

**SECTION 2
ALTERNATIVES**

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The Alternatives Section describes the alternative development and evaluation process. This 2018 LS SEIS incorporates analyses and decisions made in the 2014 LS SFEIS by reference. Specifically, this LS SEIS adopts the following decisions of the 2014 LS SFEIS:

- Eliminating the off-existing alignment highway alternatives from further consideration (Alternatives 2 through 6).
- Eliminating the Transportation System Management alternative from further consideration.
- Eliminating the Transit alternative from further consideration.
- Eliminating the reconstruction of the existing 2-lane highway from further consideration.
- Selecting the No Corridor Preservation Alternative for the US 151/WIS 23 connection.

The analyses and decisions for these adopted solutions can be reviewed at the following web link:

<http://wisconsin.gov/Pages/projects/by-region/ne/wis23exp/enviro.aspx> or a hard copy is available at the Wisconsin Department of Transportation Northeast Region Office; 944 Vanderperren Way, Green Bay, WI 54304-5344.

This Alternatives Section differs from the Alternatives Section in the 2014 LS SFEIS in that it:

- Does not repeat the screening analysis used to determine feasible alternatives.
- Does not repeat a description of the alternatives presented in the 2004 EIS. This description and analysis is available in the 2014 LS SFEIS at the web link shown above.
- Carries forward for detailed study the Passing Lane and Hybrid Alternatives because they satisfy the Purpose and Need criteria related to traffic operations. These two alternatives do not fully satisfy other Purpose and Need criteria.
- Adds Corridor Preservation associated with the Passing Lane and Hybrid Alternatives.

2.1 ALTERNATIVES AND ADVANCES

A. Adopted Decisions

This 2018 LS SEIS adopts the decisions made in previous NEPA documents regarding the elimination of alternatives. These decisions include the following.

- Transit and Alternate Modes—This alternative would establish transit service between Fond du Lac and Sheboygan where currently there is none. It would also provide a multi-modal connection between Fond du Lac and Plymouth by extending Old Plank Road Trail. This alternative was eliminated from further consideration as a stand-alone solution because these two measures do not address purpose and need criteria including continuity, safety, and bicycle and pedestrian accommodations.

A portion of this alternative, extension of the Old Plank Road Trail, is incorporated as a component in the Passing Lane, Hybrid, and 4-lane On-alignment alternatives evaluated in this document.

- Transportation System Management (TSM)—This alternative consists of low-cost improvements to improve traffic flow on the highway. Examples include innovative intersection designs and access management. This alternative was eliminated from further consideration as a stand-alone alternative because it does not address all the needs of WIS 23. Other alternatives discussed later in this document, such as the Passing Lane Alternative, Hybrid Alternative, and 4-lane On-alignment Alternative include TSM components in the form of Restricted Crossing U-Turns (RCUT) intersections, access management, and measures to relieve passing demand on the highway.

- Reconstruct Existing 2-Lane Highway—This alternative would reconstruct the existing 2-lane highway while providing minor improvements to intersections. It was eliminated from further consideration because it does not satisfy all elements of the Purpose and Need.
- Off-alignment 4-Lane Alternatives—These alternatives would construct a new 4-lane expressway off of the existing WIS 23 alignment. Numerous alignments, both north and south of the existing WIS 23 highway, were investigated. These alternatives satisfied the Purpose and Need yet were eliminated from further consideration because there were other reasonable alternatives with fewer adverse environmental impacts.
- US 151/WIS 23 Connection Alternatives—These corridor preservation alternatives looked at converting the existing diamond interchange into a system interchange with free flowing ramps connecting the US 151 expressway with the WIS 23 highway. The No Corridor Preservation alternative was selected for this highway connection because the existing diamond interchange is anticipated to be sufficient for meeting the operational needs of the connection for the next 40 to 50 years.

B. Technological Advances

Rapid advances in technology are providing the opportunity for various levels of automation in motor vehicles. The automation ranges from just assisting drivers in their driving duties to fully automated control of the vehicle. Measures such as radar, Lidar, GPS, and computer vision are used to sense surroundings and then assist in driving functions.

Many of these types of advancements have only recently emerged as technology that could be more broadly implemented in the near future. As such, these types of advances were not discussed in previous versions of the WIS 23 EIS.

While still in its infancy, the use of automated technology could eventually provide considerable benefits. By eliminating driver limitations and the potential for error, safer and more efficient use of roadways could occur. Potential benefits and challenges include:

- Reduced crashes previously caused by driver inattention.
- Reduced traffic congestion by allowing reduced headways between vehicles.
- Higher fuel efficiency.
- Integration of information systems to optimize routing and parking.
- Liability challenges—When a crash does occur, who is responsible?
- Computer compromise—When a computer or part of the system stops performing properly and impacts travel.

In May of 2013, the National Highway Traffic Safety Administration (NHTSA) issued a policy statement regarding automated technologies in motor vehicles. The intent of the policy statement is the safe implementation of this rapidly evolving technology. The document references the five levels of vehicle automation that are currently being used in the industry, which are summarized as follows.

- Level 0: No Automation
- Level 1: Function-Specific Automation
- Level 2: Combined Function Automation
- Level 3: Limited Self-Driving Automation
- Level 4: Full Self-Driving Automation

Some of the automated technologies have the potential to increase the vehicle carrying capacity of WIS 23. Limiting driver error could reduce crashes and make for more efficient traffic flow. For these benefits to be realized, much of the fleet using WIS 23 must be using these advanced technologies. The

speed of market penetration for this technology is unclear. For example, the adoption of hybrid cars has been rapid since they were introduced to the United States on a larger scale in 1999. Yet in 2011, hybrid cars only comprised about 1 to 2 percent of the vehicles on the road. In 2016 they accounted for less than 2 percent of all cars sold in the United States.¹

Metropolitan Planning Organizations and State Department of Transportations are trying to discern how these rapid technology advances will affect vehicle miles traveled (VMT) and roadway efficiency. Some experts suggest that vehicle automation could increase VMT by keeping some driver populations (i.e., elderly) in their cars longer, and the possibility of zero occupant vehicles. Currently there is no consensus on how to address the effect of these technologies.

WisDOT will monitor the potential benefits of this technology and potential adoption rates. At this point, it is not possible to fully understand how these technologies could influence the range of reasonable alternatives for the WIS 23 corridor.

C. Reasonable Alternatives

The Council on Environmental Quality (CEQ) recognizes in its regulations for implementing the National Environmental Policy Act (NEPA) that many alternatives may exist that address a project's Purpose and Need. The WIS 23 project team identified a range of reasonable alternatives that were presented in the 2004 EIS, the 2009 SDEIS and 2010 FEIS, and the 2013 LS SDEIS and 2014 LS SFEIS. Reasonable alternatives are those that are practical and feasible from systemwide engineering, environmental, and economic standpoints relative to meeting the Project Purpose and Need. The description and analysis of these alternatives is incorporated by reference and can be reviewed at the following web link:
<http://wisconsindot.gov/Pages/projects/by-region/ne/wis23exp/enviro.aspx>

D. Range of Reasonable Alternatives

This LS SEIS re-evaluated the range of reasonable alternatives in light of current socio-economic data, crash data, and updated traffic forecasts. Because of this updated information, two alternatives that were previously dismissed in the 2014 LS SFEIS (Passing Lane and Hybrid Alternatives) satisfy more of the Purpose and Need criteria, specifically criteria related to traffic operations. These two alternatives do not satisfy all of the Purpose and Need, yet they are brought forward for detailed evaluation in this 2018 LS SEIS to provide lower impact alternatives for comparison to the 4-lane On-alignment Alternative. The following paragraphs briefly describe them.

- **Passing Lane Alternative**—This alternative reconstructs WIS 23 as a 2-lane highway east of County K, but adds two passing lanes in the eastbound direction and two passing lanes in the westbound direction. This alternative includes a jug-handle intersection at County K and the extension of the Old Plank Road Trail (a multi-purpose trail) from the city of Plymouth to the city of Fond du Lac. Two suboptions exist for this alternative. One does not install left turn lanes on WIS 23 at higher volume intersections. The other installs left-turn lanes at several intersections. Section 2.3 describes this alternative in more detail.
- **Hybrid Alternative**—This alternative expands WIS 23 to a 4-lane expressway on the existing WIS 23 alignment from County K to just beyond County G. East of County G, WIS 23 is reconstructed as a 2-lane highway and adds one passing lane in the eastbound direction and one passing lane in the westbound direction. This alternative includes a jug-handle intersection at County K and diamond interchanges at County UU and County G. The Hybrid Alternative also includes the extension of the Old Plank Road Trail from the city of Plymouth to the city of Fond du Lac. This alternative installs left-turn lanes at several intersections in the 2-lane section east of County G. Section 2.4 describes this in more detail.

¹ <http://www.hybridcars.com/april-2016-dashboard/>. Accessed November 2, 2017

The 2014 LS SFEIS included a Corridor Preservation Alternative associated with the 4-lane On-alignment Alternative that would preserve right of way for future transportation improvements. It included preserving right of way for four grade separations (overpasses) as well as diamond interchanges at County W and County A. With this LS SEIS, the Passing Lane Alternative and the Hybrid Alternative also have a Corridor Preservation Alternative associated with them. With these alternatives, the Corridor Preservation Alternative would preserve the same right of way needed for the four grade separations and the County W and County A diamond interchanges. The Corridor Preservation Alternative associated with the Passing Lane and Hybrid Alternatives would also preserve the right of way needed to expand the 2-lane sections of these alternatives to 4 lanes. Additional environmental documentation would be completed prior to the construction of improvements associated with corridor preservation measures. Adopting the decision from the 2014 LS SFEIS and adding the alternatives that are now deemed reasonable from the updated traffic forecasts produces the following range of alternatives that are evaluated in this document.

1. No-Build - provides a baseline for comparison in accordance with 40 CFR 1502.14(d)
2. Passing Lane Alternative with or without left turn lanes
 - a. Corridor Preservation Associated with Passing Lane Alternative
3. Hybrid Alternative
 - a. Corridor Preservation Associated with Hybrid Alternative
4. 4-lane On-alignment Alternative
 - a. Corridor Preservation Associated with 4-lane On-alignment Alternative

Figure 2.1-1 graphically summarizes the alternatives considered in WIS 23 NEPA documents and the range of reasonable alternatives addressed in this 2018 LS SEIS.

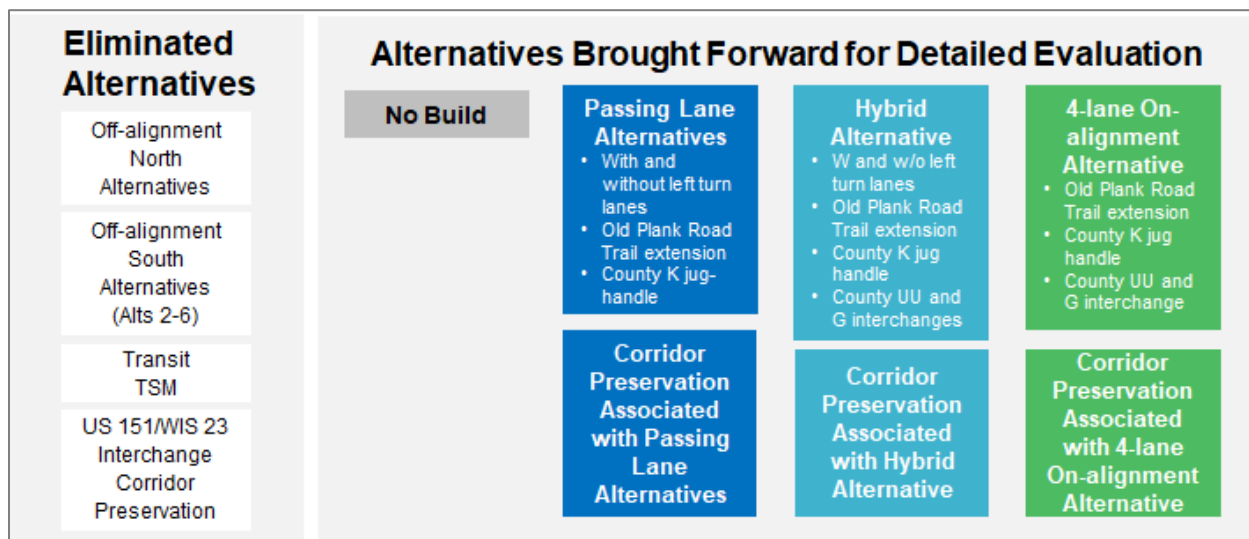


Figure 2.1-1 Range of Alternatives

E. Preferred Alternative

WisDOT and FHWA have identified a Preferred Alternative for WIS 23 and present it in this section. During the process of identification of a Preferred Alternative, many factors pertinent to the WIS 23 corridor were considered. The discussion about the factors considered and the reasons for the selection are discussed in detail in Appendix F. A summary is presented as follows.

1. Build Alternatives

For WIS 23, the factors used in the identification of the Preferred Build Alternative include:

- How well the alternative addresses the Project Purpose and Need.
- The magnitude and significance of impacts.
- Public and stakeholder support.

Table 2.1-1 summarizes how well each alternative addresses these factors.

Table 2.1-1 Preferred Alternative Identification

	No Build	Passing Ln	Hybrid	4-lane On-alignment
Purpose and Need Satisfaction				
Number of factors fully or substantially satisfied	0	4-5	3	15
Number of factors moderately satisfied	2	1	10	0
Remaining Impacts ^[1]				
Construction costs	\$4.5	\$45.2M	\$72.7M	\$85.8M
Business and farm relocations still needed	0	0	2	2
Right of Way still needed	0 ac	58 ac	193 ac	193 ac
Wetlands filled	0	29.9 ac	45.9 ac	51.8 ac
Upland/Woodland	0	5 ac	9 ac	38 ac
New stream crossings ^[2]	0	1	3	4
Local governmental support letters ^[3]	0	2	2	8
Public support from Oct 12, 2017 Meeting comments ^[4]	0	38	0	629
^[1] Much of the right of way for the 4-lane On-alignment Alternative, the Preferred Alternative in the 2014 LS SFEIS, has been purchased and buildings razed. This occurred prior to the 2014 ROD being vacated. These represent sunk costs that are not supposed to influence future actions. ^[2] New stream crossings indicate where the Old Plank Trail or a new set of 2-lanes would cross a stream/river. This could be accomplished through bridges or culvert extensions. ^[3] Letters supporting a generic improvement of WIS 23 are attributed to all Build alternatives. ^[4] No written comments received specifically mentioned support for either the No-Build or Hybrid Alternatives.				

The 4-lane On-alignment Alternative with Corridor Preservation is identified as the Preferred Alternative in this 2018 LS SEIS. Reasons for this selection include:

- The 4-lane On-alignment Alternative best fulfills WisDOT’s statutory mission and responsibilities:
 - It provides better traffic operations.
 - It provides more opportunities to incorporate safety countermeasures.
- The 4-lane On-alignment Alternative most optimally addresses the Purpose and Need factors compared to the other alternatives.
- The impacts do not outweigh the benefits derived from the 4-lane On-alignment Alternative.
- The majority of local governmental entities, along with commenting stakeholders, support the 4-lane On-alignment Alternative.

2. Corridor Preservation

Corridor Preservation that also designates WIS 23 as an expressway will be included with the 4-lane On-alignment Alternative, which preserves right of way for future improvements. These include:

1. Grade separation (overpass) at Tower Road.

2. Cul-de-sacs at Poplar Road.
3. Grade separation (overpass) at 7 Hills Road.
4. Cul-de-sac at County W south and Hinn Road.
5. Rerouting of County W south to County W north roughly along Poplar Road and Loehr Road.
6. Diamond interchange at County W north intersection.
7. Grade separation (overpass) at Scenic View Drive.
8. Cul-de-sac at Plank Road.
9. Grade separation at Sugarbush Road.
10. Diamond interchange at County A.

Reasons for including Corridor Preservation with the 4-lane On-alignment Alternative include:

- WIS 23 Corridor Preservation will protect right of way for transportation improvements that are likely to be needed in the future. In preserving these areas for future transportation improvements, development within those areas can be minimized or avoided, reducing costs for WisDOT.
- WIS 23 Corridor Preservation, while having some current effect on property owners, will reduce impacts to the property owners in the long term. Without corridor preservation, these property owners may invest in improvements that may later need to be removed or relocated for transportation improvements.
- Implementation of the improvements associated with the WIS 23 Corridor Preservation measures is likely to occur within the planning horizon (30 years from official mapping).
- WIS 23 Corridor Preservation provides information useful to local property owners and governments as they make property acquisition and development approval decisions.
- WIS 23 Corridor Preservation measures will facilitate future access reductions. Without preserving right of way needed for future access roads, development could make access removal prohibitively expensive. This in turn would diminish the future safety and mobility of the corridor.
- Designating WIS 23 as an expressway will provide cost savings in the future as right of way can be purchased before development can occur, will allow for fully conceptualized design concepts to be developed and approved, and will help local units of government in planning their development along the corridor.²

Additional environmental documentation would be completed prior to construction of improvements associated with any of the corridor preservation measures.

2.2 NO-BUILD ALTERNATIVE

The No-Build Alternative involves the continued use of the existing WIS 23 without reconstruction or enhancements of the existing roadway. It includes routine maintenance activities necessary to keep the highway infrastructure in satisfactory condition. An example of a routine maintenance activity is the planned 2018 overlay of WIS 23 in Sheboygan County to address poor pavement conditions. Figure 2.2-1 schematically illustrates the No-Build Alternative.

² WisDOT FDM 11-7-40-1.2, Accessed May 11, 2018.

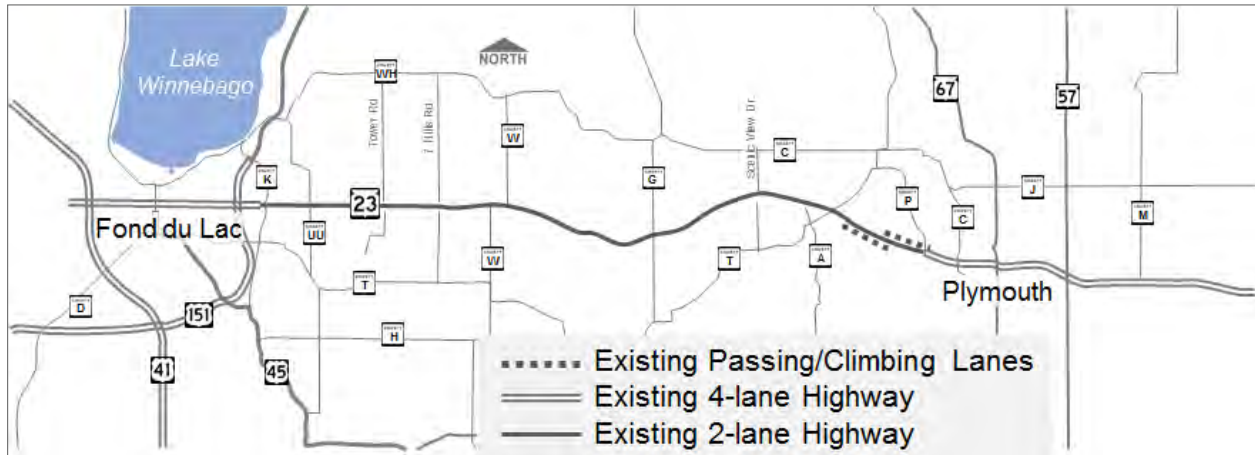


Figure 2.2-1 No-Build Alternative

Advantages of the No-Build Alternative include the following:

- Right of way acquisition would not be necessary.³
- Relocation of residences or businesses caused by construction would not occur.⁴
- Impacts to environmentally sensitive areas would be avoided.
- Infrastructure costs would be lower.

Disadvantages of the No-Build Alternative include the following:

- Current and future traffic congestion on the existing route would not be addressed.
- WIS 23 would not have highway system continuity between the 4-lane US 151 and the 4-lane section of WIS 23 to the east.
- WIS 23 would not fulfill operational objectives for a Connector route in Corridors 2030, part of the *Connections 2030 Statewide Long-Range Transportation Plan*, linking economic and tourism centers.
- This alternative does not address the dangerous mix of slow-moving farm vehicles and their difficulty crossing highway traffic.
- The 235 existing access points would continue to create crash potential along WIS 23.

Because this alternative does not satisfy the Purpose and Need, it was eliminated from consideration.

The No-Build Alternative is still carried forward in the document as a baseline for comparison in accordance with 40 CFR 1502.14(d).

³ Note that because of the previously approved ROD, right of way was acquired prior to the vacation of the ROD. If the No-Build Alternative would be selected, this recently acquired right of way would become excess right of way.

⁴ Note that because of the previously approved ROD, residences and businesses were acquired prior to the vacation of the ROD. Most of the buildings acquired to date have been razed.

2.3 PASSING LANE ALTERNATIVE

A. Passing Lane Alternative

WIS 23 is not designated as a passing lane corridor⁵ in WisDOT’s Facilities Development Manual (FDM) yet current traffic forecasts indicate design-hour volumes fall within the thresholds where passing lanes could be considered based on FDM policy.⁶ WisDOT has criteria for locating passing lanes to provide optimal operational benefits, as found in WisDOT’s FDM 11-15-10. Using this design criteria, the Passing Lane Alternative installs two passing lanes in the eastbound direction and two passing lanes in the westbound direction to complement the existing eastbound and westbound climbing lanes that exist between County A and County P in Sheboygan County. Posted speeds along WIS 23 would not be modified in this alternative. Figure 2.3-1 schematically illustrates the Passing Lane Alternative.

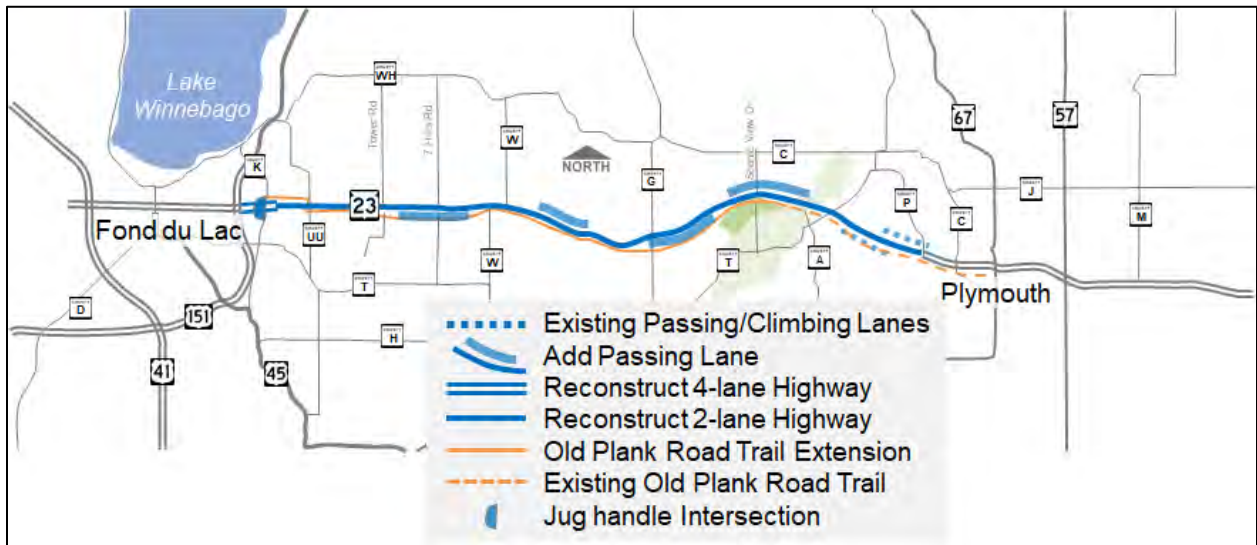


Figure 2.3-1 Passing Lane Alternative

The Passing Lane Alternative typical section would include 8 to 10-foot shoulders and shallow sloped 34-foot clear zones beyond the outside edge of the lane. Figure 2.3-2 illustrates the Passing Lane Alternative typical section.

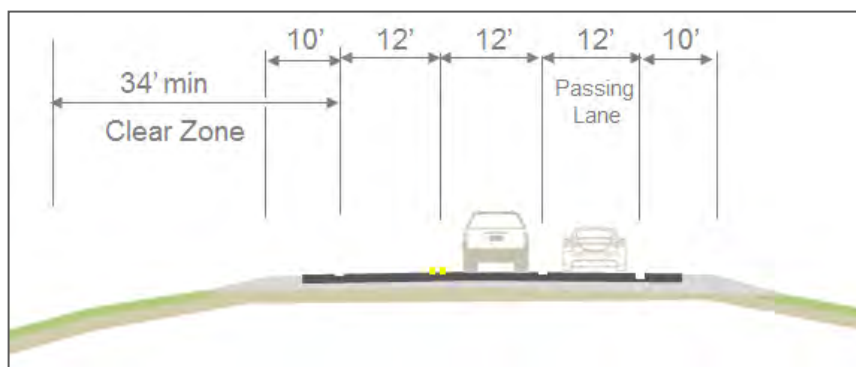


Figure 2.3-2 Passing Lane Typical Section

⁵ Passing lane corridors are specified in the WisDOT FDM 11-15-10, Attachment 10.1 which shows a map of the Wisconsin roadways that are considered passing lane corridors.

⁶ FDM 11-15, Attachment 10.2 Warrant for Considering Passing Lanes. WIS 23 assumptions: level terrain; K100=710 to 757 vph; Trucks=13% [from field data (PM peak); minimum assumptions, daily range is 22 to 26%], accessed May 11, 2018.

There are two suboptions with the Passing Lane Alternative: one that installs left turn lanes at higher volume intersections and one that does not. The Passing Lane Alternative without left-turn lanes would upgrade side-road intersections with the intersection type recommended in WisDOT's FDM. However, under this alternative, left-turn lanes that would facilitate turning movements at higher volume intersections on WIS 23, would not be provided as part of the intersection upgrades because they would decrease the amount of roadway available for passing.⁷

The Passing Lane Alternative suboption with left-turn lanes adds left-turn lanes on WIS 23 at ten higher volume intersections. These intersections include County UU, Tower Road, 7 Hills Road, County W south, County W north, County G, County U, County T, County A, and County S. According to FDM guidelines, most WIS 23 side road intersections do not have traffic volumes that warrant the installation of left-turn lanes.⁸ This sub-option includes left-turn lanes at ten intersections because they provide a warranted safety benefit. The left-turn lane provides a refuge for left-turning vehicles, removing them from exposure to the through travel stream and acting as a safety countermeasure for rear end crashes. The left-turn lane also adds a median area so that side road traffic can make a left turn onto WIS 23 as a two-stage maneuver. Adding the left-turn refuge requires the development of a median for 0.2 miles of mainline for each side of the side-road intersection, which decreases the amount of roadway that is available for passing. Figure 2.3-3 illustrates a typical configuration of a WIS 23 T-intersection with a left-turn lane and associated median. As mentioned, the median associated with the left-turn lane also provides a median refuge for side-road vehicles (passenger cars) crossing or making a left turn onto WIS 23.

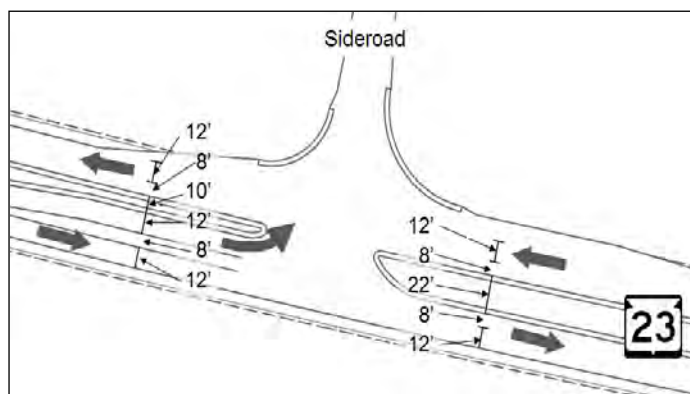


Figure 2.3-3 Typical Left Turn Layout

The Passing Lane Alternative would install a roundabout intersection at the Wisconsin American Parkway intersection with WIS 23. It would also install a new jug-handle intersection at County K to address crashes and higher traffic volumes at this intersection. The jug-handle would have a grade separation with bridges that carry WIS 23 traffic over County K. WIS 23 travelers destined for County K would have right-in/right-out access to the jug-handle loops, which connect with County K. This configuration eliminates dangerous crossing and left-turning maneuvers. The Passing Lane Alternative with left turn lanes would modify the access at select driveways near the WIS 23 left turn lanes. Figure 2.3-4 illustrates the Wisconsin American Parkway roundabout and County K jug-handle.

⁷ Providing left-turn lanes requires the installation of a median for a portion of the highway, reducing the ability to pass in these locations.

⁸ FDM 11-25-5 provides warrants for the installation of left-turn lanes on rural highways. Left turn warrants are met for the County UU, County W north and south, County U, County T and County S intersections, accessed May 11, 2018.

