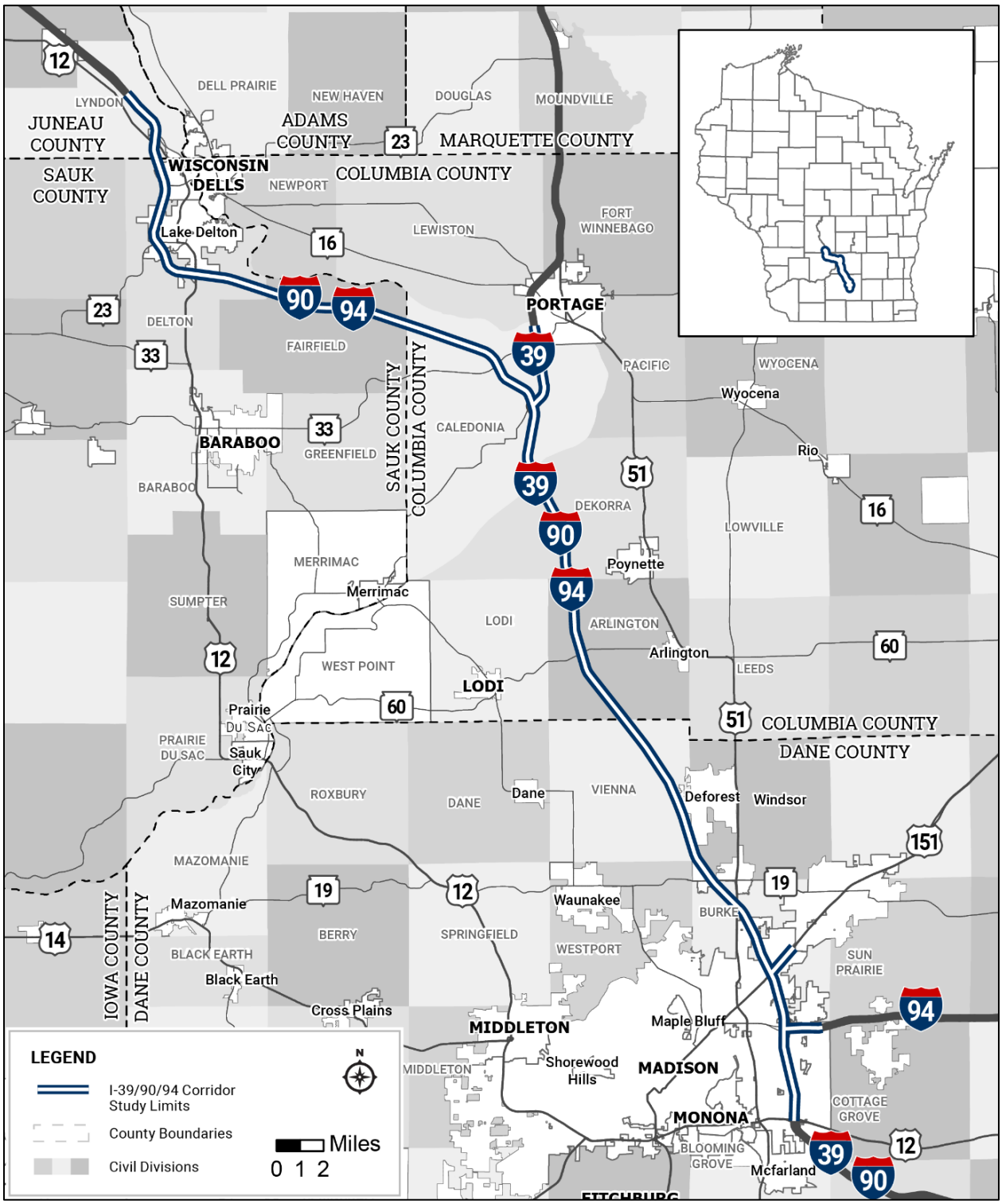
Dane County	Columbia County	Sauk County	Juneau County
Town of Blooming Grove	Town of Arlington	Town of Fairfield	Town of Lyndon
City of Madison	Town of Dekorra	Town of Delton	
City of Sun Prairie	Town of Caledonia	Village of Lake Delton	
Town of Burke	City of Portage	City of Wisconsin Dells	
Village of DeForest			
Village of Windsor			
Town of Vienna			

Land use information in this section comes from comprehensive plans and zoning ordinances adopted by study corridor communities to guide and regulate the development of land. Figure 3-2 and Figure 3-3 show existing land use. Table 3-2 summarizes the commonly used land use categories.

Table 3-2: Land Use Categories

Category	Description
Residential	Land used for housing
Commercial	Land used for the sale of goods and services for financial profit (businesses, warehouses, shops, and other infrastructure related to commerce)
Industrial	Land used for manufacturing, storing, packaging, processing goods
Transportation	Land delegated to the moving or transportation of goods and people (roads, highways, railroads, airports)
Public	Land used for parks, recreation and open space, schools, public forestland, institutions
Agricultural	Land used for growing crops or raising and grazing farm animals
Water	A body of open water or flowing waterway

Figure 3-1: Civil Divisions Map



3.1.2. Existing Land Use

Dane County

In Dane County, much of the study corridor travels through the city of Madison and other municipalities. Figure 3-2 shows the overall land use along the corridor in Dane County. Land use along the study corridor and at the interchanges is primarily commercial and industrial with some park, open space and environmental corridors. Residential land uses are present in and around the study corridor between the US 12/18 and I-94/WIS 30 interchanges. Beyond the study corridor, land use transitions to predominantly residential neighborhoods and parks associated with the surrounding cities and villages. The northern portion of the study corridor in Dane County also includes parks and environmental corridors, including Token Creek Park and the Cherokee Marsh complex near US 51 and WIS 19 and the Upper Yahara River Environmental Corridor in the village of DeForest. North of WIS 19, land use is predominantly rural open space and agricultural with rural residential farther off the study corridor associated with the villages of Windsor and DeForest.[1]

Columbia County

Land uses adjacent to the study corridor in Columbia County are largely agricultural, low-density residential and open space, as shown in Figure 3-3. Development in rural Columbia County is focused around access to the five I-39 and I-90/94 interchanges. Except for the WIS 33 Interchange at I-39, all other interchanges have commercial and residential land uses adjacent to them. Industrial land is only found at the I-39 I-90/94 Split Interchange.

West of the I-39 I-90/94 Split Interchange, I-90/94 generally runs parallel to and south of the Wisconsin River. Between I-90/94 and the Wisconsin River, a portion of the existing open space includes an undeveloped low-lying area. Part of this area is the U.S. Fish and Wildlife Service (USFWS) 950-acre Baraboo River Waterfowl Production Area and the WDNR 5,499-acre Pine Island State Wildlife and Natural Area. A ski resort, Cascade Mountain, is located on the south side of I-90/94.

Sauk County

Tourism is prevalent along the study corridor in northeastern Sauk County, primarily related to the resorts in the Wisconsin Dells area. This part of the I-39/90/94 corridor also has large amounts of land dedicated to commercial and open space/recreational uses. The three study corridor interchanges in Sauk County (US 12, WIS 23 and WIS 13) are all in or near the Wisconsin Dells and the village of Lake Delton. Two state parks, Mirror Lake and Rocky Arbor are next to I-90/94. South of the Wisconsin Dells, land use along the study corridor in the Town of Fairfield is similar to Columbia County- agricultural, low-density residential and open space.

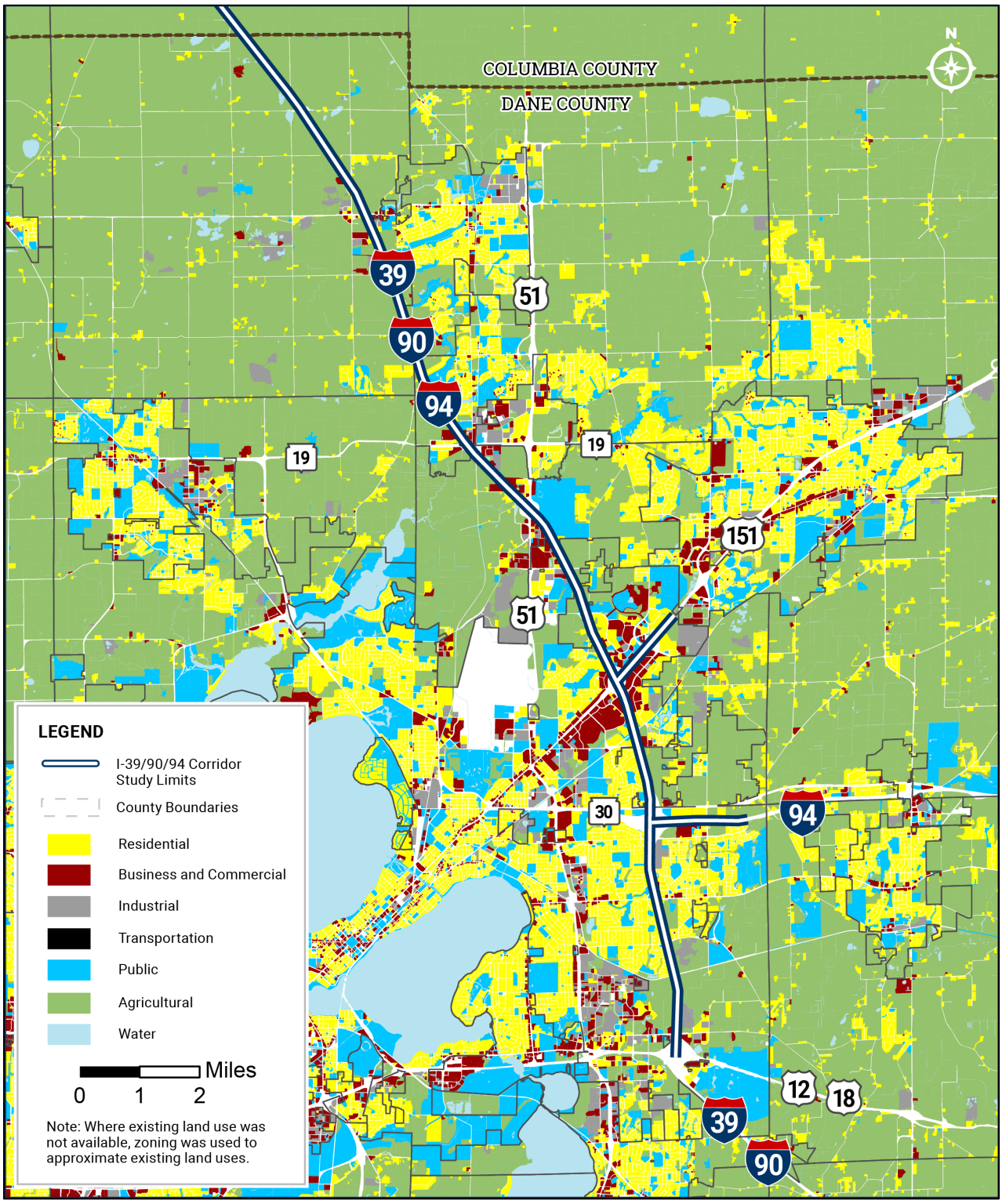
Juneau County

A small part of Juneau County is in corridor, which includes the US 12/WIS 16 Interchange. Land use in this portion of Juneau County is low density commercial, agricultural and open space.

---

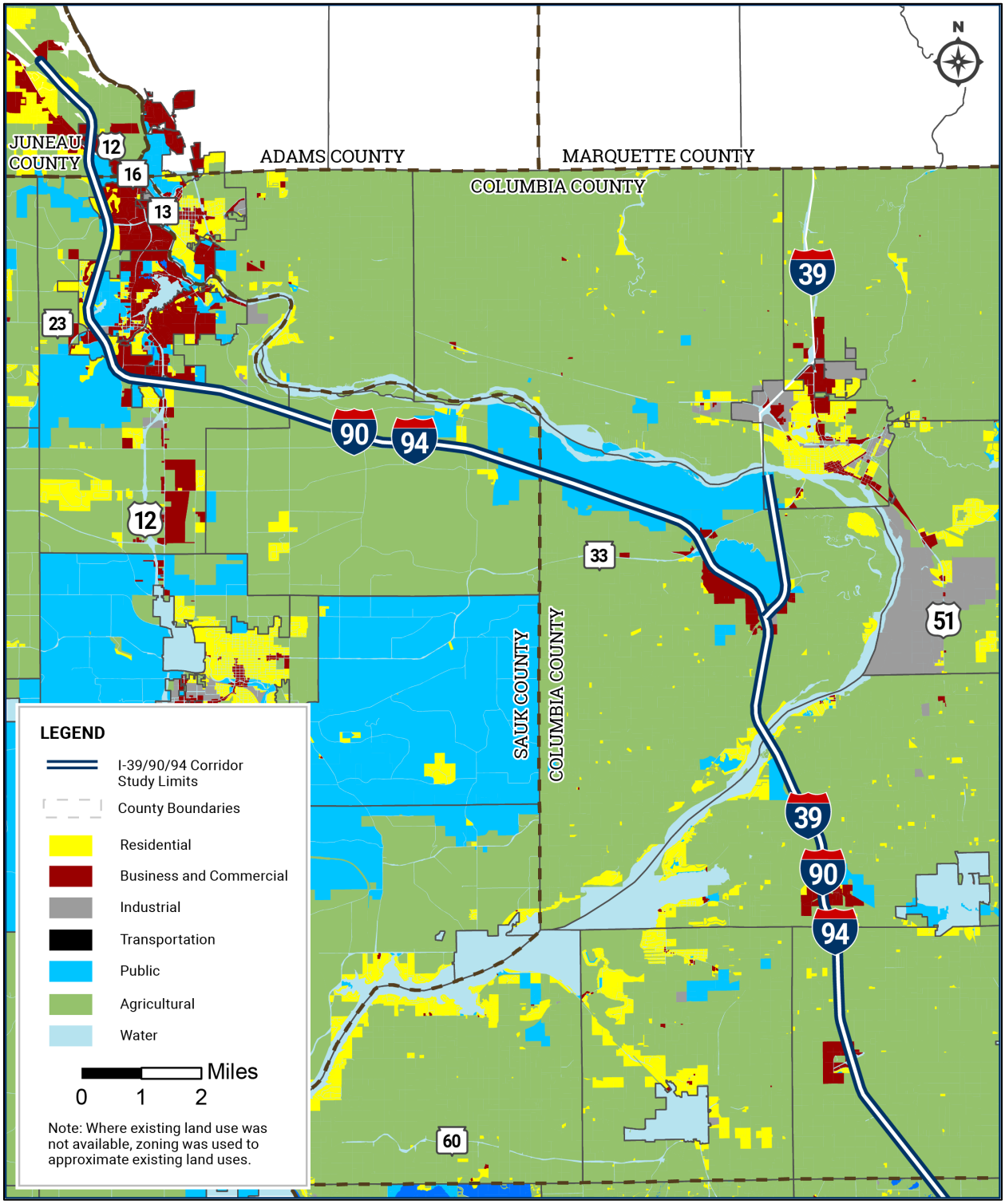
[1] *Dane County GIS Catalog. Discover Dane County. Planning. https://gis-countyofdane.opendata.arcgis.com/pages/planning. Accessed March 12, 2024.*

Figure 3-2: Existing Land Use: Dane County



Source: Dane County

Figure 3-3: Existing Land Use: Columbia, Sauk and Juneau Counties



Source: Columbia County, Sauk County, Juneau County

3.1.3. Land Use Planning

Counties and municipalities lead local planning to guide land use development and recommend transportation improvements, as needed. This section summarizes regional and local planning efforts relevant to the study corridor. All the communities along the study corridor have adopted comprehensive plans according to Wisconsin's Comprehensive Planning Law.[2]

Dane County

Table 3-3 lists key regional plans within the Dane County section of the study corridor.

Table 3-3: Dane County Regional Land Use and Planning Documents

Community	Plan	Plan Adoption Year
Dane County	Dane County Comprehensive Plan	2012, amended 2016
Dane County	Dane County Park and Open Space Plan	2018
Greater Madison Metropolitan Planning Organization	The Regional Transportation Plan 2050	2022
Greater Madison Metropolitan Planning Organization	Transport 2020	2020
Wisconsin Department of Transportation	Connect 2050	2022
Wisconsin Department of Transportation	State Rail Plan	2014
Greater Madison Metropolitan Planning Organization	Transportation Improvement Program	2023
Greater Madison Metropolitan Planning Organization	Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County	2015
Greater Madison Metropolitan Planning Organization	Connect Greater Madison 2050	2022

The Dane County Comprehensive Plan describes four foundational planning principles including, farmland preservation, parks and open space, urban service areas, and environmental corridors, which have influenced county land use patterns. These principles will continue to be an important component of the plan. The plan also draws upon and incorporates elements of regional and state plans listed in Table 3-3. The plan identifies transportation goals of providing an accessible, integrated, economical and well-maintained multi-modal transportation network compatible with planned development and reduces transportation's contribution to greenhouse gases.

By 2050, the Greater Madison Area population (defined as the area within the planning area boundary for the Greater Madison Metropolitan Planning Organization) is projected to increase by 35% between

[2] *Wisconsin Legislature: 66.1001, accessed July 2023.*

2020 and 2050. The *Connect Greater Madison 2050* plan includes six goals for accommodating this future growth. These goals include creating connected and livable communities, ensuring safety within the transportation system, building and maintaining an efficient and affordable transportation system, providing equitable transportation options, minimizing transportation-related greenhouse gas emissions, and maximizing investments made in the existing transportation system. In alignment with future growth goals, the plan discusses previous studies, the I-39/90/94 study and other future projects and their contributions to decreasing future congestion. The *Connect Greater Madison 2050 plan* discusses potential new interchanges at Hoepker Road and I-39/90/94, and at a Milwaukee Street extension at I-94.

In addition to Dane County plans listed above, Table 3-4 lists individual community comprehensive plans. These plans inform planned use and relevant transportation goals in the study corridor and are briefly described in this section.

Table 3-4: Dane County Community Land Use and Planning Documents

Community	Plan	Plan Adoption Year
City of Madison	City of Madison Comprehensive Plan	2018
City of Madison	Madison in Motion	2017
City of Madison	Vision Zero Action Plan 2020-2035	2022
City of Madison	Bicycle Transportation Plan for Madison Metropolitan Area and Dane County	2015
City of Madison	Madison's Pedestrian Transportation Plan	1997
City of Madison	Sprecher Neighborhood Development Plan	1998, amended 2012
City of Madison	Northeast Neighborhoods Development Plan	2009
City of Madison	Rattman Neighborhood Development Plan	2019, amended 2023
City of Madison	Pumpkin Hollow Neighborhood Development Plan	2008, amended 2019
City of Madison	Hanson Road Neighborhood Development Plan	2000, amended 2021
Town of Blooming Grove[3]	Town of Blooming Grove Comprehensive Plan	2005
Town of Burke[4]	Town of Burke Comprehensive Plan	2013
City of Sun Prairie	City of Sun Prairie Comprehensive Plan	2019
Village of DeForest	Village of DeForest Comprehensive Plan	2015, amended 2023
Village of Windsor	Village of Windsor Comprehensive Plan	2005, amended 2016 (amendment anticipated 2024)

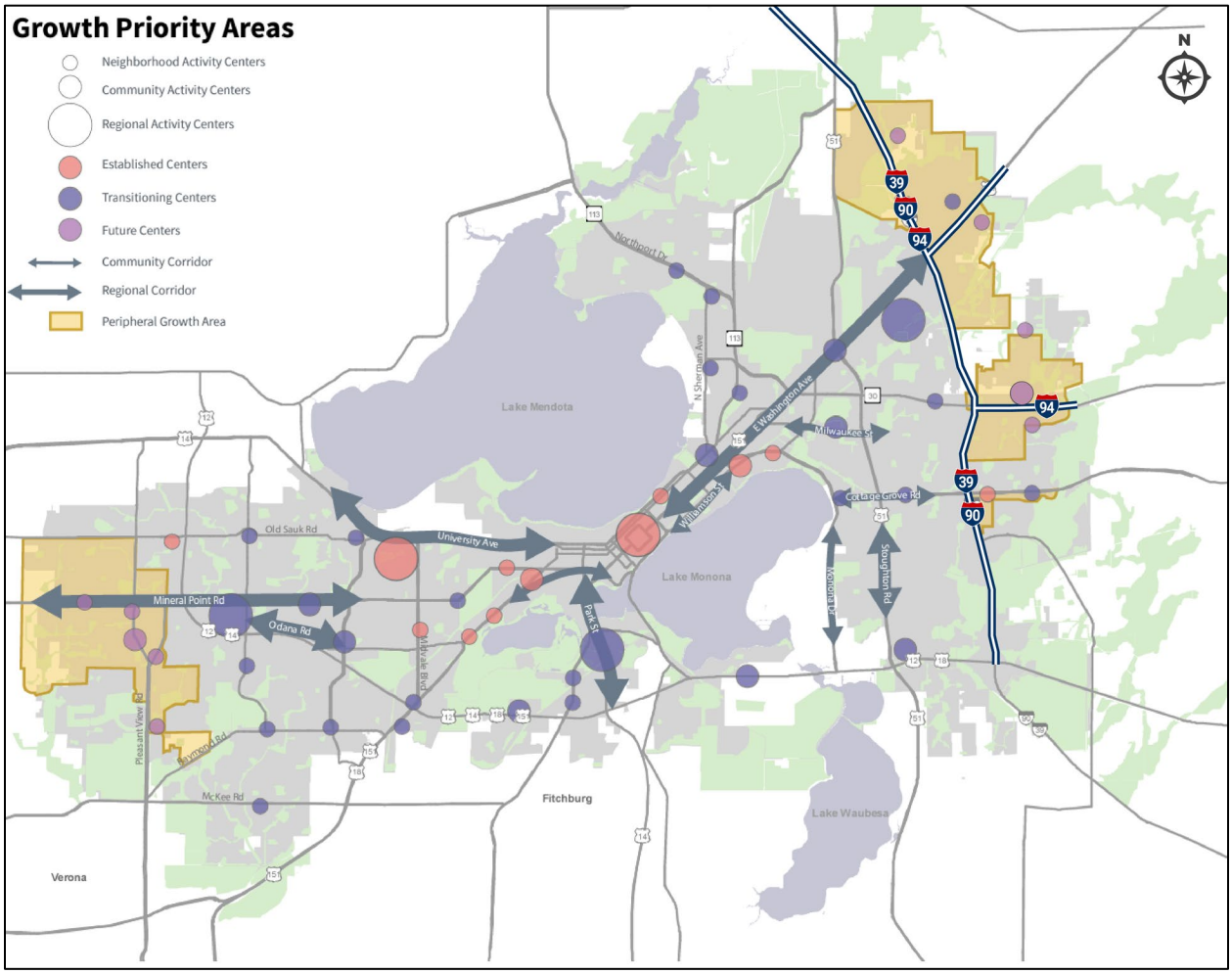
[3] *The city of Madison will annex the town of Blooming Grove and its government on Oct. 31, 2027. Relevant future land uses are discussed in the Sprecher Neighborhood Development Plan and the Northeast Neighborhoods Development Plan.*

[4] *The town of Burke will be annexed into the cities of Madison and Sun Prairie as well as the village of DeForest on Oct. 27, 2036. Relevant future land uses are discussed in the Hanson Road Neighborhood Development Plan, Pumpkin Hollow Neighborhood Development Plan, Rattman Neighborhood Development Plan, Northeast Neighborhoods Development Plan and Village of DeForest Comprehensive Plan.*

Community	Plan	Plan Adoption Year
Town of Vienna	Town of Vienna Comprehensive Plan	2006, amended 2012

City of Madison. The City of Madison Comprehensive Plan projects a 25% population increase by 2040. To address this growth, the city has two goals: to be comprised of compact, interconnected neighborhoods anchored by a network of mixed-use activity centers; and to provide a safe and efficient regional transportation network that can accommodate current and future travel demands. The comprehensive plan includes strategies to decrease travel through downtown Madison by improving access to peripheral areas and by further integrating transit, pedestrian and bicycle networks. Figure 3-4 shows the general growth priority areas for the city with peripheral neighborhood expansion and future mixed-use centers. Much of these future growth areas occur along the study corridor. The city of Madison developed several neighborhood plans (Table 3-4) to guide planned land use in growth areas around potential new interchanges in the study corridor.

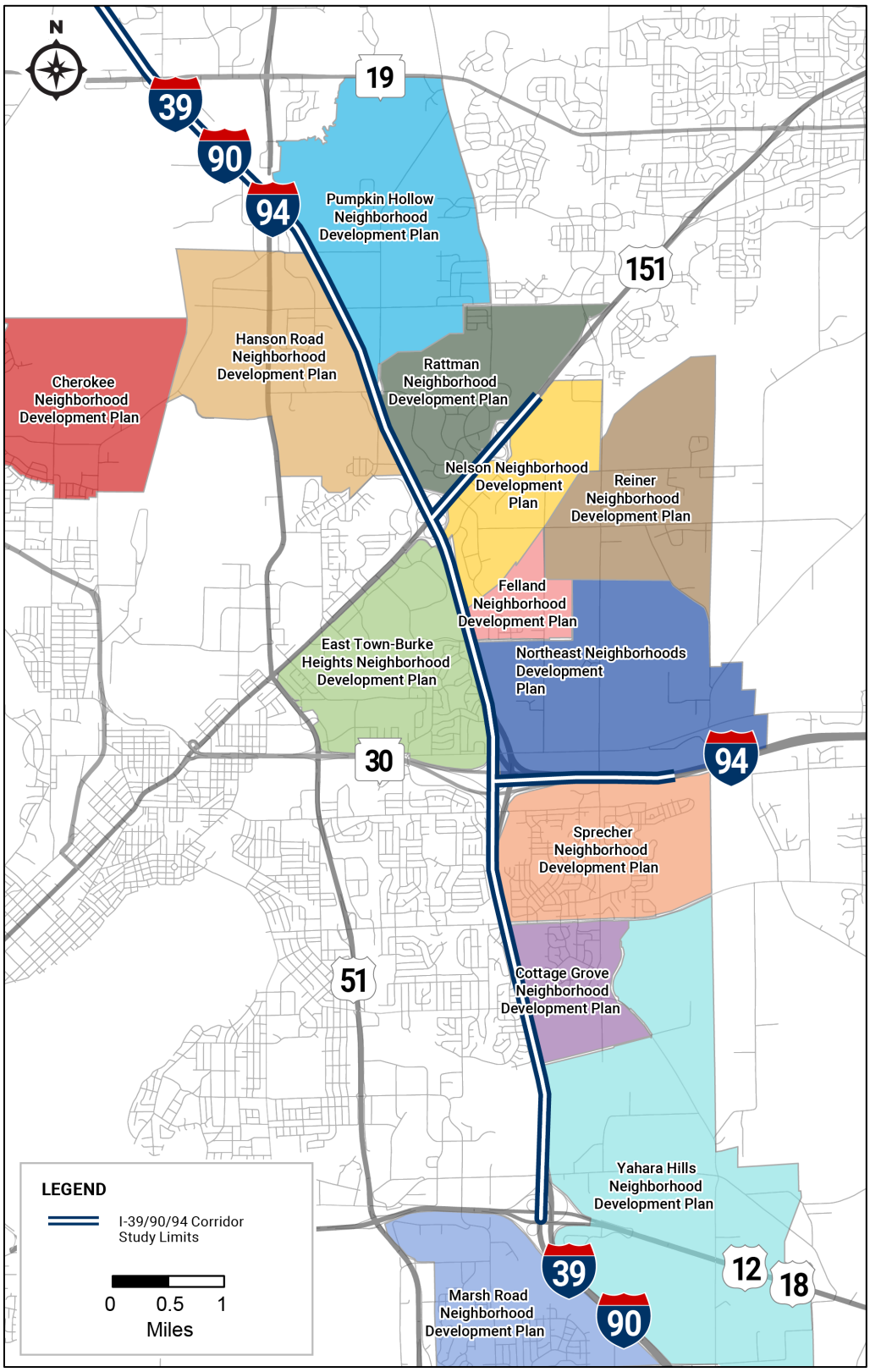
Figure 3-4: City of Madison Growth Priority Areas Map



Source: Imagine Madison. August 2018. City of Madison Comprehensive Plan. https://www.cityofmadison.com/dpced/planning/comprehensive-plan/3894/. Accessed Jan. 29, 2024.

Designated neighborhoods east of the I-94/WIS 30 Interchange include the Sprecher Neighborhood south of I-94 and the Northeast Neighborhoods north of the interstate, see Figure 3-5 . While agriculture, open space and undeveloped vacant land are dominant land uses, the area is rapidly developing. The Sprecher Neighborhood Development Plan and the Northeast Neighborhoods Development Plan recommend residential development, mixed-use development providing neighborhood goods and services, commercial and employment areas, schools and open spaces. Both plans note the possibility of and need for a new Milwaukee Street Interchange to serve transportation needs and provide direct access to I-94.

Figure 3-5: City of Madison Neighborhood Plan Boundaries



Source: City of Madison

Designated neighborhoods around the potential new Hoepker Road Interchange include the Rattman Neighborhood and Pumpkin Hollow Neighborhood on the east side of I-39/90/94 and the Hanson Road Neighborhood on the west side. The Rattman Neighborhood is mostly developed with office uses and health services. The Rattman Neighborhood Development Plan envisions primarily office and commercial development with limited (existing) areas of residential development. The plan discusses difficulties with connectivity with the rest of Madison. The plan discusses the potential of extending American Family Drive to Hoepker Road to the north to increase access to the neighborhood, as well as extend High Crossing Boulevard to the north to connect into American Family Drive for further connection within the neighborhood.

The Pumpkin Hollow Neighborhood, immediately north of the Rattman Neighborhood, is largely comprised of farmland, park and vacant undeveloped open space. The *Pumpkin Hollow Neighborhood Development Plan* envisions future land use as park and open space and low density residential. The plan mentions the concept of potential interstate access at Hoepker Road.

Agricultural uses dominate existing land uses in the Hanson Road Neighborhood. The Dane County Regional Airport is immediately south of the neighborhood and restricts development north of its runways to maintain runway clear zones. The Hanson Road Neighborhood Development Plan envisions mostly light industrial uses while preserving significant amounts of natural open space. The plan briefly describes Hanson Road and Hoepker Road as the two connectors across the I-39/90/94 in the region.

City of Sun Prairie, Village of DeForest, Village of Windsor, Town of Vienna. The City of Sun Prairie Comprehensive Plan introduces mobility and transportation goals of creating connected and livable neighborhoods, linking the city to regional transportation networks, improving public health and safety through an integrated public transportation network, improving transportation equity, and reducing the environmental impact of the transportation system. Land use along US 151 generally includes employment, general commercial and open space uses. With its large number of commuting residents, the city of Sun Prairie aims to improve access and decrease travel time to the adjacent regional highway system of I-39/90/94 and US 151.

The overall land use goal in the Village of DeForest Comprehensive Plan promotes a land use pattern that builds on community strengths, contains a mix of land uses, grows the local economy and enhances quality of life by providing places for retail, restaurant, employment, and housing uses. The plan notes a major job center in the area bounded by WIS 19, US 51 and the Interstate. The plan also notes a similar opportunity for large industrial and commercial sites to meet market demand at the County V Interchange. The plan prioritizes maintaining and expanding its transportation network for residents, workers, and employers to safely and efficiently travel by their mode of choice consistent with a suburban environment. The plan's objectives include supporting transportation improvements that serve new development without promoting unplanned or poorly planned development, accommodating pedestrian and bicycle access in all transportation improvements and land development projects, and collaborating with other transportation providers to create and maintain an integrated network. The village recently approved plans for a substantial convenience store development at County V. As part of the site development, the convenience store developer may privately fund interchange reconstruction in coordination with WisDOT, Dane County, the village and FHWA.

The Village of Windsor Comprehensive Plan generally preserves agricultural land uses, with residential uses proximate to the village of DeForest and the city of Sun Prairie. Commercial uses are planned at the WIS 19 Interchange. An overall transportation goal is to ensure efficient and safe multi-modal transportation, including efficient and safe pedestrian and bicycle travel.

The Town of Vienna Comprehensive Plan recommends land uses maximizing compatibility between neighboring uses and preserves rural character. The village of DeForest exercises extraterritorial zoning authority over commercial development near the County V Interchange, and jointly reviews development projects within the town boundaries. There are also informal growth management agreements with the village of DeForest regarding annexation. Transportation goals focus on continued maintenance of the town's infrastructure at a cost-efficient level of service desired by residents and businesses.

Columbia County

Table 3-5 lists key community plans in the Columbia County section of the study corridor.

Table 3-5: Columbia County Community Land Use and Planning Documents

Community	Plan Name	Plan Adoption Year
Columbia County	*Columbia County Comprehensive Plan 2030*	2007 amended 2013
Columbia County	*Columbia County Farmland Preservation Plan*	2013
City of Portage	*People Planning Portage: 2030 Comprehensive Plan*	2020
Town of Arlington	*Town of Arlington Comprehensive Plan 2030*	2009
Town of Caledonia	*Town of Caledonia Comprehensive Plan 2030*	2009
Town of Dekorra	*Town of Dekorra Comprehensive Plan*	2014, amended 2016

The *Columbia County Comprehensive Plan guides* the use of resources to find a balance between economic development, agricultural preservation, protection of natural and cultural resources and the recognition of private property rights. Agriculture and tourism are recognized as economic drivers and the plan works to support their preservation and enhancement. The plan includes a transportation vision of implementing a safe, efficient and well-planned transportation system that incorporates and encourages multiple modes of travel. The plan references adding lanes to I-90/94 between I-39 and the Wisconsin Dells but does not take a position. *The Columbia County Farmland Preservation Plan outlines* the county's land use and zoning approaches to farmland preservation and strategies for accommodating compatible growth in predetermined locations. There are no sewer service area plans in Columbia County.

Columbia County and the city of Portage's comprehensive plans both support a WIS 33 bypass of downtown Portage so through traffic between I-39/90/94 and destinations to the east do not have to drive through downtown Portage. One of the Portage's goals is to support transportation improvements which promote tourism. Portage sees transportation as an opportunity to advertise its assets and guide visitors through improved wayfinding.

The towns of Arlington, Caledonia, and Dekorra all focus on preserving agriculture and rural character in their plans. However, the town of Dekorra identifies land around the County CS Interchange as an area for future mixed-use development, primarily commercial and industrial. Shared transportation goals and objectives include providing a safe, well-maintained system of roads and highways; restricting access to

arterial highways and through-town road corridors to protect traffic-carrying capacity and encouraging the development and full utilization of all modes of transportation in the county.

Sauk County

Table 3-6 lists key community plans in the Sauk County section of the study corridor.

Table 3-6: Sauk County Community Land Use and Planning Documents

Community	Plan	Plan Adoption Year
Sauk County	Sauk County Comprehensive Plan	2009
Sauk County	Sauk County Farmland Preservation Plan	2013
Sauk County	Sauk County Comprehensive Outdoor Recreation Plan 2020-2024	2020
Sauk County	Making Sauk: A Place Plan	2017
Village of Lake Delton	Village of Lake Delton 2042 Comprehensive Plan (Draft)	Pending
City of Wisconsin Dells	City of Wisconsin Dells Comprehensive Plan	2003
Town of Delton	Town of Delton Comprehensive Plan	2009
Town of Fairfield	Town of Fairfield Comprehensive Plan 2005-2025	2006

The Sauk County Comprehensive Plan notes the county is one of the fastest growing counties in Wisconsin. The plan recognizes the importance of investing in traditional transportation corridors while encouraging alternative modes. Planning documents emphasize the need to plan for development along US 12, which connects to I-90/94 at US 12 in Sauk County and US 12/WIS 16 in Juneau County. Preserving the region's natural and cultural resources is seen as a key component of transportation corridor planning. The county wants to remain a leader in preserving agricultural lands, promoting recreational opportunities, and maintaining natural resource areas. The Sauk County Farmland Preservation Plan focuses on balancing the development of non-agriculture land uses with agricultural preservation. The city of Baraboo has a single community sewer service area plan, but the rest of Sauk County lacks a sewer service plan.

A central component of the village of Lake Delton and city of Wisconsin Dells comprehensive plans is balancing their positions as a major recreation and tourist destination with their residential setting, natural areas and cultural heritage. Linking housing and employment is an important component of balanced growth and workforce housing is an area of opportunity for the village of Lake Delton since very few people both live and work in the village. Wisconsin Dells identifies the US 12/WIS 16 Interchange as an alternative gateway option to WIS 13. The interchange would provide additional opportunities for branding and wayfinding as well as help to ease traffic on other routes. One of the areas designated for future commercial development is along US 12/WIS 16 to its interchange at I-90/94. Pollution of watersheds is a concern for both communities due to intense commercial development pressures in the region.

The town of Delton is a rural community undergoing a period of transition and growth. The town is planning for change by identifying areas for both development and preservation, while emphasizing the need to build out transportation and utility infrastructure. Economic development that is local and

recreation-based is prioritized. The town plans to focus tourist-oriented development on the US 12 corridor and redevelop US 12 for multimodal transportation.

The town of Fairfield's planning efforts center on preserving natural resources and the protection of farm operations through planned growth; the town encourages economic development that enhances its agriculture and conservation-based economy.

Juneau County

Table 3-7 lists key community plans within the Juneau County section of the study corridor.

Table 3-7: Juneau County Community Land Use and Planning Documents

Community	Plan	Plan Adoption Year
Juneau County	Juneau County Comprehensive Plan 2010-2030	2009
Juneau County	Juneau County Land and Water Resource Management Plan 2019-2028	2018
Town of Lyndon	Town of Lyndon Comprehensive Plan	2021

The Juneau County Comprehensive Plan emphasizes protecting natural and agricultural resources. Juneau County strives to mitigate conflicts between agricultural and non-agricultural land uses while still expanding the current economic base.

The town of Lyndon wants intentional growth that preserves its rural character and farmland. Lyndon has experienced development pressure due to its location along I-90/94 and the Wisconsin River near the Wisconsin Dells. Business corridors along US 12/WIS 16 are the preferred locations for economic development. The US 12/WIS 16 Interchange is an entry point to Lyndon and was also identified as a gateway by the city of Wisconsin Dells. The town of Lyndon does not intend to address the US 12/WIS 16 gateway because of expected annexation of this area by Wisconsin Dells.

3.1.4. Land Use Impacts

Conformity with Local and Regional Plans

Although many land use plans do not specifically address I-39/90/94, none of the build alternatives conflict with plan recommendations. The Connect Greater Madison 2050 plan acknowledges the I-39/90/94 Corridor Study, noting its intent to evaluate future transportation improvements, including proposed interchanges at Hoepker Road and Milwaukee Street. The proposed Milwaukee Street Interchange on I-94 is consistent with local plans for the Sprecher and Northeast neighborhoods that each support new interchange access to meet local land use planning goals. An interchange at or near Hoepker Road has been considered in local plans dating back to at least 1992. The Pumpkin Hollow Neighborhood Development Plan noted neighborhood residents and property owners did not support a Hoepker Road Interchange. While increasing the connectivity of the neighborhood, a new interchange would also increase traffic and provide the opportunity for development that is incompatible with the recommended neighborhood development concept.

Portage highlights easy access to I-39 as an asset of its downtown. One of the goals in Lake Delton's plan is to maintain good access from I-90/94 to the Wisconsin Dells Parkway (US 12).

Most of the towns in the study corridor, including Arlington, Caledonia, Dekorra and Delton, prefer to see new commercial development take place in areas near the interchanges with I-39/90/94. Wisconsin Dells' plan identifies the WIS 12/16 Interchange as a potential new gateway to the city. Interchange improvements proposed as part of the I-39/90/94 study could help to support development in these areas.

In addition to meeting the study needs, the build alternatives accommodate or include bike and pedestrian connections across the interstate at interchanges, underpasses and overpasses, which supports local plans for multi-modal access.

Direct Land Use Changes

No Build Alternative

No direct land use changes would occur under the No Build alternative.

Build Alternatives

The build alternatives would reconstruct I-39/90/94 and existing interchanges and two new interchanges and require up to 229 acres of land. The Interstate and interchange preferred alternatives would require up to 225 acres of land in the study corridor, see Table 3-8.

There is very little difference between the preferred Modernization Plus Added General-Purpose Lane alternative and the Modernization Hybrid alternative. The General-Purpose Lane alternative acquires only 6 acres more land in Dane County. North of WIS 19, the lane configuration of both modernization alternatives are the same for the remainder of the study corridor and there is no difference in land use impacts north of WIS 19. Appendix A shows the potential new right of way required for build alternatives along the study corridor, which are typically strip right of way acquisitions. These acquisitions are needed to accommodate proposed safety and operation improvements. Land acquired in Dane County would largely consist of commercial and agricultural land uses. The County V Interchange Diamond alternative is within existing right of way and would not directly convert land use in the area.

Primary land use impacts in Columbia and Sauk counties are agricultural. In addition to meeting traffic demand and safety needs, mainline widening in Columbia County includes flood mitigation measures that raise the Interstate out of the 100-year floodplain. In Sauk County, the preferred Trumpet alternative at the WIS 13 Interchange generally has lower land use impacts compared to the Split Diamond alternative. Land use impacts in Juneau County are spread among various land uses.

Land use on the remaining parcels of land next to Interstate would likely not substantially change under the build alternatives for the mainline and existing interchanges. Land use near the new interchanges may see increased development pressure, which may accelerate changes to undeveloped parcels, see Section 3.25 (Indirect Effects). Table 3-8 summarizes direct land use impacts of the mainline and interchange alternatives in the study corridor by county.

Table 3-8: Direct Land Use Impacts along I-39/90/94 in Dane, Columbia, Sauk and Juneau Counties

Land Use Type	Dane County (acres)	Columbia County (acres)	Sauk County (acres)	Juneau County (acres)	All Counties Preferred Alternative (acres) [a]	Range of Total Impact (acres)
Residential	3.2-6.7	3.5	2.6-3.3	0.8	13.6	10.1-14.3
Commercial	45.8-46.2	6.4	3.4-5.0	0.9	56.9	56.5-58.5
Industrial	1.6-1.7	0	0	0	1.7	1.6-1.7
Agricultural	85.0-86.4	48.5	13.6-14.4	0.3	148.8	147.4-149.6
Transportation	<0.1	0	0	0	<0.1	<0.1
Public Land	0	2.74	<0.1	0-0.8	2.74	2.74-3.5
Open Water	1.3	0	0	0	1.3	1.3
Total	136.9 (Modernization Hybrid) 142.3 (Modernization plus Added General-Purpose Lane-Preferred Alternative)	61.1 (Modernization plus Added General-Purpose Lane – Preferred Alternative)	19.6 WIS 13 Trumpet – Preferred Alternative) 23.5 (WIS 13 Split Diamond) (Modernization plus Added General-Purpose Lane – Preferred Alternative)	2.0 (Modernization plus Added General-Purpose Lane-Preferred Alternative)	225	219.6-229

a. Impacts include both mainline and interchange preferred alternatives. Agricultural land use categories include woodlands and open lands that may not be in active agricultural use. See Section 3.6 (Agricultural Resources) for detailed discussion of agricultural impact. County V Diamond alternative does not convert land use in Dane County.

Building acquisitions and/or relocations would be required at the Milwaukee Street, I-94/WIS 30, Hoepker Road, and WIS 13 interchanges and potentially at properties impacted by flood minimization measures. Section 3.3 (Residential Development), Section 3.4 (Commercial and Industrial Development), Section 3.5 (Institutional and Public Services) and Section 3.6 (Agricultural Resources) and provide more information on building acquisitions and relocations.

3.1.5. Measures to Minimize and Mitigate Adverse Land Use Impacts

Build alternatives were designed to stay within the existing right of way as much as possible to minimize the impact on surrounding land uses. Where it is not possible to remain within existing right of way, FHWA and WisDOT would compensate property owners in accordance with applicable laws and regulations for land acquired from residences, businesses, utilities and institutions. Some land currently used as highway right of way may potentially no longer be needed as right of way. WisDOT may declare the land excess right of way and it could be converted to a different land use.

3.2. Transportation Service

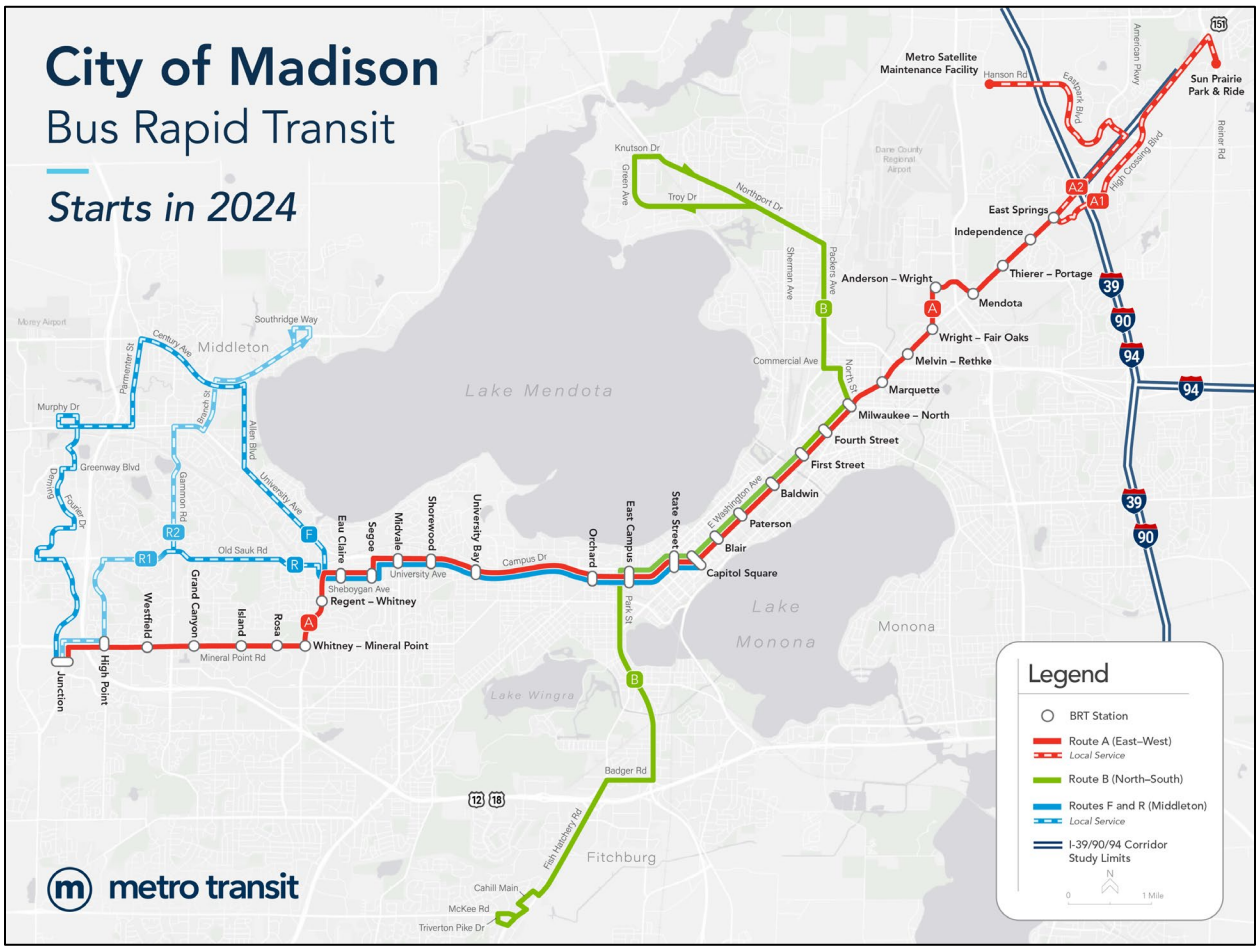
3.2.1. Affected Environment

Bus Service

The city of Madison Metro Transit provides most public transportation services in the Madison metropolitan area. Routes cross I-39/90/94 at US 151 and High Crossing Boulevard between the city of Sun Prairie and downtown Madison. Other Madison Metro Transit routes serve the village of Cottage Grove, crossing I-39/90 at Cottage Grove Road and Milwaukee Street and crossing WIS 30 at North Thompson Drive.

The city of Madison is implementing a Bus Rapid Transit (BRT) system, known as Metro Rapid, as part of an effort to improve its existing transit system and reduce travel times across the region. Route A service will start in 2024 with local service extensions that cross I-39/90/94 at US 151 and High Crossing Boulevard. Proposed BRT routes are shown in Figure 3-6.

Figure 3-6: City of Madison Bus Rapid Transit Routes



Source: https://www.cityofmadison.com/metro/routes-schedules/bus-rapid-transit/east-west-brt-line

The city of Sun Prairie also offers publicly subsidized shared-ride taxi services, primarily for intra-city trips. These services offer door-to-door transportation service within a 3-mile radius of Sun Prairie, east of I-39/90/94. In Sun Prairie, local Metro Transit service routes implemented in June 2023 will provide access to the BRT local extension. These routes interact with the study corridor along US 151, American Parkway, Reiner Road and High Crossing Boulevard.

There are no fixed-route local transit services in the study corridor in Columbia, Sauk or Juneau counties. Both the city of Portage and the Wisconsin Dells area have taxi services. Several private inter-city bus companies, such as Megabus, Greyhound, Van Galder and Badger Coaches provide regularly scheduled bus service open to the public between Madison and major destinations such as Milwaukee, Chicago and Minneapolis/St. Paul. The city of Portage is served by Coach USA/Megabus and Greyhound through a bus stop at the Amtrak station. Flixbus, Greyhound and Coach USA/Megabus provide service to the city of Wisconsin Dells and the village of Lake Delton in Sauk County. The bus stop for Wisconsin Dells is located in a parking lot on the southwest side of the WIS 23 Interchange.

Park and Ride Lots and Electric Vehicle Infrastructure

There are three existing park and ride lots near the study corridor. Two park and ride lots in the city of Sun Prairie serve Madison Metro Transit routes: the American Center (US 151/American Parkway) park and ride lot owned by WisDOT and the Sun Prairie park and ride lot owned by the city of Sun Prairie. WisDOT owns the park and ride lot in the village of DeForest, see Figure 3-7. WisDOT also continuously considers future park and ride locations, some of which may be located near the US 51 Interchange in Dane County as well as the County CS and I-39 I-90/94 Split interchanges in Columbia County.

WisDOT completed a Wisconsin Electric Vehicle Infrastructure Plan in 2022, with a vision of an interconnected electric vehicle (EV) charging network that facilitates the safe movement of people and goods throughout Wisconsin.[5] The plan analyzed existing and future conditions in the state to ensure successful build-out of Wisconsin's EV charging network. WisDOT expects electric vehicles could increase from 0.1% of the existing total registered fleet in 2022 to 31% of the total fleet in 2050. The study corridor is part of Wisconsin's designated Alternative Fuel Corridors because of its importance to serving traditionally underserved and rural portions of the state, as well as connecting tourism and recreation destinations. The plan's charging station location site criteria consider the number and types of available amenities such as fueling stations, restaurants, retail locations and big box stores. The US 12/18 and the WIS 60 interchanges meet these criteria.

[5] *Wisconsin Department of Transportation. Wisconsin Electric Vehicle Infrastructure Plan. Sept. 14, 2022.*

Figure 3-7: Existing Park and Ride Lots



Source: Wisconsin Department of Transportation

Freight and Passenger Rail Service

Freight Rail Service. There are four active freight railroad crossings in the corridor. The Wisconsin and Southern Railroad (WSOR) operates on tracks running under I-39/90 about 1 mile north of the US 12/18 Interchange and under I-39/90/94 about 1.50 miles north of the I-94/WIS 30 Interchange. The Canadian Pacific Railway (CPR) passes underneath I-39/90/94 near the WIS 19 Interchange in Dane County and again under I-90/94 north of the US 12/WIS 16 Interchange in Juneau County.

Passenger Rail Service. Amtrak's long-distance Empire Builder route, between Chicago, Milwaukee, Minneapolis/Saint Paul, Seattle and Portland serves the cities of Columbus and Portage in Columbia County and the city of Wisconsin Dells in Sauk County. Amtrak plans additional service at these stations, starting in 2024, with a new daily round-trip train between Chicago and Minneapolis/Saint Paul.[6] Amtrak coordinates with an inter-regional bus company, Lamers Bus Lines, and sells integrated tickets on their Thruway Bus service, connecting the city of Madison to the Columbus Amtrak station.

The city of Madison is working with the U.S. Department of Transportation (US DOT), Amtrak and other stakeholders to expand intercity passenger rail and to bring Amtrak service to Madison, with future connections to Milwaukee, Chicago and Minneapolis/Saint Paul.[7] [8] The potential future service would operate on tracks used by WSOR crossing under I-39/90/94.

Airports

There are three airports near the study corridor. The Dane County Regional Airport is about 2 miles west of I-39/90/94. The Dane County Regional Airport provides services to all four classes of aviation users: scheduled air carriers, commuters, general aviation and military. The Portage Municipal Airport is a public use airport in Columbia County and located about 2 miles north of the WIS 33 Interchange at I-39. The Baraboo-Wisconsin Dells Airport is a general aviation airport about 3 miles south of the US 12 Interchange in Sauk County.

Bicycle/Pedestrian/Off Road Facilities

Bicycle and pedestrian use are not permitted on I-39/90/94; however, adjacent municipalities have existing and planned bicycle facilities on surrounding roads, multi-use paths and trails. Bicycling and pedestrian use is also permitted on nearby local roads, county highways and state highways.

Madison Metropolitan Area and Dane County. Local communities actively plan and implement bicycle and pedestrian paths and sidewalks as part of the larger transportation system in Dane County. Table 3-9 summarizes relevant plans in the study corridor.

---

[6] *Amtrak Connect US. Amtrak's Vision: Madison-Milwaukee-Chicago. https://www.amtrakconnectsus.com/maps/chicago-milwaukee-madison/. Accessed May 2023.*

[7] *See note 6 above*

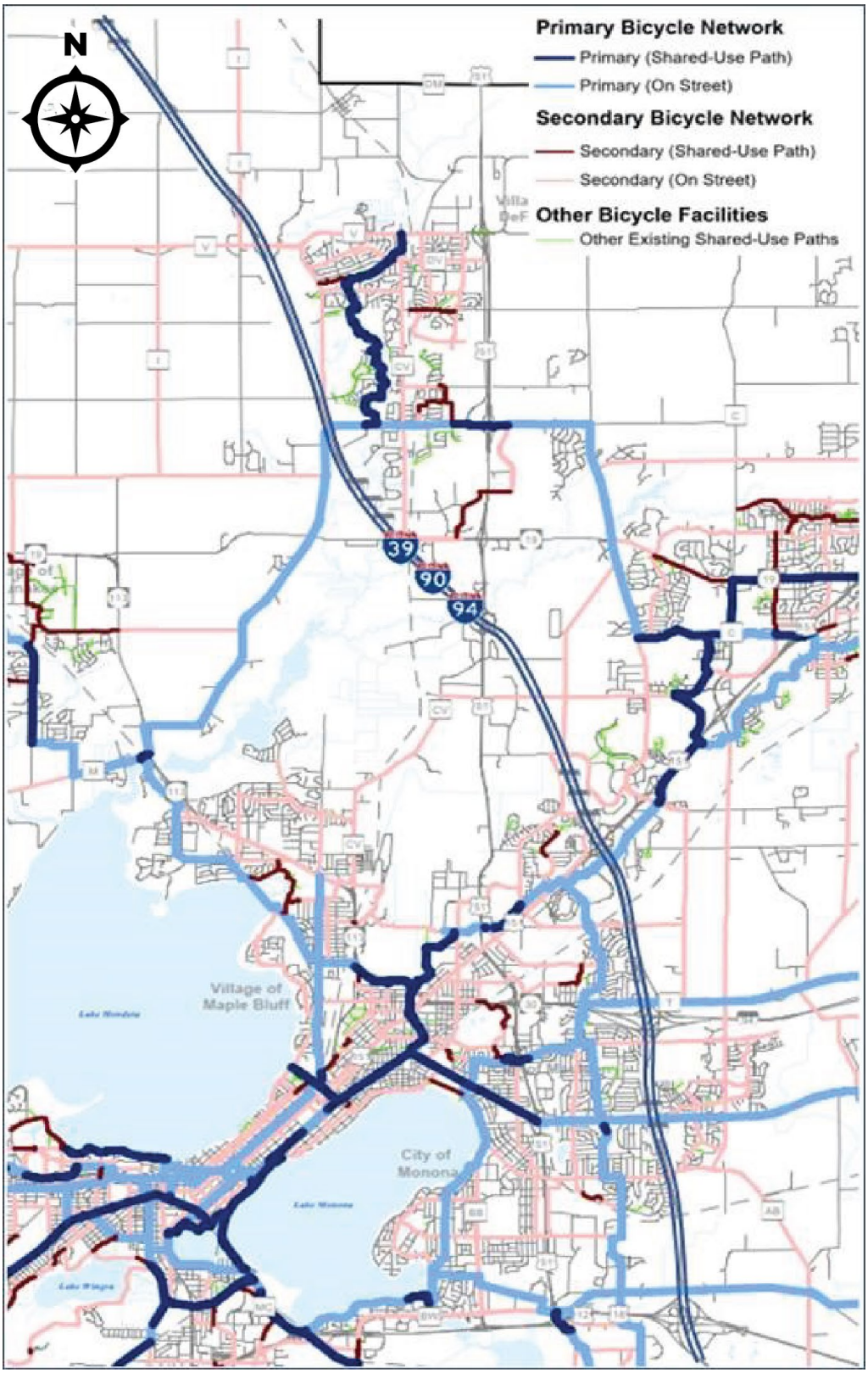
[8] *U.S. Department of Transportation Federal Railroad Administration. Midwest Regional Rail Plan. October 2021.*

Table 3-9: Bike and Pedestrian Plans in Dane County

Agency	Plan	Notes
City of Madison	*Madison in Motion 2017*	Incorporates land use planning in transportation planning to provide network connectivity within its multimodal transportation system to meet the city's goals of expanding mobility choices, improving safety and creating transportation equity for all residents.
City of Madison	*Vision Zero Action Plan 2020-2035*	Commitment to provide continuous, unobstructed and clear paths that are easy and safe to navigate for all pedestrians and bicyclists. The plan also discusses designing safe bicycling infrastructure including protected bike lanes, separated bike paths and low speed streets.
Greater Madison Metropolitan Planning Organization	*Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County, 2015*	Advances Dane County and the city of Madison's transportation goals to improve Madison's bicycle network.
City of Madison	*Pedestrian Transportation Plan, 1997*	Recommends strategies to enhance the pedestrian environment and increase opportunities to choose walking as a viable mode of transportation.
Greater Madison Metropolitan Planning Organization	*Madison Area 2050 Regional Transportation Plan*	Discusses pedestrian network improvement needs within the Madison Metropolitan Area.

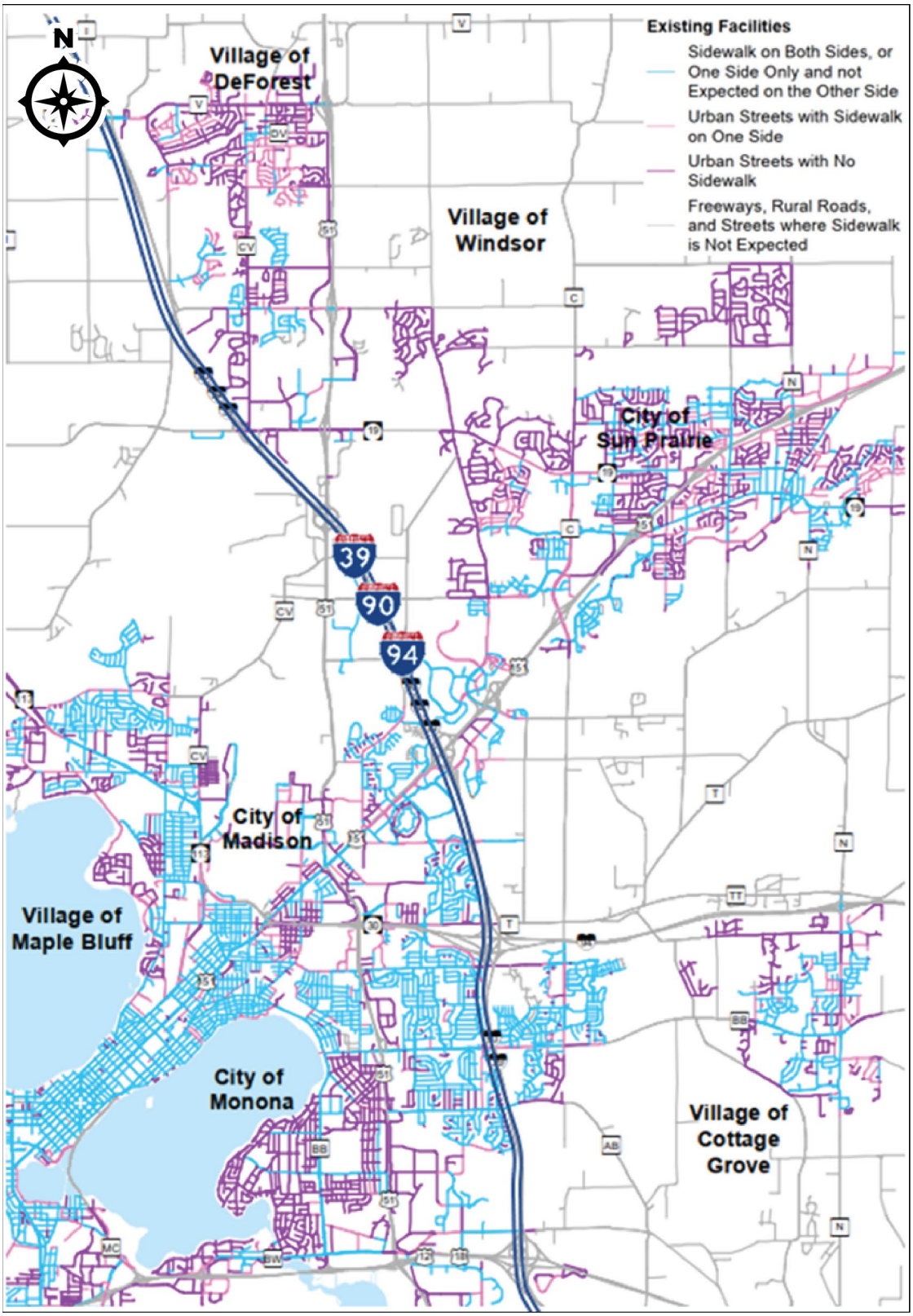
Figure 3-8 shows existing shared-use paths and on-street bicycle facilities. There are five primary on-street bike lanes crossing I-39/90/94 at Femrite Drive, Cottage Grove Road, Lien Road, High Crossing Boulevard and Hanson Road. Several other roads crossing I-39/90/94 are secondary on-street bike crossings. Figure 3-9 shows areas of existing sidewalk and areas of missing sidewalk in Madison area communities. Figure 3-10 shows potential improvement needs for sidewalks, including crossings near the study corridor. A state corridor snowmobile trail crosses over I-39/90/94 on County DM north of DeForest.

Figure 3-8: Dane County Existing Bicycle Facilities



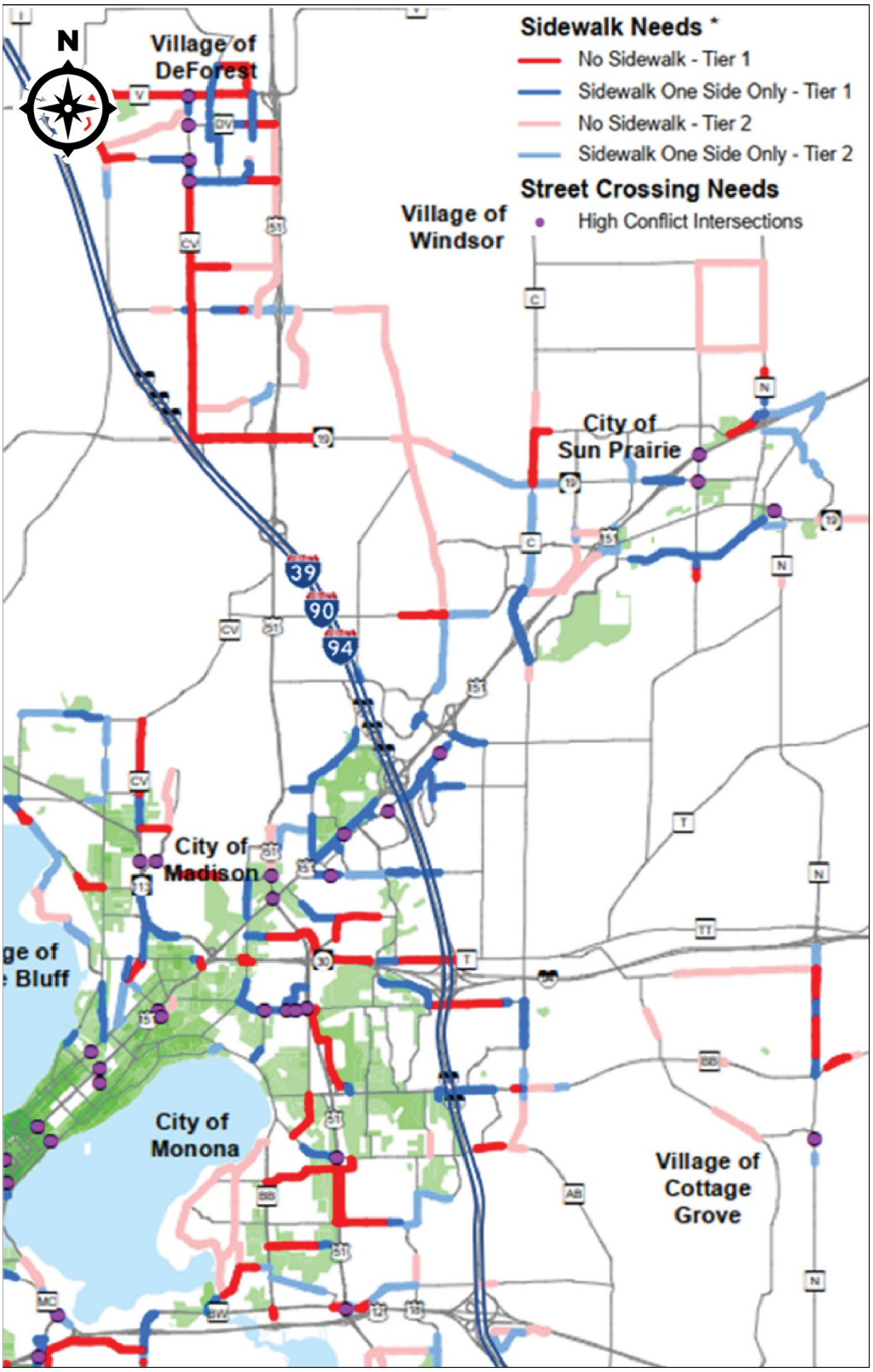
Source: Madison Area Transportation Planning Board (2015). Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County. https://www.greatermadisonmpo.org/planning/documents/Final_BTP_2015_web.pdf. Accessed in May 2023.

Figure 3-9: Existing and Missing Sidewalks in Study Corridor



Source: Madison Area Transportation Planning Board (2017). Regional Transportation Plan 2050 for the Madison Metropolitan Area. RTP_2050_Full_Report_with_Appendix_Final73117.pdf (greatermadisonmpo.org). Accessed in May 2023.

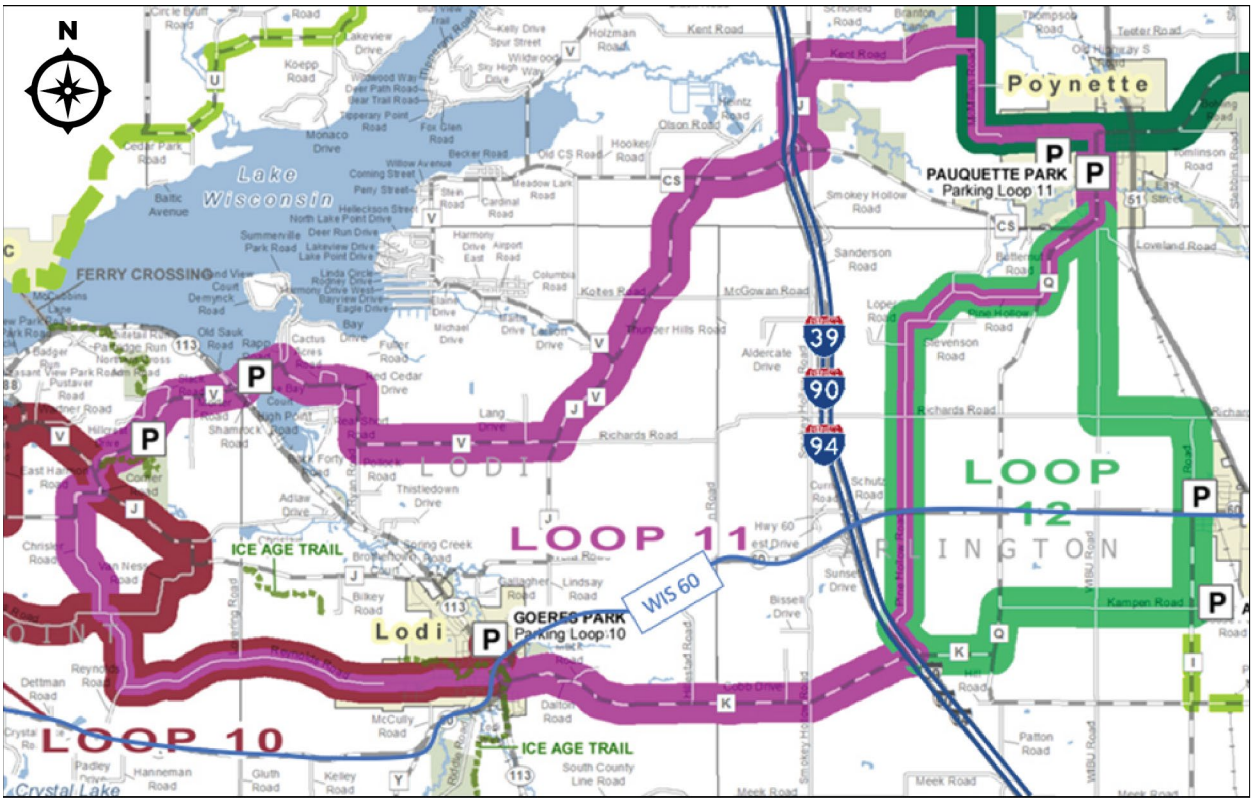
Figure 3-10: Pedestrian Improvement Needs



Source: Madison Area Transportation Planning Board (2017). Regional Transportation Plan 2050 for the Madison Metropolitan Area. RTP_2050_Full_Report_with_Appendix_Final73117.pdf (greatermadisonmpo.org). Accessed in May 2023.

Columbia County. Columbia County has two bicycle routes – known as Loop 11 and Loop 12 – that cross or run next to I-39/90/94, as shown in Figure 3-11. Neither bicycle route contains designated bike lanes, as bicycle facilities in Columbia County mainly consist of shoulder areas on existing roads. Loop 11 is approximately 34 miles long and crosses I-39/90/94 on County K and at County CS. Loop 12 is approximately 15 miles long running next to the study corridor north of County K but remains east of the Interstate. The western leg of Loop 12 is shared with Loop 11 as shown in Figure 3-11. WisDOT's bicycle map[9] rates County U and County V as having the best conditions for bicycling of roads that cross I-39/90/94 in Columbia County. County U is the only All-terrain Vehicle/Utility Task Vehicle (ATV/UTV) route that crosses I-39/90/94 in Columbia County. Snowmobile trails cross over I-39/90/94 at Richards Road and Kent Road. Pedestrian networks within Columbia County consist of sidewalks and paths within municipal limits or within parks and recreation areas. There are no sidewalks on roads crossing I-39/90/94. The Ice Age Trail crosses under I-39 at Levee Road.

Figure 3-11: Columbia County Bicycle Loop Map



Source: Columbia County Land Information. (2016). Columbia County Bicycle Loop Map. Accessed May 2023.

Sauk County. Of the roads crossing I-90/94, WIS 23 is the only road in Sauk County with dedicated bike lanes. WisDOT's bicycle map[9] rates County T as having the best conditions for bicycling of those roads crossing I-39/90/94 in the county. There are ATV/UTV routes along the majority of town roads and some county roads, including the following that cross I-90/94: Schepp Road, Van Hoosen Road, County T, Gillem Road, County A, Ishnala Road, Xanadu Road, Trout Road and County H. Snowmobile trails cross

[9] *Wisconsin Department of Transportation. Columbia County Wisconsin Bicycle Map. https://wisconsindot.gov/Documents/travel/bike/bike-maps/county/columbia.pdf. Accessed May 2023.*

I-90/94 at Ishnala Road, Trout Road and County H. WIS 23 is the only road that crosses I-90/94 with sidewalks. US 12 has sidewalks north of the US 12 Interchange, but they do not currently extend across I-90/94. The Ice Age Trail crosses under I-90/94 at Schepp Road and County H.

Juneau County. No bicycle facilities, ATV/UTV trails or sidewalks cross I-90/94 in Juneau County. However, a snowmobile trail crosses US 12 about 0.25 miles west of the US 12/WIS 16 Interchange.

3.2.2. Transportation Impacts

The difference in transportation impacts between the No Build and build alternatives are further described below. Unless noted specifically below, impacts described below are the same for all build alternatives.

Bus Service

No Build Alternative

In general, the No Build alternative would not directly impact most non-highway transportation services. However, continued deterioration of pavement and ongoing safety and congestion issues would not be addressed in the study corridor, which would reduce travel reliability on routes that transit service uses.

Build Alternatives

None of the build alternatives would affect either intercity or regional intra-city bus service. Madison Metro transit routes could continue providing service along their existing routes. Reconstructed bridges and interchanges would improve connectivity across the Interstate. The Directional alternative at the USH 151/High Crossing Boulevard Interchange, which also reconfigures the American Parkway/Nelson Road Interchange would improve mobility and safety for Madison Metro buses serving Sun Prairie and the American Center Business Park. Interchange reconstruction would address geometric deficiencies, safety issues and congestion. The improved level of service and safety on I-39/90/94 would improve travel reliability and benefit buses using I-39/90/94.

Park and Ride Lots and Electric Vehicle Charging Stations

No Build Alternative

The No Build alternative would not impact park and ride lots or existing or planned electric vehicle stations.

Build Alternatives

All the I-39/90/94 freeway and interchange build alternatives would continue to serve existing park and ride lots in the study corridor as well as future park and ride lots planned in Dane and Columbia counties. The interchange build alternatives would also provide access to future electric vehicle charging infrastructure identified in the *Wisconsin Electric Vehicle Infrastructure Plan.*

Freight and Passenger Rail Service

No Build Alternative

The No Build alternative would not impact freight or passenger rail service.

Build Alternatives

All the build alternatives would accommodate freight rail infrastructure and would not impact operations. Both freeway modernization alternatives would replace bridges over WSOR tracks in Dane County. The WIS 19 Interchange U-Ramp alternative would replace the I-39/90/94 bridge over the CPR tracks near the WIS 19 Interchange, in Dane County. The US 12/WIS 16 Interchange Diamond alternative would require replacing the I-39/90/94 bridge over CPR tracks north of the interchange in Juneau County. Reconstruction could temporarily interrupt rail service during bridge replacement activities.

Airports

No Build Alternative

The No Build alternative would not impact freight or passenger rail service.

Build Alternatives

None of the build alternatives would directly impact airports. The Interstate and interchange build alternatives may require completing an Obstruction Evaluation in coordination with the Federal Aviation Administration (FAA) during final design to determine if structures or construction equipment would interfere with flight operations during construction at either the Dane County Regional Airport, Portage Municipal Airport or the Baraboo-Dells Flight Center.

Highway Traffic and Operational Characteristics

No Build Alternative

Under the No Build alternative, I-39/90/94 would operate at a level of service of E or F in 2050, as described in Section 3.2.1. The declining traffic operations would likely divert freeway traffic onto local streets during peak travel hours because there would not be enough capacity on I-39/90/94 to handle the anticipated traffic volumes. The No Build alternative would not change existing freeway access at any interchanges, including no future access at either Hoepker Road at I-39/90/94 or Milwaukee Street on I-94.

Under the No Build alternative, none of the existing safety issues in the study corridor would be addressed. Congestion would continue to increase, which could further contribute to safety problems described in Section 1.4.2. WisDOT conducted a safety analysis of predicted average annual crash rate between 2031 and 2050 under the No Build condition. Total crashes increase 9% across Columbia, Sauk and Juneau counties with fatal and injury crashes also increasing 9% on average. Total crashes increase 26% in Dane County with fatal and injury crashes also increasing 25% on average.

The increased congestion and related safety impacts could encourage traffic diversion to local streets, increasing the potential crash risks on local streets. The No Build alternative would not address resiliency needs where prior flood events have closed both I-90/94 and I-39.

Build Alternatives

This section describes how traffic would flow on I-39/90/94, or how the Interstate would operate. Level of service (LOS) is a key descriptor to measure traffic flow and is explained in Section 1.4.1.

All build alternatives, including both freeway modernization alternatives, would improve traffic flow compared to the No Build alternative. Traffic analyses indicate the Interstate would generally operate at LOS D or better in urban areas south of County V during the morning and afternoon peak hours, as well

as Friday and Sunday afternoon peak hours in 2050, see Table 3-10. No Interstate segment would operate at LOS F.

Table 3-10: Level of Service Comparison – Year 2050

Segment	No Build	Modernization Plus General-Purpose Lane (Preferred Alternative)	Modernization Hybrid
US 12/18 to County V	LOS E and F	LOS D	LOS D
County V to I-39 I-90/94 Split Interchange	LOS D	LOS C	LOS C
I-39 I-90/94 Split Interchange to Levee Road	LOS B	LOS B	LOS B
I-39 I-90/94 Split Interchange to US 12/WIS 16	LOS E and F	LOS C	LOS C

Source: WisDOT

Note: The Modernization Hybrid lane configuration north of WIS 19 is the same as the Modernization Plus Added General-Purpose Lane alternative.

All the Interstate and interchange build alternatives would improve safety by lengthening interchange entrance and exit ramps, improving ramp curves and improving ramp site distances. The predicted Interstate crash reduction from the Modernization Hybrid alternative compared to the No Build alternative is about 1% to 3% with a predicted 1.4% reduction in fatal and injury crashes. The predicted crash reduction from the Modernization Plus Added General-Purpose Lane alternative is around 30% with a 28.3% reduction in fatal and injury crashes. The preferred WIS 13 Trumpet alternative has fewer conflict points compared to the Split Diamond alternative, which reduces crash risks.

The build alternatives may have impacts on transportation demand including both latent and induced demand. [10]

What is Induced and Latent Demand?

According to the Environmental Protection Agency, “Induced demand differs from latent demand in that it did not exist before the transportation improvement was implemented”. Latent demand is demand that existed but was suppressed before the improvement occurred while induced demand was not present until the improvement occurred. Traffic diversion can also occur, increasing the volume of the improved roadway due to re-routing of vehicles from other facilities.

Source: *U.S. Environmental Protection Agency. Guidebook on Induced Travel Demand. December 2002*

[10] *U.S. Environmental Protection Agency. Guidebook on Induced Travel Demand. December 2002.*

The I-39/90/94 facilities already exist, and surrounding areas have been identified by the Capitol Area Regional Planning Commission and Greater Madison Metropolitan Planning Organization (MPO) as locations for future growth in housing and employment in the year 2050 baseline condition, see Section 3.1.3. Accelerated development or increased intensity of development due to capacity expansion along the Interstate under both freeway modernization alternatives would be a potential source for induced demand. The Modernization Hybrid alternative does not include an added general-purpose lane in Dane County, but the added managed lane would operate during peak travel times during the weekday, as well as weekends, providing travel times similar to the Modernization Plus Added General-Purpose Lane alternative. The additional access to I-39/90/94 at the new Hoepker Road and Milwaukee Street interchanges would contribute to lower vehicle travel times to and from locations near those new interchange locations and could also be a source for induced demand.

Local Roads

No Build Alternative

The No Build alternative would not directly impact local roads. However, traffic may continue to divert from the Interstate during periods of congestion, which would impact local road traffic operations and safety of non-highway users, including pedestrians and bicyclists.

Build Alternatives

It is expected that some traffic currently using local streets to avoid congestion on I-39/90/94 would divert back to the Interstate. Neither of the freeway modernization alternatives would change local road configurations. Reconstructed interchanges, overpasses and underpasses would maintain connectivity across the Interstate. New interchanges at Hoepker Road and Milwaukee Street would improve connectivity across the Interstate. Some interchange build alternatives would affect local road traffic and/or access at existing and new interchanges, see Table 3-11. Potential changes are described below.

Table 3-11: Local Road Changes

Interchange	Alternative	Change from No Build	Impact
I-94/WIS 30	Full Modernization #2 (Preferred)	No change.	No impact.

