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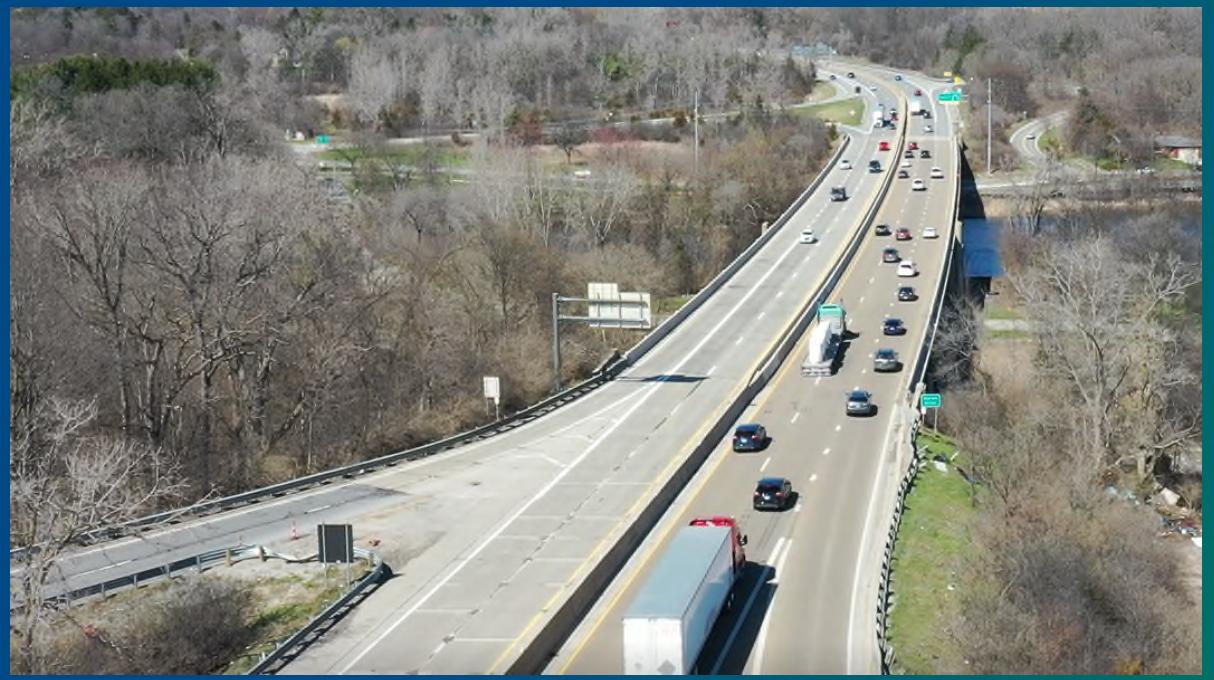
M-14 at Barton Drive PEL Study

August 10, 2023



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M 14 @ Barton Drive

Interchange PEL Study

Ann Arbor, MI

MDOT Michigan Department of Transportation

Agenda

Welcome

PEL Recap

Analysis

Recommendations

Final Steps

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How we got here

- Long history of crashes at the interchange including fuel spill to Huron River
- Original concept to extend Huron Parkway and access freeway north of location with interchange
- In 2021 the City of Ann Arbor resolved for MDOT to re-examine the interchange
- MDOT initiated this study – Planning and Environmental Linkages Study (PEL)

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Previous Safety Analysis

- RSA completed in 2021
- Several short-term recommendations:
  - Queue Warning System (installed; not online)
  - Pavement marking / sign upgrades (partly installed)
  - Flashing Exit Signage (approved; in progress)

- Additional Improvements:
  - High friction pavement treatment (completed prior)

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Why a PEL

- More efficient process
- Combines planning, engineering, and NEPA work
- Uses analysis phase to inform NEPA
- Incorporates early public engagement

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What We've Heard

Engagement Results

- 4,000+ interactions
- 1,000 video views
- Nearly 900 comments received

Engagement Efforts

- MDOT Website | Facebook | Twitter
- YouTube videos
- Ann Arbor Farmer's Market Outreach Table
- 3-week virtual open-house website and survey