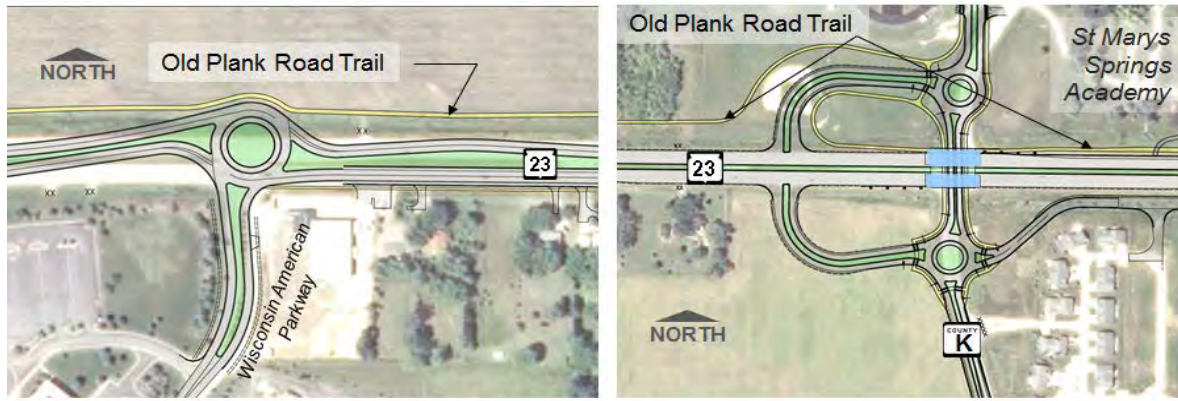


Figure 2.3-4 Wisconsin American Parkway Roundabout (left) and County K Jughandle (right)

The Passing Lane Alternative would extend the Old Plank Road Trail, a multi-use path, from where it currently ends, near the Northern Unit of the Kettle Moraine State Forest (KMSF-NU), west to the Prairie Trail in Fond du Lac.⁹ The section of the trail from the Prairie Trail to 2.5 miles east of County UU would be located on the north side of the WIS 23. Between Tower Road and Poplar Road, the trail would cross to the south side of WIS 23 through a grade separated underpass. From that point east until it connects with the existing Old Plank Road Trail near Plymouth, the Old Plank Road Trail extension would travel on the south side of WIS 23. Figure 2.3-5 schematically illustrates the Old Plank Road Trail extension in relation to other area multi-use trails. Figure 2.3-6 shows a typical section for the Old Plank Road Trail extension. The analysis for the Old Plank Road Trail extension location is described in Section 2.5 of the 2014 LS SFEIS.

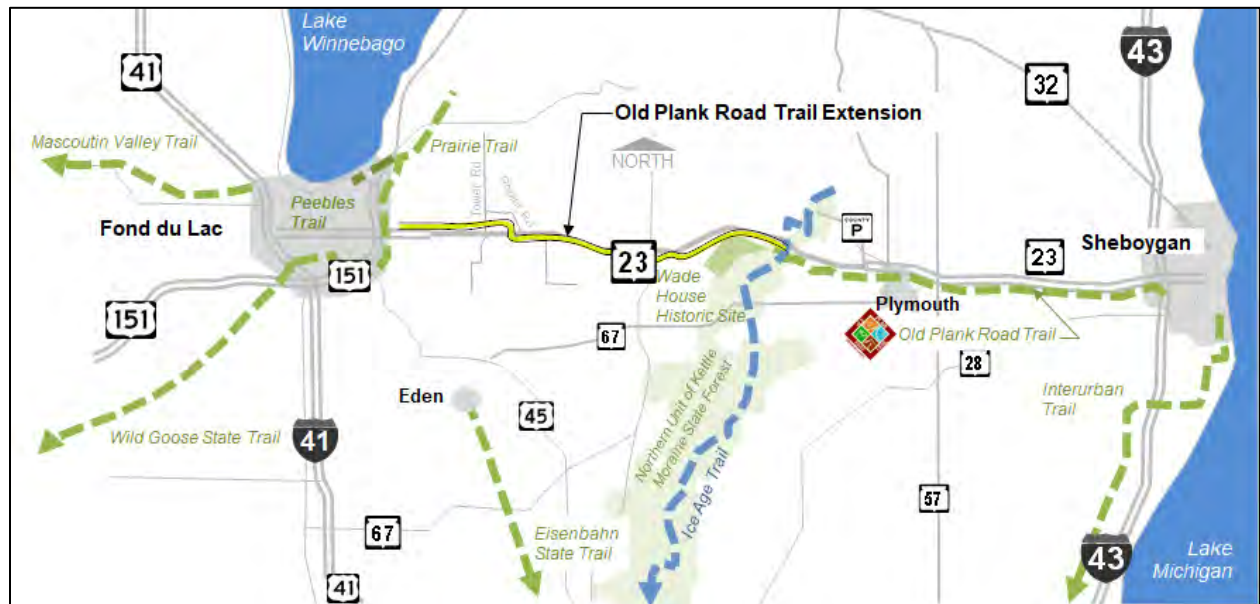


Figure 2.3-5 Old Plank Road Trail Extension

⁹ For the Passing Lane Alternative, the Old Plank Road Trail is located to minimize right of way requirements. If in the future the Passing Lane Alternative were expanded to 4-lanes, about 12 miles of the Old Plank Road Trail would need to be reconstructed.

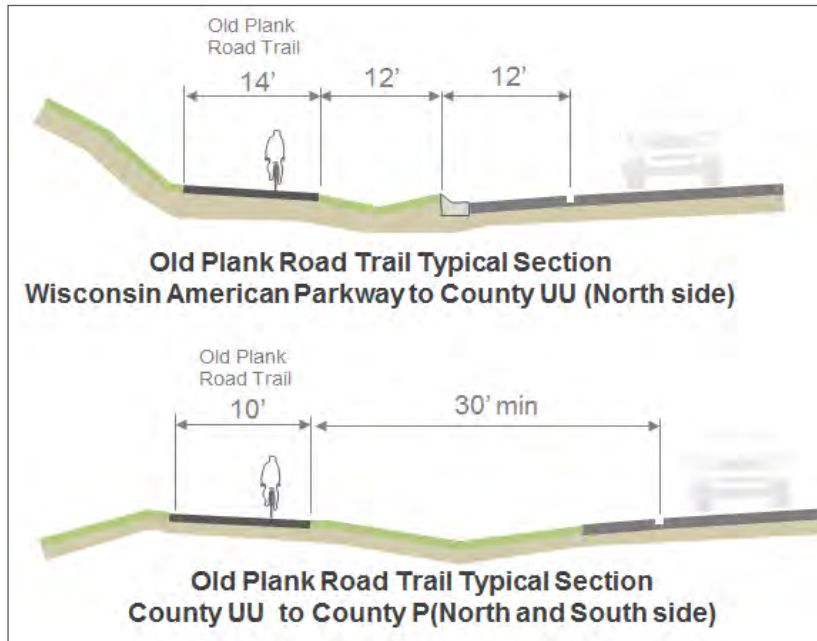


Figure 2.3-6 Old Plank Road Trail Typical Sections

The Passing Lane Alternative would also include a grade separated crossing (underpass) for the Ice Age Trail (IAT). The IAT and the State Equestrian Trail are joined as they cross WIS 23 at the KMSF-NU. A snowmobile trail also crosses WIS 23 at this location. The IAT is one of only eight National Scenic Trails, and Wisconsin's only scenic trail. The IAT, the Equestrian Trail, and the KMSF-NU are all considered 4(f) resources that require impact evaluation according to federal law. Because the IAT and State Equestrian Trail cross perpendicular to WIS 23 and the KMSF-NU is located on both sides of WIS 23, there is no opportunity to avoid the trails. To address this crossing need, WisDOT will install a grade separated underpass which will provide a clear width of 20 feet and a vertical clearance of 12 feet for the combined trails. The proposed crossing would be located near Julie Lane (see Figure 2.3-7). This crossing was negotiated with National Park Service as part of the Section 6(f) conversion request in the 2014 LS SFEIS. This commitment remains in effect. Figure 2.3-7 illustrates the Old Plank Road Trail typical sections along the corridor.

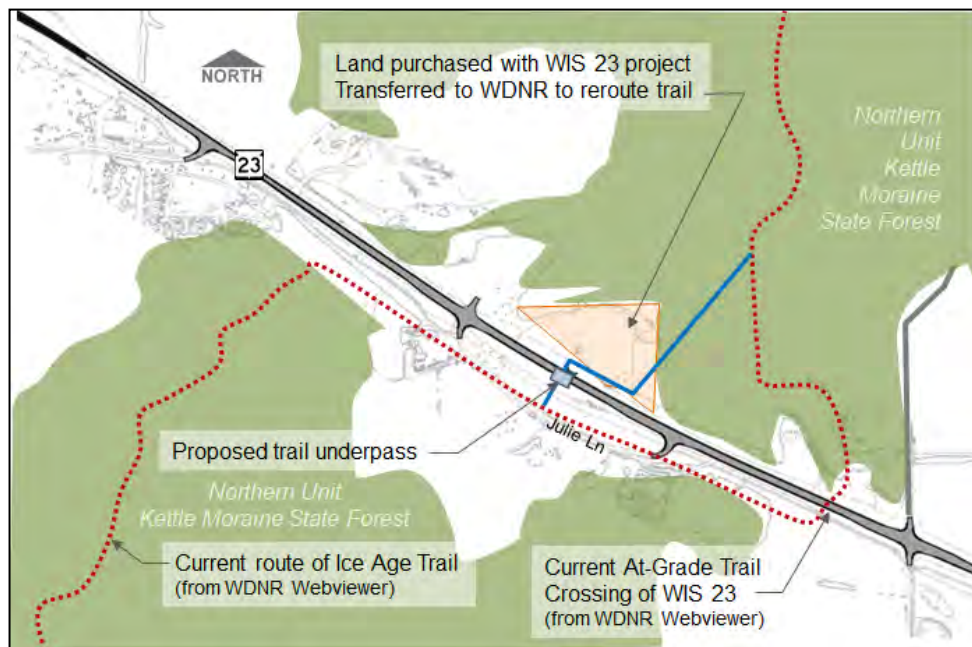


Figure 2.3-7 Ice Age Trail Treatments

B. Corridor Preservation Associated with Passing Lane Alternative

Wisconsin Statute 84.295 provides WisDOT the authority to designate a state trunk highway as a future Freeway/Expressway. Corridor preservation seeks to preserve right of way for transportation improvements that are likely to be needed in the future. This is done through the process of Official Mapping. In §84.295 (10), WisDOT is given the authority to establish locations and right of way widths for future freeways or expressways and provides WisDOT the authority to purchase Officially Mapped lands as right of way.

Through the official mapping action, conflicts with economic development can be minimized or avoided within those corridor preservation areas. This reduces costs for WisDOT, which would have to purchase those land improvements if the proposed transportation improvement is implemented. It also reduces impacts to property owners, who would have to replace or relocate investments on their property with the implementation of the transportation improvement.

Resources within the corridor preservation areas are not impacted by the act of preservation, except that property owners wishing to erect or alter a structure within that mapped right of way must give WisDOT 60 days' notice before beginning that construction. The statute also states that if notice is not given to WisDOT, compensation will not be made by WisDOT for structure improvements occurring within the corridor preservation area. In the future, if WisDOT determines that transportation improvements are needed within these preserved areas, a subsequent environmental document would be prepared which evaluates impacts and costs.

The Corridor Preservation associated with the Passing Lane Alternative preserves right of way for possible future transportation improvements and designates WIS 23 as a future Freeway/Expressway under §84.295. Corridor Preservation consists of preserving the right of way needed to expand WIS 23 to a 4-lane facility and provide access modifications to convert WIS 23 to an expressway. It would preserve right of way for the following possible future access modifications and improvements:

1. Diamond interchange at County UU.
2. Grade separation (overpass) at Tower Road.

3. Cul-de-sacs at Poplar Road.
4. Grade separation (overpass) at 7 Hills Road.
5. Cul-de-sac at County W south and Hinn Road.
6. Rerouting of County W south to County W north.
7. Diamond interchange at County W north intersection.
8. Diamond interchange at County G.
9. Grade separation (overpass) at Scenic View Drive.
10. Cul-de-sac at Plank Road.
11. Grade separation (overpass) at Sugarbush Road.
12. Diamond interchange at County A.

Figure 2.3-8 schematically illustrates these corridor preservation measures. As noted earlier, additional environmental documentation would need to be completed prior to the construction of improvements associated with corridor preservation measures.

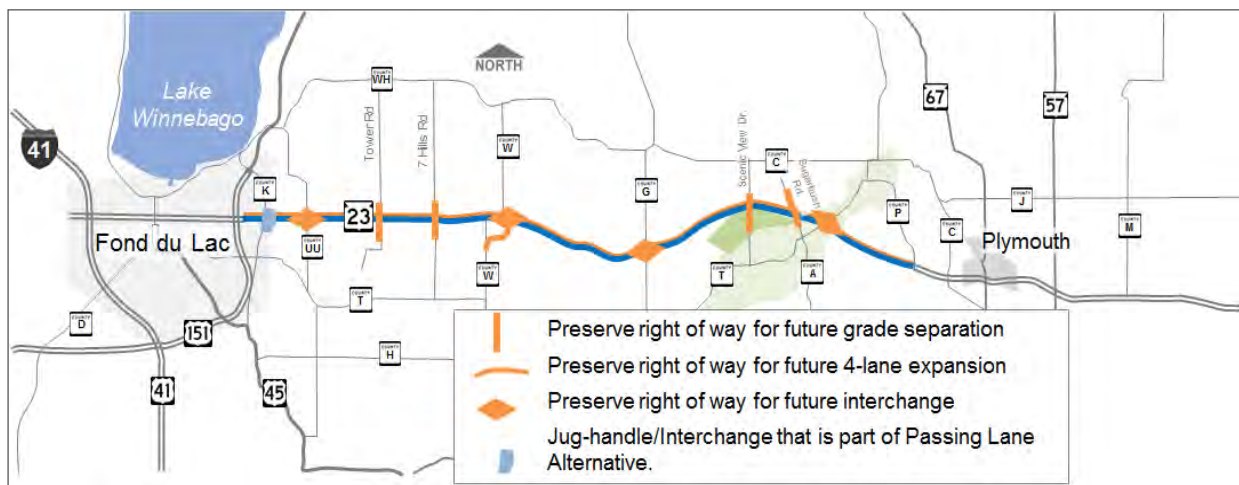


Figure 2.3-8 Corridor Preservation Associated with Passing Lane Alternative

2.4 HYBRID ALTERNATIVE

A. Hybrid Alternative

The Hybrid Alternative provides a 4-lane divided highway from US 151 to County G, and a 2-lane roadway with passing lanes from County G to County P. The 4-lane divided highway would span approximately 12 miles from US 151 in Fond du Lac to County G. East of County G, WIS 23 would be a 2-lane roadway with passing lanes and left turn lanes for the remaining 7 miles. Posted speeds along WIS 23 would not be modified in this alternative.

With this alternative, the eastbound passing lane east of County G overlaps with the County G interchange on-ramp. Figure 2.4-1 schematically illustrates this alternative.

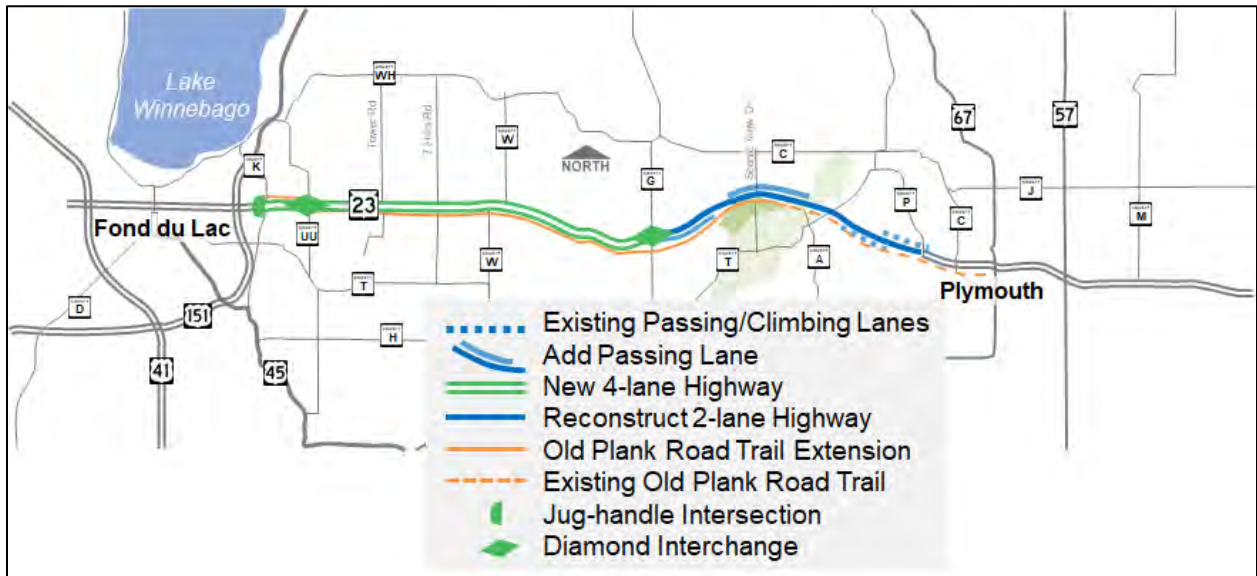


Figure 2.4-1 Hybrid Alternative—4 Lanes from US 151 to County G, 2 Lanes from County G to County P

The Hybrid Alternative has the same roundabout intersection at Wisconsin American Parkway as the Passing Lane Alternative, shown in Figure 2.3-4. It also has the same jug-handle intersection at County K, also shown in Figure 2.3-4. The Old Plank Road Trail Extension would span from US 151 to the existing Old Plank Road Trail west of the city of Plymouth.

The Hybrid Alternative also installs a diamond interchange at County UU with County UU passing over WIS 23. This interchange includes access roads that connect to adjacent property and a park and ride lot that connects with the Old Plank Road Trail extension. With the Hybrid Alternative, the Old Plank Road Trail would cross from the north to the south side of WIS 23 on County UU at the interchange. Figure 2.4-2 illustrates the County UU interchange.

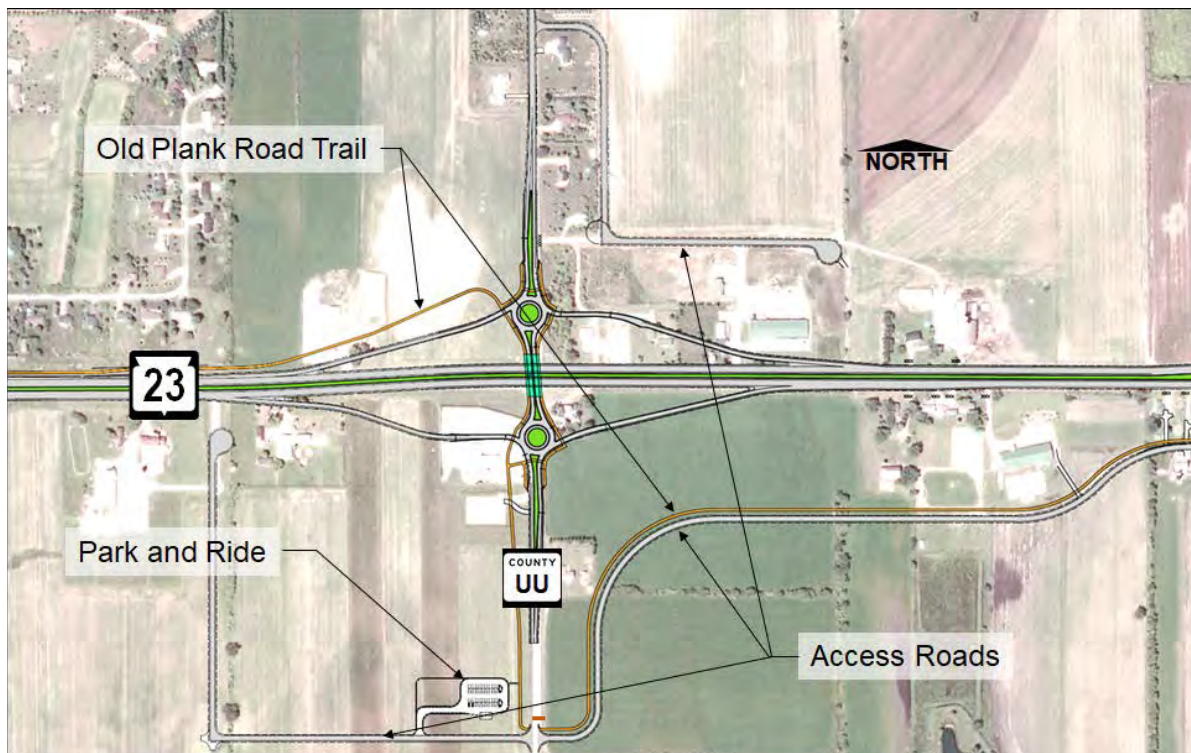


Figure 2.4-2 County UU Interchange

The Hybrid Alternative also includes a diamond interchange at County G. The interchange includes a park and ride lot in the southeast quadrant, as well as an access road to connect to adjacent properties. Figure 2.4-3 illustrates the County G interchange.

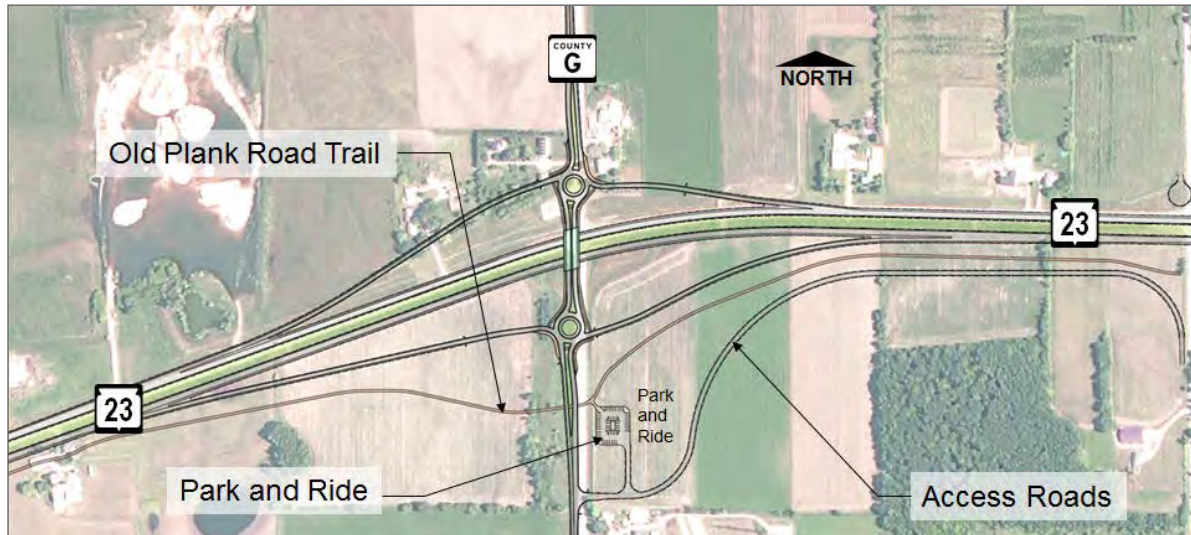


Figure 2.4-3 County G Interchange

The Hybrid Alternative makes access modifications in the 4-lane portion of the alternative. These access modifications include the installation of RCUTs at the Tower Road North, 7 Hills Road, and County W North/South intersections. The RCUT intersection design only allows right-in/right-out/left-in movements and removes the most hazardous movements from the intersection. Drivers that want to turn left or travel across WIS 23 on the side road must take a right and then make a U-turn at an appropriate distance from the intersection. This type of intersection has been successfully used in several states, including seven locations in Wisconsin, to improve intersection safety and was a recommended measure for this project from a road safety audit. The RCUT concept is shown in Figure 2.4-4.



Figure 2.4-4 RCUT Layout

The Hybrid Alternative would eliminate or relocate private access along WIS 23 in the 4-lane segment in Fond du Lac County, removing many mainline crossing conflicts. In the two-lane segment, private access would be modified at 6 private driveways near intersections. The Hybrid Alternative would also install the same grade separated underpass for the IAT, as described in Section 2.3 and shown in Figure 2.3-7.

B. Corridor Preservation Associated with Hybrid Alternative

The Corridor Preservation associated with the Hybrid Alternative preserves right of way for possible future transportation improvements and designates WIS 23 as a future Freeway/Expressway under §84.295, as discussed with the Corridor Preservation associated with the Passing Lane Alternative in Section 2.3 of this document. It includes preserving right of way needed to expand the WIS 23 section from County G to County P to a 4-lane roadway and provide access modifications to convert WIS 23 to an expressway. It would preserve right of way for the following possible future access modifications:

1. Grade separation (overpass) at Tower Road.
2. Cul-de-sacs at Poplar Road.
3. Grade separation (overpass) at 7 Hills Road.
4. Cul-de-sac at County W south and Hinn Road.
5. Rerouting of County W south to County W north.
6. Diamond interchange at County W north intersection.
7. Grade separation (overpass) at Scenic View Drive.
8. Cul-de-sac at Plank Road.
9. Grade separation (overpass) at Sugarbush Road.
10. Diamond interchange at County A.

Figure 2.4-5 schematically illustrates the Corridor Preservation associated with the Hybrid Alternative. Additional environmental documentation would be completed prior to the construction of improvements associated with the corridor preservation measures.

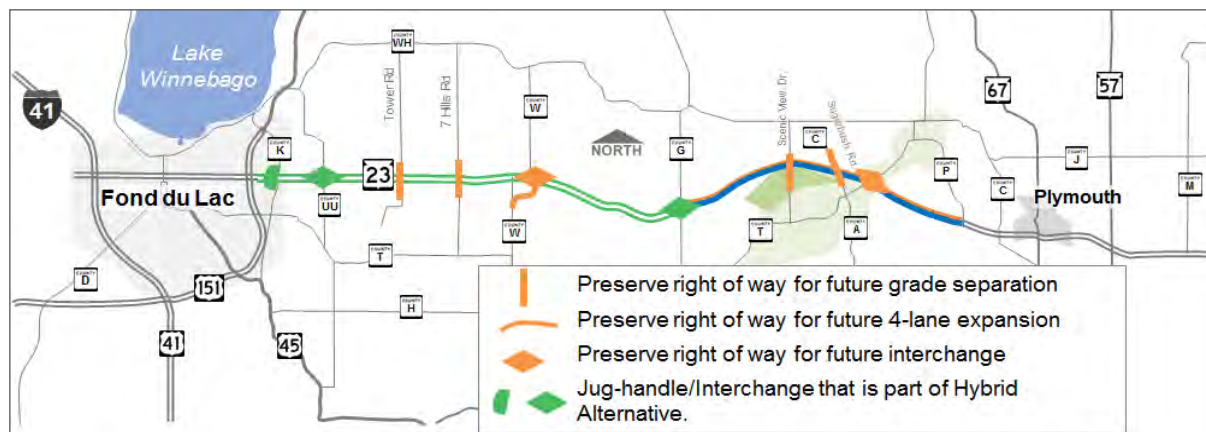


Figure 2.4-5 Corridor Preservation Associated with the Hybrid Alternative

2.5 4-LANE ON-ALIGNMENT ALTERNATIVE

A. 4-lane On-Alignment Alternative

The 4-lane On-alignment Alternative evaluated was the Preferred Alternative in the 2014 LS SFEIS. This alternative would provide a 4-lane divided highway on the existing alignment for the full length of the project. It includes the roundabout at Wisconsin American Parkway, the County K jug-handle, and diamond interchanges at County UU and County G. As discussed with the Hybrid Alternative, RCUT are proposed at eight intersections: Tower Road, 7 Hills Road, County W, County U, County T, Sugarbush Road, County A, and County S. The 4-lane On-alignment Alternative also includes the Old Plank Road Trail extension that extends from US 151 to the existing Old Plank Road Trail just west of Plymouth. The trail would cross from north to south of WIS 23 on County UU.

at the interchange, the same crossing as with the Hybrid Alternative. Figure 2.5-1 schematically illustrates the 4-lane On-alignment Alternative.