Interchange	Alternative	Change from No Build	Impact
Milwaukee Street (new)	Partial Cloverleaf (Preferred)	Existing Milwaukee Street extended for new access to I-94. Creates a new connection to County TT north of I-94.	Milwaukee Street traffic volumes could more than double over existing conditions near Sprecher Road reaching up to 10,000 to 11,000 vehicles per day by the year 2050. The intersection of Sprecher Road and Milwaukee Street operates acceptably in 2050 under the No Build and build alternatives. Traffic volumes on County TT north of I-94 and on County N at the existing I-94 interchange, located about 3 miles east of a new Milwaukee Street interchange, could decrease by 20% or more compared to future No Build conditions.
US 151/High Crossing Boulevard	Directional (Preferred)	Relocates the American Center entrance on US 151 from American Parkway to Eastpark Boulevard but maintains the Nelson Road/American Parkway entrance from High Crossing Boulevard.	May reduce free flow speeds on US 151, particularly as traffic travels inbound to East Washington Avenue. The flyover ramp from US 151 to southbound I-39/90/94 would reduce delays on US 151. The build alternative would not have substantial impacts on local road and intersection operations.
Hoepker Road (new)	Shifted Diamond (Preferred)	New access to I-94.	By the year 2050, the new interchange could increase traffic volumes by 70% or more over future No Build conditions east of the interchange. The city of Madison would be responsible to upgrading the road beyond the interchange as anticipated in the MPO's Regional Transportation Plan. West of the interchange traffic volumes are expected to be less compared the No Build alternative. Reduces traffic using the US 151 and US 51 interchanges and the US 151 Interchange at American Parkway/Nelson Road by 15% to 20% compared to future No Build conditions.

Interchange	Alternative	Change from No Build	Impact
US 51	Partial Cloverleaf (Preferred)	Removes access to US 51 from Daentl Road and North American Lane due to close proximity to interchange, which impacts traffic operations. Daentl Road traffic would access US 51 at County CV, approximately 0.20 miles south of the existing Daentl Road access. North American Lane traffic would access US 51 at East Metro Drive, approximately 0.25 miles north of the existing North American Lane access.	All left turning traffic from Daentl Road to US 51 already uses Daentl Road to County CV to US 51. The increase in traffic on Daentl Road and County CV is associated with the right turning vehicles from Daentl Road onto US 51, which is under 50 vehicles per hour. The left turning movement from Daentl Road to County CV is projected to impact approximately 45 vehicles per hour or less in year 2050 with traffic queues and operations at the Daentl Road southbound to County CV projected to be acceptable with the current configuration. Southbound US 51 vehicles destined for Daentl Road (about 110 vehicles per hour in 2050) would continue south on US 51, turn right onto County CV, then right onto Daentl Road. Traffic operations and queues would continue to operate at acceptable levels of service at the County CV intersections with Daentl Road and US 51. Increased traffic that would access East Metro Drive is about 200 vehicles per day. The village of Deforest is currently completing a project to install a traffic signal at this intersection. There are no operational impacts anticipated by this redirected traffic.

Interchange	Alternative	Change from No Build	Impact
WIS 19	U-Ramp (Preferred)	Reconstruct and expand WIS 19 to a 6-lane road with additional turn lanes at the intersections, where needed. Eliminates two of the existing, closely spaced intersections along WIS 19 near the Interstate. The village of DeForest requested a traffic signal at the WIS 19 intersection at Williamsburg Way. The signal would be included as part of the U-Ramp alternative if the intersection meets criteria for installing a signal. The village and WisDOT are continuing coordination on the need for a traffic signal at the intersection and depending on timing for future reconstruction, the traffic signal could be installed sooner than the rest of anticipated interchange reconstruction schedule.	Improves traffic operations to LOS D or better for all intersection movements along WIS 19 in the vicinity of the interchange.
County V	No Build (Preferred)	No change.	No impact.
	Diamond	No change.	No impact.
County CS	Diamond (Preferred)	No change.	No impact.
I-39 I90/94 Split	Low Build (Preferred)	Relocates Cascade Mountain Road access to the Interstate to the WIS 78 Interchange that is embedded within the build alternative.	Interstate access to and from Cascade Mountain Road maintained. No impact to traffic operations.
WIS 33 at I-39	Diamond (Preferred)	No change.	No impact.
WIS 33 at I-90/94	Partial Cloverleaf (Preferred)	No change.	No impact.
US 12	Diverging Diamond (Preferred)	No change.	No impact.
WIS 23	Diamond (Preferred)	No change.	No impact.
WIS 13	Trumpet (Preferred)	No change.	No impact.
	Split Diamond	Provides County H with direct access to I-90/94.	The relocated access would not impact traffic operations.

Interchange	Alternative	Change from No Build	Impact
US 12/WIS 16	Diamond (Preferred)	No change.	No impact.

Other local road connections. The village of DeForest requested WisDOT to include an opportunity for overpass bridges installed for future Daentl Road and Daley Road connections over the Interstate, see Appendix B. Adding new local road connections is beyond the scope of this study, but the build alternatives would not preclude a future connection that would be evaluated as a separate project.

Bicycle/Pedestrian Facilities

No Build Alternative

The No Build alternative would not provide additional bicycle and pedestrian facilities beyond existing facilities.

Build Alternatives

The build alternatives would not remove existing bicycle or pedestrian facilities. Local roads and interchanges reconstructed as part of all build alternatives would include bicycle and pedestrian accommodations, as appropriate and in coordination with local county or municipal staff. Considerations for these accommodations are made in accordance with the *United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations* and FHWA guidance. [11,12] Wis. Stat. s. 84.01(35) notes that WisDOT shall give due consideration to establishing bikeways and pedestrian ways in all new highway construction and reconstruction projects funded in whole or in part from state funds or federal funds. Local municipalities would be responsible for long term maintenance of bicycle and pedestrian facilities.

The city of Madison and several public comments received during the formal scoping comment period also requested WisDOT to provide bicycle and pedestrian connections for improved connectivity across I-39/90/94. The city prioritized crossings as noted in Figure 3-12. Bicycle and pedestrian crossings of I-39/90/94 are included under both modernization alternatives at Milwaukee Street (priority 1). In addition, the bridges over the WSOR tracks would be replaced and would be wide enough to allow access for the Glacial Drumlin Trail and the East Towne Area Plan crossing (priorities 2 and 3). An additional bicycle and pedestrian path is proposed north of US 151 as part of the US 151/High Crossing Directional interchange alternative. The build alternatives would not preclude future crossings identified in Figure 3-12.

Additional bicycle and pedestrian accommodations included in the build alternatives listed below are also presented in Appendix A plan views:

[11] *U.S. Department of Transportation Federal Highway Administration. Bicycle and Pedestrian Program. United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations. March 11, 2010.*

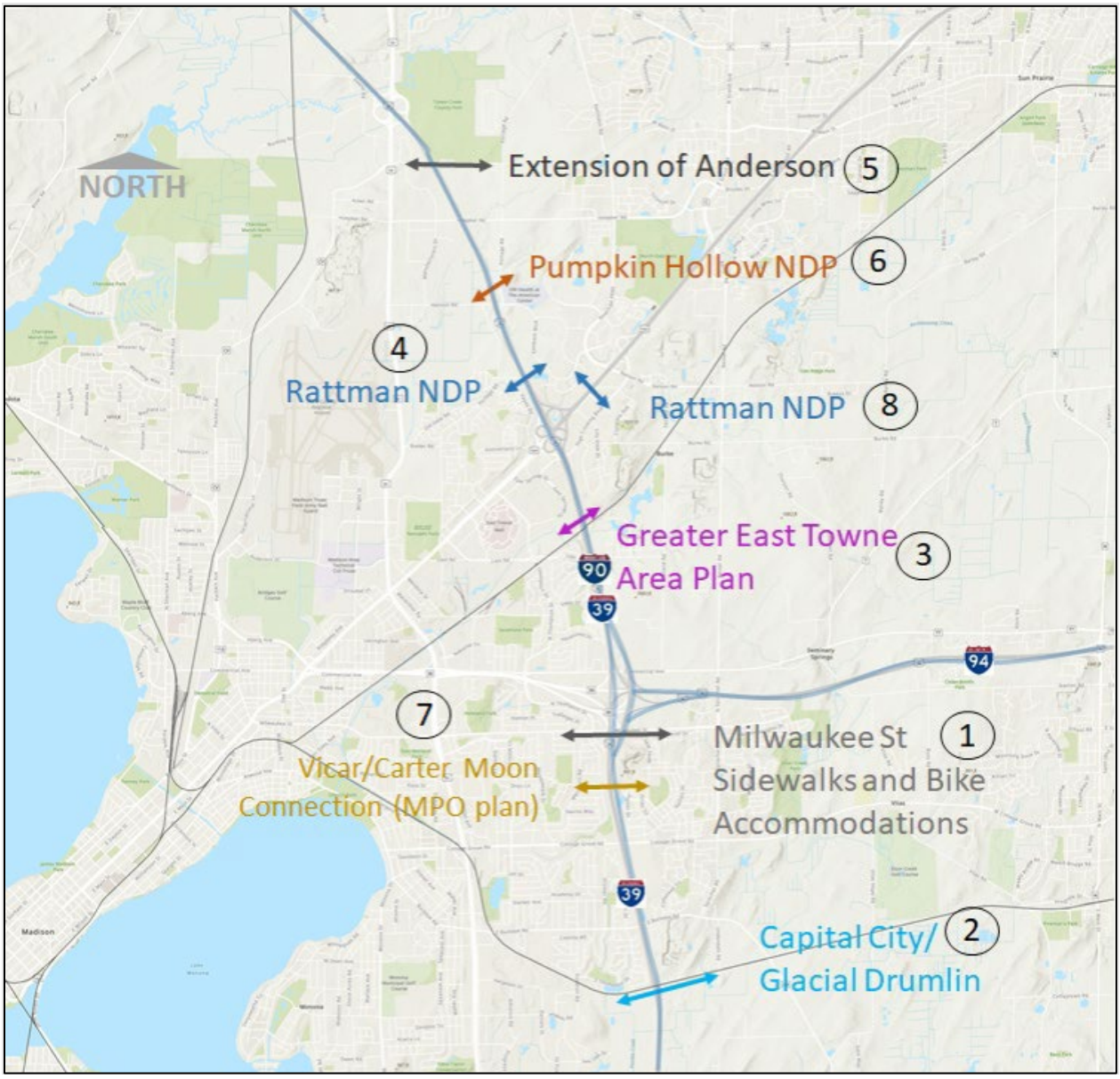
[12] *U.S. Department of Transportation Federal Highway Administration. Memorandum: Bicycle and Pedestrian Planning, Program, and Project Development Guidance. May 19, 2023.*

- Milwaukee Street Interchange – Partial Cloverleaf alternative (city of Madison): sidewalks and on-street bike lanes provided on both sides of Milwaukee Street.
- Hoepker Road Interchange - Shifted Diamond alternative (city of Madison): sidewalks and on-street bike lanes provided on both sides of Hoepker Road.
- US 51 Interchange – Partial Cloverleaf alternative (town of Burke/village of DeForest): path provided on east side of US 51.
- WIS 19 Interchange – U-Ramp alternative (village of DeForest/village of Windsor): path provided on north side of WIS 19.
- US 12 Interchange – Diverging Diamond alternative (village of Lake Delton/town of Delton): path provided on east side of US 12.
- WIS 23 Interchange - Diamond alternative (village of Lake Delton): sidewalk provided on both sides of WIS 23 and on-street bike lanes.
- WIS 13 Interchange - Split Diamond alternative (town of Delton/city of Wisconsin Dells): path provided on north side of WIS 13 to maintain connecting route access for the Ice Age Trail.

Rural roads reconstructed as part of the build alternatives would include shoulders that could accommodate bicycles and pedestrians. For other local crossings that are not part of the build alternatives, WisDOT will coordinate with the local communities during final design, pending local decisions on site locations and cost sharing agreements.

The build alternatives would require temporary closures at three of four Ice Age Trail connecting route crossings: Schepp Road, Old Highway 12/County H and 60th Street. The build alternative would not require replacing the bridge over Levee Road, the fourth connecting route crossing. WisDOT has identified detour routes during temporary closures, see Figure 3-13 and Figure 3-14.

Figure 3-12: City of Madison Priority Bicycle/Pedestrian Crossings along I-39/90/94



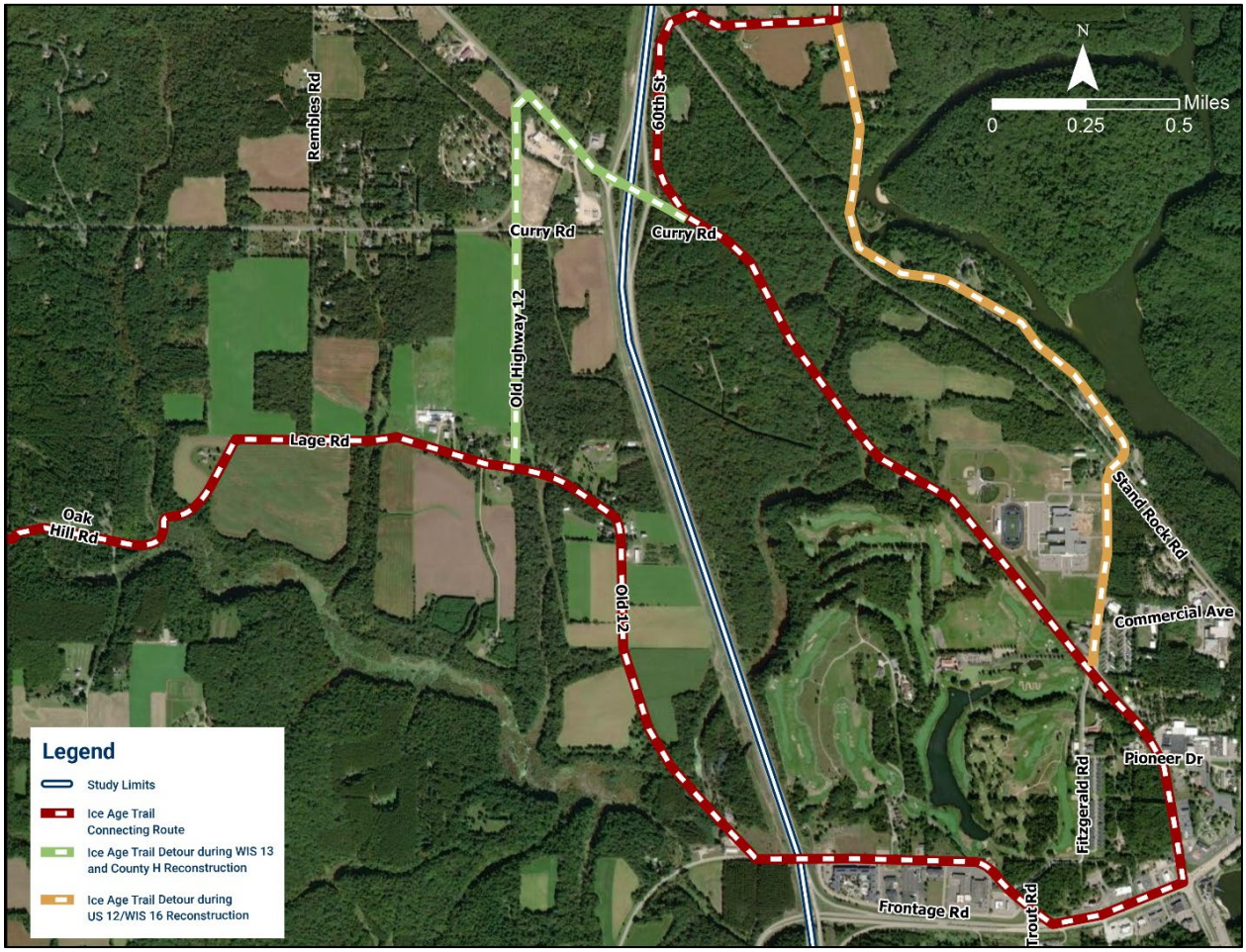
Source: City of Madison

Figure 3-13: Ice Age Trail Schepp Road Detour



Source: WisDOT

Figure 3-14: Ice Age Trail County H and 60th Street Detours



Source: WisDOT

3.2.3. Measures to Minimize and Mitigate Adverse Transportation Impacts

Section 3.24 describes measures to manage congestion during construction, as a result of lane closures and other construction activities in the study corridor. The 67-mile corridor would be constructed in phases over the course of 10 to 15 years, with each construction phase lasting from 1.5 to 3 years to minimize disruptions on other portions of the corridor that would not be in construction. For each construction phase, WisDOT will develop a transportation management plan (TMP) to coordinate and manage impacts associated with construction. TMP strategies may include temporary traffic-control measures and devices; public information and outreach; freeway service teams; and/or operational strategies such as travel demand management, staging sequential overpass, underpass and interchange closures, signal retiming and traffic incident management. WisDOT will coordinate with WSOR and the CPR to minimize interruptions to rail service at rail crossings along the study corridor. WisDOT will coordinate with Madison Metro Transit to minimize impacts to transit services and with municipalities along the study corridor to minimize impacts to pedestrian and bicycle travel during construction.

During final design, and as required, WisDOT will complete an Obstruction Evaluation and complete coordination with FAA for potential operations interference at the Dane County Regional Airport, the Portage Municipal Airport and the Baraboo-Dells Flight Center.

The additional bicycle and pedestrian facilities that are part of the build alternatives would improve public connectivity and access to employment, services and recreation on either side of the Interstate. During final design, WisDOT will coordinate with local county and municipal staff to determine bicycle and pedestrian accommodations and appropriate cost-sharing agreements.

WisDOT will coordinate with the National Park Service during final design to confirm Ice Age Trail detour routes during construction. Prior to construction, WisDOT will post detour signage for Ice Age Trail users.

3.3. Residential Development

3.3.1. Affected Environment

Most residential neighborhoods along the study corridor are concentrated in and near the city of Madison, Dane County and the village of Lake Delton, Sauk County. Residential development in areas immediately next to the study corridor are described in detail below.

Dane County

Within Dane County, the majority of residences next to the study corridor are located in the city of Madison, as part of defined neighborhoods. The village of Windsor has six residential properties along the study corridor. The city of Sun Prairie, village of DeForest and town of Burke do not have residential properties immediately along the study corridor.

The portion of the study corridor within the city of Madison runs from the US 12/18 Interchange north to approximately one-half mile south of the US 51 Interchange. The majority of Madison neighborhoods adjacent to the study corridor is fully developed, low density residential areas comprised of single- or multi-family developments. Pockets of low-medium or medium density residential, as well as parkland and commercial developments are also present. New neighborhoods are also in development or planned for development. Land use categories in the city of Madison are defined by the 2018 City of Madison Comprehensive Plan.

Between the US 12/18 and I-94/WIS 30 interchanges, neighborhoods west of I-39/90 are fully developed low density single- and multi-family residential developments. A noise barrier is present along this segment. This is the only noise barrier present along the corridor in the city of Madison. Lands along this segment and east of I-39/90 are rapidly developing former agricultural lands. Low and medium density single- and multi-family residential developments are present together with commercial, industrial and mixed land uses. North of the I-94/WIS 30 Interchange to US 51, neighborhoods west of I-39/90/94 are fully developed low and medium density developments intermixed with commercial, industrial and park lands. Lands along this section and east of I-39/90/94 are rapidly developing former agricultural lands. This area is primarily comprised of non-residential land uses, but there are pockets of low and medium density residential developments near the I-94/WIS 30 Interchange.

Columbia County

In Columbia County, the study corridor crosses rural areas with mostly farmland adjacent to the corridor and the occasional farmhouse.

Sauk County

After the I-39 I-90/94 Split Interchange, I-90/94 travels through Sauk County. The study corridor initially passes through sparsely populated farmland and recreational lands next to the Interstate before reaching developed areas in the town of Delton, village of Lake Delton and the city of Wisconsin Dells.

Along the study corridor, the town of Delton is primarily agricultural and open space. There is a subdivision of single-family homes south of I-90/94 less than one-quarter mile west of the US 12 Interchange. The nearest home is about 500 feet from the Interstate.

I-90/94 travels through the southern and western sides of the village of Lake Delton. Between the US 12 and the WIS 23 interchanges, the study corridor passes by pockets of low-density single-family housing, mainly to the south and west of the Interstate. Camp Delton, a member-owned campground with 334 campsites, is also located on the west side of I-90/94, south of the WIS 23 Interchange. Many sites have trailers and other semi-permanent dwellings. North of the WIS 23 Interchange, the study corridor passes by several low-density single and multi-family subdivisions west of and next to I-90/94.

In the city of Wisconsin Dells, there are apartment buildings being built about 600 feet southeast of the WIS 13 interchange. Low-density single and multi-family homes are also present less than one-half mile from I-90/94, located northeast of the WIS 13 Interchange and east of Trappers Turn Golf Course. Low-density single- and multi-family residences are also present on Old Hwy 12, 600 feet from I-90/94, 0.3 miles northwest of the WIS 13 Interchange.

Juneau County

The study corridor passes through the town of Lyndon. There is a subdivision of single- and multi-family homes owned by the Ho-Chunk Nation 250 feet east of I-90/94, 1.5 miles northeast of the US 12/WIS 16 interchange.

3.3.2. Residential Development Impacts

No Build Alternative

The No Build alternative would not acquire residential property or buildings nor relocate residents.

Build Alternatives

The build alternatives would acquire residential properties. Table 3-12 summarizes relocations by alternative. A new interchange at Hoepker Road would acquire a single-family residence in the southeast quadrant of the interchange. Strip residential right of way would be acquired throughout the study corridor to accommodate the build alternatives, see Appendix A for map views. Table 3-12 summarizes relocations and the number of parcels where acquisitions would occur. There is minimal difference between the freeway modernization alternatives and WIS 13 alternatives. Only one full parcel acquisition may occur, associated with a residential property impacted by flood minimization measures.

All the build alternatives would include flood minimization measures that result in increased 100-year flood elevations at one residence in the regulatory floodplain along WIS 33, between I-39 and I-90/94. Increased flood elevations at the residence would require relocation or other measures to mitigate the

impact. The recommended flood minimization option (C4) would also result in increased flood elevations at up to 9 residential properties that are outside the regulatory floodplain. WisDOT will evaluate purchasing flood easements on these properties. A flood easement would restrict development on the property to those land uses compatible with uses allowed in a floodplain. The easement is considered an acquisition, but the property owner retains ownership of the property. WisDOT would compensate the property owner for the restricted use. The easement would be applicable to existing and future property owners. See Section 3.13.2 for more discussion on the flood minimization analysis. WisDOT met with affected property owners in January 2024 to discuss potential flood elevation changes and additional measures to mitigate property impacts. Property owners did not raise issues of concern.

Table 3-12: Residential Relocations and Parcel Acquisitions by Alternative

County	Alternative	Relocations (location)	Number of Residential Parcels Partially Acquired (acres)	Number of Residential Parcels Fully Acquired (acres)
Dane	Modernization Plus General-Purpose Lane (preferred) + preferred interchange alternatives	1 (Hoepker Road Interchange)	56 (3.9 acres)	1 (5 acres)
	Modernization Hybrid + preferred interchange alternatives	1 (Hoepker Road Interchange)	56 (2.9 acres)	1 (5 acres)
Columbia (see note)	Modernization Plus General-Purpose Lane (preferred)+ preferred interchange alternatives	1 (WIS 33)	9 (3.1 acres)	1 (4.6 acres) Acquisition and relocation pending further coordination with property owner. Other mitigation measures could include flood protection of existing structures.
Sauk (see note)	Modernization Plus General-Purpose Lane (preferred) + preferred interchange alternatives + WIS 13 Split Diamond	0	12 (3.3 acres)	0

County	Alternative	Relocations (location)	Number of Residential Parcels Partially Acquired (acres)	Number of Residential Parcels Fully Acquired (acres)
	Modernization Plus General-Purpose Lane (preferred) + preferred interchange alternatives + preferred WIS 13 Trumpet	0	11 (2.6 acres)	0
Juneau (see note)	Modernization Plus General-Purpose Lane (preferred) + US 12/WIS 16 Diamond (preferred alternatives)	0	3 (0.2 acres)	0

Source: WisDOT

Note: There are no residential acquisitions under either County V No Build or County V Diamond alternatives. The lane configuration for the Modernization Plus Added General-Purpose Lane and Modernization Hybrid alternatives are the same north of WIS 19 in DeForest, Dane County.

None of the build alternatives, including reconstructed and new interchanges or changes to local roads would split a neighborhood. I-39/90/94 would remain in its existing corridor and largely within the existing right of way. A new interchange at Milwaukee Street would not split existing neighborhoods and would provide access to planned development north of I-94 (the Northeast Neighborhoods) and within the Sprecher East Neighborhood south of I-94. The residential land uses for the area south of I-94 in the Sprecher East neighborhood include single-family, multi-family, and mixed-use commercial/residential development.

WisDOT completed a Conceptual Stage Relocation Plan (CSRP) in February 2024 that indicated suitable replacement housing is available in the area. Table 3-13 summarizes the number of similar single-family houses within a 25-mile radius of impacted properties. Replacement properties can be within 50 miles of an impacted property by state law, but they must be financially feasible.[13] Table 3-14 summarizes the availability of replacement housing and Table 3-15 summarizes availability of single-family rental properties. During relocation process, WisDOT will interview the parcel owners/tenants being relocated. The interview will determine the affected individuals' preferences that WisDOT will factor into its relocation package.

[13] *Wisconsin State Legislature. Wisconsin Department of Administration Administrative Code. Wisconsin Legislature: Adm 92.52. Accessed June 10, 2024.*

Table 3-13: Number of Available and Comparable Single-Family Homes

Comparable Unit	3-Bedroom Unit	4-Bedroom Unit	5-Bedroom Unit	6-Bedroom Unit	Radius (miles)
Single Family	8	3	0	0	25

Table 3-14: Availability of Replacement Housing in DeForest, Sun Prairie, Madison and Marshall

Number Available	Value – Range
1	$350,000-$399,000
7	$400,000-$499,000
0	$500,000-$599,999
2	$600,000-$699,999
0	$700-$799,999
0	$800,000-$899,999
0	$900,000-$999,999
1	$1,000,000-$1,400,000

Source: Zillow, Apartments.com, Realtpor.com/MLS

Table 3-15: Availability of Single-Family Rentals

Rental Price Ranges (per month)	Number/Location
$1,800-$2,099 3-4 bedrooms	1/Sun Prairie
$2,100-2,399 3-4 bedrooms	1/Madison
$2,400-$2,699 3-4 bedrooms	0
$2,700-$3,000 3-4 bedrooms	1/Sun Prairie 2/Madison

Source: Zillow, Apartments.com, Realtpor.com/MLS

3.3.3. Measures to Minimize and Mitigate Adverse Residential Impacts

WisDOT developed the build alternatives to stay within the existing right of way as much as possible to minimize the impact on adjacent residences. Any property acquisition would be in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, 42 U.S.C. 4601-4655 (Uniform Act). The Uniform Act regulations are in 49 CFR Part 24.

Before initiating any type of property acquisition activities, WisDOT would contact property owners and give a detailed explanation of the acquisition process and Wisconsin's Eminent Domain Law set forth in Wis. Stat. s. 32.05. Any property acquired would be inspected by one or more professional appraisers.

The property owner would be invited to accompany the appraiser during the inspection to ensure that the appraiser is informed of every aspect of the property. Property owners would be given the opportunity to obtain an appraisal by a qualified appraiser that would be considered by WisDOT in establishing just compensation. Based on the appraisals, the value of the property would be determined, and that amount offered to the owner. In the event agreement on fair market value cannot be reached, the owner would be advised of the appropriate appeal procedure. WisDOT will also continue coordination with the impacted property owner within the regulatory floodplain to determine acquisition or other mitigation measures such as floodproofing structures. WisDOT will mitigate impacts of flood elevation rises under the 2D model through the buying of easements to the limits of allowable under Wis. Stat. s. 86.255.

Demographic data for the areas in which residential displacements would occur do not indicate age, disability, or income characteristics that would require special relocation consideration or services. If unusual circumstances were to arise during real estate activities, WisDOT real estate personnel would be available to provide appropriate relocation services. Any septic tanks, drain fields or wells on acquired properties would be abandoned in accordance with federal, state regulations and local zoning standards. WisDOT will survey all buildings to be demolished to determine whether asbestos or lead paint is present. All appropriate and applicable engineering and regulatory controls will be followed during the handling and disposal of asbestos-containing material and lead-based paint. Before a contractor demolishes a building that may contain or is known to contain asbestos, the contractor will notify WDNR and the Wisconsin Department of Health and Family Services at least 10 working days before starting the work, using WDNR Form 48500-113: “Notification of Demolition and/or Renovation and Application for Permit Exemption.” Prior to building demolition, WisDOT will also inspect buildings for presence migratory bird nests and threatened and endangered bat species. If species are present, WisDOT will coordinate with WDNR and USFWS, as needed, to implement avoidance, minimization and mitigation measures.

3.4. Commercial and Industrial Development

3.4.1. Affected Environment

Several commercial and industrial development areas exist along the study corridor, primarily focused around existing and future planned interchanges. In Dane County, the highest concentration of commercial and industrial development is found along the Interstate, centered around the US 151 and US 51 interchanges. Substantial commercial development is also mostly located in/around the Wisconsin Dells in Sauk County. The Wisconsin Dells is a tourist-oriented attraction in Sauk County that includes several resorts adjacent to the US 12 and WIS 13 interchanges. Outside of the Wisconsin Dells, commercial and industrial development in Columbia, Sauk and Juneau counties is primarily limited to the land around interchanges. Commercial and industrial development at interchanges is described in Table 3-16.

Table 3-16: Descriptions of Commercial and Industrial Development at Interchanges

Interchange	Commercial and Industrial Development
Milwaukee Street (new)	Planned commercial development along I-94, east of the I-94/WIS 30 Interchange consistent with local land use plans

Interchange	Commercial and Industrial Development
US 151 and High Crossing Boulevard Interchanges	Robust commercial and industrial development is present. Located west of I-39/90/94 and south of US 151, the Greater East Towne area is a large commercial area. The area includes hotels, gas stations, office spaces, retail establishments and restaurants. East of I-39/90/94 and south of US 151 includes lodging, office space, and automobile sales and service businesses along High Crossing Boulevard from I 39/90/94 to Nelson Road. The American Center Business Park, east of I-39/90/94 and north of US 151 includes existing and planned offices, hotels, retail establishments, medical centers and restaurants. Commercial development west of I 39/90/94 and north of US 151 includes office spaces, retail establishments, hotels and restaurants.
Hoepker Road (new)	Commercial and industrial development west of I-39/90/94 is present on both sides of Hoepker Road. Additional development is planned east of the Interstate, see Section 3.1.3.
US 51	There is commercial development along both sides of I-39/90/94 and US 51. Businesses include an automobile rental service center, gas stations, retail spaces, construction services and trucking services.
WIS 19	Businesses along I 39/90/94 and WIS 19 include retail spaces, restaurants, lodging, automobile centers and gas stations. The village of DeForest plans further commercial development west of the interchange.
County V	There is existing commercial development at this interchange east along both sides of County V in the village of DeForest and town of Vienna. The village plans further commercial development at the interchange. This interchange also serves a Wisconsin State Patrol regional office to the east. Other businesses include gas stations, restaurants, retail spaces, hotels and plastic manufacturing. The village recently approved plans for a substantial convenience store development at County V.
County CS	Commercial development is primarily highway-related gas stations and restaurants.
I-39 I-90/94 Split	There is existing commercial development along both sides of the I-39 I-90/94 Split Interchange in the town of Caledonia. To the west is a large travel center/truck stop and two hotels. To the east is a metal supplier. The Cascade Mountain ski resort is to the north along the west side of I-90/94.
I-39/WIS-33	There is no commercial development at this interchange.
I-90/94 and WIS 33	There is limited commercial development including a gas station and a trailer sales and service business. Cascade Mountain ski resort is to the south.
US 12	Substantial commercial development on the north side of I-90/94 along US 12 in the village of Lake Delton including several resorts and hotels, an outlet mall and numerous restaurants.
WIS 23	Substantial commercial development including a shopping mall, several large retail outlets, gas stations, theater and lodging is located west of I-90/94, primarily south of WIS 23. To the east is a gas station, music venue and additional lodging.
WIS 13	There is substantial commercial development including several resorts, hotels and restaurants east of I-90/94 along WIS 13. The Polynesian Wisconsin Dells Hotel is the closest business to I-90/94.
US 12/WIS 16	Commercial development is primarily highway-related gas stations and restaurants. US 12/WIS 16 provides another access route to the Wisconsin Dells.

3.4.2. Commercial and Industrial Property Impacts

Although I-39/90/94 is access-controlled (meaning no business entrances are connected directly to the freeway), commercial and industrial centers rely on access to the Interstate via interchanges throughout the corridor. Service-oriented businesses located near interchanges rely on freeway travelers for their continued viability. Impacts to commercial and industrial areas can include direct property impacts such as acquisitions and relocations, as well as access changes.

No Build Alternative

The No Build alternative would not acquire commercial or industrial properties. However, without improvements to the study corridor, commercial and industrial businesses that rely on access to and from the Interstate may experience deterioration in safety, traffic operations and overall travel time reliability. The No Build alternative would not require property acquisitions or relocations at either Hoepker Road at I-39/90/94 or Milwaukee Street at I-94.

Build Alternatives

All the build alternatives would include flood minimization measures that result in increased 100-year flood elevations at one existing commercial business and one vacant commercial business in the regulatory floodplain. Increased flood elevations at the properties could require relocation or other measures to mitigate impacts. The recommended flood minimization option (C4) would also result in increased flood elevations at up to 3 businesses and 3 vacant businesses that are outside the regulatory floodplain. WisDOT will evaluate purchasing flood easements on these properties. A flood easement would restrict development on the property to those land uses compatible with uses allowed in a floodplain. The easement is considered an acquisition, but the property owner retains ownership of the property. WisDOT would compensate the property owner for the restricted use. The easement would be applicable to existing and future property owners. Flood elevation would decrease at three businesses. See Section 3.13.2 for more discussion on the flood minimization analysis. WisDOT met with affected property owners in January 2024 to discuss potential flood elevation changes and additional measures to mitigate property impacts. Property owners did not raise issues of concern.

In addition to business properties affected by flood minimization measures, the WIS 13 alternatives would acquire and relocate commercial properties as summarized in Table 3-17. Some structures would be replaced on-site. The preferred WIS 13 Trumpet alternative would acquire and displace fewer commercial properties compared to the Split Diamond alternative. None of the other build alternatives would acquire and relocate commercial properties. All the build alternatives would acquire strip acquisitions along the corridor as shown in Appendix A and summarized in Table 3-18.

Table 3-17: Commercial and Industrial Acquisitions and Displacements by Alternative

Alternative	Relocate or Replace on-site	Property	Comments
Flood minimization (associated with all alternatives)	Relocate	1 commercial business 1 vacant business	Acquisition and relocation pending further coordination with property owners. Other mitigation measures could include flood protection of existing structures.

Alternative	Relocate or Replace on-site	Property	Comments
WIS 13 Interchange Spilt Diamond and Trumpet (preferred)	Replace on-site	Maintenance building	The Polynesian Hotel uses the building for laundry services, storage, inventory and equipment parking. A new northbound exit ramp at County H would require removing the building under both alternatives. The Split Diamond alternative would remove the westernmost two entrances. Access maintained via a third driveway along County H, a fourth driveway on N. Frontage Road along WIS 13, as well as an added access point where N. Frontage Road is reconstructed at the west side of the property.
WIS 13 Interchange Spilt Diamond	Relocate	Retail business	Building used for recreation purposes, including selling firewood. County H reconstruction to current standards impacts the building.
WIS 13 Interchange Spilt Diamond	Replace on-site	Shed	2,100 square-foot shed with an attached 600 square-foot shed used for equipment storage at Trappers Turn Golf Course. New northbound entrance ramp at County H impacts the structure. Shed will be relocated on property.
WIS 13 Interchange Spilt Diamond	Replace on-site	3 off-premises signs	Signs have electrical service. County H reconstruction to current standards impacts 2 signs and new northbound entrance ramp at County H impacts 1 sign.

Table 3-18: Commercial and Industrial Business Relocations and Parcel Acquisitions by Alternative

County	Alternative	Relocations (location)	Number of Commercial and Industrial Parcels Partially Acquired (acres)	Number of Commercial and Industrial Parcels Fully Acquired (acres)
Dane	Modernization Plus General-Purpose Lane (preferred) + all preferred interchange alternatives	0	118 (43.5 acres)	0
	Modernization Hybrid + all preferred interchange alternatives	0	118 (40.9 acres)	0

County	Alternative	Relocations (location)	Number of Commercial and Industrial Parcels Partially Acquired (acres)	Number of Commercial and Industrial Parcels Fully Acquired (acres)
Columbia (see note)	Modernization Plus General-Purpose Lane (preferred) + all preferred interchange alternatives	2, including 1 vacant business (WIS 33) Acquisition and relocation pending further coordination with property owner. Other mitigation measures could include flood protection of existing structures	10 (5.6 acres)	2 (48.8 acres)
Sauk (see note)	Modernization Plus General-Purpose Lane (preferred) + all preferred interchange alternatives + WIS 13 Split Diamond	1 retail business 1 hotel maintenance building 1 shed (County H)	11 (5.0 acres)	0
	Modernization Plus General-Purpose Lane (preferred) + all preferred interchange alternatives + preferred WIS 13 Trumpet	1 hotel maintenance building (County H)	11 (3.0 acres)	0
Juneau (see note)	Modernization Plus General-Purpose Lane + US 12/WIS 16 Diamond (preferred alternatives)	0	2 (0.9 acres)	0

Source: WisDOT.

Note: There are no residential acquisitions under either County V No Build or County V Diamond alternatives. The lane configuration for the Modernization Plus Added General-Purpose Lane and Modernization Hybrid alternatives are the same north of WIS 19 in DeForest, Dane County.

3.4.3. Commercial and Industrial Access Changes

No Build Alternative

The No Build alternative would not change access to or from commercial or industrial areas. However, the alternative would not address safety and operational problems at interchanges, nor would it address future traffic volumes that may cause additional congestion for vehicles entering and exiting I-39/90/94.

The No Build alternative would not provide new access to existing and planned development at either Hoepker Road at I-39/90/94 or Milwaukee Street at I-94 as anticipated in the city of Madison's local plans, see Section 3.1 (Land Use). Local development would continue to rely on existing interchanges, where ongoing operating and safety issues would not be addressed and may delay planned development.

Build Alternatives

Some of the interchange build alternatives would change access to commercial and industrial properties, see Table 3-19 and maps in Appendix A. Except for the WIS 13 Split Diamond alternative, all other interchange alternatives are the preferred alternative. See also Local Roads in Section 3.2.2. None of the other build alternatives impact access.

Table 3-19: Commercial and Industrial Business Access Changes

Interchange	Alternative	Change	Commercial/Industrial Business Access Maintained
Milwaukee Street (new)	Partial Cloverleaf (Preferred)	Provides direct access to existing and planned commercial development along Milwaukee Street, both north and south of I-94.	Yes
US 151/High Crossing Boulevard	Directional (Preferred)	Relocates the American Center entrance on US 151 from American Parkway to Eastpark Boulevard but maintains the Nelson Road/American Parkway entrance from High Crossing Boulevard.	Yes
Hoepker Road (new)	Shifted Diamond (Preferred)	Provides direct Interstate access to existing and planned development in the American Center Business Park. It also provides access to Sun Prairie's Prairie Lakes retail center via Hoepker Road, as well as industrial and business properties west of the Interstate.	Yes

Interchange	Alternative	Change	Commercial/Industrial Business Access Maintained
US 51	Partial Cloverleaf (Preferred)	Removes access to US 51 from Daentl Road and North American Lane. Daentl Road traffic would access US 51 at County CV, approximately 0.20 miles south of the existing Daentl Road access. North American Lane traffic would access US 51 at East Metro Drive, approximately 0.25 miles north of the existing North American Lane access.	Yes
WIS 13	Split Diamond (not preferred)	Removes two driveways on County H at Polynesian Hotel. Access maintained at third driveway.	Yes

Note: All alternatives preferred except the WIS 13 Split Diamond alternative.

Other modifications described in Section 3.2.2 would maintain access to commercial and industrial development and improve safety for existing and future commercial and industrial traffic.

All of the build alternatives would require multi-year construction that may require long-term closures of some ramps. Access to businesses would be maintained during construction. Commuters, recreational traffic, business patrons, shippers and suppliers would experience short-term inconvenience and additional travel time. Additional discussion about traffic impacts during construction is included in Section 3.24 (Construction).

3.4.4. Measures to Minimize and Mitigate Adverse Commercial and Industrial Impacts

WisDOT designed build alternatives to stay within existing right of way as much as possible to minimize the impact on surrounding commercial and industrial properties. Where it was not possible to avoid properties, commercial and industrial acquisitions and relocations will be performed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended. In addition to providing just compensation for property acquired, additional benefits are available to eligible displaced businesses, including relocation advisory services, reimbursement of moving expenses and down-payment assistance. As required by the Uniform Act and Wisconsin's Eminent Domain Law, no business will be displaced unless a comparable business location is available, or when a comparable location is not available, other compensation is provided. Compensation is available to all displaced businesses without discrimination.

Before initiating any type of property acquisition activities, WisDOT will contact property owners and give a detailed explanation of the acquisition process and Wisconsin's Eminent Domain Law set forth in Wis. Stat. s. 32.05. Any property acquired will be inspected by one or more professional appraisers. The

property owner will be invited to accompany the appraiser during the inspection to ensure that the appraiser is informed of every aspect of the property. Property owners will be given the opportunity to obtain their own appraisal, by a qualified appraiser, which will be considered by WisDOT in establishing just compensation. Based on the appraisal(s), the value of the property will be determined and that amount offered to the owner. WisDOT will mitigate impacts of flood elevation rises under the 2D model through the buying of easements to the limits of allowable under Wis. Stat. s. 86.255. WisDOT will continue coordination with business owners affected by potential flood elevation changes.

Demographic data for the areas in which commercial/industrial displacements would occur do not indicate age, disability, or income characteristics that would require special relocation consideration or services. If unusual circumstances were to arise during real estate activities, WisDOT real estate personnel would be available to provide appropriate relocation services.

Any septic tanks, drain fields or wells on acquired properties would be abandoned in accordance with federal, state regulations and local zoning standards. WisDOT will survey all buildings to be demolished to determine whether asbestos or lead paint is present. All appropriate and applicable engineering and regulatory controls will be followed during the handling and disposal of asbestos-containing material and lead-based paint. Before a contractor demolishes a building that may contain or is known to contain asbestos, the contractor must notify WDNR and the Wisconsin Department of Health and Family Services at least 10 working days before starting the work, using WDNR Form 48500-113: “Notification of Demolition and/or Renovation and Application for Permit Exemption.” Prior to building demolition, WisDOT will also inspect buildings for presence migratory bird nests and threatened and endangered bat species. If species are present, WisDOT will coordinate with WDNR and USFWS, as needed, to implement avoidance, minimization and mitigation measures.

3.5. Institutional and Public Services

3.5.1. Affected Environment

Emergency Services

Fire protection along the study corridor is provided by municipalities and volunteer groups. The service area for these providers generally follows city, village, town and county boundaries. Within Dane County, fire protection along the study corridor is provided by the cities of Madison and Sun Prairie and the village of DeForest fire departments. The Arlington Volunteer, Poynette Dekorra and Portage fire departments provide fire protection in Columbia County, while the Baraboo and Delton fire departments cover Sauk County. The Kilbourn Fire Department serves portions of Columbia, Sauk and Juneau counties.

Emergency medical service (EMS) providers along the study corridor vary by county. In Dane County, the UW Health East Madison Hospital, SSM Health Emergency Center – Sun Prairie, and Concentra Urgent Care – Madison are all within 2 miles of the study corridor. In Dane County, two EMS districts serve the study corridor itself: Madison Fire Department and DeForest Fire Department/EMS. In Columbia County, three EMS districts service the study corridor: Arlington, Poynette Dekorra and Divine Savior. The Baraboo and Dells Delton EMS districts serve the portions of Sauk and Juneau counties within the study corridor.

The Wisconsin State Patrol and county sheriff’s departments provide law enforcement on I-39/90/94. There is a Wisconsin State Patrol Station located on County V about one-half mile east of the corridor.

The Madison Police Department, Sun Prairie Police Department and DeForest Police Department serve communities next to the Interstate in Dane County. The Madison Police Department East Station is located west of and adjacent to the Interstate at Cottage Grove Road, south of the I-94/WIS 30 Interchange. The Portage Police Department, Lake Delton Police Department and Wisconsin Dells Police Department serve communities next to the study corridor in Columbia and Sauk counties. County sheriffs serve unincorporated areas in the study corridor.

Schools

Several school district boundaries cross the study corridor or the Interstate forms a district boundary. The Interstate and connecting local roads all serve local school districts for student transportation and district activities. School districts in Dane County include Monona Grove, McFarland, Madison Metropolitan, Sun Prairie, DeForest Area and Waunakee Community School District. Holy Cross Lutheran School and Holy Cross Early Childhood Education Center are west of and next to the Interstate, north of the I-94/WIS 30 Interchange at Commercial Avenue.

The Lodi, Poynette and Portage Community school districts serve Columbia County residents. The Wisconsin Dells and Baraboo school districts serve Sauk County and Juneau County residents in the study corridor. No schools directly abut the Interstate in Columbia, Sauk or Juneau counties.

Places of Worship

Three churches, Calvary Gospel Church, Crosspoint Church of Nazarene and Holy Cross Lutheran Church are next to the Interstate at the northwest quadrant of the I-94/WIS 30 Interchange in Dane County. In Sauk County, Mountain Faith Church is about 600 feet south of I-90/94 near the US 12 Interchange. Its property abuts the Interstate. Camp Chi in Lake Delton is a 600-acre religious summer camp that includes Perlstein Retreat Center, a year-round conference center. It is one-quarter mile west of the WIS 23 Interchange. The Indian Baptist Church and Cemetery is about 500 feet northeast of the US 12/WIS 16 Interchange.

Military Buildings

The Truax Field Air National Guard Base is located at the Dane County Regional Airport, one mile west of the study corridor. The U.S. Armed Forces Reserve Center is about one-half mile west of the study corridor, approximately mid-way between the US 151 Interchange and the US 51 Interchange.

Government Buildings

Dane County manages a highway maintenance building within the I-94/WIS 30 Interchange. The USFWS Leopold Wetland Management District Office is about 250 feet from I-90/94, northwest of the I-39 I-90/94 Split Interchange. The WDNR has three small storage buildings in the Pine Island State Wildlife Area on the north side of I-90/94, northwest of the I-90/94 and WIS 33 Interchange. The two WDNR buildings closest to I-90/94 are about 170 feet from the Interstate. Caledonia Town Hall is 1.50 miles from study corridor, southwest of the I-39 I-90/94 Split Interchange.

3.5.2. Institutional and Public Service Impacts

No Build Alternative

The No Build alternative would not impact institutional or public services along the study corridor. However, design deficiencies and poor traffic operations would persist, which could affect travel reliability and safety, including emergency service response time.

Build Alternatives

All the build alternatives would reconstruct I-39/90/94 and interchanges largely on the existing alignment. Access points to and across the Interstate would be maintained, and no reduced accessibility for emergency services is anticipated.

The I-94/WIS 30 Interchange Full Modernization #2 alternative would relocate the Dane County Highway Maintenance building. The building is located within the interchange, with access from County T and to I-39/90/94, see Appendix A. The site includes a salt storage shed and Interstate maintenance activities are staged from the site. Current design standards avoid placing buildings with direct access to the Interstate. WisDOT is continuing coordination with Dane County to determine if the site can be maintained within the interchange with access from local roads or would be relocated.

The Shifted Diamond alternative at Hoepker Road would provide new access to the UW Health East Madison Hospital east of the Interstate. The build alternatives would change access at other interchanges as described in Section 3.2.2, but access to institutional and public services are maintained.

Flood minimization measures along I-39 and I-90/94 would raise the 100-year water surface elevation slightly at the Leopold Wetland Management District Office located in the Baraboo River Waterfowl Production Area. The revised 100-year water surface elevation would encroach on a maintenance and storage garage and some parking associated with the garage and may require relocation on site or other floodproofing measures to mitigate impacts. One to three buildings on the Pine Island State Wildlife Area would also be similarly impacted. See Section 3.13.2 for detailed discussion of the flood minimization analysis. WisDOT has met with both USFWS and WDNR to describe potential impacts and are continuing discussion on suitable measures to avoid or minimize impacts.

None of the build alternatives would have long-term impacts to schools or would interfere with school district services that transport students within the study corridor. Detours may be required for school buses during construction, which would be inconvenient, but short-term. None of the build alternatives would impact military facilities or places of worship.

3.5.3. Measures to Minimize and Mitigate Adverse Institutional and Public Services Impacts

WisDOT will continue coordination with USFWS to finalize measures to mitigate changes in the 100-year water surface elevation at Baraboo River Waterfowl Production Area field office. WisDOT will also continue coordination with WDNR to finalize measures to mitigate changes in the 100-year water surface elevation at the Pine Island State Wildlife Area. See Section 4 for additional coordination with USFWS and WDNR. WisDOT, in coordination with USFWS and WDNR may determine impacted buildings could be moved, protected with earth berms or raised to avoid flood impacts. WisDOT will continue coordinating with Dane County if it's maintenance building can be relocated on site.

WisDOT will fairly compensate institutions for land acquired or for buildings moved or raised. If Dane County, USFWS and WDNR buildings are relocated as mitigation, WisDOT will coordinate with each agency to select a site that serves Dane County, USFWS and WDNR operations functions.

WisDOT is developing a traffic management plan, which will include coordination with emergency service providers, school districts and other stakeholders to mitigate traffic impacts and maintain access during construction. None of the build alternatives would have long term impacts to places of worship or military buildings.

3.6. Agricultural Resources

3.6.1. Affected Environment

Agriculture is a prevalent land use through much of the study corridor as it travels between Madison and Wisconsin Dells, see Figure 3-2 and Figure 3-3. The Natural Resources Conservation Service (NRCS) soil survey indicates prime farmland covers most of the area surrounding the study corridor. According to the 2017 Census of Agriculture, farmland accounts for the majority of land in Dane, Columbia and Sauk counties (Table 3-20). Agriculture is also important for the economy in the counties in the study corridor, accounting for almost $6 billion in annual economic activity (Table 3-20). Yet, in Dane County the study corridor is mostly next to urban lands and land planned for non-farmland uses from the US 12/18 Interchange to the WIS 19 Interchange.

Table 3-20: Farmland, Agricultural Employment and Economic Activity

County	Number of Farms	Farmland (acres)	Percentage of County in Farms	Employees	Economic Activity
Dane	2,566	506,688	66%	14,170	$3.1 billion
Columbia	1,357	304,058	62%	5,262	$1.5 billion
Sauk	1,412	298,906	56%	4,312	$743 million
Juneau	715	175,417	36%	1,885	$481 million

Sources: 2017 Census of Agriculture, U.S. Department of Agriculture The Contributions of Agriculture to the Wisconsin Economy: An Update for 2017

Farmland Preservation

Dane, Columbia, Sauk, and Juneau counties all have county farmland preservation plans; Dane, Columbia and Sauk counties also have farmland preservation zoning. A county farmland preservation plan identifies lands that will remain in agricultural use for the foreseeable future. Farmland preservation plans act as the foundation for other aspects of the Department of Agriculture, Trade and Consumer Protection's (DATCP) Farmland Preservation Program including certified zoning, Agricultural Enterprise Areas (AEA)[14] and farmland preservation agreements.

An AEA is a contiguous land area devoted primarily to agricultural use and locally targeted for agricultural preservation and agricultural development. In Dane County, the study corridor crosses the Vienna-Dane-Westport AEA, see Figure 3-15. In Sauk county, the study corridor is next to the Fairfield AEA along I-90/94 in the town of Fairfield. Landowners within these areas can apply for a farmland preservation agreement, which requires the land to be kept in agricultural use for 15 years and to meet state soil and water conservation standards. In return, the agreement enables the landowner to claim a farmland preservation tax credit.

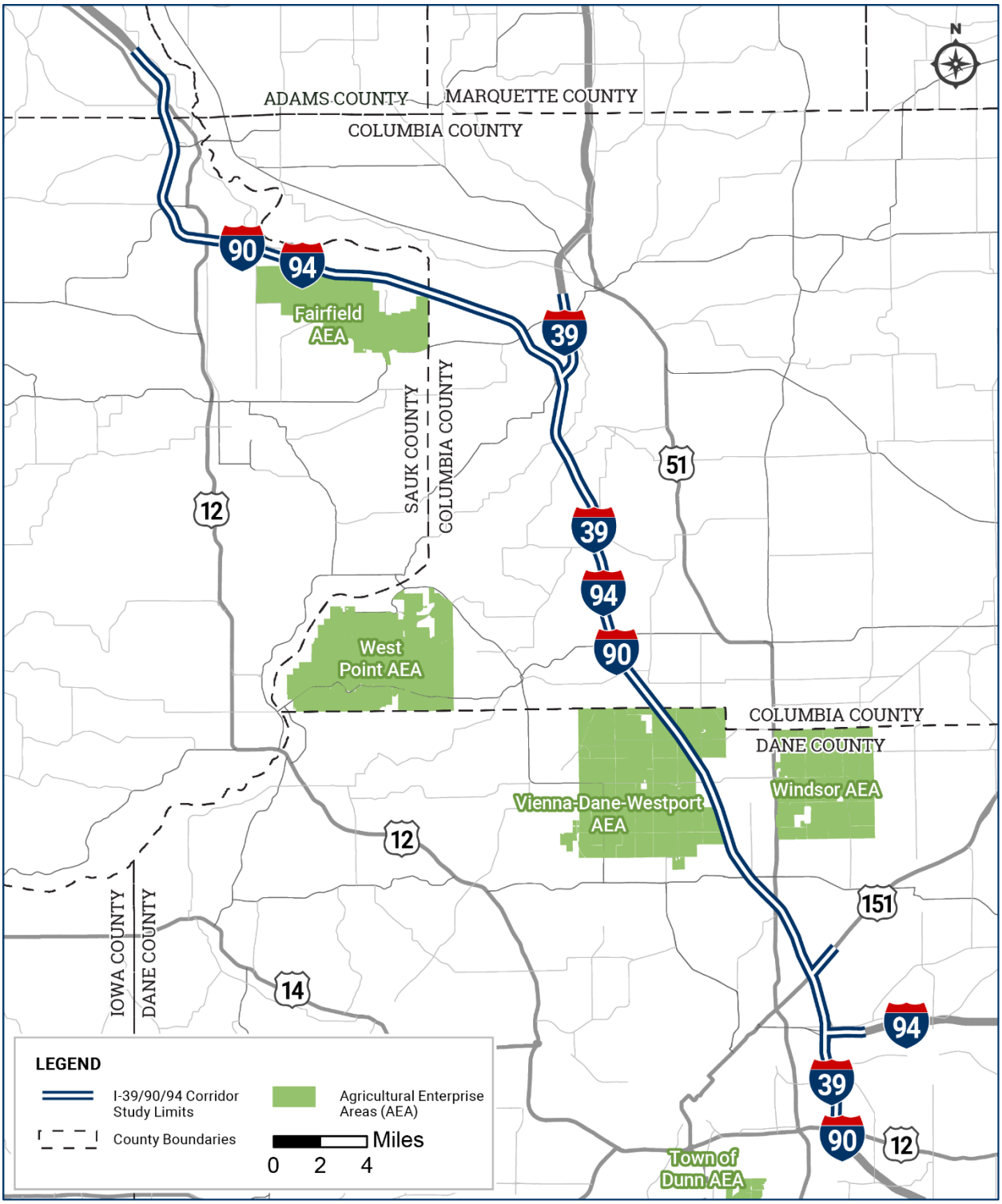
Conservation Programs

Voluntary conservation programs, including the Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP) and Wetland Reserve Program (WRP) are financial incentive programs to help agricultural landowners meet conservation goals or restore wetlands. Nationally, NRCS administers WRP and the US Department of Agriculture – Farm Service Agency (FSA) administers CRP. At the state level, DATCP administers CREP in Wisconsin. These programs register agricultural landowners for fixed length contracts or perpetual easements.

NRCS, FSA and DATCP each reviewed the study corridor for potential encroachment onto their respective program contracts and easements and indicated some properties next to the study corridor may be enrolled in these programs. Participation within NRCS, FSA and DATCP conservation programs change from year to year.

[14] *Wisconsin Department of Agriculture, Trade and Consumer Protection. Designated Agricultural Enterprise Areas (AEAs). https://datcp.wi.gov/Pages/Programs_Services/DesignatedAEAs.aspx. Accessed September 2023.*

Figure 3-15: Agricultural Enterprise Areas

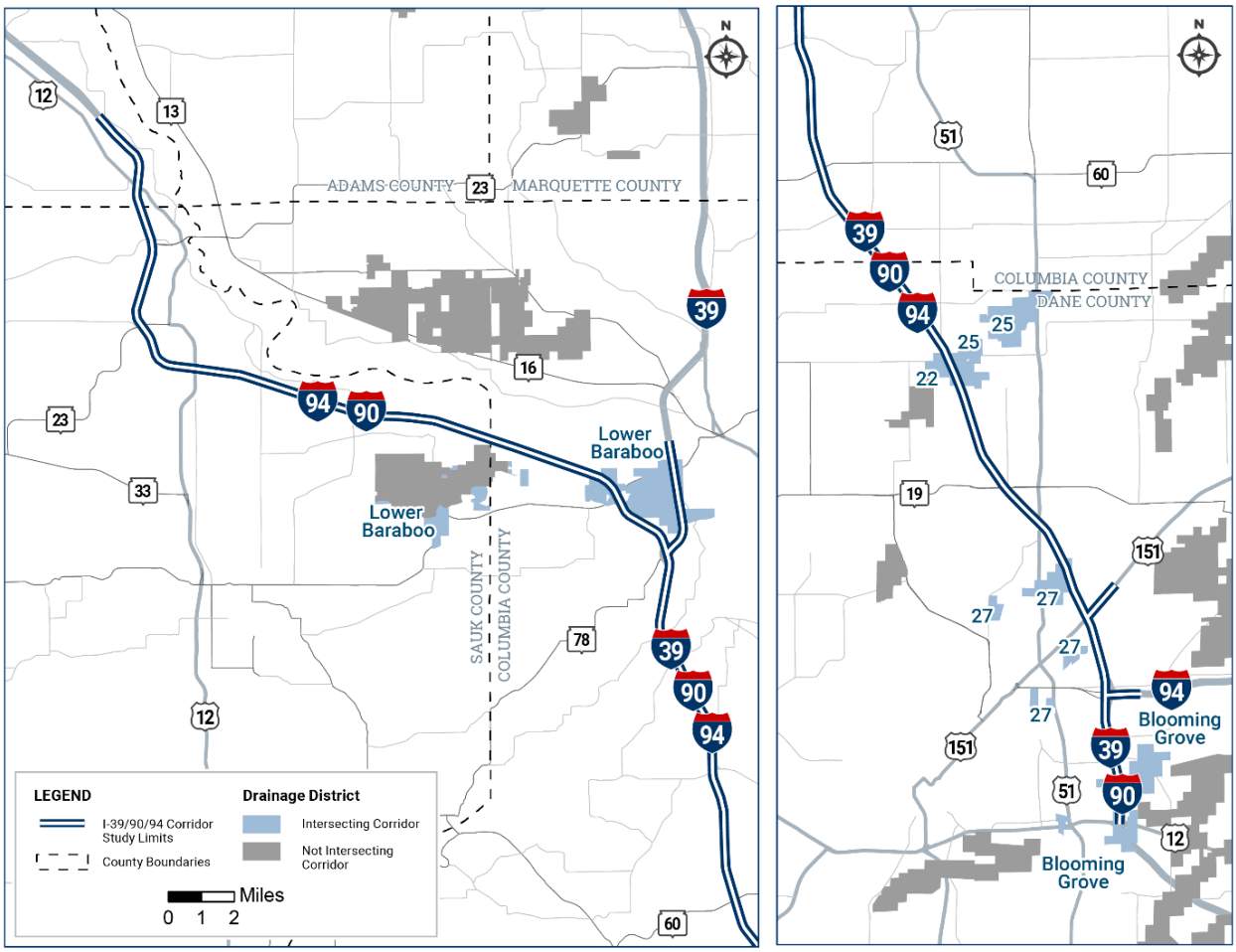


Source: Wisconsin Department of Trade, Agriculture and Consumer Protection

Drainage Districts

Drainage districts are special purpose districts formed to primarily drain agricultural land. Counties oversee districts to ensure compliance with DATCP regulations. In Dane County, the study corridor crosses drainage districts 22, 25 and 27, see Figure 3-16. The Blooming Grove drainage district passes through the US 12/18 Interchange. In Columbia County, the study corridor passes through the Lower Baraboo drainage district. The study corridor also comes within about 500 feet of the Leach Creek Subdistrict of the Lower Baraboo drainage district, which straddles Columbia and Sauk counties. Local farmers raised concerns at public involvement meetings about how the Interstate interacts with drainage on farmland, see Section 5.1.1. Current uncontrolled runoff is a result of the natural topography and increased precipitation in southern Wisconsin, leading to high groundwater and standing water, which are unrelated to Interstate operations.

Figure 3-16: Drainage Districts



Source: Wisconsin Department of Trade, Agriculture and Consumer Protection

3.6.2. Agricultural Resource Impacts

No Build Alternative

The No Build alternative would not impact agricultural land or farm operations.

Build Alternatives

Build alternatives would directly convert between 160.2 to 178.7 acres of agricultural land to highway right of way, see Table 3-21. The preferred Modernization Plus General-Purpose Lane alternative has about 3 acres more impact compared to the Modernization Hybrid alternative in Dane County. The two modernization alternatives have the same lane configuration and impacts north of WIS 19. There are no differences between the preferred County V No Build alternative and Diamond alternative as improvements are within existing right of way. The preferred Trumpet alternative at the WIS 13 Interchange would have about 15.5 more acres of impact due to the increased footprint of the interchange ramps. The WIS 13 Split Diamond alternative would impact about 1.7 acres.

Impacts would result primarily from strip acquisitions along the Interstate, modified interchange ramps and the addition of new interchanges. Impacts may include disruption to drainage systems next to the Interstate. The proposed new Milwaukee Street Interchange would sever a farm north of I-94, see Figure 3-17. The farm operation is approximately 83 acres. The preferred Partial Cloverleaf alternative at the new interchange would directly convert up to 12.5 acres severing the farm into an approximate 40-acre section to the west and an approximate 30-acre section to the east of the interchange. One barn located in the eastern 30-acre portion would be acquired. Access to the farmstead and eastern parcel would not be altered and access to the western parcel would require a new access point.

All the build alternatives would include flood minimization measures that result in increased regulatory 100-year flood elevations on about 189.8 acres of agricultural land near the USFWS Baraboo River Waterfowl Production Area and Pine Island State Wildlife Area, see Section 3.13.2. One agricultural property within the existing floodplain has six farm structures, including a barn, garage and metal and wood buildings, that would experience an increased 100-year flood elevation and are considered relocations. No residence is on the property. WisDOT met with affected property owners in January 2024 to discuss potential flood elevation changes and will continue coordination to develop measures to mitigate property impacts.

WisDOT met with NRCS, FSA and DATCP to review potential impacts from right of way acquisition and also increased 100-year flood elevations. Increases to floodplain elevations would be compatible with easements, provided current flood control structures continue to function. NRCS identified WRP infrastructure that may be impacted. WisDOT followed up with NRCS noting the flood model demonstrates the flood minimization of raising I-39 and widening the Baraboo River bridge would decrease the frequency of WRP inundation and when overtopped would route water in the same manner under the current condition, see Appendix B. Impacted properties that are in the floodplain and in the WRP, CRP or CREP programs would continue to function as they do today to preserve natural wetland and floodplain functions. The build alternatives would avoid permanent acquisition of properties currently in the WRP.

Property owner participation within FSA and DATCP conservation programs are not publicly available and change from year to year. Potential impacts from the build alternative would depend on current enrollments during final design and right of way acquisition. If such properties are potentially impacted either through temporary construction easements or permanent acquisition, FSA and DATCP would modify CRP or CREP contracts, respectively at the time of construction.

Table 3-21: Summary of Potential Agricultural Land Acquisition by County

County	Agricultural Land Potentially Acquired (acres)
Dane	35.1 (with Modernization Hybrid) 38.1 (with Modernization Plus Added General-Purpose Lane – preferred alternative)
Columbia	91.6
Sauk	33.3 (WIS 13 Interchange Split Diamond alternative) 48.8 (with WIS 13 Interchange Trumpet preferred alternative)
Juneau	0.2
Total	160.2 (with Modernization Hybrid and WIS 13 Interchange Split Diamond alternatives) 178.7 (with Modernization Plus Added General-Purpose Lane and WIS 13 Interchange Trumpet preferred alternatives)

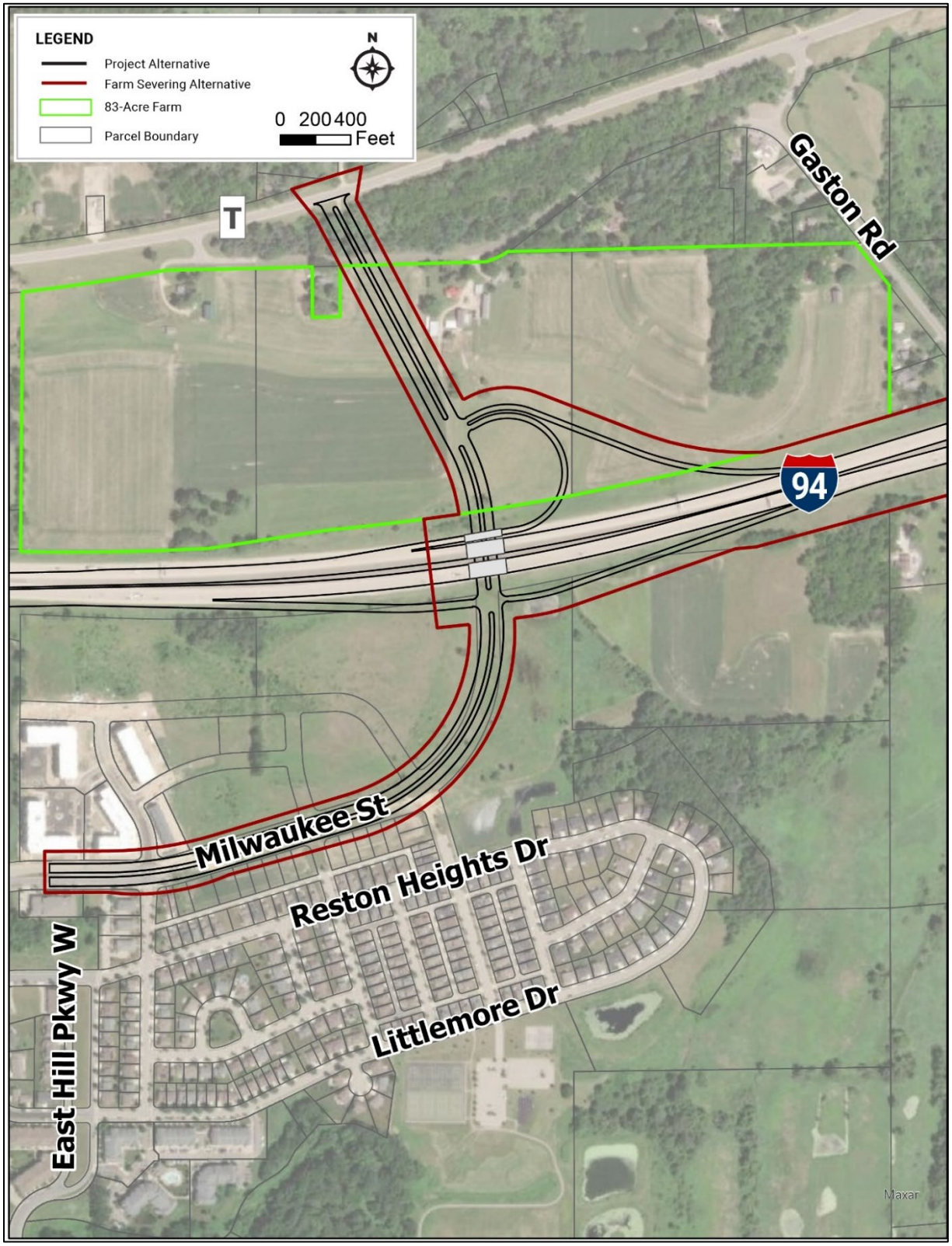
Source: WisDOT

WisDOT completed Farmland Conversion Impact Rating forms to NRCS, pursuant to the Farmland Protection Policy Act, for each county impacted by the study. NRCS determined the study's potential agricultural impacts are exempt from the provisions of the Farmland Protection Policy Act. NRCS letters of exemption, for each county impacted by the build alternatives, are provided in Appendix B.

In accordance with the Wis. Stat. s. 32.035 and the Memorandum of Agreement between DATCP and WisDOT, WisDOT notified DATCP of the study.[15] In response to the notification, DATCP published agricultural impact statement (AIS) #4472 on April 29, 2024, see Appendix L. The AIS analyzed the various impacts to individual farms, identified the acreage potentially lost or affected, conveyed the concerns of agricultural landowners and recommended ways to reduce potential study impacts to farms. The measures WisDOT will take to minimize and mitigate adverse agricultural impacts, seen in Section 3.6.3, fulfill DATCP recommendations to WisDOT.

[15] *Wisconsin Department of Agriculture, Trade and Consumer Protection and Wisconsin Department of Transportation. Memorandum of Agreement Between the State of Wisconsin Department of Agriculture, Trade and Consumer Protection and Wisconsin Department of Transportation. July 1, 2023.*

Figure 3-17: Potentially Severed Farm at the Milwaukee Street Interchange



Source: WisDOT

3.6.3. Measures to Minimize and Mitigate Adverse Agricultural Impacts

WisDOT will continue to evaluate measures to further minimize unavoidable impacts to farmlands through final design. During final design, WisDOT will determine if acquired properties have a farmland preservation agreement and will notify the Bureau of Land and Water Resources in DATCP to discuss if a release is needed. In the year preceding construction, WisDOT will coordinate with DATCP to resolve matters involving farmland preservation agreements. If design compels the release of land from an effective farmland preservation agreement and requires a landowner to pay a conversion fee under Wis. Stat. s. 91.66(1)(c), WisDOT would compensate the landowner for the release. WisDOT, in coordination with FSA, DATCP and impacted agricultural landowners to identify portions of property enrolled in active CRP and CREP agreements. In the year preceding construction, WisDOT will coordinate with DATCP to determine if CREP easements with expired federal contracts would be impacted by the project. WisDOT will work with agricultural landowners, holding CRP or CREP contracts, to remove those portions of impacted land from contract, at no cost to the landowner. Post-construction, WisDOT will revegetate lands removed from a conservation program, that are still privately held and are otherwise eligible to re-enroll in a conservation program. WisDOT will continue coordination with NRCS to avoid acquisition of private properties in the WRP. As required by Wis. Stat. s. 88.67(3), WisDOT will also follow up with local county drainage districts during final design to keep them informed and consult on issues of concern, determine where drainage tiles might be located and determine design and construction measures to maintain drainage patterns. WisDOT will also continue coordination with the impacted property owners within the regulatory floodplain to determine acquisition relocating or elevating structures outside the 100-year flood elevation, floodproofing structures or purchasing a flood easement

At the conclusion of the Final EIS, WisDOT will provide the Sauk County Land Conservation Department with project route information impacting the Fairfield AEA. As part of its right of way acquisition process, WisDOT will work with the farm owner to locate new access points to the remnant western parcel at the proposed Milwaukee Street Interchange. Prior to construction, WisDOT will provide agricultural operations at least 30 days' notice prior to loss of access, when the loss would occur and duration. Should access be lost, WisDOT will fulfill its responsibilities under Wis. Stat. s. 86.05 to provide a suitable new entrance.

In accordance with Wis. Stat. 88.87, WisDOT would build adequate ditches, culverts and other facilities to prevent obstruction of drainage, protect property owners from damage to lands caused by unreasonable diversion or retention of surface water, and maintain, as nearly as possible, the original drainage flow patterns to ensure stormwater and drainage impacts are mitigated on the remnant fields to build adequate ditches, culverts, and other facilities to prevent obstruction of drainage, protect property owners from damage to lands caused by unreasonable diversion or retention of surface water and maintain, as nearly as possible, the original drainage flow patterns to ensure stormwater and drainage impacts are mitigated on the remnant fields. WisDOT will adhere to its stormwater management standards, which are governed by Wis. Admin. Code Trans 401 Construction Site Erosion Control and Storm Water Management Procedures for Department Actions.

During construction, WisDOT would oversee communication with agricultural landowners and coordinate with construction contractors to keep landowners informed of construction activities and minimize impacts to agriculture operations, including potential damage to drainage tiles.

3.7. Utilities

3.7.1. Affected Environment

Underground and overhead utilities are located throughout the study corridor. Preliminary utility investigations identified electrical and gas transmission lines, large water lines, sewers and communication lines that run parallel to or cross the Interstate. Future engineering phases would complete detailed utility investigations.

Electrical

Electric service in the study corridor is provided by Adams-Columbia Electric, Madison Gas and Electric, Wisconsin Power and Light, the city of Wisconsin Dells and the Oakdale Electrical Cooperative. Electric transmission is provided by the American Transmission Company (ATC).

ATC owns four electric transmission lines that run parallel to and/or cross the study corridor. The largest of these is the 345 kilovolt (kV) Badger Coulee overhead electrical transmission line that largely parallels the study corridor crossing the Interstate at three locations: north of Count V in Dane County, near the I-39 I-90/94 Split Interchange in Columbia County and near Mirror Lake in Sauk County.

The remaining three ATC transmission lines are each 138 kV overhead electric transmission lines that run parallel to or cross the study corridor. The first 138 kV line runs parallel east of the Interstate from Lien Road to Hanson Road in the city of Madison. At Hanson Road, this transmission line crosses the Interstate, connects with a substation – next to the Interstate – and continues west until reaching the County I overpass in Dane County. A second substation, next to the Interstate, is at Cuba Valley Road in Dane County. North of County V, the 138 kV transmission line turns west and away from the Interstate. The second 138 kV line briefly runs parallel north of I-90/94 and crosses the Interstate about 5 miles west of the WIS 33 Interchange, heading southwest away from study corridor. The third 138kV line crosses I-90/94 north of the WIS 23 Interchange. About 1,000 feet to the west of the WIS 23 Interchange, this 138 kV line connects to a substation located along County P.

Natural Gas

The Wisconsin Power and Light Company and the Madison Gas and Electric Company provide natural gas service throughout the study corridor. Natural gas transmission in the area is provided by the Northern Natural Gas company, the ANR Pipeline company and Flint Hills Resources. Of these providers, one gas transmission line (Flint Hills Resources) crosses I-39/90 south of the US 12/18 Interchange and crosses US 12/18 east of the Interstate.

Water and Sewer

Water service in the study corridor is provided by several municipalities including the cities of Madison, Portage and Wisconsin Dells and the villages of DeForest, Lake Delton and Windsor. The village of DeForest owns three watermains crossing the Interstate at the following locations: north of the US 51 Interchange, at the WIS 19 Interchange and at the County V Interchange. A village of DeForest water main also runs parallel west of the Interstate from WIS 19 and crosses to the east side at River Road/Windsor Road.

Sanitary sewer service in the study corridor is provided by several municipalities including the cities of Portage and Wisconsin Dells, the village of Lake Delton, the town of Vienna, as well as several sewerage

or sanitary districts including the Madison Metropolitan Sewerage District and the Dekorra, Harmony Grove and Okee sanitary districts. The size and configuration of these sewer services vary.

A sewer force main operated by the Madison Metropolitan Sewerage District runs parallel east of the Interstate between the US 51 and WIS 19 interchanges, and crosses under the Interstate at WIS 19. The town of Vienna sanitary sewer crosses the Interstate just south of the County V Interchange.

Fiber Optics and Communication Lines

Fiber optic lines and communication lines are located along and cross the Interstate throughout the entirety of the study corridor.

3.7.2. Utility Impacts

No Build Alternative

Under the No Build alternative, utility impacts would be those associated with normal roadway maintenance.

Build Alternatives

WisDOT has started the utility coordination process through Chapter Trans 220 Wis. Adm. Code (Trans 220) to inform utility companies of a potential future project with facilities in the area. All the build alternatives may relocate or replace overhead or buried utilities that would conflict with roadway improvements, including the ATC lines at the US 151, Hoepker Road, US 51 and WIS 19 interchanges. The large ATC transmission line would be raised at WIS 33, US 12 and WIS 13 and a smaller ATC transmission line at the WIS 33/I-39 Interchange would also be raised. In addition to the ATC lines, anticipated impacts to electrical lines, sanitary sewer, water mains, gas mains and communications lines are expected to be similar to other highway reconstruction projects and relatively similar between all the build alternatives.

Based on utility records collected as of June 2024, the following utilities along the study corridor would be impacted through relocation or replacement. This list does not include utilities that would be built before construction:

- 175 communication lines
- 71 electric poles and lines
- 28 gas lines
- 18 sewer lines
- 5 streetlights
- 25 water mains

None of the build alternatives would impact electrical substations, pump stations or sewage treatment facilities. All the build alternatives would include flood minimization measures that result in increased 100-year flood elevations at two AT&T communications structures, one on 0.7 acres near I-90/94 and a cell tower on WisDOT property near the I-39 I-90/94 Split Interchange. Increased flood elevations at the site will require measures to mitigate impacts. See also Section 3.13.2.

3.7.3. Measures to Minimize and Mitigate Adverse Utility Impacts

WisDOT and FHWA will continue coordinating with utilities, municipalities and other service providers during the design process to avoid or minimize utility impacts, including major electrical transmission lines, high-pressure gas lines and water mains, and avoid service interruptions during construction. WisDOT will coordinate with AT&T to identify measures that avoid and minimize the impact of the increased 100-year flood elevation and may include floodproofing the structure onsite.

3.8. Socioeconomic Characteristics

3.8.1. Affected Environment

This section describes the demographic characteristics of counties and communities in the I-39/90/94 study corridor using data from the U.S. Census Bureau, Wisconsin Department of Administration and Madison Region Economic Partnership.

Population

Table 3-22 lists the existing populations based on census data. Table 3-23 lists projected population changes for counties and communities in the study corridor and the State of Wisconsin. Most counties and communities, except for Juneau County and three towns, saw increases in population between the 2010 U.S. Census and most recent 2021 census data (Table 3-22). Dane and Sauk counties grew faster than the State of Wisconsin, which grew 3.2%. The village of Windsor in Dane County had the highest growth rate, over 35.4%. This growth is likely due to its location with short commutes to the Village of Waunakee, the City of Sun Prairie, and the City of Madison

Between 2021 and 2040 the most recent state population projections show nearly all corridor communities are projected to grow. The town of Lyndon, which showed the greatest population decline in 2021 data, has the highest projected growth rate, while the village of Windsor, which grew the most between 2010 and 2021, is projected to show only a 1.0% increase in population growth by 2040. Other larger communities with anticipated high growth rates throughout the study corridor are the city of Sun Prairie (a suburb of the city of Madison), the village of Lake Delton (near Wisconsin Dells) and town of Dekorra (near Lake Wisconsin, the Wisconsin River, and the City of Portage), see Table 3-23.

Table 3-22: Population Counts by Location

Location	2010	2021	Difference 2010 to 2021	Change in Population
State of Wisconsin	5,686,986	5,871,661	184,675	3.2%
Dane County	488,073	555,474	67,401	13.8%
City of Madison	233,209	265,447	32,238	13.8%
Town of Burke	3,284	3,295	11	0.3%
City of Sun Prairie	29,364	35,528	6,164	21.0%
Village of Windsor	6,345	8,589	2,244	35.4%
Village of DeForest	8,936	10,700	1,764	19.7%

Location	2010	2021	Difference 2010 to 2021	Change in Population
Town of Vienna	1,482	1,631	149	10.1%
Columbia County	56,833	58,219	1,386	2.4%
City of Portage	10,324	10,351	27	0.3%
Town of Arlington	806	803	-3	-0.4%
Town of Caledonia	1,378	1,714	336	24.4%
Town of Dekorra	2,311	2,125	-186	-8.0%
Sauk County	61,976	65,428	3,452	5.6%
Village of Lake Delton	2,914	3,413	499	17.1%
City of Wisconsin Dells	2,678	2,685	7	0.3%
Town of Delton	2,391	2,869	478	20.0%
Town of Fairfield	1,077	1,192	115	10.7%
Juneau County	26,664	26,595	-69	-0.3%
Town of Lyndon	1,384	988	-396	-28.6%

Source: U.S. Census Bureau, 2010 Census, 2021 American Community Survey 5-Year Estimates

Note: The city of Wisconsin Dells is in Sauk, Columbia, Juneau and Adams counties.