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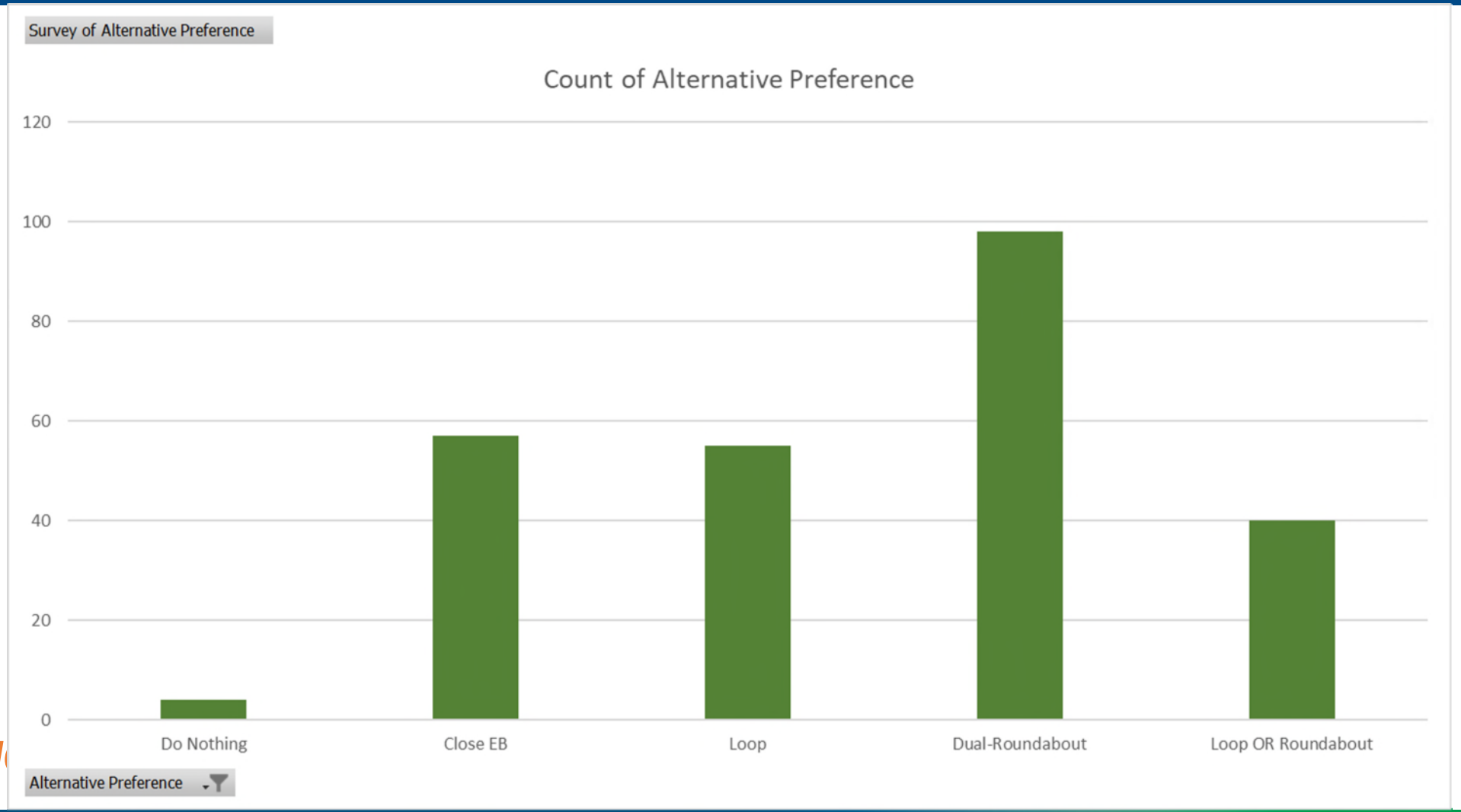
"Barton Dr has been a nightmare for more years than I can remember. It is a major access point for the North side of town and the University & the hospital. My feeling is for the money the Dog Bone is the logical solution"

"I continue to be a firm believer that the elimination of the M14/Barton Dr. and Whitmore Lk. Rd. on and off ramps are dangerous and should be closed. In particular, the Barton Dr. situation is a disaster in so many ways it's hard to fathom why it remains open."

"Please do not close any of the access points to M-14. They are absolutely essential to traffic flow on the NE side of Ann Arbor."

What We've Heard



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Alternatives Analysis

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Purpose and Need

PURPOSE

- Reduce the crashes in the area
- Improve the traffic operations in and around the interchange
- Address the speed differentials on EB M-14 near the interchange
- Stay within existing limited access right-of-way to the extent practicable
- Maintain active transportation connectivity under M-14
- Optimize constructability for maintenance of traffic
- Minimize future maintenance costs

WHY IS IT NEEDED

- Recent truck crashes including fuels spills
- History of serious injury and fatal crashes
- Stop control intersection to freeway
- Weaving issues between Main Street ramps
- Limited sight distance coming on downhill curve approach to bridge
- Tight geometry on Barton off-ramp, frequent crashes into guardrail

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Early Alternatives Dismissed