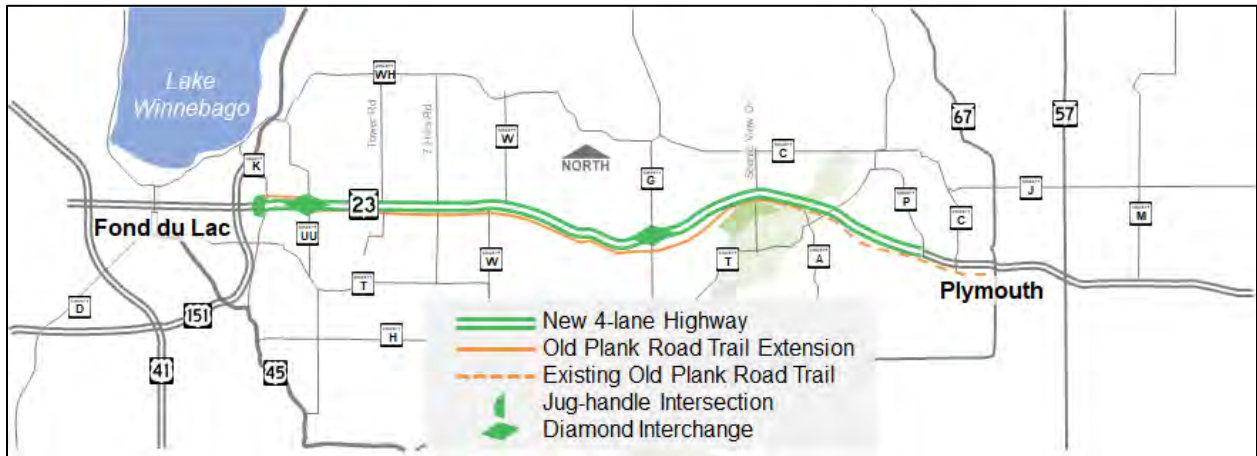


Figure 2.5-1 4-lane On-alignment Alternative

From US 151 to County UU, the 4-lane On-alignment typical section would include four 12-foot lanes, 6-foot inside shoulders, 10-foot outside shoulders, and an 18-foot median with mountable curb. The outside edges may flow into either a rural section with a ditch or use mountable curb and gutter. The design speed for this section of roadway will be 55 miles per hour (mph) and will be posted for 45 mph. Figure 2.5-2 illustrates this cross section.

From County UU east to County P in Sheboygan County, WIS 23 has a typical expressway cross section. This includes four 12-foot lanes, 6-foot inside shoulders, 10-foot outside shoulders, and a 60-foot median. Generally, the existing roadbed will carry the eastbound lanes, and the westbound lanes will be constructed north of the existing roadway. The exception to this is between County W and Division Street, where the new lanes will be south of the existing roadbed.

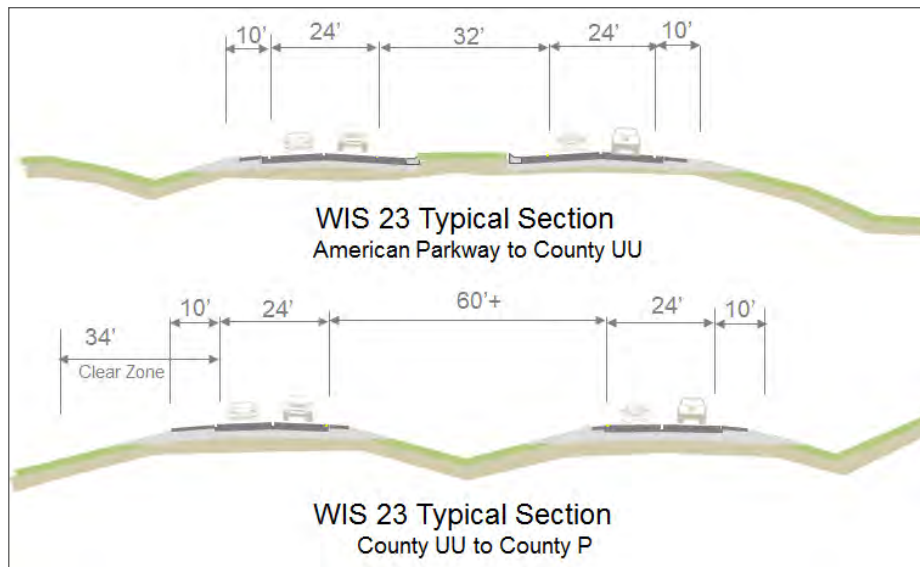


Figure 2.5-2 4-Lane On-alignment Typical Sections

Conversion to a 4-lane expressway would allow for the existing posted speeds of 55 mph along WIS 23 to be increased to 65 mph, similar to portions of WIS 23 east of the study limits and other nearby 4-lane expressways such as US 151 between Columbus and Fond du Lac.

The 4-lane On-alignment Alternative would eliminate or relocate some movements at many private access points along WIS 23 throughout the corridor, removing many mainline crossing conflicts. The

4-lane On-alignment Alternative also includes a grade separated crossing (underpass) for the IAT, as described in Section 2.3 and shown in Figure 2.3-7

B. Corridor Preservation Associated with 4-lane On-alignment Alternative

The Corridor Preservation associated with the 4-lane On-alignment Alternative includes designating WIS 23 as a Freeway/Expressway under §84.295, as described in Section 2.3 of this document, and preserving right of way needed for the following transportation improvements:

1. Grade separation (overpass) at Tower Road.
2. Cul-de-sacs at Poplar Road.
3. Grade separation (overpass) at 7 Hills Road.
4. Cul-de-sac at County W south and Hinn Road.
5. Rerouting of County W south to County W north.
6. Diamond interchange at County W north intersection.
7. Grade separation (overpass) at Scenic View Drive.
8. Cul-de-sac at Plank Road.
9. Grade separation (overpass) at Sugarbush Road.
10. Diamond interchange at County A.

Additional environmental documentation would be completed prior to the construction of improvements associated with corridor preservation measures.

Figure 2.5-4 schematically illustrates the Corridor Preservation associated with the 4-lane On-alignment Alternative.

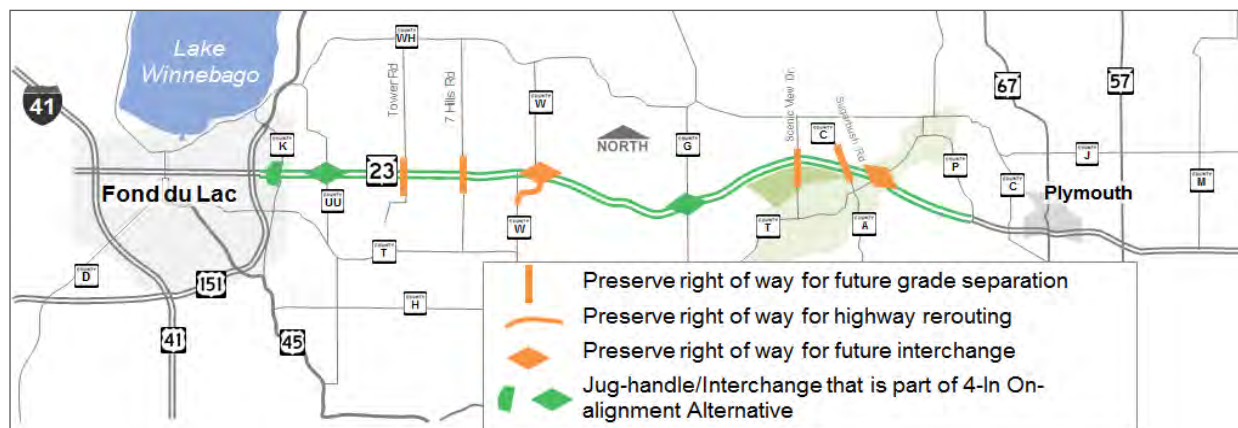


Figure 2.5-3 Corridor Preservation Associated with the 4-Lane On-Alignment Alternative

2.6 ACCESS

Different access treatments would be applied to intersections with each alternative. Generally, the No-Build Alternative maintains full access at each intersection, unless it is already restricted as at County K. While providing full access, this alternative does not restrict the more hazardous crossing and left-turning movements from side road intersections.

The Passing Lane Alternative suboption with left-turn lanes installs left-turn lanes on WIS 23 at County UU, Tower Road, 7 Hills Road, County W south, County W north, County G, County U, County T, County A, and County S. Otherwise most other intersections would remain the same. The Passing Lane Alternative suboption without left-turn lanes keeps access to all movements at most intersections along the corridor. The Corridor Preservation associated with the Passing Lane Alternative preserves land for future access modifications at many intersections along the corridor through a combination of cul-de-sacs, grade separations (overpasses), and interchanges.

The Hybrid Alternative restricts access at several intersections between County K and County G. East of County G, existing intersection access to and from WIS 23 is generally maintained. The improvements associated with the Corridor Preservation for the Hybrid Alternative preserves land for future modification of access to intersections both west and east of County G.

The 4-lane On-alignment Alternative modifies access to most intersections, with almost 85 percent of the corridor intersections receiving some type of access change. The Corridor Preservation associated with the 4-lane On-alignment Alternative further modifies access by preserving land for future grade separations (overpasses) and interchanges.

Table 2.6-1 lists the proposed intersection access for the Passing Lane, Hybrid, and 4-lane On-alignment Alternatives, and the possible future access changes that influenced the associated corridor preservation alternatives. These access modifications were developed using WisDOT’s Intersection Control Evaluation process, which reviews turning movement volumes, operations, and develops and evaluates alternatives for each intersection. These Intersection Control Evaluations are available from WisDOT upon request.

Table 2.6-1 Intersection Access Treatment for Each Alternative

Access Treatment (At-grade = full access intersection, RI/RO = right in/right out, LI = left in, RCUT = Restricted Crossing U-Turn)

Intersection	No-Build	Passing Ln Alternatives	Possible Future Improvements with the Corridor Preservation associated with Passing Ln Alts	Hybrid Alternative	Possible Future Improvements with the Corridor Preservation associated with Hybrid Alternative	4-lane On-alignment Alternative	Possible Future Improvements with the Corridor Preservation associated with 4-lane On-alignment Alternative
Wisconsin American Drive	At-grade	Multi-Lane Roundabout	Multi-Lane Roundabout	Multi-Lane Roundabout	Multi-Lane Roundabout	Multi-Lane Roundabout	Multi-Lane Roundabout
County K	RI/RO/LI	Jug-handle	Jug-handle	Jug-handle	Jug-handle	Jug-handle	Jug-handle
Mary Hill Drive	At-grade	At-grade	Access removed	Access removed	Access removed	Access removed	Access removed
Whispering Springs Drive	At-grade	RI/RO	RI/RO	RI/RO	RI/RO	RI/RO	RI/RO
Hill Top Drive	At-grade	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac
Northway Road	At-grade	At-grade	Access removed	Access removed	Access removed	Access removed	Access removed
County UU	At-grade	At-grade	Diamond Interchange	Diamond Interchange	Diamond Interchange	Diamond Interchange	Diamond Interchange
Taft Road	At-grade	At-grade	RI/RO	RI/RO	RI/RO	RI/RO	RI/RO
Tower Road North	At-grade	At-grade	Overpass	RCUT	Overpass	RCUT	Overpass
Tower Road South	At-grade	At-grade	Overpass	RI/RO	Overpass	RI/RO	Overpass
Poplar Road North	At-grade	At-grade	Cul-de-sac	RI/RO	Cul-de-sac	RI/RO	Cul-de-sac
Poplar Road South	At-grade	At-grade	Cul-de-sac	RI/RO	Cul-de-sac	RI/RO	Cul-de-sac
7 Hills Road North	At-grade	At-grade	Overpass	RCUT	Overpass	RCUT	Overpass
7 Hills Road South	At-grade	At-grade	Overpass	RCUT	Overpass	RCUT	Overpass
Hinn Road	At-grade	At-grade	Cul-de-sac	RI/RO	Cul-de-sac	RI/RO	Cul-de-sac
County W South	At-grade	At-grade	Rerouting of County W	RCUT	Rerouting of County W	RCUT	Rerouting of County W
County W North	At-grade	At-grade	Diamond Interchange	RCUT	Diamond Interchange	RCUT	Diamond Interchange
Loehr Road	At-grade	At-grade	RI/RO	RI/RO	RI/RO	RI/RO	RI/RO
Log Tavern Road North	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade

Table 2.6-1 Intersection Access Treatment for Each Alternative

Access Treatment (At-grade = full access intersection, RI/RO = right in/right out, LI = left in, RCUT = Restricted Crossing U-Turn)

Intersection	No-Build	Passing Ln Alternatives	Possible Future Improvements with the Corridor Preservation associated with Passing Ln Alts	Hybrid Alternative	Possible Future Improvements with the Corridor Preservation associated with Hybrid Alternative	4-lane On-alignment Alternative	Possible Future Improvements with the Corridor Preservation associated with 4-lane On-alignment Alternative
Log Tavern Road South	At-grade	At-grade	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac
Triple T	At-grade	At-grade	Rerouted to Pit Road South	Rerouted to Pit Road South	Rerouted to Pit Road South	Rerouted to Pit Road South	Rerouted to Pit Road South
Pit Road North	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Pit Road South	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Banner Road	At-grade	At-grade	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac
Triple T Road North	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Hillview Road North	At-grade	At-grade	RCUT	RCUT	RCUT	RCUT	RCUT
Hillview Road South	At-grade	At-grade	RI/RO	RI/RO	RI/RO	RI/RO	RI/RO
Hickory Road	At-grade	At-grade	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac	Cul-de-sac
County G	At-grade	At-grade	Diamond Interchange	Diamond Interchange	Diamond Interchange	Diamond Interchange	Diamond Interchange
Division Road North	At-grade	At-grade	Cul-de-sac	At-grade	Cul-de-sac	Cul-de-sac	Cul-de-sac
Division Road South	At-grade	At-grade	Access Road to County G	At-grade	Access Road to County G	Access Road to County G	Access Road to County G
Chickadee Drive	At-grade	At-grade	RI/RO	At-grade	RI/RO	RI/RO	RI/RO
County U	At-grade	At-grade	RCUT	At-grade	RCUT	RCUT	RCUT
Sunrise Road	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Spring Valley Drive	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Scenic View Drive North	At-grade	At-grade	Overpass	At-grade	Overpass	At-grade	Overpass
Scenic View Drive South	At-grade	At-grade	Overpass	At-grade	Overpass	At-grade	Overpass
County T	At-grade	At-grade	RCUT	At-grade	RCUT	RCUT	RCUT
Plank Road West	At-grade	At-grade	Cul-de-sac	At-grade	Cul-de-sac	RI/RO	Cul-de-sac
Sugarbush Road North	At-grade	At-grade	Overpass	At-grade	Overpass	RCUT	Overpass
Sugarbush Road South	At-grade	At-grade	Overpass	At-grade	Overpass	RI/RO with Dedicated Left lane-RCUT	Overpass
County A North	At-grade	At-grade	Interchange	At-grade	Interchange	RCUT	Interchange
County A South	At-grade	At-grade	Interchange	At-grade	Interchange	RCUT	Interchange
Plank Road East	At-grade	At-grade	RI/RO	At-grade	RI/RO	RI/RO	RI/RO
Castle Rock Court	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Julie Lane West	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Julie Lane East	At-grade	At-grade	Cul-de-sac	At-grade	Cul-de-sac	Cul-de-sac	Cul-de-sac
Ridge Road North	At-grade	At-grade	Cul-de-sac	At-grade	Cul-de-sac	Cul-de-sac	Cul-de-sac
Ridge Road South	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
County S North	At-grade	At-grade	RCUT	At-grade	RCUT	RCUT	RCUT

Table 2.6-1 Intersection Access Treatment for Each Alternative

Access Treatment (At-grade = full access intersection, RI/RO = right in/right out, LI = left in, RCUT = Restricted Crossing U-Turn)

Intersection	No-Build	Passing Ln Alternatives	Possible Future Improvements with the Corridor Preservation associated with Passing Ln Alts	Hybrid Alternative	Possible Future Improvements with the Corridor Preservation associated with Hybrid Alternative	4-lane On-alignment Alternative	Possible Future Improvements with the Corridor Preservation associated with 4-lane On-alignment Alternative
County S South	At-grade	At-grade	RCUT	At-grade	RCUT	RCUT	RCUT
Coary Lane	At-grade	At-grade	Removed from WIS 23– Sandstone Lane extended and cul-de-sac	At-grade	Removed from WIS 23– Sandstone Lane extended and cul-de-sac	Removed from WIS 23– Sandstone Lane extended and cul-de-sac	Removed from WIS 23– Sandstone Lane extended and cul-de-sac
Twinkle Lane	At-grade	At-grade	Removed from WIS 23–Valley Lane extended and cul-de-sac	At-grade	Removed from WIS 23–Valley Lane extended and cul-de-sac	Removed from WIS 23–Valley Lane extended and cul-de-sac	Removed from WIS 23–Valley Lane extended and cul-de-sac
County P North and South	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Inez St	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade	At-grade
Branch Road	At-grade	At-grade	Removed from WIS 23– Extended to Inez Court	At-grade	Removed from WIS 23– Extended to Inez Court	Removed from WIS 23– Extended to Inez Court	Removed from WIS 23– Extended to Inez Court

2.7 TRAFFIC FORECASTS AND RESULTING OPERATIONS

A. Traffic Forecasts

For this WIS 23 study, traffic volumes are expressed as average annual daily traffic (AADT). The AADT volumes reflect average annual traffic conditions rather than daily or seasonal variations. The most recent traffic volumes, also referred to as the existing traffic volumes, were derived from WisDOT traffic count data taken during the summer of 2017.

The traffic forecasting analysis developed for and presented in the main body of this WIS 23 2018 LS SEIS used an updated version of the Northeast Region Travel Demand Model (NERTDM) and recent traffic counts to develop consistent forecasts for the No-Build Alternative and each of the Build Alternatives. Per WisDOT Traffic Forecasting Section policy (as detailed in the May, 2018 Transportation Planning Manual), a separate forecasting analysis was conducted based on Traffic Analysis Forecasting Information System (TAFIS) and regression modeling to establish the reasonableness of the No-Build forecast.

The results of this separate analysis can be found in Attachment B of Appendix B of this 2018 LS SEIS, and are presented to compare the no-build results prepared for the formal NEPA study (as presented in Attachment A of this Appendix B of this 2018 LS SEIS) to those derived from WisDOT’s internal screening process. Forecast values from the two analyses are consistent.¹⁰

Once the No-Build forecast was developed WisDOT set up the NERTDM to analyze the build alternatives. Network changes were coded in the model to develop traffic forecasts for the Build Alternatives including the Passing Lane Alternative, Hybrid Alternative, and 4-lane On-alignment Alternative. The network changes showed modest capacity increases and access changes that affected traffic volumes in the Passing Lane alternative. The Hybrid alternative and 4-lane On-alignment alternative showed larger traffic effects due to greater capacity increases and additional access improvements. The Hybrid and 4-lane On-alignment alternatives attracted more traffic from

¹⁰ Refer to traffic forecast memorandum in Appendix B for additional information.

the local system than the No-Build and Passing Lane alternatives. Appendix B provides a more detailed explanation of the traffic forecasting procedures and results. Figure 2.7-1 shows the WIS 23 corridor 2040 forecasts for each of the alternatives being considered.

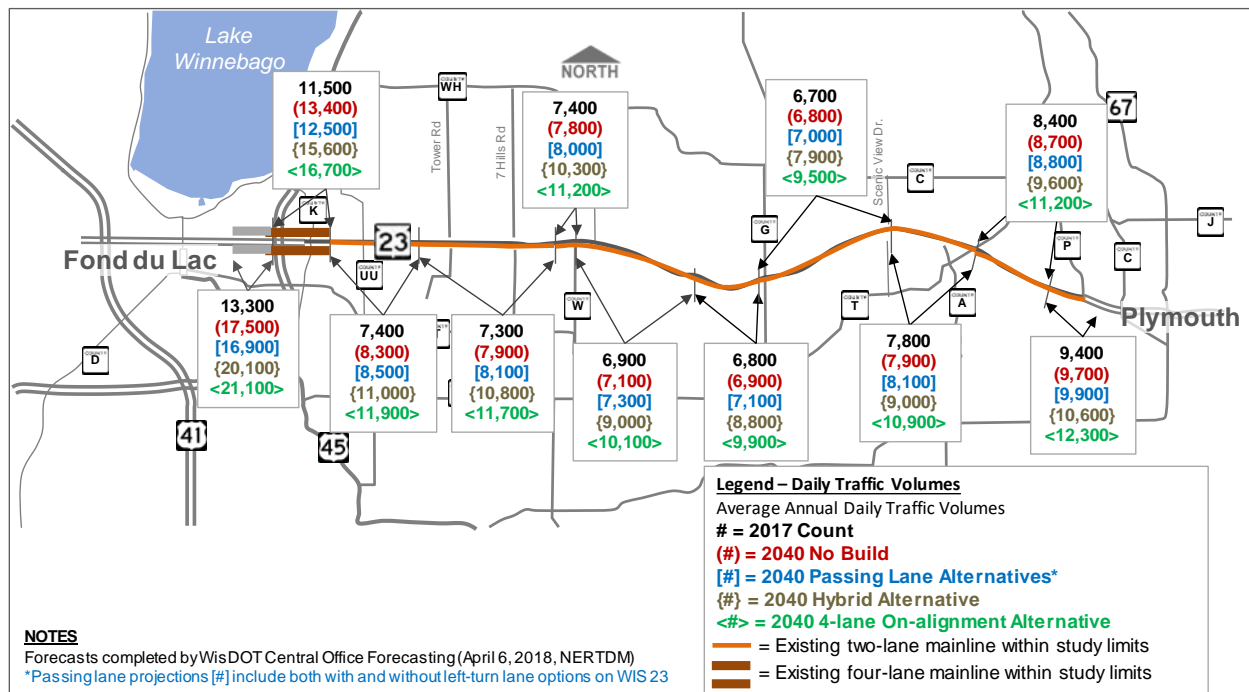


Figure 2.7-1 2040 Traffic Forecast Volumes for Alternatives

B. Operational Analysis

WisDOT performed an operational analysis for each alternative using Highway Capacity Software (HCS). The analysis included WIS 23 mainline operations analysis as well as side road operations analysis. Appendix A contains two memoranda describing the inputs and methodology used for the operational analysis.

The HCS results report Level of Service (LOS), which is a measure of how well a highway or intersection is able to serve the travel demands placed on it. Traffic and roadway design factors such as AADT volumes, peak-hour volumes, peak-hour truck percentages, number of driving lanes, lane widths, vertical grades, passing opportunities, and number of access points affect the LOS for the mainline. Turning movements, amount of cross traffic, truck percentages, and lane configurations affect the LOS for side road intersections.

LOS ranges from A to F in order of decreasing operational quality, with LOS A representing good operations, and LOS F representing poor operations. For 2-lane roads, the percent time spent following another vehicle, and in some conditions, average speed,¹¹ are the metrics that determine the LOS. The 4-lane highway LOS uses controlling (i.e. highest volume) 2040 peak hour volumes to determine the controlling basic, merge, or diverge segment to analyze at proposed interchanges. The LOS is determined by the density of the segment. The LOS for intersections is determined by the average delay a vehicle experiences exiting from a side road during the peak hours of the day.

WIS 23 is a Connector Route in Corridors 2030, part of the *Connections 2030 Statewide Long-Range Transportation Plan*. One design requirement of a Corridors 2030 Connector Route is maintaining acceptable traffic operations. WisDOT’s FDM provides the operational goals for

¹¹ Previous National Environmental Policy Act documents presented the average speed as calculated by Highway Capacity Software (HCS). Analysis of probe data (GPS data from phones or vehicles) for the WIS 23 corridor indicates that travel speeds on WIS 23 vary from those predicted by HCS. See the Traffic Modeling Methodology memorandum in Appendix A for more information.

Corridors 2030 (formerly Corridors 2020) routes. The FDM states “The highest LOS thresholds are applied to the Interstate system routes and other Corridors 2030 system routes in recognition of their importance from a mobility and economic development perspective.” For Corridors 2030 Connector routes, the FDM desirable LOS threshold is LOS C for rural and small urban areas as outlined in the FDM¹², which indicates the desirable LOS on this route is above the operational threshold between LOS C and LOS D (the numeric LOS <=4.0). The majority of the WIS 23 study corridor is outside of the urban areas of Fond du Lac and Sheboygan.¹³

Tables 2.7-1 and 2.7-2 show the operational analyses for the WIS 23 mainline. The tables divide the corridor into two sections because the 2017 volumes are slightly higher east of County G. Dividing the corridor into sections provides a more accurate analysis of each section. 2017 values are not shown for the Passing Lane, Hybrid, and 4-lane On-alignment Alternatives since 2017 represents an existing condition. The tables show LOS using fully uniform peaking characteristics for 2040 conditions. This assumes that WIS 23 would experience the exact same amount of traffic for each 15-minute period of the peak hour, consistent with current WisDOT policy for future operational analysis. The combination of the small increase in the forecast average annual daily traffic volumes (2 to 7 percent) and the leveling of volumes within the peak hour contributes to a projected 2040 No-Build LOS that will be about the same or slightly better than the LOS calculated for 2017.

Table 2.7-1 Alternative Operations–County UU to County G

	No-Build		Passing Lane Alternative Without Left Turn Lanes		Passing Lane Alternative With Left Turn Lanes		Hybrid Alternative		4-lane On-alignment Alternative	
	EB	WB	EB	WB	EB	WB	EB ^[1]	WB ^[1]	EB ^[1]	WB ^[1]
LOS 2017 (Numeric)	4.17	4.18	2017 values are not shown for the Passing Lane, Hybrid, and 4-lane On-alignment Alternatives since 2017 represents an existing condition.							
LOS 2017	D	D								
% Following 2040	66.3%	66.6%	53.1%	52.8%	54.8%	54.3%	--	--	--	--
LOS 2040 (Numeric)	4.09	4.11	3.21	3.19	3.32	3.29	--	--	--	--
LOS 2040	D	D	C	C	C	C	A	A	A	A

[1] Note that % following is not shown in alternatives with 4-lane cross section because it is not a variable in determining LOS

Table 2.7-2 Alternative Operations–County G to County P

	No-Build		Passing Lane Alternative Without Left Turn Lanes		Passing Lane Alternative With Left Turn Lanes		Hybrid Alternative		4-lane On-alignment Alternative	
	EB	WB	EB	WB	EB	WB	EB	WB	EB ^[1]	WB ^[1]
LOS 2017 (Numeric)	3.95	4.09	2017 values are not shown for the Passing Lane, Hybrid, and 4-lane On-alignment Alternatives since 2017 represents an existing condition.							
LOS 2017	C	D								
% Following 2040	62.0%	64.9%	62.0%	52.6%	64.2%	54.7%	67.7%	55.7%	--	--
LOS 2040 (Numeric)	3.80	3.99 ^[2]	3.80	3.17	3.95 ^[3]	3.31	4.05 ^[4]	3.38	--	--
LOS 2040	C	C	C	C	C	C	D	C	A	A

[1] Note that % following is not shown in alternatives with 4-lane cross section because it is not a variable in determining LOS
 [2] The numeric LOS range for LOS C is 3.01 to 4.00, and for LOS D the range is 4.01 to 5.00. For County G to County P westbound, the 2040 No-Build LOS of 3.99 is just 0.02 away from LOS D.
 [3] For County G to County P westbound, the 2040 Passing Lane Alternative LOS of 3.95 is just 0.06 away from LOS D.
 [4] For County G to County P westbound, the 2040 Hybrid Alternative LOS of 4.05 is just 0.05 away from LOS C. The Hybrid Alternative operates slightly worse than the Passing Lane Alternative because more traffic is drawn to WIS 23.

¹² Facilities Development Manual 11-5-3.2.1 Congestion and Facility LOS. Accessed March 23, 2018

¹³ <http://wisconsin.gov/Pages/projects/data-plan/plan-res/boundaries.aspx>, Accessed April 10, 2018

The FDM states that the desirable LOS for side road intersections associated with Corridors 2030 and NHS routes is LOS D or better for the intersection as a whole and for all turning movements.¹⁴ Because WIS 23 is a Corridors 2030 and a NHS route, WisDOT seeks to provide LOS D or better operation levels at all intersections. Higher volume intersections along WIS 23 include county trunk highways that are classified either as minor arterials or rural collectors. Operation levels tend to deteriorate at more highly used intersections because there is a higher demand for access, which leads to queuing.

Table 2.7-3 lists the LOS for side road intersections in the 2040 design year. Note that the traffic operations for the Passing Lane with left-turn lanes Alternative is better than the traffic operations for the Passing Lane without left-turn lanes Alternative. This is because the Passing Lane with left-turn lanes establishes a median for the left-turn bay. This median allows left turning and through vehicles from the side road to make the maneuver in two stages, improving the operations. Figure 2.7-2 illustrates this maneuver.

The RCUT operations results in Table 2.7-3 display the delay experienced for the right-in/right-out/left-in movements at the primary intersection and the delay and travel time experienced for the U-turn movements. For a RCUT, as shown in Figure 2.4-4, drivers that want to turn left or travel across WIS 23 on the side road must take a right and then make a U-turn at an appropriate distance from the intersection. This results in extra travel time, in addition to the stop-control delay, for movements that would use the U-turn.

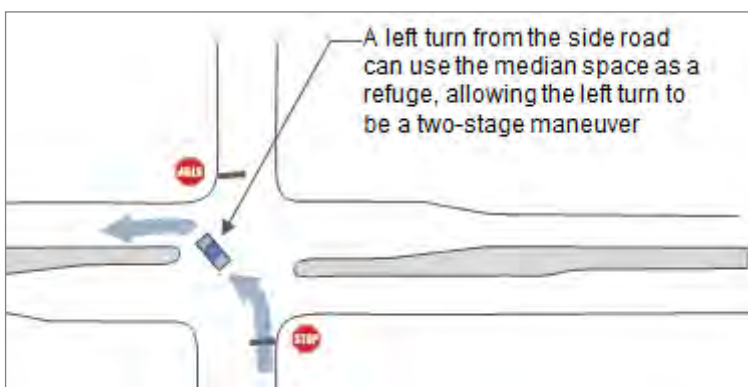


Figure 2.7-2 Left Turns with the Passing Lane with Left-Turn Lanes Alternative

¹⁴ FDM 11-5-3.2.2 Congestion and Intersection LOS. Accessed May 9, 2018.