Table 3-23: Population Projections by Location

Location	2021	2030	2040	Difference 2021 to 2040	Percent Change
State of Wisconsin	5,871,661	6,375,910	6,491,635	619,974	10.6%
Dane County	555,474	577,300	606,620	51,146	9.2%
City of Madison	265,447	270,350	281,150	15,703	5.9%
Town of Burke	3,295	3,740	3,875	580	17.6%
City of Sun Prairie	35,528	40,830	45,580	10,052	28.3%
Village of Windsor	8,589	8,055	8,675	86	1.0%
Village of DeForest	10,700	11,150	12,010	1,310	12.2%
Town of Vienna	1,631	1,670	1,720	89	5.5%
Columbia County	58,219	67,455	68,450	10,231	17.6%
City of Portage	10,351	11,730	11,680	1,329	12.8%
Town of Arlington	803	865	835	32	4.0%
Town of Caledonia	1,714	1,795	1,890	176	10.3%
Town of Dekorra	2,125	2,660	2,650	525	24.7%

Location	2021	2030	2040	Difference 2021 to 2040	Percent Change
Sauk County	65,428	75,660	77,815	12,387	18.9%
Village of Lake Delton	3,413	3,985	4,320	907	26.6%
City of Wisconsin Dells	2,685	3,060	3,055	370	13.8%
Town of Delton	2,869	3,130	3,320	451	15.7%
Town of Fairfield	1,192	1,235	1,240	48	4.0%
Juneau County	26,595	29,790	29,465	2,870	10.8%
Town of Lyndon	988	1,705	1,770	782	79.1%

Source: Wisconsin Department of Administration, 2013 Population and Household Projections from 2010 Census, MCD and Municipal Population Projections, 2010-2040; U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates.

Households

For most counties and corridor communities, the growth rate for households (Table 3-24) exceeded the rate of population growth (Table 3-22) between 2010 and 2021. As with population, the village of Windsor had the largest increase in households (127.4%). All corridor communities are projected to see more households by 2040, see Table 3-25, and household growth rates are expected to be higher than population growth rates.

Table 3-24: Number of Households by Location

Location	2010	2021	Difference 2010 to 2021	Percent Change
State of Wisconsin	2,279,768	2,401,818	122,050	5.4%
Dane County	196,383	236,036	39,653	20.2%
City of Madison	98,216	117,324	19,108	19.5%
Town of Burke	1,251	1,099	-152	-12.2%
City of Sun Prairie	10,941	14,701	3,760	34.4%
Village of Windsor	1,379	3,136	1,757	127.4%
Village of DeForest	3,240	4,012	772	23.8%
Town of Vienna	560	559	-1	-0.2%
Columbia County	22,735	24,016	1,281	5.6%
City of Portage	4,060	4,119	59	1.5%
Town of Arlington	309	308	-1	-0.3%
Town of Caledonia	549	670	121	22.0%
Town of Dekorra	974	920	-54	-5.5%
Sauk County	25,192	26,850	1,658	6.6%
Village of Lake Delton	1,269	1,634	365	28.8%

Location	2010	2021	Difference 2010 to 2021	Percent Change
City of Wisconsin Dells	1,148	1,317	169	14.7%
Town of Delton	924	1,052	128	13.9%
Town of Fairfield	424	472	48	11.3%
Juneau County	10,527	10,363	-164	-1.6%
Town of Lyndon	541	459	-82	-15.2%

Source: U.S. Census Bureau, 2010 Census, 2021 American Community Survey 5-Year Estimates

Table 3-25: Number of Households – Projections by Location

Location	2021	2030 Projection	2040 Projection	Projected Difference – 2021 to 2040	Change
State of Wisconsin	2,401,818	2,697,884	2,790,322	388,504	16.2%
Dane County	236,036	252,483	268,336	32,300	13.7%
City of Madison	117,324	124,842	131,206	13,882	11.8%
Town of Burke	1,099	1,488	1,563	464	42.2%
City of Sun Prairie	14,701	16,992	19,256	4,555	31.0%
Village of Windsor	3,136	3,242	3,546	410	13.1%
Village of DeForest	4,012	4,455	4,873	861	21.5%
Town of Vienna	59	639	668	109	19.5%
Columbia County	24,016	28,466	29,404	5,388	22.4%
City of Portage	4,119	4,831	4,832	713	17.3%
Town of Arlington	308	351	346	38	12.3%
Town of Caledonia	670	756	813	143	21.3%
Town of Dekorra	920	1,186	1,208	288	31.3%
Sauk County	26,850	32,314	33,887	7,037	26.2%
Village of Lake Delton	1634	1,817	1,997	363	22.2%
City of Wisconsin Dells	1,317	1,387	1,410	93	7.1%
Town of Delton	1,052	1,271	1,377	325	30.9%
Town of Fairfield	472	511	525	53	11.2%
Juneau County	10,363	12,871	13,082	2,719	26.2%
Town of Lyndon	459	728	778	319	69.5%

Source: Wisconsin Department of Administration, 2013; U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Age

The age of people in the study corridor is presented in Table 3-26. As of 2021, the U.S. Census Bureau estimates that 22% of the state's population was under 18 and 17% was 65 and older. Differences are apparent in most Dane County communities where the population is younger compared to much of the study corridor and State of Wisconsin. However, the town of Arlington and town of Delton in Sauk and Columbia counties, respectively have younger populations compared to the state. By comparison, several communities in Columbia, Sauk and Juneau counties have older populations, particularly in rural towns.

Table 3-26: Percentage of People Under 18 or 65 and Older

Location	Under 18	65 and Older
State of Wisconsin	22.0%	17.0%
Dane County	20.4%	13.8%
City of Madison	16.5%	12.1%
Town of Burke	26.2%	15.8%
City of Sun Prairie	24.7%	13.9%
Village of Windsor	25.0%	14.8%
Village of DeForest	28.1%	11.6%
Town of Vienna	25.3%	13.4%
Columbia County	21.3%	17.9%
City of Portage	20.0%	14.6%
Town of Arlington	24.2%	23.3%
Town of Caledonia	18.0%	18.6%
Town of Dekorra	14.8%	22.2%
Sauk County	23.0%	18.4%
Village of Lake Delton	19.1%	18.2%
City of Wisconsin Dells	18.8%	19.3%
Town of Delton	26.1%	16.2%
Town of Fairfield	21.4%	28.5%
Juneau County	20.2%	20.3%
Town of Lyndon	14.6%	22.2%

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

People with Disabilities

Dane County has a lower percentage of individuals with a disability compared to other counties in the study corridor (Table 3-27). Juneau County has a higher percentage of individuals with a disability than the State of Wisconsin, while Columbia and Sauk counties are comparable to the state. Columbia, Sauk

and Juneau counties have older populations compared to Dane County, which potentially correlates to the larger percentage of people with a disability demonstrated in these counties.

Table 3-27: Disability Status by Location

Location	Percent of People with a Disability	Location	Percent of People with a Disability
State of Wisconsin	11.6%	**Columbia County**	11.3%
Dane County	8.3%	City of Portage	17.4%
City of Madison	8.3%	Town of Arlington	5.5%
Town of Burke	6.3%	Town of Caledonia	9.4%
City of Sun Prairie	8.1%	Town of Dekorra	11.2%
Village of Windsor	7.4%	**Sauk County**	12.4%
Village of DeForest	7.6%	Village of Lake Delton	8.9%
Town of Vienna	7.4%	City of Wisconsin Dells	11.7%
Juneau County	16.8%	Town of Delton	9.5%
Town of Lyndon	13.5%	Town of Fairfield	15.0%

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Income and Poverty

Communities in the study corridor have varying levels of income and poverty rates (Table 3-28). In 2021, the median household income for the State of Wisconsin was $67,080. At the county level, median incomes were higher than the state in Dane and Columbia counties, but lower in Juneau and Sauk counties. Study corridor communities generally have higher median household incomes as compared to the state. However, median household incomes for the cities of Portage and Wisconsin Dells, village of Lake Delton and town of Lyndon are lower. Figure 3-18 shows median household income, by block group, in Dane, Columbia, Sauk and Juneau counties.

The income and poverty data in this subsection was obtained to help identify low-income persons as part of the environmental justice analysis discussed in Section 3.9 (Environmental Justice). Low-income is defined as a household income at or below poverty thresholds. The U.S. Department of Health and Human Services (HHS) publishes poverty guidelines, which are a simplification of the U.S. Census Bureau's poverty thresholds. According to HHS, a family is considered in poverty if their income is lower than the poverty threshold for their family size. For example, in 2021, a family of four would be considered in poverty if the family's total income was less than $26,500.[16]

The U.S. Census Bureau's poverty statistics represent the number of people below the U.S. Census Bureau poverty thresholds. Poverty thresholds are the original version of the federal poverty measure

[16] *Income data is collected by the American Community Survey (ACS). The ACS tracks local economic conditions annually rather than on a decennial basis like the U.S. Census. The U.S. Department of Health and Human Services (HHS) annually publishes poverty guidelines to determine financial eligibility for certain programs. The HHS guidelines are a simplification of the U.S. Census Bureau's poverty thresholds for use for administrative purposes; for instance, determining financial eligibility for certain federal programs.*

and are updated each year by the U.S. Census Bureau. Neither the U.S. Census Bureau nor the HHS tabulates the number of people below the HHS poverty guidelines. The best approximation for the number of people below the HHS poverty guidelines, in a particular area, would be the number of persons below the U.S. Census Bureau poverty thresholds in that area.

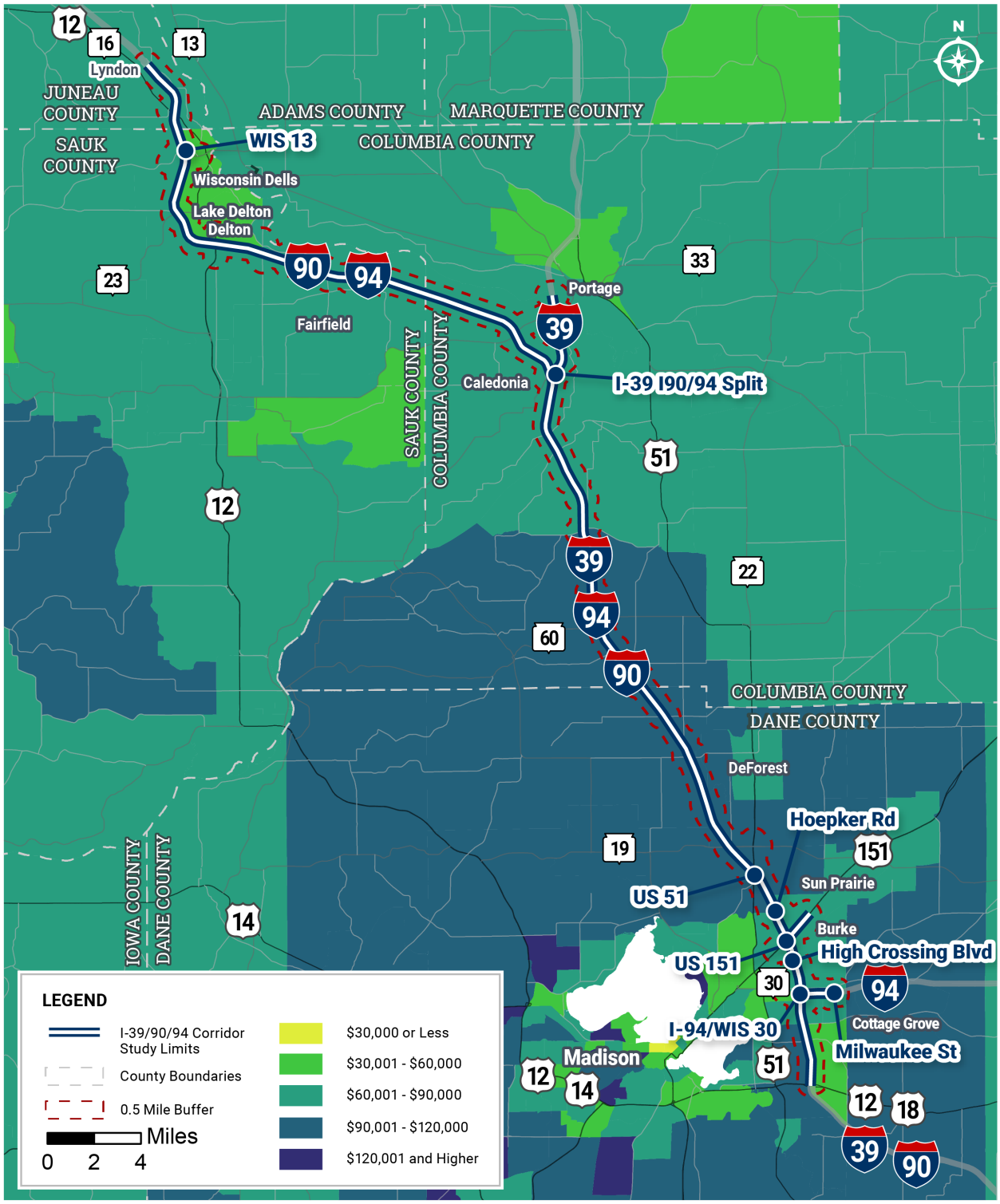
In 2021, 6.6% of Wisconsin families were living below the poverty threshold (Table 3-28). At the county level, the percentage of families living below the poverty threshold was lower than the state, except for Juneau County. With a few exceptions, study corridor communities also have below average family poverty rates. The percentage of families below the poverty threshold in the city of Portage, village of Deforest and towns of Caledonia and Fairfield all exceed state poverty levels. Figure 3-19 shows the percent of families below the poverty threshold. The higher percentage of families living in poverty in the city of Portage and village of Lake Delton also coincides with lower median household incomes.

Table 3-28: Median Household Income and Families Below Poverty Threshold by Location

Location	Median Household Income	Number of Families Below Poverty Threshold	Percentage of Families Below Poverty Threshold
State of Wisconsin	$67,080	98,322	6.6%
Dane County	$78,452	6,527	5.0%
City of Madison	$70,466	3,096	5.9%
Town of Burke	$94,738	0	0.0%
City of Sun Prairie	$83,409	371	4.1%
Village of Windsor	$104,179	86	3.8%
Village of DeForest	$88,664	253	8.7%
Town of Vienna	$121,023	13	2.8%
Columbia County	$73,786	745	4.7%
City of Portage	$56,303	202	8.7%
Town of Arlington	$106,923	2	0.8%
Town of Caledonia	$90,948	56	10.7%
Town of Dekorra	$96,111	21	3.1%
Sauk County	$67,702	1055	5.9%
Village of Lake Delton	$48,598	29	3.0%
City of Wisconsin Dells	$60,351	18	2.9%
Town of Delton	$75,646	45	5.3%
Town of Fairfield	$72,338	40	10.3%
Juneau County	$58,561	556	8.5%
Town of Lyndon	$53,875	17	6.4%

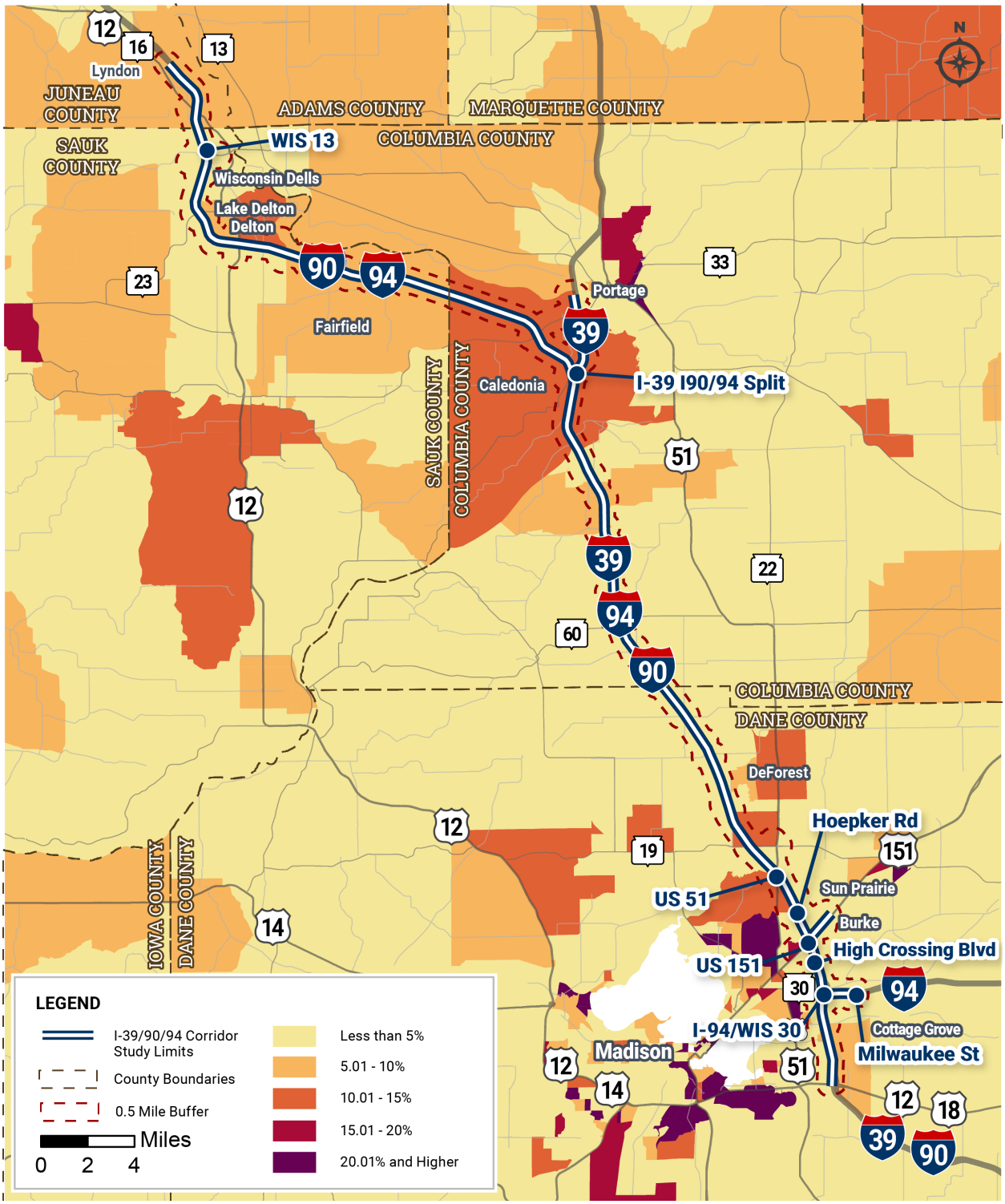
Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Figure 3-18: Median Household Income in Study Corridor Counties



U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates, by Census tract

Figure 3-19: Percent of Families Below Poverty Threshold in Study Corridor



U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates, by block group

Vehicle Ownership and Transit Dependent Populations

Statewide, 1.4% of workers 16 years and older use public transportation as a means of transport to work. Transit use is higher in Dane County compared to other corridor communities and the state as a whole. Specifically, a larger percentage of people in the city of Madison use public transportation to travel to work, likely due to available transit options. The percentage of households with no vehicles available in Dane county was higher than the State of Wisconsin (6.3%). The city of Madison and village of Windsor had higher than average rates of households without access to a vehicle.

Transit utilization is lower in Columbia, Sauk and Juneau counties and the percentage of households with no vehicles available in Columbia, Sauk and Juneau counties were all lower than the State of Wisconsin. The city of Portage, village of Lake Delton and city of Wisconsin Dells had higher than average rates of households without access to a vehicle (Table 3-29). This may reflect the number of transient workers in these communities serving the tourism industry. There is also seasonal population of farm workers present providing labor to local commercial vegetable farms.

Table 3-29: Household Means of Transportation

Location	Households with No Vehicle Available	Means of Transportation to Work: Public Transportation
State of Wisconsin	6.3%	1.4%
Dane County	7.4%	3.9%
City of Madison	11.2%	7.1%
Town of Burke	3.9%	1.5%
City of Sun Prairie	4.9%	1.2%
Village of Windsor	3.4%	0.0%
Village of DeForest	2.1%	0.0%
Town of Vienna	1.6%	0.3%
Columbia County	4.6%	0.2%
City of Portage	8.9%	0.0%
Town of Arlington	0.0%	0.0%
Town of Caledonia	1.3%	0.0%
Town of Dekorra	1.7%	0.0%
Sauk County	4.7%	0.2%
Village of Lake Delton	6.8%	0.0%
City of Wisconsin Dells	14.3%	2.2%
Town of Delton	3.1%	0.0%
Town of Fairfield	2.5%	0.0%
Juneau County	3.4%	0.1%
Town of Lyndon	2.8%	0.0%

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Minority Populations

In 2021, the statewide minority population accounted for 19.9% of the total population. In Dane County, the cities of Madison and Sun Prairie have a higher percentage of minorities than the state (Table 3-30). Asians represent the largest minority group in the city of Madison and the town of Burke. Black or African Americans are the largest minority group in the city of Sun Prairie. Hispanics represent the largest minority group in the remaining study communities in Dane County.[17] Hispanics are also the largest minority group in most of the other corridor communities in Columbia, Sauk and Juneau counties. The village of Lake Delton and town of Lyndon also have a higher percentage of minorities than the state. Hispanics represent the largest minority group in the village of Lake Delton, while Two or More Races represent the largest minority group in the town of Lyndon. American Indians are the largest single-race minority group in the towns of Delton and Lyndon. Figure 3-20 shows the total minority population by block group along the study corridor. This data also informs the environmental justice analysis discussed in Section 3.9.

[17] *Hispanic is an ethnic group, not a race and is expressed separately from race in U.S. Census Bureau data. Herein, Hispanic is reported separately from race categories, consistent with U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates data. For example, the race White is reported as White alone, not Hispanic or Latino.*

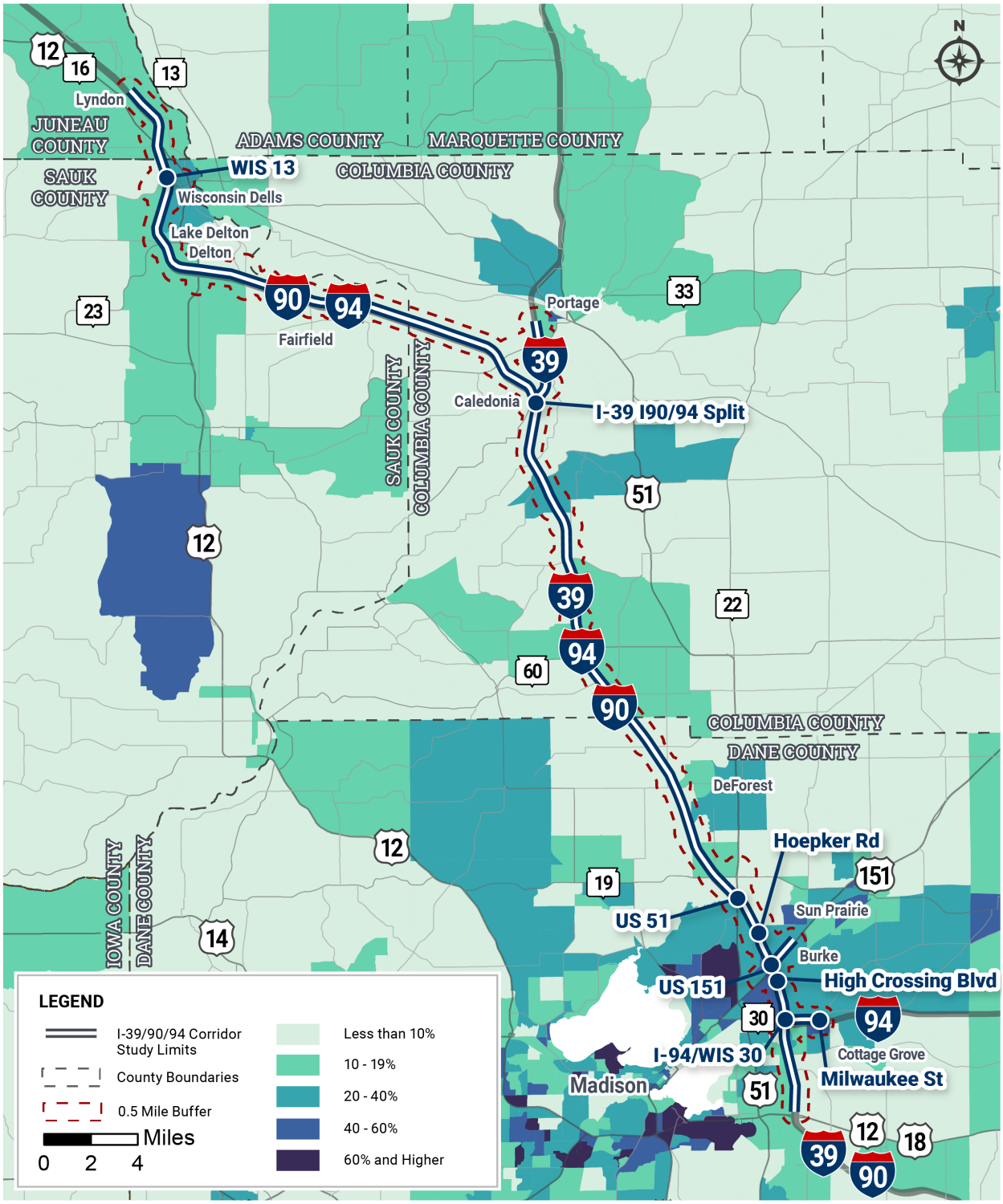
Table 3-30: Population by Race and Ethnicity

Location	White Alone	Hispanic	Black or African American	American Indian/ Alaska Native	Asian	Native Hawaiian/ Other Pacific Islander	Other	Two or More Races	Total Minority Population
State of Wisconsin	80.1%	7.2%	6.2%	0.7%	2.8%	0.0%	0.2%	2.7%	19.9%
Dane County	78.2%	6.7%	5.0%	0.2%	6.0%	0.0%	0.3%	3.6%	21.8%
City of Madison	72.0%	7.8%	6.7%	0.3%	8.9%	0.0%	0.4%	4.0%	28.0%
Town of Burke	91.9%	2.3%	0.0%	0.0%	5.1%	0.0%	0.0%	0.7%	8.1%
City of Sun Prairie	78.2%	3.7%	7.5%	0.3%	5.9%	0.2%	0.0%	4.2%	21.8%
Village of Windsor	92.2%	5.5%	0.9%	0.0%	0.6%	0.0%	0.0%	0.9%	7.8%
Village of DeForest	80.3%	8.5%	1.4%	0.3%	3.1%	0.0%	0.0%	6.4%	19.7%
Town of Vienna	98.8%	0.8%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	1.2%
Columbia County	91.6%	3.8%	1.7%	0.3%	0.9%	0.0%	0.1%	1.7%	8.4%
City of Portage	84.5%	7.1%	4.9%	0.3%	0.7%	0.0%	0.0%	2.5%	15.5%
Town of Arlington	93.2%	0.0%	0.0%	1.0%	5.7%	0.0%	0.0%	0.1%	6.8%
Town of Caledonia	91.2%	3.7%	0.8%	0.2%	0.0%	0.0%	0.0%	4.2%	8.8%
Town of Dekorra	91.7%	3.7%	1.6%	0.2%	0.0%	0.0%	0.0%	2.7%	8.3%

Location	White Alone	Hispanic	Black or African American	American Indian/ Alaska Native	Asian	Native Hawaiian/ Other Pacific Islander	Other	Two or More Races	Total Minority Population
Sauk County	89.8%	5.6%	0.8%	1.1%	0.5%	0.0%	0.1%	2.1%	10.2%
Village of Lake Delton	69.8%	19.8%	4.6%	0.0%	3.5%	0.0%	1.6%	0.7%	30.2%
City of Wisconsin Dells	88.3%	7.3%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	11.7%
Town of Delton	87.1%	5.5%	0.5%	6.1%	0.7%	0.0%	0.0%	0.0%	12.9%
Town of Fairfield	95.5%	1.0%	0.0%	0.5%	0.0%	0.0%	0.5%	2.5%	4.5%
Juneau County	89.9%	3.3%	2.4%	0.7%	0.5%	0.0%	0.0%	3.1%	10.1%
Town of Lyndon	75.0%	6.4%	2.3%	7.7%	0.3%	0.0%	0.0%	8.3%	25.0%

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Figure 3-20: Percent Minority Populationsin Study Corridor Counties



U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates, by block group

Language

English is the dominate language in Wisconsin with 91.4% of the population speaking only English at home. Three percent of the state's population spoke English less than "very well" and may possess limited English proficiency (LEP). Table 3-31 shows the language spoken at home for the population 5 years and older. A relatively low percentage of individuals speak English less than "very well", even in communities with a higher percentage of individuals who speak a language other than English. In Dane County, the city of Madison and town of Burke have the highest percentage of people who speak English less than "very well". Spanish, Asian and Pacific Island languages are the most common languages spoken other than English.

The village of Lake Delton, Sauk County also has a higher percentage of people who speak English less than "very well." Spanish is the most common language other than English spoken in the village of Lake Delton.

Table 3-31: Language Spoken at Home by Location

Location	Population 5 Years and Older	English Only	Language Other Than English	Speak English Less than "Very Well"
State of Wisconsin	5,542,337	91.4%	8.6%	3.0%
Dane County	525,227	89.7%	10.3%	3.4%
City of Madison	252,015	86.3%	13.7%	4.4%
Town of Burke	3,201	93.8%	6.2%	3.9%
City of Sun Prairie	33,310	91.7%	8.3%	2.7%
Village of Windsor	7,988	96.5%	3.5%	1.3%
Village of DeForest	9,994	97.5%	2.5%	1.0%
Town of Vienna	1,542	98.7%	1.3%	0.0%
Columbia County	55,173	95.2%	4.8%	1.4%
City of Portage	9,619	94.3%	5.7%	1.1%
Town of Arlington	766	94.1%	5.9%	1.6%
Town of Caledonia	1,635	95.5%	4.5%	0.6%
Town of Dekorra	2,061	98.9%	1.1%	0.0%
Sauk County	61,622	92.5%	7.5%	2.5%
Village of Lake Delton	3,303	69.6%	30.4%	4.7%
City of Wisconsin Dells	2,547	95.7%	4.3%	2.4%
Town of Delton	2,609	95.2%	4.8%	0.8%
Town of Fairfield	1,108	99.7%	0.3%	0.0%
Juneau County	25,307	96.0%	4.0%	1.4%
Town of Lyndon	976	93.1%	6.9%	3.0%

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Education

The percentage of residents with a high school diploma in Dane and Columbia counties is comparable or higher than the statewide rate of 92.9% (Table 3-32), except for the city of Portage. High school diploma attainment rates in Sauk and Juneau counties are lower than the state rate, except for the village of Lake Delton and city of Wisconsin Dells.

Greater variation exists in attainment rates for residents with a bachelor's degree or higher. Residents in Dane County have a much higher attainment rate for a bachelor's degree or higher, likely reflective of their proximity to higher education institutions within Dane County. Columbia County, except for the town of Arlington, Juneau County and Sauk County all have lower attainment rates for bachelor's degree or higher than the statewide rate. The city of Portage (15.4%) and the town of Lyndon (14.4%) have substantially lower attainment rates than the state as a whole. These two communities were also observed to have low-income indicators as discussed in above.

Table 3-32: Educational Attainment of the Population 25 Years and Over

Location	High School Graduate or Higher	Bachelor's Degree or Higher
State of Wisconsin	92.9%	31.5%
Dane County	96.1%	53.0%
City of Madison	95.6%	58.5%
Town of Burke	97.8%	35.7%
City of Sun Prairie	97.1%	49.6%
Village of Windsor	95.1%	41.5%
Village of DeForest	97.3%	38.1%
Town of Vienna	96.8%	38.6%
Columbia County	94.0%	23.7%
City of Portage	91.6%	15.4%
Town of Arlington	98.0%	45.8%
Town of Caledonia	94.5%	30.6%
Town of Dekorra	95.1%	26.6%
Sauk County	91.8%	24.9%
Village of Lake Delton	93.6%	24.8%
City of Wisconsin Dells	95.9%	22.7%
Town of Delton	91.6%	22.8%
Town of Fairfield	92.8%	26.0%
Juneau County	90.3%	15.5%
Town of Lyndon	90.9%	14.4%

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates

Health Condition

Potential health-related impacts from living near freeways and other high-volume roads may occur from airborne pollutants emitted from motor vehicles. Data on community health typically are aggregated at the county level and difficult to find below such level.

Sensitive individuals may be affected by low-level carbon monoxide, nitrogen oxides and fine particulate pollutant exposure. Carbon monoxide may reduce the amount of oxygen distributed throughout the body by the bloodstream. Nitrogen oxides are one of the main precursors in ground-level ozone and may affect the delicate structure of lung tissue. Fine particulate matter can penetrate the sensitive respiratory tract and affect health.[18] All three pollutants are emitted from vehicle engines, among other sources, see Section 3.18 (Air Quality) for additional analysis.

WisDOT and FHWA investigated asthma rates, which are related to air quality. Asthma is a chronic lung disease affecting approximately 7.0% of children and 8.0% of adults in the U.S.[19] The exact cause of asthma is unknown, but it is thought to be caused by both environmental and genetic factors. According to the Wisconsin Department of Health Services, Wisconsin's estimated asthma prevalence in 2018 was 9.0% for adults and 8.4% for children.[20] Between 2020 and 2022, Dane, Columbia and Sauk counties had asthma-related emergency room visit rates below the Wisconsin rate of 24.5 per 10,000 persons. Juneau County's rate of 32.6 asthma-related emergency room visits, per 10,000 persons is above the statewide rate and 8th highest in the state. During that same timeframe, Dane, Columbia and Juneau counties had average asthma-related hospitalization rates below the Wisconsin rate of 2.1 per 10,000 persons. Sauk County averaged 2.5 hospitalizations, per 10,000 persons, which is above the statewide rate and 7th highest in the state.[21]

Employment

Dane County's largest employing industry is health care and social assistance, which employs more than 50,000 people.[22] Columbia County's largest employer is manufacturing, which employs more than 5,000 people. Accommodation and food services, followed by manufacturing, are the industries which employ the most people in Sauk County. Manufacturing is also the largest industry in Juneau County.

---

[18] *U. S. Environmental Protection Agency. Particulate Matter (PM) Pollution. Particulate Matter (PM) Basics. https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM Accessed March 2024.*

[19] *U.S. Environmental Protection Agency. Environmental Topics. Health Topics. Asthma. 2015. https://www.epa.gov/asthma. Accessed online Jan. 31, 2024.*

[20] *Wisconsin Department of Health Services, Bureau of Environmental and Occupational Health, Asthma Program. Wisconsin Asthma Burden Report P-02412-20. June 2020.*

[21] *Wisconsin Department of Health Services, Diseases & Conditions, Asthma. Asthma: Wisconsin Asthma Statistics. https://www.dhs.wisconsin.gov/asthma/facts.htm. Accessed Jan. 31, 2024.*

[22] *U.S. Census Bureau. Economic Census, 2017: ECN Core Statistics Summary Statistics for the U.S., States, and Selected Geographies: 2017.*

3.8.2. Socioeconomic Impacts

Neighborhood and Community Cohesion

Roadway expansion or changes in access can affect the physical and social settings, services and other factors that promote a sense of community among residents. Cohesion is the ability of people to communicate and interact with each other in ways that lead to a sense of community and is reflected in the neighborhood's ability to function and be recognized as a singular unit. Community cohesion includes buildings and services important to the community, such as churches, commercial development, social services, municipal buildings and services, parks and schools. Residential and commercial displacements can impact community cohesion.

No Build Alternative

Under the No Build alternative, WisDOT would not acquire any residential or commercial properties. The No Build alternative would not change neighborhoods or community cohesion. The existing roadway network would remain in place. However, there would be no safety or congestion benefits for drivers on the Interstate and traffic would divert to local roads during periods of congestion. The No Build alternative would not provide bicycle or pedestrian facilities to improve access across the Interstate. The existing noise barriers would remain but no new noise barriers would be constructed.

Build Alternatives

None of the build alternatives would split neighborhoods. All build alternatives would relocate the Dane County highway maintenance building and a hotel maintenance building, see Section 3.4; a barn, see Section 3.6 and one residence, see Section 3.3. No impacts on community cohesion are anticipated under the preferred Interstate or interchanges alternatives, as well as those alternatives recommended for further study. The WIS 13 Split Diamond alternative, which is an alternative recommended for further study would relocate an additional business and a shed on Trapper's Turn Golf Course.

The recommended flood minimization option (C4) would be implemented under all the build alternatives. An additional residence, six farm buildings, a business and a vacant business impacted by flood minimization measures would be additional relocations in the regulatory floodplain. Another 9 residential properties, 3 business properties and 3 vacant business properties would experience increased flood impacts outside the regulatory floodplain and WisDOT will evaluate purchasing flood easements at these properties.

Through ongoing coordination, the city of Madison has commented that I-39/90/94 is a barrier between central Madison and its growth areas east of the Interstate. The city supports additional access that new interchanges provide at Hoepker Road (Shifted Diamond alternative) and Milwaukee Street (Partial Cloverleaf alternative). The Sprecher Neighborhood Development Plan supports a new interchange at Milwaukee Street. City of Madison staff noted the importance of the interchange for ongoing and anticipated development envisioned in the neighborhood plan and the City's Comprehensive Plan.

Feedback from residents living near the new Milwaukee Street and Hoepker Road interchanges was mixed, with concerns centered on the accompanying increases in traffic on both streets. The proposed Hoepker Road interchange is not in the current Pumpkin Hollow Neighborhood Plan but is seen by local businesses and the city of Madison as an important alternate access to health services and the American Center east of the Interstate.

The US 151/High Crossing Boulevard Directional alternative, developed in coordination with the city of Madison, achieves the city's objective of slowing speeds on East Washington Avenue. All the build alternatives provide additional bicycle and pedestrian accommodations, described in Section 3.2 (Transportation Service). The build

alternative at the US 151/High Crossing Boulevard Directional alternative includes a path along the north side of 151 between American Parkway and Washington Avenue Frontage Road to provide additional connection between the east and west sides of the Interstate. The path would connect into Madison's existing sidewalk system. The build alternatives, including the preferred alternatives provide new bicycle and pedestrian connections as further discussed in Section 3.2.2. None of the build alternatives would sever existing bicycle and pedestrian facilities. Construction may temporarily disrupt facilities and would be mitigated as discussed in Section 3.24.4. Detours of the Ice Age Trail during construction are described in Section 3.2.2.

Changes in Travel Patterns

No Build Alternative

No substantial changes in travel patterns are expected under the No Build alternative. As congestion increases on I-39/90/94, local roads may be used more frequently to avoid congestion.

Build Alternatives

All build alternatives replace the Interstate and interchanges largely in their existing footprints, minimizing substantial changes in travel patterns. However, preferred new interchange alternatives at Milwaukee Street and Hoepker Road would increase traffic on those streets, as anticipated in future plans. Conversely, traffic diverting to new interchanges would decrease traffic volumes on other local roads used for Interstate access. The new interchange at Hoepker Road would provide direct interstate access to the American Center and reduce traffic on surrounding local roads.

The preferred US 51 Interchange Partial Cloverleaf alternative would remove the right in and right-out access from US 51 to Daentl Road and North American Lane and access provided at nearby intersections. The Split Diamond alternative (recommended for further study) at the WIS 13 Interchange would provide additional direct Interstate access at both County H and WIS 13, serving the town of Delton. See Section 3.2.2 for more discussion about transportation impacts.

Should a build alternative be implemented, it is expected that some traffic currently using local streets to avoid congestion on I-39/90/94 would divert back to the Interstate. The build alternatives may have impacts on both latent and induced transportation demand, see Section 3.2.2. While I-39/90/94 already exists and supports existing and planned land uses, new interchanges provide new access and potentially lower reduced travel times that could accelerate development and induce travel demand.

Effects on Social Groups

WisDOT developed and implemented a public involvement program to assess the build alternatives' effect on social groups including elderly, minority, low-income, persons with disabilities, persons with limited English proficiency (LEP), pedestrians and bicyclists. Section 3.9.3 discusses effects and outreach to minority and/or low-income populations. Section 5 summarizes the study's public and agency outreach activities.

No Build Alternative

The No Build alternative would not directly affect or isolate distinct groups such as elderly, minority, low-income, persons with LEP or persons with disabilities. Nor would the No Build alternative affect any building or program that serves or houses these persons. Compared to build alternatives, the No Build alternative could result in higher crash rates and congestion but would not have an adverse impact on non-drivers to the extent it would on persons who rely on the Interstate for access to and efficient movement of goods and services. This higher level of

congestion on I-39/90/94 could cause some drivers to divert to local streets, causing more congestion on local roads. This greater amount of traffic on local roads would make them less safe for pedestrians and bicyclists on those roads.

Build Alternatives

Overall, all the build alternatives would improve traffic operations and safety, which would benefit all social groups using the Interstate system. As noted in Section 2.2, compared to the Modernization Hybrid alternative, the preferred Modernization Plus Added General-Purpose Lane alternative is predicted to perform better than the No Build alternative in reducing crashes. Improving operations on I-39/90/94 and at interchanges could reduce traffic volumes on some local streets, which could benefit transit riders, bicyclists and pedestrians who use those streets. The preferred new interchange alternatives at Milwaukee Street and Hoepker Road would increase traffic volumes on those streets, which could negatively impact bicyclists and pedestrians, but also provide improved access to existing and planned services in the area. All the build alternatives provide bicycle and pedestrian connections that improve access across the Interstate benefitting all social groups, as well as bicyclists and pedestrians.

None of the build alternatives would preclude construction of additional bicycle and pedestrian crossings requested by the city of Madison and described in Section 3.2.2. WisDOT will coordinate with local communities and other stakeholders on a location-by-location basis regarding these possible crossings.

WisDOT also conducted outreach to organizations serving persons with disabilities and persons with LEP as described in Section 5.1.6. No concerns for study impacts to LEP or disabled populations were reported to WisDOT.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, issued in 1997, also directs federal agencies to evaluate the impacts of their action on children and indicate why the action is preferred over other reasonably and feasible alternatives. Daycares, outdoor athletic facilities and schools are located along the study corridor. Children are more likely to concentrate in these areas than other locations in the study corridor and are more susceptible to adverse impacts from environmental pollution. Children are also more likely to be pedestrians and therefore have a greater potential for exposure to air quality and noise impacts. None of the build alternatives would have long-term impacts to schools nor interfere with school district services that transport students within the study corridor. Based on the air quality analysis, completed in Section 3.18, MSAT emissions are the highest in 2023 (Existing Condition) and lowest for the 2060 analysis year. Total MSAT emissions of the No Build alternative and build alternative in 2060 are approximately 82% to 89% lower than the emissions in 2023, respectively. While the build alternatives would have slightly higher MSAT emissions than the No Build alternative in future years, the emissions are not substantially different. Furthermore, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region wide MSAT levels to be lower than today. WisDOT also completed a Greenhouse Gas (GHG) emissions analysis, see Section 3.18. The analysis found there would be no substantial differences between the annualized GHG emissions from the build and No Build alternatives. The annualized GHG emissions of the build alternatives would be 4.7% higher than the No Build alternatives due to the additional lanes to be constructed.

Changes in Property Values

No Build Alternative

Under the No Build alternative, WisDOT would not acquire property or change the existing highway system. Property values would not change due to the No Build alternative. An indirect impact of the No Build alternative is that as congestion continues to worsen, businesses in the area may lose business or choose to relocate, which

could reduce property values. The city of Madison's anticipated tax revenues from development plans near the proposed Milwaukee Street and Hoepker Road interchanges may not be realized or could happen at a slower pace.

Build Alternatives

Residents who live near the Interstate, including preferred new interchange alternatives at Hoepker Road and Milwaukee Street, have expressed concern over the potential for their property values to decrease. This concern is frequently cited in regard to highway reconstruction projects. Home resale values are affected by numerous variables, including location, home condition, mortgage rates and the economy. Under all the build alternatives, the Interstate would be reconstructed similar to where it is today, but to determine a net change to property values due to the wider right of way would be difficult because the project would likely include noise barriers and changes in access that may also increase or decrease property values. While there has been some research on the topic, it is difficult to rely on the results of a study to draw meaningful conclusions given the variables. As part of any large transportation project, WisDOT evaluates the impacts that may lead to diminishing property values and mitigates for specific impacts to the extent practicable and allowed by law, such as noise and visual impacts, to minimize the impacts on property values. The mitigation measures are developed with community input from the beginning of the study through final design stages. WisDOT would fairly compensate property owners whose property is acquired as part of the project under the Uniform Act. Sections 3.3.3 and 3.4.4 provide additional information about the Uniform Act.

Tax Base Impacts

No Build Alternative

There would be no property acquisitions under the No Build alternative and no changes in tax base impacts.

Build Alternatives

Build alternatives can permanently remove property from the local tax base, which could impact tax revenues in a community. Impacts are primarily confined to strip acquisitions immediately next to the Interstate and interchanges but include residential and business acquisitions. The preferred Partial Cloverleaf alternative a new Milwaukee Street Interchange impacts a farm parcel north of I-94, removing about 12.5 acres from the local tax base. The impacts to local tax base would be offset with improved access to goods and services, along with improved travel reliability and safety. As noted in Section 3.1.3 and Section 3.4.3, all the build alternatives support planned land uses in Dane County.

WisDOT assessed the potential tax base loss for communities in the study corridor, using each community's gross full value tax rate as reported by the Wisconsin Department of Revenue. Land value information was obtained from parcel data collected from each community. The tax-base impact for each alternative was determined using 2022 assessment figures and taxes collected in 2023. The percentage of land being taken from a property was multiplied by the assessed land value of the property to approximate the impact on the property tax base. Table 3-33 summarizes potential tax base and revenue loss by community for the build alternatives. There is less than 4% difference between the Modernization Hybrid alternative and the preferred Modernization Plus Added General-Purpose Lane alternative. The more conservative impacts are reported for Modernization Plus General-Purpose Lane alternative, along with the preferred interchange alternatives. WIS 13 alternative impacts are reported separately. The County V Diamond Alternative does not require additional right of way and would not impact the tax base.

Table 3-33: Impacts to Property Tax Revenues*

Location	Total Tax Base (2022)	Total Property Tax (2022)	Total Tax Base Loss	Property Tax Loss	Potential Reduction in Property Tax Revenue (%)
Dane County					
City of Madison	$ 38,606,699,100	$ 799,506,080	$ 5,699,409	$118,034	0.015 %
Town of Burke	$ 660,603,000	$ 10,031,975	$ 504,400	$ 7,662	0.076 %
City of Sun Prairie	$ 4,767,506,600	$ 96,639,464	$ 45,290	$ 918	0.001 %
Village of Windsor	$ 1,305,644,600	$ 22,441,400	$ 15,101	$ 260	0.001 %
Village of DeForest	$ 1,828,925,000	$ 34,546,209	$ 172,532	$ 3,259	0.009 %
Town of Vienna	$ 332,598,400	$ 5,223,677	$ 33,126	$ 520	0.010 %
Columbia County					
City of Portage	$ 871,556,800	$ 16,822,380	$ 0	$ 0	0.00 %
Town of Arlington	$ 125,591,700	$ 2,151,686	$ 59,866	$ 1026	0.048 %
Town of Caledonia	$ 300,469,700	$ 3,840,562	$ 26,188	$ 335	0.009 %
Town of Dekorra	$ 513,499,800	$ 7,911,665	$ 71,190	$ 1097	0.014 %
Sauk County					
Village of Lake Delton	$ 1,916,198,000	$ 26,318,510	$ 73,690	$ 1012	0.004 %
City of Wisconsin Dells *WIS 13 Split Diamond Alternative*	$ 145,251,400	$ 2,833,387	$ 87,757	$ 1712	0.060 %
City of Wisconsin Dells *WIS 13 Trumpet Alternative*	$ 145,251,400	$ 2,833,387	$ 99,228	$ 1936	0.068 %
Town of Delton	$ 406,533,100	$ 5,661,499	$ 12,583	$ 175	0.003 %
Town of Fairfield	$ 152,129,500	$ 2,187,470	$ 2,686	$ 39	0.002 %
Juneau County					
Town of Lyndon	$ 157,680,100	$ 2,493,703	$ 15,140	$ 239	0.010 %

Source: WisDOT and Wisconsin Department of Revenue 2022 Town, Village and City Taxes: Taxes Levied 202-Collected 2023.

** Impacts between the Modernization Plus Added General-Purpose Lane and Modernization Hybrid alternatives are minimal. Impacts conservatively reported for preferred Modernization Plus Added General-Purpose Lane + preferred interchange alternatives, except for WIS 13 Interchange alternatives. No impacts associated with County V Diamond alternative.*

Construction Effects on Communities and Neighborhoods

Constructing the build alternatives would include removing bridges and roadways; raising the Interstate out of the 100-year flood elevation, constructing and widening bridges; constructing retaining walls; installing barriers and traffic control measures; drainage improvements, earthwork, lighting and paving. Construction impacts may include temporary increases in noise, vibrations, dust and particulate emissions; temporary changes to visual surroundings due to construction and construction equipment; and detours, lane closures and/or road closures. Section 3.24 provides additional information regarding construction impacts.

The 67-mile corridor would be constructed in phases over the course of 10 to 15 years, with each construction phase lasting from 1.5 to 3 years to minimize disruptions on other portions of the corridor that would not be in construction. For each construction phase, WisDOT will develop a transportation management plan (TMP) to coordinate and manage impacts associated with construction. WisDOT would maintain access to businesses, homes and community facilities, as well as the Interstate and local roads. Construction would not divide corridor communities or neighborhoods; however, there may be fluctuations in patronage to affected businesses due to perceived or real changes in access and construction nuisances. WisDOT has a communications and outreach program, In This Together, that provides resources for businesses to plan for highway construction impacts.[23] WisDOT will also develop an outreach and communication plan with local businesses and community services to provide information on access during construction. Any temporary neighborhood disruption during construction due to bridge replacements would be mitigated by detour routes for vehicles, pedestrians and bicyclists. WisDOT will also develop a transportation management plan to avoid and minimize travel impacts during construction.

3.8.3. Measures to Minimize and Mitigate Adverse Impacts to Socioeconomic Characteristics

WisDOT will continue to coordinate with communities to minimize socioeconomic impacts during future design phases. Section 3.25 and Section 3.26 discuss the indirect and cumulative effects of build alternatives, respectively. Measures to mitigate residential, commercial/industrial relocations and adverse noise impacts are further discussed in Section 3.3, Section 3.4 and Section 3.17, respectively. Section 3.24 discusses construction impacts and related mitigation measures.

3.9. Environmental Justice

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by the President on Feb. 11, 1994, directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. The order also directs each agency to develop a strategy for implementing environmental justice. The order is also intended to promote nondiscrimination in federal programs that affect human health and the environment and provide minority and low-income communities with access to public information and public participation.[24] WisDOT developed the I-39/90/94 Corridor Study Environmental Justice Plan, which identifies and describes environmental justice populations and stakeholders along the study corridor, see Appendix M. The plan

[23] *Wisconsin Department of Transportation. In This Together . Road Construction Guide for Business. https://wisconsindot.gov/Pages/projects/in-together/default.aspx . Accessed Jan. 23, 2024.*

[24] *Federal Register Vol. 59, No. 32. Executive Order 12898 of February 11, 1994, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations. February 16, 1994.*

analysis helps determine if there are disproportionately high and adverse effects of the project being borne by environmental justice population.

ENVIRONMENTAL JUSTICE POPULATION

Minority Persons:
Black – a person having origins in any of the black racial groups of Africa.

Hispanic – a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

Asian American – a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.

American Indian and Alaskan Native – a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition.

Native Hawaiian and Other Pacific Islander – a person having origins, in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Low-Income Persons:
Person whose median household income is at or below the Department of Health and Hunan Services poverty guidelines. (Per DOT Order 5610.2C and FHWA Order 6640.23A)

Subsequent US DOT and FHWA Orders implement Executive Order 12898:

- DOT Order 5610.2C, *U.S. Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (updated May 2021) (USDOT 2021)
- FHWA Order 6640.23A, *Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (FHWA 2012)

DOT Order 5610.2C sets forth the DOT policy to consider environmental justice principles in all (DOT) programs, policies and activities. It describes how the objectives of environmental justice are integrated into planning and programming, rulemaking and policy formulation. The Order also notes the following, which is included in the environmental justice analysis for this project:

- DOT shall collect, maintain and analyze information on the race, color, national origin and income level of persons adversely affected by DOT programs, policies and activities and use such information in complying with DOT Order 5610.2C
- Provide meaningful opportunities for public engagement with members of minority populations and low-income populations during the planning and development of programs, policies, and activities (including the identification of potential effects, alternatives, and mitigation measures)
- Ensure that disproportionately high and adverse human health and environmental effects on minority populations and low-income populations are avoided, minimized or mitigated in a manner consistent with DOT Order 5610.2C and Executive Order 12898

FHWA Order 6640.23A directs FHWA to comply with EO 12898 by conducting an environmental justice analysis. WisDOT and FHWA completed an environmental justice analysis for this study to determine whether the proposed

alternatives have the potential to incur disproportionately high and adverse effects upon minority populations or low-income populations. For any high and adverse effects found to be borne disproportionately by low-income and minority populations, the analysis examines mitigation measures, offsetting benefits and impacts of other system elements in accordance with FHWA Order 6640.23A (as well as DOT Order 5610.2C). FHWA's Guidance on Environmental Justice and NEPA (2011) advises FHWA offices on the process for addressing environmental justice during NEPA review. It informs FHWA on how to proceed if there are disproportionately high and adverse effects on minority populations and low-income populations.

The President signed EO 14096, Revitalizing Our Nations Commitment to Environmental Justice for All, on April 21, 2023. EO 14096 does not rescind EO 12898, which is currently implemented through DOT Order 5610.2C and FHWA Order 6640.23A. This implementation will continue until further guidance is provided regarding the implementation of EO 14096. EO 14096 builds on EO 12898, stating:

"To ensure that the Nation's policies and investments respond to the needs of every community, all people should be afforded the opportunity to meaningfully participate in agency decision-making processes that may affect the health of their community or environment. The Federal Government must continue to remove barriers to the meaningful involvement of the public in such decision-making, particularly those barriers that affect members of communities with environmental justice concerns, including those related to disability, language access and lack of resources. The Federal Government must also continue to respect Tribal sovereignty and support self-governance by ensuring that Tribal Nations are consulted on Federal policies that have Tribal implications." [25]

Section 3.8 discusses potential impacts to populations with disabilities and limited English proficiency. Outreach efforts for the study are further discussed in Section 3.9.2 and Section 5.

3.9.1. Identification of Existing Minority and Low-Income Populations

WisDOT performed an analysis to identify minority and low-income populations, see Section 3.8. The analysis also reviewed age, disability, vehicle ownership and language characteristics. The analysis used U.S. Census Bureau data within one-half mile of the study corridor that are in communities next to the Interstate, supplemented by the study team's public involvement program discussed in Section 5.1. A one-half mile analysis area was selected to capture the characteristics of populations most likely to experience daily construction related effects resulting from build alternatives. WisDOT also reviewed minority and low-income populations within 1,000 feet of the study corridor to determine if a higher concentration of environmental justice populations live near the Interstate as compared to populations within one-half mile.

A 1,000-foot buffer would capture persons and businesses likely to experience the highest degree of direct effects from the build alternatives, including potential property acquisition, relocation, noise and nuisances associated with construction. Those beyond 1,000 feet of the corridor would likely experience less direct, but more indirect effects of the I-39/90/94 Corridor Study. Persons and businesses at all scales of analysis would experience project benefits post-construction from reduced congestion, improved safety and improved local circulation.

Table 3-34 anticipates that, with the exception of rural Columbia County, a higher percentage of minority populations reside within 1,000 feet of the study corridor compared to the surrounding counties. A higher percentage of families in poverty tend to live close to the study corridor in all counties, but median household income is higher near the corridor in Columbia and Juneau counties.

[25] *Federal Register. Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All. April 21, 2023.*

Table 3-34: Minority and Low-Income Populations within 1,000 Feet of Study Corridor

Location	Minority Population (%)	Median Household Income*	Families in Poverty (%)
Dane County	21.8%	$ 78,452	5.0%
Dane County half-mile buffer	24.8%	$ 77,916	3.7%
Dane County 1,000-foot buffer	28.8%	$ 74,633	7.1%
Columbia County	8.4%	$ 73,786	4.7%
Columbia County half-mile buffer	7.5%	$ 86,906	4.3%
Columbia County 1,000-foot buffer	6.6%	$ 86,318	8.9%
Sauk County	10.2%	$ 67,702	5.9%
Sauk County half-mile buffer	21.0%	$ 57,416	5.3%
Sauk County 1,000-foot buffer	20.0%	$ 58,110	9.6%
Juneau County	10.1%	$ 58,561	8.5%
Juneau County half-mile buffer	19.2%	$ 57,159	9.0%
Juneau County 1,000-foot buffer	20.0%	$ 61,577	14.3%

*Source: US Census 2021 ACS 5-Year Estimates. *Census Tract*

Throughout the study corridor, populations are predominately white, non-minority residents. The Environmental Justice Plan identified Census block groups with the highest percentage of minorities in the Madison metropolitan area and near the Wisconsin Dells. Based on Census data, the study team contacted local agencies and organizations associated with or serving environmental justice populations to determine areas of additional outreach to Black or African American, Hispanic, and Asian American populations.

Measures of low-income population – median household income and the percentage of families below the poverty threshold[26] – vary across the study corridor. At the county and municipal level, Dane and Columbia counties, as well as the communities residing in the study corridor, generally had median incomes above the statewide median income of $67,080 and lower percentages of families below the poverty threshold compared to the statewide rate of 6.6%. Within Dane and Columbia counties, at the block group level the percentage of families living below the poverty threshold is higher than the county and statewide rates near the I-94/WIS 30, US 151/High Crossing and I-39 I-90/94 Split Interchanges, see Figure 3-19. Low-income indicators for Sauk and Juneau counties were mixed. Sauk and Juneau counties, as well as corridor communities, generally had median incomes comparable to or lower than the statewide median income and the percentage of families living below the poverty threshold was generally below the statewide rate. However, Juneau County as a whole and the towns of Fairfield and Lyndon had higher percentage of families living below the poverty threshold. Across the entire study corridor,

[26] *HHS guidelines are a simplification of the US Census Bureau's poverty thresholds for use for administrative purposes. Therefore, US Census Bureau 2021 poverty guidelines were used, in place of HHS poverty guidelines, to set the poverty threshold for this analysis. According to HHS, in 2021, a family of four would be considered in poverty if the family's total income was less than $26,500.*

only the city of Portage and village of Lake Delton were found to have both lower median household incomes and higher percentages of families living below the poverty threshold as compared to the state as a whole.

3.9.2. Coordination with and Participation of Minority Populations and Low-income Populations

WisDOT and FHWA developed a Public Involvement Plan (PIP) and an Environmental Justice (EJ) Plan to ensure individuals and communities are provided a meaningful voice throughout the entire study process. The EJ Plan describes the process to identify diverse groups, organizations and individuals whom the study alternatives would affect as well as to share study information and invite input on the study, including study purpose and need, alternatives, impacts and measures to avoid, minimize and mitigate adverse effects. Section 5.1.6 describes the study's public involvement process to coordinate with environmental justice populations, methodologies to promote the full participation of environmental justice populations and summarizes engagement activities.

3.9.3. Identification of Disproportionately High and Adverse Effects on Minority Populations and Low-Income Populations

No Build Alternative

The No Build alternative would not have direct environmental effects. Yet, failure to address the condition of the I-39/90/94 study corridor may have an adverse effect on low-income and minority residents, as well as the general population, because safety and traffic operations would continue to decline, compared with build alternatives. Growing congestion on the Interstate could cause increased traffic on local streets as traffic diverts from the Interstate, which limits reliable access to goods and services.

Build Alternatives

WisDOT analyzed effects – beneficial or adverse – to the general population, including environmental justice populations. The process WisDOT and FHWA followed to identify disproportionately high and adverse effects is provided in Section 5.2 of the EJ Plan. The potential effects of the build alternatives to the general, minority and low-income populations are summarized in Table 3-35 by effect category. Effect categories found to have only beneficial impacts or impacts less than adverse, were not carried forward for additional analysis for disproportionately high and adverse effects.

WisDOT worked in a multi-disciplinary fashion to avoid and minimize impacts to the extent possible. Build alternatives were designed to stay within the existing right-of-way as much as possible to minimize the effect on residents and businesses adjacent to the I-39/90/94 study corridor.

Avoidance and minimization efforts allowed the design team to reduce cost, narrow shoulders, and reduce certain elements of mainline or interchange designs to minimize construction footprint and property acquisition. In addition, WisDOT seeks to request design exceptions, where appropriate, for select interchange movements that experience low average vehicle per day usage. WisDOT and FHWA's position is that build alternatives will meet nationally accepted design criteria, unless meeting the criteria would incur a high level of impact that cannot be reasonably mitigated or would compromise another purpose and need factor.

Table 3-35 summarizes the impacts for each effect category for the preferred build alternatives, alternatives recommended for further study, as well as any mitigation that would reduce or eliminate the impacts. Build alternatives were designed to minimize impacts as much as possible while still meeting project purpose and need.

The last column in Table 3-35 notes if there is potential for an adverse impact on the general population and environmental justice populations. Where there is a potential for adverse impacts, even short-term, a more detailed review follows to demonstrate specifically where and whom would likely be affected and to help assess whether there is a disproportionately high and adverse effect on a minority or low-income population. This analysis provides a review of whether the adverse effect is predominantly borne by this population or is appreciably more severe or greater in magnitude on the minority and/or low-income population than the adverse effect suffered by the non-minority or non-low-income population.

Table 3-35: Summary of Potential Effects, Mitigation and Adverse Effect Analysis

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Land Use and Zoning (see note)	None of the build alternatives conflict with land use plan recommendations. An interchange at or near Hoepker Road has been considered in local plans dating back to at least 1992. The Pumpkin Hollow Neighborhood Development Plan noted neighborhood residents and property owners did not support a Hoepker Road Interchange. Land converted to new right of way: Modernization Plus Added General-Purpose Lane (preferred) + preferred interchange alternatives: 225 acres Modernization Hybrid + preferred interchange alternatives: 219.6 acres County V Diamond alternative: 0 acres WIS 13 Split Diamond alternative: 5.4 acres WIS 13 preferred Trumpet alternative: 3.5 acres	FHWA and WisDOT would compensate property owners in accordance with applicable laws and regulations for land acquired from residences, businesses, utilities and institutions.	The impacts of land use changes would not create an adverse effect upon environmental justice populations or the general population. Refer to the Acquisitions and Relocations Analysis below for additional analysis.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Transportation Services (see note)	Improved travel reliability for bus transit users. Allows for existing and planned park and ride lots, as well as future electric vehicle charging stations. No permanent adverse effects to intercity or regional intra-city bus service, freight and passenger rail service and airports. Construction impacts may require temporary detour routes for transit routes and bike and pedestrian facilities crossing the interstate. Construction may temporarily interrupt freight rail service during bridge replacement activities. No temporary impacts at airports are anticipated.	WisDOT will coordinate with Madison Metro Transit to minimize effects to transit services and with municipalities along the study corridor to minimize impacts to pedestrian and bicycle travel during construction. WisDOT will conduct public engagement during the construction phase, providing the public opportunities to give input on construction related impacts. During final design, and as required, WisDOT will complete an Obstruction Evaluation and complete coordination with FAA for potential operations interference at the Dane County Regional Airport, the Portage Municipal Airport and the Baraboo-Dells Flight Center. WisDOT will coordinate with WSOR and the CPR to minimize interruptions to rail service at rail crossings along the study corridor.	All build alternatives either benefit or do not permanently impact transportation services. Temporary construction impacts may cause temporary delays or detours along existing transit routes to both the general population and environmental justice populations. Identified temporary construction impacts require further analysis of potential effects to minority populations and low-income populations. Refer to the Construction Analysis below for more information.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Traffic Operations (see note)	The Interstate would generally operate at LOS D or better in urban areas south of County V during the morning and afternoon peak hours, as well as Friday and Sunday afternoon peak hours in 2050. No Interstate segment would operate at LOS F. Modern design on the Interstate and interchange, such as lengthening interchange exit and entrance ramps, improving ramp curves and improved ramp spacing improves safety. <u>Predicted Crashes and Fatal/Injury Crashes</u> • Modernization Plus Added General-Purpose Lane (preferred): Est. 30% reduction in crashes and 28.3% reduction in fatal and injury crashes compared to No Build alternative. • Modernization Hybrid: Est. up to 3% reduction in crashes and 1.4% reduction in fatal and injury crashes compared to No Build alternative. Both modernization alternatives may cause latent and induced travel demand. The Modernization Hybrid alternative does not include an added general-purpose lane in Dane County, but the added managed lane would operate during peak travel times during the weekday, as well as weekends, providing travel times similar to the Modernization Plus Added General-Purpose Lane alternative.	WisDOT will develop a transportation management plan (TMP) to coordinate and manage traffic impacts associated with construction. The TMP will include coordination with emergency service providers, school districts and other stakeholders such as transit and rail providers and local communities to mitigate traffic impacts and maintain access during construction. Refer to Section 3.2.3.	Modernization Plus Added General-Purpose Lane: Beneficial impacts, (30% crash reduction compared to the No Build alternative), no adverse effects. Modernization Hybrid: Beneficial impacts(1 – 3% crash reduction compared to No Build alternative); higher crash rates than the Modernization Plus Added General-Purpose Lane alternative. All alternatives, which include reconstructing overpasses, underpasses and interchanges, as well as adding new interchanges would improve public connectivity and access to employment, services and recreation on either side of the Interstate. Impacts to traffic operations are not anticipated to create an adverse effect upon environmental justice populations or the general population.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Local Roads (see note)	Similar travel patterns throughout most of the study corridor, except for the following: Milwaukee Street Partial Cloverleaf Interchange (preferred): New connections to jobs and services consistent with city of Madison land use plans. New interchange would double traffic volumes over existing conditions near Sprecher Road by the year 2050. Hoepker Road Shifted Diamond Interchange (preferred): New connections to jobs and services consistent with city of Madison land use plans. Traffic volumes could increase by 70% or more by the year 2050. US 51 Partial Cloverleaf Interchange (preferred): Daentl Road and North American Lane access to US 51 is closed. Traffic re-routed about 0.25 mile to existing roads. Refer to Section 3.2.2.	Alternative access to US 51, for parcels impacted by the US 51 Partial Cloverleaf Interchange, is available from nearby existing routes. WisDOT's public engagement program during construction will provide updates on interchange closures and alternative routes.	New Milwaukee Street interchange improves access to employment and services; access benefits and traffic impacts would impact environmental justice and general populations to a similar extent. New Hoepker Road interchange improves access to employment and services; access benefits and traffic volume increases occur in commercial, industrial and undeveloped land impacting environmental justice and general populations to a similar extent. Intersection closures at US 51 interchange alter access to a highway-oriented business area containing service stations and highway-oriented retail. The impacted highway-oriented businesses serve the general population and environmental justice populations to a similar extent. Changes to local roads are not anticipated to create an adverse effect upon environmental justice populations or the general population.

Bicycle/Pedestrian (see note)	Build alternatives would not remove existing bicycle or pedestrian facilities. All reconstructed crossings would maintain and improve bicycle and pedestrian facilities to the extent practicable. Added bicycle and pedestrian facilities include: • Milwaukee Street Interchange – preferred Partial Cloverleaf alternative (city of Madison): sidewalks and on-street bike lanes provided on both sides of Milwaukee Street. • Milwaukee Street overpass on I-39/90 – all alternatives (city of Madison): Added bike and pedestrian facilities. • I-39/90/94 crossings over future Glacial Drumlin Trail and Greater East Towne crossing (city of Madison): bridges widened to accommodate future trails. • US 151/High Crossing Blvd. Interchange – preferred Directional alternative (city of Madison): new connecting path on north side of highway. • Hoepker Road Interchange - preferred Shifted Diamond alternative (city of Madison): sidewalks and on-street bike lanes provided on both sides of Hoepker Road. • US 51 Interchange – preferred Partial Cloverleaf alternative (town of Burke/village of DeForest): path provided on east side of US 51. • WIS 19 Interchange – preferred U-Ramp alternative (village of DeForest/village of Windsor): path provided on north side of WIS 19. • US 12 Interchange – preferred Diverging Diamond alternative (village of Lake	WisDOT will coordinate with the National Park Service during final design to confirm Ice Age Trail detour routes during construction. Prior to construction, WisDOT will post detour signage for Ice Age Trail users. WisDOT will develop a TMP to coordinate and manage impacts. TMP strategies include public information and outreach; staging sequential overpass, underpass and interchange closures to minimize indirection.	The bicycle and pedestrian improvements where there are higher concentrations of minority and low-income populations at US 151/High Crossing Boulevard and at the Milwaukee Street interchange and overpass would improve connections to employers and services in the city of Madison. Similar improvements at the US 12 and WIS 23 interchange preferred alternatives would improve access to employers and services on either side of the Interstate. Improvements to bicycle and pedestrian facilities benefit all populations with improved access.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
	Delton/town of Delton): path provided on east side of US 12. • WIS 23 Interchange – preferred Diamond alternative (village of Lake Delton): sidewalk provided on both sides of WIS 23 and on-street bike lanes. • WIS 13 Interchange - Split Diamond alternative (town of Delton/city of Wisconsin Dells): path provided on north side of WIS 13 to maintain connecting route access for the Ice Age Trail. Construction activities may temporarily close local bicycle and pedestrian crossings.		

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Residential Development	Residential relocations: Hoepker Road preferred Shifted Diamond alternative: 1 single-family residence. Property Only Acquisitions: • Property only acquisitions are primarily strip acquisitions (i.e., acquiring narrow strips of property) • Modernization Plus Added General-Purpose Lane (preferred) + preferred interchange alternatives: 79 property-only acquisitions representing a total of 9.8 acres of new right of way. • Modernization Hybrid + preferred interchange alternatives: 79 property-only acquisitions representing a total of 8.8 acres of new right of way. • WIS 13 Split Diamond alternative: One additional property-only acquisition and 0.7 acres of total additional new right of way. Flood minimization measures would result in increased 100-year flood elevations at one residence in the regulatory floodplain and requires relocation. Nine residences outside the regulatory floodplain would experience increased flood elevations but would not be relocated.	Compensation for property acquired from residences per Uniform Act. During final design, WisDOT will continue coordination with the impacted property owners within the regulatory floodplain to determine acquisition or other mitigation measures such as floodproofing structures. WisDOT will mitigate impacts of flood elevation rises outside the regulatory floodplain through the buying of easements to the limits of allowable under Wis. Stat. s. 86.255.	Residential relocations are an adverse impact. Identified impact requires further analysis of potential effects to minority populations and low-income populations. Refer to the Acquisitions and Relocations Analysis below.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Commercial and Industrial Development	Commercial and industrial relocations: • WIS 13 preferred Trumpet alternative: 1 hotel maintenance building. • WIS 13 Split Diamond alternative: 1 hotel maintenance building, 1 retail business, 1 shed and 3 off-premises signs. Property-only acquisitions: • Modernization Plus Added General-Purpose Lane (preferred) + preferred interchange alternatives: 141 commercial property-only strip acquisitions, representing a total of 53.0 acres of new right of way. No disruption to commercial and industrial property functions. • Modernization Hybrid + preferred interchange alternatives: 141 commercial property-only strip acquisitions, representing a total of 50.4 acres of new right of way. No disruption to commercial and industrial property functions. • WIS 13 Split Diamond alternative: An additional 2.0 acres of property-only acquisition for new right of way. All alternatives include flood minimization measures that result in increased 100-year flood elevations at 1 existing commercial business, requiring relocation and 1 vacant commercial business in the regulatory floodplain. Three existing and 3 vacant businesses outside the regulatory floodplain would experience increased flood elevations outside the regulatory floodplain but would not be relocated.	Compensation for commercial and industrial acquisition per Uniform Act. During final design, WisDOT will continue coordination with the impacted property owners within the regulatory floodplain to determine acquisition or other mitigation measures such as floodproofing structures. WisDOT will mitigate impacts of flood elevation rises outside the regulatory floodplain through the buying of easements to the limits of allowable under Wis. Stat. s. 86.255.	Commercial and industrial relocations are an adverse impact. Identified impact requires further analysis of potential effects to minority populations and low-income populations. Refer to the Acquisitions and Relocations Analysis below.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Institutional and Public Services	I-94/WIS 30 preferred Full Modernization #2 alternative: relocates Dane County Highway Maintenance building. Hoepker Road preferred Shifted Diamond alternative: provides access to health facilities east of the Interstate. All build alternatives: flood minimization options raise the 100-year flood elevation at 1 USFWS maintenance/storage garage and up to 3 WDNR buildings and requires relocation.	WisDOT will fairly compensate institutions for land acquired or for buildings moved or raised. If Dane County, USFWS and WDNR buildings are relocated as mitigation, WisDOT will coordinate with each agency to select a site that serves Dane County, USFWS and WDNR operation functions. During final design, WisDOT will continue coordination with USFWS to finalize measures to mitigate changes in the flood limit boundary at the Baraboo River Waterfowl Production Area field office. WisDOT will also continue coordination with WDNR to finalize measures to mitigate changes in the flood limit boundary at the Pine Island State Wildlife Area.	Impacts to institutional and public services are not anticipated to create an adverse effect upon environmental justice populations or the general population.
Socioeconomic (see note)	No division of neighborhoods. Property acquisition does not require community facilities. Improved reliable access to current and future development; supports existing and future planned bicycle and pedestrian crossings.	No additional mitigation required.	Socioeconomic impacts are not anticipated to create an adverse effect upon environmental justice populations or the general population.

Visual Quality (see note)	Overall, the visual effect of reconstructing the Interstate and interchanges would be minimal, generally replacing infrastructure where it currently exists, see Section 3.10.2. I-94/WIS 30 preferred Full Modernization #2 alternative and US 151/High Crossing Boulevard Directional alternative would increase the interchange heights by about 30 and 40 feet, respectively. Both interchanges. The proposed new Milwaukee Street preferred Partial Cloverleaf and Hoepker Road preferred Shifted Diamond interchanges would introduce new infrastructure into viewsheds as anticipated under the city of Madison's future land use plans. Replacing the Interstate bridge over Mirror Lake could affect views from the Interstate of the lake and views of the bridge from the lake. Proposed flood minimization options, see Section 3.13, would raise I-39 about four feet and I 90/94 by about three feet. Both Interstate sections travel next to the Baraboo River Waterfowl Production Area and the Pine Island State Wildlife Area. Feasible and reasonable noise barriers in the city of Madison, village of Lake Delton and the city of Wisconsin Dells would mitigate noise impacts, but block views of and from the Interstate.	During final design, WisDOT will continue design refinements to minimize encroachment impacts on the surrounding viewshed. During final design, WisDOT will coordinate with WDNR on bridge aesthetics that are compatible with the Mirror Lake State Park aesthetic. As part of vegetative restoration of disturbed areas, WisDOT will follow guidance developed in its Facilities Development Manual (FDM) Chapter 27, Planting and Aesthetic Design. During final design, WisDOT would conduct a public involvement process and coordinate with affected property owners to select a design from available options for feasible and reasonable barriers Refer to Section 3.10.4.	Environmental justice populations and the general population may negatively perceive the appearance of the noise barriers. Reasonable and feasible noise barriers would be built if a majority of the benefitted receptors vote in favor. The proposed Milwaukee Street Interchange would utilize the existing infrastructure as an underpass. The interchange height would be similar to existing conditions, resulting in no change to the line of sight for the general population or environmental justice populations. The area surrounding the Milwaukee Street Interchange is planned for development by the city of Madison and would further reduce views of the interchange from neighborhoods. Environmental justice populations and the general population are similarly impacted by views of the reconstructed interchanges at I-94/WIS 30 and US 151/High Crossing Boulevard. Environmental justice populations and the general population are similarly impacted by views of the replacement bridge over Mirror Lake. Increased road elevations, relating to proposed flood minimization options along I-39 and I-90/94 would barely be perceptible in views to the general population. Temporary visual impacts such as, exposed earth, job-site equipment and vegetation loss, would occur throughout the study corridor during construction. When combined with proposed mitigation, the build alternatives are not anticipated to create an adverse effect upon environmental justice populations or the general population.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Surface Water (see note)	Increased impervious surface area throughout the study corridor resulting in both increased stormwater runoff volume and velocity. Up to 697 linear feet of perennial stream impacts. Up to 9,433 linear feet of intermittent stream impacts.	To minimize impacts and support total maximum daily load (TMDL) limits, WisDOT will implement best management practices (BMPs) such as stormwater detention, filters and swales to collect and store runoff. Additional measures will be implemented to avoid and minimize impacts to Mirror Lake during construction. Measures that mitigate stream impacts include design measures to maintain aquatic connectivity and water quality. Refer to Section 3.11.3.	Surface water impacts are not anticipated to create an adverse effect upon environmental justice populations or the general population.
Wetlands	Wetland Impacts: • Modernization Plus Added General-Purpose Lane (preferred) + preferred interchange alternatives: 171.6 acres of wetlands. • Modernization Hybrid + preferred interchange alternatives: 170.4 acres of wetlands. • WIS 13 preferred Trumpet alternative: 0.1 acres • WIS 13 Split Diamond alternative: 0.5 acres • County V Diamond alternative: 1.3 acres	During final design, WisDOT will continue to incorporate measures to avoid and minimize wetland impacts. Where no practicable alternative to filling wetlands, WisDOT will compensate for unavoidable wetland losses in accordance with the Wisconsin Department of Transportation Wetland Mitigation Banking Technical Guideline. Refer to Section 3.12.3.	Wetlands impacts are not anticipated to create an adverse effect upon environmental justice populations or the general population.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Floodplains (see note)	Flood minimization measures raise the Interstate and widen the I-39 Baraboo River crossing to reduce flooding risks on the Interstate. Flood minimization measures increase the 100-year elevations at up to 10 residential properties, 4 business properties and 4 vacant business properties inside and outside the regulatory floodplain. All build alternatives fill about 327 acres of the 100-year floodplain, primarily the result of the flood minimization measures.	WisDOT will minimize risks associated with unavoidable floodplain impacts to the greatest extent possible. Potential mitigation measures would include acquisition, relocating or elevating structures outside the 100-year flood elevation, floodproofing structures or purchasing a flood easement. All floodplain crossings would be constructed in accordance with the WisDOT/WDNR Cooperative Agreement. Refer to Section 3.13.	Flood minimization measures reduce risk of Interstate closures due to flooding. Outreach to property owners affected by floodplain increases indicated no impacts to low-income populations or minority populations. Floodplain impacts are not anticipated to create an adverse effect upon environmental justice populations or the general population.
Water Supply	No adverse effect on water supply.	No additional mitigation required.	There are no adverse effects on environmental justice populations or the general population.
Threatened and Endangered Species and Other Natural Resources (see note)	Federal and State listed threatened and endangered species affected by all build alternatives. Modernization Plus Added General-Purpose Lane (preferred) + preferred interchange alternatives: Up to 88.7 acres of mapped environmental corridors impacted in Dane County. Modernization Hybrid + preferred interchange alternatives: 85.6 acres mapped environmental corridor converted. All build alternatives: 232 acres upland habitat converted	WisDOT will implement avoidance and minimization measures in coordination with USFWS and WDNR. Refer to Section 3.15.3. Design alternatives to stay within existing right of way as much as possible and re-establish disturbed areas with native species. Refer to section 3.16.3.	The impacts to threatened and endangered species and other natural resources are not anticipated to create an adverse effect on environmental justice populations or the general population.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Noise (see note)	Based on preferred alternative noise modeling, noise levels would exceed noise level criteria at 1,598 receptor units.	WisDOT evaluated noise abatement measures, primarily the feasibility and reasonableness of 39 noise barriers. Of those, 12 noise barriers were determined feasible and reasonable, see Section 3.17.6. In accordance with WisDOT policy, if a simple majority of benefited receptors vote in favor of a noise barrier, it will be constructed.	The preferred alternative would result in increased traffic noise levels, exceeding the WisDOT Noise Level Criteria, resulting in adverse effects to environmental justice populations and the general population. Identified impact requires further analysis of potential effects to minority populations and low-income populations. Refer to the Noise Analysis below.
Air Quality (see note)	The study corridor is in areas in attainment for all criteria air pollutants. The project meets transportation conformity requirements. MSAT emissions could be higher relative to the No Build alternative but increases in travel speeds and reductions in congestion – which are associated with lower MSAT emissions – could offset increased MSAT emissions from build alternatives. MSAT emissions would be lower in future years regardless of alternative.	No mitigation is required.	Air quality impacts are not anticipated to create an adverse effect upon environmental justice populations or the general population.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Greenhouse Gases (GHG) (see note)	GHG emissions in 2060 would be slightly higher (4.7%) than the No Build alternative. The increase is due to the increased vehicle miles of travel from the additional lanes to be constructed. GHG emissions in general are predicted to be lower in future years due to reduced traffic congestion, vehicle fleet turnover, improved fuel economy, and increased use of alternative fuel vehicles.	WisDOT has developed several mitigation measures to reduce GHG impacts on environmental justice populations. Refer to Section 3.18.5.	GHG emissions contribute to climate change. Climate change can lead to increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and variability in the frequency and intensity of wildfires. Some studies show that climate change impacts may adversely affect environmental justice populations. Identified impact requires further analysis of GHG effects to minority populations and low-income populations. Refer to Section 3.18.5 and the Greenhouse Gas Analysis below.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Hazardous Materials (see note)	Up to 16 potentially contaminated sites could be recommended for further soil and groundwater investigation during final design. Of those sites recommended for further investigation, most involved storage tanks. In Dane County, all sites involved a leaking underground storage tank site with documented releases of petroleum. Other potential concerns included truck spills, gas stations and auto repair sites. Bridges and other structures to be removed may also contain asbestos-containing materials and/or lead-based paint.	During design, WisDOT will conduct follow-up Phase 2 and Phase 2.5 investigations to determine if sites present an environmental risk. During design, WisDOT will develop remediation measures for contaminated sites that cannot be avoided. As applicable, contract special provisions will include a Notice to Contractor describing the potential contamination with names and locations of sites.	The majority of potentially contaminated sites involve storage tanks at highway-oriented businesses and service stations. These serve the general population and environmental justice populations to a similar extent. Other potentially contaminated sites are also highway-oriented restaurants or lodgings serving the general population and environmental justice populations to a similar extent. A family medical center, located to the east of WIS 23 Interchange, is recommended for further investigation. The family medical center provides medical services to environmental justice populations and the general population in the Lake Delton area. When combined with proposed mitigation, impacts from hazardous materials are not anticipated to create an adverse effect upon environmental justice populations or the general population.
Historic and Archaeological Resources (see note)	No adverse effect on historic or archaeological properties.	No mitigation required.	There are no adverse effects on low-environmental justice populations or the general population.
Cemeteries and Burials (see note)	Monitoring recommended at four burial sites in the Area of Potential Effect during construction.	WisDOT will identify burials on final design plans and in specifications for avoidance and monitoring.	There are no adverse effects on low-environmental justice populations or the general population.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Recreational Properties (see note)	Property only strip acquisitions and easements at private recreational lands in Columbia and Sauk counties.	Compensation for commercial and industrial acquisition per Uniform Act.	Property only strip acquisitions are not anticipated to permanently alter the function of recreational properties. The impacted privately held recreational lands are associated with commercial business and activities that serve the general population and environmental justice populations to a similar extent. Impacts to recreational properties are not anticipated to create an adverse effect upon environmental justice populations or the general population.
Section 4(f)/6(f) Properties (see note)	• Temporary construction easement at the Glacial Drumlin Trail, Mirror Lake State Park and Rocky Arbor State Park. • *De minimis* impacts at the Baraboo River Waterfowl Production Area and Pine Island State Wildlife Area WIS 13 preferred Trumpet Alternative: Temporary construction easement at Hulburt Creek Fishery Area. WIS 13 Split Diamond Alternative: *de minimis* impacts at Hulburt Creek Fishery Area.	WisDOT has coordinated with both the WDNR and USFWS to avoid and minimize impacts to these resources. WisDOT would compensate WDNR and USFWS for property required with de minimis impact.	De minimis and temporary construction impacts are not anticipated to create an adverse effect upon environmental justice populations or the general population.