Summary of Initial Concepts

Concept	Improves Safety	Improves Operations	Limits ROW Impacts	Improves Access	Summary of Results
No Action	No	No	Neutral	Neutral	Carried Forward
Closure of Eastbound Ramps	Yes	Yes	Yes	No	Carried Forward
Modify the Existing Ramp Geometry	Yes	No	No	Yes	Carried Forward
Tight Diamond Interchange	Yes	Yes	No	Neutral	Removed from Consideration
Dual Roundabout Interchange	Yes	Yes	Yes	Yes	Carried Forward
Hybrid Roundabout/Diamond Interchange	Yes	Yes	No	No	Removed from Consideration
Eastbound Flyover Exit Ramp	Yes	Yes	No	Neutral	Removed from Consideration
Diverging Diamond	Yes	Yes	No	Neutral	Removed from Consideration

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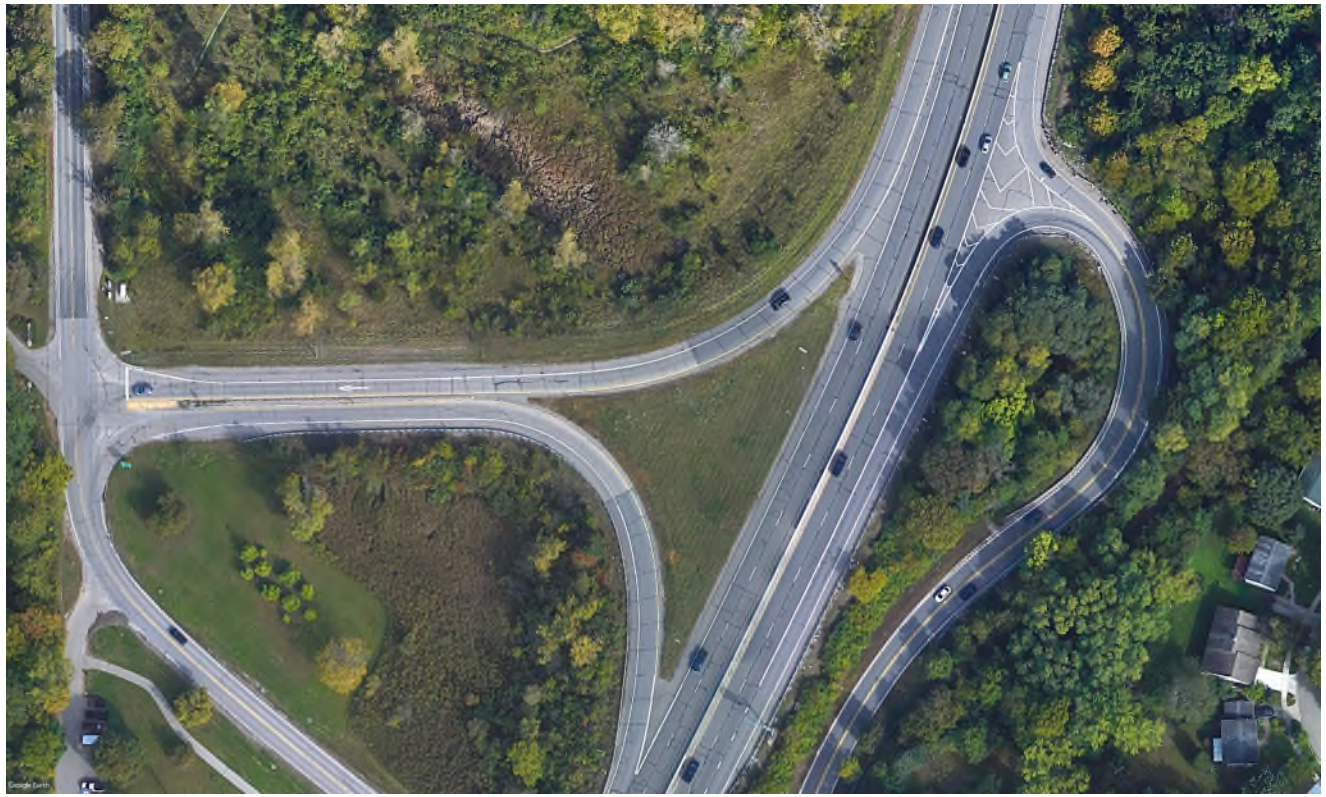
Alternative 1 (No Build)

- No changes to EB or WB ramps



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Alternative 2 (Close EB Ramps)

- Close EB ramps
- No change to WB ramps

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Alternative 3-1 (Modified Loop 1)

- Loop radius below standard and requires design exception
- Possible parkland acquisition needed
- No change to WB ramps