Table 2.7-3 Side Road Operations

NBL/TH = Northbound Left/Through, NBR = Northbound Right, SBL/TH = Southbound Left/Through, SBR = Southbound Right

Intersection and Movement (unless otherwise noted)	No-Build Delay (s)	No-Build LOS	Passing Ln w/o Left Ins Delay (s)	Passing Ln w/o Left Ins LOS	Passing Ln w/Left Ins Delay (s)	Passing Ln w/Left Ins LOS	Intersection and Movement (unless otherwise noted)	Hybrid Alternative Delay (s)	Hybrid Alternative LOS	4-lane On-alignment Delay (s)	4-lane On-alignment LOS
County UU 2040 AM Peak							Interchange with roundabout				
NBL/TH	24.5	C	25.4	D	17.3	C	NB	3.4	A	3.4	A
NBR	10.4	B	10.4	B	10.4	B	EB off	3.5	A	3.5	A
SBL/TH	22.1	C	22.7	C	16.0	C	SB	3.2	A	3.3	A
SBR	12.4	B	12.6	B	12.6	B	WB off	3.2	A	3.2	A
County UU 2040 PM Peak							Interchange with roundabout				
NBL/TH	39.1	E	41.8	E	21.2	C	NB	4.2	A	4.3	A
NBR	12.7	B	12.8	B	12.8	B	EB off	3.4	A	3.4	A
SBL/TH	27.9	D	29.0	D	18.5	C	SB	3.8	A	3.9	A
SBR	11.6	B	11.7	B	11.7	B	WB off	3.5	A	3.5	A
County W/ Loehr Rd 2040 AM Peak							RCUT				
NBL/TH	16.7	C	17.0	C	13.8	B	NBR	9.8	A	10.0	A
NBR	10.1	B	10.1	B	10.1	B	EBL	8.8	A	9.0	A
SBL/TH	17.2	C	17.7	C	14.1	B	SBR	10.4	B	10.7	B
SBR	10.7	B	10.7	B	10.7	B	U-turns	U-turns	A (delay) D (travel time)	U-turns	A (delay) D (travel time)
County W/ Loehr Rd 2040 PM Peak							RCUT				
NBL/TH	20.5	C	21.1	C	16.0	C	NBR	10.1	B	10.3	B
NBR	10.9	B	11.0	B	11.0	B	EBL	8.9	A	9.2	A
SBL/TH	21.3	C	22.1	C	15.9	C	SBR	10.6	B	11.0	B
SBR	10.8	B	10.9	B	10.9	B	U-Turns	U-turns	A-B (delay) D (travel time)	U-turns	B (delay) D (travel time)
County G 2040 AM Peak							Interchange with roundabout				
NBL/TH	17.6	C	18.1	C	14.5	B	NB	3.6	A	3.7	A
NBR	10.4	B	10.5	B	10.5	B	EB off	3.7	A	3.7	A
SBL/TH	16.9	C	17.3	C	14.1	B	SB	3.4	A	3.5	A
SBR	10.3	B	10.4	B	10.4	B	WB off	3.5	A	3.5	A
County G 2040 PM Peak							Interchange with roundabout				
NBL/TH	22.0	C	22.9	C	16.4	C	NB	3.8	A	3.9	A
NBR	10.6	B	10.7	B	10.7	B	EB off	3.7	A	3.8	A
SBL/TH	20.6	C	21.3	C	15.8	C	SB	3.4	A	3.5	A
SBR	10.5	B	10.6	B	10.6	B	WB off	3.5	A	3.5	A

Note: See Appendix A, Traffic Modeling Methodology Memorandum, for detailed operations tables and information on input and assumptions used in the intersection traffic operations analysis.

2.8 SUMMARY OF IMPACTS

Table 2.8-1 summarizes the impacts associated with the No-Build, Passing Lane, Hybrid, and 4-lane On-alignment Alternatives. Table 2.8-2 summarizes the resources, land types, residences, and businesses within the Corridor Preservation area for the Passing Lane, Hybrid, and 4-lane On-alignment Alternatives. These resources are not impacted by the act of preservation, except that property owners wishing to erect or alter a structure within that mapped right of way must give WisDOT 60 days' notice before beginning that construction. The statute also states that if notice is not given to WisDOT, compensation will not be made by WisDOT for structure improvements occurring within the corridor preservation area. In the future, if WisDOT determines that transportation improvements are needed within these preserved areas, a subsequent environmental document would be prepared which evaluates impacts and costs.

WisDOT purchased right of way for the 4-lane On-alignment Alternative between 2010 and 2015, prior to the 2014 Record of Decision (ROD) being vacated. About 38 percent of the acquisition is completed in Fond du Lac County, and 100 percent of the acquisition is completed in Sheboygan County. Much of the land, and corresponding residential and farm relocations associated with the 4-lane On-alignment Alternative was purchased. Therefore, the table designates how much is needed based on the existing right of way prior to 2010, as well as how much has been purchased since 2010 but prior to the 2014 ROD being vacated. In some instances, more land was purchased than was needed because not purchasing the land would leave an uneconomic remnant.¹⁵ This land is considered excess right of way (see Figures 2.8-1 through -47).

Describing impacts for the Passing Lane and Hybrid Alternatives is more complicated. Right of way previously purchased for the 4-lane On-alignment Alternative may not be needed for the Passing Lane or Hybrid Alternatives. However, it would be needed as part of the corridor preservation associated with the Passing Lane or Hybrid Alternatives. Figures 2.8-1 through -47 show the Passing Lane, Hybrid, and 4-lane On-alignment Alternatives superimposed on aerial photographs.

The WisDOT expenditures for right of way already acquired were not considered in the identification of the Preferred Alternative since they are a sunk cost. The land could be resold to abutting landowners, but the cost of the buildings razed is irretrievable. Additionally, impacts to natural and physical environmental resources associated with right of way acquisitions already completed have not occurred nor has mitigation for potential impacts progressed beyond the conceptual evaluation stage other than the Section 6(f) land conversion and boundary update.

¹⁵ 42 USC 61 Section 4651 states "(9) If the acquisition of only a portion of a property would leave the owner with an uneconomic remnant, the head of the Federal agency concerned shall offer to acquire that remnant. For the purposes of this chapter, an uneconomic remnant is a parcel of real property in which the owner is left with an interest after the partial acquisition of the owner's property and which the head of the Federal agency concerned has determined has little or no value or utility to the owner."

Table 2.8-1 Alternative Comparison Matrix

	UNIT	No-Build	Passing Lane Alternatives ⁴	Hybrid Alternative	4-Lane On-Alignment Alternative
Road Length	Miles	19.10	19.10	19.10	19.10
COST					
Design	Millions \$	0.4	8.3	9.4	14.4
Real Estate	Millions \$	0.0	5.8	18.5	26.7
Real Estate Costs expended prior to vacating 2014 ROD	Millions \$			19.9	
Utility	Millions \$	0.0	5.7	5.7	5.7
Utility Costs expended prior to vacating 2014 ROD	Millions \$			0.4	
Construction	Millions \$	4.5 ⁸	45.2	72.7	85.8
TOTAL COSTS ¹	Millions \$	4.9	65.0	106.3	132.6
TOTAL COSTS expended prior to vacating 2014 ROD	Millions \$			20.3	
Area Converted to Highway R/W for Alternative					
Cropland and Pasture needed for R/W	Acres	0	24	171	218
Cropland and Pasture purchased prior to vacating 2014 ROD	Acres	318	318	318	318
Cropland and Pasture Still Needed	Acres	0	18	99	99
Wetland Area needed for R/W	Acres	0	5	21	26
Wetland Area purchased prior to vacating 2014 ROD	Acres	30	30	30	30
Wetland Area Still Needed	Acres	0	2	11	11
Woodland/Upland Area to R/W	Acres	0	5	9	38
Woodland/Upland Area purchased prior to vacating 2014 ROD	Acres	44	44	44	44
Woodland/Upland Area Still Needed	Acres	0	2	4	4
Other Area needed for R/W ²	Acres	0	45	120	128
Other Area purchased prior to vacating 2014 ROD	Acres	136	136	136	136
Other Area Still Needed	Acres	0	36	79	79
Total Land needed for Highway R/W	Acres	0	79	321	410
Total Land Already Purchased for Highway R/W ⁷	Acres	528	528	528	528
Total Area Still Needed for Highway R/W	Acres	0	58	193	193
Excess Right of Way					
Excess R/W Previously Purchased and Not Required for Alternative ⁶	Acres	369	348	241	152
Wetland Mitigation	Acres	159	159	159	159
Relocations					
Total Residential Relocations needed	Number	0	12	28	30
Residences relocated prior to vacating 2014 ROD	Number	30	30	30	30
Residential Relocations where buildings were razed	Number	27	27	27	27
Residential Relocations Still Needed	Number	0	0	0	0
Total Business Relocations Required (Not Including Farms)	Number	0	0	4	4
Business relocated prior to vacating 2014 ROD	Number	3	3	3	3
Business Relocations where buildings were razed	Number	3	3	3	3
Business Relocations Still Needed	Number	0	0	1	1
Total Farm Relocations Required (One or more farm buildings)	Number	0	6	13	18
Farms relocated prior to vacating 2014 ROD	Number	17	17	17	17
Farm Relocations where buildings were razed	Number	16	16	16	16
Farm Relocations Still Needed	Number	0	0	1	1
Farms Severed	Number	0	1	5	5
Other Impacts					
Eligible Historic Structures/Archeological Sites identified	Yes/No	Yes	Yes	Yes	Yes
Section 106 MOA Required	Yes/No	No	Yes	Yes	Yes
Section 4(f) Evaluation Required	Yes/No	No	Yes	Yes	Yes
Section 6(f) Land Conversion Required	Yes/No	No	No ³	No ³	Yes
Floodplain Encroachment	Yes/No	No	Yes	Yes	Yes
Total Wetlands Filled (includes wetlands in existing and new R/W)	Acres	0	29.9	45.9	51.8
Stream Crossings	Number	3	3	3	3
Threatened/Endangered Species	Yes/No	No	Yes	Yes	Yes
Noise Analysis Required	Yes/No	No	Yes	Yes	Yes
Receptors Impacted in the design year	Number	44	ND ⁵	ND ⁵	47
Contaminated Sites	Number	0	4	6	6

¹ Costs are in 2017 dollars.

² Other Area includes: Single- and Multi-Family Residential, Commercial, Industrial, Community, Institutional, Manufacturing, Mining, Retail Trade, Parks/Recreation, Undeveloped, and Transportation.

³ While technically not required, the land conversion has already taken place. Correspondence with NPS indicates they expect the provisions of the 6f conversion agreement to be honored through the process.

⁴ Passing Lane Impacts represent the higher impact option: Passing Lane Alternative with Left Turn Lanes.

⁵ The traffic noise analysis in the 2014 LS SFEIS modeled the 4-lane On-alignment Alternative and shows the worst case situation compared to the Passing Lane and Hybrid Alternatives. The Passing Lane and the Hybrid Alternatives (in Sheboygan County) would have a larger separation distance between the roadway traffic and the receptor and therefore the same or fewer receptors impacted in the design year.

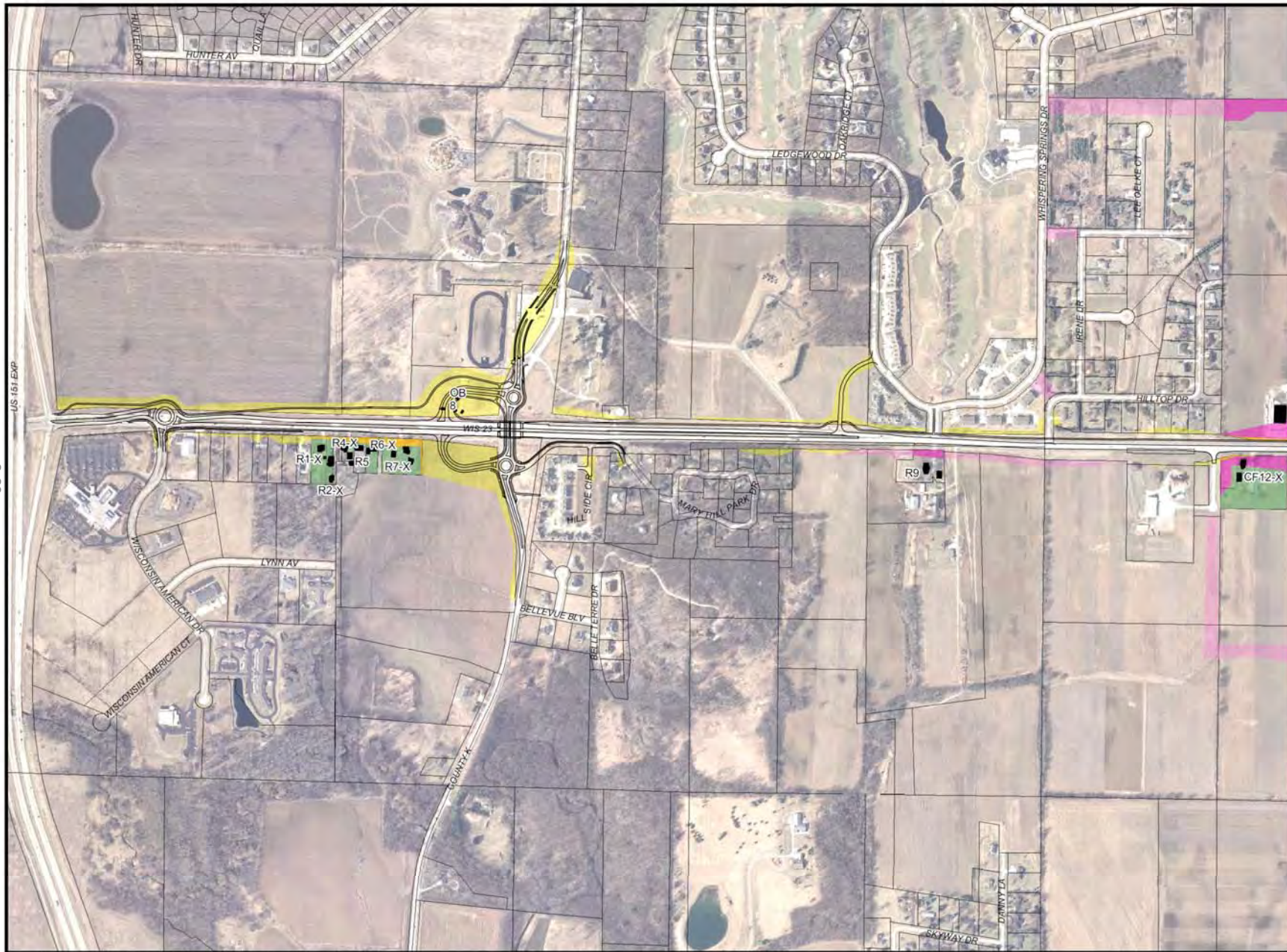
⁶ Excess right of way includes parcels purchased resulting in uneconomic remnants and land locked parcels. The purchase of right of way and excess right of way is consistent with normal procedures and is typical for this type of project.

⁷ Actual surveyed amount is 530 acres between excess right of way and wetland mitigation. Value shown represents the approximate amount calculated using GIS parcel line files, not surveyed right of way lines.

⁸ Cost provides a 2" mill resurface for the entire corridor based on 2017 construction costs from Division Road to County P.

ND - Not Determined

Table 2.8-2 Corridor Preservation Comparison				
	UNIT	Corridor Preservation associated with Passing Lane Alternatives ¹	Corridor Preservation associated with Hybrid Alternative ²	Corridor Preservation associated with 4-Lane On-Alignment Alternative ³
Land Types within Corridor Preservation Limits				
Cropland and Pasture	Acres	244	97	50
Wetland Area	Acres	22	6	1
Woodland/Upland Area	Acres	40	36	7
Other Area ⁴	Acres	100	26	18
Total Land Converted	Acres	407	165	76
Total Land Already Purchased for Highway R/W ⁶	Acres	528	528	528
Area Still Needed for 84.295 Mapping	Acres	211	75	75
Excess Right of Way				
Excess R/W is R/W Previously Purchased and Not Required for Alternative ⁵	Acres	152	152	152
Wetland Mitigation	Acres	159	159	159
Potential Restriction of Property Improvement (Relocations)				
Residences within Corridor Preservation Area	Number	21	5	3
Residences within Corridor Preservation Area relocated prior to vacating 2014 ROD	Number	18	2	0
Residential relocations where buildings were razed	Number	17	2	0
Businesses within Corridor Preservation Area	Number	6	2	2
Businesses within Corridor Preservation Area relocated prior to vacating 2014 ROD	Number	3	0	0
Business relocations where buildings were razed	Number	3	0	0
Farms within Corridor Preservation Area (One or more farm buildings)	Number	16	9	4
Farm Relocations completed prior to vacating 2014 ROD	Number	11	5	0
Farm Relocations where buildings were razed	Number	10	4	0
Other Impacts (if the planned projects are implemented)				
Wetlands within Corridor Preservation Area (includes wetlands in existing and new R/W)	Acres	24.1	8.1	2.2
¹ Corridor Preservation consists of preserving the right of way needed to convert WIS 23 to a 4-lane facility. It also includes preserving right of way needed for future access modifications and improvements for future overpasses and interchanges.				
² Corridor Preservation consists of preserving the right of way needed to convert WIS 23 to a 4-lane facility from County G to County P. It also includes preserving right of way needed for future access modifications and improvements for future overpasses and interchanges.				
³ Corridor Preservation consists of preserving right of way needed for future access modifications and improvements for future overpasses and interchanges.				
⁴ Other Area includes: Single- and Multi-Family Residential, Commercial, Industrial, Community, Institutional, Manufacturing, Mining, Retail Trade, Parks/Recreation, Undeveloped, and Transportation.				
⁵ Excess right of way includes parcels purchased resulting in uneconomic remnants and land locked parcels. The purchase of right of way and excess right of way is consistent with normal procedures and is typical for this type of project.				
⁶ Actual surveyed amount is 530 acres between excess right of way and wetland mitigation. Value shown represents the approximate amount calculated using GIS parcel line files, not surveyed right of way lines.				
N/A - Not Applicable				



Legend
PASSING LANE ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

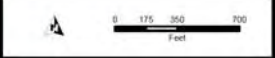
CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

PROJECT ID 1440-13/15-00
WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

WISCONSIN DEPARTMENT
OF TRANSPORTATION

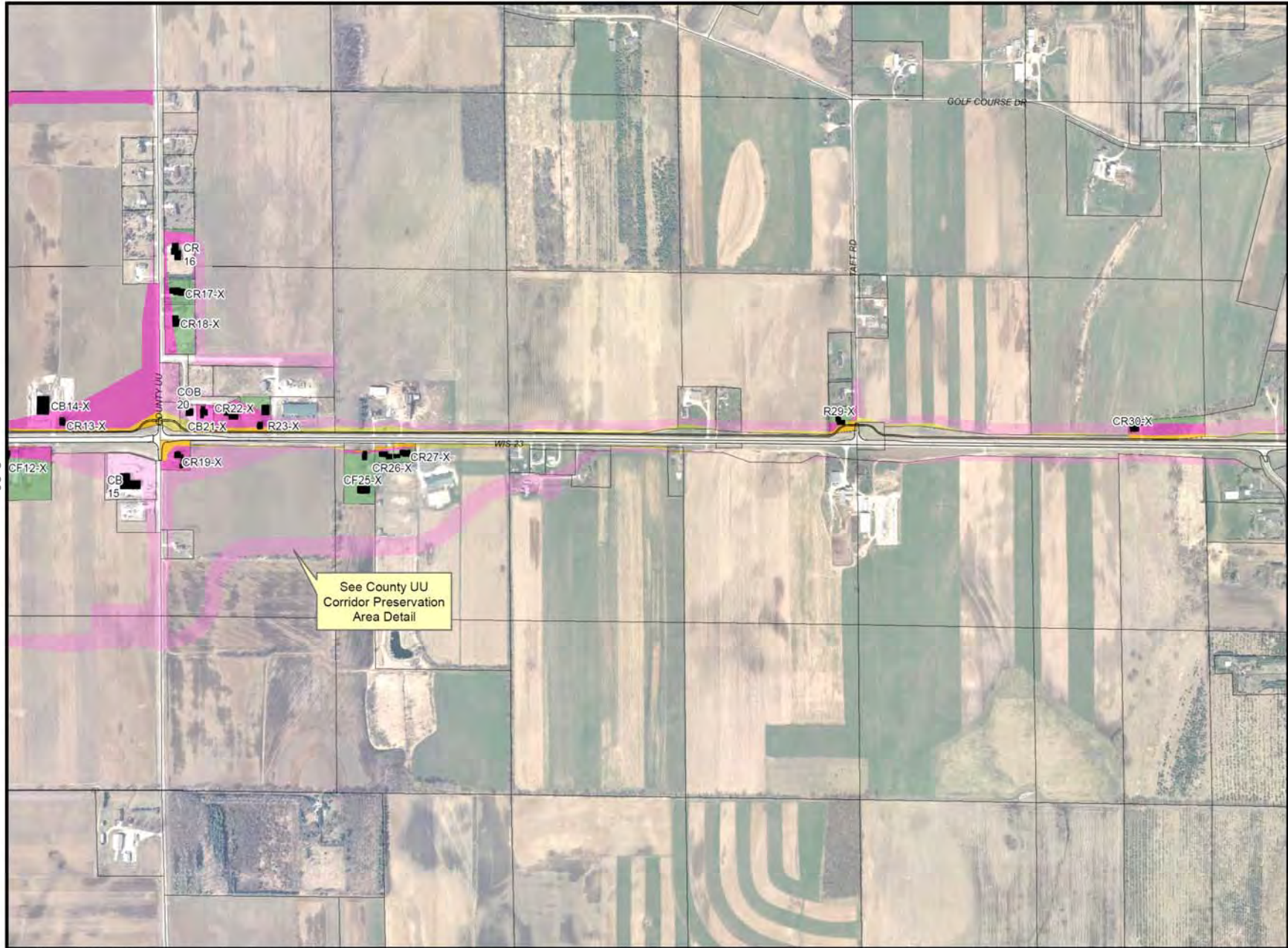
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



1

Passing Lane Alternative

Figure 2.8-1



Legend
PASSING LANE ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
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SHEBOYGAN COUNTIES,
WISCONSIN

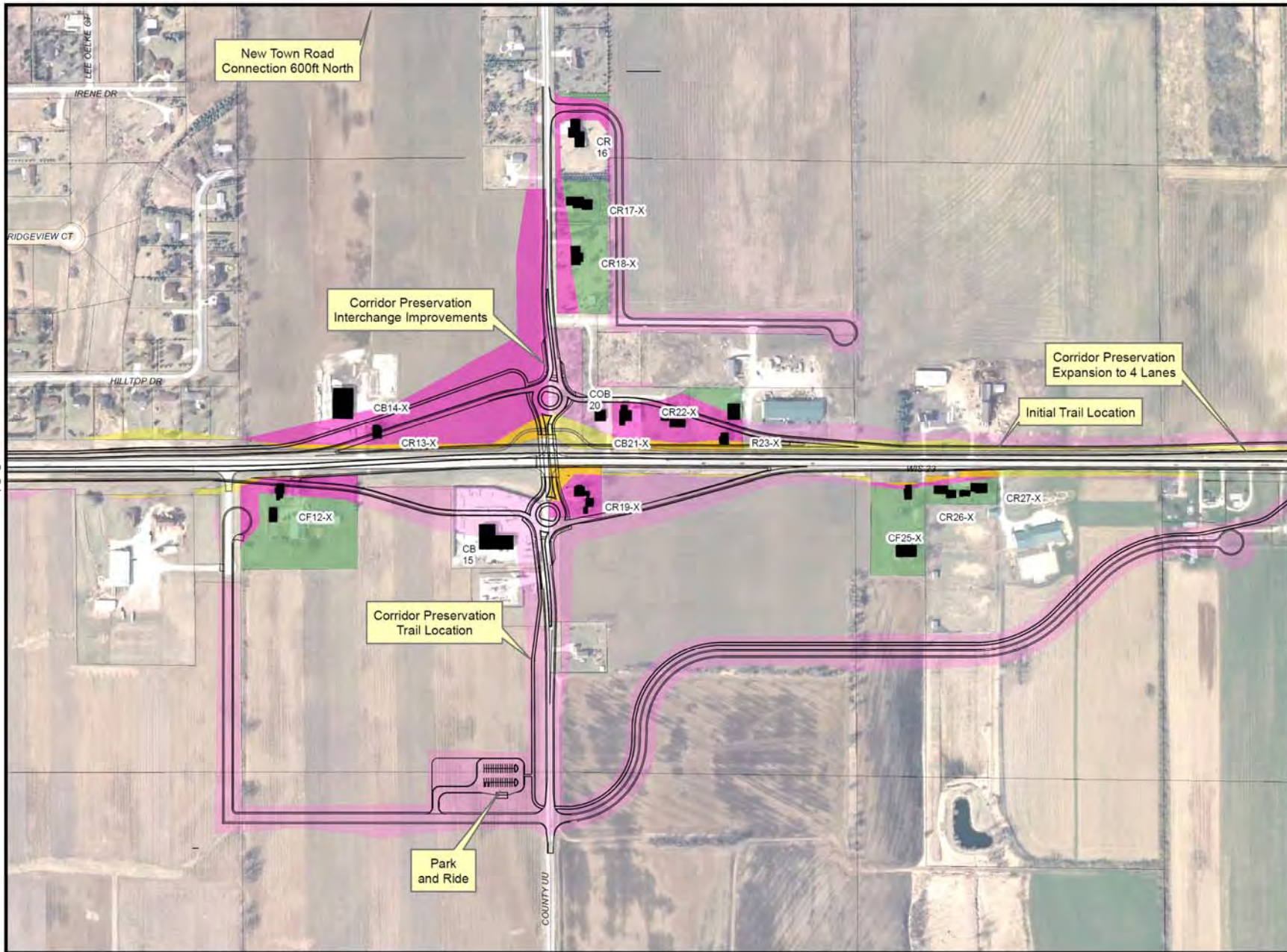


2

Passing Lane Alternative

Figure 2.8-2

2-30



Legend
CORRIDOR PRESERVATION FOR PASSING LANE COUNTY UU DETAIL

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
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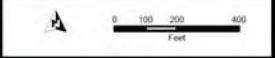
CR = Residential Property within Preservation Area
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PROJECT ID 1440-13/15-00
WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

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OF TRANSPORTATION

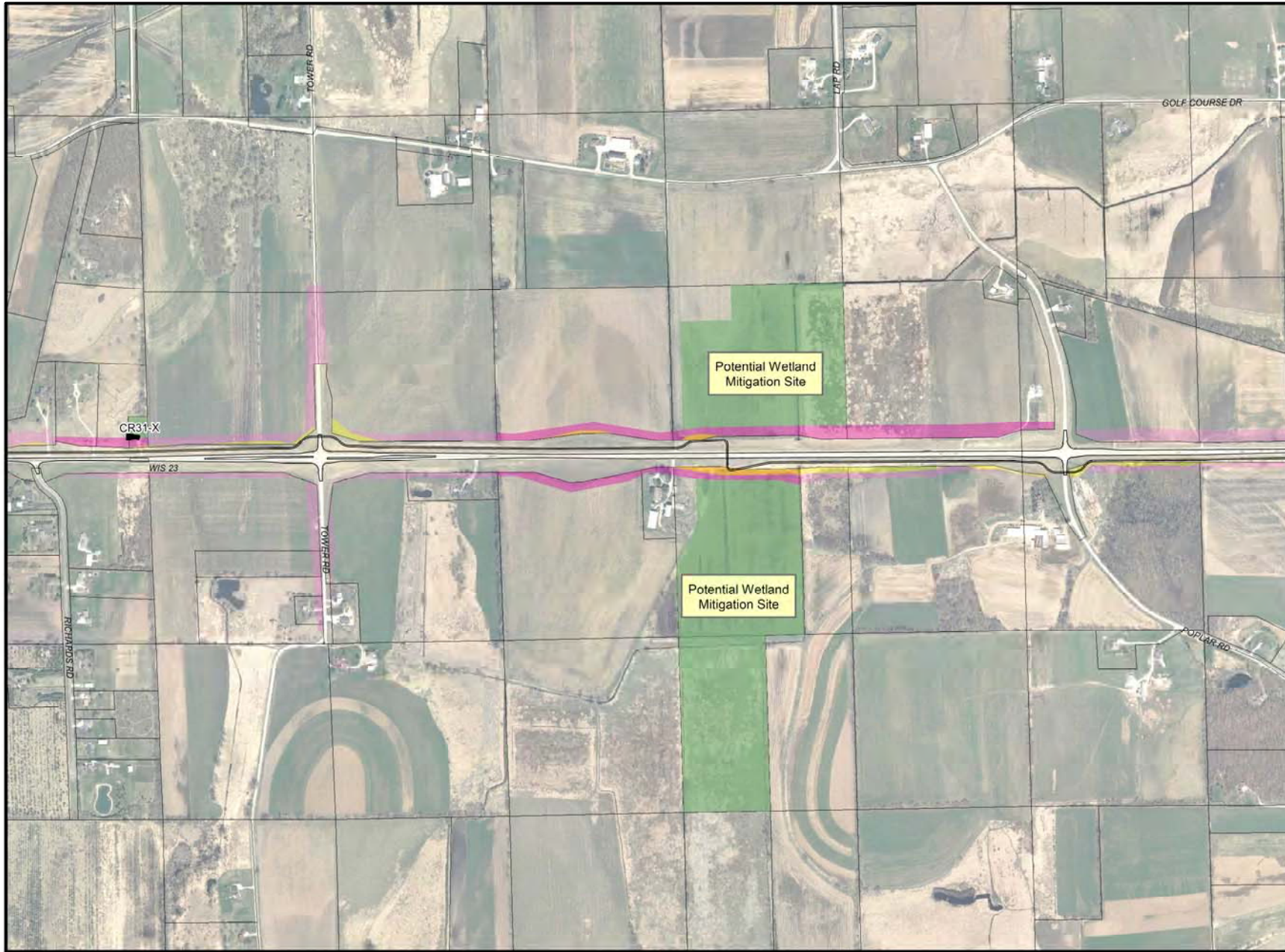
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