Effect Category	Modernization Plus Added General-Purpose Lane (Preferred Alternative) Preferred Interchange Alternatives Modernization Hybrid; WIS 13 Split Diamond, County V Diamond	Relevant Mitigation Measures	Impacts on General Population/ Environmental Justice Population
Construction (see note)	Beneficial economic effects in the form of jobs, increase in local expenditures on materials and services. Noise, emissions, and dust from equipment; demolition and construction; vibration; traffic and transit diversions; pedestrian and bicycle detours from construction zones; erosion and siltation; and material sources and disposal of demolition waste are anticipated.	WisDOT would implement measures to minimize construction-related noise, vibration, emissions, water quality and erosion, dust, traffic, material source and disposal sites and noxious weeds. (Section 3.24.4). WisDOT would develop a transportation management plan (TMP) to coordinate and manage traffic impacts associated with construction.	People living closest to the freeway (less than one-half mile) would experience direct and indirect construction impacts. Analysis has shown a higher percentage of minority and low-income populations reside within one-half mile of the study corridor as compared to the general population. Identified impact requires further analysis of potential effects to minority populations and low-income populations. Refer to the Construction Analysis below.

Note: Except as noted in table, there is no measurable difference between the build alternatives and effects are analyzed together.

Effect categories, including acquisitions and relocations, noise, GHG and construction, were found to have potential adverse effects to minority and/or low-income populations. In accordance with DOT Order 5610.2C and FHWA Order 6640.23A, WisDOT further evaluated these effect categories determine if and effect would be borne disproportionately on minority and/or low-income populations. Indirect and cumulative effects were also analyzed for potentially disproportional adverse effects on environmental justice populations.

Acquisitions and Relocations

Effects on Overall Population

The Modernization Plus General-Purpose Lane, Modernization Hybrid and all interchange build alternatives would acquire a similar amount of new right of way. The Modernization Plus Added General-Purpose Lane alternative, along with the preferred interchange alternatives would require partial acquisition from 79 residential parcels (9.8 acres) and 141 commercial parcels (53.0 acres). None of these acquisitions would require relocations or disrupt business activities at commercial properties. The Modernization Hybrid alternative, along with the preferred interchange alternatives would acquire property from 79 residential parcels (8.8 acres) and 141 commercial parcels (50.4 acres). Maps in Appendix A show the majority of these acquisitions for proposed new right of way occur as narrow strip acquisitions across the entire corridor. Flood minimization measures would relocate impacted structures on a residential parcel (4.6 acres) and a commercial parcel (48.8 acres) in the regulatory floodplain.

The Modernization Plus General-Purpose Lane alternative, along with the preferred interchange alternatives would have four relocations: a barn, the Dane County Highway maintenance building, one residence and a hotel maintenance building. These impacts are the same for the Modernization Hybrid alternative when combined with the preferred interchange alternatives. The WIS 13 Split Diamond Interchange alternative would relocate an additional business and shed along County H.

Under all alternatives, the flood minimization measures along I-39 and I-90/94 impact properties on WIS 33 and require relocations in the regulatory floodplain: a residence, six farm buildings on an unoccupied parcel, a business and a vacant commercial property. Another 9 residences, 3 commercial businesses and 3 vacant commercial businesses outside the regulatory floodplain may require purchasing of flood easements.

Effects on Environmental Justice Populations

As shown in Figure 3-21 through Figure 3-24, minority and/or low-income populations form a larger percentage of the overall populations, as compared to county wide demographics, in the census block groups near the study corridor in the Madison metropolitan area, Dane county and the Wisconsin Dells area, Sauk County.

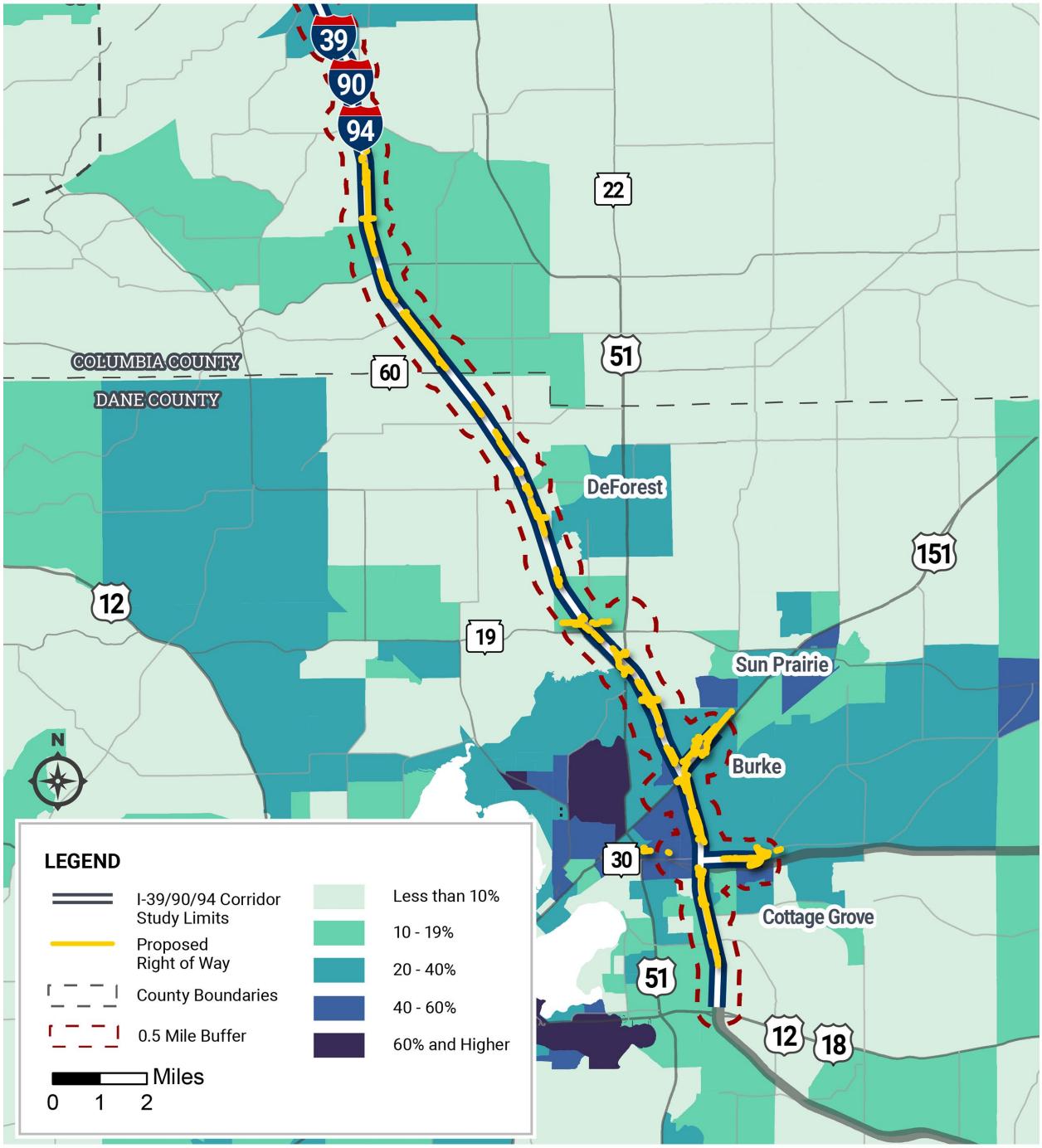
In both areas, the build alternatives would primarily acquire narrow strips of right of way in areas with minority and low-income populations. Strip acquisitions (i.e., property only) in environmental justice areas would affect highway oriented commercial parcels that serve general population and environmental justice populations to a similar extent. Strip acquisitions would also impact residential parcels occupied by the general population and environmental justice populations.

The proposed strip acquisitions in the Madison area are generally less than 25 feet in width. In Census blocks with minority and low-income populations, strip acquisitions are narrower still and generally less than 10 feet in width. Acquisitions occur in both residential and commercial areas. Relocations in the Madison metropolitan area would not affect minorities or low-income groups and are not anticipated to affect the functions of institutional or public services serving these populations.

In the Wisconsin Dells area, there are fewer right of way acquisitions, see Figure 3-23 and Figure 3-24. Of the proposed strip acquisitions, there are a few occurring in Census blocks with minority and low-income populations where acquisitions occur both in residential and commercial areas. The relocated hotel maintenance building (both WIS 13 interchange alternatives) and business on County H (WIS 13 Split Diamond alternative) in the Wisconsin Dells area would not affect minorities or low-income groups and are not anticipated to affect the functions of institutional or public services serving these populations.

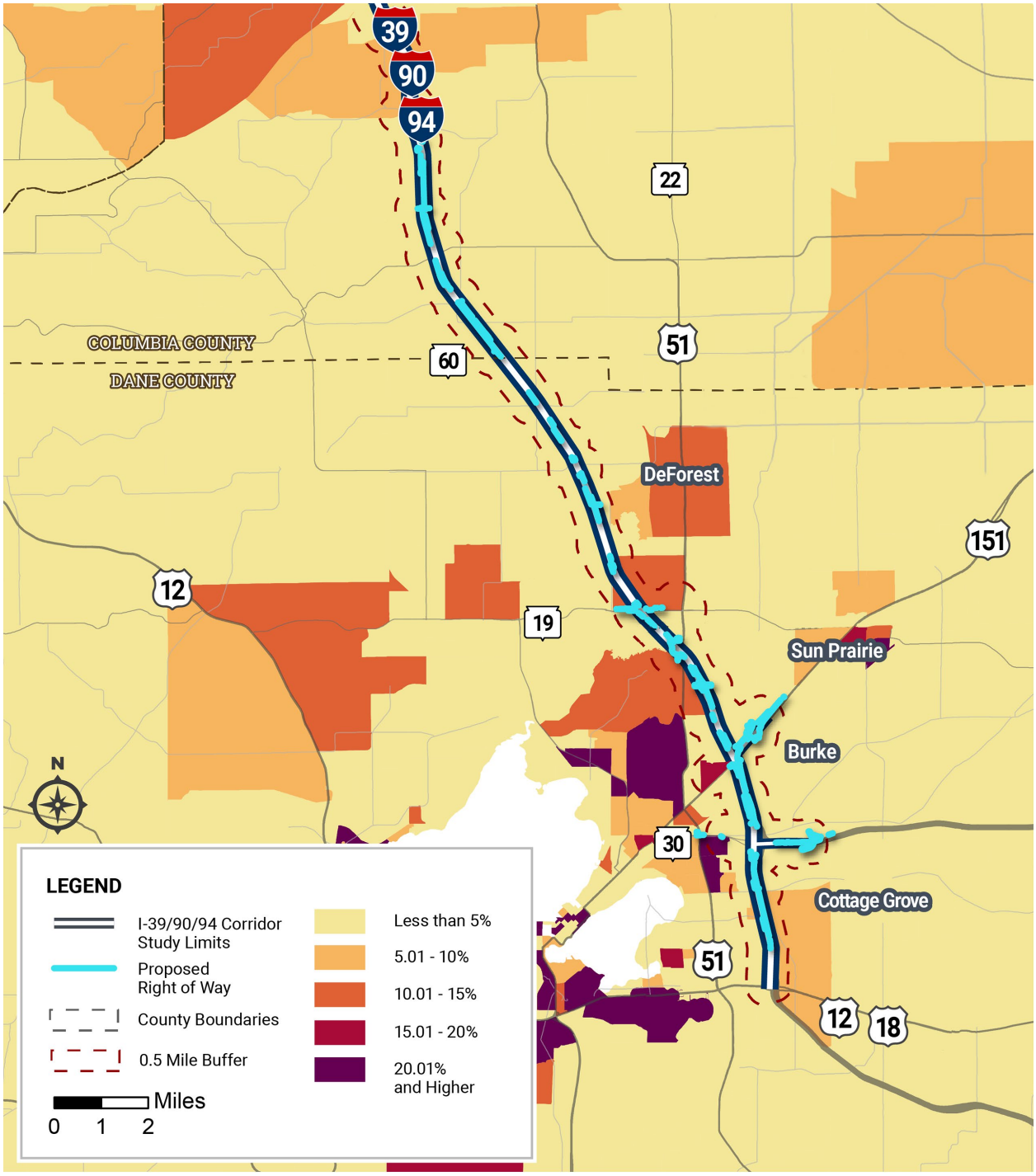
Census data indicates the presence of low-income and minority populations in the flood minimization area near the I-39 I-90/94 Split Interchange; however, outreach with affected property owners indicate no low-income and/or minority populations would be affected. Furthermore, no minority and/or low-income residents or businesses would be affected by the potential increased flood elevations. Additional outreach described in Section 5.1.6. **With mitigation, acquisitions and relocations are not expected to result in disproportionately high and adverse impacts to minority and/or low-income populations.**

Figure 3-21: Proposed New Right of Way and Minority Population – Dane/Columbia Counties



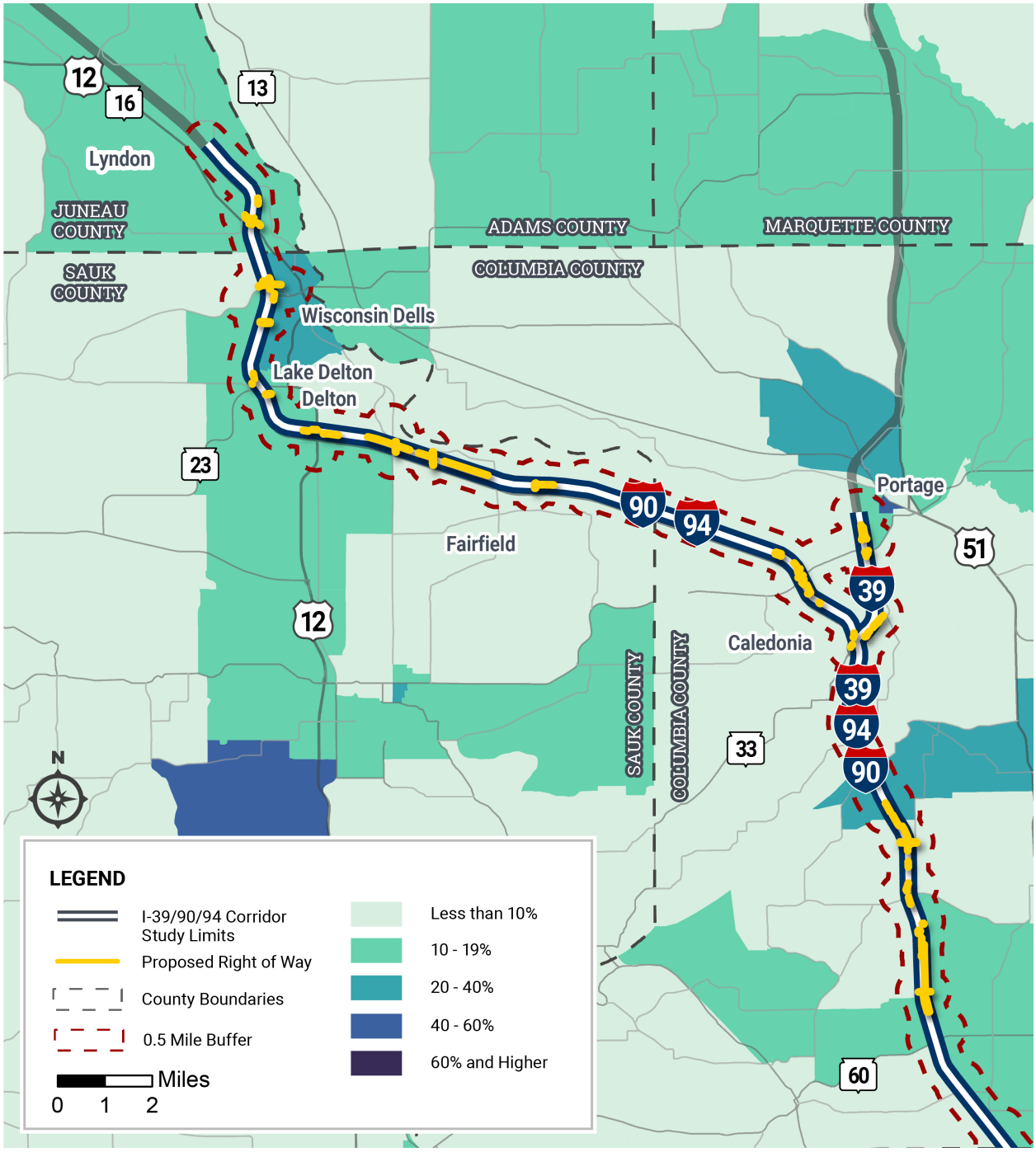
U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Figure 3-22: Proposed New Right of Way and Percent of Families Below Poverty – Dane/Columbia Counties



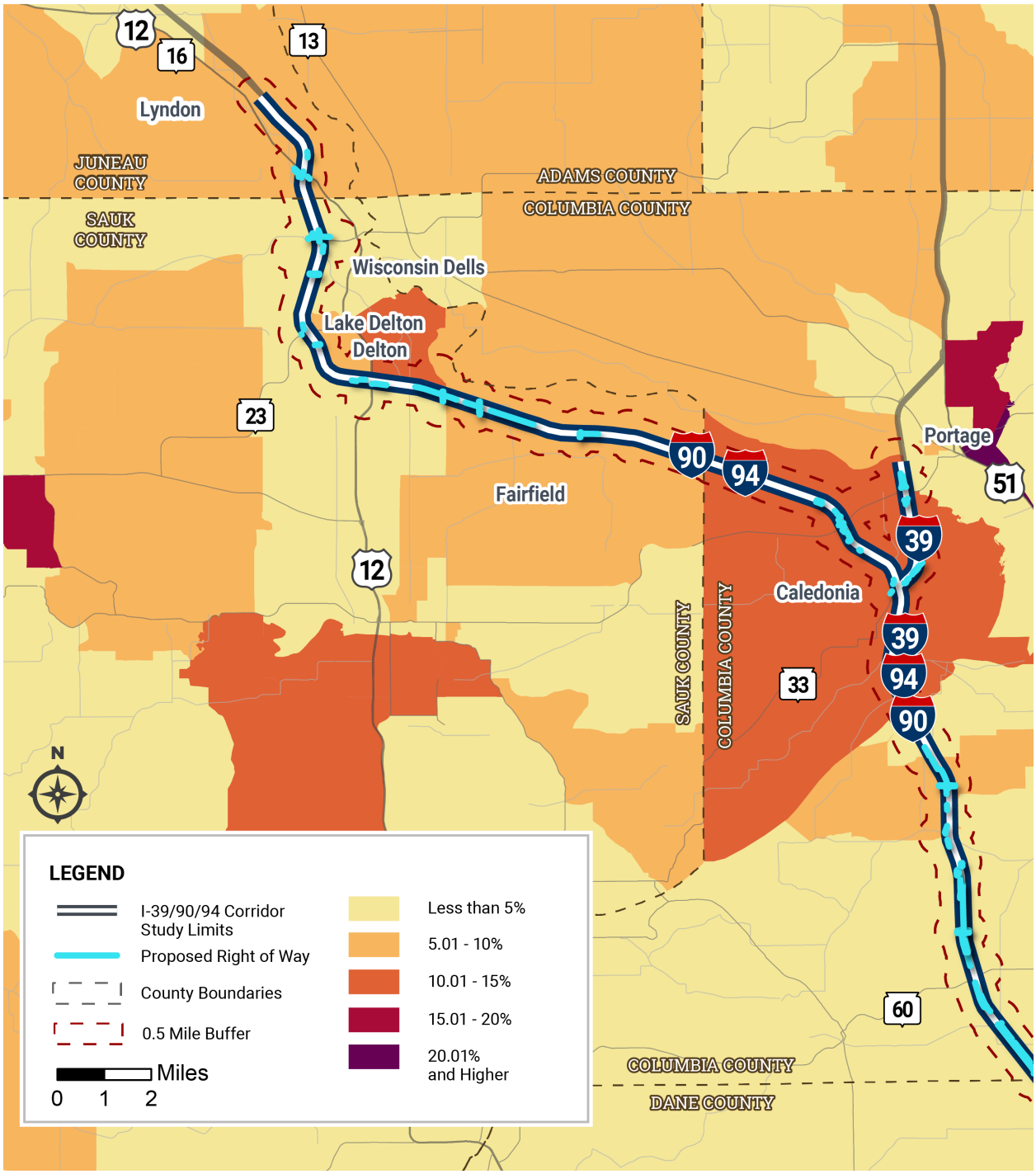
U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Figure 3-23: Proposed New Right of Way and Minority Population – Columbia, Sauk, Juneau Counties



U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Figure 3-24: Proposed New Right of Way and Percent of Families Below Poverty – Columbia, Sauk, Juneau Counties



U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Mitigation Measures

The mitigation of residential and business relocations and strip acquisitions will address impacts to the general population and environmental justice populations. Any property acquisition would be in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, 42 U.S.C. 4601-4655 (Uniform Act). The Uniform Act regulations are in 49 CFR Part 24. See Section 3.3.3 and Section 3.4.4 for details on measures to minimize and mitigate adverse residential and commercial/industrial effects, respectively. During final design, WisDOT will continue coordination with the affected property owners within the regulatory floodplain to determine acquisition or other mitigation measures such as floodproofing structures. WisDOT will mitigate impacts of flood elevation rises outside the regulatory floodplain through the buying of easements to the limits of allowable under Wis. Stat. s. 86.255.

Noise

Effects on Overall Population

Traffic noise is the primary source of noise within about 500 feet of the Interstate and there are locations where traffic noise levels currently exceed the WisDOT Noise Level Criteria, see Section 3.17. All alternatives would result in increased traffic noise levels beyond the existing noise levels, resulting in an adverse effect to the general population. Noise studies identified 1,343 receptor units impacted by the preferred alternatives in the southern portion of the study corridor between US 12/18 and WIS 60. In the north portion, between WIS 60 and US 12/WIS 16, 255 receptor units would be affected by the preferred alternatives.

Effects on Environmental Justice Populations

Minority and low-income populations form a larger percentage of the overall population, as compared to county wide demographics, within both one-half mile and 1,000 feet of the study corridor, with the exception of rural Columbia County (Table 3-34). Persons within 1,000 feet of the study corridor would experience the highest degree of traffic noise impacts. Impacts would also be dispersed throughout the corridor where receptors are next to I-39/90/94.

The extent of effects to environmental justice populations would vary between the southern and northern sections. In the South Section, there are several census block groups next to the study corridor – between the proposed Milwaukee Street interchange and US 51 interchange – where minority (Figure 3-25) and low-income (Figure 3-26) populations form a higher percentage of the total population as compared to Dane County. Likewise in the North Section, there are several census block groups next the study corridor between WIS 12 and WIS 23 in Sauk County with higher minority (Figure 3-27) and low-income (Figure 3-28) populations than the county as a whole. The remainder of the study corridor is representative of the general population. **With mitigation, the noise impacts of the project would not be disproportionately high and adverse to minority and/or low-income populations.**

Mitigation Measures

WisDOT and FHWA determined noise barriers were the most feasible and reasonable method to mitigate traffic noise impacts for the general population and environmental justice populations along the study corridor. The reasonableness and feasibility of constructing individual noise barriers is set forth by criteria in FDM 23 as shown in Section 3.17.5.

WisDOT and FHWA analyzed 39 new noise barriers in the study corridor and found that 12 noise barriers are found feasible and reasonable. Twenty-six noise barriers are feasible, but not reasonable and one noise barrier is not feasible or reasonable. Results of the noise barrier analysis are presented in Table 3-61 and Table 3-62.

Feasible and reasonable noise barriers are all located in areas containing minority and/or low-income populations in the Madison area and along I-90/94 between WIS 12 and WIS 23 in Sauk County. Figure 3-25 through Figure 3-28 show the locations of proposed feasible and reasonable noise barriers along the study corridor in environmental justice areas. The figures also show noise barriers that were considered and dismissed because they were not feasible or reasonable. See also Section 3.17.5 for further discussion on noise mitigation analyses.

Map sets in Appendix A include locations of feasible and reasonable noise barriers. In the South Section, eight noise barriers were feasible and reasonable, including S1, S2, S3, S4, S7, S10, S13 and S14. In the North Section, four noise barriers were feasible and reasonable, including N6, N8, N10 and N7. In the south section, existing noise barrier E1 was analyzed and found to be feasible and reasonable as built. Existing noise barrier E2, also in the south section, would be replaced in-kind.

Analysis of receptors benefiting from proposed feasible and reasonable noise barriers indicates that 87% of receptors with proposed noise barriers, are in block groups with greater than 10% minority populations, see Table 3-36. There are fewer low-income noise receptors impacted as compared to total impacted noise receptors. However, almost three-quarters of impacted receptors in block groups with greater than 5% poverty rates would benefit from the feasible and reasonable noise barriers, see Table 3-37.

While both the general population and environmental justice populations would be impacted by traffic noise, mitigation with feasible and reasonable noise barriers benefits both environmental justice populations and the general population. If a simple majority of benefited receptors vote in favor of a feasible and reasonable noise barrier, it will be constructed.

Table 3-36: Impacted Receptors Benefiting from Feasible and Reasonable Noise Barriers in Minority Areas

Total Impacted Noise Receptors (see note)	Impacted Receptors in Block Groups with >10% Minority Population Barrier Proposed	Impacted Receptors in Block Groups with >10% Minority Population No Barrier Proposed
1,598	1390	81

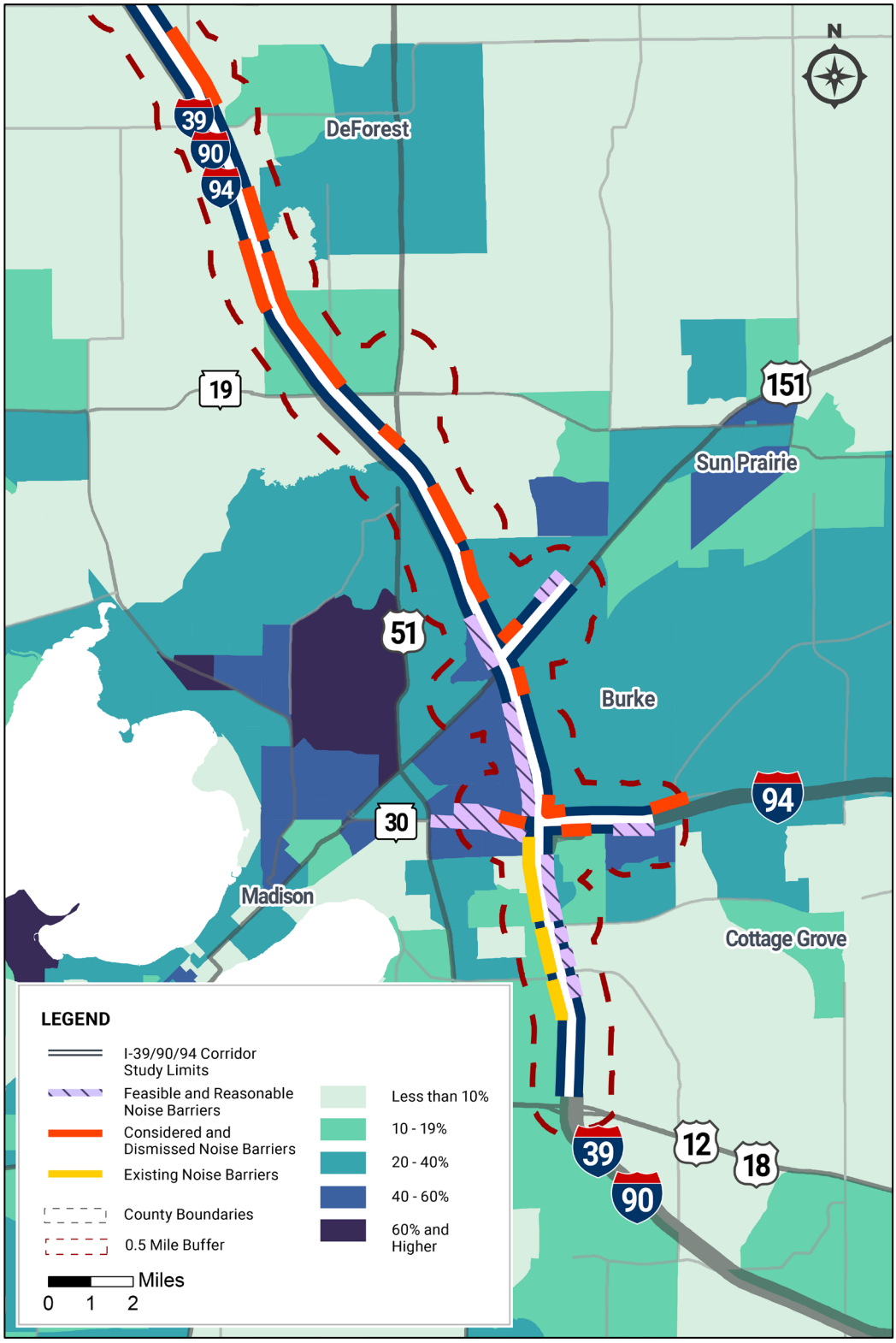
Note: Total impacted noise receptors include minority population receptors in addition to the general population and low-income population receptors.

Table 3-37: Impacted Receptors Benefiting from Feasible and Reasonable Noise Barriers in Poverty Areas

Total Impacted Noise Receptors (see note)	Impacted Receptors in Block Group with >5% Poverty Rates Barrier Proposed (see note)	Impacted Receptors in Block Group with >5% Poverty Rates No Barrier Proposed (see note)
1,598	131	51

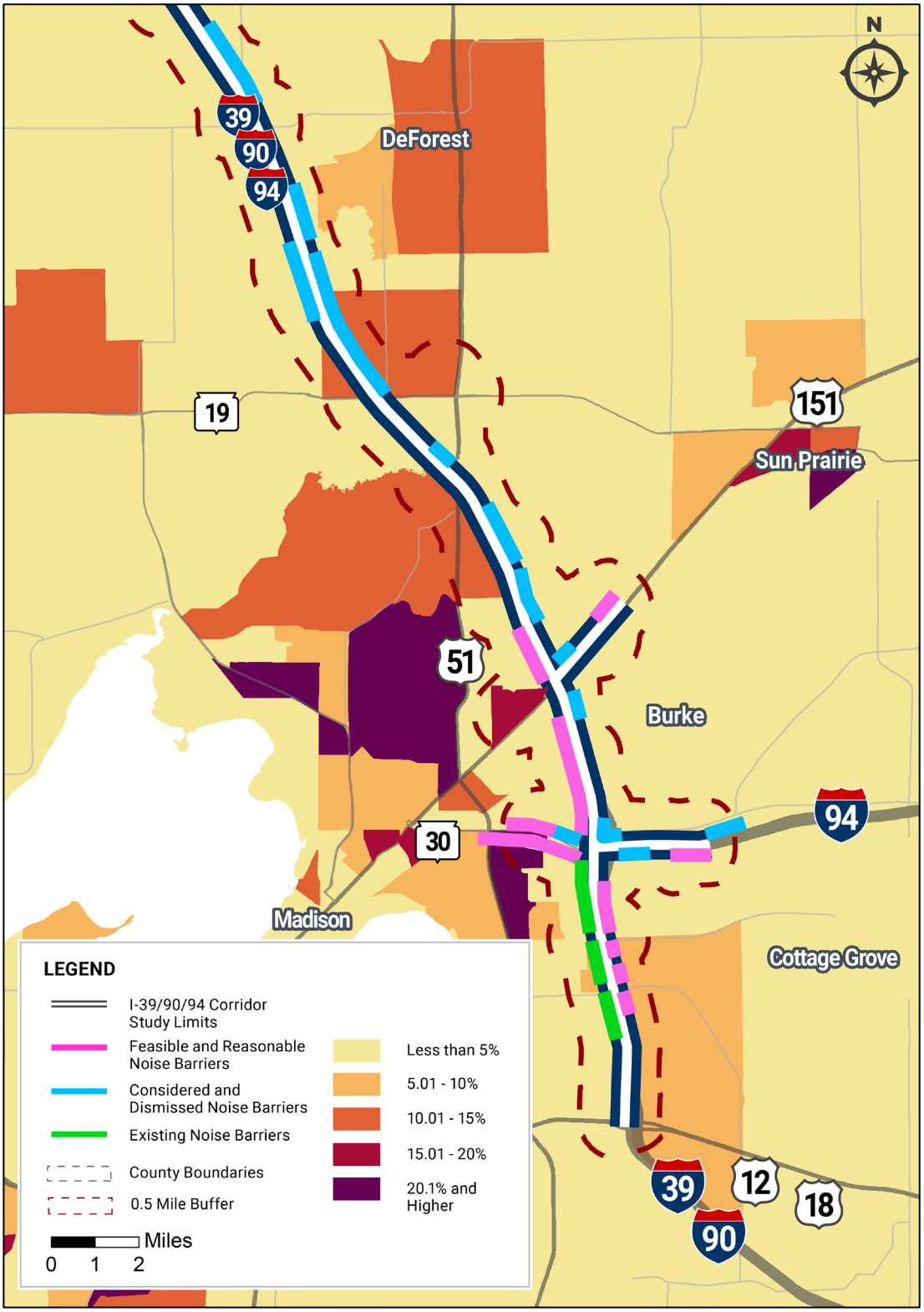
Note: Total impacted noise receptors include low-income population receptors in addition to the general population and minority population receptors.
Note: Poverty population is comprised of receptors in census block groups of families living below the poverty threshold.

Figure 3-25: Noise Barriers and Minority Populations – Dane/Columbia Counties



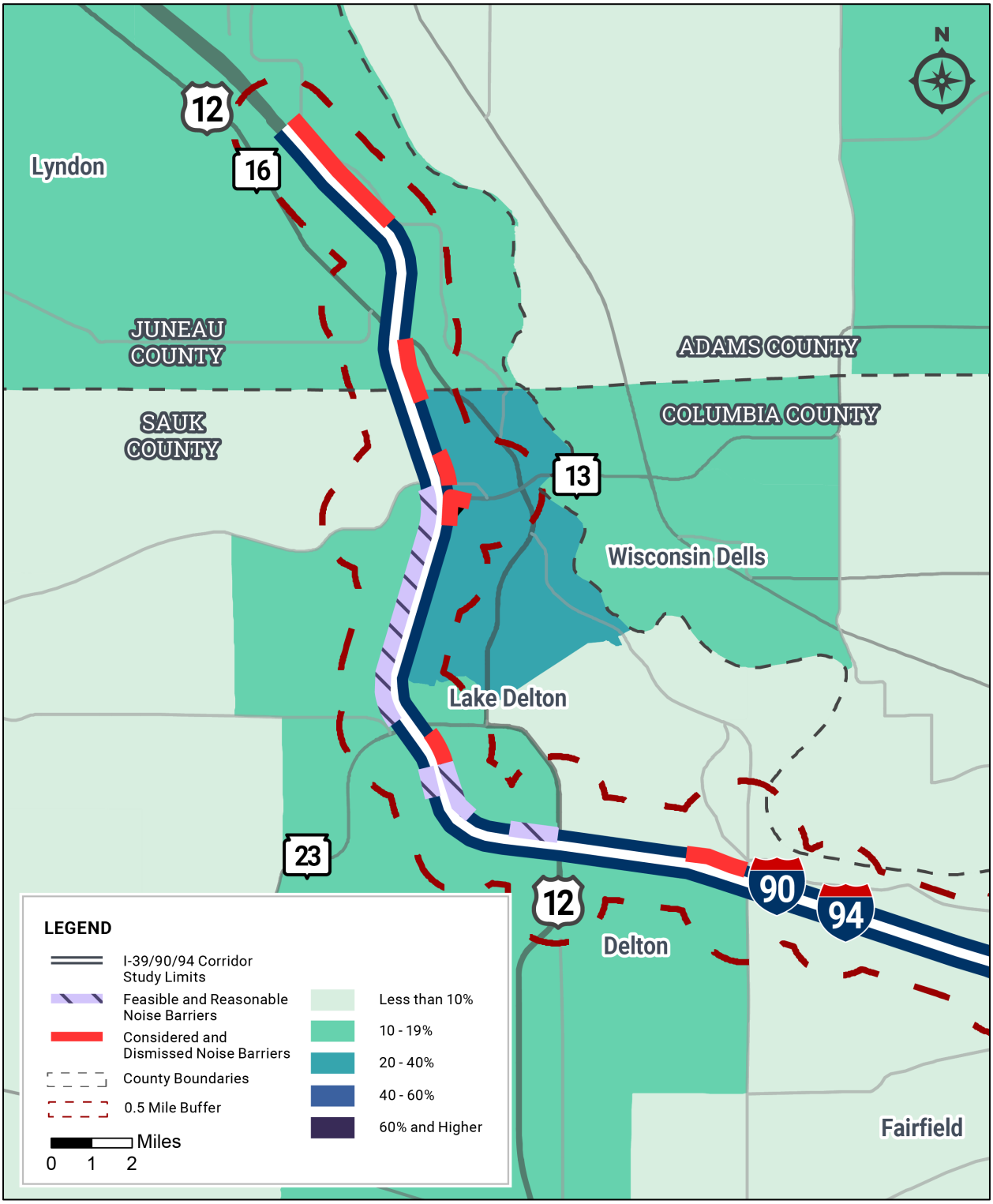
U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Figure 3-26: Noise Barriers and Percent of Families Below Poverty – Dane/Columbia Counties



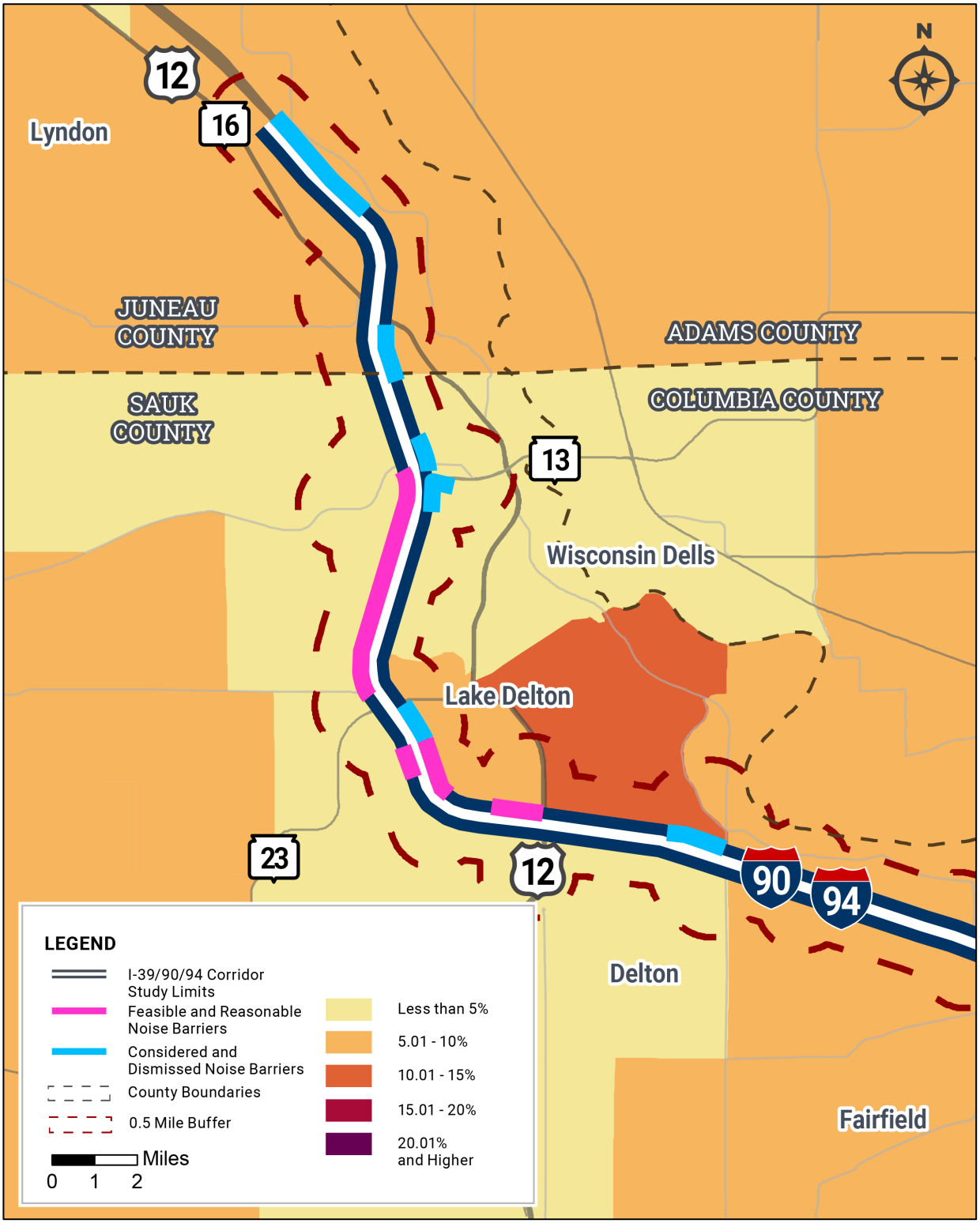
U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Figure 3-27: Noise Barriers and Minority Population – Columbia, Sauk, Juneau Counties



U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Figure 3-28: Noise Barriers and Percent of Families Below Poverty – Columbia, Sauk, Juneau Counties



U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates by block group

Greenhouse Gases (GHG)

Effects on Overall Population

Burning fossil fuels like gasoline and diesel releases GHG into the atmosphere, and the buildup of CO_2 and other GHGs is causing global warming, resulting in changes to the climate that are already visible today. Cumulative climate change effects are felt locally and regionally; however, climate change effects experienced at local and regional levels are not the direct result of an individual project's contributions, but the result of cumulative, global contributions. GHGs are different from other air pollutants evaluated in federal environmental reviews because their effects are not localized or regional. Each emission source may make a relatively small contribution to global atmospheric GHG concentrations.

Annualized and cumulative GHG emissions for vehicle operations, construction, and operation and maintenance of the I-39/90/94 Corridor Study were analyzed for the No Build alternative and build alternatives over a 30-year period between 2030 and 2060, see Section 3.18.4. The Modernization Plus Added General-Purpose Lane alternative and the Modernization Hybrid alternative would each add capacity and there is little to no difference in terms of intensity of construction activity needs and traffic volumes/patterns of vehicles on the roadways in the study area. Therefore, GHG emissions of the two alternatives were quantified using the same set of representative construction and operation data.

Results show build alternatives would slightly increase GHG emissions by 4.7% as compared to the No Build alternative in 2060. This is an impact to the general population. The greatest GHG emissions would be from vehicle operation (vehicle travel) on the study corridor. In future years there would be lower GHG emissions from vehicles due to vehicle fleet turnover, improved fuel economy and increased use of alternative fuel vehicles. This is a benefit to the general population and minority and low-income populations.

Effects on Environmental Justice Populations

Minority and low-income populations present within the I-39/90/94 study corridor would have an increased risk for climate change–related harms. Council on Environmental Quality (CEQ) interim guidance on how to evaluate GHG emissions under NEPA noted, "Numerous studies have found that environmental hazards (including those driven by climate change) are more prevalent in and pose particular risks to areas where people of color and low-income populations represent a higher fraction of the population compared with the general population."[27] The guidance also noted, "Agencies should be aware of the ongoing efforts to address the effects of climate change on human health and vulnerable communities. Certain groups, including children, the elderly, communities with environmental justice concerns, which often include communities of color, low-income communities, Tribal Nations and Indigenous communities, and underserved communities are more vulnerable to climate-related health effects and may face barriers to engaging on issues that disproportionately affect them".[27]

Populations within one-half mile of the study corridor are most likely to experience direct and/or indirect effects given the proximity to the construction and operation of the freeway. Persons and businesses within 1,000 feet of the study corridor would experience the highest degree of direct effects from the build alternatives. Minority and low-income populations form a larger percentage of the overall population, as compared to county wide demographics, within both one-half mile and 1,000 feet of the study corridor, with the exception of rural Columbia County (Table 3-34). According to CEQ guidance, these environmental justice populations could experience possible effects of climate change at a higher prevalence than the general population. As noted previously, in

[27] *Council of Environmental Quality. 2023. Guidance: National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. https://www.regulations.gov/document/CEQ-2022-0005-0001. Accessed May 14, 2024.*

future years there would be lower GHG emissions from vehicles due to vehicle fleet turnover, improved fuel economy and increased use of alternative fuel vehicles. **With mitigation, the impacts from GHG emissions of the project would not result in a disproportionately high and adverse effect to minority and/or low-income populations.**

Mitigation Measures

Section 3.18.5 describes mitigation measures to reduce GHG emissions as a strategy to address climate change impact. These collective measures would reduce or offset GHG emissions from study corridor construction and benefit all populations, including environmental justice populations, living along the study corridor.

Mitigation measures have been identified to minimize construction impacts, including air quality impacts, on environmental justice populations. Prior to construction, WisDOT would develop a plan to establish construction phases, estimated durations, appropriate sequencing, mitigation commitments, and community outreach and communication commitments. WisDOT would continue its public outreach inclusive of minority and low-income populations. Access to and from I-39/90/94 during construction would be maintained to the extent possible, or alternative access would be provided.

Construction

Effects on Overall Population

Construction impacts, which are temporary, would be experienced primarily by residents and businesses next to the I-39/90/94 study corridor. The duration of construction is currently estimated to last approximately 10 to 15 years and could start as soon as 2030. Construction durations in specific segments are expected to be less than 3 years. Construction impacts could include the following:

- Temporary increases in construction noise and vibration
- Temporary increases in emissions and dust from construction vehicles
- Temporary increases in traffic congestion and diversion to local streets
- Potential release of hazardous material contaminants due to ground-disturbing activities
- Temporary visual impacts due to construction activities and materials
- Introduction of noxious weeds and invasive species

Travelers, transit riders, bicyclists and pedestrians may also experience inconveniences and additional delay during construction. Construction jobs would be created as a result of the build alternatives. Construction impacts are described in Section 3.24.

Effects on Environmental Justice Populations

People living near the freeway corridor would experience the temporary construction impacts described above. Minority and low-income populations present within the I-39/90/94 study corridor would experience an increased risk for temporary construction related impacts detailed in Section 3.24. Minority and low-income populations form a larger percentage of the overall population, as compared to county wide demographics, within both one-half mile and 1,000 feet of the study corridor, with the exception of rural Columbia County (Table 3-34). **While the temporary construction impacts would constitute adverse effects, with mitigation, they do not disproportionately effect minority and/or low-income populations.**

Construction jobs would be created as a result of the build alternatives. WisDOT will use local or other geographic and economic hiring preferences for construction to create jobs for minority and/or low-income populations.

Through WisDOT's robust Disadvantaged Business Enterprise (DBE) program, environmental justice populations and businesses may also benefit from construction employment and secondary economic activities. Depending on the type of project, WisDOT anticipates the DBE goals to range between 6% and 12%. The DBE opportunities are tailored to each individual project. If a DBE opportunity does not exist in the individual project, then the DBE goal could be reduced due to lack of opportunities. WisDOT will work collectively with industry to make sure all opportunities are advertised and available.

Mitigation Measures

Mitigation measures used by WisDOT to minimize and mitigate potential temporary construction impacts are described in Section 3.24. Prior to construction, WisDOT would develop a plan to establish construction phases, estimated durations, appropriate sequencing and community outreach and communication commitments. WisDOT would continue its target stakeholder outreach inclusive of minority and low-income populations.

Indirect and Cumulative Impacts

The following provides a summary of the indirect effects of the build alternatives as it relates to consideration of environmental justice. Refer to Section 3.25 for additional detail regarding the indirect effects of the project.

The I-39/90/94 Corridor Study cumulative impacts analysis also considered impacts that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. The analysis of potential cumulative effects found impacts are related to three resources including agricultural, surface water quality and wetlands, refer to Section 3.26.3. The identified resources are present across the study corridor in the general population and environmental justice population areas and effects to these resources would impact both populations to a similar extent. Therefore, cumulative impacts are not further discussed in this section. Refer to Section 3.26 for details on the cumulative impacts analysis.

The I-39/90/94 air quality analysis also considered the cumulative effects of GHG emissions, which is a topic of concern to general and environmental justice populations and are not further discussed in this section. Refer to Section 3.18.4 for details on the lifecycle GHG impact analysis.

Indirect Effects on Environmental Justice Populations

The indirect impacts analysis for the I-39/90/94 Corridor Study considers potential indirect land use impacts related to adding a new travel lane in each direction (potentially along the entire length of the corridor), modifying existing interchanges and potentially adding two new interchanges at Milwaukee Street and Hoepker Road. The analysis also considered potential encroachment-alteration effects related to the expansions of infrastructure. The following summarizes the aspects of the indirect effects analysis that relate to minority populations and low-income populations in the study area. There are minimal direct impacts as a result of this project, thus, the scale of potential indirect effects is also small.

Project-Influenced Development

The added travel lanes and design modernizations proposed by both mainline build alternatives improve travel reliability and could potentially induce growth in select locations where there is currently undeveloped land or agriculture. Based on a review of key causal variables identified in Table 3-74 and the considerations identified in American Association of State Highway and Transportation Officials practitioner handbook, the potential for project-influenced land use change is generally low. However, during the expert panel meetings, local planners indicated that build alternatives could affect the pace of development at undeveloped lands near Hoepker Road, at the County V Interchange east of I-39/90/94, and in the Wisconsin Dells area, and facilitate planned

development at the proposed Milwaukee Street Interchange. The magnitude of this change is expected to be moderated by factors such as new capacity along an existing freeway, limited travel time savings, and the affected communities' comprehensive plan and supporting development policies to promote an efficient growth pattern.

The potential new Milwaukee Street Interchange would facilitate planned development with improved accessibility to an area where land is available for residential and business development. Local comprehensive plans anticipate that undeveloped or agricultural lands in this area will continue to transition to residential and employment uses and have planned for new development in this area. If the interchange is built, development may happen sooner in areas surrounding the Milwaukee Street Interchange. Minority populations reside in the block groups next to the proposed interchange and would experience impacts associated with increased development. However, these impacts are anticipated as the Connect Greater Madison 2050 Regional Transportation Plan[28] estimates future land use would be similar both with and without the proposed improvements.

Encroachment-Alteration Impacts

Table 3-38 identifies the resources considered for potential project encroachment impacts based on direct impacts described in the Draft EIS and stakeholder input. The subset of resources relating to environmental justice considerations are provided below in Table 3-38.

The indirect effects of the project would be borne proportionately by the general population and environmental justice populations. Therefore, the build alternatives are not expected to have disproportionately high and adverse effects on environmental justice populations.

[28] *Greater Madison Metropolitan Planning Organization. Connect Greater Madison 2050 Regional Transportation Plan: Executive Summary. May 2022.*

Table 3-38: Environmental Justice Related Resources Considered for Potential Project Encroachment

Resource	Will this resource be directly affected?	Would this environmental justice related resource experience project encroachment impacts?
Residential Development	The Hoepker Road Shifted Diamond alternative relocates a residence. Flood minimization measures would result in increased 100-year flood elevation at one residence in the regulatory floodplain which could require relocation or other measures to mitigate impacts. Another 9 residences outside the regulatory floodplain would experience an increased 100-year flood elevation. WisDOT will evaluate purchasing flood easements at these properties.	No. Direct impacts (residential relocations) would not result in the loss of community cohesion to the general population or environmental justice populations. During the expert panel meetings that were part of the indirect and cumulative impacts analysis, participants noted that in Madison the build alternatives would have a positive impact on low-income neighborhoods west of I-39/90/94 by reducing traffic on the local network; and provide a benefit to low-income areas next to US 51, west of I-39/90/94 by reducing traffic volumes and adding bicycle and pedestrian facilities at the on US 51 at the interchange.
Commercial and Industrial Development	The build alternatives improve traffic operations and safety on I-39/90/94, but it would not change the economic characteristics of the study area. The WIS 13 Interchange Split Diamond alternative would relocate an active business, a hotel maintenance building and a shed. The WIS 13 Interchange Trumpet alternative would relocate a hotel maintenance building. Flood minimization measures would result in increased 100-year flood elevation at one existing business and one vacant business in the regulatory floodplain which could require relocation or other measures to mitigate impacts. Another 3 businesses and 3 vacant businesses outside the regulatory floodplain would experience an increased 100-year flood elevation. WisDOT will evaluate purchasing flood easements at these properties. During construction, there may be short-term ramp closures, delays, and inconvenience for roadway users. Access to local businesses would be maintained during construction.	No. WisDOT does not expect project encroachment impacts to occur, either within or outside the build alternatives' footprint. Direct impacts (access changes, business relocations and strip acquisitions) would not result in the loss of economic viability of remaining businesses, business centers or districts in general population or environmental justice population areas.
Noise	The build alternatives produce a noise impact. Feasible and reasonable noise barriers will mitigate direct impacts.	No. The noise analysis considers traffic volumes that include the future users attracted to the proposed action. Therefore, the noise levels predicted by traffic modeling already incorporate project encroachment impacts and would be analyzed and mitigated for as a direct impact. Refer to Section 3.17.

Resource	Will this resource be directly affected?	Would this environmental justice related resource experience project encroachment impacts?
Air	The study area is in attainment for all criteria air pollutants. The level of mobile source air toxics (MSAT) emissions for the study's build alternatives could be slightly higher than the No Build alternative but will be lower than existing conditions. Greenhouse gas (GHG) emissions of the build alternatives would be slightly higher (4.7%) than the No Build alternative in 2060. The study will implement mitigation measures to reduce or offset GHG emissions from project construction. These measures will be further developed during final design.	The build alternatives are not anticipated to violate National Ambient Air Quality Standards, and the potential of MSAT impacts are lower in future years under the build alternatives in general population areas and environmental justice population areas. The analysis of GHG emissions considered indirect (upstream) emissions with direct impacts, which affects environmental justice populations and the general population to a similar extent. Refer to Section 3.18.4.

3.9.4. Conclusion

When making an environmental justice determination USDOT Order 5610.2C and FHWA Order 6640.23A direct project proponents to consider the effects of a project and who may be affected, then consider the mitigation proposed for these effects, then consider any offsetting benefits to minority and/or low-income populations.

Both the general population and environmental justice populations would experience both beneficial and negative effects as a result of implementation of any of the build alternatives.

The build alternatives would reconstruct I-39/90/94, add capacity to the roadway resulting in improved traffic operations and the efficient movements of goods and services. In addition, the build alternatives include construction of new bicycle and pedestrian crossings and noise barriers where they have been determined feasible and reasonable.

Where negative effects may occur, mitigation measures to address these effects are detailed in Table 3-35 by resource category. A summary list of the mitigation practices, specific to environmental justice populations include:

- Continued public outreach to minority and low-income populations throughout final design with meaningful engagement opportunities.
- A transportation management plan to coordinate and manage traffic effects associated with construction.
- A Disadvantaged Business Enterprise program that provides business and employment opportunities for environmental justice populations.
- Feasible and reasonable noise barriers.
- Construction-related measures to mitigate noise, vibration, emissions, water quality and erosion, dust, traffic, and noxious weeds

Based on the information available and analysis conducted, **none of the build alternatives are expected to cause disproportionately high and adverse effects on environmental justice populations in accordance with the provisions of Executive Order 12898, USDOT order 5610.2C and FHWA Order 6640.23A.** FHWA is seeking additional input on environmental justice effects before making a final determination in the final EIS/record of decision.

3.10. Visual Character

This section describes the existing visual conditions and aesthetic character within the I-39/90/94 study corridor and qualitatively evaluates the visual effects of the alternatives.

3.10.1. Affected Environment

The visual character of the study corridor is typical of interstate highways throughout both rural and built environments in central and southern Wisconsin. The topography is level to gently rolling, with low-lying areas associated with lakes, streams, rivers or wetlands. The freeway is generally level with the surrounding landscape for most of the study corridor and visible from nearby areas in some parts of the corridor.

Whose view is potentially affected by a transportation improvement?

- Users of the roadway: Commuters, residents, transporters and tourists
- Viewers from the surrounding environment: Residents, businesses, recreation area visitors

The southern end of the study corridor in Dane County is within the built environment of the Madison metropolitan area, see Figure 3-29. Throughout this built environment, the Interstate is generally bordered by industrial parks, office parks, highway-oriented businesses, fast-food restaurants and other types of retail and service businesses. Medium and high-density residential development is also present. On-site and off-site advertising signage is common throughout this built environment. The business mix is a combination of franchise businesses, often occupying "trademark" buildings, and locally owned businesses.

North of the US 51 Interchange, I-39/90/94 transitions to a rural setting, continuing through Columbia and Sauk counties. Views from the Interstate are generally of natural landscapes, woodlands, farmsteads, croplands and scattered rural residences. These views transition to mostly wooded areas and trees between the WIS 33/I-39 Interchange and Levee Road, see Figure 3-30 through Figure 3-32. As southbound I-39 approaches the split interchange, views to the southwest include the Baraboo Range in the background of Figure 3-31. Along I-90/94, northwest of the split interchange, views include the Baraboo Range to the west and low-lying grasslands to the east. The Baraboo River Waterfowl Production Area (Figure 3-32) and Pine Island State Wildlife Area (Figure 3-33) are also next to I-90/94 along this part of the corridor. Cascade Mountain is the only natural area where viewers can look down and see the entire width of the freeway.

Traveling west on I-90/94, the landscape transitions to pockets of built environment in Sauk County beginning near the US 12 Interchange and through the WIS 13 Interchange. Resorts are the most prominent visual element of the built environment as the study corridor travels through the village of Lake Delton and the city of Wisconsin Dells, see Figure 3-34. However, trees and earthen berms, as shown in Figure 3-35, screen most other commercial developments, residential areas and subdivisions adjacent to the Interstate. I-90/94 passes next to Mirror Lake State Park before crossing over Mirror Lake, where there are brief views of a wooded ravine and water below. Views from Mirror Lake and select locations along the adjacent bluff include the I-90/94 bridge over Mirror Lake as shown in Figure 3-36. Mirror Lake sees heavy recreational use and the Interstate bridge is highly visible from the water.

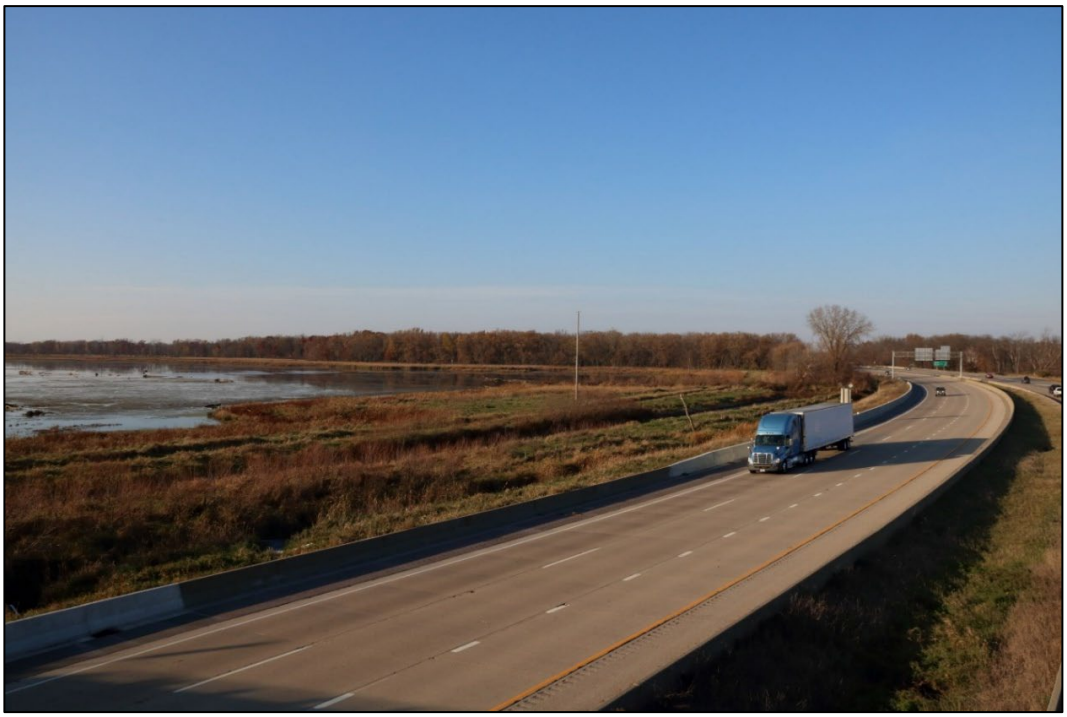
Views from the limited extent of study corridor in Juneau County include woodlands with relatively dense stands of trees, with a few isolated farmsteads and croplands. Dense stands of trees block views of and from Rocky Arbor State Park, located east of the US 12/WIS 16 interchange, see Figure 3-37.

Figure 3-29: View of I-39/90/94 from High Crossing Boulevard



View from High Crossing Boulevard looking south to I-39/90/94, Dane County

Figure 3-30: View of I-39 from Cascade Mountain Road



View from Cascade Mountain Road looking north to southbound I-39, Columbia County

Figure 3-31: View of I-39 South of the WIS 33 Interchange



View from I-39, south of the WIS 33 Interchange, looking south to I-90/94 and the Baraboo Range, Columbia County

Figure 3-32: View of I-90/94 from Baraboo River Waterfowl Production Area



View from the Baraboo River Waterfowl Production Area looking north to Cascade Mountain Road (shown midground) and I-90/94 (shown left midground, behind Cascade Mountain Road Columbia County)

Figure 3-33: View of I-90/94 from Pine Island State Wildlife Area



View from the Pine Island State Wildlife Area looking south toward I-90/94 (not visible in the background), Columbia County.

Figure 3-34: View of I-90/94 in the Wisconsin Dells



View looking east on I-90/94 towards built environment, Sauk County

Figure 3-35: View of I-90/94 From Xanadu Road



View from Xanadu Road looking south; berm and trees along I-90/94, Sauk County

Figure 3-36: View of I-90/94 Bridge over Mirror Lake



View from the top ridge of Mirror Lake State Park looking northeast to the I-90/94 bridge over Mirror Lake, Sauk County

Figure 3-37: View toward I-90/94 from Rocky Arbor State Park



View from Rocky Arbor State Park campsite, next to I-90/94 (not visible from campsite), Juneau County.

3.10.2. Visual Character/Aesthetic Impacts

Highways are prominent features in the landscape that can affect the visual quality of the natural and built environment; likewise, the visual quality of the adjacent natural and built environment affects highway travelers' visual experiences. This section qualitatively summarizes the potential visual impacts from the build alternatives for the Interstate and interchange. A separate visual impact analysis for the Mirror Lake Bridge replacement is discussed in Section 3.10.3.

No Build Alternative

The No Build alternative would not change the visual environment.

Build Alternatives

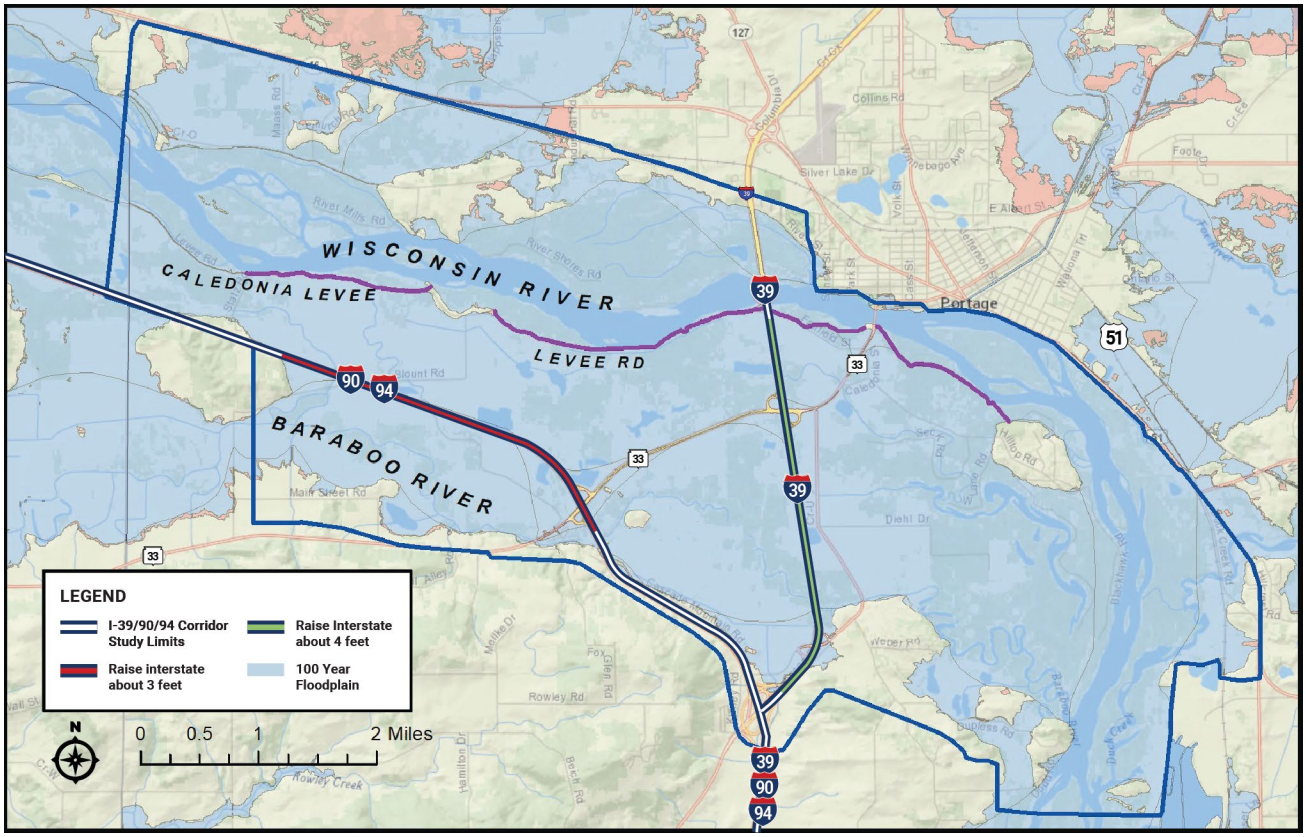
Views of and from I-39/90/94

Under both freeway modernization alternatives, which would include the addition of lanes on I-39/90/94 (either as general-purpose, managed, C-D or auxiliary lanes), the visual environment would be similarly altered. However, maintaining the freeway character largely within the existing Interstate corridor by widening into the median would minimize visual impacts to adjacent areas. To further minimize impacts and costs, both modernization alternatives match existing elevations as much as possible.

Visual impacts would be most likely in areas where flood minimization measures raise the freeway above its current elevation to prevent flooding from nearby waterbodies and wetlands. All build alternatives include two segments where the increased elevation may affect views to or from the Interstate, see Figure 3-38:

- I-90/94 from 0.5 miles east of WIS 33 to 3 miles west of WIS 33 (generally about 3 feet higher for 3.5 miles)
- I-39 between the I-39 I-90/94 Split Interchange to Levee Road (generally about 3 to 4 feet higher for 2.9 miles)

Figure 3-38: Location of Increased Interstate Elevation



Source: WisDOT

Views from the freeway would change minimally along both of these sections because travelers would be slightly more elevated and may be able to see more of adjacent natural areas where the freeway is not screened by woods and trees. Views of the freeway would be somewhat more prominent from Cascade Mountain, the Pine Island State Wildlife Area, and the Baraboo River Waterfowl Production Area, in areas next to the Interstate not screened by woods and trees. The visual impact would diminish with increased distance from the Interstate, which travels through areas of broad, open views.

Overall, the freeway modernization alternatives would not substantially change views from the Interstate. The reconstructed freeway would feature a concrete median barrier between US 12/18 and Smokey Hollow Road, approaching the Wisconsin River Bridges from the south, and a grass median at remaining locations similar to the existing median. The freeway modernization alternatives would also add a travel lane along I-39/90/94 (or a managed lane between US 12/18 and WIS 19 under the Modernization Hybrid alternative). The freeway would be

widened to the inside to minimize impacts to naturally existing topography and vegetation that may block existing views of and from the Interstate. However, some views may be altered where reconstruction would widen the freeway to the outside of existing pavement. Construction would likely require vegetation clearing within the entirety of the existing and proposed right of way and would be reestablished after construction. While most of the study corridor has open vistas, there are areas where tree clearing along fence lines may open views of and from the Interstate. Areas where anticipated clearing may change views include:

- Two residences at the west end of Highland Drive, east of I-39/90/94 in Dane County
- A residence south of County K, west of I-39/90/94 in Columbia County
- The northeast corner of Spring Brook Golf Course, west of I-90/94 in Sauk County
- The southwest corner of Trappers Turn Golf Course, east of I-90/94 in Sauk County

Final design would identify specific areas where existing topography would be altered, but natural barriers will be retained if possible and impacts will be mitigated to the extent practicable.

WisDOT is likely to incorporate twelve reasonable and feasible noise barriers in Dane and Sauk counties, pending final design and public involvement. Appendix A identifies barrier locations along the study corridor. The barriers would change views of and from the interstate at the following locations:

Dane County

- Barrier S1: along I-39/90 northbound from the WSOR bridge to Cottage Grove Road
- Barrier S2: Along I-39/90 northbound from Buckeye Rd. to Milwaukee St.
- Barrier S3: Along WIS 30 eastbound from Milwaukee St. to US 51
- Barrier S4: Along WIS 30 westbound from Walsh Road to approximately 300 feet east of Thompson Drive
- Barrier S7: Along I-94 eastbound from Sprecher Rd. to approximately 300 feet west of proposed Milwaukee St.
- Barrier S10: Along I-39/90/94 southbound from Commercial Ave. to High Crossing Blvd.
- Barrier S13: Along US 151 westbound from west of the Goodman Path to proposed Eastpark Blvd.
- Barrier S14: Along I-39/90/94 southbound from US 151 to approx. 1,700 feet south of Hanson Rd.

Sauk County

- Barrier N6: Along I-90/94 WB from US 12 to Ishnala Rd.
- Barrier N7: Along I-90/94 northbound from Ishnala Rd. to Mirror Lake
- Barrier N8: Along I-90/94 southbound from Mirror Lake to Xanadu Rd
- Barrier N10: Along I-90/94 southbound from WIS 23 to Trout Rd.

The barriers would block views from neighborhoods of the Interstate, as well as views of the neighborhoods from the Interstate. WisDOT would coordinate with affected property owners to select a barrier design from available options during final design.

Views of and from the Interchanges

The build alternatives would also reconstruct the existing interchanges to correct substandard conditions. Some interchange layouts would be substantially different from the existing interchanges, while at other interchanges the new ramps would be reconstructed in or close to the current footprint. Generally, the overall visual effect of reconstructing an interchange in the same or similar footprint would be minimal. However, for the preferred I-

94/WIS 30 Full Modernization #2 and US 151/High Crossing Boulevard Directional alternatives, new segments of mainline and ramps would increase the interchange heights by about 30 and 40 feet, respectively.

Development around the I-94/WIS 30 Interchange generally consists of open areas and single-story homes, with a few two-story homes and a church. The existing WIS 30 overpass is not a prominent feature on the landscape because berms and other terrain rise to meet the bridge. Increasing the interchange height by 30 feet under the Full Modernization #2 alternative would noticeably change residents' view of the interchange, especially from areas not screened by trees or from the upper levels of two-story homes. One of the open areas is the Kennedy Little League complex in the northeast quadrant. Some of the ballfields are screened by trees, but the southeastern field is not screened and is elevated several feet above the adjacent ramps. This elevation difference would give sensitive viewers a direct view of the new interchange.

The US 151/High Crossing Boulevard Interchange is surrounded by multi-story commercial buildings, and the large scale of the existing overpass and ramps is not tempered or blocked by berms and the adjacent terrain. Therefore, this interchange is a prominent feature on the landscape. Increasing the height of this interchange by 40 feet under the Directional alternative would change the view of the freeway from adjacent properties and would also allow travelers to have a more expansive view from the freeway. The taller ramps and structures would further dominate the landscape and would substantially change views of the interchange; although, the viewers from the commercial areas would not be considered sensitive.

The preferred new Partial Cloverleaf alternative at Milwaukee Street and Shifted Diamond alternative at Hoepker Road in the city of Madison would also change the visual environment of the surrounding adjacent areas. Near the planned Milwaukee Street Interchange, existing views from residential areas south of I-94 and from County T, Seminary Springs Drive, and Gaston Road north of I-94 are generally of open fields with the Interstate in the distance. The existing Interstate bridge (built as an overpass to accommodate a future Milwaukee Street extension) is not a prominent feature on the landscape. Extending Milwaukee Street through fields to the Interstate would require a large cut north of the Interstate to accommodate the interchange, ramps and new road through agricultural fields to County T. Because the existing Interstate and County T profiles would generally remain unchanged, the visual impacts would be focused on the new ramps and roadway segments. The proposed Milwaukee Street Interchange would substantially change existing views of the Interstate. Views of existing and developing residential and commercial areas to the south, however, would not substantially change.

The Shifted Diamond alternative at Hoepker Road would change views from and of the Interstate. The views that are not screened by trees include agricultural land east of the Interstate and industrial buildings to the west. The new interchange would introduce new ramps and structures and remove several trees, a farmhouse and outbuildings from the southeast quadrant. Therefore, the Shifted Diamond alternative would open up views of agricultural land to the east from the freeway and would introduce new views of the freeway and transportation. Property east of the Interstate is planned for redevelopment and anticipates a potential new interchange at this location, see Section 3.1.3.

Several temporary visual impacts throughout the study corridor, such as exposed earth, job-site equipment and vegetation loss, would occur during construction. Construction of feasible and reasonable noise barriers in the study corridor could eliminate view of and from the freeway in several locations. Visual impacts due to construction would occur sequentially along the entire study corridor as separate construction projects and could begin as early as 2030. Each construction project is expected to be under three years.

3.10.3. Mirror Lake Visual Impact Analysis

This section summarizes the findings of the Visual Impacts Analysis, Mirror Lake Bridge Replacement in Appendix D. Because Mirror Lake is considered an important natural feature by the Town of Delton and WDNR, and recreationists boating within Mirror Lake State Park could be affected by the freeway modernization alternatives' visual changes, WisDOT conducted a site-specific visual impact assessment of the proposed I-90/94 bridge replacements over the lake.

Mirror Lake flows through the bottom of a steep, narrow ravine. The freeway currently crosses Mirror Lake on two, 2-lane arch bridges separated by an 85-foot-wide gap. The bridges are currently visible to viewers on the lake and on the freeway from about 0.25 mile away. The viewshed next to the bridges is relatively limited because of the lake's shape, topography, and dense surrounding vegetation. The viewshed on the Interstate is relatively limited because slight curves in the road about 0.25 mile north and south of the bridges preclude travelers from seeing the bridges from farther away. The abundant dense vegetation around the freeway creates a natural-appearing landscape. North- and south-facing views include signs, overhead utilities and pavement discrepancies, none of which are memorable features that demonstrate high visual values. The presence of the bridges is barely perceptible from the highway, indicated only by concrete parapets and a more open view. For these reasons the existing visual quality rating of the landscape viewed from the bridges is in the upper range of "low", as defined by the visual quality rating analysis.

Views of the bridges are restricted primarily to non-motorized boaters visiting Mirror Lake State Park during warm weather months. While the bridges represent a human-made intrusion, their placement at the top of the ravine minimizes the visual intrusion into an otherwise natural-appearing landscape. The smooth, slightly curving lines of the arches exhibit a simple elegance. The resulting existing visual quality of views from the lake is considered high.

The existing arch bridges would be replaced with two, 3-lane beam bridges constructed side-by-side and giving the appearance one, 6-lane wide bridge with a concrete median. The bottom of the bridge would be a straight line instead of an arch, and the sides of the bridge would be solid concrete with a rust-colored girders (similar to existing) and about 1 foot taller. The taller sides and side-by-side configuration of the bridges would hinder views of Mirror Lake for the travelers on the bridges slightly more than existing conditions. However, drivers would still be focused north or south, rather than east or west toward the lake. Passengers would be more affected, but views from the bridges would typically last less than 5 seconds. In addition, under existing conditions, the lake is not readily visible from the bridges due to their height above water and bends in the waterbody, so the change would be barely perceptible.

Recreationists boating on Mirror Lake, including visitors to the state park and residents of Camp Delton, would experience more open views of the landscape due to removal of the piers extending into the hillside. Although the visual interest present in the existing bridges would be removed, resulting in a minor adverse impact, the new bridges would encroach less upon views of the landscape, resulting in a minor beneficial impact.

WisDOT's visual analysis found that visual quality would be reduced for both views from the bridges and from the lake. However, visual quality would remain within the existing "low" and "high" ranges, respectively. Changes would result in an overall neutral impact for drivers who would be facing primarily north-south, and adverse for passengers who look to the east or west. Recreationists at the state park would also experience neutral impacts, which would occur primarily in summer during boating season.

Visual impacts from construction would last two to three years. Heavy equipment such as cranes, large construction vehicles, staging and stockpiling areas, detour and safety signing, and construction personnel would be seen by highway users and adjacent landowners. Travelers on the freeway would experience more visual

impacts than recreationists on the lake, as access to the lake in proximity to the bridges would be closed during construction and demolition, and most boating occurs during summer. Any nighttime construction would require lighting, making construction visible from farther distances than daytime work.

3.10.4. Measures to Minimize and Mitigate Adverse Aesthetic Impacts

WisDOT will continue design refinements to minimize encroachment impacts on the surrounding viewshed. The color of replacement girders on the bridge over Mirror Lake would closely mimic the existing bridge color. WisDOT will continue public engagement during final design and coordinate with WDNR on bridge aesthetics that are compatible with the Mirror Lake State Park aesthetic. As part of vegetative restoration of temporarily disturbed areas, WisDOT will follow guidance developed in its Facilities Development Manual (FDM) Chapter 27, Planting and Aesthetic Design,[29] which emphasizes a vegetation management system to foster sustainable, ecologically sound and visually pleasing roadside vegetation in a cost-effective manner. During final design, WisDOT would conduct a public involvement process and coordinate with affected property owners to select a design from available options for feasible and reasonable barriers, see also Section 3.17.6. During construction, WisDOT will direct the construction contractor to limit tree removal to the median and avoid clearing vegetation outside existing pavement to the greatest extent practicable.

[29] *Wisconsin Department of Transportation. Facilities Development Manual. Chapter 27 Planting and Aesthetic Design Section 1 Introduction. Feb. 15, 2024.*

3.11.Surface Water

3.11.1. Affected Environment

Information in this section comes from the WDNR Explore Wisconsin's Water Database.[30]

Waterways

The study corridor lies within the Lower Rock River Basin and the Lower Wisconsin River Basin. Each basin consists of several watersheds shown in Figure 3-39. These watersheds include a wide range of land uses, ranging from existing and emerging urbanized areas in Dane County and Wisconsin Dells to agricultural and forested areas subjected to ditching and drainage. Erosion and stormwater runoff are prevalent sources of water pollutants such as high chloride and sodium levels from winter street salting, sediments and contaminants attached to sediments, as well as and nutrients from agricultural runoff. Both basins contain waters or flow into waters with Total Maximum Daily Loads (TMDL).[31, 32]

Rock River Recovery is the TMDL implementation process for the Rock River Basin. The TMDL focuses on waters impaired by excessive sediment and nutrients (phosphorus). The TMDL provides a quantitative analysis of the amount of sediment and/or phosphorus that waterbodies can receive from both point and nonpoint sources while still meeting water quality standards. Wisconsin River TMDLs focus on total phosphorus and address the impairment of aquatic recreational and aquatic life uses. Highway runoff is considered a non-point source of pollutants and is managed collaboratively with WDNR.