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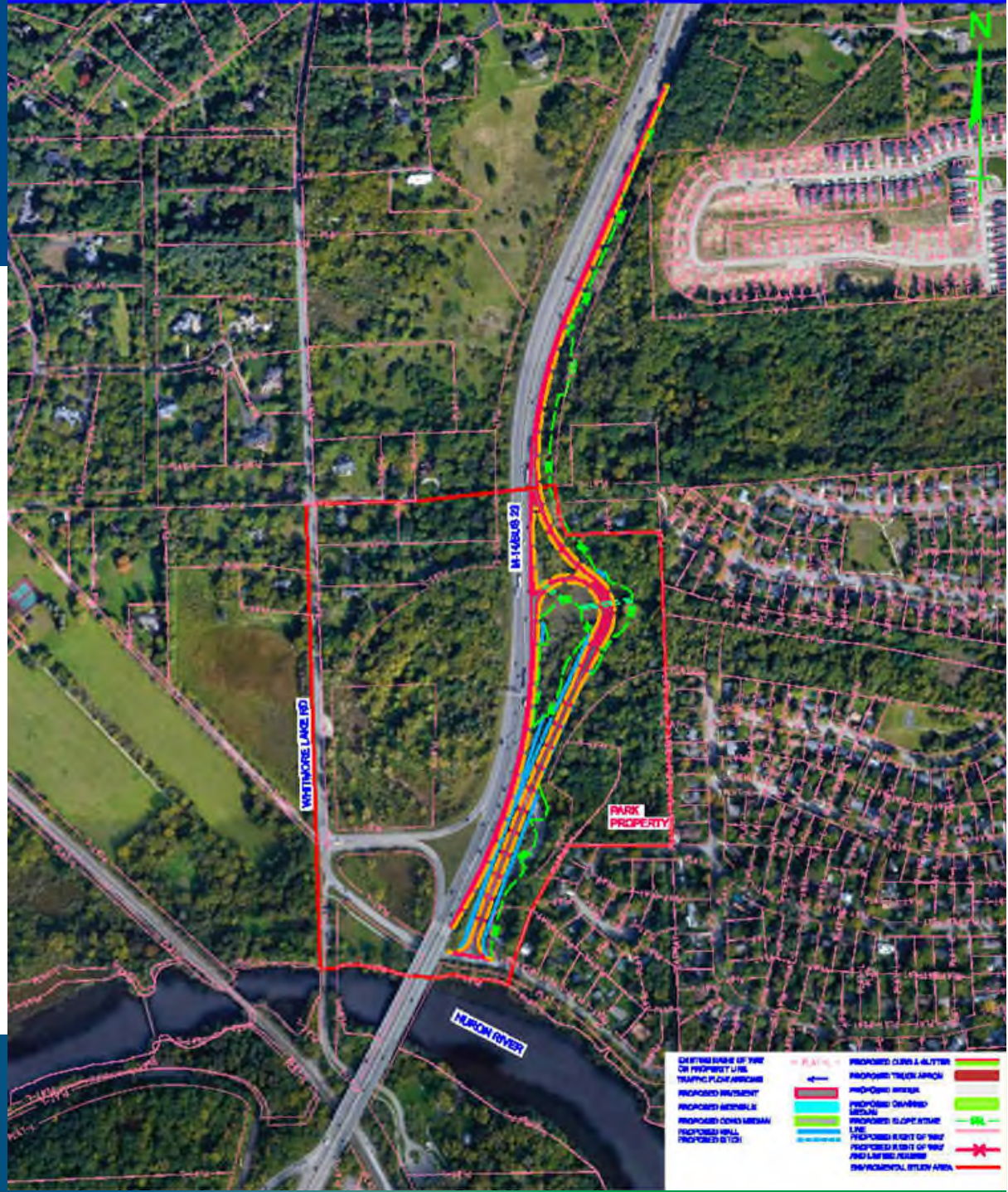
Interchange PEL Study

Ann Arbor, MI



Alternative 3-1 (Zoomed-In)

EXISTING RIGHT OF WAY OR PROPERTY LINE

TRAFFIC FLOW ARROWS

PROPOSED PAVEMENT

PROPOSED SIDEWALK

PROPOSED CONC MEDIAN

PROPOSED WALL

PROPOSED DITCH

PROPOSED CURB & GUTTER

PROPOSED TRUCK APRON

PROPOSED BRIDGE

PROPOSED GRASSED MEDIAN

PROPOSED SLOPE STAKE LINE

SSL

PROPOSED RIGHT OF WAY

PROPOSED RIGHT OF WAY AND LIMITED ACCESS

ENVIROMENTAL STUDY AREA

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Alternative 3-2 (Modified Loop 2)

- Loop radius meets the minimum standard
- Requires residential real-estate acquisitions
- Possible parkland acquisition needed
- No change to WB ramps