Passing Lane Alternative

Figure 2.8-3

2-31



Legend

PASSING LANE ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
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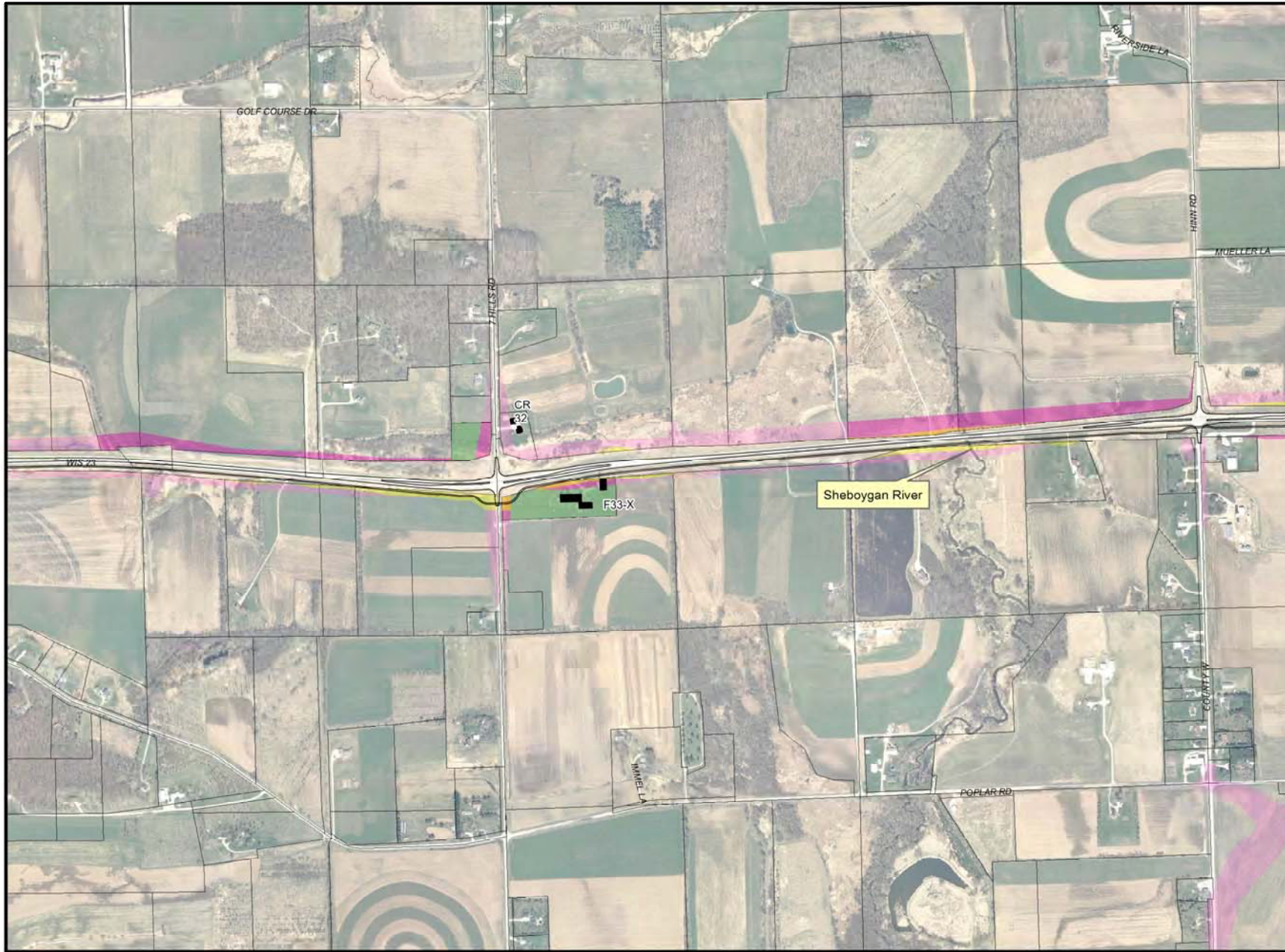
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



3

Passing Lane Alternative

Figure 2.8-4



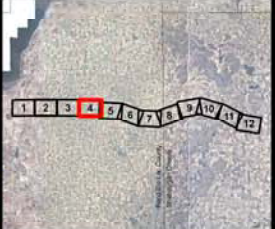
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PASSING LANE ALTERNATIVE

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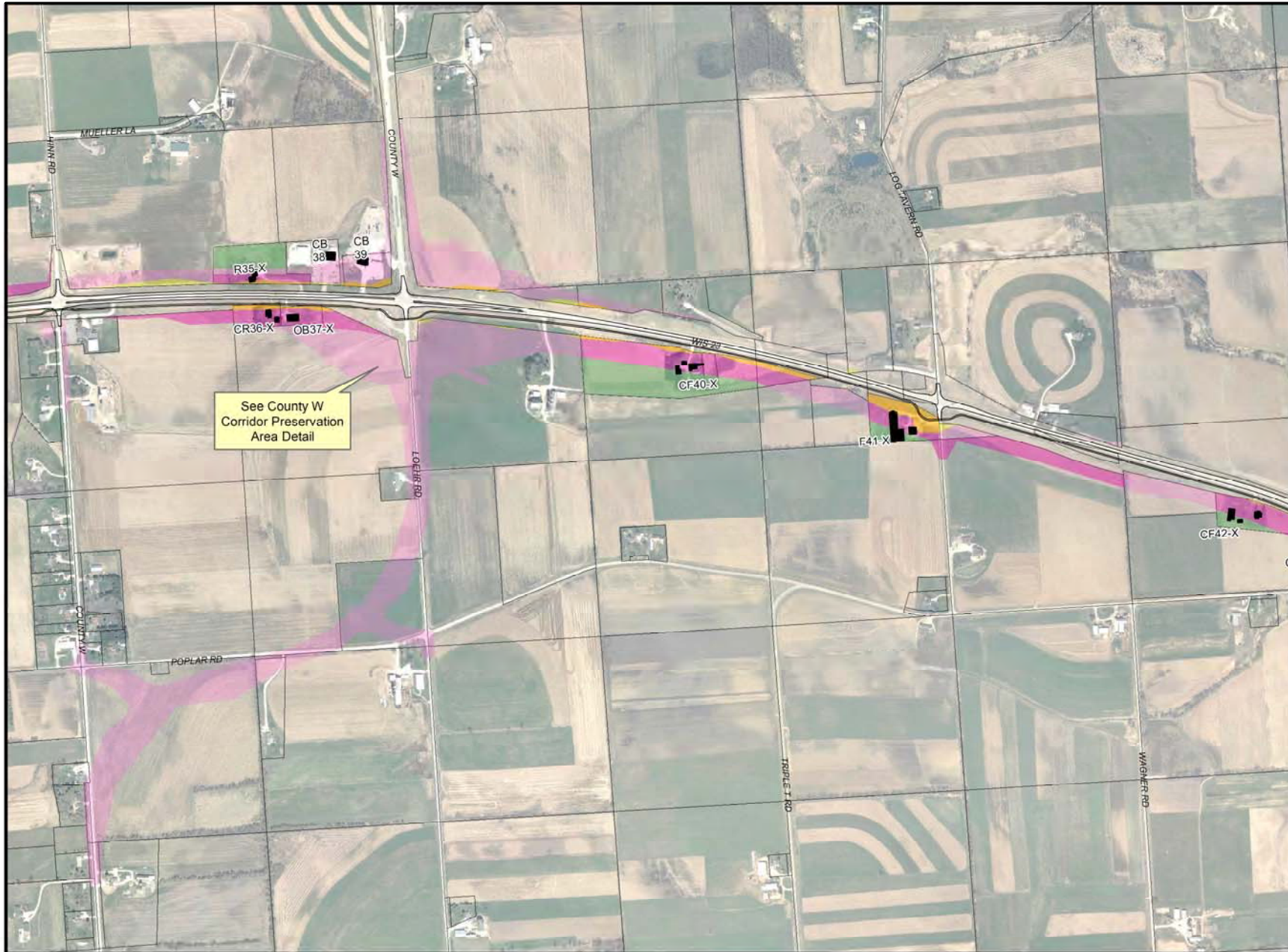
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SHEBOYGAN COUNTIES,
WISCONSIN



4

Passing Lane Alternative

Figure 2.8-5



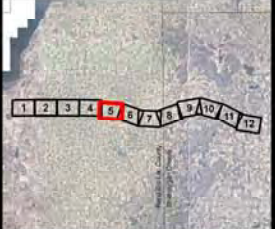
Legend

PASSING LANE ALTERNATIVE

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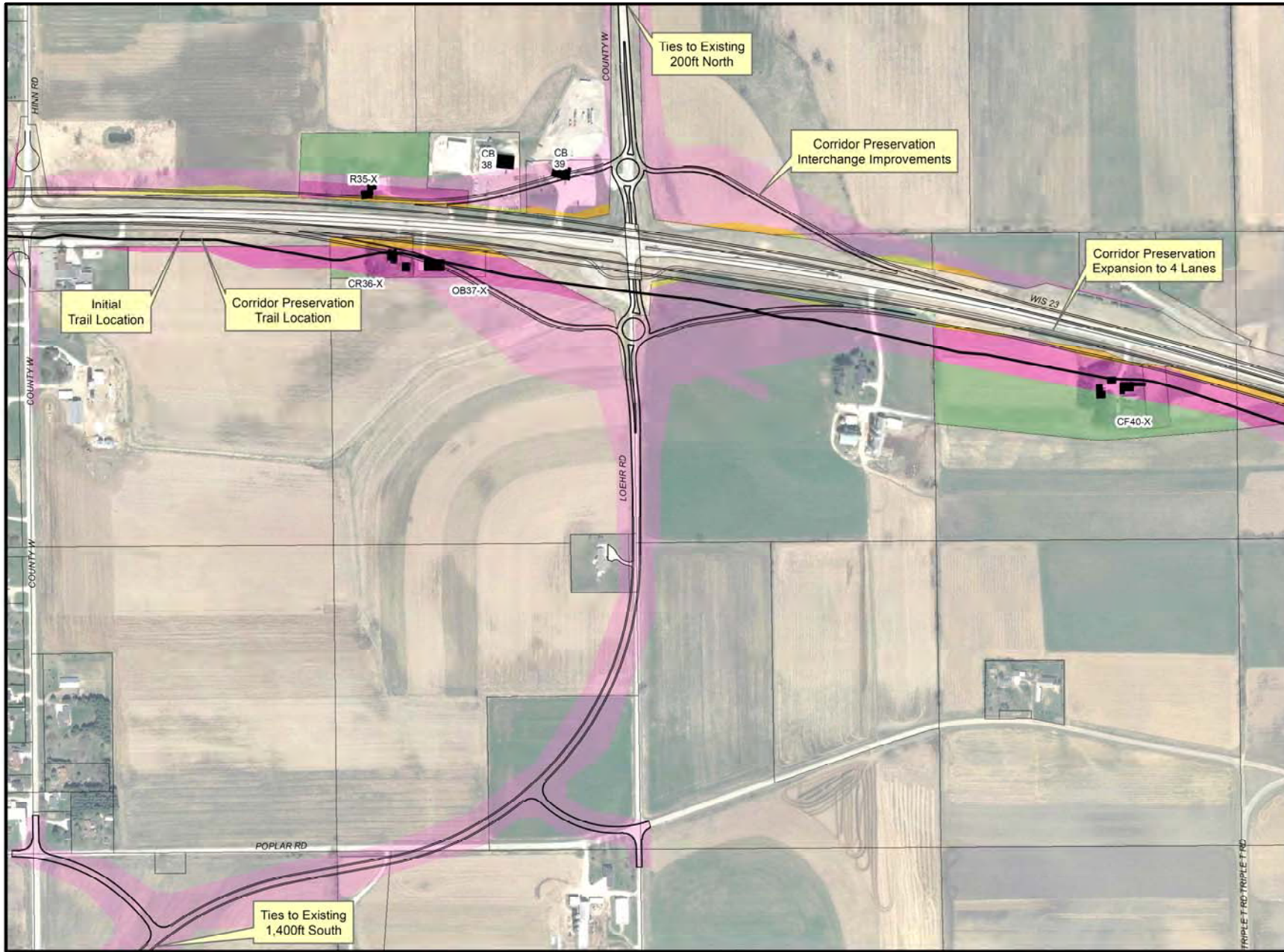
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



5

Passing Lane Alternative

Figure 2.8-6



Legend
CORRIDOR PRESERVATION FOR PASSING LANE COUNTY W DETAIL

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
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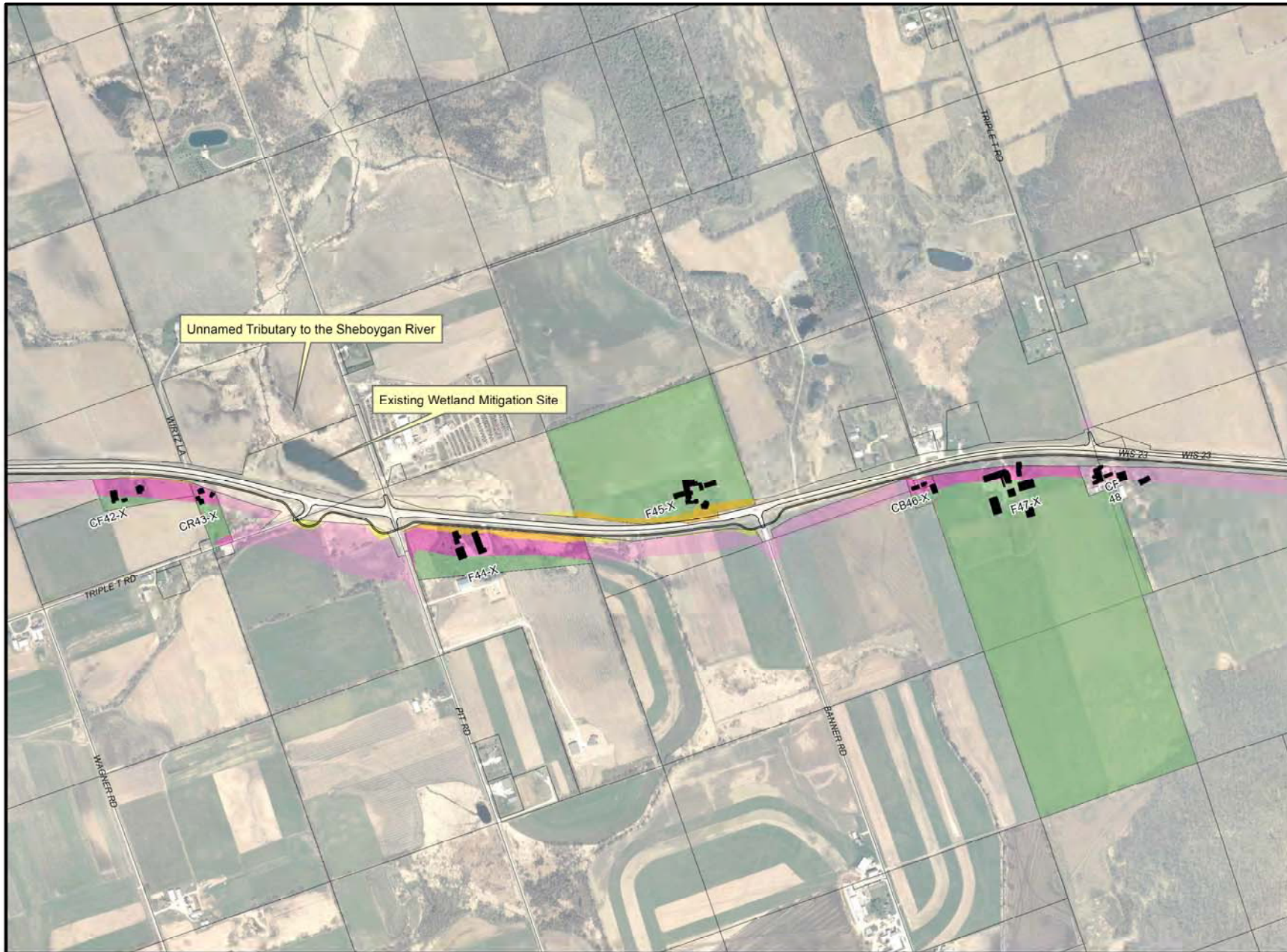
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PROJECT ID 1440-13/15-00
WISCONSIN STATE HIGHWAY 23
FOND DU LAC TO PLYMOUTH
WISCONSIN DEPARTMENT OF TRANSPORTATION
FOND DU LAC AND SHEBOYGAN COUNTIES, WISCONSIN



Passing Lane Alternative

Figure 2.8-7



Legend

PASSING LANE ALTERNATIVE

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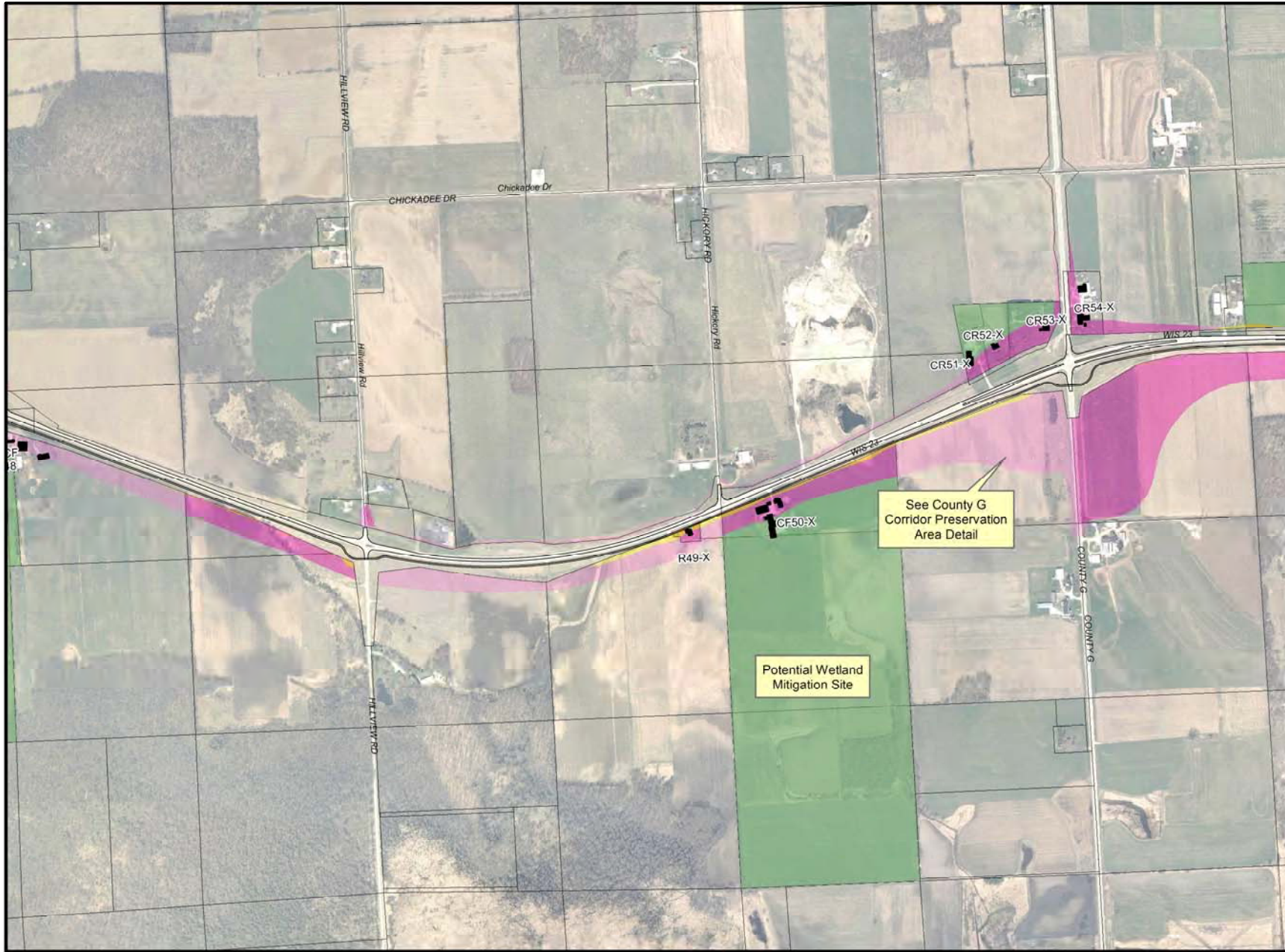
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



Passing Lane Alternative

Figure 2.8-8

2-37



Legend

PASSING LANE ALTERNATIVE

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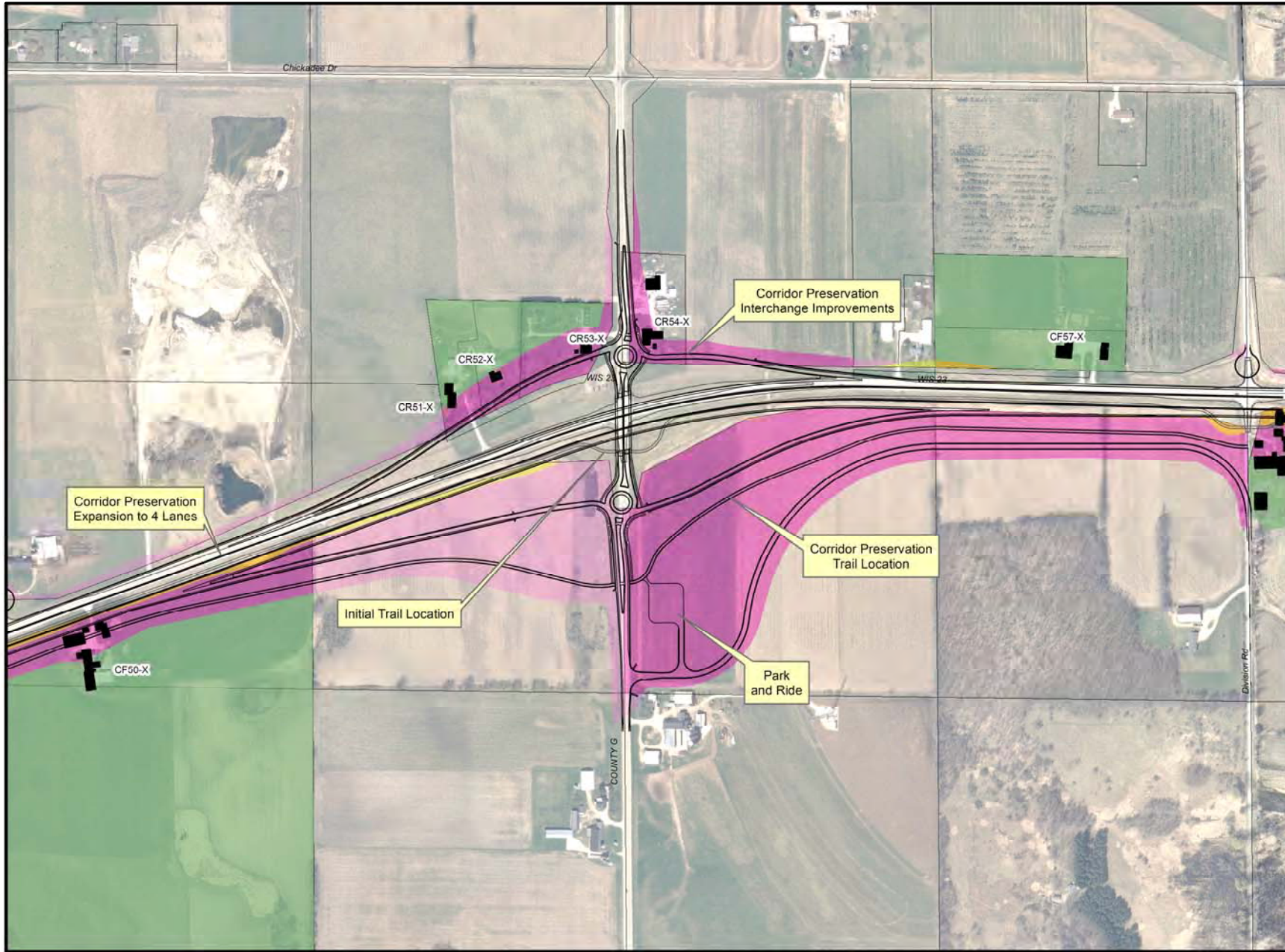
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



7

Passing Lane Alternative

Figure 2.8-9



Legend
CORRIDOR PRESERVATION FOR PASSING LANE COUNTY G DETAIL

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
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HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

WISCONSIN DEPARTMENT
OF TRANSPORTATION

FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



Passing Lane Alternative

Figure 2.8-10

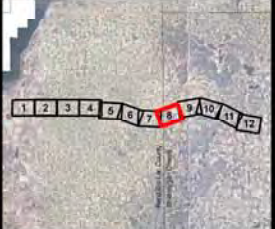


Legend
PASSING LANE ALTERNATIVE

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- █ Corridor Preservation Already Purchased
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WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

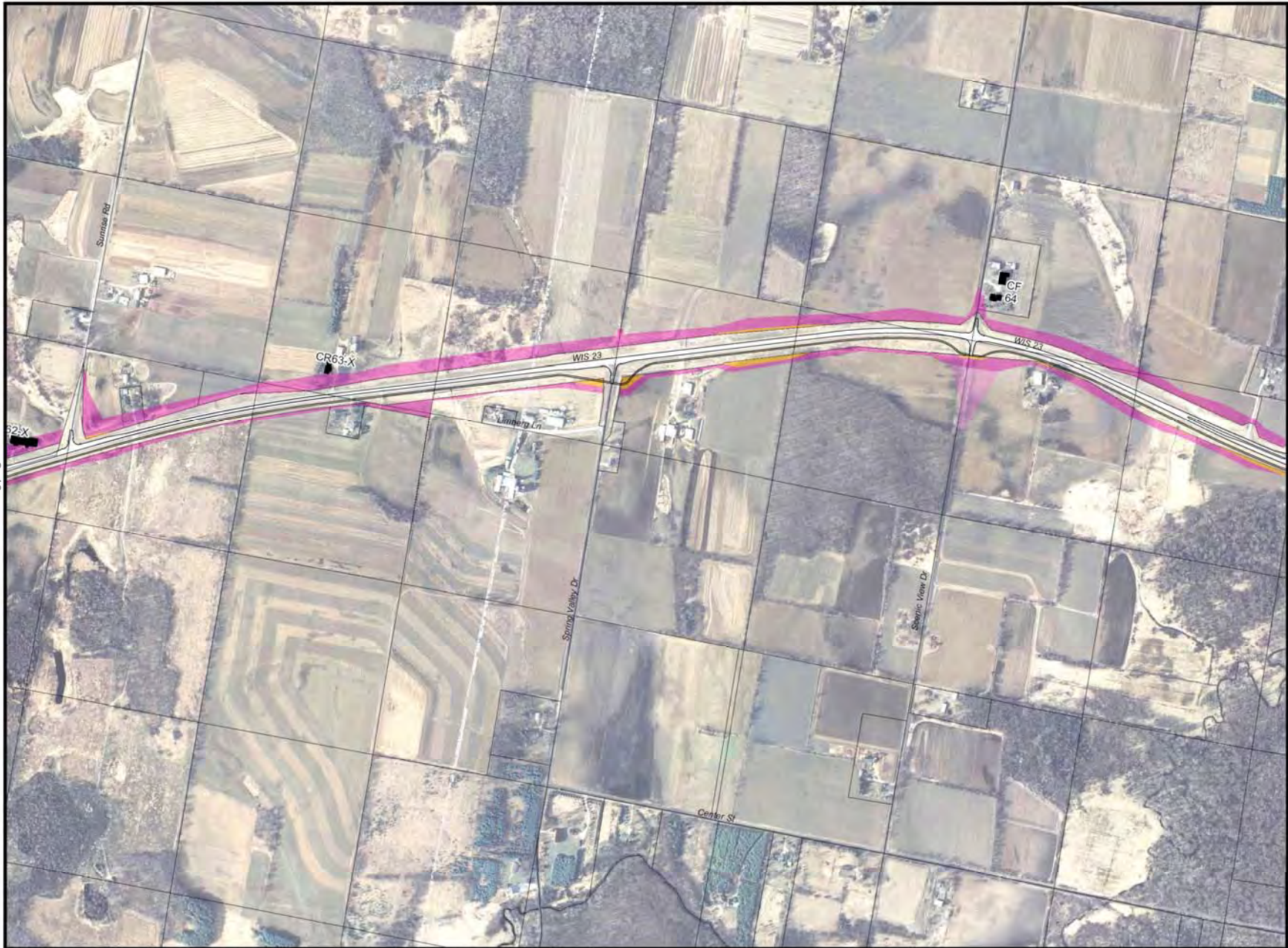
WISCONSIN DEPARTMENT
OF TRANSPORTATION

FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



Passing Lane Alternative

Figure 2.8-11



Legend
PASSING LANE ALTERNATIVE

- █ Excess R/W Purchased
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 OB = Outbuilding
 -X = Building Razed

CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding



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WISCONSIN STATE
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FOND DU LAC TO
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WISCONSIN DEPARTMENT
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SHEBOYGAN COUNTIES,
WISCONSIN



9

Passing Lane Alternative

Figure 2.8-12

2-40

2-41



Legend
PASSING LANE ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 CB = Outbuilding
 -X = Building Razed

CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

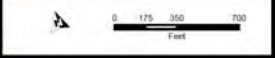


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HIGHWAY 23

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FOND DU LAC AND
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WISCONSIN

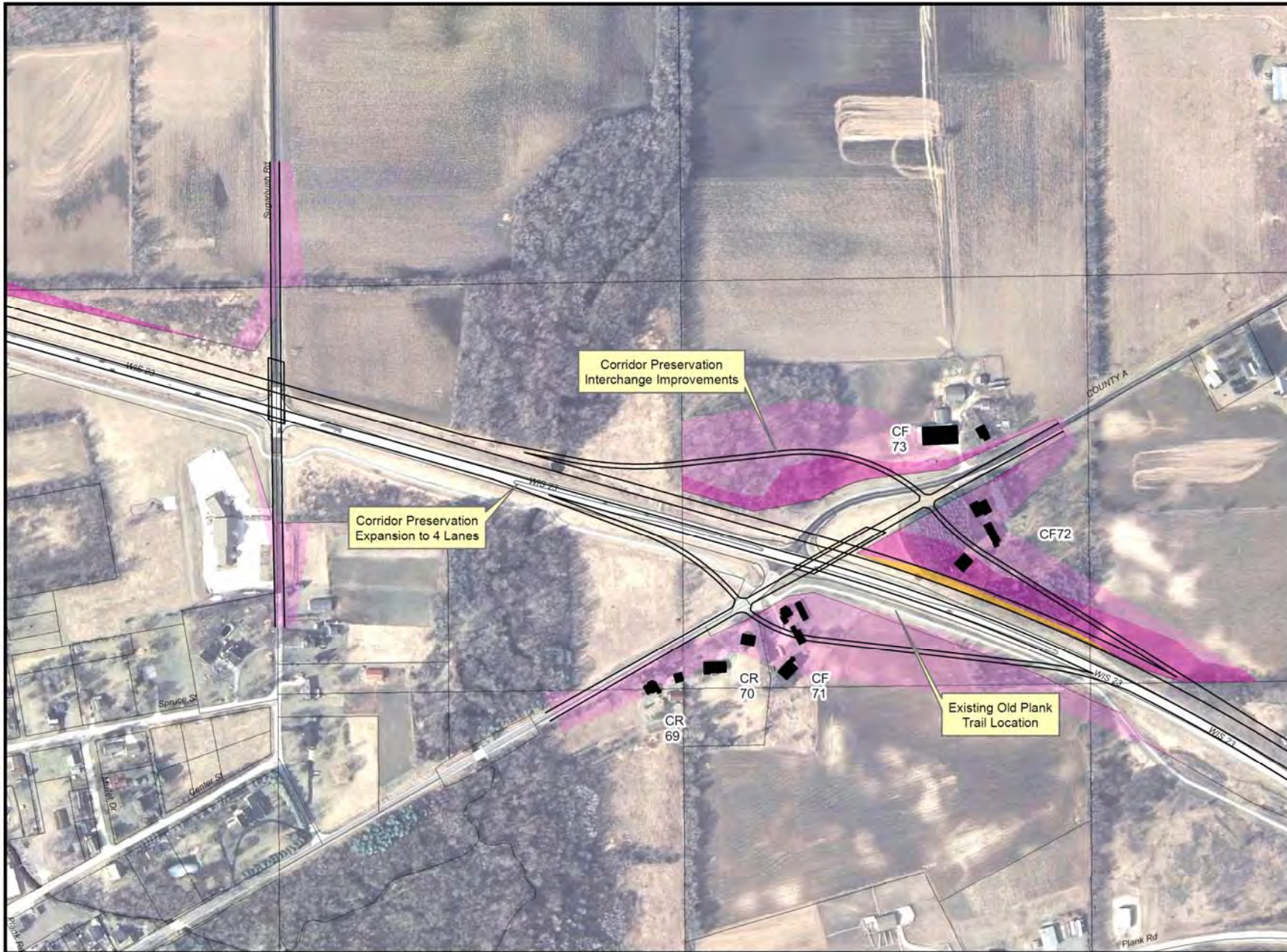


10

Passing Lane Alternative

Figure 2.8-13

2-42



Legend
CORRIDOR PRESERVATION FOR PASSING LANE COUNTY A DETAIL

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

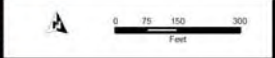
CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

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WISCONSIN



Passing Lane Alternative

Figure 2.8-14



Legend

PASSING LANE ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

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 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

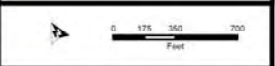


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FOND DU LAC AND
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WISCONSIN



11

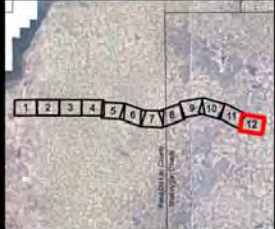
Passing Lane Alternative

Figure 2.8-15

2-444



- Legend**
- PASSING LANE ALTERNATIVE**
- █ Excess R/W Purchased
 - █ Corridor Preservation Already Purchased
 - █ Corridor Preservation Not Purchased
 - █ R/W Needed Already Purchased
 - █ R/W Needed
 - █ Relocated Buildings
- R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed
- CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

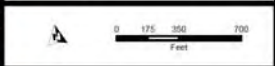


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FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



12

Passing Lane Alternative

Figure 2.8-16



Legend
HYBRID ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

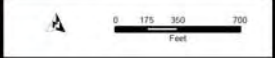
CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

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HIGHWAY 23

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1

Hybrid Alternative

Figure 2.8-17



Legend
HYBRID ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings
- R = Residential Relocation
- B = Business Relocation
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CR = Residential Property within Preservation Area
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WISCONSIN

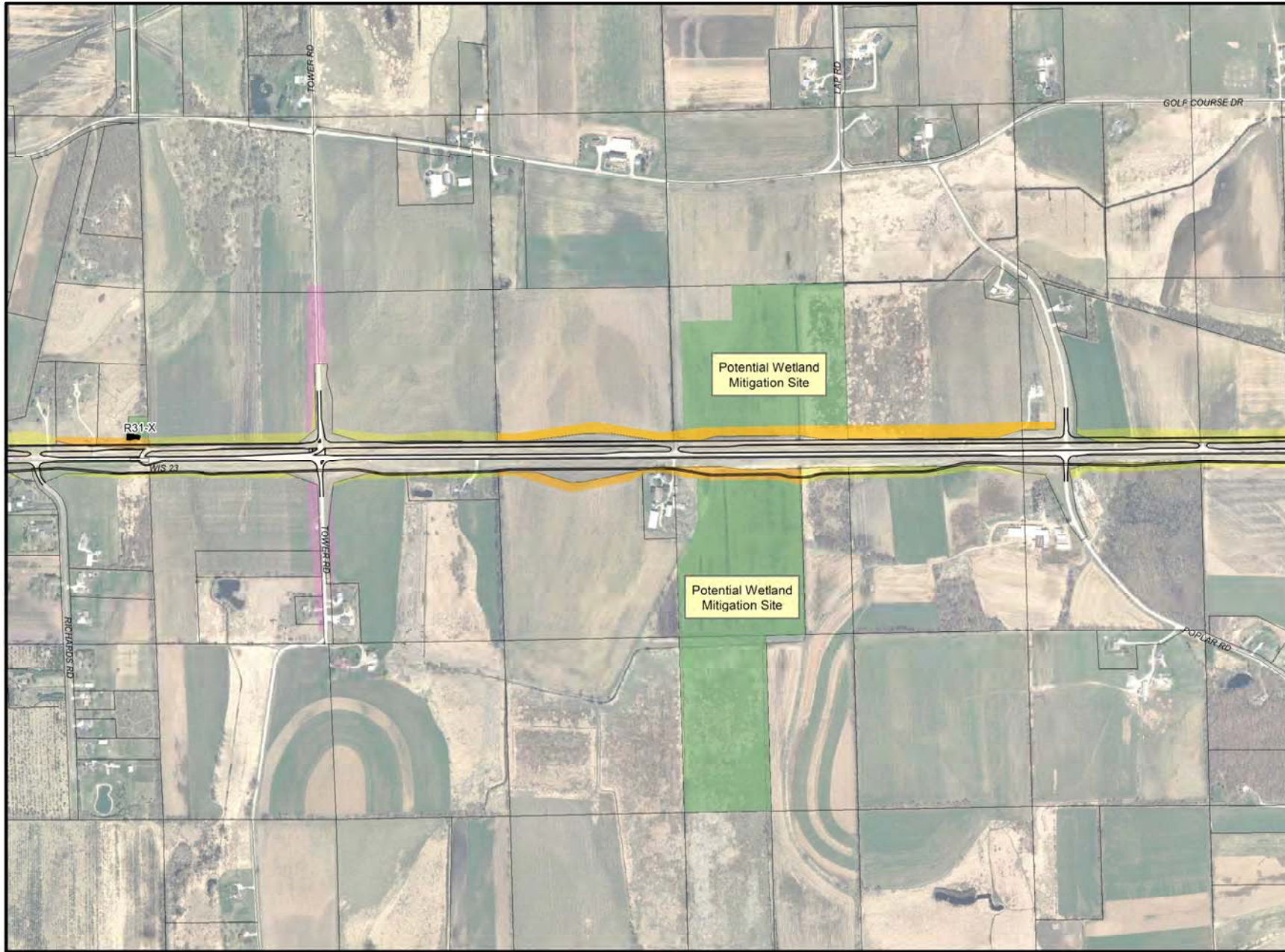


2

Hybrid Alternative

Figure 2.8-18

2-46



Legend
HYBRID ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
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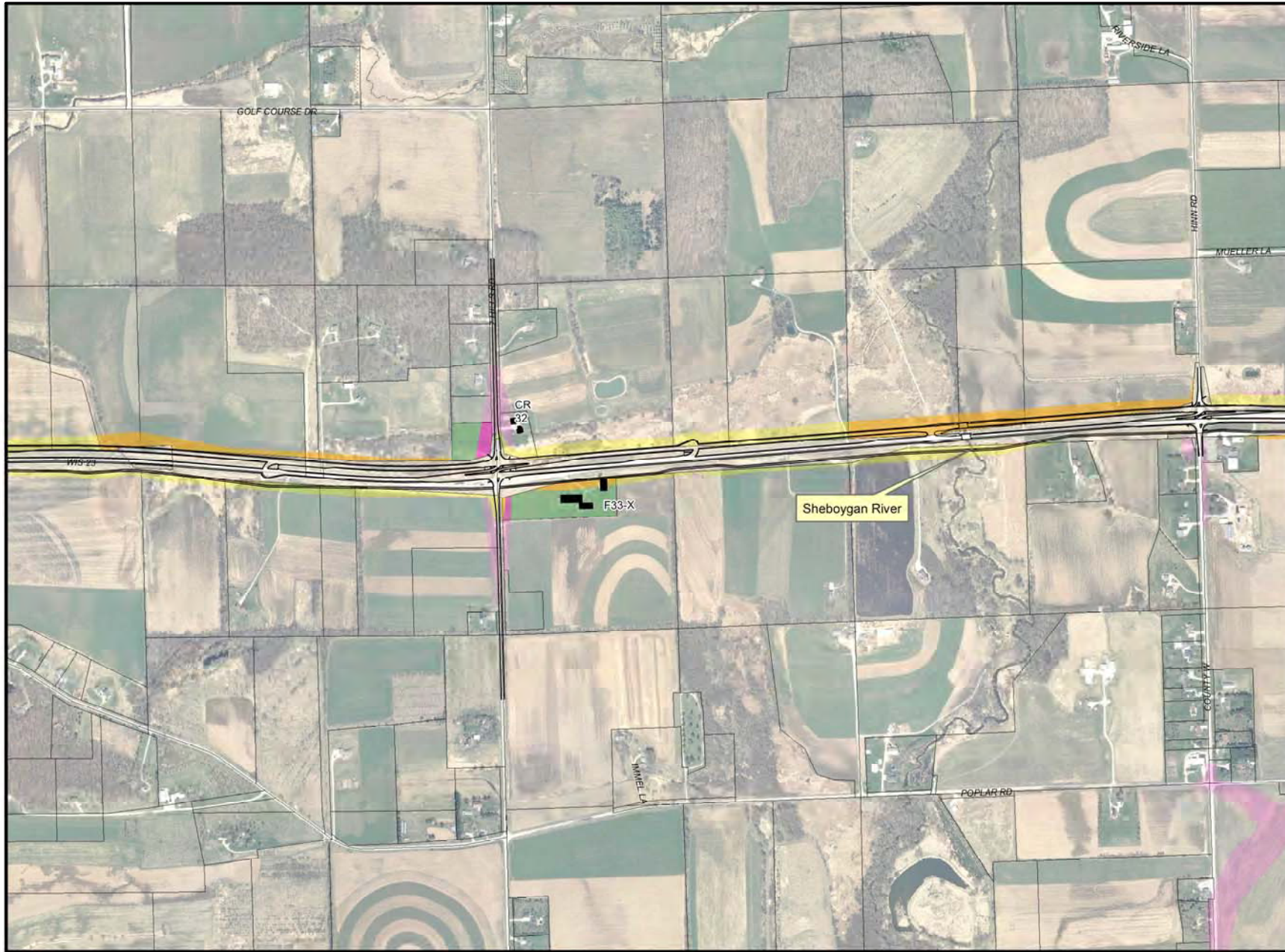
FOND DU LAC AND
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WISCONSIN



3

Hybrid Alternative

Figure 2.8-19

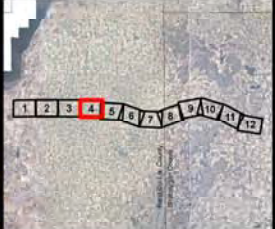


Legend
HYBRID ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

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 CF = Farm Property within Preservation Area
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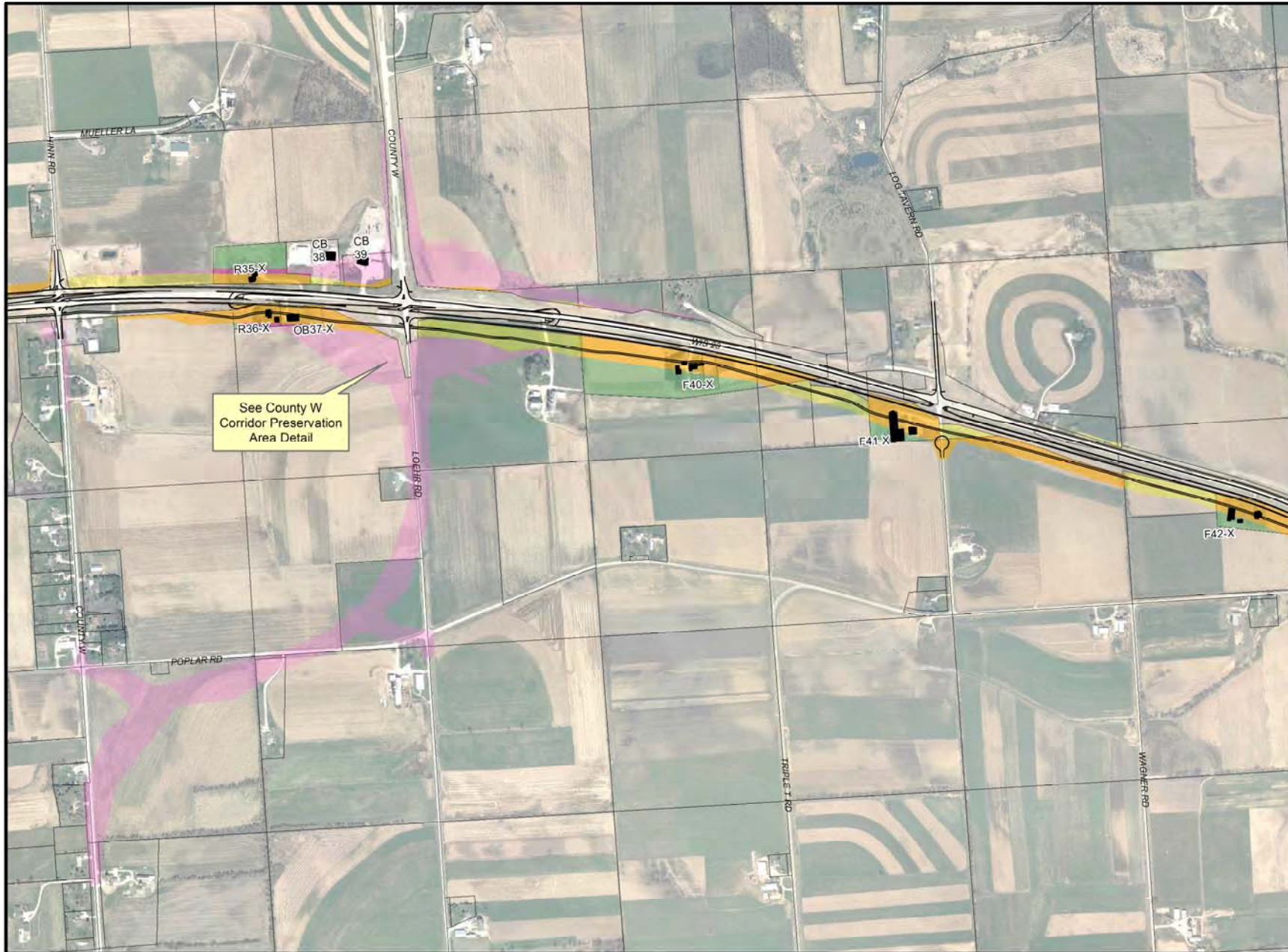
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WISCONSIN



4

Hybrid Alternative

Figure 2.8-20

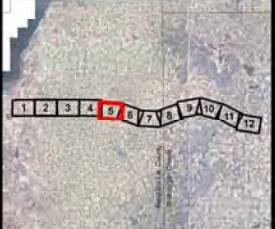


Legend
HYBRID ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

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HIGHWAY 23

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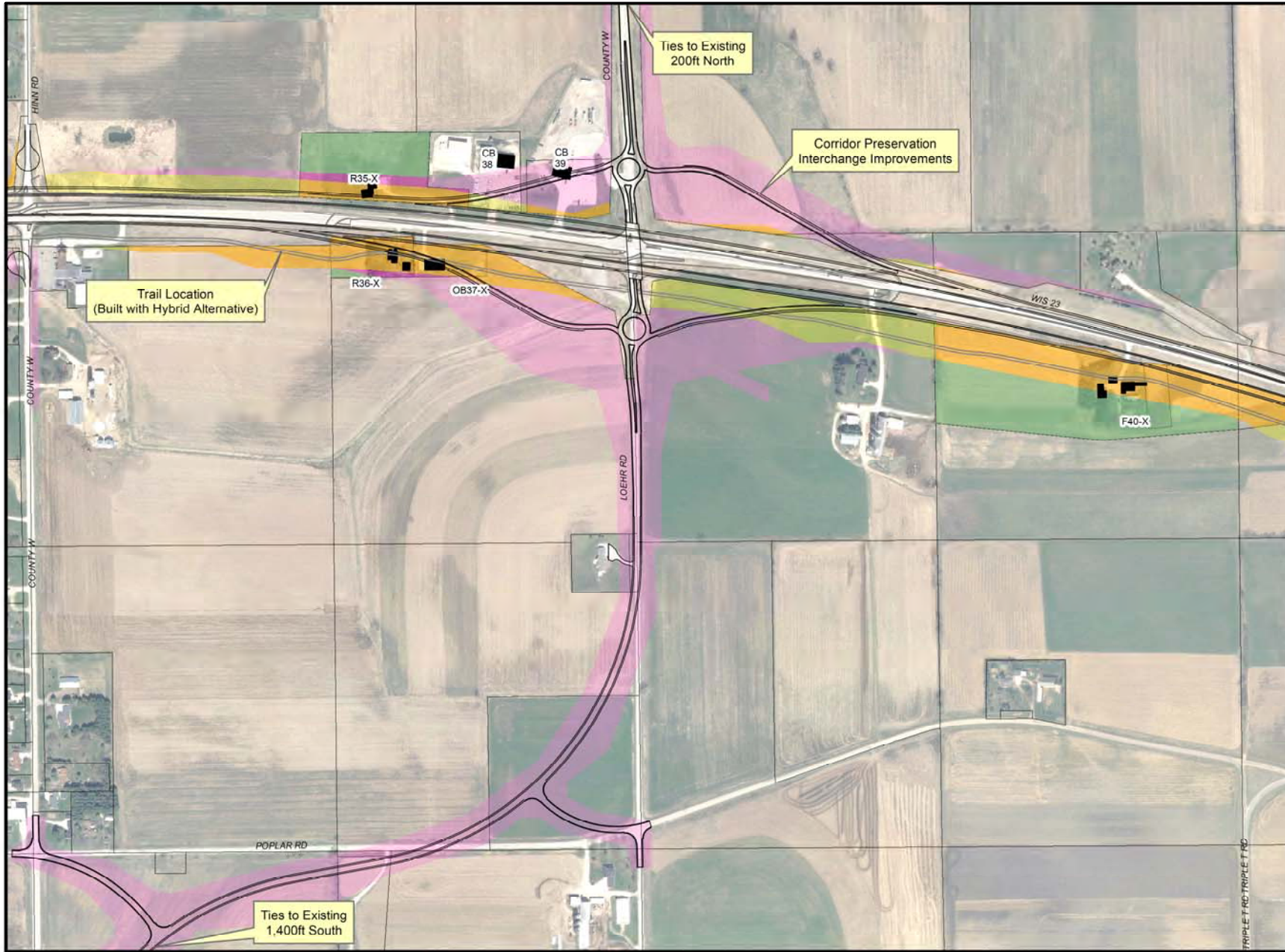
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WISCONSIN



5

Hybrid Alternative

Figure 2.8-21



Legend
CORRIDOR PRESERVATION FOR HYBRID ALTERNATIVE COUNTY W DETAIL

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ R/W Needed Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed
- █ Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

CR = Residential Property within Preservation Area
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 CF = Farm Property within Preservation Area
 COB = Outbuilding

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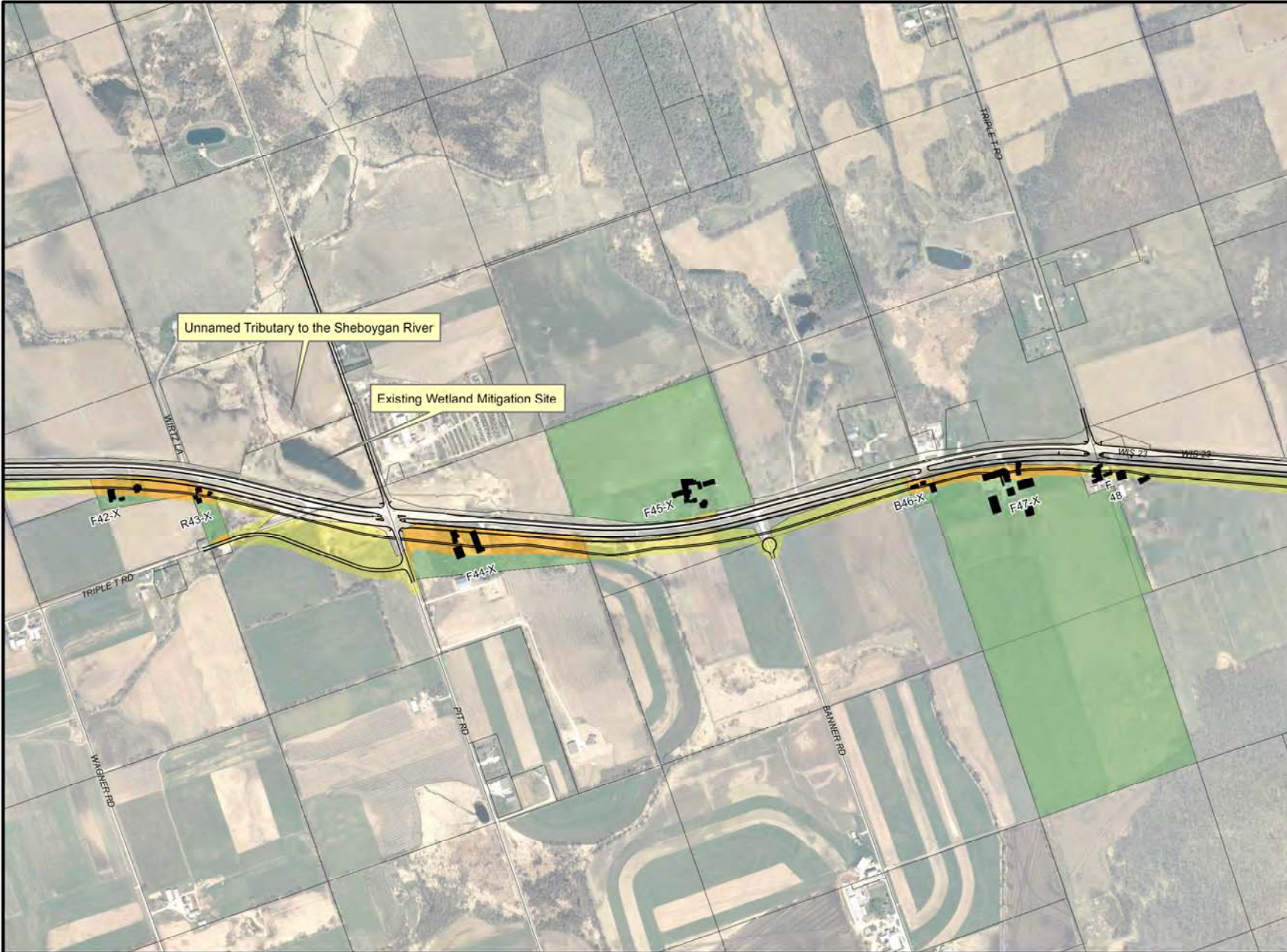
WISCONSIN DEPARTMENT
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WISCONSIN