The study corridor crosses a total of 11 named waterways and 31 unnamed waterways, primarily with box culverts or bridges.

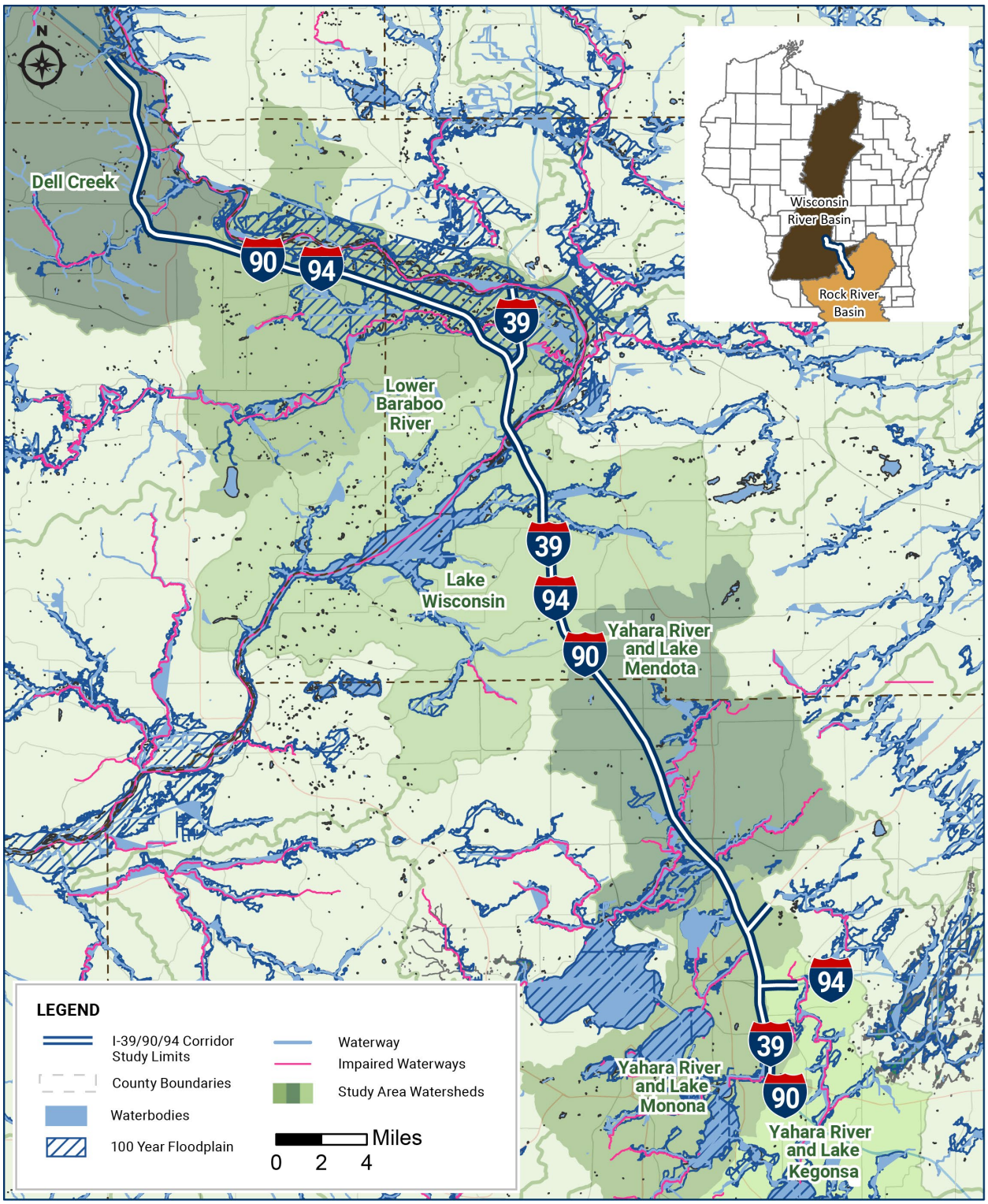
---

[30] *Wisconsin Department of Natural Resources. Explore Wisconsin's Water. https://dnr.wisconsin.gov/topic/SurfaceWater/WEx.html. Accessed Aug. 16, 2023.*

[31] *Section 303(d) of the Clean Water Act (CWA) requires delegated states to determine on a biennial basis whether waterbodies are impaired (not meeting designated uses or water quality criteria). One of the underlying goals of the CWA is to restore all impaired waters so they meet applicable water quality standards. One of the key tools to meet this goal is the development of a total maximum daily load (TMDL). A TMDL is the amount of a pollutant a water can receive and still meet water quality standards.*

[32] *Wisconsin Department of Natural Resources. TMDL Overview. https://dnr.wisconsin.gov/topic/TMDLs/Overview.html. Accessed Feb. 14, 2024.*

Figure 3-39: Watersheds, Waterways, Waterbodies and Floodplains



Source: Wisconsin Department of Natural Resources

Door Creek. Door Creek crosses I-94 east of I-39/90/94 through a box culvert, near the potential new Milwaukee Street Interchange. Door Creek, a tributary to the Yahara River, begins as a small stream in the Town of Burke and flows south 12.7 miles to Lake Kegonsa. Much of Door Creek has been straightened and ditched to facilitate drainage and provide more agricultural land. The associated riparian areas of the creek consist of narrow, shallow marsh wetlands dominated by invasive cattails and are largely restricted to the ditches along the roadway. Riparian areas have also been altered to manicured lawns down to the water's edge where they are located on private property. Water quality in the creek is poor with some stretches having 4-6 feet of silt under 2 feet of water. This sedimentation decreases the amount of adequate aquatic habitat, increases the turbidity of the water and affects the creek's temperature. The creek is on the state's impaired waters list for total phosphorus. [33] Drainage of wetlands and poor soil conservation practices within the watershed contribute to high phosphorous and inorganic nitrogen loading from Door Creek to Lake Kegonsa.

Starkweather Creek. Starkweather Creek is a 3.65-mile tributary to Lake Monona at its north end, draining urban land on the east side of Madison. Starkweather Creek crosses under I-39/90/94 through a box culvert. Most of its wetlands have been drained, filled, and developed for industrial, commercial, and residential purposes. The creek has been extensively channelized and water quality in the mainstem and the east and west branches is very poor. The riparian areas also show signs of significant disturbance being confined between railways and parking lots. These areas are generally narrow emergent wetlands with fringes of European buckthorn present. Segments of Starkweather creek are on the state's impaired waters list for biological oxygen demand (BOD), low dissolved oxygen (DO), sediment, degraded habitat chloride, perfluoro octane sulfonate (PFOS) in fish tissue and unspecified metals causing toxicity.

Token Creek. Token Creek crosses the Interstate just north of the US 51 Interchange through a box culvert. Token Creek is 3-mile-long spring-fed Class III trout stream [34], and is the primary tributary to the Yahara River. The stream passes through residential, agricultural, commercial and wetland areas as it flows through the project area. These developments have largely incised the riparian areas to be steep banks dominated by reed canary grass. Minor remnants of southern dry mesic forest remain along the riparian corridor, but these areas are dominated by box elders with buckthorn and honeysuckles in the understory. Development and intense agricultural practices in the area may contribute sediment and nutrients to the stream and small impoundments in upstream areas warm the water, harm trout habitat, and contribute to excessive rooted aquatic plant growth. This in turn can result in periods of low DO and high turbidity. The segment of the creek crossing the I-39/90/94 corridor is not on the state's impaired water list.

Yahara River. The Yahara River is a large, slow moving warm waterway and tributary to the Rock River, draining over one-third of Dane County. The Yahara River crosses the Interstate just north of WIS 19 through a box culvert. The river is 40 miles long, originating in the marshy areas of Columbia County and flows as a small creek through extensively farmed land until it empties into Cherokee Marsh and eventually Lake Mendota. The study corridor crosses a segment of the Yahara River that is on the state's impaired waters list generally for elevated phosphorus, chloride, or TSS or low DO. This impairment is partly due to the river flowing through the Lake Windsor Country Club immediately to the east of the project where the greens extend to the ordinary highwater mark. To the west of the interstate, the riparian areas are gradually sloped emergent wetlands dominated by reed canary grass and

---

[33] Sections 303(d) and 305(b) of the Clean Water Act (CWA) require states to publish a list of all waters not meeting water quality standards and an overall report on surface water quality. It includes waters with no cleanup plan in place. Wisconsin's impaired waters list is the official CWA 303(d) list.

[34] Wisconsin Department of Natural Resources. Trout Stream Classifications Wisconsin Trout Fishing. https://dnr.wisconsin.gov/topic/Fishing/trout/streamclassification.html. Accessed August 2023.

bordered by agricultural fields. WisDOT has received comments from members of the public to evaluate opportunities to improve access for canoeists and paddlers under the Interstate.

Wheeler Wilcox Creek. Wheeler Wilcox Creek is a 4.65-mile creek that crosses the Interstate one-half mile south of Windsor Road through a box culvert. This creek is not impaired. It passes through residential and agricultural areas. Similar to the Yahara River, the creek flows through the Lake Windsor Country Club immediately to the east of the project, where the greens extend to the ordinary highwater mark. To the west of the interstate, the riparian areas are gradually sloped emergent wetlands dominated by reed canary grass and bordered by agricultural fields.

Rowan Creek. Rowan Creek is a 16.8-mile tributary to Lake Wisconsin that crosses the Interstate north of the County CS Interchange. The upper 4 miles of Rowan Creek are designated as Class I trout water, and the lower 8 miles, where it crosses the Interstate, is designated as Class II trout water. It is known as one of the best trout streams in Columbia County. The riparian areas along the creek consist of relatively undisturbed forested wetlands before entering the project area, where they transition to emergent cattail marshes within the highway corridor. To the west of the corridor, the riparian areas are forested wetlands where the creek maintains a functioning floodplain. There are nonpoint source pollution problems in Rowan Creek's upper end from cattle access, bank erosion and cropland erosion. Additionally, adjacent new housing developments have increased stormwater runoff.

Baraboo River. The Baraboo River is a 119-mile-long tributary to the Wisconsin River. It crosses I-39 north of the I-39 I-90/94 Split Interchange and crosses I-90/94 south of the WIS 33 Interchange with I-90/94 in Columbia County. Both I-39 and I-90/94 are in a low area as they cross the Baraboo River and flooding has caused partial or full closures of I-39 and I-90/94, see Section 3.13. The riparian corridor in this area is largely forested wetland, with the floodplain dominated by silver maples with little to no understory due to frequent flooding. Where the Interstate crosses the river, the riparian areas transition to sloped uplands of the engineered roadway.

The Baraboo River historically had up to seven dams along its length, though all the dams have now been removed. Most of these dams were initially built to generate power and were later maintained for recreational purposes. As a result of habitat fragmentation and other issues caused by the dams, the portion of the Baraboo River that flows through the city of Baraboo is on the state's impaired waters list due to high phosphorus levels.

Mirror Lake. Mirror Lake is a 137-acre impoundment of Dell Creek above Lake Delton. I-90/94 crosses Mirror Lake one-half mile south of the WIS 23 Interchange. Mirror Lake State Park, which surrounds the lake, provides public access. The riparian area within the project is negligible, as the lake is boarded by vertical cliff faces that drop approximately 50 feet down to the water. The lake is on the state's impaired waters list due to high phosphorus levels. Recent studies have documented sedimentation in Mirror Lake and report that channelized gullies and land use practices in the contributing watershed have made sediment an increasingly important concern, leading to the formation of deltas that obstruct navigation. (Mirror Lake Drainage District, 2022). The study further recommends gully repair, installation of velocity checks and dredging.

Spring Brook. Spring Brook, a 4-mile-long tributary to Lake Delton, crosses I-90/94 one-half mile north of the WIS 23 Interchange. An impoundment on the stream creates Blass Lake. Riparian areas are limited due to steep sloped uplands where white pine forests intersperse with residential areas. Elevated temperatures, low DO, low flow and limited in-stream habitat impact Spring Brook. These problems result from nonpoint sources of pollution, including cropland erosion, barnyard runoff, hydrologic modification and urban stormwater runoff. Spring Brook is not currently on the state's impaired waters list.

Hulburt Creek. Hulburt Creek, a 6.5-mile-long tributary to the Wisconsin River, crosses through the WIS 13 Interchange. Upstream of the I-90/94 crossing, Hulburt Creek is a Class I trout stream and classified as an

exceptional resource water by WDNR.[35] From County H to the Wisconsin River, the creek is a Class II trout stream. The riparian area for this portion of the creek consists of a riparian emergent wetland that functions as a floodplain. This area is bordered by white pine forests and red pine plantations. Downstream, the creek is affected by urban development in Wisconsin Dells, where the riparian corridor becomes a narrow wet meadow dominated by reed canary grass. Other problems on the creek include agricultural nonpoint pollution and limited in-stream habitat. The portion of the creek downstream from I-90/94 is on the state's list of impaired waters due to high phosphorus levels. On the west side of the WIS 13 Interchange, the WDNR owns the 300-acre Hulburt Fishery along Hulburt Creek, which is open to the public, see also Section 4.3.2.

Unnamed Rivers and Streams. The 31 unnamed streams that pass under I-39/90/94 are typically a few feet wide and some may not flow year-round. They typically pass under the freeway in pipe or box culverts. Two unnamed streams between Hoepker Road and the I-94/WIS 30 interchanges are impaired for total phosphorus, chlorides and PFOS. Impairment and water quality data on the remaining unnamed streams is not available.

Stormwater Management

WisDOT collects stormwater from I-39/90/94 in storm sewers in urbanized portions of Dane County. The storm sewers ultimately discharge to lakes within and surrounding the city of Madison.[36] In rural areas stormwater runs into grassed swales that drain to nearby receiving streams. WDNR regulates stormwater management through municipal separate storm sewer system permitting (known as MS4 permits) and transportation separate storm sewer system permitting (known as TS4 permits). The permits cover stormwater draining (known as discharges) to waters of the state. The study corridor is within a MS4 permitted area throughout Dane County and the city of Portage in Columbia County. The study corridor does not cross through MS4 permit areas in Sauk and Juneau counties. The purpose of WisDOT's TS4 permits is to identify conditions under which stormwater can be discharged to help protect the quality of surface waters, wetlands and groundwater. WisDOT has received a TS4 state-wide general permit. The TS4 Permit is applicable to WisDOT roadway rights-of-way and properties owned, operated and maintained WisDOT that are located within urbanized areas of Wisconsin. [37] WisDOT's TS4 permit is applicable in Dane County and the city of Portage. WisDOT collaborates with WDNR to manage stormwater runoff.

3.11.2. Surface Water Impacts

No Build Alternative

Under the No Build alternative, there would be no change in impervious surface area or stormwater control. The build alternatives' impacts to surface waters are discussed below. Under the No Build alternative, no physical impacts to streams, including new water crossings would occur.

---

[35] *Exceptional resource waters are surface waters that provide outstanding recreational opportunities, support valuable fisheries and wildlife habitat, have good water quality, and are not significantly impacted by human activities.*

[36] *City of Madison Engineering. Hidden Infrastructure. Stormwater Drainage System. https://www.cityofmadison.com/engineering/stormwater/education/stormwater-drainage-system. Accessed July 2023.*

[37] *Wisconsin Department of Transportation. Stormwater Management. https://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/environment/stormwtr-mgmnt.aspx Accessed Feb. 14, 2024.*

Build Alternatives

Water Quality

Water quality impacts are associated with operating and maintaining roadways. All build alternatives would increase impervious area (that is, pavement) compared to the No Build alternative, see Table 3-39. Increased pavement contributes to increased stormwater runoff. During normal roadway operation, pollutants can be washed from the roadway surface by stormwater runoff to nearby water bodies. The effects of the pollutants would be greatest at locations that discharge directly to waterways. Winter road maintenance includes applying deicing agents such as salt and sand. Deicing salts can affect water quality by increasing chloride levels during runoff and snowmelt. Salt flows into ditches and travels to receiving waterways. Salt spray from passing vehicles drifts as a mist and deposits on vegetation and soil.

Stormwater runoff from pavement is typically warmer than stream water temperature and, therefore, increased runoff may raise stream temperatures. Increased stream water temperatures can impair habitat for cold-water aquatic species by lowering the amount of dissolved oxygen available and increasing the amount of biological activity, further affecting dissolved oxygen levels. Bridge spans may reduce surface water habitat by shading sections of streams from direct sunlight.

All build alternatives would also reconstruct stream crossing structures and place fill in wetlands and floodplains, see Section 3.12 and Section 3.13.

The primary construction impact is the potential for erosion and siltation into streams. An increase in suspended sediment can reduce aquatic productivity by limiting photosynthesis, lowering oxygen levels, impact aquatic macroinvertebrates, covering food sources and fish spawning areas, see also Section 3.24 (Construction).

Water Quantity

The amount of stormwater runoff from highways increases proportionally to the amount of pavement. Table 3-39 summarizes the build alternatives' anticipated increased pavement compared to the No Build alternative (existing condition). An increase in runoff volume can increase the velocity of the runoff, which may result in erosion and increased sediment.[38] Section 3.11.3 discusses WisDOT and FHWA's response to minimize the amount of runoff entering water bodies, reduce runoff flow velocity and improve the water quality of the runoff.

The city of Wisconsin Dells has also expressed concerns for the impact of increased stormwater at the WIS 13 Interchange. Drainage from the WIS 13 Interchange discharges to a sensitive floodplain before it ultimately enters the Wisconsin River.

[38] *Bent, Gardner C., John R. Gray, Kirk P. Smith, and G. Douglas Glysson. U.S. Geological Survey, in cooperation with FHWA. A Synopsis of Technical Issues for Monitoring Sediment in Highway and Urban Runoff. 2001.*

Table 3-39: Increase in Impervious Surface Compared to Existing Condition

County	Alternative	Acres of Increased Impervious Area	Percent Increase in Impervious Surface
Dane County	Modernization Plus Added General-Purpose Lane (preferred alternative) + preferred interchange alternatives	138.3	26.3%
Dane County	Modernization Hybrid + preferred interchange alternatives	123.4	24.2%
Dane County	County V Diamond	0	0
Columbia County	Modernization Plus Added General-Purpose Lane (preferred alternative) + preferred interchange alternatives	70.3	25.0%
Sauk County	Modernization Plus Added General-Purpose Lane (preferred alternative) + preferred interchange alternatives	67.2	25.0%
Sauk County	WIS 13 Split Diamond	1.2	12.1%
Sauk County	WIS 13 Trumpet (preferred alternative)	2.0	20.6%
Juneau County	Modernization Plus Added General-Purpose Lane + US 12/WIS 16 Interchange (preferred alternatives)	8.8	42.1%

Note: The Modernization Hybrid alternative lane configuration north of WIS 19 in Dane County is the same as the Modernization Plus Added General Purpose Lane alternative. Modernization alternatives includes the interchange build alternative, except at County V and WIS 13 where more than one alternative is evaluated.

Stream Crossings

In addition to related water quality and water quantity impacts, the alternatives evaluation also considers physical changes to streams, categorized as primary and secondary impacts. Primary impacts typically occur during initial construction and may involve activities such as the removal of bank vegetation, alteration, removal or simplification of river substrates, increases in the suspended particulate matter, and changes to stream hydrology or wetland habitats. These are contrasted with secondary impacts, which develop over a period of time. Common examples include introduction of pollutants like road salts, alterations in recreational uses or aesthetics, and changes in wildlife or human use due to changes in water quality, vegetation or structure.

All waterways crossing the I-39/90/94 study corridor are currently conveyed under the highway via bridges, box culverts or pipe culverts. Culverts, in particular, have a greater impact on stream hydrology compared to bridges, as they replace the natural stream bottom with a human-made bottom. In low-flow conditions, flat culvert bottoms tend to spread the stream flow thinly, posing difficulties for fish passage. Erosion at the down-stream exit of a culvert can result in a "perched" outfall, further hindering passage for aquatic organisms.

All build alternatives would replace structures conveying streams in the I-39/90/94 study corridor. Most pipes and smaller box culverts would be longer than existing structures due to added general-purpose lanes under both freeway modernization alternatives. This increase in length is anticipated to have primary impacts by altering stream hydrology and substrate composition. Additionally, transitioning vegetated stream banks to concrete or

steel encased enclosures would remove vegetation and limit light penetration, impacting waterway ecology. While some sedimentation may occur during construction due to vegetation removal, erosion and sediment control measures will be utilized to minimize these effects.

Secondary impacts on waterway crossings include increased traffic volumes and alterations to waterway structure. Additional lanes will likely increase the amount of road salts or aggregates used for traction during the winter months, potentially leading to increased inputs of these pollutants to waterways. Although much of this impact would be reduced by the eventual revegetation of the surrounding areas, aquatic species spawning, development, or feeding, may be affected resulting in a potential loss of species diversity or abundance. For example, changes in trophic food webs may occur. Aquatic plants and zooplankton would no longer be able to produce within dark segments of culvert or pipe, resulting in a cascade that would affect species at higher trophic levels. These impacts may be offset, however, by an increase in productivity downstream. Increases to nutrients and light availability within waterways generally tend to lead to increases in production which in turn yields higher production in the waterway overall.

Detailed descriptions of the avoidance and minimization measures, along with mitigation strategies to offset any potential net negative effects are further described in the sections below.

Table 3-40 summarizes anticipated linear feet of stream impacts. Between County CS and Smokey Hollow Road up to 3,700 feet of constructed stormwater drainage swales and weirs and 2,225 feet of ephemeral stream would be reconstructed under the freeway modernization alternatives and the County CS Diamond alternative. Wetland delineations conducted at this drainage initially identified it as an intermittent stream based on WDNR online resources, but field reviews completed in 2023 and 2024 verified the drainage is a mix of previously existing stormwater conveyance and ephemeral stream channel, and not an intermittent stream indicated by WDNR online resources. WisDOT completed Stream Features Worksheets for this area based on the U.S. Army Corps of Engineers (USACE) Saint Paul District Stream Mitigation Procedures guidance document and determined the stream does not meet the definition of Waters of the US, see Appendix N.

Table 3-40: Estimated Stream Impacts

Stream Type	Alternative	Estimated Impact (Linear feet)
Perennial	Modernization Plus Added General-Purpose Lane – (preferred) + preferred Interchange alternatives	697
Perennial	Modernization Hybrid + preferred interchange alternatives	637
Intermittent	Modernization Plus Added General-Purpose Lane – (preferred) + preferred Interchange alternatives	9,433
Intermittent	Modernization Hybrid + preferred interchange alternatives	9,409

Note: No stream impacts with County V alternatives. Assumes preferred WIS 13 Trumpet Interchange.

The Mirror Lake bridge would be replaced without placing piers in the water. The freeway modernization alternatives would widen the existing I-39 bridge over the Baraboo River from 180 feet to 500 as part of flood

minimization measures. The widened bridge would allow for some of the natural, beneficial channel processes to remain in the waterway. Box culvert bottoms would be set below existing streams to avoid perched outfalls. Unavoidable stream impacts will be evaluated in accordance with USACE's Stream Mitigation Procedures.[39] Any required compensatory mitigation for stream losses, as determined in coordination with USACE for compliance with Section 404 of the Clean Water Act will be determined at the time of permitting.

WATERWAY CATEGORIES

Waterways are categorized as perennial, intermittent or ephemeral.

Perennial is defined as surface water flowing continuously year-round (typically 9-12 months of flow).

Intermittent is defined as surface water flowing continuously during certain times of the year and more than in direct response to precipitation (typically 3-9 months of flow).

Ephemeral is defined as a surface water flowing or pooling only in direct response to precipitation (typically less than 3 months of flow).

3.11.3. Measures to Minimize and Mitigate Adverse Surface Water Impacts

Water Quality and Quantity

To minimize potential adverse impacts and support TMDL water quality targets, WisDOT will implement stormwater management best practices for the build alternatives. The WisDOT/WDNR Cooperative Agreement contains a Memorandum of Understanding (MOU) regarding stormwater discharge into waters of the state. The MOU requires WisDOT to implement a stormwater management program for its projects that is consistent with Section 402(p) of the Clean Water Act, Chapter 283 Wis. Stat., and Chapter NR 216 Wis. Admin. Code. [40,41] WisDOT will also conform to TS4 permit requirements.

Wis. Admin. Code Chapter NR 151 establishes runoff pollution performance standards for transportation facilities.[42] As it applies to this study, the rule for redevelopment requires removal of 40% of total suspended solids compared to no runoff management controls. The rule for new development, including new interchanges at Hoepker Road and Milwaukee Street, requires removal of 80% of total suspended solids compared to no runoff management controls. WisDOT will incorporate compliance with these rules into final design to the maximum extent practicable.

---

[39] *US Army Corps of Engineers St. Paul District. St. Paul District Stream Mitigation Procedures Version 1.0. April 2023.*

[40] *Wisconsin Department of Transportation and Wisconsin Department of Natural Resources. Cooperative Agreement Between Wisconsin Department of Natural Resources and Wisconsin Department of Transportation. June 1, 2020.*

[41] *Wisconsin Department of Transportation and Wisconsin Department of Natural Resources. Attachment A4 to the DOT/DNR Cooperative Agreement Memorandum of Understanding By And Between the Wisconsin Department of Natural Resources and the Wisconsin Department of Transportation Relating to the Authorization of Storm Water Discharges to Waters of the State Of Wisconsin. Jan. 26, 1999.*

[42] *Wisconsin State Legislature. Chapter NR 151. https://docs.legis.wisconsin.gov/code/admin_code/nr/100/151. Accessed Aug. 16, 2023.*

WisDOT identified potential stormwater detention basins, which are shown in Appendix A. WisDOT will continue refining stormwater management design during final design. Stormwater treatment measures would be evaluated during final design include the following options:

- Retention Basins (Wet Detention Basins) — Retention basins have a permanent pool of water year-round that allows pollutant particles in stormwater runoff to settle over an extended period. Nutrient uptake also occurs through increased biological activity.
- Dry Detention Basins — A dry detention basin is designed to store runoff and discharge it slowly to reduce the peak discharge downstream.
- Infiltration Devices — Infiltration devices such as trenches or grass swales are used to slow the flow of water to improve infiltration and increase the removal of pollutants from runoff.
- Grass-lined Ditches — Ditches help reduce suspended solids content in runoff as required under NR 151.
- Trapezoidal Swale through Infield — This best management practice combines grass ditch treatment with peak flow reduction and provides the same level of suspended solid control as grass ditches.
- Vegetated Rock Filters — Rock filters may be used at outfalls to waterways or anywhere concentrated runoff leaves the right of way. It is conceptually similar to a level spreader, which attempts to reintroduce sheet flow and provides a small amount of peak flow and volume reduction.
- Swale Blocks/Ditch Checks — Swale blocks/ditch checks are small earthen berms constructed in the bottom of ditches at regular intervals to detain runoff from frequent storms. They provide peak flow reduction and may provide infiltration benefits depending on soil conditions.
- Inline Storage — Storm sewer pipes would be designed larger than normal to provide storage in the sewer during rain, then the water is gradually released after the rain ends. This method is not desirable from a water quality standpoint but would manage water quantity.
- Biofiltration Basins — Biofiltration basins are similar to infiltration devices and look like a garden area. They use engineered soil, underdrains, native vegetation and shallow detention to allow flows to be stored on the surface and slowly infiltrate to the subsoils, or in cases of contaminated or poorly drained soils, drain through underdrain to a storm sewer. In narrow or restricted land space areas, stormwater biofiltration systems may be used within ditch areas, between mainline and frontage road lanes, or within ramp areas.
- Stormwater Trees — Trees may be used in the study corridor or watershed to reduce runoff. Stormwater trees absorb stormwater during a rainfall event, absorb carbon dioxide, serve as an urban canopy to reduce urban heat zones and reduce erosion.

To avoid and minimize impacts to Mirror Lake and other waterways during construction, WisDOT will implement measures in WisDOT's Standard Specifications for Highway and Structure Construction. [43] WisDOT will prepare a structure removal and clean-up plan as part of an Erosion Control Implementation Plan. WisDOT will remove existing structures conforming to the department-approved structure removal and clean-up plan. Work will also conform to requirements under a USACE Section 404 Permit. The removal plan will include:

- Methods and schedule to remove the structure
- Methods to control potentially harmful environmental impacts
- Methods for removing piers and abutments. If blasting in water, include restrictions that regulatory agencies require

[43] *Wisconsin Department of Transportation. Standard Specification for Highway and Structure Construction – 2024 Edition. 2024.*

- Methods to control dust and contain slurry
- Methods for clearing debris from the waterway or wetland
- Location of spoil material stockpiles

Stockpiled materials will be placed on an upland site at an adequate distance from the waterway, wetland or open water created by excavation. WisDOT will also install erosion control measures, including storm water control best management practices, between the spoil pile and the waterway, wetland or excavation site.

In addition to the practices above, WisDOT will coordinate with WDNR and Mirror Lake staff to consider additional measures such as ongoing instream monitoring during construction to keep the waterway clear of debris.

Stream Crossings

The Agreement on Aquatic Connectivity at Road-Stream Crossings (ACONN) is an attachment to the WisDOT/WDNR Cooperative Agreement which formalizes departmental commitments to address aquatic connectivity at road-stream crossings on WisDOT administered transportation activities.[44] WisDOT would evaluate the road-stream crossings, with consideration for the recommended ACONN accommodations provided by WDNR, to determine the appropriate structure type, geometry and placement. Such measures could include setting culvert bottoms 1 foot below the existing surveyed stream bed elevation. In coordination with WDNR, WisDOT will evaluate opportunities to provide a forced low flow cell in a multi-cell culvert, which avoids blockage and resulting ponding associated with wide openings and maintains a channel during low flow conditions. WisDOT is currently evaluating the need for stream mitigation with USACE and WDNR, during which the need for additional mitigation measures may be identified. These measures may include reconstructing streams with trapezoidal bottoms to improve drainage and slow water flow, allowing sediment settling. Another measure may involve revegetating disturbed stream beds and banks with salvaged topsoil to maintain the hydric qualities of the original soils.

The USACE has responsibility for determining compensatory mitigation required to offset unavoidable losses of aquatic resource functions. WisDOT will coordinate with the USACE and provide additional stream features worksheets as needed to determine the stream impact severity. The stream relocation at County CS would not meet the definition of Waters of the US and stream mitigation is not anticipated. WisDOT will continue coordination with USACE regarding jurisdiction of the relocated stream through a formal jurisdictional determination during design and permitting. Initial coordination with USACE and WDNR indicate the stream relocation would provide an opportunity to improve stream functions compared to the existing condition. WisDOT will continue coordination with USACE and WDNR regarding stream relocation design and restoration during final design.

WisDOT will coordinate with WDNR during design to evaluate opportunities for improved access under the Interstate for canoeists and other users of the Yahara River. During final design, WisDOT will coordinate with WDNR and USACE to identify locations and measures for stream mitigation, as well as design treatment of the constructed stormwater drainage swales and weirs at the County CS Interchange.

[44] *Wisconsin Department of Transportation and Wisconsin Department of Natural Resources. Attachment to the DNR/DOT Cooperative Agreement Memorandum of Understanding by and between the Wisconsin Department of Natural Resources (DNR) and the Wisconsin Department of Transportation (DOT) on Aquatic Connectivity at Road-Stream Crossings. Dec. 7, 2021.*

3.12.Wetlands

The USACE Wetland Delineation Manual (1987) defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions." According to the 1987 manual, in order to be considered a jurisdictional wetland, the following three criteria must be met: (1) a prevalence of hydrophytic vegetation, (2) the presence of hydric soils and (3) wetland hydrology.

Wetlands provide function and value depending on their position in the landscape and proximity to other plant communities, wildlife and associated habitats and the built environment. Wetland functions include floral diversity, wildlife habitat, fishery habitat, flood/storm water attenuation, water quality protection, shoreline and groundwater protection, as well as aesthetics, recreation and education opportunities.

3.12.1. Affected Environment

WisDOT completed wetland delineations along the I-39/90/94 study corridor between 2021 and 2022.[45, 46, 47] Wetlands within the study corridor were identified through a pre-field records review and site visits, which included soil probes, vegetation identification and hydrologic conditions. Wetland delineations identified 1,484 wetlands, totaling nearly 570 acres, in the study corridor.

The delineated wetlands were generally found along roadside ditches, and near ponds and waterways. Vegetation communities consisted of plant species expected in areas of historic disturbances related to roadways and agricultural practices. In some cases, wetlands were connected hydrologically via culverts or altered waterways that were intended to shed water from the landscape. The number and size of wetland community types described below are the wetland community types within the area of investigation, not the size of the individual wetland complexes. Wetland locations are shown on the maps in Appendix A.

The Wisconsin Department of Transportation Wetland Mitigation Banking Technical Guideline was used to classify wetlands in the I-39/90/94 study corridor, which include aquatic bed, deep marsh, riparian wooded, riparian emergent, shallow marsh, shrub scrub, wet meadow, and wooded swamp. Wetland communities were classified as "degraded" if they had "been exposed to deleterious activities such as excessive use as pasture, cultivation, over exposure to urban effects, or storm water runoff to the extent that natural characteristics have been severely compromised and wetland function has been substantially reduced".[48] Many identified wetlands had multiple wetland classifications.

Table 3-41 summarizes wetland types found within the study corridor.

[45] *GEI Consultants. Wetland Delineation Report I-39, US 12/18 to WIS 60 and Wetland Delineation Report WIS 60 to Dees Rd, I-39/90/94 to I-90/94-County N, I-39/90/94-US 151 to US 151-Reiner Rd. Jan. 19, 2023 and Feb. 14, 2023.*

[46] *Stantec. Interstate Highway 39: Madison to Portage Wetland Delineation. Undated.*

[47] *Stantec. Interstate 90: Wisconsin Dells to Portage Wetland Delineation. June 30, 2022.*

[48] *Wisconsin Department of Transportation in cooperation with: Wisconsin Department of Natural Resources, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish & Wildlife Service, Federal Highway Administration. Wetland Mitigation Banking Technical Guideline. July 1993, First Revision: January 1997, Second Revision: March 2022.*

Table 3-41: Wetlands Along the I-39/90/94 Study Corridor

Wetland Type	Number in Study Corridor	Acres Delineated	Location (County)
Aquatic Bed	118	44.7	Dane, Columbia, Sauk and Juneau
Deep Marsh	21	27.3	Columbia and Sauk
Riparian Emergent	137	17.4	Dane, Columbia and Sauk
Riparian Wooded	55	32.7	Dane, Columbia and Sauk
Shallow Marsh	395	145.7	Dane, Columbia, Sauk, and Juneau
Shrub Scrub	45	14.6	Dane, Columbia, Sauk, and Juneau
Wet Meadow	651	209.1	Dane, Columbia, Sauk and Juneau
Wooded Swamp	62	78.3	Dane, Columbia, Sauk and Juneau
Total	**1,484**	**569.8**	

Source: WisDOT

WisDOT assessed wetland functional values at locations where large areas of wetlands would be impacted, see Appendix O. Table 3-42 summarizes functional values in these areas.

Table 3-42: Summary of Significance of Wetland Functional Values

Functional Value	US 151/High Crossing Boulevard Interchange	US 51 Interchange	I-39 I-90/94 Split Interchange	WIS 33 at I-39 Interchange	WIS 33 at I-90/94 Interchange
Floristic Integrity	Low: non-native and/or invasive species dominant; disturbances include right of way mowing.	Low: non-native and/or invasive species dominant; a few areas have multiple strata of a variety of native species; disturbances include right of way mowing.	Low: non-native and/or invasive species dominant; a few areas have multiple strata of a variety of native species; disturbances include right of way mowing.	Medium: non-native and/or invasive species dominant; some wetlands have a variety of native species.	Low: non-native and/or invasive species dominant; a few areas have multiple strata of a variety of native species.
Human Use Values	Low: potential for bird watching.	Low: potential for bird watching or educational uses.	Low: potential for bird watching or educational uses.	Medium: accessible to Pine Island State Wildlife Area; aesthetically pleasing due to diversity of habitat types and lack of degradation.	Low: potential for bird watching or educational uses.
Wildlife Habitat	Low: potential for bird and wildlife may be present.	Low: Low potential for habitat in assessment area; Token Creek County Park and Cherokee Marsh Fishery Area next to interchange have may have higher quality habitat.	Medium: Connection to large blocks of habitat and variety of wetland types may support a variety of wildlife; 2 important bird areas within and nearby buffer area.	Medium: connected wetlands, variety of habitat types, connection to offsite habitat.	Medium: connected wetlands, variety of wetland types and connection to offsite habitat
Fish and Aquatic Life Habitat	Low: some wetland may have vegetation that is seasonally inundated and might support macroinvertebrates or amphibians.	Low: standing water in small ponds and Token Creek provide habitat for amphibians and aquatic invertebrates; some wetlands are directly connected to or proximate to other surface waters and vegetation with portions likely inundated in spring. Token Creek impacted by farm practices contributing sediment and nutrients.	Low: standing water provides habitat for amphibians and aquatic invertebrates; some wetlands directly connected to or near other surface waters and wetlands likely inundated in spring; waterway in assessment area likely manmade.	Low: standing water provides habitat for amphibians and aquatic invertebrates; some wetlands directly connected to or near other surface waters and wetlands likely inundated in spring; 2 excavated ponds present.	Low: standing water present, proximate to other surface waters and vegetation likely to be seasonally wet.

Functional Value	US 151/High Crossing Boulevard Interchange	US 51 Interchange	I-39 I-90/94 Split Interchange	WIS 33 at I-39 Interchange	WIS 33 at I-90/94 Interchange
Shoreline Protection	Low: none of the wetlands are next to a waterway.	Low: wetland along shoreline of waterway/waterbody and has densely rooted vegetation; does not have potential for erosion.	Low: wetland along shoreline of waterway/waterbody and has densely rooted vegetation; does not have potential for erosion.	Low: wetland along shoreline of waterway/waterbody and has densely rooted vegetation; does not have potential for erosion.	Low: wetland along shoreline of waterway/waterbody and has densely rooted vegetation; does not have potential for erosion.
Flood and Stormwater Storage	Low: do not provide substantial storage of stormwater.	Medium: wetlands assumed to hold more than 10% of runoff from contributing area.	Medium: wetlands assumed to hold more than 10% of runoff from contributing area.	Medium: wetlands assumed to hold more than 10% of runoff from contributing area.	Medium: wetlands assumed to hold more than 10% of runoff from contributing area.
Water Quality Protection	Low: no discharge to surface waters occurs.	Medium: stormwater storage; filters pollutants; heavy plant growth.	Medium: stormwater storage; filters pollutants; heavy plant growth.	Medium: stormwater storage; filters pollutants; heavy plant growth.	Medium: stormwater storage; filters pollutants; heavy plant growth.
Groundwater Processes	Low: no indicators of recharge present.	Low: springs, seeps and other groundwater indicators present; wetlands remain saturated for long period of time with no added water inputs; wetlands likely receive groundwater discharge; some wetlands may provide recharge in late summer dry season during heavy rain events; organic soil map units present.	Medium: springs, seeps and other groundwater indicators present; wetlands likely receive groundwater discharge during dry season; some wetlands may provide groundwater recharge in later summer dry season after heavy rain events; organic soil map units present.	Low: wetlands likely receive groundwater discharge during dry season; recharge unlikely except in late summer dry season after heavy rain events.	Low: wetlands likely receive groundwater discharge during dry season; recharge unlikely except in late summer dry season after heavy rain events.

Source: GEI Consultants, 2024.

3.12.2. Wetland Impacts

No Build Alternative

The No Build alternative would not impact wetlands.

Build Alternatives

The Modernization Plus Added General-Purpose Lane and preferred interchange alternatives could impact up to 172 acres of wetlands as a result of fill placement during construction. Table 3-43 summarizes total wetland impacts by County and wetland type. The US 51 Partial Cloverleaf alternative would have the greatest overall impact to wetlands in Dane County, potentially filling about 15 acres of wetlands. Impacted wetlands consist of wet meadow, riparian emergent, shallow marsh, shrub scrub, riparian wooded and aquatic bed wetlands. The US 151/High Crossing Boulevard Directional alternative would have the second greatest impact to wetlands, potentially impacting about 7 acres of wetlands.

In Columbia County, the WIS 33/I-39 Diamond alternative would have the greatest overall impact on wetlands, potentially filling up to 42 acres of wetlands. Impacted wetlands would include aquatic bed, deep marsh, shallow marsh, wet meadow and wooded swamp. In Sauk County, the largest impact to wetlands – 0.5 acres – would be at the WIS 13 interchange Split Diamond alternative. The US 12/WIS 16 Diamond alternative in Juneau County would impact 0.1 acres of wetlands. Table 3-44 summarizes wetland type impacts by alternative. In Dane County, the Modernization Hybrid alternative, including interchange alternatives as noted in the table, has slightly lower impacts, compared to the Modernization Plus Added General-Purpose Lane alternative combined with preferred interchange build alternatives. The preferred WIS 13 Interchange Trumpet alternative has slightly lower impacts compared to the Split Diamond alternative. A Diamond alternative at the County V Interchange could impact 1.3 acres of wetlands.

Table 3-43: Wetland Impact by County

Wetland Type	Dane County (acres)*	Columbia County (acres)	Sauk County (acres)	Juneau County (acres)*	Total (acres)
Aquatic Bed	1.5	1.9	0.1	-	3.5
Deep Marsh	0.8	1.4	-	-	2.2
Riparian Emergent	1.7	0.4	0.1-0.5	-	2.2-2.6
Riparian Wooded	0.5	4.7	-	-	5.2
Shallow Marsh	26.8-28.2	25.9	0.1	0.1	52.9-54.3
Shrub Scrub	0.4	2.4	-	0.2	3.0
Wet Meadow	35.2-36.2	29.2	0.9	5.4	70.7-71.7
Wooded Swamp	1.3	23.8	<0.1	5.7	30.8-30.9
Total	68.2-70.7	89.7	1.2-1.6	11.4	170.5-173.4

Source: WisDOT

Table 3-44: Wetland Impact by Alternative

Wetland Type	Modernization Plus General-Purpose Lane (Preferred) (acres)*	Modernization Hybrid (acres)*	County V Diamond (acres)	WIS 13 Split Diamond (acres)	WIS 13 Trumpet (Preferred) (acres)
Aquatic Bed	3.5	3.5			
Deep Marsh	2.2	2.2			
Riparian Emergent	2.1	2.1		0.5	0.1
Riparian Wooded	5.2	5.2			
Shallow Marsh	53.3	52.9	1.0		
Shrub Scrub	3.0	3.0			
Wet Meadow	71.4	70.7	0.3		
Wooded Swamp	30.9	30.8			
Total	171.6	170.4	1.3	0.5	0.1

Source: WisDOT

** Freeway modernization alternatives include interchange preferred alternative impacts, excepting County V and WIS 13 interchanges as shown above.*

WisDOT completed an assessment to further determine the impacts to wetland functions and values of in areas of higher impact, see Table 3-45 and Appendix O. Based on assessments, the significance of impacts ranged are anticipated to be low as the build alternatives largely replace existing infrastructure.

Table 3-45: Summary of Significance of Wetland Impacts

Functional Value	US 151/High Crossing Boulevard Interchange – Directional (Preferred Alternative)	US 51 Interchange – Partial Cloverleaf (Preferred Alternative)	I-39 I-90/94 Split Interchange – Low Build (Preferred Alternative)	WIS 33 at I-39 Interchange – Diamond (Preferred Alternative)	WIS 33 at I-90/94 Interchange – Partial Cloverleaf (Preferred Alternative)
Expected Direct Impacts	Low: reconstructing and reconfiguring existing infrastructure.	Low: reconstructing and reconfiguring existing infrastructure.	Low: reconstructing and reconfiguring existing infrastructure.	Low: reconstructing and reconfiguring existing infrastructure.	Low: reconstructing existing infrastructure.
Secondary Impacts	Low: see comments above.	Low: see comments above.	Low: see comments above.	Low: see comments above.	Low: see comments above.
Cumulative Impacts	Low: see comments above.	Low: see comments above.	Low: see comments above.	Low: see comments above.	Low: see comments above.
Spatial Habitat Integrity	Low: see comments above.	Low: see comments above; no expected significant impact to integrity of the area since large blocks of habitat are present next to the site.	Low: see comments above; no expected significant impact to integrity of the area since large blocks of habitat are present next to the site.	Low: see comments above; no expected significant impact to integrity of the area since large blocks of habitat are present next to the site.	Low: see comments above; no expected significant impact to integrity of the area since large blocks of habitat are present next to the site
Rare Plant/Animal Communities/Natural Areas	Low: see comments above.	Low: see comments above; probability of protected species in area of disturbance is unlikely and compliance with federal and state regulations for species. Large amount of habitat and wetlands present nearby.	Low: see comments above; probability of protected species in area of disturbance is unlikely and compliance with federal and state regulations for species. Large amount of habitat and wetlands present nearby.	Low: see comments above; probability of protected species in area of disturbance is unlikely and compliance with federal and state regulations for species.	Low: see comments above. Probability of protected species in area of disturbance is unlikely and compliance with federal and state regulations for species.

Source: GEI Consultants. 2024.

3.12.3. Measures to Mitigate Wetland Impacts

Presidential Executive Order 11990, Protection of Wetlands, requires federal agencies to avoid, to the extent practicable, long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, the order directs federal agencies to avoid new construction in wetlands unless there is no practicable alternative. The order states that where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to wetlands.

The Clean Water Act's Section 404(b)1 Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230) are administered by USEPA and USACE. The guidelines state that dredged or fill material should not be discharged into aquatic ecosystems (including wetlands), unless it can be demonstrated that there are no practicable alternatives to such discharge; that such discharge will not have unacceptable adverse impacts; and that all practicable measures to mitigate adverse effects are undertaken.

In accordance with state and federal agency policies and regulation for wetland preservation, including Section 404(b)(1) guidelines, the following sections describe wetland mitigation strategies for the I-39/90/94 Build alternatives.

Avoid and Minimize Wetland Impacts

Wetlands are present throughout the study corridor, including in ditches draining the freeway, it is not possible to avoid wetland impacts completely with the build alternatives. WisDOT developed the alternatives to stay within existing right of way as much as possible. To the extent practicable, widening for an added general-purpose lane would occur inside the existing Interstate median, primarily between the County CS interchange on I-39/90/94 and the US 12/WIS 16 interchange on I-90/94. While wetlands can and do occur in the right of way, the alternatives limit impacts to wetlands that have historically been affected by roadway construction and operation. WisDOT recommends a partial cloverleaf alternative at the WIS 33 Interchange at I-94 instead of the more familiar diamond configuration to avoid 11.5 acres of wetlands.

As design progresses, WisDOT will continue to incorporate measures to avoid and minimize wetland impacts, such as keeping roadway side slopes as steep as practicable; using beam guard; disposing of excavated material on roadway side slopes or in upland areas; using equalizer pipes to maintain wetland hydrology; minimizing sedimentation and siltation into adjacent wetlands by using strict erosion-control measures; and using detention ponds to reduce pollutant loading and protect streams from sedimentation.

Wetland Compensation

If a build alternative is implemented, WisDOT would develop a wetland mitigation plan during future project design phases, in consultation with state and federal agencies. Where there is no practicable alternative to filling wetlands, state and federal regulations require compensatory mitigation. Compensation for unavoidable wetland loss will be carried out in accordance with the Wisconsin Department of Transportation Wetland Mitigation Banking Technical Guideline developed as part of the WisDOT/WDNR Cooperative Agreement on Compensatory Wetland Mitigation and the regulations for compensatory wetland mitigation issued jointly by the Corps of Engineers and USEPA in May 2008 (33 CFR Part 325, 33 CFR Part 332, and 40 CFR Part 230 [April 10, 2008]). Replacement of the same or similar wetland amount and type is an objective, lessening the potential for changing wetland composition in the area. In coordination with WDNR and USACE, WisDOT continues to pursue opportunities for additional wetland mitigation sites close to the study corridor.

3.13.Floodplains

Executive Order 11988 on Floodplain Management, and Code of Federal Regulations (CFR) 23 CFR 650A – Bridges, Structures, and Hydraulics, direct federal agencies to take action to reduce the risk of flooding; minimize the impacts of floods on human safety, health and welfare; and to restore and preserve the natural and beneficial values served by floodplains. [49,50] The Federal regulation also requires agencies to elevate bridges above the flood elevation wherever possible. The purpose of the order is to avoid the long- and short-term adverse impacts associated with filling and modifying floodplain and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

The 100-year floodplain is the area predicted to flood during a 100-year storm. A 100-year storm is a storm that has a 1 percent chance of occurring in any given year. Areas within the 100-year floodplain may flood during smaller storms too. The Federal Emergency Management Agency uses the 100-year floodplain as a basic mapping tool for its federal flood insurance program, and municipalities and counties in the National Flood Insurance Program use it to regulate development. There are also 2-year floods and 10-year floods which statistically have a 50 percent and a 10 percent chance, respectively, of occurring in a year.

Through the WisDOT/WDNR Cooperative Agreement, WisDOT is required to determine the impact of new or modified bridges and box culverts on the 100-year flood elevation. A hydraulic analysis of both existing and proposed conditions is conducted to determine if the bridge or culvert causes a change in the 100-year flood elevation. WisDOT is required to assist affected municipalities in updating floodplain information in its floodplain ordinance for submittal to the Federal Emergency Management Agency (FEMA). WisDOT provides the results of the analysis, the hydraulic models developed, mapping, and other exhibits developed for analysis.

3.13.1. Affected Environment

Flooding is part of the normal cycle of streams and lakes. Flooding becomes a potential problem when development occurs in the floodplain. The floodplain is land that has been or may be covered by floodwater during the 100-year flood. The floodplain includes the floodway and flood fringe areas, see Figure 3-40.

The floodway is the channel of a river or stream and the area next to the channel that must remain open to carry the deeper, faster moving water during a flood. When the floodway is obstructed by buildings, structures, or debris, flood waters back up and increase the flooding potential upstream. The flood fringe is the portion of the floodplain outside of the floodway that is covered by flood water during the 100-year flood.

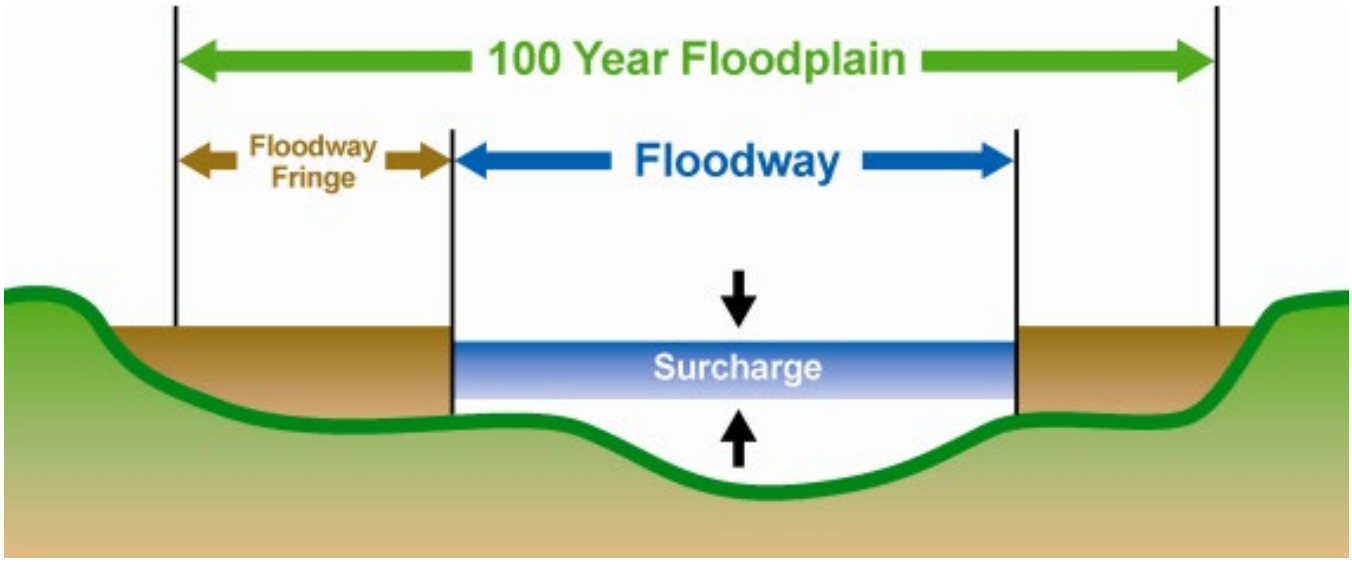
Floodplains provide natural flood control by slowing down and temporarily storing flood water. Flooplains also improve water quality by filtering nutrients and sediments, recharging groundwater through infiltration, providing

[49] *Federal Emergency Management Agency. Executive Order 11988 Floodplain Management. May 1977. https://www.fema.gov/glossary/executive-order-11988-floodplain-management. Accessed Jan. 23, 2024.*

[50] *Code of Federal Regulations. Title 23 CFR Part 650 Subpart A Location and Hydraulic Design of Encroachments on Flood Plains. 2024.*

fish and wildlife habitat, and providing open space and recreational opportunities. Locations where the 100-year floodplain crosses or is next to the study corridor are shown in Figure 3-39.

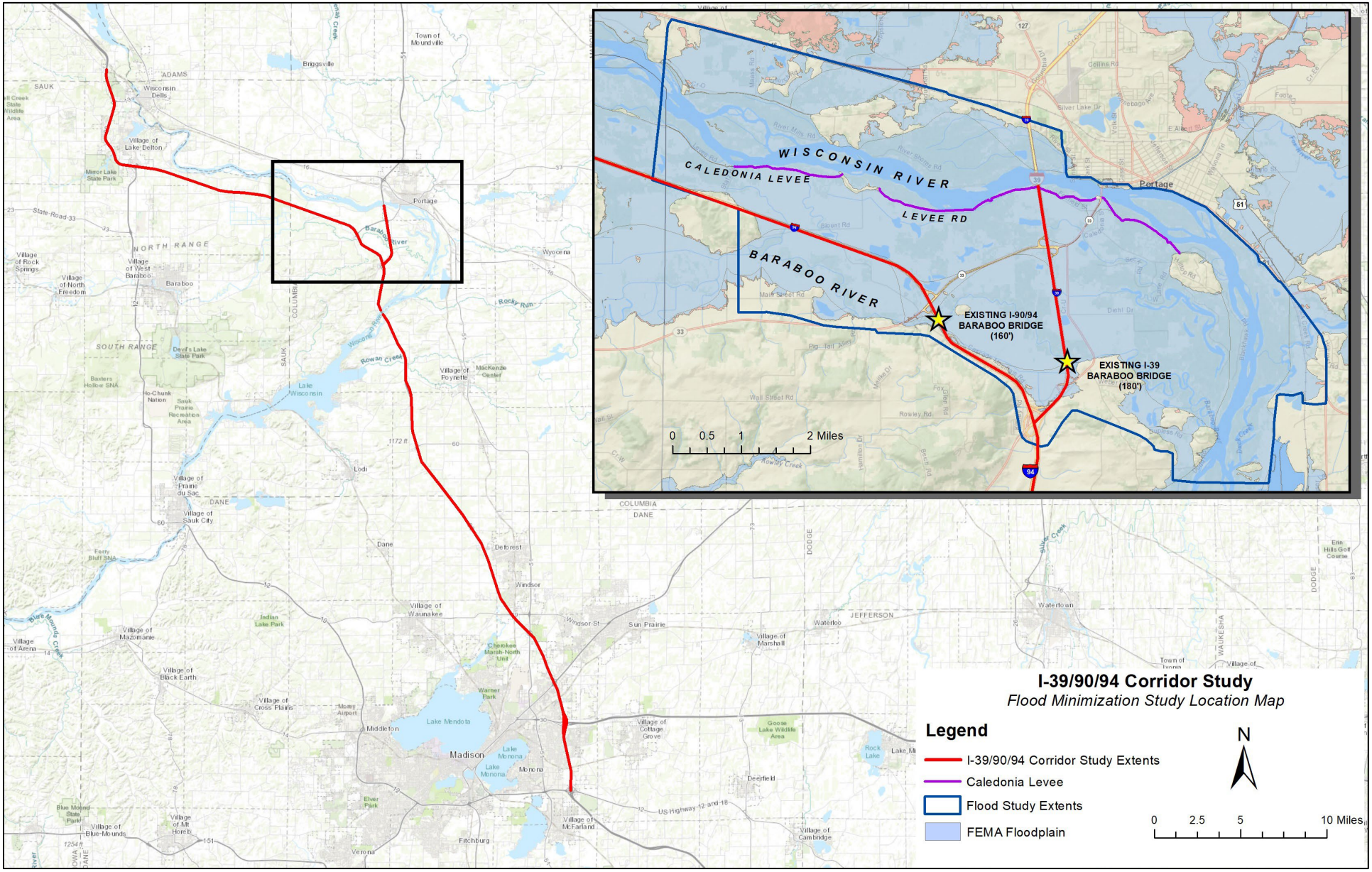
Figure 3-40: Characteristics of a Floodplain



Source: Guidance for Flood Risk Analysis and mapping (FEMA, 2019)

Both I-39 and I-90/94, as well as WIS 33 are within the floodplains of both the Wisconsin and Baraboo rivers which meet about 2.5 miles east of the I-39 I-90/94 Split Interchange. Flooding on the Baraboo River has caused extensive damage and road closures. In 2008 and 2018 flooding overtopped and closed I-39 and I-90/94 in Columbia County for several days, see Figure 1-21 in Section 1.4.5. While the 2008 flooding was the result of the Baraboo River, the much larger Wisconsin River has the potential to flood substantial portions of the floodplain and overtop I-39, I-90/94 and WIS 33. Figure 3-41 shows the FEMA Special Flood Hazard Areas (FEMA floodplain) around the study corridor.

Figure 3-41 FEMA Regulatory Flood Mapping for Columbia and Sauk Counties



Source: Flood Insurance Study, Columbia County, Wisconsin and Incorporated Areas, revised publication 05/16/2016. Accessed through FEMA's National Flood Hazard Layer Viewer, June 2023.

3.13.2. Flood Minimization Study

WisDOT prepared a resiliency study that identified flood minimization strategies in the Baraboo River and Wisconsin River area, see Appendix E. The study used the same assumptions FEMA used for the development of the regulatory 100-year floodplain as part of the National Flood Insurance Program (NFIP). Figure 3-41 shows the Flood Insurance Study (FIS) 100-year floodplain for Columbia and Sauk counties in the vicinity of this flood minimization study.

Flood Minimization Options

WisDOT evaluated the costs and benefits of several options to minimize flooding. All of the options include raising 3.5 miles of I-90/94 approximately 3 feet and about 2.9 miles of I-39 approximately 3 to 4 feet to prevent overtopping. The options vary in their approach to preventing overtopping and conveying flood waters past I-39. Two approaches were examined for an alternate solution. Option A would raise I-39 on a causeway with a series of long bridges to keep it above flood waters while allowing flood water to pass beneath . This allows for free passage of flood flows and no rise in the base flood elevation but opens downstream residents and businesses to more persistent flooding. The second approach, Option C, would build shorter bridges at select locations to consolidate floodwater under and away from the freeway .[51] Option C would cause impacts both upstream and downstream of I-39. However, the total impact would be less than raising the Interstate without adding additional bridge conveyance (causing as much as 2 feet of upstream water surface rise) or providing free passage of floodwater (increasing the flood risk to roughly 25 downstream residents).

WisDOT used two models to analyze flood minimization options. The 1-dimensional (1D) FEMA regulatory floodplain model (HEC-RAS v4.3) developed for the NFIP, and a 2-dimensional (2D) unsteady (or dynamic) hydrodynamic modeling (SRH2D) [52] internally developed by WisDOT. Any change to the 1D regulatory model floodplain elevations requires a conditional letter of map revision, including a mitigation plan for all insurable structures with a flood elevation rise greater than 0.005 feet. The 2D model, which provides more detailed hydraulic outputs (water depth and velocity), is the primary tool used to evaluate flood minimization options and assess impacts to properties.

In Option A, WisDOT would raise I-39 and build three long bridges on I-39 between Cascade Mountain Road and the Wisconsin River to minimize the risk of flood water overtopping I-39. Approximately 3 miles of I-39 would be raised between 1.6 to 3.7 feet between the I-39 I-90/94 Split Interchange to the south and the north study limit at Levee Road. By building roughly 6,000 feet of bridge, the overtopping of I-39 could be avoided during the 100-year flood, with no net rise in upstream flood elevation per the 1D regulatory floodplain model. Results of the 2D model indicate a decrease in water elevation during the 100-year flood between I-90/94 and I-39, including the USFWS Baraboo River Waterfowl Production Area. Results of the 2D model also indicate increased flood elevations immediately downstream (east) of I-39. There are 23 residences and 7 businesses included in the impact area, see Table 3-47. The bridges are also very expensive, roughly 110 million dollars, see Table 3-46.

---

[51] *WisDOT also considered an Option B to either recertify the Caledonia levee as a flood protection facility or raise WIS 33 to function in a similar manner. This was dismissed due to concerns over long term maintenance, risk, liability, and cost.*

[52] *Bureau of Reclamation. SRH-2D (Sediment and River Hydraulics). https://www.usbr.gov/tsc/techreferences/computer%20software/models/srh2d/index.html. Accessed Jan. 30, 2024.*

In Option C, WisDOT would build shorter and fewer new bridges on I-39 and raise I-39 such that some water surface rise in the upstream (west) flood elevation is expected. Option C raises I-39 about 3 to 4 feet between the I-39 I-90/94 Split Interchange and the north study limit at Levee Road, a length of approximately 2.9 miles. About 3.5 miles of I-90/94 would be raised 3 feet around the WIS 33 Interchange. The goal of Option C is to balance upstream impacts with the risks to downstream properties, creating a solution that would minimize the overall flood impact of the build alternatives. WisDOT developed and evaluated several variations of Option C (C2, C3 and C4).[53] All C options would also reduce the risk of floodwater overtopping I-39 and I-90/94. The majority of affected property upstream of I-39 is owned by WDNR and USFWS and used as a wildlife refuge. The remainder is privately owned farmland, undeveloped land and a few residences and businesses.

Option C2 would lengthen the current Baraboo River bridge to 250 feet and build a second 250-foot bridge roughly 2,000 feet north of the current Baraboo River bridge. Option C3 is similar, however the new bridge would be on I-39 north of the WIS 33 Interchange. Option C4 would lengthen the current Baraboo River crossing to 500 feet without adding any additional bridges. For all C options, the existing Baraboo River bridges on both I-39 and I-90/94 would be raised proportionally to the surrounding road profile in order to accommodate appropriate freeboard and deck thickness.

Lengthening the Baraboo River bridge has multiple benefits, the current 180-foot bridge was constructed in 1962 and spans only the active Baraboo River channel. A longer bridge spanning part of the floodplain would allow for some of the natural, beneficial channel processes to remain and would reduce the risk of scour at the pier foundations and abutments.

The 1D model results are fundamentally different from the 2D model outputs. Options C2, C3 and C4 have the same area of impact from the 1D model perspective.

Option C2 would raise the flood elevation to areas west of I-39 that are largely within the Baraboo River Waterfowl Production Area and the Pine Island State Wildlife Area. While coordination is on-going, impacts from relatively small surface water elevations are not expected to negatively affect either property. If affected, flood elevation increases would be anywhere from a few inches up to 1 foot in a 100-year flood. Impacts also reach to the north of the Wisconsin River and south of I-90/94. However, some properties would experience flooding at lower frequency flow events, which they do not currently experience.

Under Option C3, the impacts upstream of I-39 are less substantial, with a maximum upstream rise of up to 1 foot and no water surface increase to the north of the Wisconsin River. However, the northern proposed bridge would increase flood elevations downstream of I-39 along WIS 33. Additionally, those properties would experience flooding at lower frequency flow events, which they do not currently experience.

Under Option C4, the flood minimization measures would be limited to lengthening the bridge at the Baraboo River crossing. The extent of the increases and decreases in surface water elevation would be very similar to Option C2. The 100-year flood increase would be up to 1.5 feet, occurring mostly on WDNR- and USFWS-owned land upstream of I-39 and creates little downstream flood elevation increase. The increase that is created downstream of I-39 is limited to the Baraboo River floodplain and avoids private residences. This is true for both the 100-year event and more frequent flood events. WisDOT recommends implementing Option C4 as part of the build alternatives for the I-39/90/94 Corridor Study. Option C4 and C3 have nearly identical benefit cost analysis (BCA) ratios, 2.27 and 2.28 respectively. Option C3 increases the flood elevation to at least 24 properties east of I-39 during more frequent storms, such as the 10- and 25-year events on the Wisconsin River, this is not reflected in

[53] *Option C1 was dismissed due to the high number of bridges and associated costs, see Appendix E.*

the BCA. A 500-foot bridge span also allows for more geomorphic and ecological benefits by reconnecting a portion of the floodplain to the main channel through the bridge structure. Table 3-46 summarizes the flood minimization options WisDOT considered.

Table 3-46: Flood Minimization Options Summary

Option	Mitigation Measure on I-39	Regulatory Water Surface Elevation Rise (1D model)	Downstream Water Surface Elevation Rise (2D model)	Preliminary Cost Estimate (millions)[a]	Benefit Cost Analysis
A	Multiple large bridges	No	Yes, primarily on the residences on County U and WIS 33 east of I-39	110.5	0.58
C2	Widen Baraboo River bridge and one floodplain bridge between Baraboo River and WIS 33 Interchange	Yes	Yes, primarily residences on County U	31.0	2.19
C3	Widen Baraboo River bridge and one floodplain bridge north of WIS 33 Interchange	Yes	Yes, primarily residences on WIS 33 and east of I-39	28.8	2.28
C4[b]	Widen Baraboo River bridge	Yes	Yes, localized to historic Baraboo River floodplain. No properties at risk east of I-39	29.0	2.27

a. Preliminary cost estimate includes cost of earthwork and bridge replacements. It also includes $2.9 million in property acquisition costs for each of the C options.

b. Highlighted row is the recommended option to implement with build alternatives. A Benefit Cost Analysis determines the future risk reduction benefits of a project and compares those benefits to its costs. A project is considered cost-effective when the ratio is 1.0 or greater.

Flood Minimization Option Impacts

Based on the 2D model, the primary impact of the flood minimization options WisDOT considered is that flood elevations would change by a few inches in some locations to over 1.0 foot in one location. This would occur east and west of I-39 between the I-39 I-90/94 Split interchange and the Wisconsin River, about 3 miles north of the split interchange.

The impacts presented here are worst case. The 1D regulatory floodplain model impacts range from 0.01 to 0.70 feet. Consistent with FEMA's 100-year floodplain assumptions, WisDOT's models assume the existing Caledonia Levee is not in place. Also, some areas would see increased flood elevations in a 100-year flood compared to today, but those same areas would see a lower flood elevation in a 10-year flood or a 2-year flood. Those floods, statistically, are more likely to occur than a 100-year flood.

Changing the flood elevation would not affect any properties or resources until there is a flood. In most locations the flood elevation would change only during a 100-year flood. The duration of impact is likely to persist only for a portion of the total flood duration, days to weeks depending on the timing, the amount of rainfall and water volumes in the river. Key resource impacts are described below. See Appendix E for additional discussion.

Residences and Businesses. Insurable structures that are impacted under the 1D regulatory model would need to either be relocated or floodproofed (such as raising structures). Up to one residence and two businesses in the 1D regulatory model would experience a higher flood elevation during a 100-year flood under each option.

Table 3-47 summarizes residences and businesses that would experience an increase or decrease in the 100-year flood elevation under both the 1D and 2D models. These properties are located in the existing 100-year regulatory floodplain. Residences and businesses that experience an increase in flood elevation with the 2D non-regulatory model would not need to be relocated unless they also experience an increase with the 1D regulatory model.

Table 3-47: Residences and Business Experiencing a Change in 100-Year Flood Elevation

Option	Residences and Businesses with Increased Flood Elevation (Regulatory 1D Model)	Residences and Businesses with Increased Flood Elevation (Non-Regulatory 2D Model)	Residences and Businesses with Reduced Flood Elevation (Regulatory 1D Model)	Residences and Businesses with Reduced Flood Elevation (Non-Regulatory 2D Model)
A	0	23 Residences 7 Businesses (incl. 2 vacant)	0	1 Residence 1 Business (vacant)
C2	1 Residence 2 Businesses (incl. 1 vacant) 1 USFWS Maintenance/Storage Building 3 Buildings on WDNR Property 1 AT&T structure 1 cell tower/building	12 Residences 6 Businesses (incl. 2 vacant) 1 USFWS Maintenance/Storage Building 1 Building on WDNR Property	0	26 Residences 3 Businesses
C3	1 Residence 2 Businesses (incl. 1 vacant) 1 USFWS Maintenance/Storage Building 3 Buildings on WDNR Property 1 AT&T structure 1 cell tower/building	6 Residences 6 Businesses (incl. 3 vacant) 1 USFWS Maintenance/Storage Building	0	2 Residences

Option	Residences and Businesses with Increased Flood Elevation (Regulatory 1D Model)	Residences and Businesses with Increased Flood Elevation (Non-Regulatory 2D Model)	Residences and Businesses with Reduced Flood Elevation (Regulatory 1D Model)	Residences and Businesses with Reduced Flood Elevation (Non-Regulatory 2D Model)
C4	1 Residence 2 Businesses (incl. 1 vacant) 1 USFWS Maintenance/Storage Building 3 Buildings on WDNR Property 1 AT&T structure 1 cell tower/building	9 Residences 6 Businesses (incl. 3 vacant) 1 USFWS Maintenance/Storage Building 1 Building on WDNR Property	0	26 Residences 3 Businesses

Community Facilities. In the area near UWFWS's field office on Cascade Mountain Road, just north of I-90/94, Options C2 and C4 would raise the 100-year flood limit boundary slightly. It would encroach onto one of USFWS's maintenance and storage garage and some parking and may add the building to the 100-year floodplain. One to three buildings on WDNR property would also be impacted within the existing 100-year floodplain. No other community facilities would be affected by changes in 100-year flood elevation.

Agriculture. Several hundred acres of farmland would see an increase in the 100-year flood elevation based on the 2D model. Up to 130 acres would see a decrease in the flood elevation during floods based on the 2D models. The agricultural land is already prone to flooding because it is in the floodplain. During normal conditions the flood minimization options would not affect farmland but during flood events the land may take longer to drain than it would today. This could affect planting or increase the crops lost to a flood.

Environmental Justice. WisDOT met with private property owners on Jan. 29, 2024 to discuss potential impacts to individual properties. Property owner interviews indicated no evidence of environmental justice populations living in the area affected by changing 100-year flood elevations.

Flood Minimization Study Coordination

As part of its detailed flood study, WisDOT met with WDNR, Columbia County (the local floodplain zoning administrator), and property owners impacted by the recommended option. Table 3-48 summarizes outreach activities. WDNR is the agency responsible for the floodplain management program mandated by state statutes. WDNR also partners with FEMA, through the Cooperating Technical Partners program, on the implementation of the NFIP Program. WisDOT will continue coordination with WDNR through the design process as updated flood maps are developed and finalized. WisDOT will request a formal Conditional Letter of Map Revision from FEMA. After construction, WisDOT will submit as-built plans of the Interstate and interchanges, along with the final flood map to FEMA and request a Letter of Map Revision. During final design, WisDOT will continue coordination with property owners affected by potential flood elevation changes and finalize measures to mitigate property impacts, if needed.

Table 3-48: Summary of Floodplain Minimization Coordination

Agency or Stakeholder	Date
WDNR	June 29, 2023 Jan. 24, 2024
Columbia County	June 29, 2023
Town of Caledonia	Jan. 10, 2024
USFWS	Dec. 6, 2023
FEMA[a]	Jan. 24, 2024
Private Property Owners	Jan. 29, 2024

a. Wisconsin State National Flood Insurance Program (NFIP) coordinator participated in this meeting.

3.13.3. Floodplain Impacts

No Build Alternative

No floodplains would be affected under the No Build alternative. However, the existing Interstate would be vulnerable to future flood events, with the risk of future freeway closures.

Build Alternatives

Direct impacts to floodplains can occur in two ways: transverse stream crossings and longitudinal encroachments into floodplain areas. Transverse crossings occur when a stream is crossed and roadway construction in the floodplain is generally perpendicular to the stream flow. Longitudinal encroachment occurs when roadway construction in the floodplain is generally parallel to the stream flow. In either case, the additional fill required to raise, widen or construct a new roadway can reduce the cross-sectional area of the floodway necessary to convey the flow or can reduce the volume available for flood storage.

Encroachments farther from the channel banks have little effect since the conveyance capacity in the distant floodplain is small compared to that of the main channel. In many cases, it may not be possible or practicable to replace the loss of flow area or storage volume, and the resulting encroachment would raise the floodwater surface profile, thereby causing inundation of areas that were previously outside the floodplain.

Across the I-39/90/94 study corridor, the preferred Interstate and interchange alternatives would require filling up to 327 acres in the 100-year floodplain, including both floodway and flood fringe impacts. Table 3-49 summarizes floodplain impacts by county. Most substantive impacts are in Columbia County and related to flood minimization options requiring fill to raise the Interstate, the I-39 I-90/94 Split Interchange and the two WIS 33 Interchanges above the Baraboo River and Wisconsin River 100-year flood elevation.

All bridges would be sized to pass a 100-year flood without interruption to traffic due to flood damage to the roadway or structures. With the exception of the area near WIS 33 along I-39 and I-90/94, headwater elevations would not increase by more than the permissible 0.01 foot.

Table 3-49: Floodplain Filling Impacts per Alternative

County	Alternative	Floodplain Fill (acres)	Streams
Dane County	Modernization Plus Added General-Purpose Lane (preferred alternative) + preferred interchange alternatives Modernization Hybrid (differences between the alternatives are minimal)	17.0	Yahara River, Wheeler Wilcox Creek, Unnamed Tributary to Upper Mud Lake, Door Creek, Starkweather Creek, Unnamed Stream (5034561), Unnamed Stream (5034689), West Branch Starkweather Creek (Airport Road Creek), Token Creek, Unnamed Stream (806700), Yahara River (No floodplains at County V)
Columbia County	Modernization Plus Added General-Purpose Lane*(preferred alternative) + preferred interchange alternatives	300.0	Rowan Creek, Wisconsin River, Baraboo River, Dell Creek, Wisconsin River, Rowan Creek
Sauk County	Modernization Plus Added General-Purpose Lane + WIS 13 Split Diamond Interchange* Modernization Plus Added General-Purpose Lane + WIS 13 Trumpet Interchange*(preferred alternatives)	9.8 10.0	Dell Creek and Wisconsin River WIS 13 Split Diamond: Hulburt Creek: 0.8 acres WIS 13 Trumpet: Hulburt Creek: 1.0 acres
Juneau County	Modernization Plus Added General-Purpose Lane*+ US 12/WIS 16 Diamond (preferred alternatives)	0.0	
Total		326.8-327.0	

**Lane configuration for Modernization Hybrid alternative is the same as Modernization Plus Added General-Purpose Lane in Columbia, Sauk and Juneau counties*

3.13.4. Measures to Minimize and Mitigate Adverse Floodplain Impacts

WisDOT will continue coordinating with WDNR through final design and prior to construction. WisDOT will request a formal Conditional Letter of Map Revision from FEMA. After construction, WisDOT will submit plans of the Interstate and interchanges, as built, along with the final flood map and request a Letter of Map Revision from FEMA. During final design, WisDOT will continue coordination with property owners affected by potential flood elevation changes and finalize measures to mitigate property impacts, if needed.

WisDOT will minimize risks associated with unavoidable floodplain impacts to the greatest extent possible. Potential flood mitigation measures would include acquisition, relocating or elevating structures outside the 100-year flood elevation, floodproofing structures or purchasing a flood easement, see Section 3.3.3 and Section 3.4.4. The build alternatives include measures to minimize impacts by widening the Interstate to the inside and

steepening side slopes where feasible. All floodplain crossings would be constructed in accordance with the WisDOT/WDNR Cooperative Agreement.

Floodplain crossings would be consistent with local floodplain management goals and objectives, which include maintaining the natural and beneficial floodplain values and avoiding alternatives which adversely impact the health, safety and vitality of the community. WisDOT will design floodplain crossings to avoid and minimize impacts to existing flood profiles on adjacent landowners' properties. Additionally, the communities surrounding the study corridor have floodplain management regulations in place to prevent inappropriate development. WisDOT is required to assist municipalities in updating their floodplain insurance rate maps (FIRMs) for the affected area and does so through FEMA, WDNR and the County. WisDOT will provide the results of the analysis, the hydraulic models developed, mapping and other exhibits developed for analysis.

3.13.5. Evaluation

Both freeway modernization build alternatives, which include the preferred Interstate and interchange alternatives increase the resilience of I-39/90/94 to flooding and potential flooding risks related to climate change. While resilience is improved this results in a significant encroachment to a floodplain. Consistent with 23 CFR 650A, WisDOT would minimize risks associated with unavoidable floodplain impacts to the greatest extent practicable. WisDOT evaluated the build alternatives, including the preferred Interstate and interchange alternatives to comply with 23 CFR 650.111. Furthermore, WisDOT and FHWA must determine there is no practicable alternative to the proposed encroachment as required in 23 CFR 650.113. A final decision according to 23 CFR 650.113 will be made in the Final EIS and Record of Decision. The following discussion addresses and evaluates elements of 23 CFR 650.111 requirements.

NFIP mapping. WisDOT used NFIP mapping to identify floodplains in the study corridor, see Figure 3-39 and Figure 3-41. WisDOT used NFIP mapping to identify potential encroachments on floodplains. WisDOT reviewed NFIP maps to identify locations of potential floodplain encroachments of all the build alternatives.

Evaluation of the practicability of alternatives to longitudinal encroachments. All the build alternatives are proposed in the existing Interstate corridor where floodplain encroachments are unavoidable. Of floodplain crossings in the study corridor, all the Interstate and interchange build alternatives would result in a similar longitudinal floodplain encroachment where the Baraboo River and Wisconsin River converge in the vicinity of I-39 north of the I-39 I-90/94 Split interchange, and along I-90/94 west of the split interchange, see Figure 3-41 and Appendix A (in Columbia County). In this location, previous flood events required closing or partially closing both Interstate highways. WisDOT considered four flood minimization options for I-39/90/94 to reduce flood risks and increase resiliency to flood events on the Interstate. Three of the four options encroach on the floodplain and impact the 100-year flood elevations. Flood Minimization Option A would not increase the regulatory 100-year flood elevation and avoid a longitudinal floodplain encroachment but would cause downstream flood impacts at 23 residences and 7 businesses.

The remaining flood minimization options (C options) would cause a longitudinal encroachment in the Baraboo River and Wisconsin River floodplains. The C options result in varying levels of increased regulatory flood elevations, depending on the number of and location of additional bridges, see Table 3-46. Options C2 and C3 are less costly compared to Option A but still increase the flood elevation at properties downstream of I-39. Options C2 and C3 also result in some properties experiencing flooding during lower flow events, that they currently do not experience. Option C4 would raise the regulatory flood elevation, similar to Options C2 and C3, but creates little downstream flood elevation increase, see Flood Minimization Options. The wider Baraboo River crossing

under Option C4 would allow adequate room to pass the base flood discharge without damaging the roadway, bridges, or disrupting traffic operations on I-39 or I-90/94.

The No Build alternative would avoid encroachment on the floodplain in this area but would not reduce the risk of potential future flooding on the Interstate, which adversely impacts study corridor resiliency.

Discussion of risk or environmental impact for all alternatives containing encroachments and for those actions which would support base floodplain development. In addition to the longitudinal encroachment discussed above, all the build alternatives include similar floodplain filling encroachments in other portions of the study corridor, see Table 3-49. The encroachments are unavoidable as all the build alternatives reconstruct existing crossings in a similar manner.

Risks associated with implementation of the build alternatives. Unavoidable floodplain encroachments of the build alternatives present similar risks, including filling that could increase the base flood elevation, which would impact structures and emergency vehicle access, reduce the natural and beneficial values of floodplain functions and encourage incompatible floodplain development, see also Section 3.13.2 and Section 3.13.3 that discuss impacts of flood minimization options and floodplain filling impacts, respectively. As noted in Section 3.13.2, the flood minimization options vary in their impact to the base flood elevation at upstream and downstream properties. All of the build alternatives are similar in that they avoid and reduce the risk of interruption or termination of access for emergency vehicles or evacuation routes. The flood minimization options included in all the build alternatives would raise I-39 and I-90/94 out of the 100-year flood elevation to avoid and minimize interrupting public or emergency vehicle access and damage to the roadway or structures during flood events.