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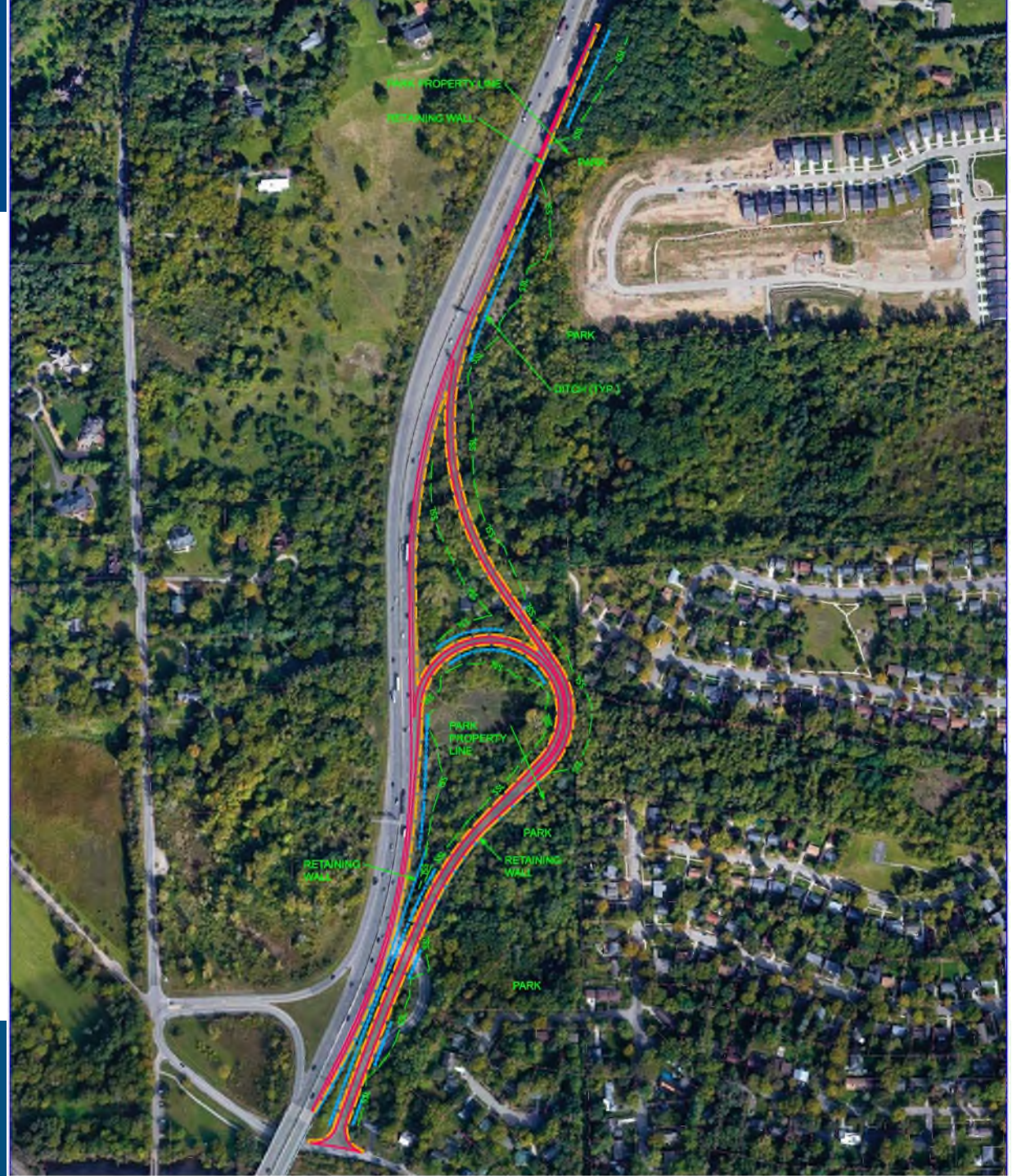

Alternative 3-2 (Zoomed-In)

EXISTING RIGHT OF WAY OR PROPERTY LINE

TRAFFIC FLOW ARROWS

PROPOSED PAVEMENT

PROPOSED SIDEWALK

PROPOSED CONC MEDIAN

PROPOSED WALL

PROPOSED DITCH

PROPOSED CURB & GUTTER

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PROPOSED RIGHT OF WAY

PROPOSED RIGHT OF WAY AND LIMITED ACCESS

ENVIROMENTAL STUDY AREA

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Ann Arbor, MI

Alternative 4 (Dual Roundabout)