Hybrid Alternative

Figure 2.8-22



Legend
HYBRID ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
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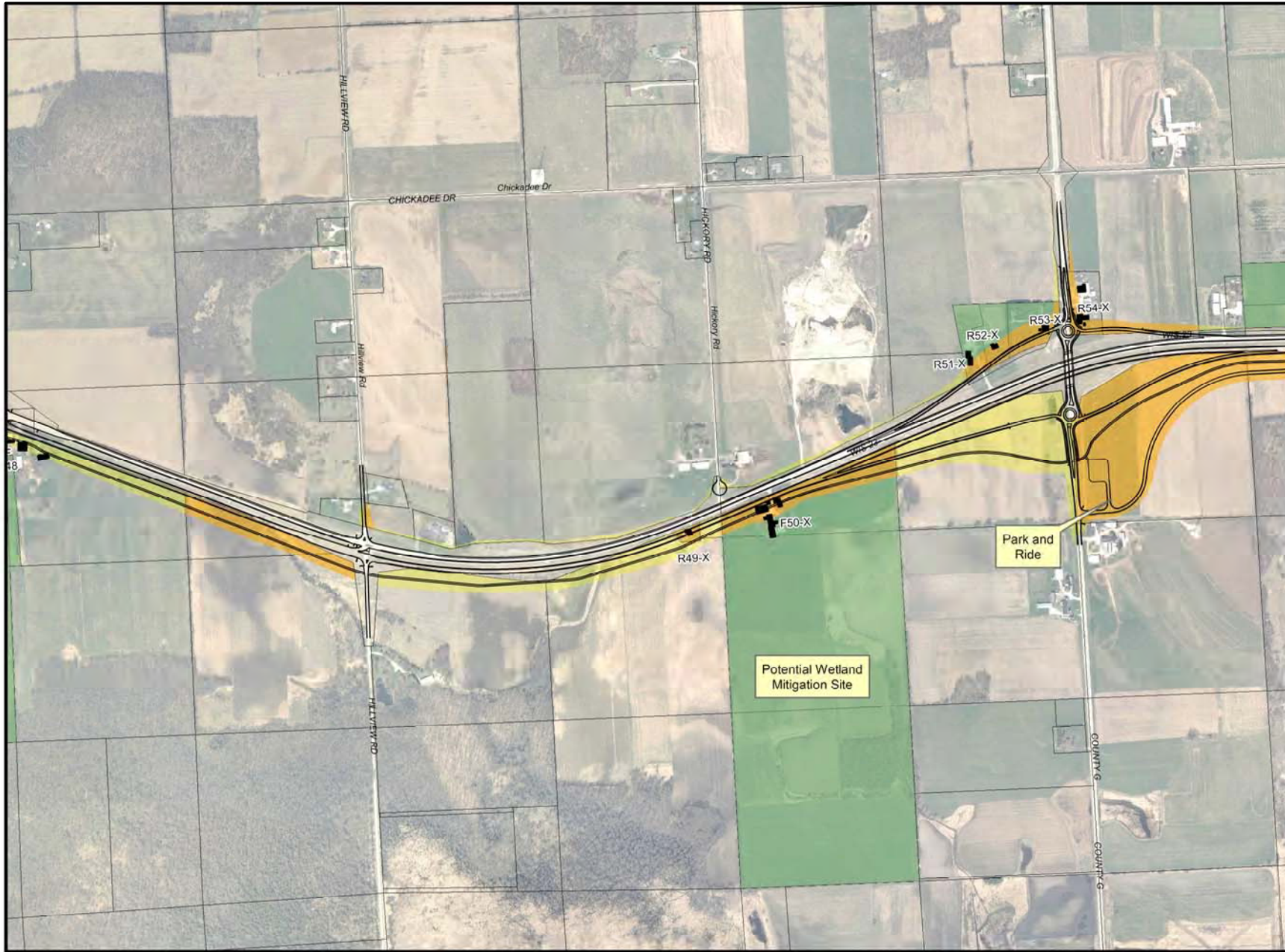
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SHEBOYGAN COUNTIES,
WISCONSIN



6

Hybrid Alternative

Figure 2.8-23



Legend
HYBRID ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
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7

Hybrid Alternative

Figure 2.8-24

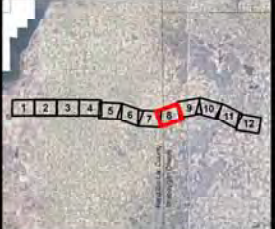


Legend
HYBRID ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
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 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
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SHEBOYGAN COUNTIES,
WISCONSIN

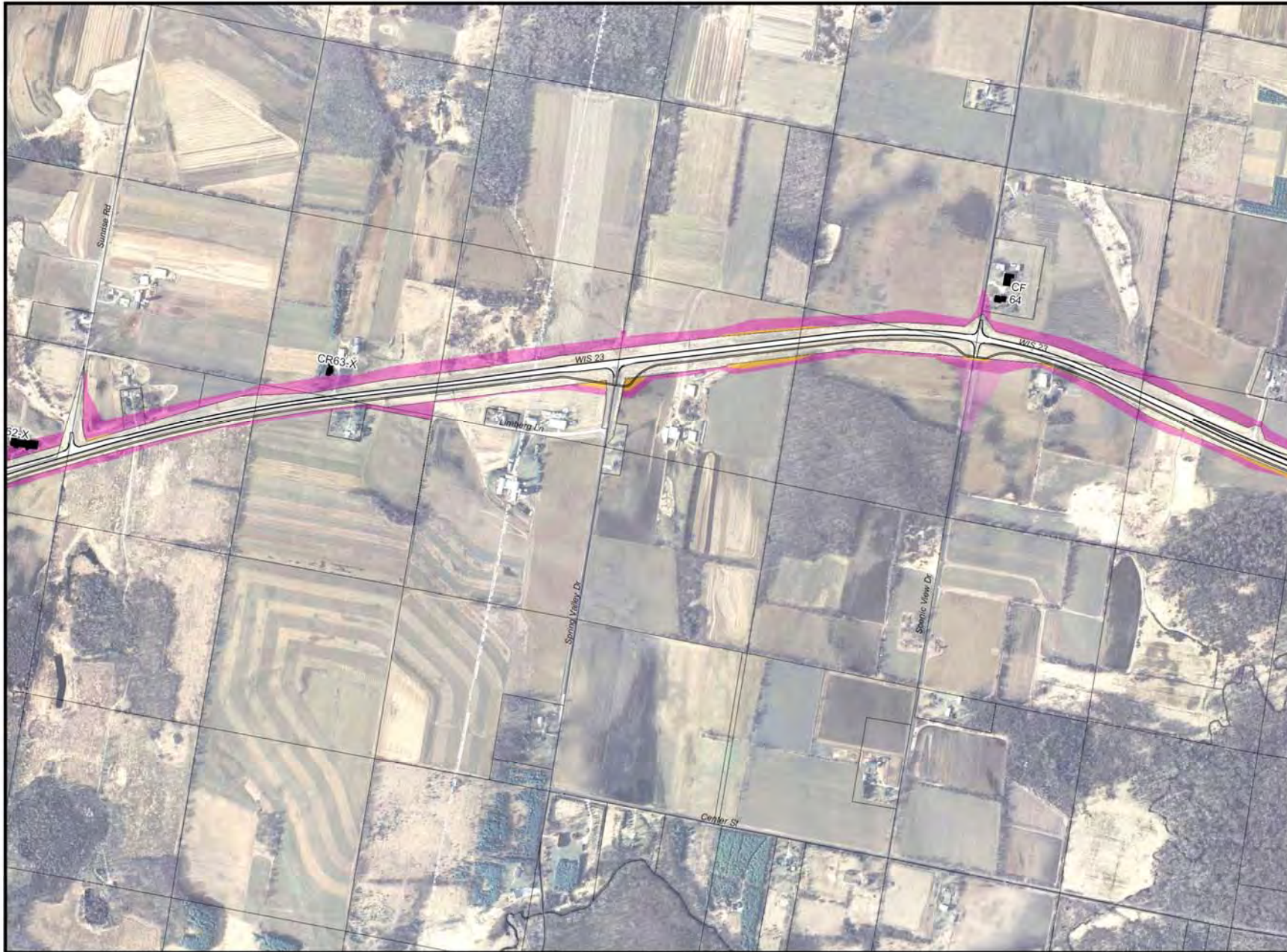


8

Hybrid Alternative

Figure 2.8-25

2-54



- Legend**
HYBRID ALTERNATIVE
- █ Excess R/W Purchased
 - █ Corridor Preservation Already Purchased
 - █ Corridor Preservation Not Purchased
 - █ R/W Needed Already Purchased
 - █ R/W Needed
 - █ Relocated Buildings
- R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 CB = Outbuilding
 -X = Building Razed
- CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

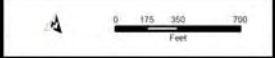


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HIGHWAY 23

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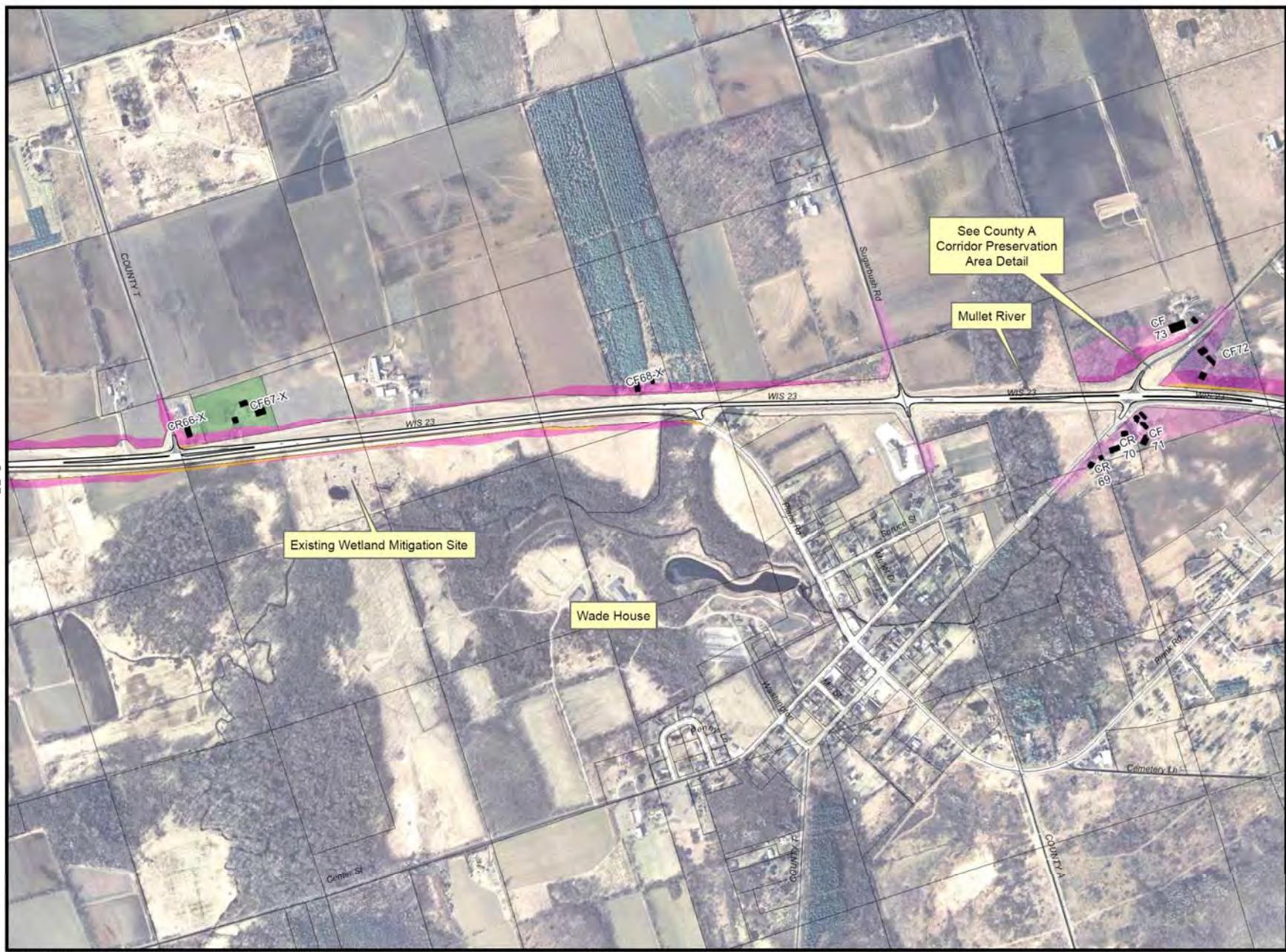
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WISCONSIN



9

Hybrid Alternative

Figure 2.8-26



Legend
HYBRID ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 CB = Outbuilding
 -X = Building Razed

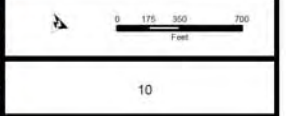
CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 CCB = Outbuilding

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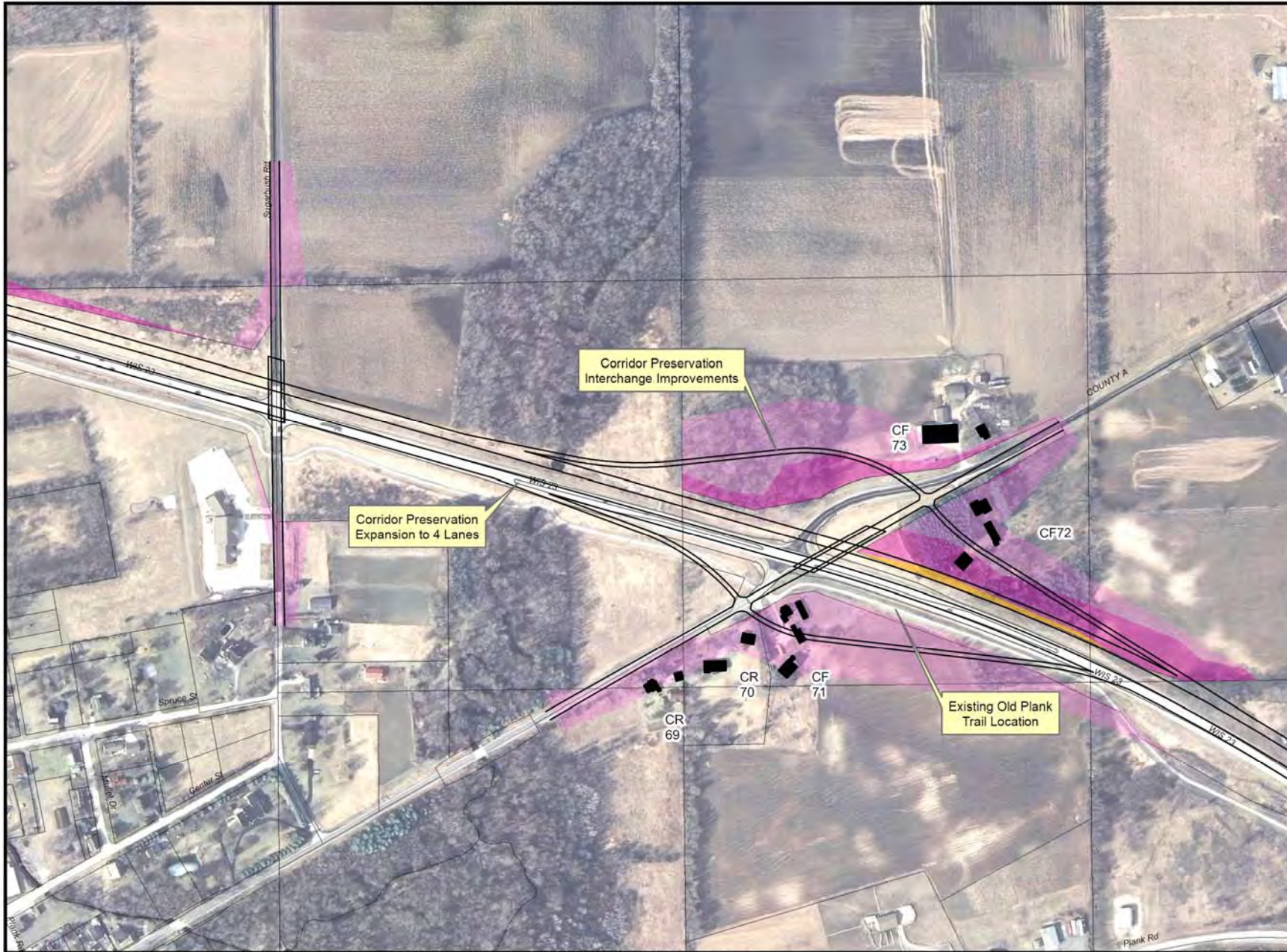
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WISCONSIN



Hybrid Alternative

Figure 2.8-27



Legend
CORRIDOR PRESERVATION FOR HYBRID ALTERNATIVE COUNTY A DETAIL

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

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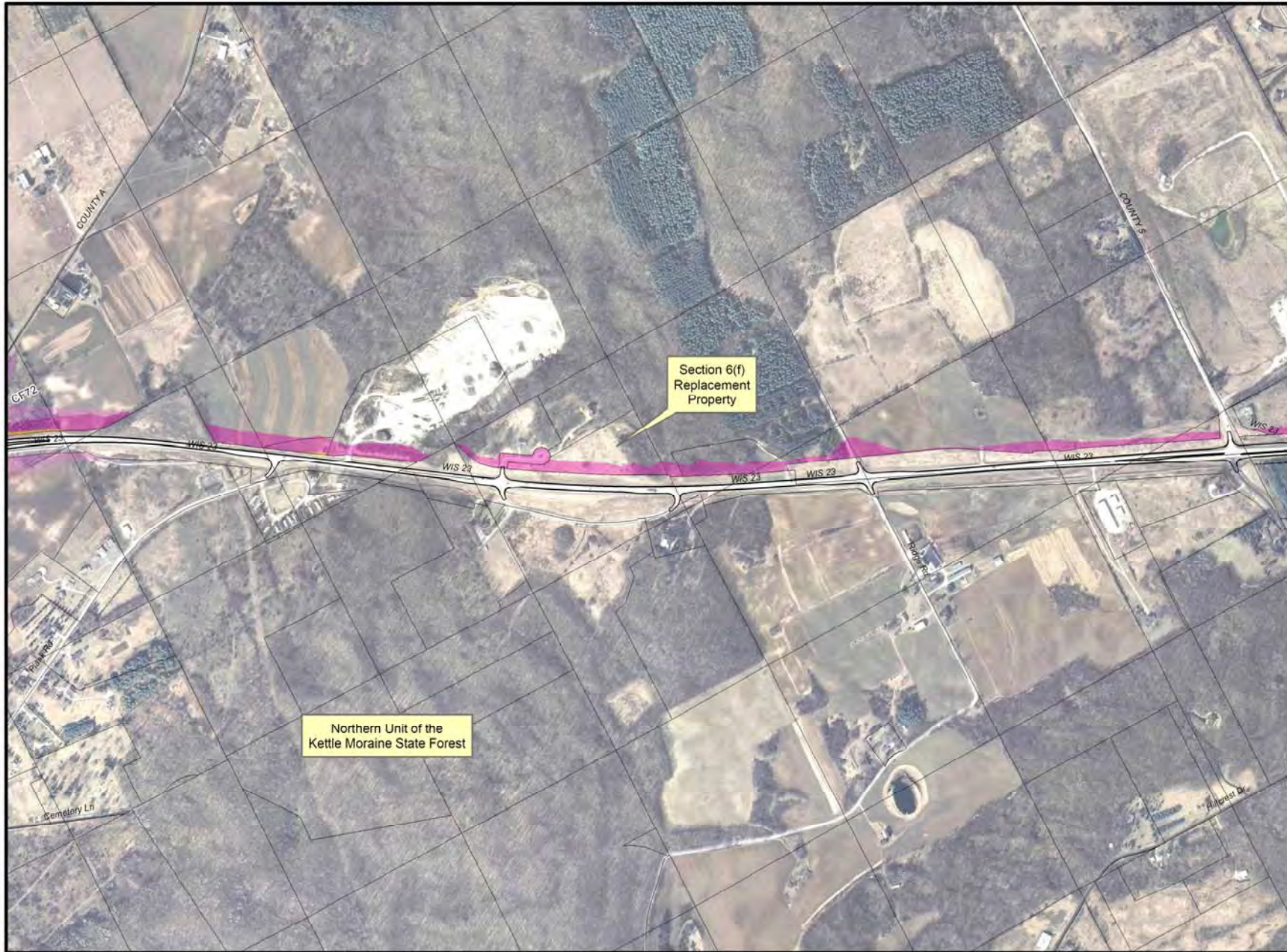
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WISCONSIN



Hybrid Alternative

Figure 2.8-28



Legend
HYBRID ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 X = Building Razed

CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding



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WISCONSIN



11

Hybrid Alternative

Figure 2.8-29



- Legend**
HYBRID ALTERNATIVE
- █ Excess R/W Purchased
 - █ Corridor Preservation Already Purchased
 - █ Corridor Preservation Not Purchased
 - █ R/W Needed Already Purchased
 - █ R/W Needed
 - █ Relocated Buildings
- R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed
- CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding

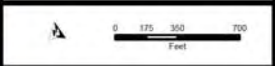


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WISCONSIN



12

Hybrid Alternative

Figure 2.8-30



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

R = Residential Relocation
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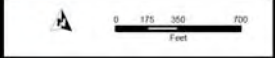


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SHEBOYGAN COUNTIES,
WISCONSIN



1

4-In On-alignment
 Alternative

Figure 2.8-31



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

R = Residential Relocation
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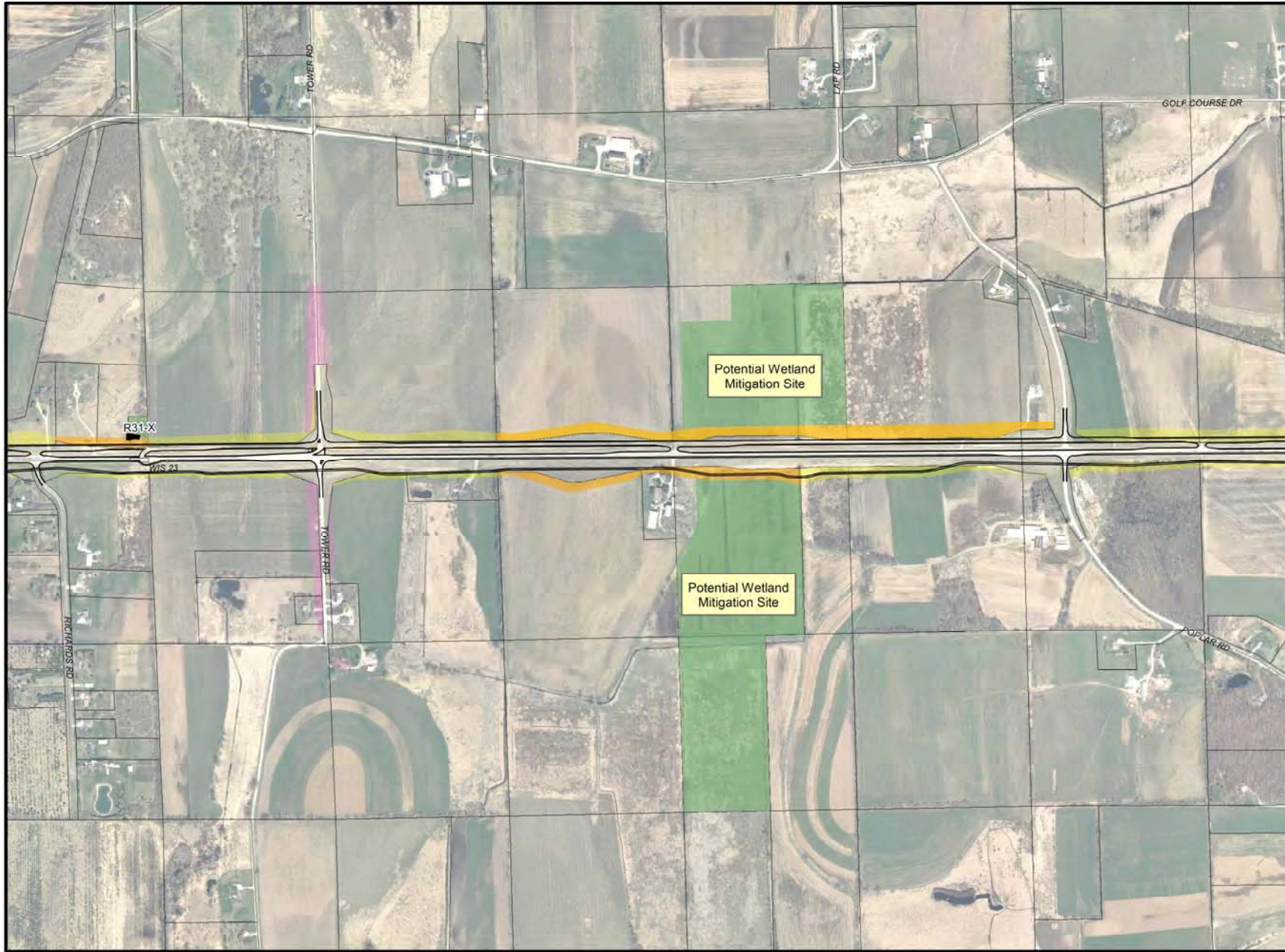


2

4-In On-alignment
 Alternative

Figure 2.8-32

2-60



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

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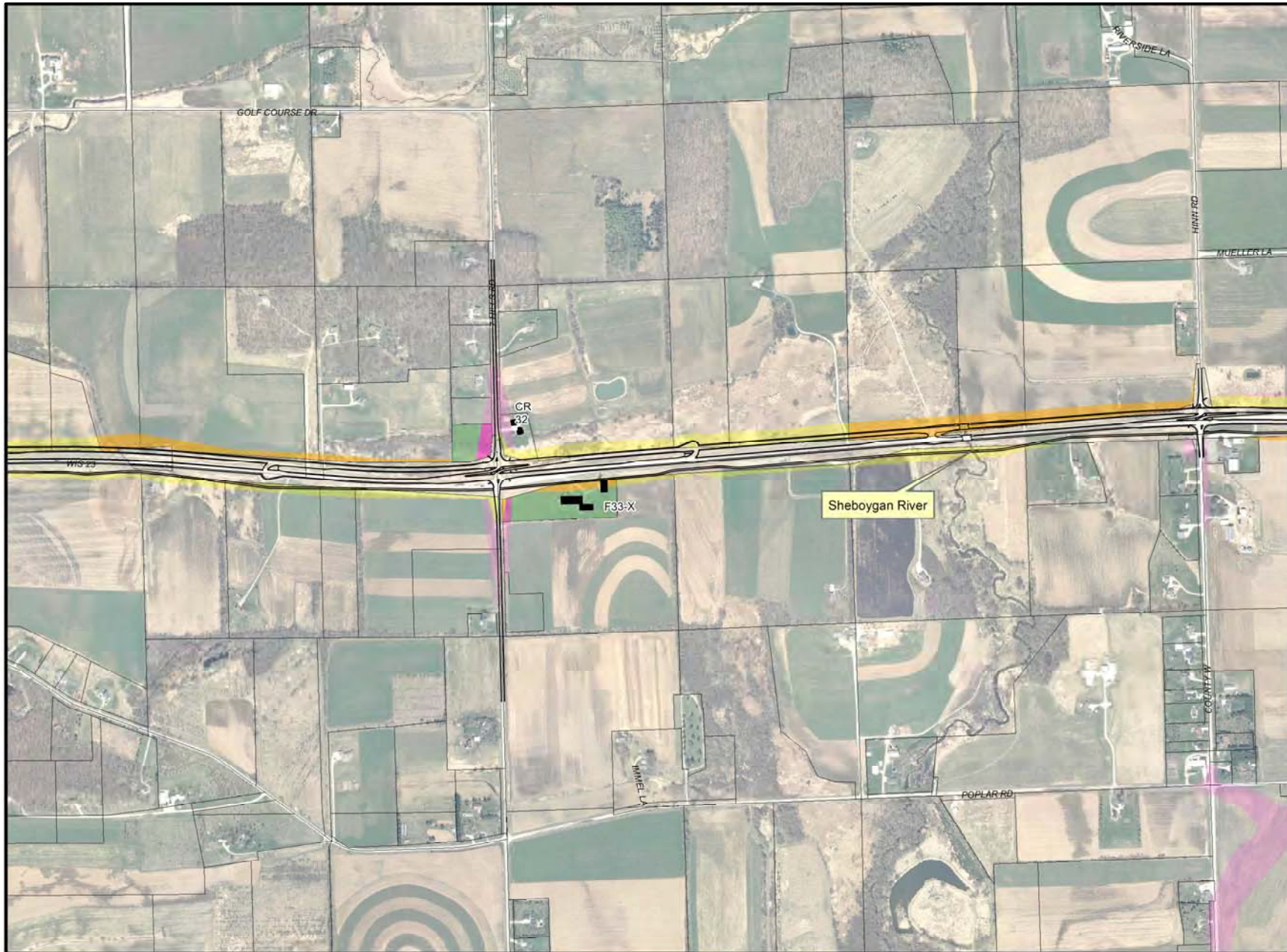
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WISCONSIN



3

4-In On-alignment
 Alternative

Figure 2.8-33



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

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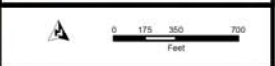


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WISCONSIN DEPARTMENT
OF TRANSPORTATION