Impacts on natural and beneficial floodplain values. Floodplain filling reduces floodplain functions that support the ecological health of watersheds, including flood storage, water quality maintenance, groundwater recharge, and providing wildlife habitat. All the build alternatives include flood minimization options and floodplain crossings throughout the study corridor that would fill floodplains for Interstate widening and interchange construction.

Support of probable incompatible floodplain development. The build alternatives would be consistent with local floodplain management goals and objectives, which include maintaining the natural and beneficial floodplain values on local public lands and avoiding support of incompatible floodplain development. The flood minimization options in the Baraboo River and Wisconsin River floodplains, which have varying impacts on the base flood elevation, does not encourage incompatible development. A large portion of impacted property is within public lands dedicated to habitat preservation. Impacted private properties would remain within the 100-year floodplain, where land use is locally regulated. The build alternatives at other floodplain crossings do not support development in floodplains, as local communities and counties have floodplain management regulations in place to prevent inappropriate development.

Measures to minimize floodplain impacts associated with the build alternatives. The flood minimization options vary in their impacts to the base flood elevation upstream and downstream of I-39. Of the options, Option C4 balances the impact of increased upstream base flood elevation impacts, while minimizing increased elevations downstream of I-39. Option C4 increases base flood elevations by more than 0.01 foot primarily on WDNR and USFWS wildlife refuge property where wetland habitats are present and managed for wildlife habitat. The change in base flood elevation is anticipated to have little impact on wetland type and function. The duration of impact is likely to persist only for a portion of the total flood duration. Impacts are also anticipated on private properties and WisDOT will mitigate unavoidable impacts to insurable structures in the regulatory floodplain with either relocation or floodproofing structures. WisDOT will mitigate impacts of flood elevation rises under the 2D model through the buying of easements to the limits of allowable under Wis. Stat. s. 86.255.

In other locations where the build alternatives encroach on floodplains, WisDOT would minimize impacts by widening the Interstate to the inside and steepening side slopes where practicable and crossing structures designed consistent with WDNR Floodplain Management criteria established in Wis. Admin. Code NR 116.

Measures to restore and preserve the natural and beneficial floodplain values impacted by the build alternatives. The flood minimization options would preserve the natural and beneficial floodplain values in the Baraboo River and Wisconsin River floodplains. The longer I-39 bridge over the Baraboo River would span part of the floodplain, allowing for some of the natural, beneficial channel processes to remain. Some unavoidable floodplain impacts will be mitigated as part of wetland mitigation measures noted in Section 3.12.3. Additional mitigation includes reconstructing streams with trapezoidal bottoms to improve drainage and slow water flow to allow sediment settling, revegetating disturbed stream beds and banks with salvaged topsoil to maintain the hydric qualities of the original soils.

Evaluation and discussion of the practicability of alternatives to any significant encroachments or any support of incompatible floodplain development. WisDOT considered alternatives to significant floodplain encroachment associated with the preferred alternative, as well as the build alternatives recommended for further study. Early in the study, WisDOT evaluated and dismissed a new alignment alternative that would avoid floodplain impacts. A new alignment alternative would not meet the purpose and need for study corridor, and it would have comparatively higher impacts associated with the acquisition of property along the new road corridor and disturbance of natural resources. As described earlier, WisDOT also considered Flood Minimization Option A which would construct I-39 on a causeway. Option A would not increase the regulatory 100-year flood elevation and avoid a floodplain encroachment, but it would cause downstream flood impacts at 23 residences and 7 businesses. WisDOT dismissed Option A from further consideration due to downstream property impacts. The remaining flood minimization options WisDOT evaluated would avoid and reduce flood risk and damage to the Interstate and increase flood resiliency by raising it out of the base flood elevation.

The options C2, C3 and C4 cause unavoidable encroachments into the Baraboo River and Wisconsin River floodplains which would raise the base flood elevation upstream. The recommended C4 option avoids and minimizes impacts to downstream properties. The base flood elevation increase, which occurs in the 100-year floodplain, would not support incompatible floodplain development, which is regulated by local zoning codes on private properties and land use management policies on the publicly owned Baraboo River Waterfowl Production Area and Pine Island State Wildlife Area. The remaining floodplain encroachments in the study corridor are associated with widening and reconstructing existing infrastructure and are similar under all build alternatives, see Table 3-49. These encroachments are unavoidable and will be further minimized during final design and in coordination with WDNR as part of the WisDOT/WDNR Cooperative Agreement. The No Build alternative would avoid floodplain encroachments but would not respond to the study corridor purpose and need to address traffic demands, safety issues, aging and outdated infrastructure and corridor resiliency. The No Build alternative is not a practicable alternative to encroachment on floodplains in the study corridor. Of the flood minimization options, Option A would not encroach on floodplains, but would cause substantial downstream flooding on residential and business properties.

Under Option C4, the extent of the increases and decreases in surface water elevation would be very similar to Option C2. The 100-year flood increase would occur mostly on WDNR- and USFWS-owned land upstream of I-39 and creates little downstream flood elevation increase and avoids private residences. Option C4 and C3 have nearly identical BCA ratios. Option C3 increases the flood elevation to at least 24 properties east of I-39 during more frequent storms. WisDOT recommends implementing Option C4 as part of the build alternatives for the I-39/90/94 Corridor Study.

Agency coordination. Table 3-48 summarizes coordination with local, state and federal water resources and floodplain management agencies. Increases in regulatory floodplain elevations are permissible when coordinated with WDNR following procedures defined in the Feb. 11, 1988 Cooperative Agreement Implementation Memo of the DOT/DNR Cooperative Agreement, Section VII – Waterway Crossings and Other Floodplain Encroachments (March 1987).

3.14.Groundwater and Water Supply

3.14.1. Affected Environment

Within the study corridor, drinking water is supplied via private wells and public utilities. The following municipalities have wellhead protection plans in place near the study corridor: the cities of Madison, Sun Prairie, Portage and Wisconsin Dells, as well as the villages of Windsor and Lake Delton. A wellhead protection area for the city of Wisconsin Dells is east of the WIS 13 Interchange. [54] Wellhead protection areas for wells in the city of Madison and village of DeForest intersect the study corridor near Cottage Grove Road and WIS 19, respectively. Both wells are also located within 1,200 feet of existing Interstate right of way. Nitrate is Wisconsin's most widespread groundwater contaminant and levels are increasing. About 90% of nitrate in groundwater is from agriculture, mostly manure and fertilizer.[55] There are no sole source aquifers along the study corridor.[56]

3.14.2. Groundwater and Water Supply Impacts

No Build Alternative

The No Build alternative would not change existing groundwater conditions or drinking water supplies.

Build Alternatives

Groundwater quality impacts can occur due to stormwater runoff from highways. Runoff pollution is rainwater or melting snow that washes off roads, bridges and other impermeable surfaces. As it flows over these surfaces, the water picks up contaminants that can infiltrate surface aquifers and have the potential to affect groundwater quality. Stormwater, and the impacts to water resources, are discussed further in Section 3.11.

The build alternatives have the same impacts and are not expected to adversely affect the drinking water supply or localized groundwater at or near the surface. The build alternatives direct stormwater to storm sewers, urban stormwater detention structures and ditches along the Interstate to help avoid and minimize impacts to wells and groundwater. Since sizeable dewatering or depressurizing activities are not anticipated during construction, temporary impacts on the groundwater system are not expected or would be minimal and in isolated locations

[54] *NR 811 defines a wellhead protection area as "...that portion of the recharge area equivalent to a 5-year time of travel to the well." There are also setback distances to potential contamination sources. The only potential contamination source related to a transportation facility that has a setback distance in NR 811 is salt storage. The setback is 1,200 ft.*

[55] *Wisconsin Department of Natural Resources Groundwater Coordinating Council. Groundwater Quality GCC Report to the Legislature. 2023.*

[56] *Sole Source Aquifers (arcgis.com). Accessed March 27, 2024.*

such as creeks, stream beds and other low-lying areas. No degradation of water quality entering the shallow aquifer is expected.

3.14.3. Measures to Minimize and Mitigate Adverse Groundwater Impacts

For the build alternatives, WisDOT would implement stormwater best management practices, which are discussed in Section 3.11.3.

WisDOT will relocate the salt storage shed within the I-94/WIS 30 Interchange in compliance with NR 811, see Section 3.4. WisDOT takes several measures to mitigate the potential for road salt to impact groundwater. WisDOT salt storage sites must have an impermeable base and cover, as well as a holding basin to contain runoff. These requirements help minimize the impact to groundwater from storage facilities. WisDOT sets guidelines, for contracted local municipalities, conducting salt applications as a means to control application rates. Municipalities are also required to report the type and amount of deicer used for each application.

3.15.Threatened and Endangered Species

WisDOT has consulted with USFWS and WDNR to identify federally listed and state listed threatened and endangered species that may be present within the study corridor. Additional details about agency coordination and public involvement are provided in Section 5.

3.15.1. Affected Environment

To evaluate federal, state and other protected species, the following surveys were completed:

- Habitat assessments to identify suitable habitat for the threatened and endangered species known to be potentially found within the area of impact[57]
- Mussel survey for I-90/94 bridge crossings of the Baraboo River, Columbia County, Wisc.[58]
- Rare plant presence/absence surveys for federally listed plant species[59]
- Bat presence/absence surveys[60]

WisDOT also completed a biological assessment of federally listed species, the findings of which are summarized in this section.

[57] *GEI Consultants, Inc. – Threatened and Endangered Species Report: Interstate Highway 39 WisDOT Project ID: 1015-05-00. 2023.*

[58] *Kitchel, L., & Weinzinger, J. Wisconsin Department of Natural Resources Natural Heritage Conservation. Mussel Survey for I-90/04 bridge crossings of the Baraboo River, Columbia Co, WI. In Project number: WIS DOT 1014-00-39 – I90/94 Baraboo River Bridges. 2021.*

[59] *GEI Consultants, Inc. Rare Species Report Interstate Highway 39/90/94, Intersection with USH 12/18 to Intersection with Dees Road WisDOT Project ID: 1015-05-00 Dane, Columbia, Sauk, and Juneau Counties, Wisconsin. Dec. 11, 2023.*

[60] *GEI Consultants, Inc. I-39/90/94 2023 Bat Survey Tech Memo 1015-05-00 Sauk, Juneau, Columbia, and Dane County, Wisconsin GEI Project No. 2210696. Dec. 11, 2023.*

Federally Listed Species

The official species list of federally protected species was generated using USFWS's Information for Planning and Consultation (IPaC) tool on Feb. 29, 2024. The IPaC database review identified 13 species in the official species list, which included three mammals, one bird, three insects, three mussels, one reptile and two flowering plants that are known or expected to be near the study corridor, see Table 3-50.

No federally designated critical habitats were identified within the study corridor. Suitable habitat for a species may exist beyond what is designated as critical habitat. Potentially suitable habitat was found within the study corridor for several federally listed species. Descriptions of suitable habitat are included in Table 3-50 under habitat preferences.

Table 3-50: Federally Listed Species

Group Name	Species Common Name	Species Scientific Name	Federal Status	Habitat Preferences	Species Presence within Study Corridor
Mammal	Gray wolf	*Canis lupus*	Endangered	Forested habitats and grasslands with minimal habitat fragmentation.	Assumed present
Mammal	Tricolored bat	*Perimyotis subflavus*	Proposed Endangered	Variety of forested habitats and artificial roosts in summer. Hibernates in caves or mines in winter. Potentially suitable habitat exists within the study corridor.	Assumed present
Mammal	Northern long-eared bat	*Myotis septentrionalis*	Endangered	Variety of forested habitats in summer. Hibernates in caves or mines in winter. Potentially suitable habitat exists within the study corridor.	Assumed present
Bird	Whooping crane	*Grus americana*	Experimental Population, Non-Essential	Wisconsin's non-essential population is not necessary for the continued existence of the species. No nesting or stopover habitat occurs within the study corridor.	Assumed present
Reptile	Eastern massasauga	*Sistrurus catenatus*	Threatened	Floodplain forest, prairie, marshes, sand barrens, thickets, fen and grasslands. Potentially suitable habitat exists within the study corridor.	Assumed present

Group Name	Species Common Name	Species Scientific Name	Federal Status	Habitat Preferences	Species Presence within Study Corridor
Mussel	Higgins eye	*Lampsilis higginsii*	Endangered	Large river systems in Wisconsin with good water quality. Potentially suitable habitat was surveyed by WDNR. WDNR did not confirm presence.	Assumed not present
Mussel	Sheepnose	*Plethobasus cyphyus*	Endangered	Large river systems in Wisconsin with good water quality. Potentially suitable habitat was surveyed by WDNR. WDNR did not confirm presence.	Assumed not present
Mussel	Salamander mussel	*Simpsonaias ambigua*	Proposed Endangered	Rivers, streams, creeks or lakes with varying substrate types such as bedrock, sand, gravel or mud.	Assumed present
Insect	Karner blue butterfly	*Lycaeides melissa samuelis*	Endangered	Sandy soils of oak savannas, sand and brush prairies, lakeshore dunes, oak barrens and pine barrens where wild blue lupin grows. Can also be found in areas that are maintained in an open early successional stage (such as roadsidesand utility rights-of-way). Potentially suitable habitat exists within the study corridor.	Assumed present
Insect	Monarch butterfly	*Danaus plexippus*	Candidate	In the spring/summer, requires a diversity of blooming nectar resources and abundant milkweed for larval consumption and adult feeding. Typically found in open fields, meadows, transportation rights of way and field edges. Potentially suitable habitat exists within the study corridor.	Assumed present
Insect	Rusty patched bumble bee (RPBB)	*Bombus affinis*	Endangered	Relies on diverse and abundant flowering plant species in proximity to suitable overwintering sites such as sandy soils or woodlands but does not include wetlands. Segments of the study corridor are located within a USFWS-designated High Potential Zone for the RPBB.	Assumed present

Group Name	Species Common Name	Species Scientific Name	Federal Status	Habitat Preferences	Species Presence within Study Corridor
Flowering Plant	Eastern prairie fringed orchid	*Platanthera leucophaea*	Threatened	Mesic prairie to wetlands, such as sedge meadows, marsh edges and bogs. Potentially suitable habitat exists within the study corridor. Habitat was surveyed. No individuals were found.	Assumed present
Flowering Plant	Prairie bush-clover	*Lespedeza leptostachya*	Threatened	This plant is found in gravelly or sandy hillside prairies. Potentially suitable habitat exists within the study corridor. Habitat was surveyed. No individuals were found.	Assumed present

GEI Consultants. 2024.

Bats

Presence/absence surveys for the federally endangered northern long-eared bat and proposed endangered tricolored bat were completed for 88 bridges and 45 culverts in summer 2023.[61] Bat guano was observed at three bridges: the Mirror Lake Bridge, the 63rd Street bridge in Juneau County and the I-90/94 bridge over the CPR tracks, just north of US 12/16. While evidence of bats was found, no individual bats were present.

The WDNR Natural Heritage Inventory (NHI) database was reviewed for known occurrences of federally listed bat species and there is one active roost within 0.25 miles of the study corridor in Sauk County. The WDNR has indicated there are no known northern long-eared bat maternity roost trees within 150 feet of the study corridor or known hibernacula within 0.25 miles.

Mussels

The WDNR completed a mussel survey in September 2021, at the I–90/94 bridge crossings eastbound and westbound of the Baraboo River. No state or federally listed mussels were encountered during the survey.[62] No other potentially suitable habitat was identified for sheepnose or Higgins eye mussels. Potentially suitable habitat for the salamander mussel may exist within the study corridor at Mirror Lake (Dell Creek); however, no in-water impacts below the ordinary high water mark are anticipated at this time. Further information is included within the Biological Assessment.[63]

[61] *See note 60 above*

[62] *Wisconsin Department of Natural Resources Natural Heritage Conservation. Kitchel & Weinzinger. Mussel Survey for I-90/04 bridge crossings of the Baraboo River, Columbia Co, WI. Project number: WIS DOT 1014-00-39 – I90/94 Baraboo River Bridges. 2021.*

[63] *GEI Consultants. Biological Assessment, I-39/90/94, Wisconsin Dells to Madison (WisDOT Project 1015-05-00). April 30, 2024.*

Plants

Presence/absence surveys were conducted in summer 2023 for eastern prairie fringed orchid and prairie bush-clover within areas of potentially suitable habitat throughout the study corridor. No individual plant species were observed during surveys of suitable habitats. However, suitable habitat was observed for both species during the survey effort.[64]

State Listed Species

The WDNR generated an updated list of State Threatened and Endangered species from the NHI June 2024. The study corridor is near known occurrences of 36 state listed threatened and endangered species listed below:

- Ten plants
- Two insects
- Nine birds
- Six herptiles
- One fish
- Three mammals
- Five mollusks

The NHI review also identified 23 natural communities known to occur along the study corridor. Natural communities are described in Section 3.16.

Field surveys were completed in June and July of 2022 to assess areas of potential habitat for state listed species. Areas that were determined to be potentially suitable habitat along the study corridor were mapped. Nineteen habitat types considered to be moderately or significantly associated with state listed species were present along the study corridor.[65]

Other Protected Species

The Migratory Bird Treaty Act of 1918 (MBTA) states that unless permitted by regulation, it is unlawful to kill or capture migratory birds or destroy their eggs and nests. The law protects birds that commonly nest under bridges, including barn swallows. It is very likely migratory birds use bridges and other structures in the study corridor. It is permissible to use exclusion netting to prohibit nesting and to remove nests without eggs.

In addition to the MBTA, bald and golden eagles are afforded protection under the Bald and Golden Eagle Protection Act of 1940. The act prohibits the taking of bald and golden eagles. This includes removing an active nest or disturbing an adult bird so that it abandons the nest, causing the eggs or young to die. The WDNR NHI database indicated one bald eagle nest near the study corridor (330 to 660 feet). Further information is included within the Biological Assessment.[66]

---

[64] *See note 59 above*

[65] *See note 57 above*

[66] *See note 63 above*

Critical Habitat Areas

Critical habitat includes specific geographic areas that contain physical or biological features that are essential to the conservation of a listed species and may require special management or protection. Not all listed species or species proposed to be listed have designated critical habitat. No current federally designated critical habitat areas are present along the study corridor.

Additional areas of habitat located along the study corridor consist of county, state and federally managed properties. These designated natural areas, fisheries management tracts and state and county parks contain potential suitable habitat for federal and state listed species and are discussed in further detail in Section 3.16.

3.15.2. Threatened and Endangered Species Impacts

This section describes the potential impacts to threatened and endangered species under the No Build and build alternatives.

No Build Alternative

The No Build alternative would not impact threatened or endangered species.

Build Alternatives

FHWA and WisDOT made determinations of effects for federally listed species based on all the build alternatives and are summarized below in Table 3-51. Additional information about the effect determinations is available in the Biological Assessment.[67]

Construction sequencing and implementation of nesting exclusion measures will make it unlikely that any bird species protected under the MBTA would be adversely affected by the build alternatives.

Impacts to state listed species may occur where the build alternatives overlap with suitable species' habitat and will be evaluated in accordance with WDNR guidance once field surveys are conducted during final design and prior to construction. Location specific impacts to state listed species will be determined through consultation with the WDNR.

Table 3-51: Federally Threatened and Endangered Species Effect Determinations

Type	Species Common Name	Federal Status	Effect Determination
Mammal	Gray wolf	Endangered	May affect, but is not likely to adversely affect
Mammal	Northern long-eared bat	Endangered	May affect and is likely to adversely affect
Mammal	Tricolored bat	Proposed endangered	Not likely to jeopardize the continued existence of the species – provisional effect determination: May affect and is likely to adversely affect

[67] *See note 63 above*

Type	Species Common Name	Federal Status	Effect Determination
Bird	Whooping crane	Experimental population, non-essential	Not likely to jeopardize the continued existence of the species
Reptile	Eastern massasauga rattlesnake	Threatened	May affect and is likely to adversely affect
Invertebrate	Higgins eye	Endangered	May affect, but is not likely to adversely affect
Invertebrate	Sheepnose mussel	Endangered	May affect, but is not likely to adversely affect
Invertebrate	Salamander mussel	Proposed endangered	Not likely to jeopardize the continued existence of the species – provisional effect determination: May affect but is not likely to adversely affect
Insect	Karner blue butterfly	Endangered	May affect and is likely to adversely affect
Insect	Monarch butterfly	Candidate	Not likely to jeopardize the continued existence of the species
Insect	Rusty patched bumble bee	Endangered	May affect and is likely to adversely affect
Plant	Eastern prairie fringed orchid	Threatened	May effect, but is not likely to adversely affect
Plant	Prairie bush-clover	Threatened	May effect, but is not likely to adversely affect

Source: GEI Consultants. 2024

3.15.3. Measures to Minimize and Mitigate Adverse Threatened and Endangered Species Impacts

Build alternatives were designed to stay within the existing right of way as much as possible to minimize impacts on potential threatened and endangered species and their habitats along the study corridor. WisDOT proposes avoidance and minimization measures (AMMs), where applicable. The final commitments for avoidance and mitigation measures will be included in final design plans and specifications.

Bats

AMMs for northern long-eared bat and tricolored bat will be consistent with the measures described in the FHWA, FRA, FTA Programmatic Biological Opinion (PBO) for Transportation Projects in the Range of the Indiana Bat and Northern Long-eared Bat. Although USFWS has not released conservation measures for tricolored bat at this time, the NLEB AMMs should be protective for the tricolored bat. These AMMs are as follows.

- General AMM 1: Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.
- Lighting AMM 1. Direct temporary lighting away from suitable habitat during the active season.
- Lighting AMM 2. When installing new or replacing existing permanent lights, use downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting); or for those transportation agencies using the BUG (Backlight, Uplight, and Glare) system developed by the Illuminating Engineering Society the goal is to be as close to 0 for all three ratings with a priority of "uplight" of 0 and "backlight" as low as practicable.

- Tree Removal AMM 1. Modify all phases/aspects of the build alternatives (e.g., temporary work areas, alignments) to the extent practicable to avoid tree removal in excess of what is required to implement the build alternatives safely.
- Tree Removal AMM 2. Apply time of year restrictions for tree removal (when bats are not likely to be present). Tree cutting avoidance periods will occur during the NLEB breeding/ active season from April 1 through October 31.
- Tree Removal AMM 3. Ensure tree removal is limited to that specified in build alternative plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits).

Mussels

AMMs for the Higgin's eye, sheepnose and salamander mussels are as follows:

- Erosion and sediment control best management practices during construction will be used to minimize impacts per WisDOT, WDNR and Chapter Trans 401 of the Wis Admin. Code. Erosion control measures must adhere to the Wisconsin Pollutant Discharge Elimination System TCGP.
- Erosion control strategies that may be used to minimize adverse effects during construction include upslope tracking on all slopes longer than 40 feet, application of soil stabilizer for temporary conditions, erosion mat placement, appropriately sized riprap for steeper slopes, ditches and completion of restoration/revegetation in a timely manner.
- If necessary, in-stream or river sediment traps and/or turbidity curtains will be used to control erosion and sedimentation within waterways during construction. Authorization (permits) from the appropriate regulatory authorities will be obtained.
- Storing of fuels and fueling of construction equipment will be done in upland areas, away from environmentally sensitive locations. Accidental spills during refueling at construction sites or resulting from accidents involving hazardous material haulers will be handled in accordance with local government response procedures. First response will be through local fire departments and emergency service personnel to ensure public safety and to contain immediate threats to the environment. Depending on the nature and/or size of the spill, WDNR may be notified to provide additional instructions regarding cleanup procedures and restoration of any affected resources.
- Install permanent stormwater facilities to treat road runoff according to Wis. Admin. Code Chapter NR 151. Under this statue redevelopment projects are required to remove 40% of TSS and the new development at the new interchanges are required to remove 80% of TSS compared to no runoff management controls.

Flowering Plants

WisDOT will implement the following AMM to address the eastern prairie fringed orchid and prairie bush-clover: .

- Implement best management practices to minimize the spread of invasive species, including the inspection and cleaning of equipment/vehicles for invasive plant materials and seeds before entering suitable habitat areas.

Birds

AMMs for bird species protected under the MBTA include:

- Removal of trees which are likely to support active nests will be completed between November 1 and March 31, which avoids the nesting season (April 15 through August 31).
- As the Project is expected to span four construction seasons, bridge demolition will occur outside of the nesting season, or physical deterrents such as netting may be installed to deter migratory birds from nesting on existing I-39/90/94 bridges. If physical deterrents are determined to not be prudent or reasonable, and/or bridge demolition cannot be completed outside of the nesting season, a migratory bird depredation permit will be obtained as a last resort.

USFWS guidance recommends an Incidental Take permit for all construction activities conducted within the breeding season and located within 330 to 660 feet of a bald eagle nest, except for if similar activities have been conducted within 660 feet and eagles are tolerant of past disturbances.[68] The WDNR NHI database indicated one bald eagle nest near the study corridor (within 330 to 660 feet). Construction activity is anticipated to be visible from the nest location and proposed activities will not be able to avoid the entire bald eagle nesting season (December – August). However, the close proximity of the eagle nest to the existing study corridor indicates that the eagles are tolerant of high-traffic interstate disturbances and would likely be tolerant of the proposed disturbances. WisDOT is consulting with USFWS and will determine if an Incidental Take Permit would be required prior to construction. If additional bald eagle nests are identified in the study corridor, WisDOT will notify USFWS and follow "Bald Eagle Management Guidelines and Conservation Measures" located online at https://www.fws.gov/media/national-bald-eagle-management-guidelines.

Insects

AMMs are proposed during all phases of the build alternatives' development including vegetation management, active construction and maintenance activities.

Karner Blue Butterfly

AMMs for Karner blue butterfly are as follows:

- In final design, areas of suitable habitat within the species' range will be surveyed for native wild blue lupine using the monitoring protocols outlined in the WDNR's Karner Blue butterfly Habitat Conservation Plan User Guide[69] (WDNR, 2010). Surveys will be repeated if they are more than five years old at the time of construction.
- In final design, areas determined to contain native wild blue lupine at a sufficient density to support Karner blue butterflies will be surveyed for adult Karner blue butterflies following the WDNR monitoring protocols (WDNR, 2010). Surveys will be repeated if they are more than five years old at the time of construction.
- Where Karner blue butterfly is confirmed to be present, disturbance and vegetation clearing will be minimized to the extent practical .
- Seed mixes containing a diversity of native flowering plants, including native wild blue lupine, will be used to re-seed existing suitable habitat areas that require re-vegetation/restoration.

---

[68] *U.S. Fish & Wildlife Service. Do I need an eagle take permit? https://www.fws.gov/story/do-i-need-eagle-take-permit#:~:text=When%20is%20a%20permit,permit%20may%20not%20be%20recommended. Accessed April 2024.*

[69] *Karner Blue Butterfly NCP Partners in Protection. Karner Blue Butterfly HCP Management Guideline. Construction, Maintenance, Repair and Management Guideline (aka Construction Guideline). Revision: 01. May 7, 2010.*

- The use of BMPs during construction and vegetation management activities to prevent the spread of invasive species will help to maintain greater plant diversity along the study corridor.

Rusty Patched Bumble Bee

AMMs for RPBB are as follows:

- In final design, areas within HPZs may be further evaluated using the Rusty Patched Bumble Bee Habitat: Assessment Form & Guide or another comparable habitat evaluation method to better define habitat quality and/or refine the extent of project impacts.[70]
- In areas with medium to high quality RPBB suitable habitat within HPZs, temporary and permanent impacts will be minimized to the extent practical.
- In areas with medium to high quality RPBB nesting and overwintering habitat within HPZs, ground disturbance will be minimized or avoided when RPBB may be present, when practical (i.e., during inactive season in overwintering habitat or during active season in nesting habitat).
- In areas of medium to high quality RPBB nesting habitat within HPZs, habitat may be made unsuitable for RPBB nesting prior to the start of the active season through stripping of vegetation/topsoil and/or frequently mowing of vegetation, when practical.
- In areas of medium to high quality RPBB overwintering habitat, hand tools (depending on clearing area size/ location) and felling (cutting but not removing trees) will be utilized for tree clearing when practical for work conducted during the winter.
- Seed mixes containing a diversity of native flowering plants will be used to re-seed existing suitable habitat areas that require re-vegetation/restoration within HPZs.
- The use of BMPs during construction and vegetation management activities to prevent the spread of invasive species will help to maintain greater plant diversity along the Project corridor.

Reptiles

AMMs for the eastern massasauga rattlesnake include:

- Implement best management practices to minimize the spread of invasive species, including the inspection and cleaning of equipment/vehicles for invasive plant materials and seeds before entering eastern massasauga rattlesnake suitable habitat areas.
- Re-vegetate areas of suitable habitat with appropriate native species to ensure habitat is restored to condition that is equal to or better than current conditions.
- Install exclusionary silt fence with “J-turns” at silt fence ends adjacent to wetlands and open water areas in suitable habitat to exclude and redirect the rattlesnake from the work area. Exclusionary silt fence will be installed during the rattlesnake’s inactive season (mid-November through early April), prior to emergence from their overwintering habitats.
- Utilize wildlife safe erosion control products (ex. leno weave). The products will consist of materials that are 100% biodegradable and use a loose weave that allow animals to wiggle free. To minimize wildlife entanglement and plastic debris pollution, temporary erosion and sediment control products that either do not contain netting, or that contain netting manufactured from 100% biodegradable non-plastic materials such as jute, sisal, or coir fiber, will be used. Degradable, photodegradable, UV-degradable, oxo-degradable, or oxo-biodegradable plastic

[70] *Xerces Society for Invertebrate Conservation. Rusty Patched Bumble Bee Conservation Habitat. 2017.*

netting (including polypropylene, nylon, polyethylene, and polyester acceptable alternatives and will not be used. All netting materials used will have a wildlife-safe, loose-weave design with movable, non-welded joints between the horizontal and vertical twines, allowing the twines to move independently and thus reducing the potential for wildlife entanglement.

- Conduct preconstruction sweeps for the rattlesnake prior to vegetation or ground disturbance in suitable habitat areas during its active season (early April to mid-November). Sweeps will be conducted by a qualified and permitted biological monitor. If any eastern massasauga rattlesnakes are encountered, the biological monitor will attempt to capture and relocate them to adjacent suitable habitat outside of the work area.

Project personnel will be instructed to report any eastern massasauga rattlesnake observations during construction to the USFWS within 24 hours.

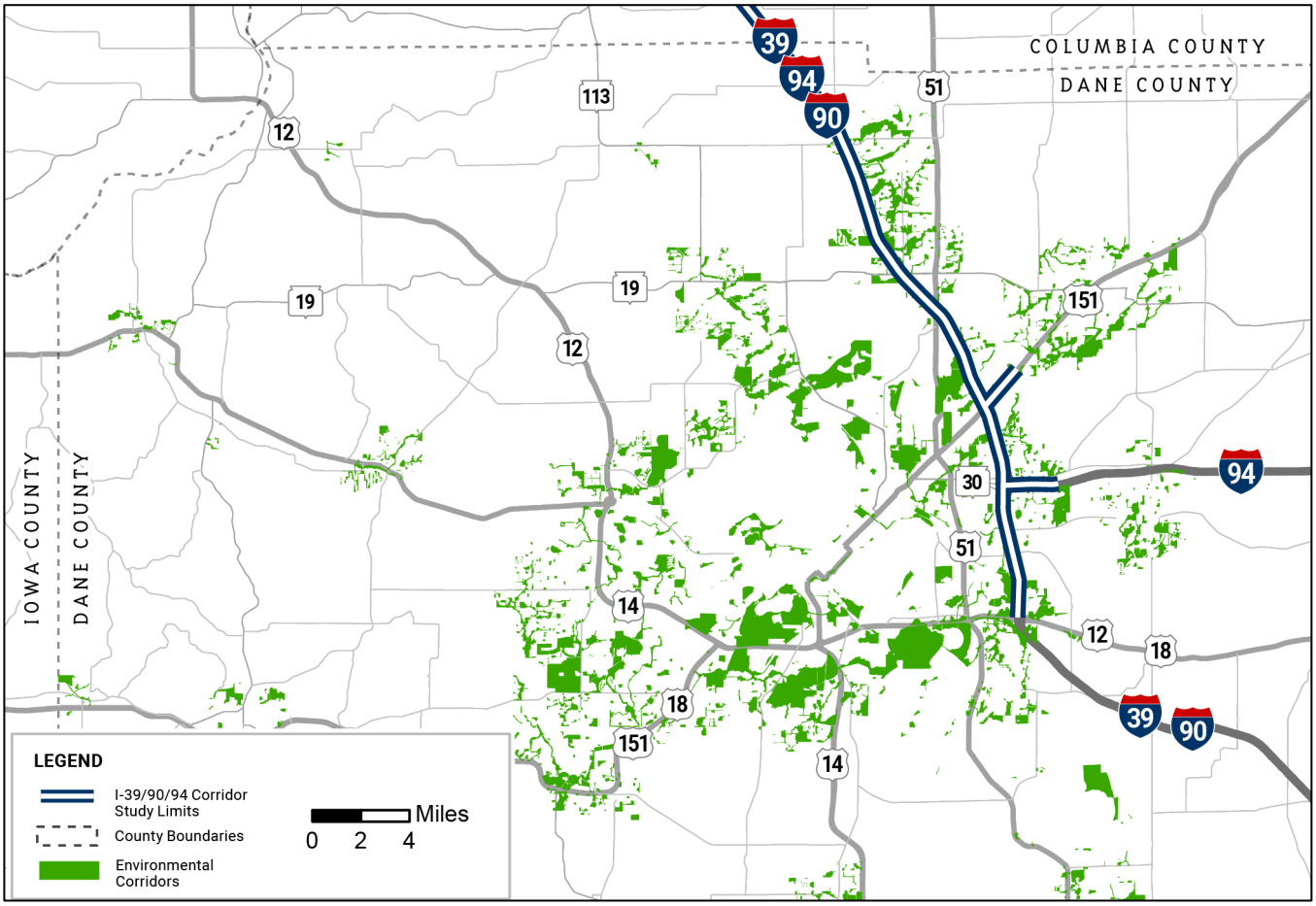
3.16.Other Natural Resources

3.16.1. Affected Environment

In addition to wetland and aquatic resources, other natural resources are next to the I-39/90/94 study corridor. The study corridor includes defined environmental corridors in Dane County. WisDOT also identified notable environmental resources and upland habitats. It is assumed all resources within the existing and proposed right of way would be disturbed, plus 20 feet for temporary disturbance during construction.

The Capital Area Regional Planning Commission (CARPC) identifies environmental corridors in Dane County, see Figure 3-42. The CARPC defines environmental corridors as continuous linear open space that include environmentally sensitive lands, natural resources requiring protection from disturbance and development and lands needed for open space and recreational use. Other identified primary uses include stormwater management. Several environmental corridors extend into existing roadway right of way. Local governments oversee activities in environmental corridors and coordinate with CARPC and WDNR regarding restrictions to protect surface and groundwater quality; reduce storm water runoff and flood impacts; protect sensitive natural resource areas and maintain important wildlife habitats or recreational areas.

Figure 3-42: Dane County Environmental Corridors



Source: Capital Area Regional Plan Commission. 2019.

Notable Environmental Resources

Notable environmental resources that intersect the I-39/90/94 study corridor are located in county, state and federally managed lands, see Table 3-52. These resources, which are noted on the maps in Appendix A, support biodiversity and recreational uses throughout the study corridor. Section 4 describes county, state and federally managed lands subject to Section 4(f) review.

USDA NRCS's national easement dataset was reviewed to determine whether any affected properties are located within conservation or wetland reserve programs. A portion of a wetland reserve program (WRP) easement was identified along the study corridor, primarily associated with the USFWS Baraboo River Waterfowl Production Area. See Section 3.6 for further discussion about WRP lands.

Table 3-52: Notable Environmental Resources

Property	County	Managing Agency	General Community Types Present
World Dairy Center Wetland Mitigation Bank	Dane	WisDOT	Wet-mesic prairie
Glacial Drumlin State Trail	Dane	WDNR	Prairie, woodlands
Token Creek County Park	Dane	Dane County	Coldwater stream, prairie, woodlands
Cherokee Marsh Wildlife Area/Cherokee Marsh Fishery Area	Dane	Multiple	Emergent marsh, oak savanna, hardwood forest, grassland, shrub-carr, sedge meadow
Rowan Creek Fishery Area	Columbia	WDNR	Emergent marsh, shrub-carr, floodplain forest, woodlands
Dekorra Public Hunting Grounds	Columbia	WDNR	Oak savanna, oak woodlands
Baraboo River Waterfowl Production Area and Baraboo River/Baraboo River Floodplain Forest State Natural Area	Columbia	USFWS	Floodplain forest
Pine Island State Wildlife Area/ Pine Island Savana State Natural Area	Columbia	WDNR	Floodplain forest, floodplain savannas, sand prairie
Mirror Lake State Park/Mirror Lake Pine Oak Forest State Natural Area	Sauk	WDNR	Dry-mesic forest, dry cliffs, shrub-carr, ephemeral pond
Hulburt Creek Fisheries Management area	Juneau/Sauk	WDNR	Coldwater stream, dry-mesic forest
Rocky Arbor State Park	Juneau/Sauk	WDNR	Dry cliffs, dry-mesic forest, oak woodlands

Source: Wisconsin Department of Natural Resources, Endangered Resources, Protecting Wisconsin's Biodiversity. https://dnr.wisconsin.gov/topic/endangeredresources/biodiversity . Accessed March 1, 2024.

Upland Habitat

Upland habitat within the study corridor includes dry mesic prairie, northern dry forest, northern dry-mesic forest, mesic prairie, oak opening, oak woodland, southern dry-mesic forest and southern mesic forest. Additional areas include woodlands and shrub thickets, fallow fields and fence lines.

Upland areas provide habitat for wildlife species commonly found in southern Wisconsin. Examples of common mammal species include white-tailed deer, opossums, squirrels, red foxes, raccoons, striped skunks and chipmunks. Examples of common bird species include American goldfinches, wild turkeys, sparrows, owls, warblers, hawks and vireos. There are also many common amphibians (frogs and salamanders) and reptiles (snakes, turtles and lizards).

The WDNR defines some forested and grassland upland community types in the study corridor as critically imperiled or imperiled in Wisconsin due to a restricted range, few populations or occurrences, steep declines,

severe threats, or other factors.[71] Although much of the land next to the Interstate is developed or farmed, there are undeveloped areas of upland habitat and larger public parks and natural areas.

Forested Upland Habitat

Forested upland habitat dominated by hardwood species are found in portions of the study corridor with concentrations occurring south of the County CS interchange, at the WIS 13 and US 12/WIS 16 interchanges and the northern study limits in Juneau County. Most of the wooded areas are comprised of plots of approximately 40 acres or less and are isolated from other wooded areas by agricultural fields. Oak woodland, a rare community type, is defined by WDNR as imperiled. This community is found in the northern part of the study corridor in Juneau, Columbia and Sauk counties. More specifically, it is located east of Pine Island State Wildlife Area and in Rocky Arbor State Park.

Grassland Upland Habitat

Grassland habitat in the study corridor can be classified as dry-mesic prairie, mesic prairie, surrogate grassland and oak opening. Dry-mesic prairie is a rare community and is found in the northern part of the study corridor in Juneau, Columbia and Sauk counties.

Oak opening is a rare community that the WDNR considers imperiled. An oak opening is an open savanna community dominated by white oak species with a heavy prairie component. Oak openings are found along Cascade Mountain Road north of the I-39 I-90/94 Split interchange and at the US 12/WIS 16 Interchange.

3.16.2. Other Natural Resource Impacts

No Build Alternative

The No Build alternative would not affect habitat or notable environmental resources.

Build Alternatives

All the build alternatives would impact upland habitat, including vegetation clearing, loss of habitat due to highway and interchange construction and bridge and culvert reconstruction throughout the study corridor. Temporary impacts may include impacts from additional vehicle traffic, lighting and noise during construction activities.

The preferred Modernization Plus Added General Purpose Lane alternative would impact about 88.7 acres in Dane County, while the Modernization Hybrid alternative impacts about 85.6 acres. These impacts include defined environmental corridors within existing right of way, such as at the US 151/High Crossing Boulevard, WIS 19 and County V interchanges where surrogate grassland is present. The preferred alternative for the new Hoepker Road interchange would permanently convert about 9 acres of environment corridor, and the preferred alternative for the new Milwaukee Street interchange would convert about 1.7 acres. The CARPC noted impacts at the Milwaukee Street Interchange would require adjusting Environmental Corridor mapping, see Appendix B. CARPC also noted similar adjustments may also be required at the US 151/High Crossing Boulevard and Hoepker Road interchanges.

[71] *Wisconsin Department of Natural Resources. Wisconsin Natural Heritage Inventory Working List. https://dnr.wisconsin.gov/topic/NHI/WList. Accessed Dec. 18, 2023.*

Estimated permanent upland habitat impacts within each county are presented in Table 3-53 through Table 3-56.[72] The build alternatives avoid or have minimal permanent or temporary construction impacts to notable resources in public parks and recreation areas, see Section 4. The build alternatives would not impact the World Dairy Center Wetland Mitigation Bank.

The primary impact associated with the loss of upland plant communities is the loss of wildlife habitat that serves as movement corridors and provides cover for breeding, foraging and resting. Other wildlife impacts caused by removing vegetation include interrupting the natural succession to mature communities, increasing the potential for soil erosion and reducing aesthetic value.

Impacts reported below are based on the preferred Modernization Plus Added General-Purpose Lane alternative and the preferred interchange alternatives. South of WIS 19 in Dane County, the Modernization Hybrid alternative would impact slightly less upland habitat by widening the road footprint a total of 12 feet (6 feet on either side), compared to 24 feet under the Modernization Plus Added General-Purpose Lane alternative. The impacts of the two alternatives are the same north of WIS 19.

There is less than a 1 acre difference between the preferred WIS 13 Interchange Trumpet alternative and the Split Diamond alternative in Sauk County. The County V Diamond alternative in Dane County would impact less than an acre of surrogate grassland within existing right of way compared to the County V No Build alternative, which would not impact upland habitat.

Table 3-53: Juneau County Estimated Preferred Alternatives Upland Habitat Impacts

Upland Habitat Impacts	Acres
Dry cliff	0.5
Northern dry forest	5.3
Northern dry mesic forest	4.6
Oak opening	1.3
Oak woodland	2.7
Southern mesic forest	0.1

Note: Impacts presented are based on preferred freeway modernization and interchange alternatives. The Modernization Hybrid alternative has the same impact as the Modernization Plus Added General-Purpose Lane alternative in Juneau County.

Table 3-54: Sauk County Estimated Preferred Alternatives Upland Habitat Impacts

Upland Habitat Impacts	Acres
Dry cliff	5.6
Dry mesic prairie	6.2
Northern dry forest	5.6

[72] *Wisconsin Department of Natural Resources, Endangered Resources, Protecting Wisconsin's Biodiversity. https://dnr.wisconsin.gov/topic/endangeredresources/biodiversity. Accessed March 1, 2024.*

Upland Habitat Impacts	Acres
Northern dry-mesic forest	9.7
Oak woodland	3.8
Southern dry-mesic forest	4.1
Southern mesic forest	4.7
Surrogate grassland	39.8

Note: Impacts presented are based on preferred freeway modernization and interchange alternatives. The Modernization Hybrid alternative has the same impact as the Modernization Plus Added General-Purpose Lane alternative in Sauk County.

Table 3-55: Columbia County Estimated Preferred Alternatives Upland Habitat Impacts

Upland Habitat Impacts	Acres
Dry mesic prairie	2.8
Mesic prairie	0.1
Oak opening	0.1
Oak woodland	6.1
Southern dry-mesic forest	0.1
Southern mesic forest	20.2
Surrogate grassland	23.3

Note: Impacts presented are based on preferred freeway modernization and interchange alternatives. The Modernization Hybrid alternative has the same impact as the Modernization Plus Added General-Purpose Lane alternative in Columbia County.

Table 3-56: Dane County Estimated Preferred Alternatives Upland Habitat Impacts

Upland Habitat Impacts	Acres
Southern dry-mesic forest	2.3
Southern mesic forest	1.3
Dry-mesic prairie	less than 0.1
Surrogate grassland	81.7

Note: Impacts presented are based on preferred freeway modernization and interchange alternatives. The Modernization Hybrid alternative would impact about 3 acres less surrogate grassland.

3.16.3. Measures to Minimize and Mitigate Adverse Natural Resource Impacts

Alternatives were designed to stay within existing right of way as much as possible to minimize the impact to natural areas and wildlife habitat along the study corridor. Reconstruction would primarily expand the Interstate to the inside in the existing median where practicable.

WisDOT will include design measures such as steepened slopes to further avoid and minimize impacts. Temporary construction impacts will be mitigated by replanting and reseeding disturbed areas with native species, including planting trees and reseeding native grass and flowering plants. Such measures will be determined in coordination with the WDNR during preliminary engineering. WisDOT will coordinate with CARPC to adjust Environmental Corridor maps where impacts are unavoidable. WisDOT will continue coordination with WDNR during design to identify where native seed mixes will be used to restore disturbed areas. Additional avoidance and minimization measures in public recreation areas and wildlife refuges are discussed in Section 4. Avoidance, minimization and mitigation measures for habitats where threatened and endangered species may be present are further discussed in Section 3.15.

3.17.Noise

3.17.1. Affected Environment

Noise is generally defined as unwanted sound. Airborne sound is what we hear when there are rapid fluctuations (or variations) in air pressure above and below atmospheric pressure. The ear is sensitive to these pressure variations and perceives them as sound. The intensity of these pressure variations causes the ear to discern different levels of loudness.

Sound pressure levels are measured and expressed in decibels (dB). The dB scale is logarithmic and expresses the ratio of the sound pressure level being measured to a standard reference level. Therefore, a 26% change in the energy level only changes the sound level 1 dB. The human ear would not detect this change except in a controlled environment. A doubling of the energy level would result in a 3-dB increase, which would be barely perceptible in the natural environment. A change of 10 times the energy level would result in a 10-dB change in the sound level. This would be perceived as a doubling (or halving) of the apparent loudness.

Because the human ear does not respond to all frequencies equally, weighting scales are used to define the relative loudness of different frequencies. The “A” weighting scale is widely used in environmental work because it closely resembles the non-linearity of human hearing. The A-weighted sound level in decibels is identified as dBA.

It is necessary to use a method of measure that will account for the time-varying nature of sound when studying environmental noise. The equivalent sound pressure level (L_{eq}) is defined as the continuous steady sound level that would have the same total A-weighted sound energy as the real fluctuating sound measured over a given period of time. As a result, the three characteristics of noise combine to form a single descriptor (L_{eq} in dBA) that is used to evaluate human response to noise. The time-period used to determine traffic noise levels is one hour and uses the descriptor $L_{eq(h)}$.

The traffic noise analysis was performed using the FHWA’s Traffic Noise Model Version 2.5 (TNM2.5).[73] TNM2.5 estimates vehicle noise emissions based on mean (average) noise emission levels for five classes of vehicles used for this analysis: automobiles, medium trucks (2-axle) and heavy trucks (3-axle or more), buses and motorcycles. TNM2.5 uses modeling objects called “receivers” where noise levels are predicted in the model. A receiver location is used to predict noise levels for noise-sensitive receptors and may represent multiple receptors. The

[73] *As noted in FHWA’s December 2023 Frequently Asked Questions Traffic Noise Model 3.2, TNM 3.2 is not required for use on federal-aid highway project noise analyses until FHWA updates the noise regulations at 23 CFR 772 (FHWA 2023).*

following parameters were used in FHWA's TNM2.5 model to calculate an hourly $L_{eq(h)}$ at specific receiver locations:

- Distance between roadway and receiver
- Relative elevations of roadway and receiver (all receivers are assumed to be 5 feet off the ground unless associated with an upper-level residential unit or other outdoor use)
- Hourly traffic volumes
- Vehicle speed
- Roadway grade
- Ground absorption
- Topographic features, including retaining walls and berms
- Noise source height of vehicles

Based on this input data, TNM2.5 uses its acoustic algorithms to predict noise levels at receiver locations by considering sound propagation divergence, intervening ground, barriers, building rows and topographic features. In accordance with the procedure in WisDOT's FDM Chapter 23*,* Noise (FDM 23), noise-sensitive receptors located within 500 feet of the edge of pavement of the build alternative were assessed for traffic noise impacts.[74] Noise levels produced by highway vehicles can be attributed to three major categories:

- Running gear and accessories (tires, drive train, fan and other auxiliary equipment)
- Engine (intake and exhaust noise, radiation from engine casing)
- Aerodynamic and body noise

Tires are the dominant noise source at speeds greater than 20 to 30 mph for automobiles and 50 mph for trucks.[75] Tire sound levels increase with vehicle speed but also depend upon road surface, vehicle weight, tread design and wear. Change in any of these can vary noise levels. At lower speeds, especially in trucks and buses, the dominant noise source is the engine and related accessories.

Noise-sensitive land use in the study corridor is described by geographic location below. In addition to review of aerial photography and performing site reconnaissance, information requests were initiated to municipalities along the study corridor to determine plans for future permitted or platted development.

WisDOT analyzed the study corridor as two geographic sections, see Section 1.1.2. The South Section is generally representative of the Madison metropolitan area and the North Section is generally representative of more rural areas.

South Section

Aerial photos and land use data of the study corridor were reviewed to select 2,886 representative noise receivers (S1 – S1717). The 2,886 representative receivers represent 3,861 total receptor units, including 3,777 single family and multi-family receptor units (Land Use Category B), 47 recreational outdoor use receptor units (Land Use

[74] *Wisconsin Department of Transportation. Facilities Development Manual Chapter 23 Noise Section 23-35-20.1. March 16, 2018.*

[75] *U.S. Department of Transportation Federal Highway Administration. Pavements. Sustainable Pavement Program. Tire-Pavement Noise. https://www.fhwa.dot.gov/pavement/sustainability/articles/tire_noise.cfm. Accessed March 28, 2024.*

Category C), two interior use receptor units (Land Use Category D), and 35 hotel, restaurant, or office receptor units (Land Use Category E).

Information requests were initiated to Columbia and Dane counties, the towns of Blooming Grove, Burke, Cottage Grove, Sun Prairie and Vienna, the villages of Arlington, Cottage Grove, DeForest and Windsor and the cities of Madison and Sun Prairie. GIS parcel data was also utilized to determine where new development had been approved along the corridor. Where available, permitted plans were used to determine receptor locations and dwelling unit information. Upon review of the information obtained, permitted noise-sensitive properties were identified in the city of Madison, including residential units at the Meadowlands, residential units at The Winston at Churchill, Home 2 Suites and Tru by Hilton, residential units at Signature Pointe Apartments, residential units at American Center Apartments and residential units at Pumpkin Hollow North. Review of city of Madison information also identified that Super 8 by Wyndham Madison East will be converted to residential units called Sandburg Studios.

North Section

Aerial photos and land use data of the entire study corridor were reviewed to select 512 representative noise receivers (N1 – N301). The 512 representative receivers represent 581 total receptor units, including 530 single family and multi-family receptor units (Land Use Category B), 44 recreational outdoor use receptor units (Land Use Category C), three interior use receptor units (Land Use Category D), and four hotel or restaurant receptor units (Land Use Category E).

Information requests were initiated to Columbia, Juneau and Sauk counties, the towns of Arlington, Caledonia, Dekorra, Delton, Fairfield and Lyndon, the village of Lake Delton and the cities of Portage and Wisconsin Dells. GIS parcel data was also utilized to determine where new development had been approved along the corridor. Where available, permitted plans were used to determine receptor locations and dwelling unit information. Upon review of the information obtained, permitted noise-sensitive properties were identified in the city of Wisconsin Dells, including residential units at Stoney Acres Apartments and an expansion at the Kalahari Resort.

3.17.2. Noise Level Measurements

Existing noise level measurements were conducted on Aug. 23 and Aug. 24, 2022 at 14 locations in the South Section and on Aug. 10, 2022 at 10 locations in the North Section. Four locations were field sites (FS) and 20 were used as model validation sites (VS). Measurements were taken with ANSI Type 1 integrating sound level meters for a duration of 20 minutes at each location. The measurements were made in accordance with WisDOT guidelines in FDM 23, Section 23-20.5.[76] Traffic counts were conducted concurrently with the noise measurements and classified by vehicle type: cars, medium trucks (two axle), heavy trucks (three or more axles), buses and motorcycles.

Table 3-57 describes each measurement location and lists the measured noise level. Existing measured noise levels ranged from 61 to 76 dBA in the South Section and 58 to 77 dBA in the North Section. The locations of the measurement sites are shown in Attachment A of Appendix G.

[76] *Wisconsin Department of Transportation Facilities Development Manual Chapter 23 Noise Section 23-20-5. July 28, 2011.*

Table 3-57: Measurement Site Descriptions and Measured Noise Levels

Monitoring Location Site	Site Description	Measured $L_{eq(h)}$ (dBA)
VS-1	Residential, The Point at Richmond Hills Apartments	73
VS-2	City of Madison Police Department- East District	73
VS-3	Single family residential at corner of Kurt Dr. and Thompson Dr.	63
VS-4	Residential, Harmony at Grandview Commons Apartments	67
VS-5	Parking lot of Steamfitters Local 601 near Town Center Park	67
FS-6	Residential, The Meadowlands Apartments at corner of Wyalusing Dr. and Milwaukee St.	61
VS-9	Single family residential at cul-de-sac of Tony Dr.	72
VS-10	Residential, Cherry Tree Crossings Apartments	74
FS-11	Residential, 22 Slate Apartments	63
FS-14	Bike path between Hoepker Rd. and Hanson Rd.	67
VS-15	Single family residential off Daentl Rd.	71
VS-17	DeForest Athletic Complex off River Rd.	73
VS-18	Grass area between Wibu Rd. and I-39/90/94 near single family residence, north of County DM	76
VS-19	Field north of single family residential off Prospect Dr.	66
VS-21	Grass area adjacent to single family residential on Sanderson Rd.	67
VS-22	Single family residential off St. Lawrence Bluff Rd.	68
VS-23	Grass area along I-39 northbound adjacent to single family residence on County U	77
VS-24	Cascade Mountain parking lot	75
VS-25	Natural Resources Department maintenance buildings of Pine Island State Wildlife Area	76
FS-26	Overflow parking lot of Kalahari Resort & Convention Center	58
VS-27	Ishnala Trail	65
VS-28	Open area along I-94 northbound adjacent to single family residential on Painters Ln.	75
VS-29	Spring Brook Golf Course	76
VS-30	Rocky Arbor State Park campsite	68

Note: The measurement sites do not appear numbered sequentially since several measurement sites are no longer located in the study corridor.

3.17.3. Comparison of Field Data vs Modeled Noise Levels

Comparing the modeled noise levels to the measured noise levels validates TNM2.5 for use on a specific project. The validation process compares the measured sound levels at each site to the noise levels calculated with TNM2.5 using the existing site geometry and traffic counts taken during each measurement as input to the model. The modeled data compared within 3 dBA of the measured levels, which satisfies the WisDOT requirement for

validating noise measurements. The site-by-site comparison for the model validation sites is presented in Table 3-58. The field sites were not used for model validation due to either proximity from the roadway or the presence of significant topography features that partially or fully shielded the roadway.

Table 3-58: Comparison of Measured and Modeled Noise Levels

Monitoring Location Site	Measured $L_{eq(h)}$ (dBA)	TNM2.5-Predicted $L_{eq(h)}$ (dBA)	Difference (dBA)
VS-1	73	70	-3
VS-2	73	74	1
VS-3	63	62	-1
VS-4	67	65	-2
VS-5	67	66	-1
VS-9	72	74	2
VS-10	74	76	2
VS-15	71	74	3
VS-17	73	72	-1
VS-18	76	75	-1
VS-19	66	68	2
VS-21	67	68	1
VS-22	68	71	3
VS-23	77	75	-2
VS-24	75	76	1
VS-25	76	75	-1
VS-27	65	66	0
VS-28	75	73	-2
VS-29	76	76	0
VS-30	68	68	0

3.17.4. Noise Impacts

The noise analysis presents the existing and future noise levels at various locations in the study corridor. The determination of noise abatement measures and locations is within the framework of FDM 23. FDM 23 is WisDOT's FHWA-approved interpretation of 23 CFR Part 772. Table 3-59 presents the WisDOT Noise Level Criteria (NLC) for considering noise barriers. The noise level descriptor used is the equivalent sound pressure level, $L_{eq(h)}$, defined as the continuous steady sound level, which in a stated period of time (usually one hour) contains the same sound energy as the actual time-varying sound.

Noise abatement measures will be considered when the predicted noise levels approach or exceed those values shown for the appropriate Land Use Category in Table 3-59, or when the predicted traffic noise levels substantially exceed the existing noise levels. WisDOT identifies a noise impact when predicted future noise levels exceed existing levels by 15 dB or more, or when future noise levels "approach" (defined as 1 dB less than the NLC) or exceed the NLC level for the applicable Land Use Category.

Table 3-59: Noise Level Criteria for Considering Barriers

Land Use Category	$L_{eq(h)}$[1] (dBA) (Evaluation Location)	Description of Land Use Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67 (Exterior)	Residential
C[2]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D[3]	52 (Interior)	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, schools and television studios.
E[2]	72 (Exterior)	Hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in A-D or F.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical) and warehousing.
G	--	Undeveloped lands that are not permitted.

Source: Wis. Admin. Code – Chapter Trans 405

[1] "L_{eq}" means the equivalent steady-state sound level, which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same period. For purposes of measuring or predicting noise levels, a receptor is assumed to be at ear height, located five feet above ground surface. "Leq(h)" means the hourly value of Leq.

[2] Includes undeveloped lands permitted for this activity category or publicly owned recreation lands formally designated in a public agency's Master Plan.

[3] Use of interior noise levels shall be limited to situations where a determination has been made that exterior abatement measures will not be feasible and reasonable and after exhausting all outdoor mitigation options.

TNM2.5 was used to calculate existing and future peak hour noise levels at the representative noise receivers identified for the study (S1 through S1717 in the South Section and N1 through N301 in the North Section). Each receiver represents a single point in the noise model and is representative of the noise receptors being analyzed. One receiver can represent multiple receptors or units in the noise analysis, such as a single receiver point representing multiple residential units. The modeled receivers are shown on the figures in Attachment A of Appendix G. The South Section used existing year (2019) and design year (2050) traffic data, and the North Section used existing year (2021) and design year (2050) traffic data. The South Section utilized 2019 count data to maximize the investment in the data collection and traffic analysis already completed for this section, while the North Section utilized 2021 count data since a new data collection effort was required for this section and 2021

daily counts show higher volumes than the 2019 daily counts. Appendix K of the Draft EIS provides more information on the traffic data used for this study.

The existing and future year noise levels and analysis results by receiver are presented in Attachment C of Appendix G, along with a distance to centerline of the nearest future roadway lane, a receiver description, the number of receptor units represented by each receiver and the NLC.

Land Use Category C properties that do not have an exterior area of frequent human use are categorized under Land Use Category D, which are evaluated for interior impacts. According to FDM 23, Section 23-35-5, "Land Use Category D is only used as the basis for noise impact determination in situations where no exterior activities are to be affected by the traffic noise, or where the exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities."[77] Five receivers were modeled as Land Use Category D (interior) because no observable exterior area of frequent human use was identified, including Madison Fire Station (S958) and SSM Health Emergency Center (S1635) in the South Section and Delton Family Medical Center (N102), DaVita Lake Delton Dialysis (N103) and Indian Baptist Church (N282) in the North Section. Table 6 in FHWA's Highway Traffic Noise: Analysis and Abatement Guidance provides values to help estimate interior noise levels. [78] A building noise reduction factor of 25 dB was used for the medical facilities and Madison Fire Station as they are all masonry buildings with at least single glazed windows. A building noise reduction factor of 20 dB was used for Indian Baptist Church as it is a light frame building with assumed ordinary sash windows. The building noise reduction factors were applied to modeled exterior noise levels to determine interior noise levels at these receivers. No impacts are predicted at Land Use Category D receivers based on the estimated interior noise levels.

FDM 23, Section 23-35-15 defines how to determine the appropriate number of receptors for Land Use Category A, C, D and E facilities (or properties). Generally, each discrete parcel or property with outdoor use is counted as one receptor. Section 4(f) properties and other Land Use Category C properties are evaluated on a case-by-case basis to determine the location of receptors that will each count as one receptor. WisDOT coordinated with FHWA to document the noise analysis receptors identified under Land Use Category C for Section 4(f) and other recreational outdoor use throughout the study corridor. For golf courses, receptor locations were identified for each hole within 500 feet of the roadway. For campgrounds, receptor locations were identified to represent each campsite within 500 feet of the roadway, with a usage factor applied based on months of the year the campground is open.

A summary of impacted receptor units is given in Table 3-60 and discussed by each geographic section below.

Table 3-60: Total Receiver and Receptor Impact Counts – Number of Receptor Units Impacted

Land Use Activity Category	South Section	North Section	Total
A	0	0	0

[77] *Wisconsin Department of Transportation. Facilities Development Manual Chapter 23 Noise Section 23-35-5.4. May 17, 2022.*

[78] *U.S. Department of Transportation Federal Highway Administration Office of Planning, Environment, & Realty (HEP). Environment. Noise. Regulations and Guidance. Analysis and Abatement Guidance. Highway Traffic Noise Regulation. https://www.fhwa.dot.gov/Environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/polguide02.cfm. Accessed March 19, 2024.*

Land Use Activity Category	South Section	North Section	Total
B	1,300	216	1,516
C	31	39	70
D	0	0	0
E	12	0	12
Total	**1,343**	**255**	**1,598**

South Section

Predicted existing year (2019) exterior traffic noise levels for modeled receivers range from 44 to 77 dBA $L_{eq(h)}$. Predicted future year (2050) exterior traffic noise levels for modeled receivers range from 37 to 80 dBA $L_{eq(h)}$. Changes in $L_{eq(h)}$ noise levels in 2050 under the build alternative will range from -8 to 16 dBA compared to existing conditions.

The 2050 noise levels predicted with TNM2.5 indicate that 1,343 receptor units would be exposed to $L_{eq(h)}$ noise levels that approach or exceed the NLC. This includes 1,300 residential receptor units (Land Use Category B), 31 outdoor use receptor units (Land Use Category C), and 12 outdoor use receptor units at hotels, restaurants or offices (Land Use Category E).

Three residential receptors in the study corridor (S1016, S1024 and S1027) would be exposed to an increase in sound levels of 15 dBA or more; these receptors are located west of I-39/90/94 north of the WIS 30/I-94 Interchange off of Tony Drive and Park Meadow Drive. The substantial increases are due to the design moving roadways closer to these receptors, with increases in traffic volumes in the future year, along with topographic changes due to the design that cut into an existing berm in this area. These three receptors are also impacted based on the NLC and are included in the impact count given above, see Table 3-60).

North Section

Predicted existing year (2021) exterior traffic noise levels for modeled receivers range from 37 to 78 dBA $L_{eq(h)}$. Predicted future year (2050) exterior traffic noise levels for modeled receivers range from 38 to 77 dBA $L_{eq(h)}$. Changes in $L_{eq(h)}$) noise levels in 2050 under the build alternative will range from -8 to 6 dBA compared to existing conditions.

The 2050 noise levels predicted with TNM2.5 indicate that 255 receptor units would be exposed to $L_{eq(h)}$ noise levels that approach or exceed the NLC. This includes 216 residential receptor units (Land Use Category B) and 39 outdoor use receptor units (Land Use Category C). No receptors in the North Section would be exposed to an increase in sound levels of 15 dBA or more.

3.17.5. Measures to Minimize and Mitigate Adverse Noise Impacts

Based on the requirements of 23 CFR 772 and within the framework of the FDM 23, various methods were reviewed to mitigate the noise impact of the preferred alternative. Among the mitigation options considered were those listed below.

- Restricting truck traffic to specific times of the day.
- Prohibiting truck traffic.
- Altering horizontal and vertical alignments.
- Acquiring property to create buffer zones to prevent development that could be adversely impacted.
- Soundproofing for land use Activity Category D only.
- Constructing berms (linear earthen mounds).
- Installing noise barriers (a wall located between the highway and receptors).

Restricting or prohibiting trucks is beyond the scope of this study and would require changes in legislation. Design criteria and recommended termini do not allow for sufficient changes in alignment to provide a noticeable change in the traffic noise levels at the abutting properties. A 15-foot-tall earthen noise berm would have a footprint ranging in width from 35 to 95 feet. Therefore, it is not the most feasible or reasonable abatement alternative to construct noise berms within the study corridor due to the cost of materials and potential need to acquire substantial amounts of right of way. Soundproofing of buildings is not necessary as noise impact is not predicted at Land Use Category D land uses. The construction of noise barriers appears to be the most feasible and reasonable method to mitigate noise impacts for this study. Abatement is recommended for consideration where it is feasible and reasonable to construct a noise barrier.

A noise analysis identifies “where noise abatement is feasible and reasonable and locations with impacts that have no feasible or reasonable noise abatement alternatives.” The most efficient location for a noise barrier is as close to the source or the receiver as possible. Therefore, in the areas of the predicted noise impacts where a noise barrier was feasible to analyze, noise barriers were generally modeled following the highest future elevation either as close to the edge of pavement or right of way as possible. Noise barriers were modeled to remain at least seven feet away from the proposed edge of the pavement or 10 feet away from the proposed right of way to allow sufficient clearance for concrete safety barriers and maintenance work.

Note that noise barriers were not modeled on WisDOT bridges due to a policy item in the WisDOT Bridge Manual, Chapter 30.3. Noise barriers are analyzed where impacts are identified and generally start with a length that is four times the perpendicular distance to the last impact in an area. If this results in a barrier that crosses intersecting roadways or roadway bridges, the barrier is gapped at that location and considered as a barrier system with separate segments.

FDM 23 has established criteria for determining noise barrier feasibility and reasonableness and summarized as follows:

- The barrier must meet engineering considerations, such as safety, height, drainage, utilities and property and maintenance access to be considered feasible.
- The barrier must provide a minimum 5-decibel noise reduction at one impacted receptor or common use area to be considered feasible.
- One receptor or common use area must meet the 9-decibel noise reduction design goal for the noise barrier to be considered for reasonableness.

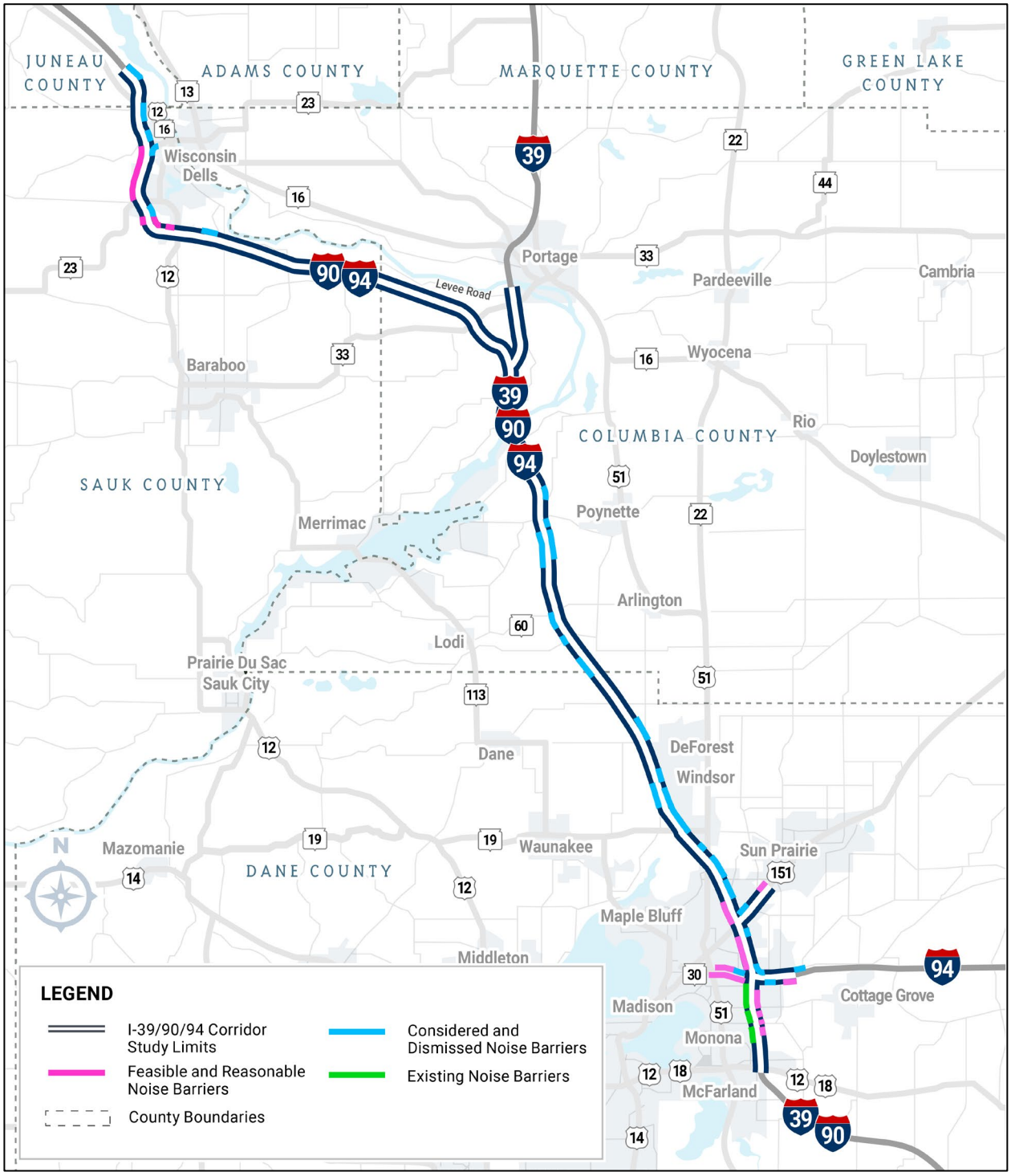
- A noise barrier must reduce noise levels by a minimum of 8 decibels for a receptor or common use area to be considered as benefited for the purposes of determining reasonableness. The total cost of the barrier may not exceed $50,000 per benefited receptor based on a noise barrier cost of $30.00 per square foot. A benefited receptor can be either an impacted or a non-impacted receptor.
- If a common noise environment exists within the study termini, cost averaging of multiple barriers within the common noise environment may occur as part of the reasonableness determination. Noise barriers exceeding $100,000 per benefited receptor cannot be included in the cost averaging. The order of cost averaging of eligible multiple barriers will start with the most cost-effective noise barrier increasing to the second most cost-effective barrier to the third, etc., until the average cost approaches or equals but does not exceed $50,000 per benefited receptor. The noise barriers included in the cost averaging may be carried forward for a determination of whether they will be incorporated. WisDOT must receive a vote of support for the barrier from a simple majority of all votes cast by the owners or residents of the benefited receptors.
    - For this noise analysis, the South and North sections were divided into three CNEs. The South Section contains CNE 1 (Greater Madison area) and part of CNE 2 (Rural Dane, Columbia and Sauk counties). The North Section also contains part of CNE 2 and CNE 3 (Greater Wisconsin Dells area). Cost averaging was implemented on the barriers where the average cost exceeds $50,000 per benefited receptor but is below $100,000 per benefited receptor. Two noise barriers were eligible for cost averaging (below $100,000 per benefited receptor) in CNE 1, no noise barriers were eligible for cost averaging in CNE 2, and one noise barrier was eligible for cost averaging in CNE 3.

In the South Section, 25 noise barriers (labeled S1 through S25) and two existing noise barriers (labeled E1 and E2) were analyzed to determine feasibility and reasonableness. In the North Section, 14 noise barriers (labeled N1 through N14) were analyzed adjacent to the study corridor; there are no existing noise barriers in the North Section. These noise barriers are identified on the figures in Attachment A of Appendix G and are further described in the following sections. Figure 3-43 shows locations of evaluated noise barriers in the study corridor.

For receptors that are isolated, meaning no other noise-sensitive receptors exist within 2,000 feet in either direction, barrier analysis has been completed qualitatively. A distance of 2,000 feet for isolated receptors has been determined based on the FHWA recommendation that noise barriers extend at least four times the perpendicular distance between the receptor and the barrier. With this in mind, a receptor at 500 feet from the roadway (the noise study area distance) would need a noise barrier to extend 2,000 feet in either direction for it to be effective. If no other receptors exist within this 2,000-foot distance, the receptor would be isolated.

Receptors in the study area are generally at least 50 feet from either the roadway shoulder or the right of way. For an isolated receptor that is 50 feet from a potential noise barrier (whether located at the roadway shoulder or right of way), the noise barrier would need to extend four times that distance beyond the receptor on either end of the noise barrier. This would result in a minimum length noise barrier of 400 feet. At a conservative height of 10 feet, this size noise barrier would cost $120,000 (4,000 square feet x $30 per square foot). With only one noise-sensitive receptor behind the noise barrier, the cost per potential benefit would be over $100,000; therefore, noise barriers for isolated receptors would not be reasonable and would not be eligible for cost averaging.

Figure 3-43: Summary of Evaluated Noise Barriers



3.17.6. Summary of Noise Impact Mitigation

The South Section analysis found eight noise barriers were feasible and reasonable, including S1, S2, S3, S4, S7, S10, S13 and S14. Two of these barriers, S1 and S4, are reasonable via cost averaging. The North Section analysis found four noise barriers were feasible and reasonable, including N6, N8, N10 and N7. One of these barriers, N7, is reasonable via cost averaging.

The two existing noise barriers were evaluated in the South Section. Per FHWA guidance, if noise impact is identified behind an existing noise barrier, an analysis should be completed to determine if the barrier is still feasible and reasonable.[79] The design year noise levels are determined with and without the existing noise barrier for this analysis. If the existing noise barrier is feasible and reasonable as built, no further analysis is required.

To summarize, of the 39 new noise barriers analyzed across both sections of the study corridor, 12 noise barriers were found feasible and reasonable. Twenty-six noise barriers were found feasible, but not reasonable and one noise barrier was found not feasible or reasonable. Existing noise barrier E1 was analyzed and found to be feasible and reasonable as built and will remain in place. E2 is considered a replacement in kind due to the proposed relocation of an approximate 900-foot section. There is no predicted noise impact behind this replacement barrier; therefore, no further noise abatement evaluation was completed.

The results of the noise barrier analysis completed with TNM2.5, including barrier location, future $L_{eq(h)}$ noise levels without and with a barrier, barrier length and height, estimated cost based on $30.00 per square foot, the number of benefited receptors, the noise reduction provided by the barrier and the cost per benefited receptor are presented in Table 3-61 for the South Section and Table 3-62 for the North Section. Noise level ranges presented in the tables are reported for benefited receptors only unless no benefits were achieved. Detailed noise barrier analysis results by receptor are presented in Attachment D of Appendix G. Cost averaging calculations across eligible barriers are presented in Attachment E of Appendix G.

Based on the studies thus far accomplished, WisDOT is likely to incorporate the noise barriers shown as feasible and reasonable in Table 3-61 and Table 3-62, pending final design and public involvement. The preliminary indications of likely abatement measures are based on preliminary design for the barrier cost and noise reduction. WisDOT will initiate a separate public involvement process to determine whether or not the benefited owners and tenants support noise barrier construction. If final design results in substantial changes in roadway design from modeled conditions, noise abatement measures and the location of feasible and reasonable noise mitigation will be reassessed.

[79] *U.S. Department of Transportation Federal Highway Administration Office of Planning, Environment, & Realty (HEP). Environment. Noise. Consideration of Existing Noise Barrier in a Type I Noise Analysis FHWA-HEP-12-051. https://www.fhwa.dot.gov/environment/noise/noise_barriers/abatement/existing.cfm. Accessed March 29, 2024.*

Table 3-61: Acoustical Mitigation- Noise Barrier Locations Analyzed in the South Section

Barrier Number	Locations	Existing $L_{eq(h)}$ Noise Levels, dBA	Range of Future $L_{eq(h)}$ Noise Levels, dBA		Noise Reduction (dB)	Barrier Characteristics		Cost[a]	Number of Benefited Receptors	Cost per Benefited Receptor	Feasible and Reasonable
			w/o Barrier	Barrier		Length (ft)	Height (ft)				
E1	Along I-39/90 southbound from the Wisconsin and Southern Railroad to Cottage Grove Rd.	60-66	70-79	61-68	8-15	6,535	7-21	$2,701,620	65	$ 41,563	NA[c]
E2	Along I-39/90 southbound from Cottage Grove Rd. to Milwaukee St.	55-65	NA[c]	57-65	NA[c]	4,644	5-21	NA[c]	NA[c]	NA[c]	NA[c]
S1	Along I-39/90 northbound from the Wisconsin and Southern Railroad to Cottage Grove Rd.	59-73	60-74	52-65	8-11	3,449	16-24	$2,358,060	31	$ 76,066	Y[b]
S2	Along I-39/90 northbound from Buckeye Rd. to Milwaukee St.	48-74	50-79	42-68	8-17	4,254	18-24	$2,918,880	229	$ 12,746	Y
S3	Along WIS 30 eastbound from Milwaukee St. to US 51	51-72	53-72	45-62	8-14	8,071	16-24	$5,217,870	208	$ 25,086	Y
S4	Along WIS 30 westbound from Walsh Rd. to approximately 300 feet east of Thompson Dr.	56-71	58-73	49-65	8-14	2,946	18-24	$1,906,650	35	$ 54,476	Y[b]
S5	Along I-94 eastbound from approximately 500 feet west of Town Center Dr. to 1,200 feet east of proposed Milwaukee St.	37-69	42-72	34-61	8-13	6,016	14-24	$3,893,340	79	$ 49,283	Y

Barrier Number	Locations	Existing $L_{eq(h)}$ Noise Levels, dBA	Range of Future $L_{eq(h)}$ Noise Levels, dBA		Noise Reduction (dB)	Barrier Characteristics		Cost[a]	Number of Benefited Receptors	Cost per Benefited Receptor	Feasible and Reasonable
			w/o Barrier	Barrier		Length (ft)	Height (ft)				
S5	Along WIS 30 westbound from approximately 400 feet east of North Thompson Dr. to 2,300 feet east of Thompson Dr.	67	66	58	8	1,900	24	$1,367,880	1	$1,367,880	N
S6[d]	Along I-94 eastbound from approximately 750 feet west of Town Center Dr. to Sprecher Rd.	37	42	34	8	1,941	24	$1,397,280	1	$1,397,280	N
S7	Along I-94 eastbound from Sprecher Rd. to approximately 300 feet west of proposed Milwaukee St.	57-69	60-72	51-64	8-13	3,092	14-24	$2,011,470	68	$ 29,580	Y
S8	Along I-94 westbound on either side of Gaston Rd.	68	69	61	8	2,739	24	$1,972,020	1	$1,972,020	N
S9	Along I-94 westbound at the Kennedy Little League baseball fields	70-71	67-68	59	8-9	1,900	22	$1,254,060	2	$ 627,030	N
S10	Along I-39/90/94 southbound from Commercial Ave. to High Crossing Blvd.	55-77	56-80	48-66	8-19	9,035	14-24	$6,272,820	126	$ 49,784	Y
S11	Along I-39/90/94 northbound from north of the Wisconsin and Southern Railroad to High Crossing Blvd.	69-71	74-75	65-67	8-9	1,999	12-22	$1,235,970	3	$ 411,990	N
S12	Along US 151 westbound from American Pkwy. to I-39/90/94	69-70	71-73	63-64	8-9	1,024	16-20	$ 559,920	2	$ 279,960	N

Barrier Number	Locations	Existing $L_{eq(h)}$ Noise Levels, dBA	Range of Future $L_{eq(h)}$ Noise Levels, dBA		Noise Reduction (dB)	Barrier Characteristics		Cost[a]	Number of Benefited Receptors	Cost per Benefited Receptor	Feasible and Reasonable
			w/o Barrier	Barrier		Length (ft)	Height (ft)				
S13	Along US 151 westbound from west of the Goodman Path to proposed Eastpark Blvd.	57-68	61-71	53-62	8-10	2,802	18-22	$1,700,910	43	$ 39,556	Y
S14	Along I-39/90/94 southbound from US 151 to approx. 1,700 feet south of Hanson Rd.	55-77	57-79	48-70	8-16	3,749	14-24	$2,503,380	554	$ 4,519	Y
S15	Along I-39/90/94 northbound from south of Eastpark Blvd. to Hoepker Rd.	65-69	67-72	59-64	8	5,037	24	$3,626,730	2	$1,813,365	N
S16	Along I-39/90/94 northbound from north of Hoepker Rd. to US 51	63-67	68-70	60-62	8-9	4,140	6-24	$2,825,070	3	$ 941,690	N
S17	Along I-39/90/94 southbound at Daentl Rd. near Token Creek	67-74	66-76	60-64	8-12	1,392	18-22	$ 827,670	7	$ 118,239	N
S18	Along I-39/90/94 NB from WIS 19 to River Rd.	65-75	67-76	57-64	8-14	8,151	10-22	$5,282,880	21	$ 251,566	N
S19	Along I-39/90/94 southbound on either side of River Rd.	65	66	58	8	3,160	24	$2,274,870	1	$2,274,870	N
S20	Along I-39/90/94 northbound from River Rd. to Innovation Dr.	72	73	64-65	8-9	1,011	10-18	$ 495,960	2	$ 247,980	N
S21	Along I-39/90/94 northbound from approx. 1,900 feet north of Innovation Dr. to 5,200 feet north of Innovation Dr.	66-70	66-71	58-62	8-9	3,200	18-24	$2,057,820	2	$1,028,910	N

Barrier Number	Locations	Existing $L_{eq(h)}$ Noise Levels, dBA	Range of Future $L_{eq(h)}$ Noise Levels, dBA		Noise Reduction (dB)	Barrier Characteristics		Cost[a]	Number of Benefited Receptors	Cost per Benefited Receptor	Feasible and Reasonable
			w/o Barrier	Barrier		Length (ft)	Height (ft)				
S22	Along I-39/90/94 northbound from County V to Hahn Rd.	63-65	63-66	59-61	4-6	3,983	24	$2,867,730	0	NA	N
S23	Along I-39/90/94 southbound on either side of Patton Rd.	64-65	65-66	60-61	5-6	3,665	24	$2,638,320	0	NA	N
S24	Along I-39/90/94 southbound on either side of County K	72-77	73-79	65-70	8-9	1,355	6-16	$ 590,340	2	$ 295,170	N
S25	Along I-39/90/94 southbound from approx. 3,800 feet south of WIS 60 to 600 feet south of WIS 60	67-74	68-76	60-62	8-14	3,099	20-22	$2,009,010	5	$ 401,802	N

a. Based on $30.00 per square foot

b. Based on cost averaging of multiple barriers within the common noise environment

c. Existing noise barriers were analyzed to determine if they are feasible and reasonable as built. E1 is feasible and reasonable as built at under $50,000 per benefited receptor. No impact is predicted behind E2; therefore, no barrier analysis was completed. Noise level ranges are provided for all receptors behind E2. This barrier is being impacted by the roadway design for an approximate 900-foot section and is considered a replacement in kind.

d. This barrier benefits a Land Use Category D receptor only.