- Changes to WB and EB ramps
- Possible temporary parkland permitting needed

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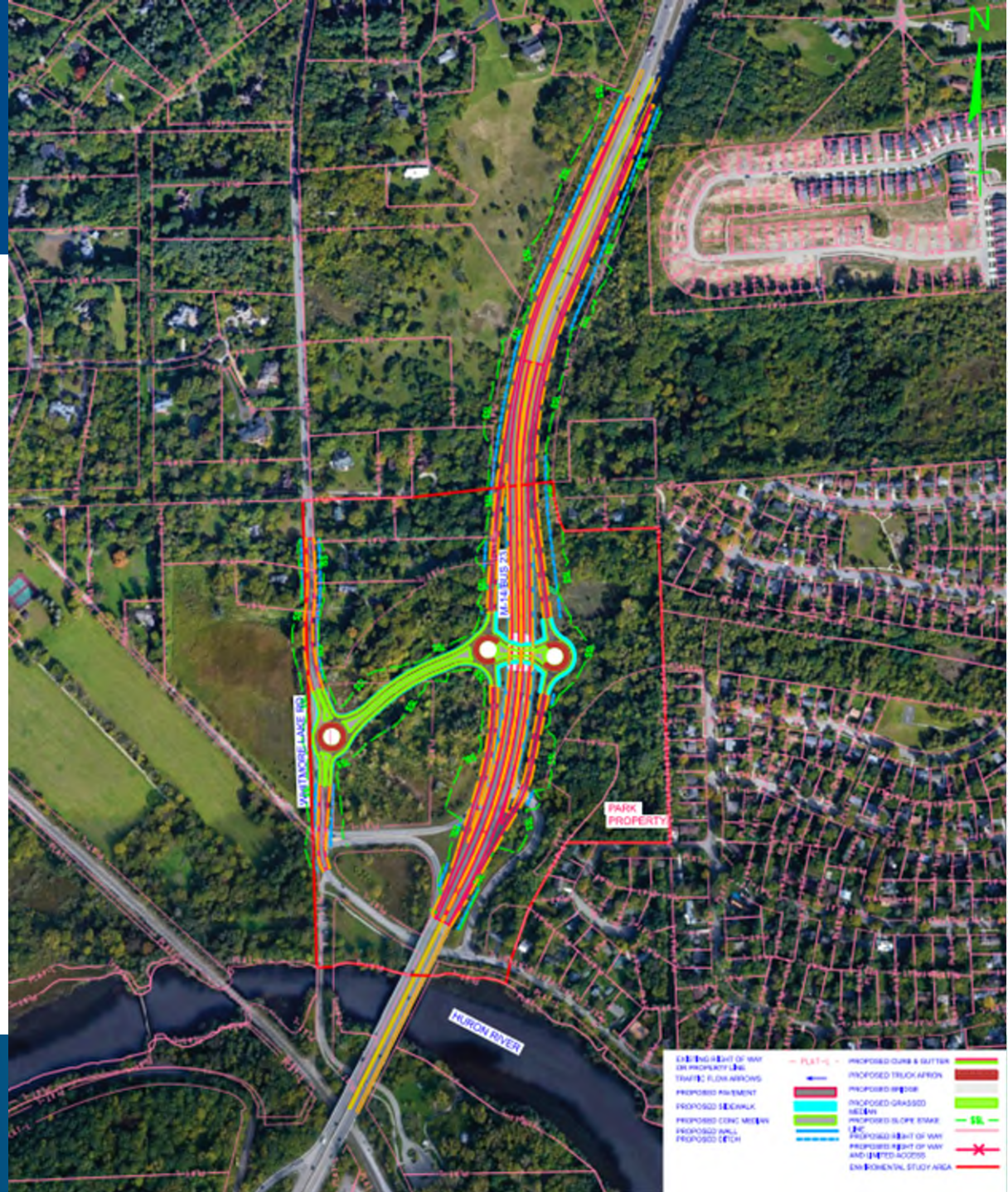

M 14 @ Barton Drive

Interchange PEL Study

Ann Arbor, MI

Alternative 4 (Zoomed-In)