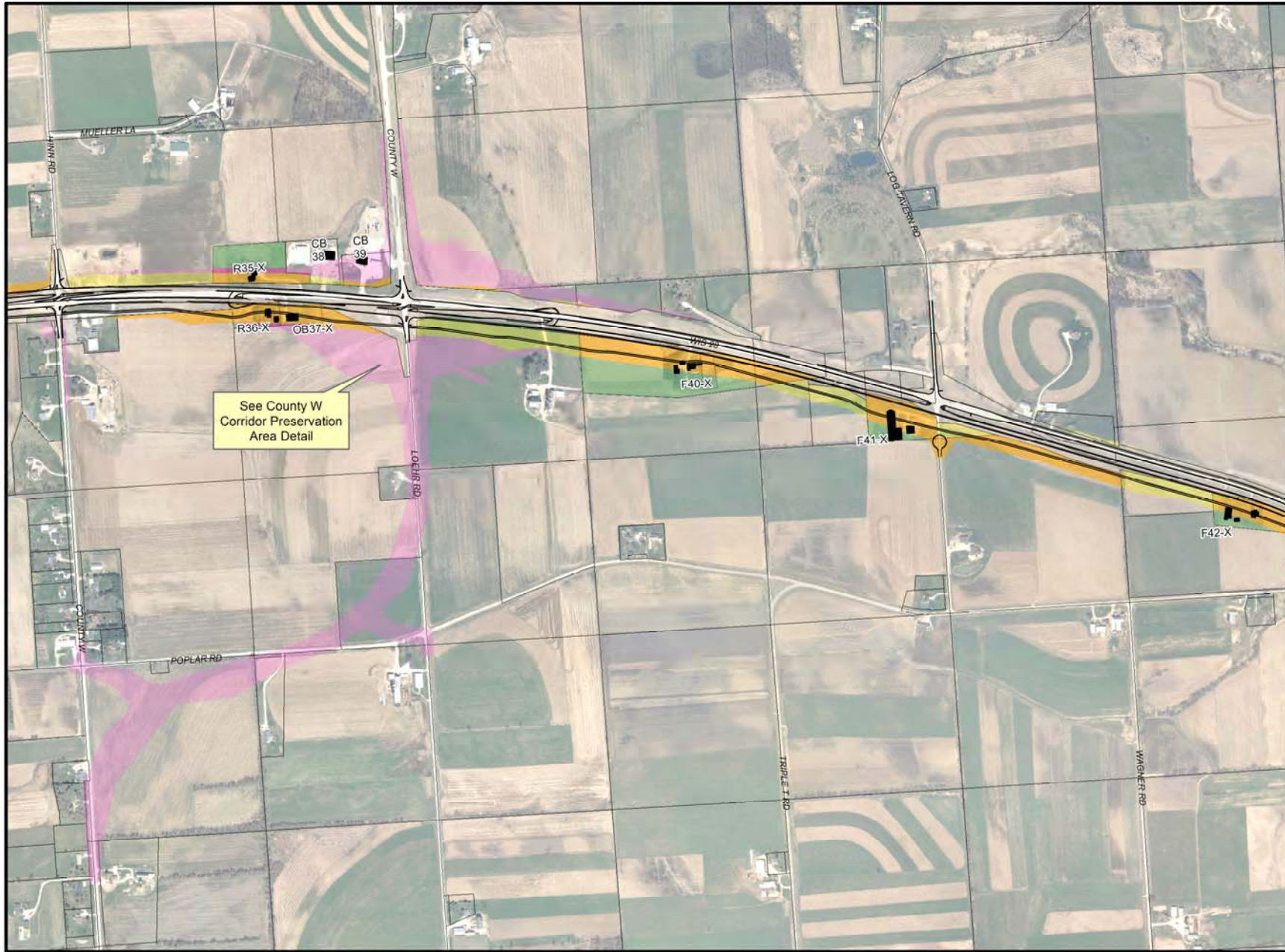
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



4

4-In On-alignment
 Alternative

Figure 2.8-34



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
 OB = Outbuilding
 -X = Building Razed

CR = Residential Property within Preservation Area
 CB = Business Property within Preservation Area
 CF = Farm Property within Preservation Area
 COB = Outbuilding



PROJECT ID 1440-13/15-00
WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

WISCONSIN DEPARTMENT
OF TRANSPORTATION

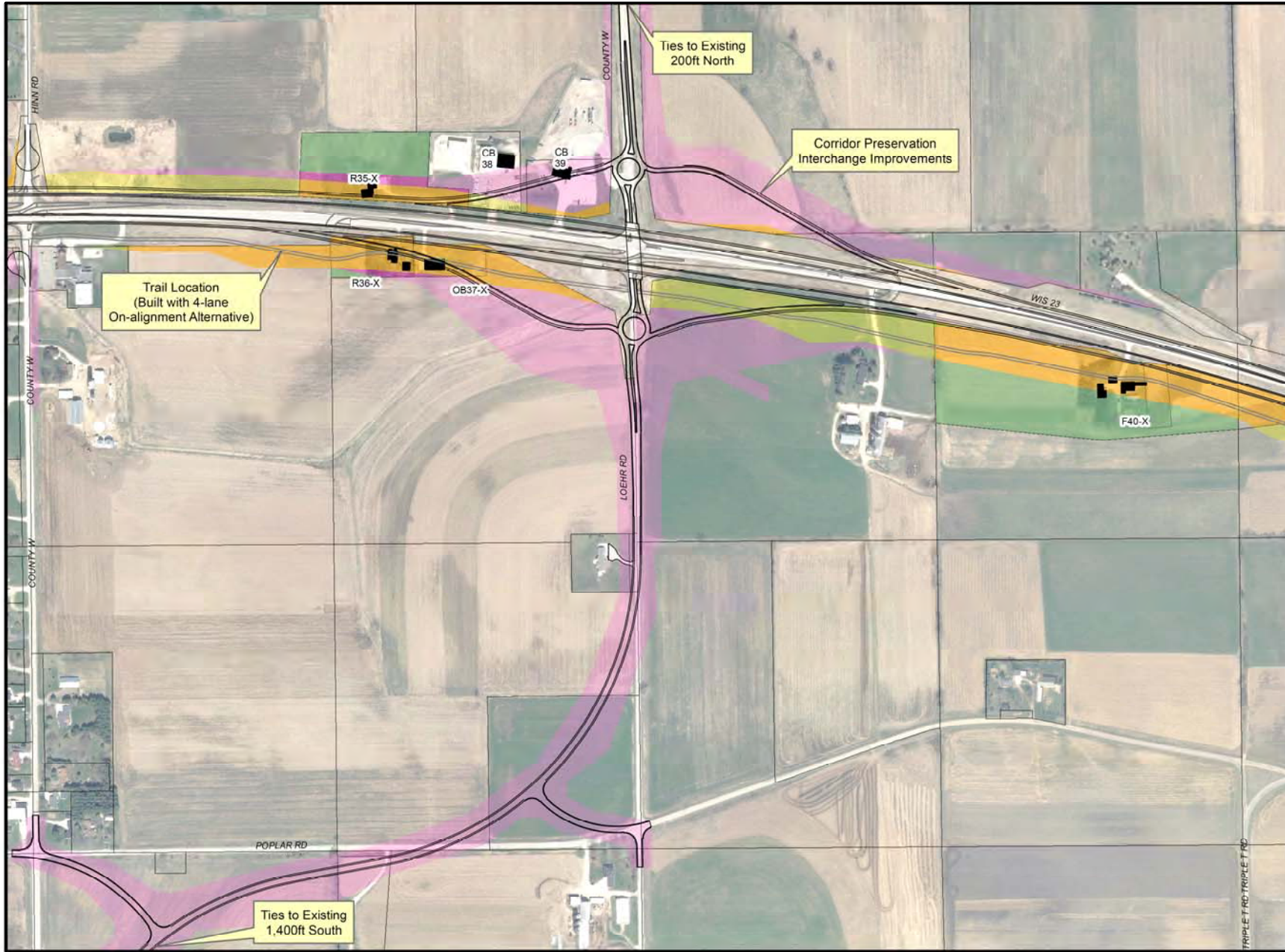
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



5

4-In On-alignment
 Alternative

Figure 2.8-35



Legend
CORRIDOR PRESERVATION FOR 4-LANE ON-ALIGNMENT COUNTY W DETAIL

- Excess R/W Purchased
- R/W Needed Already Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed
- Relocated Buildings

R = Residential Relocation
 B = Business Relocation
 F = Farm Relocation
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 -X = Building Razed

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 CB = Business Property within Preservation Area
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WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

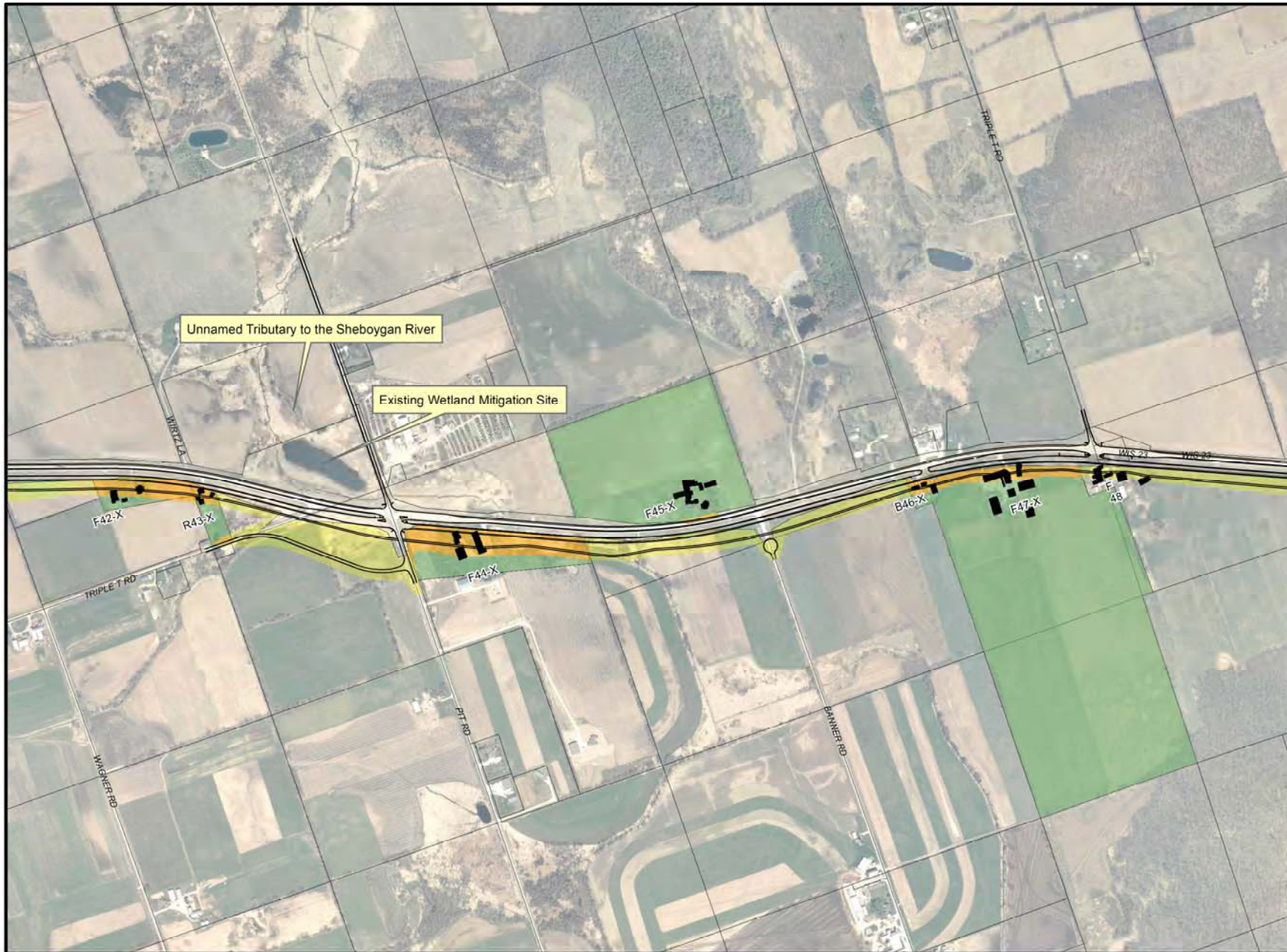
WISCONSIN DEPARTMENT
OF TRANSPORTATION

FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



4-In On-alignment
Alternative

Figure 2.8-36

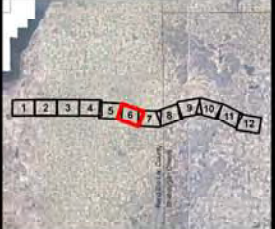


Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

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PLYMOUTH

WISCONSIN DEPARTMENT
OF TRANSPORTATION

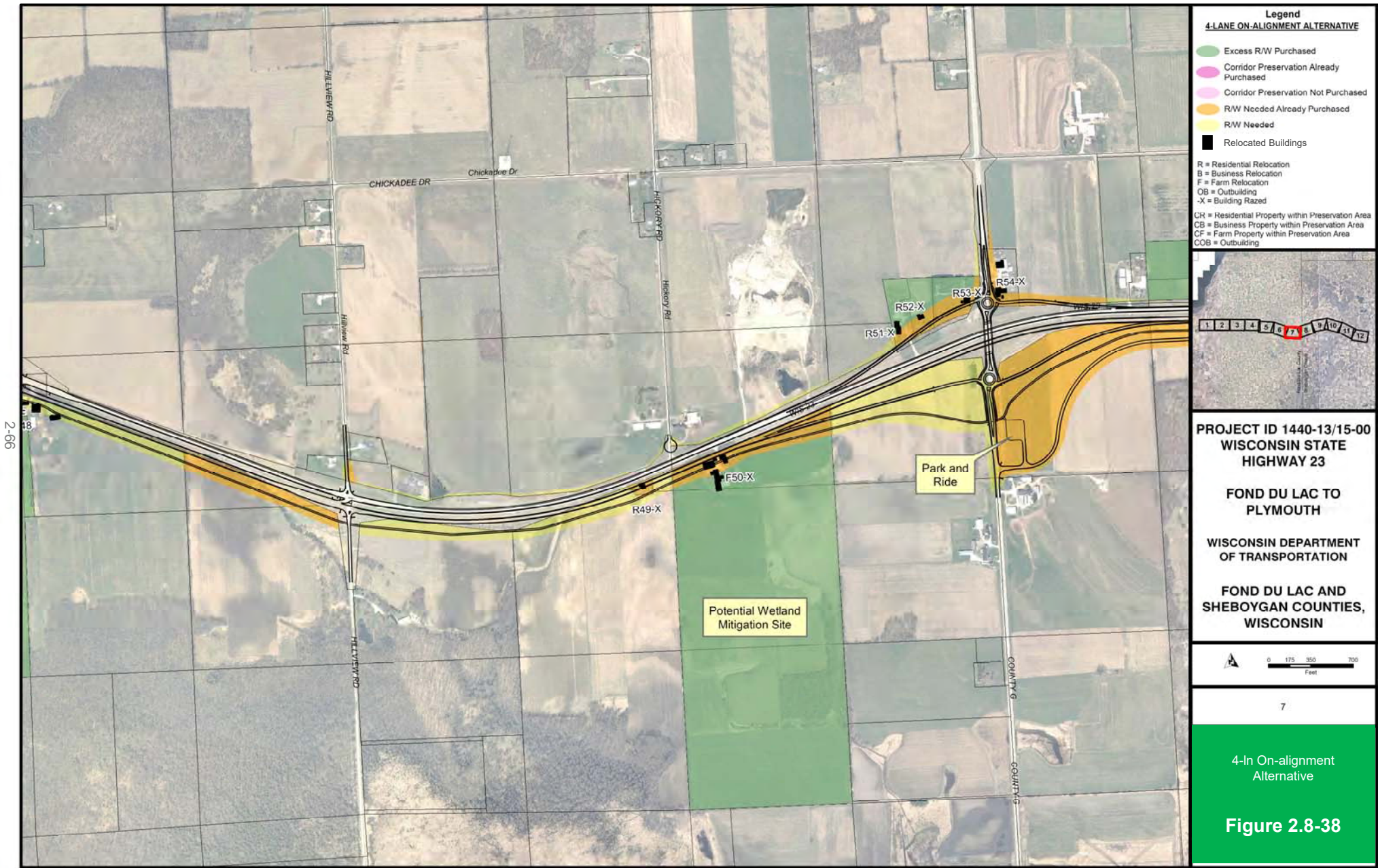
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



6

4-In On-alignment
 Alternative

Figure 2.8-37





Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

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WISCONSIN DEPARTMENT
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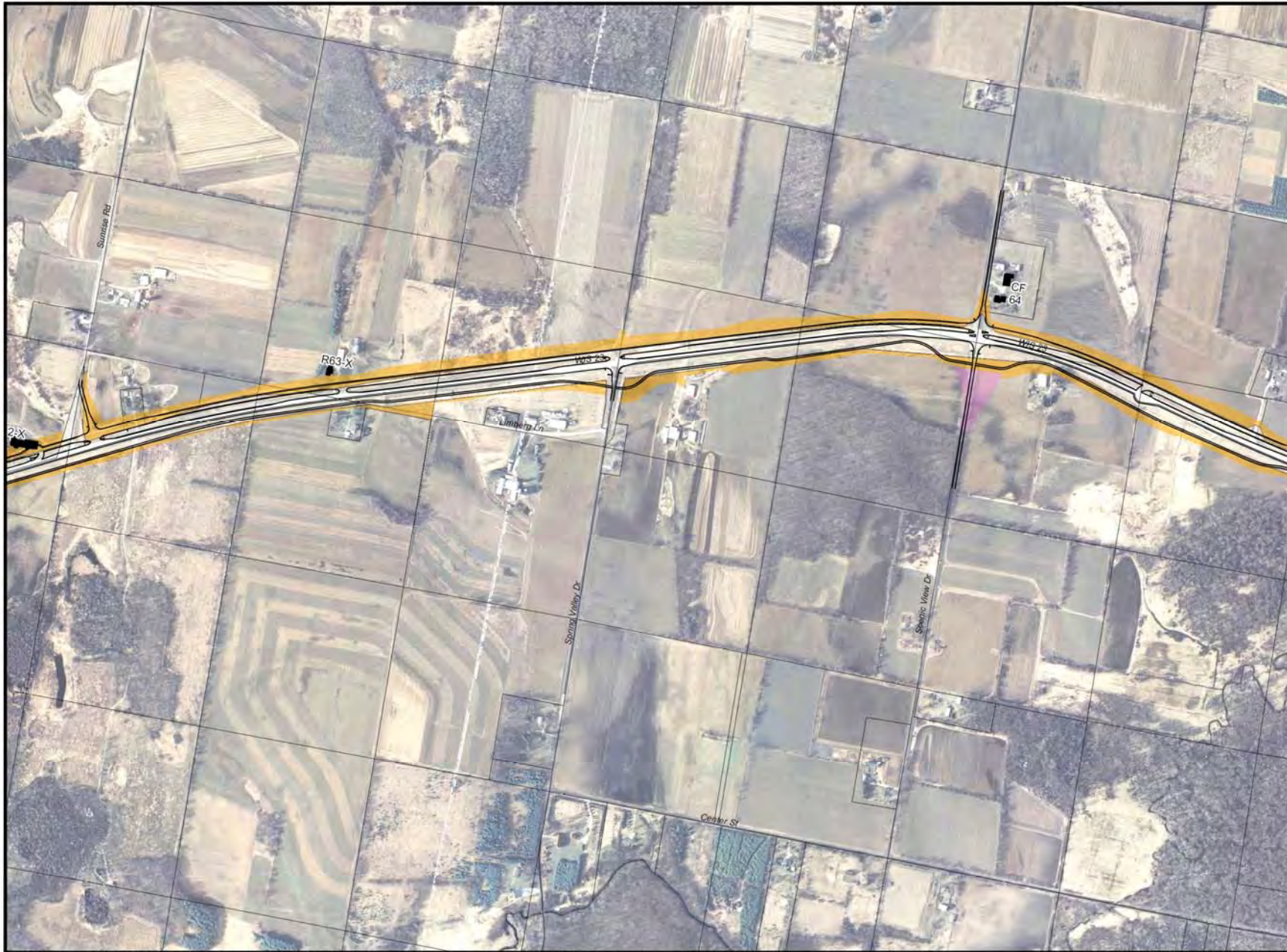
FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



8

4-In On-alignment
Alternative

Figure 2.8-39



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

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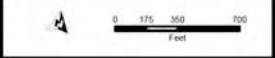


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FOND DU LAC TO
PLYMOUTH

WISCONSIN DEPARTMENT
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FOND DU LAC AND
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WISCONSIN



9

4-In On-alignment
Alternative

Figure 2.8-40



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- R/W Needed Already Purchased
- R/W Needed
- Relocated Buildings

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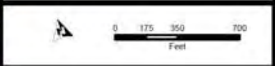


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WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

WISCONSIN DEPARTMENT
OF TRANSPORTATION

FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN

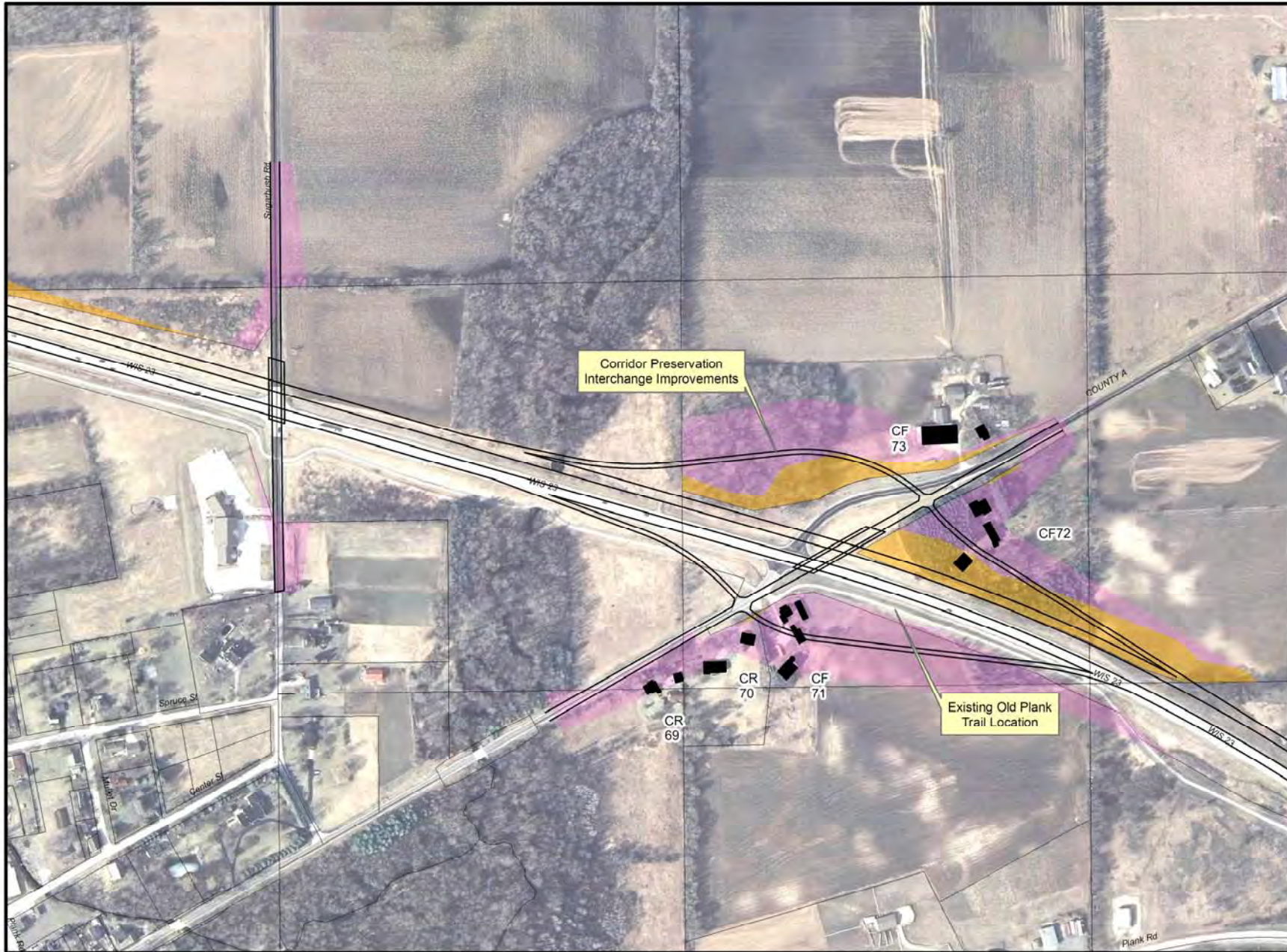


10

4-In On-alignment
Alternative

Figure 2.8-41

2-70



Legend
CORRIDOR PRESERVATION FOR 4-LANE ON-ALIGNMENT COUNTY A DETAIL

- RW Needed Already Purchased
- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- RW Needed
- Relocated Buildings

R = Residential Relocation
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WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

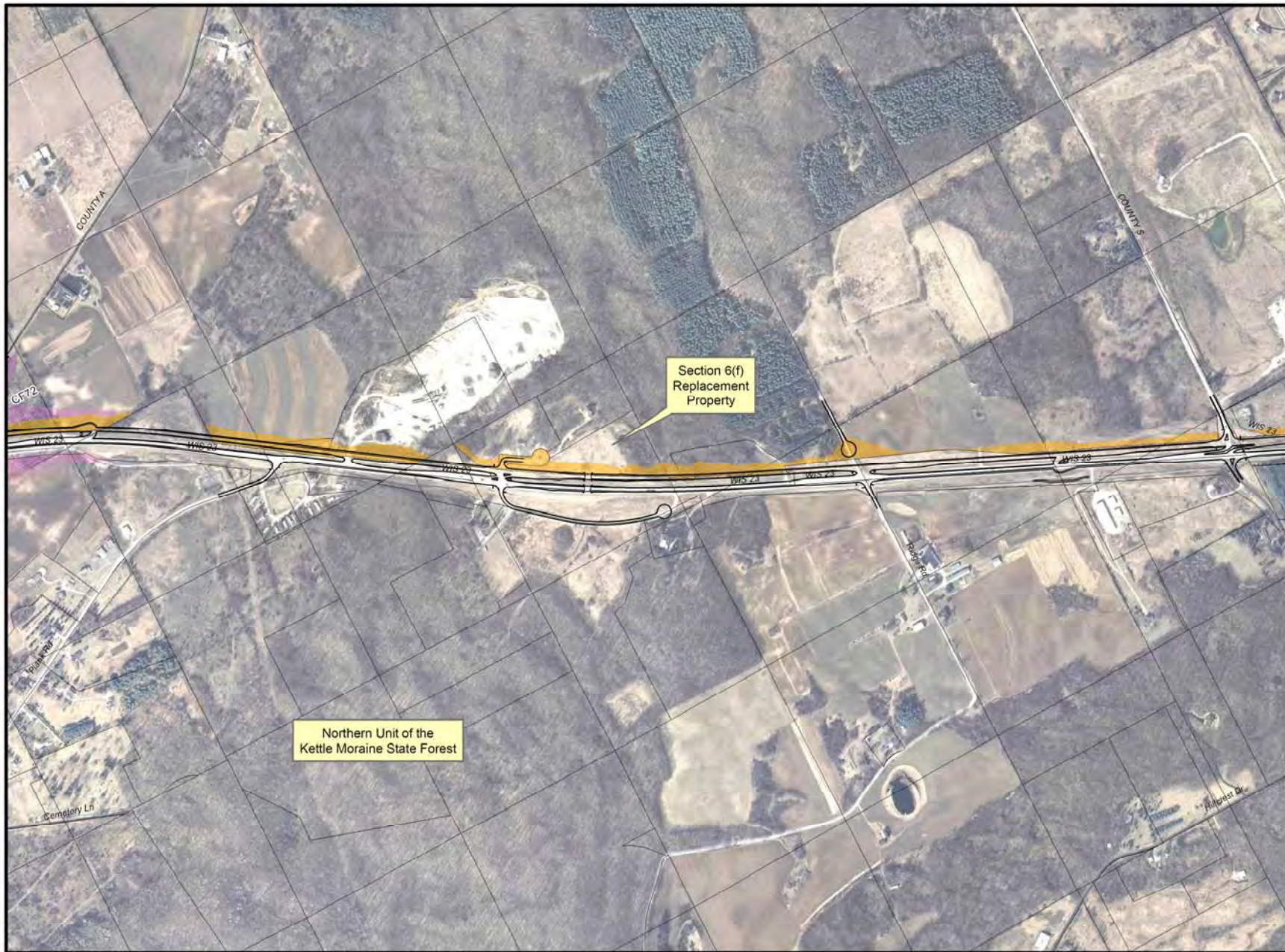
WISCONSIN DEPARTMENT
OF TRANSPORTATION

FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



4-In On-alignment
Alternative

Figure 2.8-42



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- Excess R/W Purchased
- Corridor Preservation Already Purchased
- Corridor Preservation Not Purchased
- RW Needed Already Purchased
- RW Needed
- Relocated Buildings

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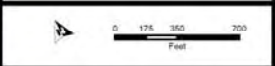


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WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

WISCONSIN DEPARTMENT
OF TRANSPORTATION

FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



4-In On-alignment
Alternative

Figure 2.8-43

2-72



Legend
4-LANE ON-ALIGNMENT ALTERNATIVE

- █ Excess R/W Purchased
- █ Corridor Preservation Already Purchased
- █ Corridor Preservation Not Purchased
- █ R/W Needed Already Purchased
- █ R/W Needed
- █ Relocated Buildings

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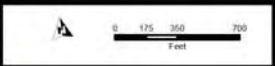


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WISCONSIN STATE
HIGHWAY 23

FOND DU LAC TO
PLYMOUTH

WISCONSIN DEPARTMENT
OF TRANSPORTATION

FOND DU LAC AND
SHEBOYGAN COUNTIES,
WISCONSIN



12

4-In On-alignment
 Alternative

Figure 2.8-44