Table 3-62: Acoustical Mitigation – Noise Barrier Locations Analyzed in the North Section

Barrier Number	Locations	Existing $L_{eq(h)}$ Noise Levels, dBA	Range of Future $L_{eq(h)}$ Noise Levels, dBA		Noise Reduction (dB)	Barrier Characteristics		Cost[a]	Number of Benefited Receptors	Cost per Benefited Receptor	Feasible and Reasonable
			w/o Barrier	Barrier		Length (ft)	Height (ft)				
N1	Along I-39/90/94 southbound from Smokey Hollow Rd. to Richards Rd.	69-71	70-72	59-63	8-11	3,782	22	$2,496,120	4	$ 624,030	N
N2	Along I-39/90/94 northbound from Sanderson Rd. to Smokey Hollow Rd.	70	69	61	8	2,218	16	$1,064,640	1	$1,064,640	N
N3	Along I-39/90/94 northbound from Smokey Hollow Rd. to County CS	71-75	69-71	64	5-7	1,400	24	$1,008,000	0	NA	N
N4	Along I-39/90/94 northbound from County CS to Kent Rd.	73-74	73-74	65-66	8	1,035	18	$ 558,900	3	$ 186,300	N
N5	Along I-90/94 WB from County A to Bunker Rd.	72	72	61	11	2,608	18	$1,408,320	1	$1,408,320	N
N6	Along I-90/94 WB from US 12 to Ishnala Rd.	72-76	72-76	61-72	8-12	1,488	20	$ 892,800	24	$ 37,200	Y
N7	Along I-90/94 northbound from Ishnala Rd. to Mirror Lake	71-75	72-77	63-67	9-13	2,284	20	$1,370,400	15	$ 91,360	Y[b]
N8	Along I-90/94 southbound from Mirror Lake to Xanadu Rd.	76-78	75-77	64-66	9-13	793	12	$ 285,480	8	$ 35,685	Y
N9	Along I-90/94 northbound from Mirror Lake to Xanadu Rd.	61-66	67-68	59-60	8	1,778	24	$1,280,160	2	$ 640,080	N

Barrier Number	Locations	Existing $L_{eq(h)}$ Noise Levels, dBA	Range of Future $L_{eq(h)}$ Noise Levels, dBA		Noise Reduction (dB)	Barrier Characteristics		Cost[a]	Number of Benefited Receptors	Cost per Benefited Receptor	Feasible and Reasonable
			w/o Barrier	Barrier		Length (ft)	Height (ft)				
N10	Along I-90/94 southbound from WIS 23 to Trout Rd.	42-76	43-77	38-69	8-14	7,719	14	$3,241,980	106	$ 30,585	Y
N11	Along I-90/94 northbound from Jones Rd. to WIS 13	54-66	55-66	55-64	0-3	3,208	24	$2,309,760	0	NA	N
N12	Along I-90/94 northbound from County H to US 12	69-75	71-75	63	8-12	2,800	24	$2,016,000	2	$1,008,000	N
N13	Along I-90/94 northbound from County H to US 12	68-72	70-72	62-63	8-9	1,891	18	$1,021,140	5	$ 204,228	N
N14	Along I-90/94 northbound from 60th St. to Dees Rd.	67-72	67-72	58-62	8-12	4,002	14	$1,680,840	9	$ 186,760	N

a Based on $30.00 per square foot

b Based on cost averaging of multiple barriers within the common noise environment

3.18.Air Quality

3.18.1. Affected Environment

Federal air quality policies are regulated through the Clean Air Act (CAA). Congress passed the CAA in 1970 and its amendments in 1977 and 1990. Pursuant to the CAA, the US Environmental Protection Agency (USEPA) established national air quality standards to protect public health and welfare with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (NAAQS), were developed for criteria pollutants including ozone, nitrogen dioxide, carbon monoxide, particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$), sulfur dioxide and lead.

The NAAQS represents maximum concentrations for each pollutant to avoid specific adverse effects on human health and the environment. Two types of NAAQS have been established: primary and secondary standards. Primary standards set limits to protect public health, especially for sensitive populations such as asthmatics, children and seniors. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops and buildings.

USEPA classifies regions depending on whether the area's monitored air quality meets the NAAQS with respect to each criteria pollutant. A region that meets the NAAQS for a given pollutant is designated as being in attainment for that pollutant. If the region does not meet the air quality standard, it is designated as being in nonattainment for that pollutant. An area that was designated as nonattainment and has been re-designated to attainment under a federal approved maintenance plan is in maintenance for that pollutant. The 1977 CAA Amendments require each state to develop and maintain a state implementation plan (SIP) for each criteria pollutant where a violation of the applicable NAAQS occurred.

Transportation projects in nonattainment and maintenance areas are subject to transportation conformity requirements. Transportation conformity is required under CAA section 176(c) (42 U.S.C. 7506(c)) to ensure that federally supported highway and transit project activities are consistent with the purpose of a Statewide Transportation Improvement Program (STIP) or local Transportation Implementation Plan (TIP). Conformity to a STIP and TIP requires that a federal action to demonstrate it would not cause a violation of any NAAQS, worsen an existing violation or delay timely attainment of the NAAQS.

The study is listed in the Madison Metropolitan Area and Dane County 2024-2028 TIP under project ID 1012-05-02.[80] Portions of the study corridor outside the TIP boundaries are included in the 2023-2027 STIP as an October 2021 amendment under project IDs 1012-05-03, 1012-05-01 and 1012-06-00 .[81]

The study corridor spans two air quality control regions in Wisconsin, as designated under Wis. Admin. Code Chapter NR 404.03(2). The Southern Wisconsin Intrastate Air Quality Control Region overlaps the study corridor in Dane, Columbia and Sauk counties, while the North Central Wisconsin Intrastate Air Quality Control Region

[80] *TIPfinal24_WebVersion.pdf (greatermadisonmpo.org). Accessed May 9, 2024.*

[81] *Wisconsin Department of Transportation Statewide Transportation Improvement Program (STIP) (wisconsindot.gov). See 2021 amendment for October. Accessed Dec. 4, 2023.*

overlaps the study corridor in Juneau County. All four counties are in attainment for all six NAAQS criteria pollutants; therefore, a project would not be subject to transportation conformity requirements.[82]

3.18.2. Mobile Source Air Toxics (MSAT)

In addition to establishing the NAAQS for criteria pollutants, USEPA regulates air toxics. MSATs are compounds emitted from on-road vehicles, non-road vehicles and equipment that are known to cause serious health and environmental effects.

Controlling air toxic emissions became a national priority with the passage of the CCA Amendments of 1990, whereby Congress mandated that the USEPA regulate 188 air toxics, also known as hazardous air pollutants. USEPA assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register*, Vol. 72, No. 37, page 8430, Feb. 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in USEPA's Integrated Risk Information System (IRIS).[83] In addition, USEPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from USEPA's 2011 National Air Toxics Assessment.[84] These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in future USEPA rules.

Transportation projects may affect the regional or local air toxics concentrations because of the MSAT emissions from vehicles. MSAT emissions are expected to be lower than current levels in future years nationwide because of stringent emission standards, improvements in fuel economy, and fleet turnover, see Appendix F for detailed discussion.

3.18.3. Greenhouse Gases

Greenhouse gases are trace gases that trap heat in the earth's atmosphere. Some greenhouse gases such as carbon dioxide (CO_2) occur naturally and are emitted to the atmosphere through natural processes and human activities. Others (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases.[85] Human activity is the cause of increased GHG concentrations. Industrial activities have raised atmospheric carbon dioxide levels by nearly 50% since 1750.[86]

According to the 2021 Wisconsin Greenhouse Gas Emissions Inventory, Wisconsin's net GHG emissions were 145.4 million metric tons of CO_2 equivalent (MMT CO_2e). Electricity generation is the top contributor to the GHG

---

[82] *U.S. Environmental Protection Agency. Greenbook. Criteria Pollutant Nonattainment Summary Report. https://www3.epa.gov/airquality/greenbook/ancl3.html. Accessed 2023.*

[83] *U.S. Environmental Protection Agency. Integrated Risk Information System. https://www.epa.gov/iris. Accessed February 2023.*

[84] *U.S. Environmental Protection Agency. National Air Toxics Assessment. 2011 NATA: Assessment Results. https://www.epa.gov/national-air-toxics-assessment/2011-nata-assessment-results. Accessed 2024.*

[85] *U.S. Environmental Protection Agency. Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. September 2021.*

[86] *NASA 2023. Global Climate Change Vital Signs of the Planet. https://climate.nasa.gov/vital-signs/carbon-dioxide/#:~:text=Since%20the%20onset%20of%20industrial,ice%20age%2020%2C000%20years%20ago.*

emissions in Wisconsin (32%), followed by transportation (27%). The state's gross GHG emissions decreased by 6.1% between 2005 and 2018. Taking into account the carbon storage from natural and working lands, the net GHG emissions are 126.3 MMT CO_2e, which is a decrease of 9.1% between 2005 and 2018.[87]

3.18.4. Air Quality Impacts

Because the build alternatives are located in areas that are in attainment for all criteria pollutants, air quality analysis is focused on the MSAT effects and GHG effects evaluation. Both freeway modernization alternatives would add capacity and there is little to no difference in terms of the intensity of construction activities and the traffic volumes or patterns on the roadways during vehicle operation in the study area between the two alternatives. Because traffic conditions are similar among the build alternatives, the impact analysis used the same construction and operation information for all build alternatives.

MSAT Analysis

The MSAT effects evaluation followed guidance in WisDOT's FDM Chapter 22 Section 25-3 and FHWA memorandum titled Updated Interim Guidance on Air Toxic Analysis in NEPA Documents.[88,89] The results of the MSAT analysis are summarized in this section and described in more detail in Appendix F. FHWA developed a tiered approach with three categories for analyzing MSAT impacts, depending on specific project circumstances:

1. No analysis for projects with no potential for meaningful MSAT effects;
2. Qualitative analysis for projects with low potential MSAT effects; or
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

To determine the required level of MSAT analysis, future year AADT was estimated for the study area. The AADT on one segment of the study area in Dane County would be greater than 150,000 vehicles under the build condition, and some of the study area would be located close to populated areas. According to FHWA's updated interim guidance, the study area has high potential for MSAT effects. Therefore, a quantitative MSAT analysis was performed.

The quantitative MSAT analysis for the study area and other affected roadways is presented in Appendix F. MSAT emissions were evaluated for the existing condition, and the No Build alternative and the build alternatives in 2030 and 2060. MSAT emissions for each of the analysis scenarios were estimated using EPA's MOVES4 model, the latest official version of MOVES at the time of this study. Comparisons of the MSAT emissions of the scenarios analyzed are presented in Appendix F.

When compared with existing conditions, the total MSAT emissions of the No Build alternative and build alternatives in 2030 are approximately 61% to 63% lower than the emissions in 2023, respectively. Total MSAT emissions of the No Build alternative and build alternatives in 2060 are approximately 82% to 89% lower than the

[87] *Wisconsin Department of Natural Resources. Wisconsin Greenhouse Gas Emissions Inventory Report. Publication Number: AM-610-2021. December 2021.*

[88] *Wisconsin Department of Transportation. Facilities Development Manual Chapter 22: Air Quality Section 22-25-3. Aug. 15, 2023.*

[89] *U.S. Department of Transportation Federal Highway Administration. Memorandum: INFORMATION: Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Jan. 18, 2023.*

emissions in 2023, respectively. This trend is consistent with the FHWA finding that annual MSAT emissions are projected to decrease by 76% between 2020 and 2060, even with VMT increases.[90]

While the build alternatives would have slightly higher MSAT emissions than the No Build alternative in future years, the emissions are not substantially different. In 2030, total MSAT emissions from the build alternatives are similar to the No Build alternative (0.8% difference) when most of the study corridor construction has not been completed and only limited segments are improved. In the 2060 design year, total MSAT emissions from the build alternatives in the study area would be 4.4% higher than the No Build alternative, consistent with the trend of higher VMT under the build alternatives. Diesel particulate matter (PM) emissions would have higher increases than other MSATs because diesel PM emissions tend to be higher at higher speeds such as 60 to 70 mph. As the improvements increase the vehicle speeds after the buildout, the diesel PM emissions increase more than other MSATs because more vehicles are traveling at higher speeds.

The MSAT analysis provides the basis for identifying and comparing the potential differences among MSAT emissions from the study alternatives. In summary, the level of MSAT emissions for the study's build alternatives could be slightly higher than the No Build alternative in the study area due to increased VMT. This effect could be offset by congestion relief and reductions in traffic delays (which are associated with lower MSAT emissions). MSAT emissions may be higher at some locations based on roadway expansion, but they would be lower in other locations when traffic shifts away from them. On a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region wide MSAT levels to be substantially lower than today.

This MSAT analysis provides the likely MSAT impacts of the proposed project. Because of the limitations of information and methodology of the analysis, a discussion of the limitation and unavailable information is included in Appendix F in accordance with CEQ regulations regarding incomplete or unavailable information (40 CFR 1502.22[b]).

Greenhouse Gases

The GHG and climate change impact analysis of the study area was conducted following the Council on Environmental Quality (CEQ) interim guidance regarding how to evaluate GHG emissions and climate change under the National Environmental Policy Act.[91] The GHG and climate change impact analysis is presented in Appendix F and summarized in the following sections. Because traffic conditions are similar between the two modernization alternatives, the impact analysis presented here reflects the preferred Modernization Plus Added General-Purpose Lane alternative. Appendix F provides detailed results of GHG emissions for both modernization alternatives.

GHG Emissions

Lifecycle GHG emissions associated with the study area construction and operation were quantified as a proxy to evaluate the GHG impacts to the environment. GHG emissions from the study area construction and operation were estimated using USEPA MOVES4 and FHWA's Infrastructure Carbon Estimator (ICE), Version 2.2.8 (FHWA

[90] *U.S. Department of Transportation Federal Highway Administration. Memorandum: Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents HEPN-10. Jan. 18, 2023.*

[91] *Council on Environmental Quality [CEQ-2022-0005] RIN 0331-AA06. National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. Federal Register / Vol. 88, No. 5/Monday, Jan. 9, 2023/Notice.*

2023). Both the annualized and cumulative GHG emissions were analyzed for the affected roadways for a 30-year period from 2030 to 2060.

The annualized and cumulative GHG emissions over the period of 2030 to 2060 are summarized in Table 3-63. The emission results indicate that there would be no substantial differences between the GHG emissions from the build and No Build alternatives. The GHG emissions of the build alternatives would be slightly higher (4.7%) than the No Build alternative due to the increased VMT from the additional lanes to be constructed.

Table 3-63: Annualize Lifecycle GHG Emissions 2030-2060 (Mt CO_2e/Year)

Activities	Annualized GHG Emissions No Build	Annualized GHG Emissions Modernization Plus Added General-Purpose Lane	Cumulative Emissions No Build	Cumulative Emissions Modernization Plus Added General-Purpose Lane
Bridges/Overpasses	0	2,330	0	69,897
Construction and O&M Lighting	41	96	1,238	2,889
Construction and O&M Roadways	4,154	17,316	124,616	519,491
Signage	0	210	0	6,297
Vehicle Operations Construction Delay	0	405	0	12,144
Vehicle Operations VMT Operations	1,062,622	1,096,127	31,878,667	32,883,810
Total	1,066,817	1,116,484	32,004,522	33,494,527
Difference Build vs No-Build	NA	49,667	NA	1,490,005
Difference Build vs No-Build %	NA	4.7%	NA	4.7%

Data Source: FHWA ICE tool, Version 2.2.8

GHG Equivalency

Based on the GHG emission results, GHG equivalency values were derived using USEPA's Greenhouse Gas Equivalencies Calculator to provide accessible comparisons for the public and decision makers to understand GHG emissions in more familiar terms.[92] The GHG equivalency values corresponding to the annualized emission increase due to the build alternatives are summarized in Table 3-64.

[92] *U.S. Environmental Protection Agency. Energy and the Environment. Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. Accessed 2023.*

Table 3-64: Annualized GHG Emissions Equivalency for the Emissions Increases from Build Alternatives (Compared to No-*Build* Alternative)

	GHG Equivalency (Emission Increase of Modernization Plus Added General-Purpose Lane)
Barrels of crude oil consumed per year	114,879
Gasoline-powered passenger vehicles driven for one year	11,076
Tanker truck's worth of gasoline per year	656
Natural-gas-fired power plant in one year	0.15

Source: WisDOT

GHG Social Cost

Following the CEQ interim guidance, to provide additional context for GHG emissions, social costs of GHG (SC-GHG) due to GHG emissions from the study alternatives were estimated to translate climate impacts into the metric of dollars, to allow decision makers and the public to make comparisons, help evaluate the significance of an action's climate change effects and better understand the tradeoffs associated with an action and its alternatives.

Annual SC-GHG were calculated for the years 2030 and 2060 and summarized Table 3-65 and Table 3-67 . The annual emissions used in the SC-GHG calculation included the vehicle operation emissions based on the operational VMT in the study area in 2030 and 2060, and the annualized construction emissions. Unit social costs for CO_2 were taken from the EPA Report on the Social Cost of Greenhouse Gases[93] and are presented by emission year in 2020 dollars per MT CO_2e at various discount rates.

For the same emission year and discount rate, the SC-GHG of the build alternatives would be 2.5 percent higher than the No-Build Alternatives for the 2030 emission year, and 7.0 percent higher than the No-Build Alternative for the 2060 emission year. SC-GHG would be higher in 2060 than in 2030, which is consistent with the trend of the higher GHG emissions and the higher unit SC-GHG cost factors in 2060.

[93] *USEPA. Supplementary Material for the Regulatory Impact Analysis for the Final Rulemaking, "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" EPA Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances. https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf. November 2023.*

Table 3-65: Social Cost of Greenhouse Gases for Emissions in 2030 (2020 Dollars)

Discount Rate	No Build	Modernization Plus Added General-Purpose Lane	Change (Build vs No Build)	% Change (Build vs No Build
2.5%	$152,917,250	$156,704,898	$3,787,648	2.5%
2.0%	$251,221,196	$257,443,761	$6,222,565	2.5%
1.5%	$415,061,106	$425,341,866	$10,280,760	2.5%

Source: WisDOT

Table 3-66: Social Cost of Greenhouse Gases for Emissions in 2060 (2020 Dollars)

Discount Rate	No Build	Modernization Plus Added General-Purpose Lane	Change (Build vs No Build)	% Change (Build vs No Build)
2.5%	$231,439,342	$ 43,055,832	$16,131,693	7.0%
2.0%	$352,190,304	$ 104,410,393	$24,548,228	7.0%
1.5%	$533,316,745	$ 137,778,663	$37,173,031	7.0%

Source: WisDOT

Cumulative SC-GHGs during the 30-year analysis period are summarized in Table 3-67. The cumulative SC-GHG of the build alternatives would be approximately 5% higher than the cumulative SC-GHG of the No Build alternative.

Table 3-67: Cumulative Social Cost in 2030 to 2060 (2020 Dollars) and Comparisons to No Build Alternative

Discount Rate	SC-GHG ($) No Build	SC-GHG ($) Modernization Plus Added General-Purpose Lane	Changes (Build vs No Build)	2030 % Change (Build vs No Build)
2.5%	$5,892,190,180	$6,178,295,014	$286,104,834	4.9%
2.0%	$9,243,116,199	$9,689,156,188	$446,039,989	4.8%
1.5%	$14,514,313,546	$15,209,688,982	$695,375,436	4.8%

Source: WisDOT

Effects of Climate Change, Resiliency and Adaptation

Globally, climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity and in the frequency and intensity of wildfires. Wisconsin is expected to experience higher temperatures, increased precipitation and more extreme weather events in future years. In the study area, warmer temperature and more frequent extreme precipitation events are likely to contribute to potential hazards along the study area.

To enhance the resiliency and reliability of the transportation system, and in accordance with federal requirements, Wisconsin continues to focus on resiliency with infrastructure assessments. WisDOT is currently developing a flood risk assessment tool to identify locations on the state highway system with the highest risk of experiencing flooding or being significantly impacted by flooding. This tool will use data and a risk-based scoring system combined with a project prioritization method to identify high-risk flood-prone areas for improvement throughout the state at the 0.25-mile level. The flood risk assessment tool will enhance WisDOT's ability to implement strategic, cost-effective solutions that will increase the resiliency of the highway system. The build alternatives include a strategy to manage flooding events by raising roadway embankments and bridges above flood levels, see Section 3.13.2.

WisDOT will remain vigilant in its preparation by ensuring robust data-driven consideration in the planning, design and prioritization processes and by ensuring responses to incidents such as crashes, flooding and extreme winter weather are well coordinated and efficiently and effectively implemented. As part of the I-39/90/94 Corridor Study, WisDOT prepared a resiliency study that identified flood minimization strategies in the Baraboo River and Wisconsin River area. WisDOT would also implement design and planning strategies to increase resilience against climate change effects, see Appendix E.

The GHG and climate change impacts, as presented in Appendix F, also discusses the impacts of GHG emissions on environmental justice populations. Climate change does not affect all people equally. Some communities experience disproportionate impacts because of existing vulnerabilities, historical patterns of inequity, socioeconomic disparities and systemic environmental injustices. Detailed information on impacts can be found in Section 3.9.3.

3.18.5. Measures to Mitigate Air Quality Impacts

Based on the air quality analysis completed for the proposed improvements, the build alternatives will not contribute to any violation of the NAAQS and MSAT emissions are expected to decrease.

Reducing GHG emissions is a key strategy to address climate change impacts. GHG emissions would be produced at different levels throughout the study corridor's construction phase. At a project level, although GHG mitigation measures are not specifically required under NEPA or other state and federal regulations, the TDM and TSMO measures anticipated as part of the build alternatives would help reduce the impact of GHG emissions. WisDOT will follow its Standard Specifications for Highway and Structure Construction (WisDOT 2024). The WisDOT Standard Specifications is updated annually and set forth up-to-date standards of highways and structures, as well as emission control requirements for construction activities to address pollution reduction/containment measures for the contractors. WisDOT will also implement the following mitigation measures to help reduce GHG emissions, as appropriate to the size and scale of each construction project:

- Implement detours and strategic construction timing where feasible to reduce construction delays, including vehicle idling from backups.
- Set up active construction zones, staging areas and material transfer sites in a way that reduces standing wait times for equipment. Reducing idling times reduces GHG emissions from passenger cars and construction vehicles.
- Work with contractors and subcontractors to reduce idling times. An example would be for contractors and subcontractors to complete and submit idling logs of construction vehicles/equipment every 6 months and monitor by comparing a baseline log at inception of the project.

- Communicate with local municipalities and neighborhood groups, including groups focused on serving environmental justice populations, as to the location of staging areas and material transfer sites. Work with the same municipalities and groups to minimize the impacts of staging areas and material transfer sites.
- Encourage construction contractors to use ridesharing and other commute trip reduction efforts to reduce GHG emissions from commute vehicles of employees working on the project.
  - WisDOT will evaluate areas in proximity to the jobsite where construction staff and equipment parking could occur, and that results in distribution of GHG emissions.
  - WisDOT will post signs to encourage construction staff to use public transport or rideshare.
- Apply/implement TDM/TSMO measures such as freeway monitoring and advisory information, crash investigation sites and law enforcement pads, traffic detectors and enhanced mile-marker posts.
- Recycle construction and demolition materials to the extent possible. Asphalt, concrete and rubble are often recycled into aggregate or new asphalt and concrete products. Metals—including steel—are also valuable commodities to recycle.
- Use LED bulbs in new lighting installed along the study corridor. LEDs use less electricity than traditional light bulbs, which in turn reduces the amount of fuel being burned to generate electricity.
- Plant stormwater trees in the study corridor. Trees absorb stormwater and reduce erosion during a rainfall event; they also absorb CO_2 and serve as an urban canopy to reduce urban heat zones.
- Construction of the study corridor will follow WisDOT project site air quality specifications. This includes establishing staging zones for trucks waiting to load and unload; locating staging zones where idling of diesel-powered equipment will have minimal impact on abutting properties and the general public; having trucks queue up in these zones when practicable; and encouraging drivers to shut down diesel trucks as soon as it appears likely they will be queued up for more than 10 minutes.
- WisDOT will continue to coordinate with the city of Madison and Madison Metro Transit throughout design and construction to support transit service implementation and avoid and minimize transit service disruption during construction. The additional bicycle and pedestrian facilities that are part of the build alternatives would support alternative transportation choices.

Mitigation measures have been identified to minimize construction impacts, including air quality impacts, on environmental justice populations. Prior to construction, WisDOT will develop a plan to establish construction phases, estimated durations, appropriate sequencing, and community outreach and communication commitments.

WisDOT would continue its public outreach inclusive of minority and low-income populations. Access to and from the Interstate during construction would be maintained to the extent possible, or alternative access would be provided. If alternative access is not available, the specific construction activity would be reviewed to determine whether it could occur during non-peak hours. Section 3.9 of the EIS identifies mitigation for environmental justice communities. Section 3.24.4 identifies additional mitigation measures to reduce construction-related air quality impacts. These collective measures would reduce or offset GHG emissions and other air quality impacts from study corridor construction and benefit all populations, including environmental justice populations, living along the study corridor.

3.19.Hazardous Materials

3.19.1. Affected Environment

WisDOT conducted a Phase 1 Hazardous Materials Assessment that included a records search of state and federal referencing databases, regulatory agency (USEPA and WDNR) listings and historical aerial photographs, topographic maps, city directories, fire insurance maps, as-built plans, past or present land use data, and site reconnaissance. This search identified a total of 225 sites of environmental concern within or next to the study corridor, see Table 3-68.

Table 3-68: Sites of Environmental Concern by County

County	Sites of Environmental Concern (number)
Dane	123
Columbia	57
Sauk	40
Juneau	5
Total	225

WisDOT completed additional review at 40 sites, including some site visits at locations that would be potentially acquired or impacted by construction. Site visits included walking the property, taking photographs and notes, interviewing a property representative, if available, and completing a WisDOT Site Summary Form. Below is a record of WisDOT's initial findings:

- Of the 40 sites subjected to additional review, up to 16 sites could be recommended for additional field sampling and testing. Additional investigations may not be required at all recommended sites if they are not acquired or impacted by construction activities.
- Of those sites recommended for further investigation, most involved storage tanks. In Dane County, all sites involved a leaking underground storage tank (LUST) site with documented releases of petroleum. Contaminated soils or groundwater and underground storage tanks may be encountered if future utilities or roadway excavations occur at these sites. Other potential concerns included truck spills, gas stations and auto repair sites.
- Recommendations for further investigation for other sites located along the study corridor depend on real estate acquisition and construction requirements.
- There are four railroad crossings along the study corridor. Railroads are known potential soil contaminant sources that impact adjacent surface and subsurface soils. All railroad crossings and areas of work within the railroad right of way are considered potential hazardous material sites.
- Bridges to be demolished in the study corridor may contain asbestos and/or lead-based paint.

3.19.2. Hazardous Materials Impacts

No Build Alternative

The No Build alternative would not affect any potentially contaminated sites.

Build Alternatives

All build alternatives may affect 16 or more potentially contaminated sites recommended for Phase 2 or Phase 2.5 investigation during final design. Bridges in the study corridor may contain asbestos-containing materials. WisDOT considers all paint on bridges to be lead-based paint. Buildings to be acquired under the build alternatives could also contain asbestos-containing materials or lead-based paint.

3.19.3. Measures to Minimize and Mitigate Adverse Hazardous Material Impacts

Build alternatives were designed to stay within existing right of way as much as possible to minimize the impact on hazardous materials locations along the study corridor. If a build alternative is selected, WisDOT will conduct a follow-up Phase 2 or Phase 2.5 investigations to determine if sites present an environmental risk. During final design, WisDOT will develop remediation measures for contaminated sites that cannot be avoided. Disturbance near potentially contaminated sites will be minimized to the extent possible and practicable. As applicable, contract special provisions will include a Notice to Contractor describing the potential contamination with names and locations of sites.

Contractors must comply with USEPA regulations; National Emission Standards for Asbestos; the Occupational, Safety, and Health Administration regulations on asbestos removal; local government regulations; and all other applicable regulations. The most recent editions of all applicable standards, codes, or regulations shall be used. Additionally, any person performing asbestos abatement must comply with all training certification requirements, rules, regulations, and laws of the State of Wisconsin regarding asbestos removal.

The regional WisDOT office will work with concerned parties to ensure the disposition of any contamination is resolved to the satisfaction of WDNR, WisDOT and FHWA before acquisition.

During final design, WisDOT will inspect bridges that would be replaced for presence of lead-based paint and asbestos-containing materials. WisDOT will make copies of inspection reports available at the WisDOT region office.

During the project's real-estate acquisition phase, WisDOT will survey all buildings and structures that would be acquired and demolished to determine whether asbestos or lead-based paint is present. All appropriate and applicable engineering and regulatory controls will be followed during the handling and disposal of asbestos containing materials and lead-based paint.

3.20.Historic Properties

Section 106 of the National Historic Preservation Act (Section 106) and its implementing regulations at 36 CFR Part 800, require FHWA to consider the effects of its undertakings on historic properties and to provide opportunity for public input. To identify historic properties, WisDOT, on behalf of FHWA, investigated the undertaking's Area of Potential Effects (APE). The study corridor APE for above-ground resources (buildings and structures) is based on the range of alternatives being evaluated and generally includes properties along the Interstate within one-quarter

mile of I-39/90/94 between interchanges and bridge over/underpasses. To account for potential expanded construction footprints, WisDOT established the APE to include properties within one-half mile of interchanges and bridge over/underpasses. The investigation report and Determinations of Eligibility are included in Appendix I.

3.20.1. Affected Environment

Using the National Register of Historic Places (NRHP) criteria for evaluation, WisDOT identified several above-ground historic properties in the APE. They are listed in Table 3-69.

Table 3-69: Above-Ground Properties Listed In or Eligible for the NRHP

Property	Address	Description
Founder Shrine	5901 Cottage Grove Road, Madison, Dane County	NRHP-eligible as a religious property with well-preserved architecture representative of the influence of other regions and nationalities on architectural design in the United States and the continuous transmittal of ideas from one place to another and from the past to modern day.
Seminary Springs School	3153 Gaston Road, town of Burke, Dane County	NRHP-eligible for its association with the State of Wisconsin's early 20th century effort to consolidate rural schools. As an intact example of early 20th century school and overall property type.
Adam and Mary Smith House	2531 Smith's Crossing, Sun Prairie, Dane County	NRHP-listed property as a local example of Italianate style house.
Messerschmidt House	5723 US 51 (original site) 5446 Portage Road, Madison, Dane County (moved here in 2000)	Since the property was determined NRHP-eligible for its architectural value when at 5723 US 51 and retains its character defining architectural features at its new location, it is assumed to still be eligible.
William Black Farmstead	W9624 Black Road, Town of Dekorra	NRHP-eligible as a typical southern Wisconsin farm from the late nineteenth century and early twentieth century demonstrating the evolution of livestock farming. It was determined eligible for its vernacular agricultural outbuildings and dwelling typical of the World War II period. The farmhouse and all outbuildings excepting the pole barn are considered contributing resources.
Rocky Arbor State Park	N101 US 12 and 16, Wisconsin Dells	NRHP-eligible in the areas of conservation, entertainment/recreation and politics/government.

3.20.2. Impacts to Historic Properties

No Build Alternative

The No Build alternative would not impact historic properties.

Build Alternatives

WisDOT consulted with the State Historic Preservation Officer (SHPO) to determine the build alternatives' effect on historic resources in accordance with Section 106 evaluation criteria. Table 3-70 summarizes impacts at historic properties and determination of effect.

Table 3-70: Summary of Historic Properties, Impacts and Effects

Property	Impact	Effect
Founder Shrine	Build alternatives expand the Interstate, by adding either a new general-purpose lane or managed lane for a total of eight lanes. An auxiliary lane also would be added in each direction. The nearest traffic lane could move up to 12 feet closer to the Messerschmidt House, still about 1,000 feet east of the Interstate. No right of way acquired and no temporary construction easements.	No adverse effect
Seminary Springs School	New Milwaukee Street Interchange. New ramps would be approximately 1,000 feet from property and separated by a wooded area and farmland. No right of way acquired and no temporary construction easements.	No adverse effect
Adam and Mary Smith House	Property is near the center of a modern planned community in the northeast quadrant of the Reiner Road Interchange on US 151. Proposed improvements would be limited to the Reiner Road interchange with activities only extending to the US 151 northbound exit ramp and no alterations to the interchange. Proposed construction would be approximately 1,600 feet southeast of the property. No right of way acquired and no temporary construction easements.	No adverse effect
Messerschmidt House	Build alternatives expand the Interstate, by adding either a new general-purpose lane or managed lane for a total of eight lanes. An auxiliary lane also would be added in each direction. The nearest traffic lane could move up to 12 feet closer to the Messerschmidt House, still about 500 feet west of the Interstate. No right of way acquired and no temporary construction easements.	No adverse effect
William Black Farmstead	Build alternative would expand the Interstate to eight lanes with general purpose lanes in each direction. The new lanes would be constructed within the existing right of way, but a temporary limited easement (TLE) is expected from approximately 0.40 acres of the larger Black property, outside of the historic boundary, for drainage work. No right of way acquired and no impacts to resources associated with the historic farmstead.	No adverse effect

Property	Impact	Effect
Rocky Arbor State Park	Build alternative expands the Interstate to six lanes, increases length to entrance and exit ramps. Reconstruct US 12/WIS 16 Interchange to include a divided median for protected left turns. Impacts minimized by confining work along existing alignments. About 0.30 acres temporary construction easement (some within historic boundary). About 0.80 acres acquired outside historic boundary. None of the park's resources are in the temporary easement or acquired areas.	No adverse effect

3.20.3. Section 106 Consultation

WisDOT and FHWA have consulted with SHPO as required under Section 106 of the National Historic Preservation Act (NHPA). The SHPO concurred on Feb. 13, 2024 that the study alternatives would not have an adverse effect on historic properties, see Appendix I.

WisDOT also coordinated with Tribes that may be interested in participating in the Section 106 consultation process. WisDOT sent initial coordination letters to tribes in June 2022 to invite them to become consulting parties. The Forest County Potawatomi Tribe requested to remain a consulting party. The tribe did not have any comments on historic properties, see Appendix I.

Additional Tribal coordination continued through the study with WisDOT providing updates through WisDOT's agency coordination meetings held on Sept. 13, 2022, and Jan. 30, 2023. See Section 5.2.3 for additional discussion about Tribal coordination.

3.21.Archaeological Resources

3.21.1. Affected Environment

In 2022 WisDOT conducted a Phase I (site identification) archaeological survey of the archaeological APE. The APE includes areas of existing and proposed right-of-way where there may be direct, physical impacts. The Phase I survey included a literature search of published reports, site forms and reports on previously recorded sites on file at regional libraries, historical societies and the Wisconsin Historical Society. The survey included visual inspection, pedestrian field survey, surface collection and shovel tests as needed to verify the presence or absence of archaeological material within the APE. [94, 95]

The literature review identified 42 previously reported archaeological sites. WisDOT evaluated the archaeological sites for listing on or eligible for listing on the NRHP. Of the 42 previously reported sites, a single archaeological site was identified as potentially eligible for listing on the NRHP. This archaeological site was initially recommended potentially eligible for listing on the NRHP in 1995. The 2022 survey recovered additional cultural materials within the APE of this site. Another site of the 42 previously reported sites is listed on the NRHP, however the portion

[94] *Commonwealth Heritage Group. Phase I Archaeological Survey Report. WISDOT Project ID 1012-05-01 IH 39 STH 60 to Levee Road, Columbia County and WISDOT Project ID 1015-05-00 IH 90 STH 16/USH 12 to IH 39, Columbia, Juneau, Sauk Counties. January 2023.*

[95] *Commonwealth Heritage Group. Phase I Archaeological Survey Report. WISDOT Project ID 1012-05-02 IH 39 Madison-Portage, USH 12/18 to STH 60, Dane and Columbia Counties. October 2022.*

within the APE is disturbed by the roadbed and roadside ditch and is therefore recommended as not contributing to the site's eligibility. The remainder of the archaeological sites within the APE are disturbed and recommended as not eligible for the NRHP.

In addition to the 42 previously reported sites, the survey identified two previously unreported archaeological sites. One is an isolated lithic artifact, and one is a non-intact farmstead. Both are recommended not eligible for listing on the NRHP.

3.21.2. Impacts to Archaeological Resources

No Build Alternative

The No Build alternative would not affect archaeological resources.

Build Alternatives

The build alternatives would not affect the 44 (42 previously reported sites and 2 unreported sites) archaeological sites investigated in the APE.

3.21.3. Section 106 Consultation

WisDOT and FHWA have consulted with SHPO as required under Section 106 of the National Historic Preservation Act (NHPA). The SHPO concurred on Feb. 13, 2024 that the study alternatives would not have an adverse effect on archaeological properties, see Appendix I.

The Forest County Potawatomi Tribe requested to remain a consulting party. The tribe also requested in the event an Inadvertent Discovery occurs at any phase of the project or undertaking as defined, and human remains or archaeological materials are exposed as a result of project activities, work should cease immediately, and the tribe must be included with the SHPO in any consultation regarding treatment and disposition of the find, see Appendix I.

Additional Tribal coordination continued through the study with WisDOT providing updates through WisDOT's agency coordination meetings held on Sept. 13, 2022 and Jan. 30, 2023.

3.22.Cemeteries and Burial Sites

3.22.1. Affected Environment

Nine previously reported cemetery/burial sites overlap the APE. One cemetery was verified in the field along Portage Road between Hanson Road and Hoepker Road (Burke Lutheran Cemetery). The remaining eight burial sites are either no longer intact, disturbed within the APE or partially disturbed. No cultural materials or evidence of human burials were found within the APE at any of the burial sites. All burial sites are protected under Wisconsin §157.70.

3.22.2. Impacts to Cemeteries and Burial Sites

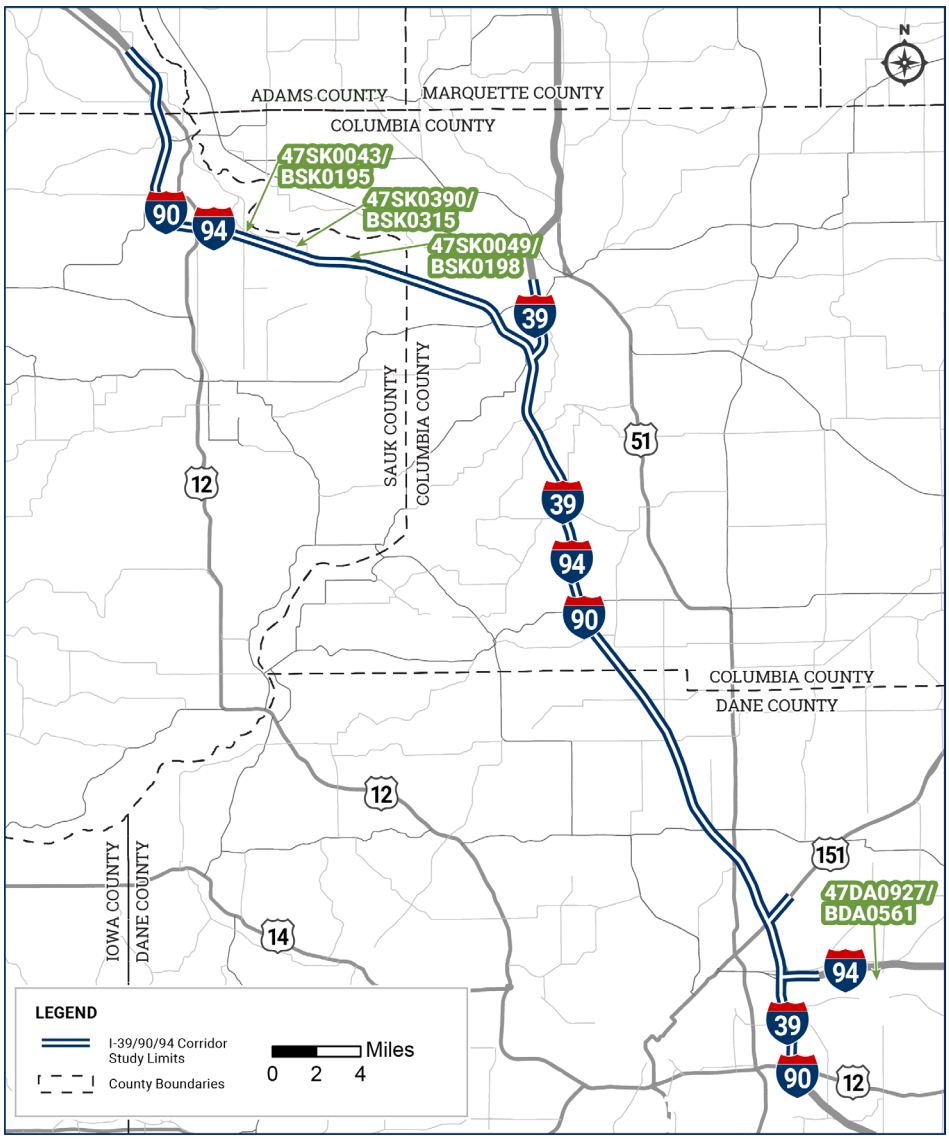
No Build Alternative

The No Build alternative would not affect burial sites.

Build Alternatives

Of nine burial sites, all the build alternatives potentially affect four burial sites within or next to the APE. While the four burial sites were previously or partially disturbed, monitoring is recommended during construction. A fence separates the graves at Burke Lutheran Cemetery from the APE and no monitoring is recommended if construction remains outside of the fenced cemetery. No further investigation is recommended at remaining four burial sites.

Figure 3-44: Burials Recommended for Monitoring During Construction



3.22.3. Measures to Minimize and Mitigate Adverse Cemetery and Burial Site Impacts

WisDOT in consultation with the State Historic Preservation Officer will implement additional monitoring during construction at the four burial sites within the APE. During final design, WisDOT will identify the burial sites on plans and note monitoring commitments in plan specifications for construction contractor instruction.

If human remains are inadvertently/accidentally discovered during implementation of the build alternatives, all ground disturbing activities in the immediate area of the discovery shall halt until the following actions have been carried out, in accordance with Wisconsin Stature 157.70 and the Native American Graves Protection and Repatriation Act, as required. WisDOT shall immediately implement measures to protect the human remains from inclement weather and vandalism and notify appropriate law environment officials to determine whether or not the remains are subject to a criminal investigation by local or federal authorities.

3.23. Recreational Properties

WisDOT identified private recreational properties within 1,000 feet of the study corridor. Public recreational properties subject to Section 4(f) of the 1966 U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act of 1965 are discussed in detail in Section 4.

3.23.1. Affected Environment

Private recreational properties include parks, playgrounds and recreational areas. Resources described below are noted on plan maps in Appendix A.

Joshua Circle Basketball Court. Located in a residential subdivision in the center of Joshua Circle cul-de-sac, west of the Interstate and south of Milwaukee Street.

Kennedy Little League Baseball Field. Located in the northeast quadrant of the I-94/WIS 30 Interchange.

Calvary Gospel Church Playground. Outdoor playground located in the northwest quadrant of the I-94/WIS 30 Interchange.

In My Garden Bilingual Day Care Playground. Outdoor playground located west of the Interstate, between Commercial Avenue and WIS 30.

Holy Cross Lutheran School & Early Learning Center. Located north of Commercial Avenue, near the northwest quadrant of the I-94/WIS 30 Interchange. A daycare, outdoor play area, baseball diamond, soccer field and basketball hoops are located on this site.

Lake Windsor Country Club. Located next to and east of the Interstate, north of the WIS 19 Interchange.

Cascade Mountain. Ski resort located next to and southwest of I-90/94 between the I-39 I-90/94 Interchange and WIS 33 Interchange on I-90/94. It has trails for skiing and tubing as well as a ski school, restaurant and ski shop.

Aldo Leopold Foundation Property. Nature center and recreation area is between Lake Delton and Portage approximately 700 feet north of I-90/94 at its closest point to the Interstate. The property has 2.5 miles of trails for hiking, skiing, or snowshoeing, the Leopold Center (the Aldo Leopold Foundation headquarters, visitor center and meeting space), the Shack (where Aldo Leopold and his family stayed on weekend retreats) and the Leopold Memorial Site.

Great Wolf Lodge and Kalahari Resorts and Conventions. Located on the north side of the US 12 Interchange in Wisconsin Dells. Recreational activities include indoor and outdoor water parks.

Polynesian Hotel. Located on the east side of I-90/94 at the WIS 13 Interchange. County H is on the north side of the hotel and WIS 13 is on the south side.

Yogi Bear's Jellystone Park Camp-Resort. Located next to and east of I-90/94 in Wisconsin Dells. The resort offers campsites and cabins for staying overnight and recreational amenities including an activity pool, water slides and mini golf.

Jewish Community Center (JCC) Camp Chi. Youth summer camp located next to and east of I-90/94 in Lake Delton at the WIS 23 Interchange. The camp has multiple outdoor amenities including swimming pools, tennis courts, cabins and a ropes course.

Spring Brook Golf Course. 9-hole golf course in the Spring Brook Vacation Home Resort located next to and west of I-90/94 in Wisconsin Dells.

Trappers Turn Golf Course. Located next to and east of I-90/94 in Wisconsin Dells. The golf course has 27 holes and a clubhouse for dining, meetings and special occasions.

3.23.2. Impacts to Private Recreational Properties

No Build Alternative

The No Build alternative would not affect privately held recreational properties.

Build Alternatives

Build alternatives may impact the following private recreational properties.

Cascade Mountain. The build alternative may acquire about 0.9 acres in a narrow strip along I-90/94 but would not affect the ski hill's operation.

Kalahari Resorts and Conventions. The build alternative may acquire about 0.2 acres from the south and west side of the resort's property along I-90/94 in order to reconstruct the exit ramp from I-90/94 to US 12 but would not affect the resort's operation.

Great Wolf Lodge. The build alternative may acquire about 0.8 acres from the south and east side of the lodge's property along I-90/94 in order to reconstruct the I-90/94 entrance ramp from US 12 but would not affect the lodge's operation.

Yogi Bear's Jellystone Park Camp-Resort. The build alternative may acquire about 0.1 acre in narrow strips along I-90/94 but would not affect the campground's operation. Because the two new general-purpose lanes would be added to the median, the outside edge of the Interstate would be the same distance from the campground as it is today.

Polynesian Hotel. Both the WIS 13 Split Diamond and Trumpet alternatives may acquire about 0.8 acres from the west side of the hotel, along the I-90/94 and the WIS 13 northbound exit ramp. The hotel and its parking lot would not be affected, but an approximately 3,000 square-foot building used for laundry and storage for maintenance supplies would be removed and relocated as discussed in Section 3.4 (Commercial and Industrial Development). Additionally, the Split Diamond alternative would close the westernmost two entrances to the property. WisDOT coordinated with the property manager to verify hotel functions would be maintained with a relocated support building and that access would be adequately maintained via a third driveway on County H, a fourth driveway on

N. Frontage Road along WIS 13, as well as an added access point where N. Frontage Road is reconstructed at the west side of the property.

Jewish Community Center (JCC) Camp Chi. The build alternative may acquire about 0.5-acre total from Camp Chi in narrow strips along WIS 23 and the WIS 23 northbound ramp onto I-90/94. The freeway would be the same distance from Camp Chi as it is today, but the westbound entrance ramp from WIS 23 to I-90/94 would be up to 15 feet closer than it is today.

Spring Brook Golf Course. The build alternative may acquire about 1.1 acres from the northern edge of the golf course. Construction may temporarily impact use of the seventh hole during construction, but use of the seventh hole would be returned after construction. Additionally, the seventh hole may need to be modified if it cannot be returned to its original configuration.

Trappers Turn Golf Course. The build alternative may acquire about 1.2 acres from the western edge of the golf course's Canyon course. Construction may temporarily impact use of the fourth and fifth holes during construction, but use of the holes would be returned after construction. Additionally, the fourth and fifth holes may need to be modified if they cannot be returned to their original configuration. A 2,100 square-foot shed with an attached 600 square-foot shed would be relocated on the golf course property, see also Section 3.4 (Commercial and Industrial Development).

3.23.3. Mitigation of Impacts to Private Recreational Resources

WisDOT designed the build alternatives to stay within existing right of way as much as possible to minimize the impacts to private recreational properties near the study corridor. During final design, WisDOT may require temporary easements to allow room for construction equipment and grading. Following construction, resource activities and features will be restored to current uses. At Spring Brook Golf Course, WisDOT will continue design refinements to minimize temporary construction impacts at the seventh hole. If the hole cannot be restored to its current configuration, WisDOT will coordinate with the golf course to develop a modified configuration. At the Trappers Turn Golf Course, WisDOT will continue design refinements to avoid and minimize property acquisition, minimize modifications at the golf course fourth and fifth holes and identify an alternate site for the relocated shed.

For those resources where the build alternatives require permanent property acquisition, WisDOT will follow state and federal requirements to fairly compensate the owner(s) and restore the function and use of the resource(s) to the extent practicable. Where it is not possible to avoid properties, acquisitions will be in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, 42 U.S.C. 4601-4655 (Uniform Act).

Before initiating property acquisition activities, WisDOT will contact property owners to give a detailed explanation of the acquisition process and Wisconsin's Eminent Domain Law set forth in Wis. Stat. s. 32.05. Any property acquired will be inspected by one or more professional appraisers. The property owner will be invited to accompany the appraiser during the inspection to ensure that the appraiser is informed of every aspect of the property. Property owners will be given the opportunity to obtain an appraisal by a qualified appraiser that will be considered by WisDOT in establishing just compensation. Based on the appraisal(s), the value of the property will be determined, and that amount offered to the owner.

3.24.Construction

This section identifies effects that would be expected during the construction phase for the build alternatives. Construction activities would include removing existing structures and roadways, bridge construction and widening, earthwork, utility relocations, drainage improvements, traffic control, traffic signals, barrier installation, lighting and paving.

Many factors would influence actual construction. The duration of construction is expected to be 10 to 15 years. Like most transportation projects, construction details cannot be fully defined until design advances past the conceptual stage.

3.24.1. Construction Costs

The No Build alternative would not initially incur construction costs. However, infrastructure across the study corridor would eventually need to be replaced, which would incur future construction costs. Maintaining the current study corridor infrastructure, in its current configuration, would cost an estimated $950.4 million in 2024 dollars. This alternative only assumes maintenance projects for mainline pavement. No pavement replacement or pavement reconstruction projects are included in the cost. This alternative does not represent how WisDOT would likely address this corridor's rehabilitation/reconstruction should the preferred alternative not move forward.

The immediate economic impact of the build alternatives would be expenditure of state and federal funds to reconstruct the study corridor. Additional local funds would also contribute to funding new interchanges in the city of Madison. Build alternatives' construction packages could cost up to $2.60 billion, with an additional $1.21 billion in real estate acquisition, design, utility, oversight and contingency costs (2024 dollars). In total, the build alternatives are estimated to cost up to $3.78 billion in 2024 dollars. When taking into account a preliminary potential construction schedule and using Global Insight inflationary numbers (ranging from 2.98% to 3.45%), the overall year of expenditure cost for the study corridor could cost up to $5.28 billion; this number could increase with any delays to the preliminary potential schedule or major variations in inflation percentages. Table 3-55 summarizes maximum estimated construction costs for build alternatives.

Table 3-71: Preliminary Cost Estimate Table

Build Alternative	Estimated Construction Package Cost (2024 dollars in millions)	Estimated Construction Package Cost (Year of Expenditure dollars in millions)
I-39/90/94 Mainline Freeway Modernization Plus added General-Purpose Lane (preferred alternative)	$1,434.3	$2,012.7
Modernization Hybrid	$1,419.7	$1,992.2
I-94/WIS 30 Interchange Full Modernization #2 (preferred alternative)	$460.1	$762.5
Proposed New Milwaukee Street Interchange Partial Cloverleaf (preferred alternative)	$16.4	$29.0

Build Alternative	Estimated Construction Package Cost (2024 dollars in millions)	Estimated Construction Package Cost (Year of Expenditure dollars in millions)
US 151 and High Crossing Boulevard Interchanges Directional (preferred alternative)	$301.7	$388.6
Proposed New Hoepker Road Interchange Shifted Diamond (preferred alternative)	$15.2	$18.4
US 51 Interchange Partial Cloverleaf (preferred alternative)	$28.7	$46.3
WIS 19 Interchange U-Ramp (preferred alternative)	$33.5	$47.8
County V Interchange (preferred alternative)	No Build; expected $7.0M cost by others	No Build; expected $7.2 (by others)
County V Diamond Interchange	$0.5	$0.6
County CS Interchange Diamond (preferred alternative)	$16.0	$24.2
I-39 I-90/94 Split and Cascade Mountain Road Interchanges Low Build (preferred alternative)	$158.6	$211.4
WIS 33 at I-39 Interchange Diamond (preferred alternative)	$27.7	$34.5
WIS 33 at I-90/94 Interchange Partial Cloverleaf (preferred alternative)	$15.6	$21.5
US 12 Interchange Diverging Diamond (preferred alternative)	$17.1	$20.7
WIS 23 Interchange Diamond (preferred alternative)	$9.9	$12.3
WIS 13 Split Diamond Interchange	$26.1	$31.5
WIS 13 Trumpet Interchange (preferred alternative)	$19.2	$23.2
US 12/WIS 16 Interchange Diamond (preferred alternative)	$10.9	$13.6

Source: WisDOT

3.24.2. Operation and Maintenance Cost

The economic impact of the No Build alternative would be the long-term cost of maintaining the Interstate and interchanges, including pavement resurfacing or replacement, and bridge rehabilitation or replacement. Increased

traffic volumes, particularly heavy trucks, would contribute to the frequency of required pavement maintenance. The public and local governments would experience increased costs associated with crashes compared to build alternatives.

Maintenance costs under the build alternatives would be less than the No Build alternative because pavement, bridges and structures would be new. Snow removal costs would be higher for build alternatives that include additional travel lanes as compared to the No Build alternative.

3.24.3. Construction Employment

No substantial short-term construction employment related economic impacts would result from the No Build alternative.

Substantial short-term construction employment related economic impacts would result from the build alternatives compared to the No Build alternative. WisDOT anticipates implementing over 60 construction projects under build alternatives. On average, each construction project would employ about 100 on-site and off-site workers. The impacts may be measured by increases in state output/economic activity, employment and job earnings. Construction expenditures would occur over the duration of construction, directly creating new demand for construction materials and jobs. The direct impacts would lead to indirect or secondary economic impacts, as output from other industries increases to supply the construction industry. The direct and indirect impacts of construction expenditures cause firms in all industries to employ more workers, leading to induced impacts as the additional wages and salaries paid to workers lead to higher consumer spending, creating new demand in many other economic sectors.

The construction job opportunities for the build alternatives would consist of a combination of new jobs and shifting of existing construction jobs to this study corridor. The following types of construction jobs are required for the build alternatives: concrete and asphalt workers, iron workers, truckers, general laborers, heavy equipment operators, engineers, electricians, landscapers and surveyors. Construction employment provides opportunities for local business enrolled in WisDOT's Disadvantaged Business Enterprise (DBE) program.

WisDOT has a robust DBE program as evidenced by prior years of participation. Depending on the type of project, WisDOT anticipates the DBE goals to range between 6 percent and 12 percent. The DBE opportunities are tailored to each individual project. If a DBE opportunity does not exist in the individual project, then the DBE goal could be reduced due to lack of opportunities. WisDOT will work collectively with industry to make sure all opportunities are advertised and available.

3.24.4. Construction Impacts and Mitigation

No Build Alternative

Under the No Build alternative, no construction impacts, other than regular maintenance, would occur in the short term. However, WisDOT would perform maintenance on the Interstate more frequently and eventually replace it, resulting in periodic lane closures, construction noise, dust and other impacts as portions of freeway are replaced.

Build Alternatives

Impacts associated with build alternatives and possible mitigation measures would be addressed at various points during the planning, design and construction stages. Implementation of most mitigation measures would take place during the construction stage and would be specified in construction documents. The following sections describe potential construction related impacts associated with the build alternatives and associated mitigation.

Noise

Noise would be generated by construction equipment used to reconstruct Interstate and portions of local roadway within the study corridor. Typical construction equipment includes dump trucks, graders, cranes, bulldozers, pile-driving equipment and pavement construction equipment. The noise generated by the construction equipment would vary greatly, depending upon the equipment type and model, mode and duration of operation, and specific type of work effort; however, typical noise levels may occur in the 75 to 95 dBA range at a distance of 50 feet. Other distance-typical noise level ranges are shown in Table 3-72.

Table 3-72: Construction Noise/Distance Relationships

Distance From Construction Site (feet)	Range of Typical Noise Levels (dBA)[1]
25	82-102
50	75-95
100	69-89
200	63-83
300	59-79
400	57-77
500	55-75
1,000	49-69

[1] Point Sources = 6 dBA reduction per doubling of distance (Source: EPA and WisDOT)

Sources: WisDOT FDM 23-40-1.2 Attachment 1.1

Variations in building setbacks and land use, local intensity of specific construction activities, and sequencing and timing of construction would result in varying degrees of exposure to construction noise and hence varying levels of resulting impacts. Adverse impacts related to construction noise are anticipated to be of a localized, temporary, and transient nature. WisDOT will conduct a public involvement process to inform noise-sensitive receptors about construction activities. Construction noise will be controlled in accordance with FDM 23, Section 23-40-1, including measures described below.

WisDOT Standard Specifications 107.8(6) and 108.7.1 will apply. This includes checking for and complying with local ordinances governing the hours for operation of construction equipment and obtaining the engineer's written approval for operations between the hours of 10:00 p.m. to 6:00 a.m. Pursuant to WisDOT Standard Specification 108.7.1(3), motorized construction equipment will be required to have mufflers constructed in accordance with the equipment manufacturer's specifications or a system of equivalent noise-reducing capacity.

WisDOT will also require that mufflers and exhaust systems are maintained in good operating condition, free of leaks and holes.[96]

Vibration

Ground-borne vibration has the potential to affect nearby buildings. Blasting and impact pile driving are associated with high levels of vibration. Excavation and backfilling can generate vibration that is perceptible or noticeable in nearby buildings.

Vibration from construction vehicles such as graders, loaders, dozers, scrapers and trucks is generally of the same order of magnitude as the vibration caused by heavy vehicles traveling on streets and highways. In general, ground-borne vibration from vehicles on streets is not sufficient to impact adjacent buildings.

Buildings that are in good structural condition would likely not be affected by construction-related vibration. Prior to construction, WisDOT will coordinate with adjacent property owners of buildings near construction areas that are in poor structural condition and complete crack and damage surveys as needed. WisDOT would notify potentially affected residents prior to vibration-intensive activities. WisDOT will meet the city of Madison and other affected municipalities with vibration ordinances.

Air Quality (Emissions and Dust)

Demolition and construction activities can result in short-term increases in equipment related emissions and fugitive dust in and around the study corridor. Air quality impacts during construction would be generated by motor vehicles, machinery, earthwork and other construction activities. Equipment-related particulate emissions could be minimized if the equipment is well maintained. The potential air quality impacts would be short-term, occurring only while demolition and construction work is in progress and when specific weather conditions are present.

Air quality impacts during construction would be generated by motor vehicle, machinery, and particulate emissions resulting from earthwork and other construction activities. Construction vehicle activity and the disruption of normal traffic flows may result in increased motor vehicle emissions within certain areas. Construction vehicle emission impacts will be mitigated through implementing and maintaining a comprehensive traffic control plan, enforcing emission standards for gasoline and diesel construction equipment, and stipulating that unnecessary idling and equipment operation is to be avoided. In addition, WisDOT will work with the applicable local units of government when identifying haul routes in the final construction plans and specifications to minimize construction traffic from using roadways near schools, daycare facilities and parks when possible.

Several air-quality construction mitigation best practices are available to assist in reducing diesel emission impacts from construction equipment. Off-road diesel engines can contribute significantly to the levels of particulate matter and nitrogen oxides in the air. Several air quality construction mitigation best practices are available to assist in reducing diesel emission impacts from construction equipment. In recent years, USEPA has set emissions standards for engines used in most new construction equipment. However, construction equipment can last for a long time, and it may take years before all equipment is furnished with engines that meet USEPA standards. To address this, WisDOT and FHWA will implement several strategies to reduce emissions, on a voluntary or mandatory basis, including the following:

- Reducing unnecessary idling at the construction site to reduce emissions and fuel consumption.

[96] *See note 43 above*

- Properly maintaining of the diesel engines so that engines perform better and emit less pollution.
- Switching to fuels that contain lower levels of sulfur to reduce particulate matter. Using ultra-low sulfur diesel does not require equipment changes or modification. Using fuels that contain a lower level of sulfur also tends to increase the effectiveness of retrofit technologies.
- Retrofitting off-road construction equipment with diesel-emission control devices to reduce particulate matter, nitrogen oxides, carbon monoxide, or hydrocarbons, in addition to other air pollutants. Diesel particulate filters can be used to physically trap and oxidize pollutants in the exhaust stream.

USEPA's comments during the Scoping period suggested several measures to reduce emissions from construction equipment during construction, see Appendix B. In final design, WisDOT will consider including the measures on a voluntary or mandatory basis.

Fugitive dust impacts generated by construction will be mitigated by standard dust control measures. The measures may include frequent watering of construction sites that have large expanses of exposed soil, watering debris generated during the demolition of existing structures, washing construction vehicle tires before they leave construction sites, and securing and covering equipment and loose materials prior to travel.

Dust and particulates control during construction will be accomplished in accordance with WisDOT's current Standard Specifications for Highway and Structure Construction[97], which requires applying water or other dust control measures during grading and on haul roads. The contractor is responsible for treating vulnerable areas of the project, as necessary, to control dust from construction equipment and public traffic.[98] Any special provisions developed during coordination with WDNR regarding air-quality standards and emissions would also apply. Any portable material plants would be operated in accordance with WDNR air-quality requirements and guidelines. The WisDOT project engineer would also be responsible for approving the location of any concrete batch plant or portable material plant. Demolition and disposal of residential or commercial buildings is regulated under WDNR's asbestos renovation and demolition requirements (Wis. Admin. Code, Chapter NR 447 Control of Asbestos Emissions). Section 3.18.5 includes additional mitigation measures to reduce construction related GHG emissions and air quality impacts.

Traffic, Construction Staging, Transit, Bicycles and Pedestrians

During construction, I-39/90/94 will be open to traffic. However, at times some traffic will be diverted away from the Interstate to avoid construction. When traffic is diverted, other freeways and local roads would experience increased traffic volumes and congestion. During construction, traffic would divert from segments of the Interstate, especially if interchange ramps are closed for extended periods. Other local streets, such as US 51 in Madison, would experience increased traffic volumes during construction as a result. After a preferred alternative is selected, WisDOT will begin developing the construction staging plan during design. After the construction staging plan is developed, WisDOT will analyze how much traffic would be diverted from the Interstate and the routes to which the traffic would divert. WisDOT, as part of their analysis, will determine if improvements to these routes are necessary before traffic diversions begin. Impacts of needed improvements on other routes will be evaluated in separate environmental review documents, in accordance with NEPA, as required.

---

[97] See note 43 above

[98] Wisconsin Department of Transportation. 2024 Standard Specifications (Standard Spec) – 623 Dust Control Surface Treatment. https://wisconsindot.gov/rdwy/stndspec/ss-06-23.pdf. Accessed March 22, 2024

While there are no current transit, pedestrian or bicycle routes directly on the Interstate, there are several crossings that could be impacted during construction. Pedestrian and bicyclists that cross I-39/90/94 may need to temporarily modify their routes during construction. Local street construction will be staged to minimize impacts to the local route crossings. Local Metro routes that use Hanson Road, US 151, High Crossing Boulevard, Milwaukee Street and Cottage Grove Road may need to be temporarily modified during construction.

WisDOT's transportation management planning process includes outreach to communicate construction plans and schedules to the general public, including environmental justice populations, emergency service providers, schools and transit providers. WisDOT would not close successive Interstate crossings to minimize indirection for transit service and bicyclists and pedestrians.

Construction staging plans will be developed to ease disruptions to the extent possible. WisDOT will analyze these plans and assess the amount of traffic estimated to be diverted and develop a Transportation Management Plan to minimize delay and disruption of normal traffic flow. Other mitigation factors may include:

- Holding workshops to determine methods to reduce the effects of construction on local communities
- Creating and implementing a public involvement plan to inform the public of real time construction activities
- Encouraging use of transit and other alternative modes of transportation
- Encouraging businesses to modify work schedules and/or shipping schedules to avoid peak-period traffic
- Improving detour routes to accommodate diverted traffic resulting from construction
- Identifying bicycle and pedestrian detour routes and staging local street closures to minimize or avoid closure of adjacent streets at the same time.

There are few schools and other areas where children congregate near the Interstate, but some facilities are present in the vicinity of the I-94/WIS 30 Interchange. To the extent practicable, the transportation management plan would instruct contractors to route construction traffic away from these facilities.

Water Quality/Erosion

Construction in and near waterways would be performed in accordance with WisDOT's Standard Specifications for Highway and Structure Construction, Wis. Admin. Code Chapter TRANS 401-Construction Site Erosion Control and Stormwater Management Procedures, and the WisDOT/WDNR Cooperative Agreement - Memorandum of Understanding on Erosion Control and Stormwater Management[99]. Appropriate techniques and best management practices (BMPs), as described in the WisDOT FDM Chapter 10, Erosion Control and Storm Water Quality, will be employed to prevent erosion and to minimize siltation to environmentally sensitive resources in the project area.[100] Erosion control devices will be installed before erosion-prone construction activities begin. Section 3.11 (Surface Water) describes the range of measures WisDOT would take to minimize and mitigate surface water quality and erosion impacts.

There is potential for erosion during construction as soils are disturbed by excavation and grading. WisDOT's construction contractor will adhere to the Wisconsin Pollutant Discharge Elimination System Transportation Construction General Permit (TCGP) for stormwater discharges and use standard erosion control devices and BMPs

[99] *Wisconsin Department of Transportation. Attachment A1 to the DOT/DNR* Cooperative Agreement *Memorandum of Understanding on Erosion Control and Stormwater Management. October 1994.*

[100] *Wisconsin Department of Transportation. Facilities Development Manual Chapter 10: Erosion Control and Storm Water Quality. Feb. 15, 2024.*

to reduce and control the deposit of sediment into environmentally sensitive resources before erosion-prone construction begins. The construction contractor will be required to prepare an Erosion Control Implementation Plan that includes all erosion control commitments made by WisDOT while planning and designing the project. The construction plans and contract special provisions must include the specific erosion control measures agreed on by WisDOT in consultation with WDNR. WDNR will review the Erosion Control Implementation Plan.

The following measures will be used during construction:

- Minimizing the amount of land exposed at one time
- Silt fencing
- Sedimentation traps
- Dust abatement
- Turbidity barriers
- Street sweeping
- Inlet protection barriers
- Temporary seeding
- Erosion mats
- Ditch or slope sodding
- Seeding and mulching exposed soils

Under the WisDOT/WDNR Cooperative Agreement, Memorandum of Understanding on Erosion Control and Stormwater Management, following construction, disturbed land will be re-seeded with a mix of fast-growing grasses. Drainage systems will be maintained, restored or re-established in a manner that would not impound water.

Additional construction impact mitigation techniques, as prescribed in the WisDOT FDM Chapter 10 and the WisDOT Construction and Materials Manual Section 130, may include the following – as needed to manage water quality and erosion – at any particular locations:

- If dewatering is required, dirty water will be pumped into a settling basin before it would be allowed to re-enter a stream.
- Trenched-in erosion bales will be installed in areas of moderate velocity runoff; clean-aggregate ditch checks will be installed in ditches with moderate- to high velocity runoff during and after construction; and ditches will be protected with erosion bales and matting in conjunction with seeding.
- Storing and fueling construction equipment will be done in upland areas, away from environmentally sensitive areas. Accidental spills during refueling at construction sites or as a result of an accident involving hazardous material haulers will be handled in accordance with local government response procedures. First response would be through local fire departments and emergency service personnel to ensure public safety and to contain immediate threats to the environment. Depending on the nature of the spill, the construction contractor will notify WDNR to receive additional instructions regarding cleanup and restoration of any affected resources. The cost of cleanup operations will be the responsibility of the contractor or carrier involved in the spill. Further, per WisDOT's Standard Specifications, public safety and environmental protection measures will be enforced by the construction contractor.

- Pursuant to Wis. Admin. Code Chapter NR 40, contractors will be required to follow WDNR guidelines for ensuring that construction equipment used in or near waterways is adequately decontaminated for aquatic plants and aquatic animals.
- Dispose of slash and debris piles associated with clearing and grubbing
- Install and maintain erosion control devices such as erosion matting, silt fencing and silt screens to prevent soil erosion, and which comply with USFWS guidelines for wildlife safe devices.
- Install tracking pads at entrances to construction sites to minimize soil transportation on/off the site
- Revegetate all disturbed areas with appropriate plant species
- WisDOT and FHWA are also required to take specific actions, as directed from Section 7 consultation with USFWS, that may overlap with the control of invasive plant species, including inspecting and cleaning equipment and vehicles for invasive plant materials, seeds, and aquatic animals

WisDOT will implement additional measures described in Section 3.11-Surface Water to avoid and minimize impacts to Mirror Lake during bridge demolition and construction activities.

Material Source and Disposal Sites

The construction contractor is responsible for selecting material source sites for gravel and soil. Material would most likely be obtained from local quarry sites. The contractor will use material source sites that WisDOT has verified no sensitive resources are adversely impacted, including wetlands, threatened or endangered or cultural resources. Unusable excavated material will be disposed of by the contractor in accordance with the erosion control implementation plan (ECIP) as required under Trans 401 of the Wisconsin administrative code to ensure protection of wetlands and waterways. [101] The construction contractor will abide by all local zoning regulations and requirements, prepare a reclamation plan as required and obtain any other required local, state and federal approvals for material source/disposal sites.

Soil and excavated material, including vegetation, will be stockpiled or disposed of in an upland area, away from wetlands, streams and other open water. Where applicable, silt fence or other sediment control device, will be placed between the disposal area and any wetland and open water areas.

If any material sources are necessary to construct the project, appropriate erosion control measures will be applied to these sites during and following construction; and following use, such site will be properly seeded, mulched and protected from erosion.

Any portable material plants will be properly managed to prevent erosion and WisDOT will coordinate with WDNR to review site plans, including any gravel-washing operations, high-capacity wells and site closure/restoration.

To the extent practicable and in consultation with WDNR, WisDOT will consider implementing USEPA's recommendation for opportunities to reuse and/or recycle exiting pavement and other practices outlined in USEPA's Sustainable Management of Construction and Demolition Materials webpage. [102]

[101] *Wisconsin Department of Transportation. 2024 Standard Specifications (Standard Spec). https://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/rdwy/stndspec.aspx. Accessed Jan. 23, 2024.*

[102] *U.S. Environmental Protection Agency. Sustainable Materials Management. Sustainable Management of Construction and Demolition Materials. https://www.epa.gov/smm/sustainable-management-construction-and-demolition-materials. Accessed Jan. 23, 2024.*

Noxious Weeds and Invasive Species

Construction activities may introduce noxious weeds or other invasive plants species into the study corridor. Noxious weeds may also spread from parcel to parcel by construction equipment and project activities. Mitigation and control of noxious weeds and invasive species will be conducted in accordance with Wis. Admin. Code Chapter NR 40 Invasive Species Identification, Classification and Control. Techniques and BMPs used to minimize and mitigate the spread of noxious weeds are described under WisDOT Standard Specification 213 Finishing Roadway and 628 Erosion Control. [103] These include but are not limited to the following:

- Destroying noxious weeds within the right of way
- Dispose of slash and debris piles associated with clearing and grubbing
- Install and maintain erosion control devices such as erosion matting, silt fencing and silt screens to prevent soil erosion, and which comply with USFWS guidelines for wildlife safe devices, such as biodegradable netting. [104]
- Install tracking pads at entrances to construction sites to minimize soil transportation on/off the site
- Revegetate all disturbed areas with appropriate native or non-invasive plant species

WisDOT and FHWA are also required to take specific actions, as directed from Section 7 consultation with USFWS, that may overlap with the control of invasive plant species, including, inspecting and cleaning equipment and vehicles for invasive plant materials and seeds.

Cultural Resources

If previously unrecorded cultural resources are found during construction, activities in the site area would be immediately halted, and the WisDOT construction project manager would immediately notify WisDOT's Bureau of Technical Services, who would then notify FHWA and any interested consulting parties. No work would occur in the area until consultation with aforementioned parties is complete.

3.25.Indirect Impacts

This subsection summarizes the indirect impacts analyses of the I-39/90/94 Corridor Study. The complete Indirect and Cumulative Impact Analysis technical memorandum is in Appendix H.

40 CFR 1508.1(g) defines indirect impacts as follows: Indirect effects, which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to the induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems.

The indirect impacts analysis used the following systematic six-step approach as outlined in WisDOT's Guidance for Conducting an Indirect Effects Analysis (November 2014):

- Step 1: Scoping, selecting tools/activities and determining the study area.
- Step 2: Inventory the study area and notable features.
- Step 3: Identify the impact-causing activities of the proposed corridor alternatives.

---

[103] *See note 43 above*

[104] *Make the Change to Wildlife-Friendly Erosion Control Products! | U.S. Fish & Wildlife Service (fws.gov). Accessed May 11,2024.*

- Step 4: Identify the potentially significant indirect effects.[105]
- Step 5: Analyze the indirect effects, describe their significance for the corridor alternatives, and evaluate assumptions.
- Step 6: Assess consequences and identify mitigation activities.

The following subsections summarize the six steps.

3.25.1. Step 1: Scoping, Selecting Activities and Determining Study Area

The goals of the first step of the analysis are to gather information on the issues to be evaluated in the analysis; determine the tools and techniques to be employed in the analysis; and determine the location and extent of the Indirect Impacts study area.

Scoping Indirect Effects

WisDOT and FHWA published a notice of intent (NOI) to the Federal Register on July 18, 2023, to solicit comment and advise the public, agencies, and stakeholders that an EIS will be prepared for the study. WisDOT and FHWA received seven comments from federal, state, and local government agencies in response to the NOI for I-39/90/94 Corridor Study. Comments requested consideration of the potential for land use change at interchanges, as well as the potential for indirect air quality, wetlands, and surface water impacts, which this analysis has accounted for in considering potential impacts.

Selecting the Tools and Activities

The study team employed an array of tools and activities recommended in WisDOT's Guidance for Conducting an Indirect Effects Analysis[106], such as reviewing a variety of technical and statistical data, local and regional information, and plans, including past indirect and cumulative impacts analyses completed for projects in the study area, and other data/analyses collected in the environmental documentation process to conduct the analysis. The study team also conducted a survey and five expert panel meetings in March 2023 with local planners and agency officials in the region, including representatives from: Greater Madison MPO, Dane County, city of Madison, city of Sun Prairie, village of DeForest, village of Windsor, Columbia County, city of Portage, town of Arlington, town of Caledonia, Sauk County, city of Wisconsin Dells, University of Wisconsin Madison, Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), and Wisconsin Department of Natural Resources (WDNR). WisDOT interviewed expert panel members and used their input to identify available information and data, the indirect impacts study area as well as garner input on indirect impact issues.

Determining the Indirect Effects Study Area

The Indirect Impacts study area is the geographic area that may experience indirect impacts from the proposed build alternatives. The boundaries for the analysis need to extend beyond the potential footprint of the proposed

[105] *Effects and impacts are used interchangeably. This section will use the term impacts, except at locations where "effects" is used by the guidance that is cited.*

[106] *American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence. Practitioner's Handbook 12, Assessing Indirect Effects and Cumulative Impacts Under NEPA. August 2016.*

transportation project, since indirect impacts can occur at some distance from a proposed project. Several techniques are available to determine the study area for indirect impacts. These include adopting geographical or political boundaries, watershed or habitat boundaries, and incorporating input from stakeholders. The study team used a combination of accepted techniques for delineating the study area for indirect effects, including political boundaries, resources boundaries, professional judgement, data collection, and stakeholder interviews. Refer to Figure 3-45 and Figure 3-46, Indirect Impacts study area boundary. The Indirect Impacts study area is approximately 76.4 square miles and encompasses the social, historic, and natural resources that have the greatest likelihood for indirect impacts.