EXISTING RIGHT OF WAY OR PROPERTY LINE
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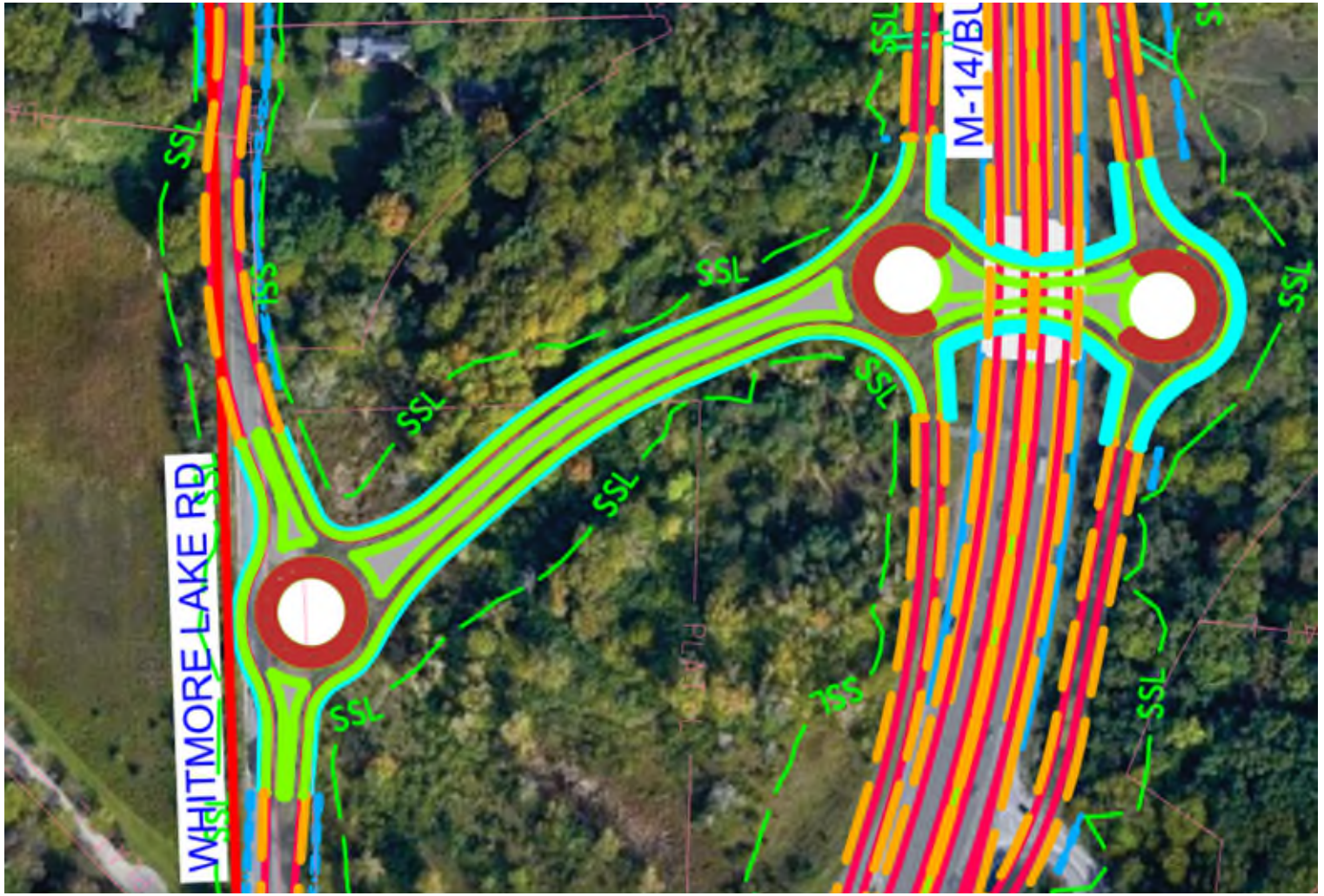

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Safety Analysis of Alternatives

- Detailed Analysis using Highway Safety Manual (a predictive methodology)
- Looked at project area and network in the area
- Alternative 2 – Close Eastbound Ramps
  - expected to reduce Fatal / Injury crashes by 8.1 per yr.
- Alternative 4 – Dual Roundabouts
  - expected to reduce Fatal / Injury crashes by 7.7 per yr.

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Draft Evaluation Matrix

Evaluation Criteria	Performance Measure	Evaluation Description	Alternative 1 – No Action	Alternative 2 – Closure of the Eastbound Ramps	Alternative 3 – Modify Existing Eastbound Ramp Geometry	Alternative 4 – Dual Roundabout Interchange
Safety						
Reduction in Fatal & Injury Crashes – Study Area	• Reduction in expected total crashes in 2025/2045 • Reduction in expected fatal and injury crashes in 2025/2045 • Statistically significant reductions with a level of confidence >95%	• Average number of expected crashes reduced per year expected within study area (includes mainline M-14, ramps, and ramp terminals). • Average number of expected crashes reduced per year expected outside the study area due to changes within the study area.				
Reduction in Total Crashes – Study Area						
Reduction in Fatal & Injury Crashes – Impacted Areas Outside Study Area						
Reduction in Total Crashes – Impacted Areas Outside Study Area						
Traffic Operations						
Freeway Weaving	Level of Service	Lane changes on M-14 that slow traffic.				
Ramp Terminals		Traffic conditions at Barton Dr on and off ramps (EB and WB).				
Freeway Mainline		Traffic conditions on M-14 from west of Main St to north of Barton Dr				
Arterial Network – within Study Area		Traffic conditions on local street network within the study area.				

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Draft Evaluation Matrix

Evaluation Criteria	Performance Measure	Evaluation Description	Alternative 1 – No Action	Alternative 2 – Closure of the Eastbound Ramps	Alternative 3 – Modify Existing Eastbound Ramp Geometry	Alternative 4 – Dual Roundabout Interchange
Arterial Network – Outside Study Area		Traffic conditions on local street network outside the study area regionally.				
Community Cohesion						
Community Cohesion	Increase/no change/decrease	Creates or removes barriers between local and regional communities and facilities.				
Non-Motorized Connectivity		Addition of sidewalk or bike lanes with project.				
Community Resources Connectivity		Adds or removes access to other parts of the community/city from local neighborhoods.				
Right-of-Way						
ROW	Number of parcels	Need to purchase land or have a temporary/permanent easement.				
Parkland/4(f)	Number of facilities	Change in use, connectivity, or access at publicly owned public parks, recreation areas, and wildlife or waterfowl refuges, or any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places (historic sites accounted for in the Cultural/Historic category).				