Figure 3-45: Indirect Impacts Study Area Dane County

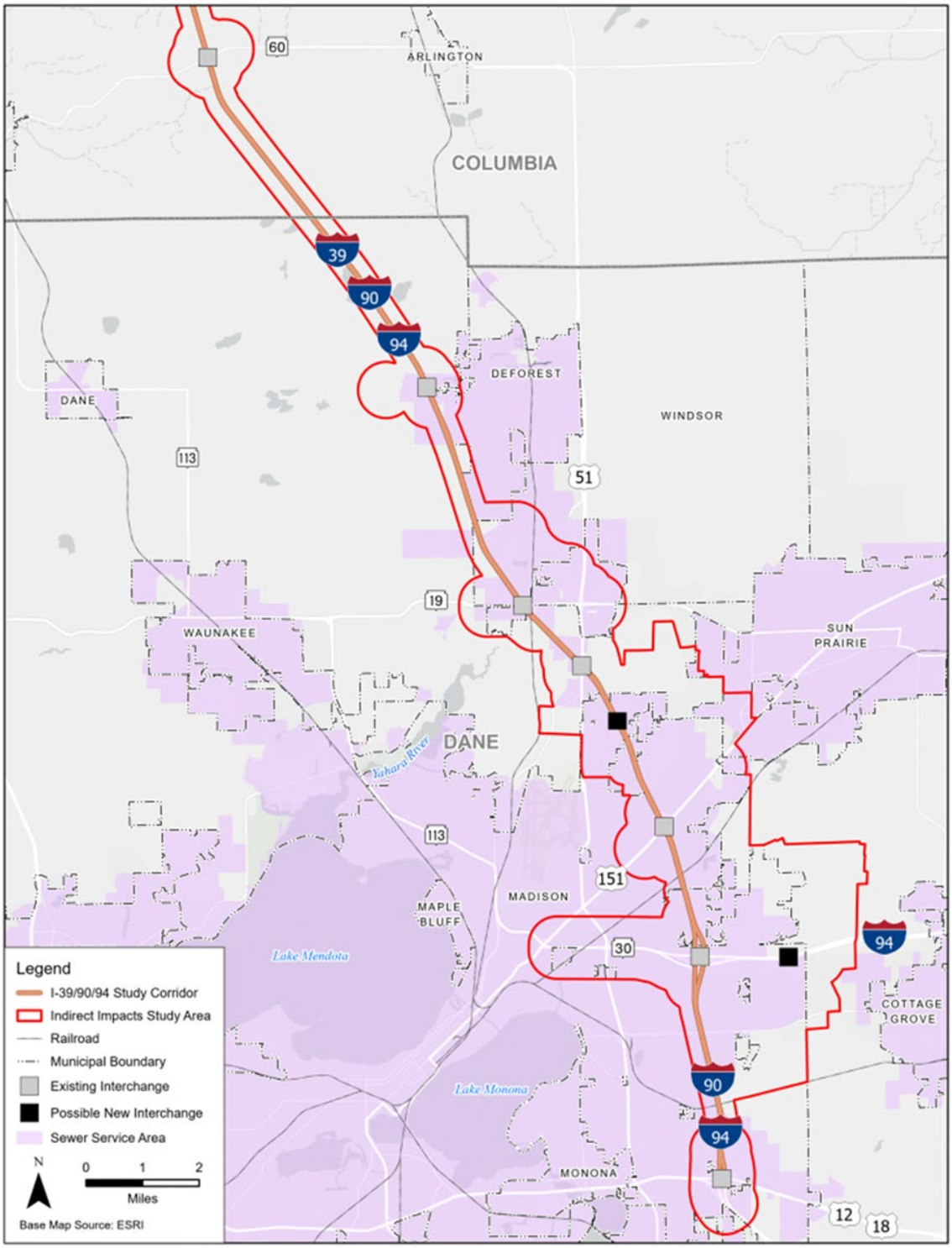
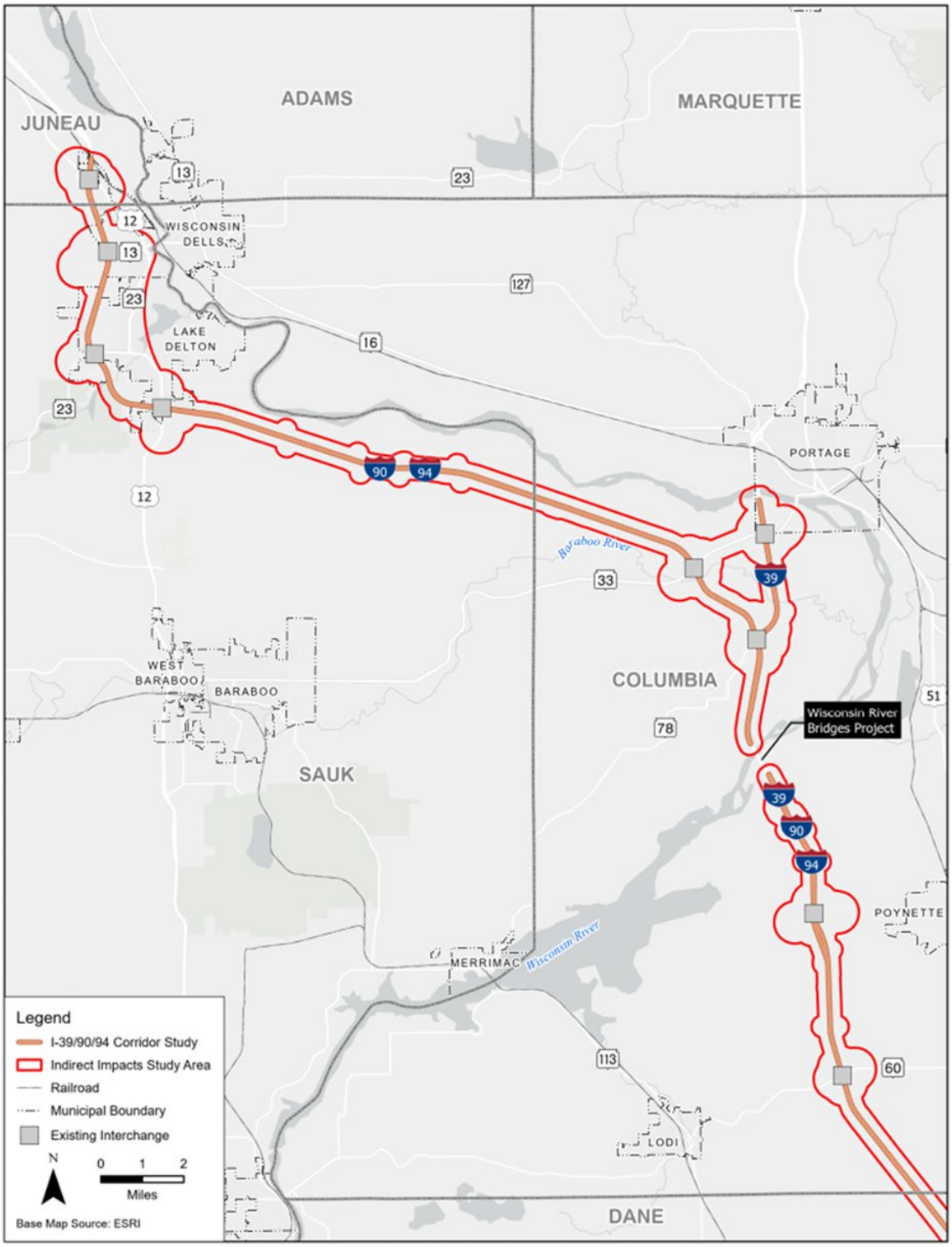


Figure 3-46: Indirect Impacts Study Area Columbia, Sauk and Juneau Counties



3.25.2. Step 2: Inventory the Study Area and Notable Features

This section summarizes the local, regional, and state plans; state and local regulations, including the regulatory framework for future growth (including zoning and other ordinances); socioeconomic trends; land use and development; natural and historic resources; and other pertinent location-specific information that could be affected by indirect impacts. More detailed information is provided in the technical memorandum, Appendix H.

Regional and Local Plans

Regional and local comprehensive plans provide insight to the growth-related goals and aspirations of a community. Understanding community goals and aspirations within the indirect impacts study area provides a basis for assessing project compatibility and potential impacts.

The proposed action is mostly consistent with community comprehensive plans. The city of Madison and the Greater Madison Metropolitan Planning Organization (MPO) explicitly support the potential new interchange at Milwaukee Street. The Greater Madison MPO and Capital Area Regional Plan Regional Planning Commission support the potential new interchange at Hoepker Road, which is not addressed in the city of Madison's plans. The Columbia County Comprehensive Plan 2030 references adding lanes to I 90/94 between I-39 and the Wisconsin Dells but does not explicitly identify a position (i.e., support or opposition to the improvements). The Sauk County Comprehensive Plan does not address improvements to I-90/94 but recognizes the importance of investing in traditional transportation corridors while encouraging alternative modes.

Local communities along the study corridor recognize I-39/90/94 as an asset and identify opportunities for commercial, business, and industrial development near interchanges. During the expert panel process the city of Sun Prairie in Dane County mentioned that although their community plans do not explicitly mention the I-39/90/94 improvements, the community recognizes the potential benefits of improved access and an improved transportation network in the area. Two neighborhood development plans (Sprecher and Northeast) in the city of Madison in the vicinity of the Milwaukee Street Interchange have expressed support for a new interchange. Towns in Columbia and Sauk counties, including Arlington, Caledonia, Dekorra and Delton, prefer to see new commercial development take place in areas near the interchanges with I-39/90/94.

State and Local Regulations

Wisconsin's comprehensive planning and smart growth law requires that as of 2010, county and local land use actions be consistent with comprehensive plans. Effectively, the law required all local governments in Wisconsin to have a comprehensive plan in place by 2010, to be able to engage in programs or actions that affect land use.

Local jurisdictions employ the following regulations to manage future growth: zoning ordinance, subdivision ordinance, official map, tax incremental financing (TIF) districts, extraterritorial jurisdiction and cooperative boundary plans. All jurisdictions in the indirect impacts study area have zoning ordinances and the majority have subdivision ordinances.

Six Dane County-administered ordinances, three Columbia County-administered ordinances, four Sauk County-administered ordinances, three Juneau County-administered ordinances, NR 121 Water Quality Planning and local government administered ordinances provide the tools for environmental preservation in the study area.

Socioeconomic Data and Trends

This section describes socioeconomic trends that have the potential to influence transportation demand and land use in the indirect impacts study area.

Dane County is the most populous county in the study area. In 2021 it had a population of 555,474, and Dane, Columbia, Sauk and Juneau counties had a combined population of 705,716. Between 2010 and 2021, Dane, Columbia, Sauk and Juneau counties experienced an approximately 1.0% average annual growth rate, with Dane County experiencing the highest average annual growth rate at approximately 1.25%. This was faster than the average annual growth rate of 0.3% across the state of Wisconsin. The Wisconsin Department of Administration forecasts that Dane, Columbia, Sauk and Juneau counties will experience average annual growth rates between 0.5% and 1.0% over the period 2021 to 2040. The municipalities and minor civil divisions in the study area will experience a combined average annual growth rate of 0.5%. Most municipalities and jurisdictions also experienced growth in the number of households between 2010 and 2021. All communities are projected to see more households by 2040.

WisDOT performed an analysis to identify environmental justice populations, including minority and low-income populations, which is described in Section 3.9. The build alternatives are not expected to result in disproportionately high and adverse effects to environmental justice populations within the study area.

Wisconsin is split into 11 Workforce Development Areas (WDAs) and employment projections are made every two years for the WDAs. Dane, Columbia and Sauk counties are part of the South-Central WDA where regional employment is expected to grow by 11.2% from 2020 to 2030, amounting to 55,901 additional jobs. This growth rate outpaces the state, which is projected to grow by 6.3% during the same period. Juneau County is part of the Western WDA where regional employment is expected to grow by 6.5% (10,029 jobs) over the 10-year period.

Land Use and Development Trends

Land uses in the indirect impacts study area vary from urban to rural, and generally consist of residential, commercial, industrial, agricultural, public land and open spaces. Dane County, which includes the Madison metropolitan area, is more urbanized compared to other counties in the study area. Outside of the city of Wisconsin Dells and village of Lake Delton in Sauk County, a major tourist destination, land uses in the indirect impact study area in Columbia, Sauk and southern portion of Juneau County are largely agricultural, low-density residential and open space.

The I-39/90/94 study area has experienced continued growth over the years, primarily in the Madison metropolitan area. In the more rural sections of the study area, there has been modest residential, commercial, and industrial growth. In Dane County, the study area is experiencing ongoing development, attracting major employers and jobs. The city of Madison has identified priority growth areas including peripheral neighborhood expansion and future mixed-use centers. Some of these future growth areas occur in the indirect impacts study area, including adjacent to the two proposed new interchanges (Milwaukee Street and Hoepker Road).

In Madison, the area east of the I-39/90/94 study corridor between WIS 30 and US 151/High Crossing Boulevard is platted for development. Much of the areas north and south of US 151 east of the US 151/High Crossing Boulevard Interchange are built out, including at The American Center, a 447-acre business park. Within The American Center, the UW Health Eastpark Medical Center is under construction and the Commons District is planned. Along Hoepker Road and I-39/90/94 study corridor much of the land is developed or protected from development. To support planned development near Hoepker Road and I-39/90/94, the city of Madison requested

WisDOT to evaluate an interchange at Hoepker Road. North of Madison in DeForest, a number and variety of developments are planned or ongoing.

Outside of Dane County, development is more limited within the indirect impacts study area, though tourist-oriented development continues in the Wisconsin Dells area. Additional ongoing and planned development projects in the indirect impacts study area identified during meetings with local and regional planners can be found in Section 3.26, Cumulative Impacts.

Development is restricted on some of the agricultural land next to I-39/90/94. Wisconsin has a Farmland Preservation Program, which helps farmers and local governments preserve farmland, protect soil and water and minimize land use conflicts with agriculture. Through participation in the program, counties develop farmland preservation plans; local governments can develop farmland preservation zoning districts; and landowners and local governments together form Agricultural Enterprise Areas (AEAs). There are two AEAs in the indirect impacts study area, the Vienna-Dane-Westport AEA in Dane County and the Fairfield AEA in Sauk County.

Natural and Cultural Resources

The indirect impacts study area is in the Yahara River and Lake Kegonsa, Yahara River and Lake Monona, Yahara River and Lake Mendota, Lake Wisconsin, Lower Baraboo River and Dell Creek Watersheds. Waterways included Door Creek, Starkweather Creek, Token Creek, Yahara River, Wheeler Wilcox Creek, Rowan Creek, Wisconsin River, Baraboo River, Mirror Lake, Spring Brook, Hulburt Creek and 31 unnamed streams.

Wetlands are present throughout the indirect impacts study area and wetland delineations identified 653.3 acres of wetlands next to I-39/90/94 study corridor. They can be found where the Interstate crosses waterways, in agricultural fields and alongside I-39/90/94 serving as swales or drainage basins for stormwater runoff from the roadway.

The 100-year floodplain crosses the indirect impacts study area at a number of locations throughout the corridor (refer to Figures of Notable Natural and Cultural Resources in Appendix H). The WIS 33 interchanges at I-39 and I-90/94 have been the site of several notable floods in the past two decades. WIS 33 and the two Interstate highways are within the floodplains of both the Wisconsin and Baraboo Rivers, which meet about 2.5 miles east of the I-39 I-90/94 Split Interchange. High flows on either or both rivers have the potential to cause large-scale flooding on the freeway. Indirect impacts include traffic interruptions through delayed traffic and closed roads.

The indirect impacts study area includes three main habitat types: upland, wetland and the aquatic habitat (rivers, streams and lakes). Although much of the land next to the Interstate is developed or farmed, there are undeveloped areas of upland and wetland habitat and larger public parks and natural areas. There are 13 federally listed and 35 state listed threatened and endangered species that are known or expected to be near the study corridor. No current federally designated critical habitat areas are found along the I-39/90/94 study corridor.

There are nine historic properties within one-quarter mile of I-39/90/94 between existing interchanges and grade separations and within one-half mile of existing interchanges and grade separations. Based on a literature review, 42 previously reported archaeological sites and nine burial sites are located completely or partially within the indirect impacts study area.

3.25.3. Step 3: Identify Impact Causing Activities of the Proposed Project Alternative

Step 3 of the analysis examines the No Build alternative and build alternatives and identifies potential impact-causing activities that may be associated with them, including construction, operation and maintenance relevant

to indirect impacts. Impact-causing activities have the potential to be substantial and could affect resources in the indirect impacts study area.

No Build Alternative

The impact-causing activities of the No Build alternative relate to its lack of action. While the No Build alternative would avoid any specific impact-causing activities to land use or environmental factors, it does not address the purpose of and need to provide a safe, efficient highway that meets interstate standards and corrects existing safety and operational deficiencies.

Build Alternatives

The following components of the build alternatives may have identifiable indirect impacts:

- Capacity expansion of the I-39/90/94 corridor, with the new travel lane(s) along most of the corridor:
  - Freeway Modernization Plus Added General-Purpose Lane Alternative
  - Freeway Modernization Hybrid
- Change in access at Hoepker Road and I-39/90/94, and Milwaukee Street and I-94
- The encroachment of the interstate could indirectly impact the quality of residential neighborhoods, business districts, and natural resources.

3.25.4. Step 4 and 5: Analyze the Indirect Effects, and Evaluate Assumptions and Identify Potentially Significant Indirect Effects

This section identifies and analyzes the potential for project-influenced development and project encroachment impacts.

Project-Influenced Development

WisDOT describes project-influenced development or induced growth as "the potential for land use changes to occur as a result of the project action that could reasonably occur sometime in the future." An example of project-influenced development would include a commercial development occurring around a new interchange and the environmental impacts associated with this development.[107]

The build alternatives could potentially induce growth in the indirect impacts study area in select locations where there is currently vacant/undeveloped land or agriculture. However, availability of land alone is not enough to cause land use change. WisDOT used two different approaches to assess the potential for project-influenced land use change. The first approach relied on the National Cooperative Highway Research Program (NCHRP) Project 25-25, Task 22: Forecasting Indirect Land Use Effects of Transportation Projects, which identifies several factors such as local government land use policies, availability of supporting infrastructure (such as water and sewer), expected growth and change in accessibility as indicators of the potential for project-influenced land use change. Table 3-73 summarizes key underlying issues considered by WisDOT when assessing the potential for project-influenced land use change.

[107] *See note 106 above*

Table 3-73: Assessing the Potential for Project-Influenced Land Use Change

Key Issues to Consider	Assessment
Public Policy and Constraints on Growth Potential	The region's strong regional and local land use controls and regulatory constraints will direct new development in the study area to locations consistent with regional and local plans. The potential for project-influenced land use change from the build alternatives is weak in areas with strong policy and a strong record of policy enforcement and implementation.[108] Wisconsin's Smart Growth Law requires county and local land use actions to be consistent with adopted comprehensive plans. During expert panel meetings, communities indicated that they do not often veer from their comprehensive plans
Project Purpose and Need	The build alternatives do not have an explicit economic development purpose and are not intended to produce land use change.
Growth Trends and Projections	There is ongoing population and employment growth occurring in the study area without the proposed build alternatives due to proximity to both Madison and Wisconsin Dells job markets and other factors identified during expert panel meetings. Study area population growth is estimated at an average annual rate of 0.5% for municipalities and municipal civil divisions and between 0.5% and 1.0% for study area counties. Employment growth in the South Central Workforce Development Area is estimated at an average annual rate of 1.1%. NCHRP technical reports identify the potential for project-influenced land use change from population and employment growth at this annual rate of growth as weak.[109]

[108] *NCHRP Project 25-25, Task 22: Forecasting Indirect Land Use Effects of Transportation Projects identifies communities with strong policy, strong record of policy enforcement, and implementation, then the potential for land-use change is probably as none to very weak.*

[109] *NCHRP Project 25-25, Task 22: Forecasting Indirect Land Use Effects of Transportation Projects identifies average annual population and employment growth of less than 1 percent as none to very weak potential for project-influenced land use change, and between 1 and 2 percent as weak to moderate potential for project-influenced land use change.*

Key Issues to Consider	Assessment
Change in Accessibility	The potential for land use change is generally low when a travel time savings is less than 5 minutes. The build alternatives improve an existing freeway to improve travel reliability, and the travel time savings between the build and no-build condition is below this threshold. The change in accessibility at the two proposed new interchanges is not anticipated to result in unplanned land use change. The proposed improvement at Milwaukee Street is included in community comprehensive plans, and WisDOT was asked by local communities to evaluate a potential new interchange at Hoepker Road to support planned development. Much of the land near the Hoepker Road Interchange is: • protected from development (Cherokee Marsh, Token Creek County Park, Token Creek corridor, Starkweather Creek corridor, and areas with steep slopes to the southeast of the Hoepker Road/Portage Road), • constrained by the presence of the Dane County Regional Airport (limits development on the substantial airport property as well as building height limitations on adjacent properties), or • under construction or recently approved for development (University of Wisconsin Health's Eastpark Clinic, new residential development [approximately 1,000 units] along Eastpark Boulevard just south of the clinic). The proposed Hoepker Road Interchange is supported by the city of Sun Prairie. Local land use controls and regulatory constraints will direct new development to locations consistent with local plans. The change in accessibility at the WIS 13 Interchange where two configurations are under consideration is not anticipated to result in unplanned land use change. There are two reconstruction configurations: a split diamond interchange, and a trumpet interchange. Both options provide similar accessibility to WIS 13 as the existing interchange and the split diamond provides improved accessibility to County H. Reconstructing the interchange is not anticipated to result in unplanned land use change. The reconstruction of other existing interchanges is not anticipated to change accessibility. Improvements at existing interchanges are designed to meet modern standards and to improve safety. No capacity is being added at existing interchanges. During the expert panel meetings, local planners indicated that the additional capacity of the build alternatives could potentially affect the pace of development at remaining undeveloped areas at Hoepker Road, at the County V Interchange east of I-39/90/94 (DeForest), at the commercial area east of the WIS 13 Interchange, and the Wisconsin Dells area in general.

WisDOT also considered AASHTO's Practitioner's Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under NEPA, which describes several questions to consider in analyzing the potential for growth-related indirect

effects.[110] Based on a review of key causal variables identified in Table 3-73 and the considerations identified in AASHTO's practitioner handbook, the potential for project-influenced land use change is generally low. However, during the expert panel meetings, local planners indicated that the build alternatives could affect the pace of development at undeveloped lands near Hoepker Road, at the County V Interchange east of I-39/90/94, and in the Wisconsin Dells area, and facilitate planned development at the proposed Milwaukee Street Interchange.

Impacts Related to Project-Influenced Development

WisDOT does not anticipate substantial changes in land use and development from constructing the build alternatives. The exception is at the potential new Milwaukee Street Interchange, which would facilitate planned development with improved accessibility to an area where land is available for residential and business development. The communities' comprehensive plan anticipates that undeveloped or agricultural lands in this area will continue to transition to residential and employment uses and have planned for new development in this area. The magnitude of this change is expected to be moderated by the fact that this new interchange is in a mature transportation system, and limited travel time savings are anticipated. If the interchange is built this may affect the timing of development, that is development may happen sooner, but in 2050 the regional transportation plan estimates that land use is similar both with and without the proposed improvements.

New travel lanes along the study corridor have the potential to increase the pace of planned development at undeveloped lands near Hoepker Road, near the County V Interchange east of I 39/90/94, at the commercial area east of the WIS 13 Interchange and in the Wisconsin Dells area. The magnitude of this change is expected to be moderated by the fact that this new capacity is along an existing freeway, limited travel time savings are anticipated, and the affected communities' have comprehensive plans and supporting development policies to promote an efficient growth pattern.

Encroachment-Alteration Impacts

Table 3-74 identifies the resources considered for potential project encroachment impacts based on direct impacts described in the Draft EIS and stakeholder input.

Table 3-74: Resources Considered for Encroachment-Alteration Impacts

Resource	Would this resource experience project encroachment impacts?
Commercial and Industrial Development	No. WisDOT does not expect project encroachment impacts to occur, either within or outside the build alternatives' footprint. Direct impacts (access changes, business relocations and strip acquisitions) would not result in the loss of economic viability of remaining businesses, business centers, or districts
Residential Development	No. Direct impacts (residential relocations) would not result in the loss of community cohesion.

[110] *See note 106 above*

Resource	Would this resource experience project encroachment impacts?
Institutional and Public Services	No. WisDOT does not expect project encroachment impacts to occur, either within or outside the build alternatives' footprint. Direct impacts (access changes and strip acquisitions) would not impact the functions of institutional and public services.
Socioeconomic Characteristics and Environmental Justice	**Socioeconomic Characteristics**. No. Project encroachment impacts are not expected to occur, either within or outside the build alternatives' footprint. Access changes and strip acquisitions would not result in the loss of community cohesion. **Environmental Justice**. No. Project encroachment impacts are not anticipated. During the expert panel meetings, participants noted that in Madison the build alternatives would have a positive impact on low-income neighborhoods west of I-39/90/94 by reducing traffic on the local network; and provide a benefit to low-income areas next to US 51, west of I-39/90/94 by reducing traffic volumes and adding bicycle and pedestrian facilities at the Stoughton Road (US 51) intersection.
Visual Character and Aesthetics	No. Indirect impacts to visual quality are typically associated with growth. Limited growth is anticipated as a result of the build alternatives. Strong regional and local land use controls and regulatory constraints direct new development in the study area to locations consistent with regional and local plans.
Agricultural Resources	Yes. Project encroachment impacts to farmland are not anticipated to include remnant sections outside the construction footprint that are no longer suitable for agricultural production. However, there may be project encroachment impacts to agricultural resources as a result of the flood minimization measures. Flood minimization measures increase the 100-year water surface elevations on farmland, which is already prone to flooding because it is in the floodplain. During normal conditions the flood minimization options would not affect farmland but during flood events the land may take longer to drain than it would today. This could affect planting or increase the crops lost to a flood. The floodplains analysis considered potential encroachment impacts of the expected higher water surface elevations with the build alternatives on agriculture. Both direct and encroachment impacts will be mitigated with avoidance and minimization efforts and compensated per state and federal regulations. See agricultural resources discussion in Section 3.25.5.

Resource	Would this resource experience project encroachment impacts?
Wetlands	Yes. Indirect wetland impacts are typically disturbances that reduce or eliminate wetland functions without directly filling or excavating wetland soils. Project encroachment impacts could result from disturbances that occur in areas outside of wetlands, such as uplands, other wetlands or waterways, and include the influx of surface water and sediments, fragmentation of a wetland from a contiguous wetland complex, loss of recharge area, or changes in local drainage patterns. Another potential impact could include a change in wetland type due to changes in vegetation composition, wetland hydrology, and wetland size. Flood minimization measures that raise the 100-year flood elevation within the existing 100-year floodplain could change the types of plants that grow in the wetlands or even change the wetland boundary. The risk of wetland impacts due to flood minimization is low as the wetlands are already functioning as floodplain wetlands. The frequency of flooding would not increase. The increased water surface elevation is unlikely to change the functionality of these wetlands. Wetland mitigation requirements for the build alternatives would be subject to federal and state regulations, and project encroachment impacts are not anticipated to be substantial. See wetlands discussion in Section 3.25.5.
Surface Water	Yes. There may be project encroachment impacts to water quality and aquatic habitat as a result of the increase in stormwater runoff from the increase in impervious cover. However, project encroachment impacts are not anticipated to be substantial. Regulatory protections exist for water in many study area municipalities, as well as at the county, state, and national level, which when implemented, would serve to mitigate potential adverse impacts to water resources indirectly impacted by the build alternatives. See surface water discussion following in Section 3.25.5.
Floodplains	No. The floodplains analysis considered potential encroachment impacts of the expected higher water surface elevations with the build alternatives on land use, community facilities, agriculture, environmental justice populations, visual, wetlands, threatened and endangered species, cultural resources, and recreation as a direct impact. The proposed improvements may change the characteristics of the area's flooding near the confluence of the Baraboo River and Wisconsin River, but the extent is not expected to change. The proposed improvements within floodplains have been developed in accordance with the Federal Emergency Management Agency Regulations on Floodplain Management, Executive Orders, state and local regulations. Encroachment impacts will be mitigated with direct impacts, after avoidance and minimization efforts, and compensation per state and federal regulations.

Resource	Would this resource experience project encroachment impacts?
Threatened and Endangered Species	No. The threatened and endangered species analysis considered project encroachment impacts as a direct impact. Both direct and indirect encroachment impacts will be mitigated with avoidance and minimization efforts and compensation per state and federal regulations. Flood minimization measures would not impact threatened or endangered species' occurring in floodplains. These species are frequently found in floodplains or in habitats that exhibit a prolonged seasonally high water and/or standing surface water. It is unlikely that an increase in flood levels within the study area would negatively impact established populations of state listed plant species that currently exist within the floodplain along the study corridor.
Other Natural Resources Environmental Corridors	Yes. There are encroachment impacts to wetlands and surface waters within environmental corridors. Impacts to these resources are addressed in the wetlands and surface water discussions in Section 3.24.5. Upland Habitat. No. The analysis considered project encroachment impacts as a direct impact. Both direct and indirect impacts will be mitigated with avoidance and minimization efforts and compensation per state and federal regulations.
Air	The build alternatives are not anticipated to violate National Ambient Air Quality Standards, and the potential of MSAT impacts are low under the build alternatives. The analysis of GHG emissions considered indirect (upstream) emissions with direct impacts.
Noise	No. The noise analysis considers traffic volumes that include the future users attracted to the proposed action. Therefore, the noise levels predicted by traffic modeling already incorporate project encroachment impacts and would be analyzed and mitigated for as a direct impact.
Section 4(f)	No. The build alternatives are not anticipated to change the use of the Section 4(f) properties; therefore, project encroachments are not expected to occur.

3.25.5. Step 6: Assess Consequences and Identify Mitigation Activities

Project-Influenced Development

Potential Consequences

The build alternatives have the potential to induce growth in the indirect impacts study area in select locations; however, it is not anticipated to substantially change land use and development in the area as discussed in Section 3.24.4.

Potential Mitigation Measures

As mentioned in Section 3.24.2, communities within the indirect impacts study area have dedicated staff/departments, comprehensive planning documents and zoning regulations in place to direct the amount, type, and density of development within their communities. No further mitigation is recommended.

Encroachment Alteration Effects

Agricultural Resources

Potential Consequences

Indirect impacts to agricultural resources are disturbances that make farmland no longer suitable for agricultural production without directly acquiring the land. Project encroachment impacts are discussed in Table 3-74. The flood minimization measures could have an indirect impact on farmlands in the Baraboo River and Wisconsin River floodplains.

Potential Mitigation Measures

Potential mitigation measures are those that WisDOT or other agencies could implement to minimize indirect impacts. WisDOT will continue coordination with property owners affected by potential flood elevation changes and finalize measures to mitigate property impacts, if needed. WisDOT will minimize risks associated with unavoidable floodplain impacts to the greatest extent possible. Potential flood mitigation measures could include acquisition, relocating or elevating structures outside the 100-year flood elevation, floodproofing structures or purchasing a flood easement.

Surface Water

Potential Consequences

Potential indirect impacts to surface water quality may occur from stream bank erosion from increased stormwater volume. In addition, construction of waterway crossing structures may potentially impact waterway health through disturbance to the creek bed, banks, vegetation, and aquatic fauna movement. However, in consideration of mitigation measures, impacts are not anticipated to be substantial.

Potential Mitigation Measures

Potential mitigation measures include those that WisDOT or other agencies could implement to minimize indirect impacts. Stormwater management will follow WisDOT/WDNR TRANS 401, WDNR 151/216, and TS4 requirements and conform to local municipal stormwater management regulations, which control potential indirect impacts to waterways. Per regulations, the build alternatives are required to reduce annual total suspended solids loadings by 40%, based upon an average annual rainfall year, when compared to no runoff management controls. Stormwater best management practices, including, but not limited to, grass swales, vegetative filter strips, street-cleaning practices, catch basins, biofilters, and detention ponds, will be evaluated during more detailed project design to provide an appropriate measure to manage additional runoff from increased impervious surfaces. A stormwater management plan will be developed in coordination with the WDNR to reduce and/or minimize impacts to waterways by conforming to TS4, TRANS 401, and NR 151/216 requirements.

Where a waterway has the potential to offer passage of aquatic fauna, the road crossing would be designed in a manner that would not discourage fauna passage.

Wetlands

Potential Consequences

Indirect wetland impacts are typically disturbances that reduce or eliminate wetland functions without directly filling or excavating wetland soils. Project encroachment impacts are discussed in Table 3-74.

The build alternatives could have an indirect impact on wetlands receiving stormwater runoff. For most wetlands remaining adjacent to the roadway, the hydrology originates as direct precipitation or runoff from other areas or from adjacent streams. Only one hydrologic source – the unnamed stream between County CS and Smokey Hollow Road – would be modified by the roadway. Existing culverts will be extended or new culverts will be installed to maintain flow across the roadway corridor.

Potential Mitigation Measures

Potential mitigation measures include those that WisDOT or other agencies could implement to minimize indirect impacts. Buffers can eliminate or minimize the potential for losses of wetland functions from impacts occurring on adjacent uplands or wetlands. Dense grassy or herbaceous buffers on gradual slopes intercept overland runoff, trap sediments, remove pollutants, and promote ground water recharge. For steeper slopes, greater buffer widths and denser vegetation (e.g., shrubs and trees) are necessary. The quality of stormwater runoff into wetlands adjacent to the construction footprint will be managed by stormwater best management practices such as grass swales, vegetative filter strips, street-cleaning practices, catch basins, biofilters, and detention ponds, which will filter runoff from the roadway before entering the adjacent wetland.

Mitigation could also include wetland restoration, which involves taking an existing wetland from a poor, unhealthy, or degraded state to the level of productivity and habitat value associated with undisturbed natural wetlands occurring in the vicinity. This process often can be accomplished by changing surrounding water inflow or drainage, eliminating erosion and siltation, and reducing pollution from adjacent areas.

3.26.Cumulative Impacts

Cumulative impacts or effects[111] on the environment result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.1(g)).

The methodology used to assess cumulative impacts for the I-39/90/94 Corridor Study is based on WisDOT's Guidance for Conducting a Cumulative Effects Analysis,[112] which includes CEQ's 11-step process identified in the handbook Considering Cumulative Effects under the National Environmental Policy Act.[113] The 11-step process has three primary elements: scoping, describing the affected environment, and determining the environmental consequences.

[111] *Effects and impacts are used interchangeably. This section will use the term impacts, except at locations where "effects" is used by the guidance that is cited.*

[112] *Wisconsin Department of Transportation. Guidance for Conducting a Cumulative Effects Analysis. November 2007.*

[113] *Council on Environmental Quality. Considering Cumulative Effects Under the National Environmental Policy Act, January 1997.*

- Scoping – Step 1, identify the significant issues associated with the proposed action and define the assessment; Steps 2 and 3, establish geographic scope and timeframe of the analysis; Step 4, identify other actions affecting the resources, ecosystems, and human communities of concern.
- Describe the affected environment – Step 5, characterize resources identified in scoping in terms of their response to change and capacity to withstand stress; Step 6, characterize the stresses affecting these resources and their relation to regulatory thresholds; Step 7, define a baseline condition for the resources.
- Determine the environmental consequences – Step 8, identify the important cause-and-effect relationships between human activities and resources; Step 9, determine the magnitude and significance of cumulative impacts; Step 10, modify or add alternatives to mitigate significant cumulative impacts; Step 11, monitor the cumulative impacts of the selected alternative and adapt management.

The following subsections describe the cumulative impacts scoping process, the affected environment, and environmental consequences.

3.26.1. Scoping Cumulative Impacts

As indicated in AASHTO's Practitioner's Handbook Assessing the Indirect Effects and Cumulative Impacts Under NEPA, the resources assessed for cumulative impacts "are typically a subset of the range of environmental resources considered in the assessment of direct and indirect effects—in many cases, just two or three topics are chosen for analysis."[114] The cumulative impact analysis does not include resources on which the build alternatives would not have an impact or those for which impacts could be mitigated.

WisDOT used CEQ's document Considering Cumulative Effects Under the National Environmental Policy Act to determine which resource topics to analyze for cumulative impacts. The document notes the following about cumulative impacts: "In a broad sense, all the impacts on affected resources are probably cumulative; however, the role of the analyst is to narrow the focus of the cumulative effects analysis to important issues of national, regional, or local significance. Not all potential cumulative effect issues identified during scoping need to be included in an Environmental Assessment or an EIS. Some may be irrelevant or inconsequential to decisions about the proposed action and corridor alternatives. Cumulative effects analysis should count what counts, not produce superficial analysis of a long laundry list of issues that have little relevance to the effects of the proposed action or eventual decisions." [115]

The direct and indirect effects of the proposed action are a building block of the cumulative impact analysis.[116] A cumulative impact analysis is required when there is a direct and/or indirect effect on a specific natural, historic, cultural resource, or population for the proposed action to exert a cumulative influence. [117] If no direct and/or indirect impact to a specific resource is suspected, or the impact could be mitigated, then there is no need to consider cumulative impacts to that resource.

[114] *See note 110 above*

[115] *See note 113 above*

[116] *See note 114 above*

[117] *See note 112 above*

Scoping Cumulative Impacts – Step 1

The cumulative impact analysis considers the resources that could be affected directly and indirectly by the Preferred Alternative when combined with other past, present, or reasonably foreseeable future actions that potentially affect the same resources or human communities. Based on the anticipated direct and indirect project impacts; stakeholder interviews; demographic, land use, and natural resources information; and guidance documents, three resources were reviewed for potential cumulative impacts:

- Agriculture
- Surface Water Quality
- Wetlands

The stakeholder input described in the indirect impacts analysis (Section 3.25) was also used to help identify potential cumulative impacts. In addition, the cumulative impact analysis is informed by data on demographics, land use trends, and agricultural and water resources in the technical memorandum, Appendix H.

Cumulative Impacts Study Area and Timeframe for Analysis – Steps 2 and 3

Figure 3-47 and Figure 3-48 illustrate the cumulative impacts study area for agricultural resources, surface water quality and wetlands. The study team used guidance from CEQ, WisDOT, AASHTO, and traffic analysis to develop the study area. CEQ recommends that a cumulative effects analysis should be conducted on the scale of human communities, landscapes, watershed, or airsheds. Thus, the study area for the impact analysis varies by resource and the distance an effect can travel. AASHTO points out that a study area for a cumulative impact analysis should be "large enough to provide the context necessary for understanding the health of the resource and compact enough to present a proper perspective."[118] Further, the guidance recommends the cumulative effects assessment boundaries must be at least as large as the direct and indirect effect study areas because direct and indirect effects are components of cumulative impacts.

[118] *See note 114 above*

Figure 3-47: Cumulative Impacts Study Area: Dane County

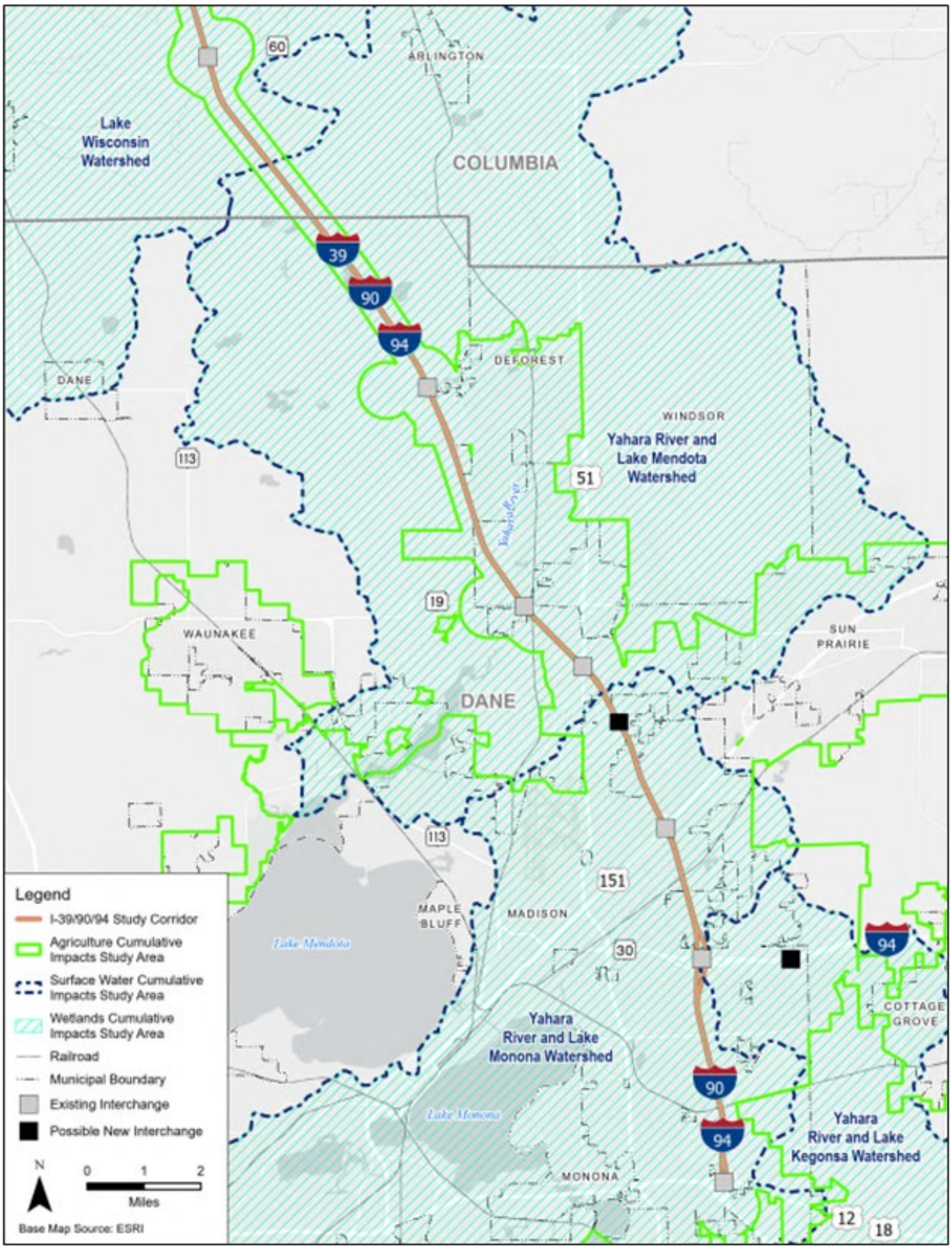
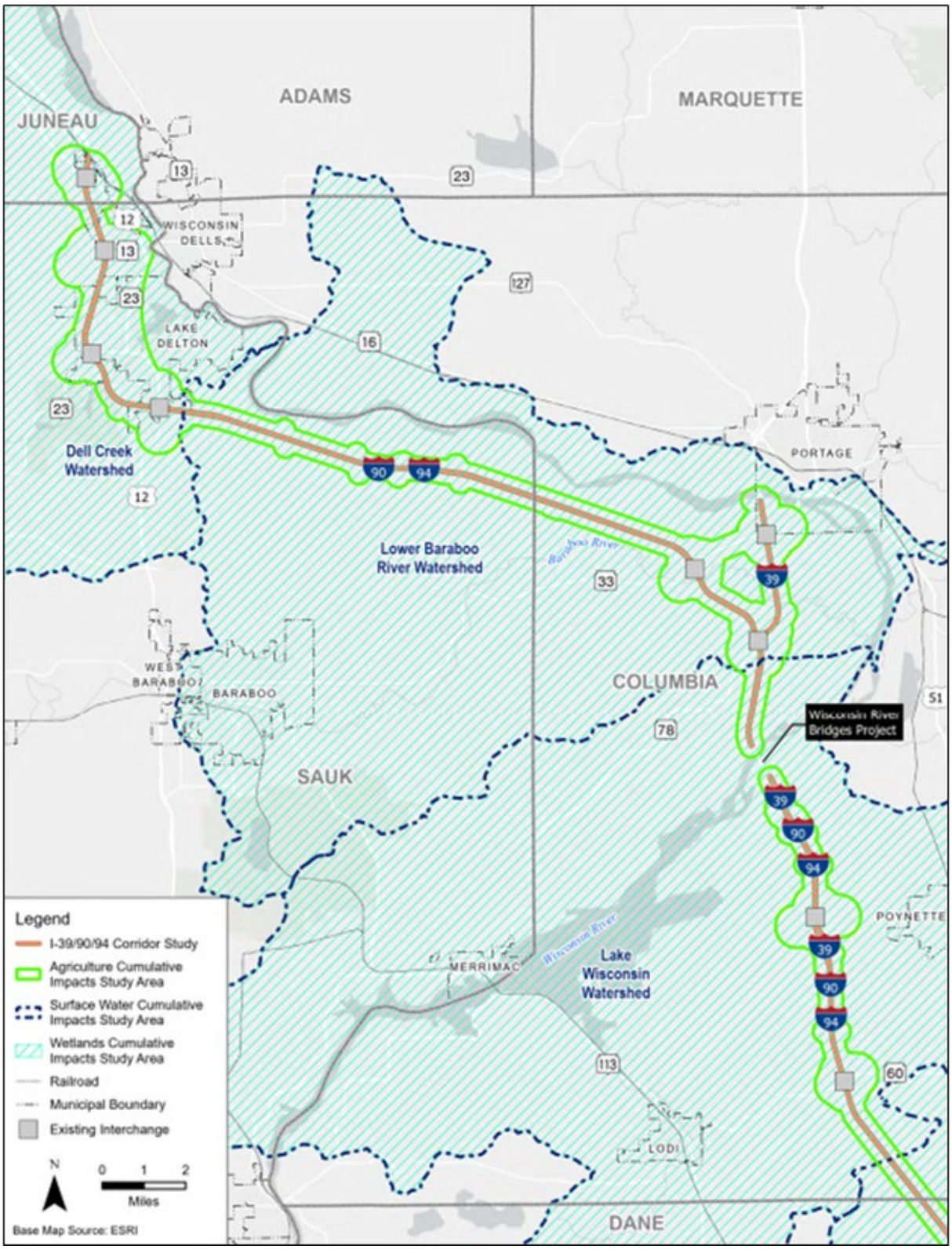


Figure 3-48: Cumulative Impacts Study Area: Columbia, Sauk and Juneau Counties



The timeframe for the analysis is 2040, which coincides with the availability of study area demographic and resource information, and this timeframe is long enough for cumulative impacts to unfold, but not so far into the future that the impacts become too difficult to reasonably anticipate.

3.26.2. Identify Past, Present and Reasonably Foreseeable Future Actions – Step 4

The cumulative impacts study area varies from an urban to rural landscape, and generally consists of residential, commercial, industrial, agricultural, woodland, and wetland areas. Dane County in the southern portion of the cumulative impacts study area is more urbanized (which includes with the Madison metropolitan area) compared to other counties in the study area. Outside of the city of Wisconsin Dells and village of Lake Delton in Sauk County, a major tourist destination, the study area is predominantly agricultural lands, woodland, and wetland areas.

The study area has experienced continued growth over the years, primarily in the Madison metropolitan area. Most of the future growth in the Madison metropolitan area would occur on the edges of the cumulative impacts study area, including next to the two proposed new interchanges (Milwaukee Street and Hoepker Road). Outside of Dane County, development is more limited within the cumulative impacts study area, though tourist-oriented development continues in the Wisconsin Dells area including an expansion of the Kalahari Resort at the US 12 Interchange. Communities in the study area have prepared and adopted comprehensive (Smart Growth) plans that describe long-term development concepts to manage land use and growth in the future. Table 3-75 identifies notable past, present, or reasonably foreseeable future actions, that when considered with the build alternatives, may have cumulative impacts on environmental resources. Active transportation projects include bicycle or pedestrian infrastructure. Maps of ongoing and planned developments as well as notable past, present, and reasonably foreseeable future transportation projects can be found in Appendix H.

Table 3-75: Notable Past, Present and Reasonably Foreseeable Future Actions

Project	Past, Present or Future Action	May Contribute to a Cumulative Impact on the Following Resources
Transportation	--	
I-39/90 Expansion Project (Illinois state line to US 12/18). The 45 miles of existing 4-lane divided interstate highway were expanded to 6 lanes through most of the corridor and to 8 lanes through the Janesville area.	Past (2022)	Agriculture, Surface Water Quality, Wetlands
Beltline Interchange Reconstruction (US 12/18 and I-39/90). This project reconstructed the interchange to improve safety and ensure compatibility with the I-39/90 Expansion Project.	Past (2021)	Agriculture, Surface Water Quality, Wetlands
Flex Lane on US 12/18 (I-39/90 to Whitney Way). This project improved the inside median shoulders on US 12/18 to provide an additional travel lane (Flex Lane) during peak traffic periods.	Past (2022)	Agriculture, Surface Water Quality, Wetlands
Cottage Grove Road Reconstruction (I-39/90 to Sprecher Road). This projected reconstructed Cottage Grove Road to a four lane, urban boulevard section with on-street buffered bike lanes in each direction and left turn lanes at intersections.	Past (2020)	Agriculture, Surface Water Quality, Wetlands

Project	Past, Present or Future Action	May Contribute to a Cumulative Impact on the Following Resources
City View Drive Extension (Lien Road to Crossroads Drive). This project constructed a new road, an extension of City View Drive, southeast of the US 151/High Crossing Boulevard interchanges.	Past (2020)	Agriculture, Surface Water Quality, Wetlands
WIS 19 Reconstruction and Widening (I-39/90/94 to River Road). This project expanded the highway from 2 to 4 lanes.	Past (2020)	Agriculture, Surface Water Quality, Wetlands
I-39/90/94 and WIS 60 Interchange. This project replaced the interstate bridges on I-39/90/94 at WIS 60. The existing ramps were reconfigured into a diamond interchange with roundabouts at the terminals, and WIS 60 reconstructed from Sunset Drive to Pine Hollow Road.	Past (2023)	Agriculture, Surface Water Quality, Wetlands
Commercial Avenue and Stand Rock Road Reconstruction	Past (2023)	Surface Water Quality, Wetlands
US 12/18 and County AB Interchange with Extension of Millpond Road to County AB. The project includes a new overpass/interchange at US 12/18 and County AB, as well as a new frontage road connecting County AB and Millpond Rd. A pedestrian/bike path will be constructed along the new frontage road and a separated path on new overpass. It is a safety project, which will directly affect access to and from the Ho-Chunk Casino which is situated southeast of the US 12/18 Interchange.	Past (2023)	Agriculture, Surface Water Quality, Wetlands
Windsor Road Reconstruction (County CV to River Road). This project will reconstruct the road to an urban cross-section with a pedestrian/bike path.	Past 2023	Agriculture, Surface Water Quality, Wetlands
Madison Beltline Study (US 14 to County N). WisDOT is conducting a planning-level analysis, also called a "planning and environmental linkages" study. The study focuses primarily on addressing existing safety, capacity, and geometric issues.	Present	Surface Water Quality, Wetlands
US 51 South Study (Voges Road to WIS 30). WisDOT is beginning a study to assess how to best accommodate traffic volumes with a focus on safety and access, with consideration or incorporation of the goals for the corridor outlined in the city of Madison's Stoughton Road Revitalization Plan.	Present	Surface Water Quality, Wetlands
US 51 North Study (WIS 30 to I-39/90/94). WisDOT is beginning a study to assess how to best accommodate traffic volumes with a focus on safety issues that affect travel along US 51.	Present	Agriculture, Surface Water Quality, Wetlands
River Road Reconstruction (ABS Boulevard to South Street).	Present	Agriculture, Surface Water Quality, Wetlands

Project	Past, Present or Future Action	May Contribute to a Cumulative Impact on the Following Resources
US 51 Reconstruction (I-39/90 to US 12/18). This project consists of reconstruction, resurfacing and widening in certain segments. A 1.4-mile section of US 51 on the west side of Stoughton will be expanded from 2 lanes to 4 lanes. Intersections and bicycle accommodations will be improved, and pedestrian facilities provided in urban areas and some rural areas.	Future (2024-2029)	Agriculture, Surface Water Quality, Wetlands
Sprecher Road Realignment (Buckeye Road to Wyalusing Drive). This project will realign and widen Sprecher Road to the east.	Future	Agriculture, Surface Water Quality, Wetlands
Clarmar Drive Extension to Bailey Road. This project will extend Clarmar Drive south to Bailey Road.	Future (2026)	Agriculture
Lake Road/County CV Reconstruction (WIS 19 to Vinburn Road).	Future (2024-2025)	Agriculture, Surface Water Quality, Wetlands
North Towne Road Extension. This project will connect the north and south segments of North Towne Road between WIS 19 and Windsor Road.	Future	Agriculture, Surface Water Quality, Wetlands
Wisconsin River Bridges Replacement. This project will replace the existing I-39/90/94 Wisconsin River bridges. One new bridge will be located to the east of the existing bridges and the other will be located at approximately the same location as the existing bridges.	Present (2024-2027)	Agriculture, Surface Water Quality, Wetlands
New Mount Olympus Road. This project will construct a new road in Lake Delton that will connect to US 12/Wisconsin Dells Parkway.	Future (2024)	Agriculture, Surface Water Quality, Wetlands
WIS 23 Resurfacing (WIS 16 to Gulch Road).	Future (2028)	Surface Water Quality, Wetlands
US 12/Wisconsin Dells Parkway Safety Improvements (WIS 13 to Adams Street). This project will improve corridor safety by converting the existing four lanes to a five-lane roadway with two lanes in each direction separated by a Two-Way Left-Turn Lane (TWLTL) in the median.	Future (2025-2026)	Agriculture, Surface Water Quality, Wetlands
Bicycle and Pedestrian		
Capital City Trail Extension (Connect to Glacial Drumlin State Trail). This project would complete the final phase of the Capital City Trail and close the gap between Madison and the Glacial Drumlin State Trail in Cottage Grove.	Future (2025-2026)	Agriculture, Surface Water Quality, Wetlands

Project	Past, Present or Future Action	May Contribute to a Cumulative Impact on the Following Resources
Autumn Ridge Path (Portland Parkway to Ziegler Road) and Bridge over US 30. This project includes a bicycle/pedestrian overpass of WIS 30, a significant barrier to north/south travel by foot or by bike in the area between Stoughton Road/US 51 and I-39/90. It will provide access to the Milwaukee Street commercial area and provide a connection into the downtown.	Future (2024)	Agriculture, Surface Water Quality, Wetlands
Land Use and Development		
3330 Marsh Road, Madison. A 14,400 SF multi-tenant spec industrial building was built northwest of the US 12/18 Interchange.	Past (2022)	Agriculture, Surface Water Quality, Wetlands
Hooper Corporation (6450 Pederson Crossing Boulevard, DeForest). Hooper Corporation's new headquarters consists of a 68,860 square-foot office building and a 207,226 square-foot fabrication facility located on 50 acres two miles east of the WIS 19 Interchange.	Past (2021)	Agriculture, Surface Water Quality, Wetlands
Olympus Water & Theme Park Expansion (1881 Wisconsin Dells Parkway, Wisconsin Dells). The Medusa Slidewheel, a Lake Delton-incentivized project at Mount Olympus, opened in 2022. The slide is part of a $23 million expansion project at Mount Olympus which is located southeast of the WIS 13 Interchange.	Past (2022)	Agriculture, Surface Water Quality, Wetlands
Elm Street Plaza (Wisconsin Dells). A $4.5 million, 35,000 square-foot entertainment venue in downtown Wisconsin Dells (1.5 miles west of the WIS 13 Interchange).	Past (2023)	Surface Water Quality, Wetlands
Tradesman Commerce Park (5525 Tradesmen Drive, Madison). This project includes construction of an industrial development southwest of the US 12/18 Interchange; Phase I is 130,000 square feet and Phase II is 150,000 square feet.	Present (Under Construction)	Agriculture, Surface Water Quality, Wetlands
Wyoming Project (4800 Voges Road, Madison). This project is a commercial warehouse development southwest of the US 12/18 Interchange. Building 1 is 202,800 square feet and building 2 is 152,500 square feet.	Present (Under Construction)	Agriculture, Surface Water Quality, Wetlands
Madison Industrial Campus (6002 Femrite Drive, Madison). This project includes construction of a 169,000 square-foot industrial building northeast of the US 12/18 Interchange.	Present (Under Construction)	Agriculture, Surface Water Quality, Wetlands
Village at Autumn Lake (2121-2157 Waterfall Way, Madison). The village of Autumn Lake is a Traditional Residential-Planned (TR-P) District southeast of the US 151 and High Crossing Boulevard interchanges.	Present and Future (Development Ongoing)	Agriculture, Surface Water Quality, Wetlands

Project	Past, Present or Future Action	May Contribute to a Cumulative Impact on the Following Resources
UW Health Eastpark Medical Center (Eastpark Drive, Madison). This project is a 469,000 square-foot ambulatory facility across from East Madison Hospital and UW Health Rehabilitation Hospital.	Present (Under Construction)	Agriculture, Surface Water Quality, Wetlands
Windsor Crossing (Windsor). This project is a mixed-use development in Windsor adjacent to US 51 about 2.5 miles northeast of the WIS 19 Interchange. It includes 16 acres of commercial and retail; a conservancy area with stormwater management facilities and a trail system; and residential housing (74 single-family and 228 multi-family housing units).	Present and Future (Development Ongoing)	Agriculture, Surface Water Quality, Wetlands
Conservancy Place (DeForest). Condominium development is ongoing at Conservancy Place, a planned mixed-use neighborhood. PinSeekers, a golf and entertainment facility, recently opened just east of I-39/90/94 between the WIS 19 and County V interchanges. The expansion of ABS's headquarters is also underway.	Present and Future (Development Ongoing)	Agriculture, Surface Water Quality, Wetlands
Rolling Prairie Subdivision (Portage). The new subdivision will include 120 single family homes. The city of Portage is providing infrastructure for the development, installing water and sewer mains, and connecting Gunderson Drive with Hamilton Street.	Present (Under Construction)	Surface Water Quality, Wetlands
Kalahari Resort Expansion (1305 Kalahari Drive, Wisconsin Dells). A $50 million expansion project will add 237 new rooms to the Kalahari Resort which is next to the US 12 Interchange.	Present (Under Construction)	Agriculture, Surface Water Quality, Wetlands
Land of Natura (151 Grand Cambrian Drive, Wisconsin Dells). The planned development is a 150-acre natural adventure park located 3 miles southeast of the WIS 13 Interchange. The first phase opened in 2022 and the entire project is estimated to cost $60 million.	Present and Future (Development Ongoing)	Surface Water Quality, Wetlands
Stoney Acres Apartments (701 Stony Acres Rd, Wisconsin Dells). The first of a three-building project opened in 2022 with 75 units southeast of the WIS 13 Interchange.	Present and Future (Development Ongoing)	Agriculture, Surface Water Quality, Wetlands
Dane County Sustainability Campus (7101 US Hwy 12 and 18/4502 Brandt Road/County AB, Madison). Dane County plans to redevelop part of the Yahara Hills Golf Course (southeast of the US 12/18 Interchange) into a sustainable business park to divert waste and create local circular economies. One lot will be for a landfill and one lot for industrial development.	Future	Agriculture, Surface Water Quality, Wetlands

Project	Past, Present or Future Action	May Contribute to a Cumulative Impact on the Following Resources
All Metals Recycling Center (5651 Tradesmen Drive, Madison). This project includes the construction of a junkyard which will consist of a 50,000 square-foot warehouse building attached to a 4,000 square-foot office building southwest of the US 12/18 Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
Capitol View at Oak Park (5817 Halley Way, Madison). This project is a 99-unit senior housing development southwest of the potential Milwaukee Street Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
Door Creek Park Shelter (7035 Littlemore Drive, Madison). The city of Madison plans to construct a 4,000 square-foot community center in Door Creek Park, southeast of the potential Milwaukee Street Interchange.	Future (2025)	Agriculture, Surface Water Quality, Wetlands
Sprecher and Milwaukee Apartments (102 S Sprecher Road, Madison). A four-story, 160-unit apartment building will be constructed southwest of the potential Milwaukee Street Interchange	Future	Agriculture, Surface Water Quality, Wetlands
Metro Tech Apartments (6321 Town Center Drive, Madison). This project will include three multi-family buildings with a total of 74 units southwest of the potential Milwaukee Street Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
Eastwood Springs Subdivision (6602 Commercial Avenue, Madison). Located northwest of the potential Milwaukee Street Interchange, the planned subdivision includes six lots for multi-family development, one lot for mixed-use development, one lot for future development, one lot to be dedicated for public parkland, and one lot for public stormwater management.	Future	Agriculture, Surface Water Quality, Wetlands
Jannah Village (804 Felland Road, Madison). This project is located northwest of the potential Milwaukee Street Interchange and includes the construction of a 134-unit residential building complex, 103 rowhouse units, and pool and clubhouse.	Future	Agriculture, Surface Water Quality, Wetlands
Facility Conversion to New Behavioral Health Hospital (2335 City View Drive, Madison). Acadia Healthcare plans to construct a 33,375 square-foot addition and convert an office building into a behavioral health hospital southeast of the US 151/High Crossing Boulevard Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
Signature Pointe Apartments (2101-2115 East Springs Drive, Madison). A residential building complex with 463 apartments in four buildings will be constructed southwest of the US 151/High Crossing Boulevard Interchange.	Future	Agriculture, Surface Water Quality, Wetlands

Project	Past, Present or Future Action	May Contribute to a Cumulative Impact on the Following Resources
Home 2 Suites & Tru Dual Brand Hotel by Hilton (2403 East Springs Drive, Madison). This project includes the construction of a five-story, 219-room hotel southwest of the US 151/High Crossing Boulevard Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
The Winston (4205 Portage Road, Madison). This project includes the construction of a residential building complex containing 484 apartments in five buildings northwest of the US 151/High Crossing Boulevard Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
The Commons District at The American Center (4846 Eastpark Boulevard, Madison). The project will provide a total of up to 950 dwelling units and 14,000 square-feet of commercial space across multiple buildings northeast of the US 151/High Crossing Boulevard Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
Industrial Development (Daentl Road, DeForest). This project is still under review and would include 50 acres of industrial/transshipment development south of the WIS 19 Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
Buc-ee's (County Hwy V and County Highway I, DeForest). A travel center with 120 gas pumps, 613 parking spaces, and a 73,000 SF store is proposed just west of the County V Interchange.	Future	Agriculture, Surface Water Quality, Wetlands
Hotel and Truck Stop (I-90/94 and WIS 33 Interchange).	Future	Agriculture, Surface Water Quality, Wetlands

3.26.3. Describe the Affected Environment and Determine the Environmental Consequences and Potential Mitigation Measures – Steps 5-11

Agricultural Lands

Affected Environment

Resource Condition, Trends and Other Future Actions

Agriculture is a prevalent land use and important economic activity in the study area. As discussed in Section 3.6, farmland occupies nearly 1.3 million acres, representing between 36% and 66% of land across Dane, Columbia, Sauk, and Juneau counties. According to the 2017 Census of Agriculture, farmland accounts for the majority of land in Dane, Columbia and Sauk counties. Agriculture is important for the economy in the counties in the study area, accounting for almost $6 billion in annual economic activity. Importantly, in Dane County, the cumulative impacts study area is mostly adjacent to urban lands and land planned for non-farmland uses.

In Dane County there has been a trend towards the consolidation of agricultural production to larger operations. The county has experienced an increase in farms larger than 500 acres while the number of smaller farms has

been in decline. Between 2000 and 2020, single family residential development accounted for more permanent conversion of Dane County agricultural land (11,104 acres) than any other land use.[119]

Table 3-76, from the Census of Agriculture, illustrates how farmland has changed in Columbia and Sauk counties since the 1990s. In both Columbia and Sauk counties trends in the number of farms and average farm size shifted after 2007. Since 2007 the number of farms has decreased while farm size increased in both counties. Of note though, the amount of farmland in Columbia and Sauk counties is difficult to compare between years as Wisconsin began using value assessment over this period, which may have resulted in more lands being self-reported as Agriculture. [120] In Juneau County the number of farms decreased while farm size increased between 2012 and 2022.

Table 3-76: Farmland Trends

County	1992	1997	2002	2007	2012	2017	2022
Columbia County							
Total Farms	1,443	1,359	1,526	1,585	1,564	1,357	1,199
Farmland (acres)	327,185	325,723	348,369	316,193	307,973	304,058	290,003
Average Farm Size (acres)	227	240	228	199	197	224	242
Sauk County							
Total Farms	1,383	1,452	1,673	1,923	1,665	1,412	1,408
Farmland (acres)	335,517	357,633	353,104	358,919	332,649	298,906	298,103
Average Farm Size (acres)	243	206	211	187	200	212	212

Source: Columbia County 2013, Sauk County 2013, Census of Agriculture 2012, Census of Agriculture 2017, Census of Agriculture 2022.

Resource Management

Dane, Columbia, Sauk, and Juneau counties all have county farmland preservation plans; Dane, Columbia and Sauk counties also have farmland preservation zoning. A county farmland preservation plan identifies lands that will remain in agricultural use for the foreseeable future. Farmland preservation plans act as the foundation for other

[119] *Dane County Planning & Development. 2022 Dane County Farmland Preservation Plan Volume I: Background, Policies & Plan Development As adopted by the Dane County Board of Supervisors. Dec. 15, 2022.*

[120] *Sauk County Farmland Preservation Plan. Sauk County Farmland Preservation Plan. 2013.*

aspects of the DATCP's farmland preservation program including certified zoning, agricultural enterprise areas (AEA)[121] and farmland preservation agreements. A Farmland Preservation Plan identifies a set of policies, goals, and objectives that guide development in order to best protect working farmland and preserve the farm economy. A Farmland Preservation Plan makes farmers eligible to receive income tax credits from the State of Wisconsin.

An AEA is a contiguous land area devoted primarily to agricultural use and locally targeted for agricultural preservation and agricultural development. In Dane County, the cumulative impacts study area includes the Vienna-Dane-Westport AEA and Windsor AEA. In Sauk county, the cumulative impacts study area includes the Fairfield AEA along I-90/94 in the town of Fairfield, see Figures in Appendix H. Landowners within these areas can apply for a farmland preservation agreement, which requires the land to be kept in agricultural use for 15 years and meet state soil and water conservation standards. In return, the agreement enables the landowner to claim a farmland preservation tax credit.

Summary-Baseline Condition for the Resource

Population and employment growth results in development competing with agriculture for the same land. In general, development has resulted in a gradual decrease of land within agricultural production in the cumulative impacts study area. Population and employment projections indicate that the study area will continue to grow to 2040, particularly in the Madison metropolitan area. Study area communities that intend to allow development within areas that are currently farmed encourage infill development and growth next to existing development to minimize the costs of extending infrastructure.

Environmental Consequences

Cumulative impacts to agricultural land are possible and include those general direct impacts to agriculture discussed Section 3.6, as well as the impacts of the projects listed in Table 3-75.

Population and employment growth will contribute to the continued decline in the amount of land in agricultural production in the study area. This growth is driven by the area's proximity to both the Madison area's job markets and its attractive quality of life, as well as the expansion of the tourism industry in the Wisconsin Dells area. As discussed in Section Indirect Impacts, the proposed action's contribution to this decline is anticipated to be minimal. The growth that is leading to a decline in agricultural land in the study area is driven by factors other than the proposed action.

Potential Mitigation

Potential mitigation measures include those that WisDOT or other agencies could implement to minimize indirect impacts. WisDOT completed an Agricultural Impact Notice for Highway Projects (Form ARM-LWR-359) and coordinated with DATCP in accordance with standards and applicable laws. Potential mitigation measures for cumulative impacts WisDOT could implement include refining the design to avoid or minimize impacts during final design, and/or compensating for unavoidable impacts through the right of way acquisition process.

As discussed in Section 3.25, Indirect Impacts, local governments, and the state have land use and environmental regulations and management practices in place to mitigate potential impacts from the build alternatives and other current and future developments listed in Table 3-75. Conforming with land use planning and regulation tools such as comprehensive planning, zoning and subdivision ordinances, extraterritorial review and approval, Farmland

[121] *Wisconsin Department of Agriculture, Trade and Consumer Protection. Designated Agricultural Enterprise Areas (AEAs). https://datcp.wi.gov/Pages/Programs_Services/DesignatedAEAs.aspx. Accessed Sept. 2023.*

Preservation Program, and official mapping, will play an important role in minimizing and mitigating the cumulative impacts to agriculture.

Surface Water Quality

Affected Environment

Resource Condition, Trends and Other Future Actions

The study corridor lies within the Lower Rock River Basin and Lower Wisconsin River Basin. Each basin consists of several watersheds shown in Figure 3-47 and Figure 3-48. Land use varies by watershed, ranging from existing and emerging urbanized areas in Dane County and around Wisconsin Dells to agricultural and forested areas subjected to ditching and drainage. The study corridor crosses a total of 11 named waterways and 31 unnamed waterways, primarily with box culverts or bridges. Erosion and stormwater runoff are prevalent sources of water pollutants such as high chloride and sodium levels from winter street salting; oil, gas and heavy metals from vehicle use on roadways; and sediments and contaminants attached to sediments and nutrients from agricultural runoff. Section 3.11 provides more information on surface water features and conditions.

The Wisconsin Department of Natural Resources reports that overall, some of the Lower Rock River Basin's natural resources are slightly improved compared to 20 years ago.[122] Land management and forestry law changes have supported a small increase in forests in the basin. Better treatment at wastewater treatment plants has improved water quality in some stretches of streams. Yet today, most water bodies in the basin remain significantly impacted by soil and nutrients washing into the streams and lakes from urban and rural stormwater runoff. Wildlife habitat continues to be lost and fragmentation of habitat accelerates.

WDNR identifies the most serious challenges facing the basin today including water quality impacts and increased runoff quantity from agriculture and urban land uses, such that many of the rivers and streams are not meeting water quality standards; loss of agricultural lands, with its effect on wildlife habitat, recreational usages, the rural landowners and economy; loss of critical sensitive habitat and connection between habitats; lower urban groundwater levels due to increased use and decreased groundwater infiltration due to more acres of impervious land; and significant groundwater contamination in areas of the basin.

The Wisconsin Department of Natural Resources describes the water quality in the Wisconsin River Basin as generally good. [123] WDNR identifies the primary water quality problems are caused by nonpoint sources of pollution, particularly from agricultural operations, excessive populations of rough fish and hydrologic modifications such as dams, stream straightening and the ditching, draining or other alteration of wetlands.

Resource Management

Point-source pollution is regulated through the federal Clean Water Act and the National Pollutant Discharge Elimination System. Nonpoint-source pollution is regulated by WDNR through performance standards for runoff management in NR 151 of the Wis. Admin. Code. County and local erosion control and stormwater ordinances, and agricultural performance standards and agricultural waste management ordinances (detailed in Appendix H) are important for reducing total phosphorus and total suspended solids in surface waters. Section 404(b)(1)

---

[122] *Wisconsin Department of Natural Resources. Watersheds and Basins. Lower Rock River Basin. https://dnr.wisconsin.gov/topic/Watersheds/basins/lowerrock Accessed Feb. 15, 2024.*

[123] *Wisconsin Department of Natural Resources. Watersheds and Basins. Lower Wisconsin River Basin. https://dnr.wisconsin.gov/topic/Watersheds/basins/lowerwis . Accessed Feb. 15, 2024.*

requires the U.S. Army Corps of Engineers to determine the potential short- or long-term effects by determining the nature and degree of effect any proposed discharge would have individually or cumulatively, if applicable. If impacts remain after avoidance and minimization actions are implemented, they would be mitigated.

Summary – Baseline Condition for the Resource

Water quality in the cumulative impacts study area has been affected by human activities such as farming practices and urban development. Portions of the Yahara River and its tributaries (i.e., Door Creek, Starkweather Creek, and Token Creek), and the Baraboo River in the cumulative impacts study area are considered impaired waterbodies under Section 303(d) of the Clean Water Act. Mirror Lake, an impoundment of Dell Creek, is on the state's list of impaired waters. Portions of Hulbert Creek, a tributary to the Wisconsin River, is also on the state's impaired waters list. Further, two unnamed streams between Hoepker Road and the I-94/WIS 30 interchanges are impaired. Impairment and water quality data on the remaining unnamed streams is not available. Resource regulation and management efforts are ongoing to improve water quality in the study area.

Environmental Consequences

Cumulative impacts to surface water quality would include those general direct (Section 3.11) and indirect impacts (Section 3.25) to surface water, as well as the impacts of the projects listed in Table 3-75.

Current and future land development, including farming practices and urban development within the study area could cumulatively impact water quality. Increased impervious area in the study area would increase the likelihood of stormwater carrying sediment and other nonpoint-source pollutants to waterbodies. The I-39/90/94 project in combination with the other projects listed in Table 3-75, could incrementally further degrade water quality due to runoff. Excess nitrogen, phosphorus, and road salt can decrease the oxygen in water that fish and other aquatic life need to survive.

Stormwater best management practices are anticipated to partially offset increases in flows due to the addition of impermeable cover which will provide some water quality benefits and reduce erosion and sedimentation. After mitigation, the increase in impervious area from the build alternatives is anticipated to have a small contribution, when compared to total impervious area for the Lower Rock River Basin and Lower Wisconsin River Basin.

Potential Mitigation

Potential mitigation measures include those that WisDOT or other agencies could implement to minimize direct and indirect impacts. Stormwater management will follow WisDOT/DNR TRANS 401, DNR 151/216, and TS4 requirements, and conform to local municipal stormwater management regulations. New transportation facilities are required to reduce total suspended solids loadings by 80%, based upon an average annual rainfall year, when compared to no runoff management controls, while reconstruction projects are required to reduce total suspended solids loadings by 40%. Stormwater best management practices, including, but not limited to, retention basins (wet detention basins), dry detention basins, infiltration devices, grass-lined ditches, trapezoidal swale through infield, vegetated rock filters, swale blocks/ditch checks, inline storage, biofiltration basins, and stormwater trees, will be evaluated by WisDOT to provide an appropriate measure to manage additional runoff from increased impervious surfaces. As identified in Appendix H, local governments have regulations and management practices in place (e.g., stormwater management ordinances) to mitigate potential impacts from other current and future developments.

Wetlands

Affected Environment

Resource Condition, Trends, and Other Future Actions

There are 93,589 acres of wetland in the Lower Rock River basin and 257,514 acres of wetland in the Lower Wisconsin River basin. In both basins, forested and emergent/wet meadow are the dominate wetland community types.[124] On-site field delineations identified 1,484 wetlands, totaling nearly 570 acres in the vicinity of the study corridor (Section 3.12).

When a wetland functions properly, it provides water quality protection, fish and wildlife habitat, natural floodwater storage, and reduction in the erosive potential of surface water. A degraded wetland is less able to effectively perform these functions. The greatest threat to wetlands is posed by human activities, such as population growth, urbanization, and industrial development.

Resource Management

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the U.S., including wetlands. Section 404 permits are authorized by the U.S. Army Corps of Engineers. County and municipal ordinances regulate development activity within wetlands. Point-source pollution is regulated through the federal Clean Water Act and the National Pollutant Discharge Elimination System. Nonpoint-source pollution is regulated by WDNR through performance standards for runoff management in NR 151 of the Wis. Admin. Code.

Summary-Baseline Condition for the Resource

There are a variety of wetlands and wetland community types throughout the cumulative impacts study area and study corridor. Wetland quality has been affected by population growth and urban development, overgrazing of pastures, cultivation and stormwater runoff. Almost 60% of the wetlands identified through wetland delineations are considered degraded. Resource regulations are in place to protect the quality of wetlands.

Environmental Consequences

The build alternatives would impact about 172 acres of wetlands. These impacts, combined with existing and future development activities as outlined in Table 3-75, could have a cumulative impact of wetland resources in the study area. Increased development would increase the influx of surface water and sediments into wetlands, further fragment contiguous wetland complexes, increase the loss of groundwater recharge and further modify drainage patterns. The build alternatives' unavoidable impact to wetlands will be offset by mitigation.

Assuming no major modifications to Section 404 of the Clean Water Act, or county and local regulations in the future, all of these impacts would be subject to the same permitting requirements as the proposed action, regardless of the project sponsor or funding source. In consideration of federal and state permitting requirements and local regulations, cumulative impacts to wetlands are not anticipated to be substantial.

Potential Mitigation

Potential mitigation measures include those that WisDOT or other agencies could implement to minimize impacts. There are strict wetland regulations at the federal, county, and municipal levels, promoting the continued preservation of wetland, and thus a reduction in future wetland losses. In addition, more aggressive wetland

[124] *Wisconsin Department of Natural Resources. WI DNR Open Data. Watersheds. https://data-wi-dnr.opendata.arcgis.com/datasets/wi-dnr::watersheds/about. July 18, 2017.*

regulations require higher mitigation ratios. Based on agreements with regulatory agencies (WisDNR, USACE, USEPA), the WisDOT Wetland Mitigation Banking Technical Guideline[125] requires WisDOT compensate for wetland losses at:

- 1:1 where wetland acreage losses are applied to an existing mitigation bank site for which WDNR and WisDOT agree that credits are available at the time of wetland loss (1:1 when replaced in-kind but may increase based on factors identified in the technical guideline), or
- 1.5:1 where wetland acreage losses are compensated as part of a concurrent transportation project design.

Thus, in many cases, more wetlands are being created than destroyed by individual projects. Replacement of the same or similar wetland amount and type is an objective, lessening the potential for changing wetland composition in the area. In coordination with WDNR and USACE, WisDOT continues to pursue opportunities for additional wetland mitigation sites close to the study corridor. These mitigation requirements are applicable to both private and public projects.

Dane, Columbia, Sauk, and Juneau counties, the city of Madison, village of Windsor, village of DeForest, city of Portage, village of Lake Delton, and city of Wisconsin Dells have shoreland-wetland zoning ordinances (Appendix H) that regulate development activity within wetlands.

3.27.Relationship of Local and Short-term Uses versus Long-term Productivity

Highway construction projects require the investment or commitment of resources in the study corridor. Short-term uses refer to the immediate consequences of the study alternatives, whereas long-term productivity relates to direct and indirect effects on future generations.

No Build Alternative

The No Build alternative would involve minimal short-term and localized construction impacts associated with pavement and structure maintenance. Projected traffic growth in the study corridor would further reduce the operational efficiency of the existing highway, reducing safety, continuing deterioration of pavement and structures, and continued deterioration of resiliency due to flood risks. The No Build alternative could result in the possible loss of economic growth opportunities, within and outside the study corridor, reflecting the importance that the corridor holds on the region and state.

Build Alternatives

All build alternatives have same effects and they are analyzed together. The following are short-term consequences of the build alternatives:

- Committing public funds to construct the highway improvements. Because highway funding is derived mainly from vehicle user fees and motor fuel taxes, motorists using the highway ultimately pay for the improvements.
- Converting residential, commercial and agricultural land, wetland, and other uses to transportation uses.
- Acquiring right of way from some residential properties, which may result in non-conforming lot sizes and residences that are closer to I-39/90/94.

[125] *Environmental Services - Wetland mitigation banking technical guideline (wisconsindot.gov).*

- Increasing travel time and inconvenience for through and local traffic, area residents, and businesses during the construction period.
- Generating construction noise and dust that may affect residences, schools, and businesses near construction areas.

Long-term benefits of the build alternatives include the following:

- Reduced congestion and increased safety.
- Increased operational energy efficiency.
- Added roadway capacity to address future traffic demand.
- Improved travel reliability.
- Support planned land uses at proposed new interchanges in Dane County.
- Improved resiliency and reduced flood risk.

The local short-term impacts and use of resources by the build alternatives are consistent with maintenance and enhancement of long-term productivity.

3.28.Irreversible and Irretrievable Commitments of Resources

The No Build alternative would involve substantial commitments of resources to maintain the existing deteriorating pavement and structures. Under the build alternatives, land acquired for highway construction is considered an irreversible commitment during the time period such land is used for highway purposes. Considerable amounts of fossil fuel, labor and highway construction materials such as cement, aggregate and asphaltic material would be required. Considerable labor and natural resources would be used in the fabrication and preparation of construction materials. The resources generally are not retrievable. However, they are expected to remain in adequate supply.

Expenditure of public funds for construction of the build alternatives is considered an irretrievable commitment. In addition, land converted from private to public use would reduce local tax revenues. As an alternative to total use of new resources, clean construction demolition materials and recycled cement or asphaltic materials will be considered. Depending on current technology available when the project would be constructed, alternative types and sources of materials may be available.

The proposed commitment of resources is based on the concept that residents, business and public services in the study corridor, region, and state would benefit from the improved quality of the Interstate. Benefits, which are expected to outweigh the commitment of resources, will include improved safety and resiliency, preservation of an important transportation corridor, and improved travel reliability.

3.29.Summary of Impacts

Table 3-77: Impact Summary Table

Environmental Factor	No Build	Modernization Plus General Purpose Lane (Preferred Alternative) + Preferred Interchange alternatives[1]	Modernization Hybrid + Preferred Interchange alternatives[1]	County V Diamond	WIS 13 Split Diamond	WIS 13 Trumpet (Preferred Alternative)
Construction Cost Estimate (2024 dollars in millions)	$950.4	$2,571.9	$2,557.3	$0.5	$26.1	$19.2
New Right of Way (acres)	0	225	219.6	0	5.4	3.5
Residential Relocations (housing units)	0	1	1	0	0	0
Flood minimization Residential Relocations	0	1	1	0	0	0
Flood minimization Residential flood easements outside regulatory floodplain	0	9	9	0	0	0
Commercial Relocations	0	1 maintenance bldg.	1 maintenance bldg.	0	1 retail business 1 maintenance bldg. 1 shed	1 maintenance bldg.
Flood minimization Commercial Relocations	0	2, including 1 vacant	2, including 1 vacant	0	0	0
Flood minimization Commercial flood easements outside the regulatory floodplain	0	6, including 3 vacant	6, including 3 vacant	0	0	0
Farmland (buildings relocated/acres acquired)	0	1 barn 161.5 acres	1 barn 158.5 acres	0	1.7	15.5

Environmental Factor	No Build	Modernization Plus General Purpose Lane (Preferred Alternative) + Preferred Interchange alternatives[1]	Modernization Hybrid + Preferred Interchange alternatives[1]	County V Diamond	WIS 13 Split Diamond	WIS 13 Trumpet (Preferred Alternative)
Flood minimization	0	6 structures	6 structures	0	0	0
Farmland Impacts (buildings relocated/acres impacted)		189.8 acres	189.8 acres			
Institutional Public Building Relocations	0	1	1	0	0	0
Flood minimization Institutional Public Building relocations	0	4	4	0	0	0
100-Year Floodplain (acres)	0 Corridor resiliency not addressed	327	326.8	0	0.8	1.0
Wetland (acres)	0	171.6	170.4	1.3	0.5	0.1
Federally listed Threatened and Endangered Species (Yes/No)	No	Yes	Yes	Yes	Yes	Yes
State listed Threatened and Endangered Species (Yes/No)	No	Yes	Yes	Yes	Yes	Yes
Adverse Effects to Historic Properties	0	0	0	0	0	0
Archaeological Sites Affected	0	0	0	0	0	0
Environmental Justice Disproportionate and Adverse Impact (Yes/No)	No	No Alternative could facilitate access to employment centers, provide added bicycle and pedestrian connections	No Alternative could facilitate access to employment centers, provide added bicycle and pedestrian connections	No Alternative modifies exiting ramps	No Alternative could facilitate access to employment centers	No Alternative could facilitate access to employment centers
Receptor Units Impacted (design year 2050)	Not applicable	1,598 receptor units	1,598 receptor units	0 receptor units	9 receptor units	9 receptor units

Environmental Factor	No Build	Modernization Plus General Purpose Lane (Preferred Alternative) + Preferred Interchange alternatives[1]	Modernization Hybrid + Preferred Interchange alternatives[1]	County V Diamond	WIS 13 Split Diamond	WIS 13 Trumpet (Preferred Alternative)
Potential Contaminated Sites (sites recommended for additional field testing)	Not applicable	16	16	0	0	0
Section 4(f) Properties - *De minimis* use	0	3	3	0	1	0
Indirect Effects	Does not address study purpose of and need; may slow pace of planned development	Land use effect: facilitates planned redevelopment and development in study area.	Land use effect: facilitates planned redevelopment and development in study area.	No, replaces existing access	Land use effect: local land use controls avoid and minimize potential impact of new Interstate access at County H.	No, replaces existing access
Cumulative Effects	No	Limited effect: Mitigation measures minimize effects	Limited effect: Mitigation measures minimize effects	No, replaces existing infrastructure	Limited effect: Mitigation measures minimize effects	Limited effect: Mitigation measures minimize effects

1. Includes all preferred interchange alternatives, including WIS 13 Trumpet alternative.