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Draft Evaluation Matrix

Evaluation Criteria	Performance Measure	Evaluation Description	Alternative 1 – No Action	Alternative 2 – Closure of the Eastbound Ramps	Alternative 3 – Modify Existing Eastbound Ramp Geometry	Alternative 4 – Dual Roundabout Interchange
Wetland Impacts	Acres	Acres of wetland disturbed or filled.				
Stream Impacts	Linear Feet	LF of stream impacted.				
Floodplain Impacts	Temporary/permanent	Encroachment into floodplain.				
Water Quality	Increase/same/decrease	Increase in impervious surface and required stormwater treatment.				
Forest Impacts	Acres	Acres of forest removed for grading.				
Flora/Fauna	Presence/absence of habitat or species	Acres of threatened and endangered species habitat removed or disturbed.				
Cultural/Historic	Number of sites	Disturbance, change in setting, or use of historic or archaeological sites.				
Construction and Maintenance						
Constructability	Ease or difficulty of construction	Addition or removal of structures or other non-standard, complicated features included in design to complete the alternative.				
Maintenance of Traffic during Construction	Closure of ramps and length of construction	Maintenance of acceptable traffic operations during construction and complicated detours or closures required.				

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Recommendations

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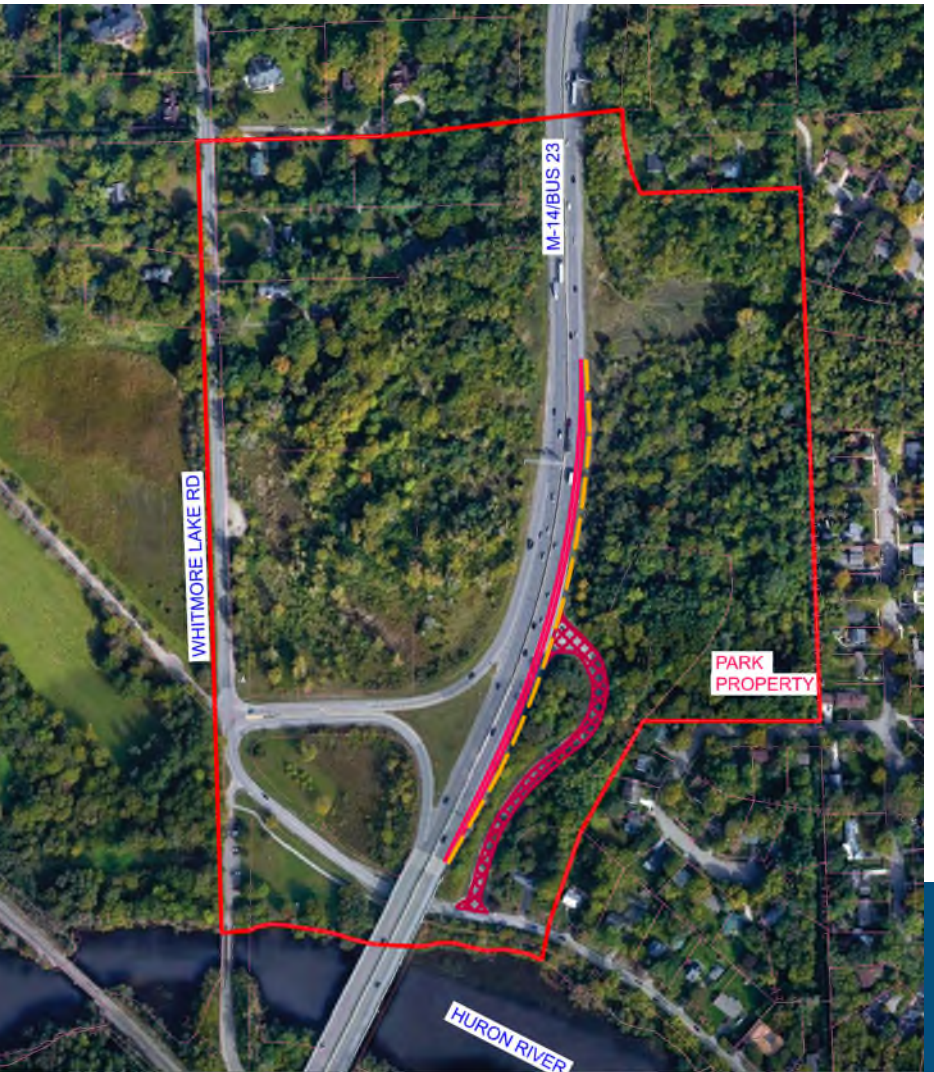
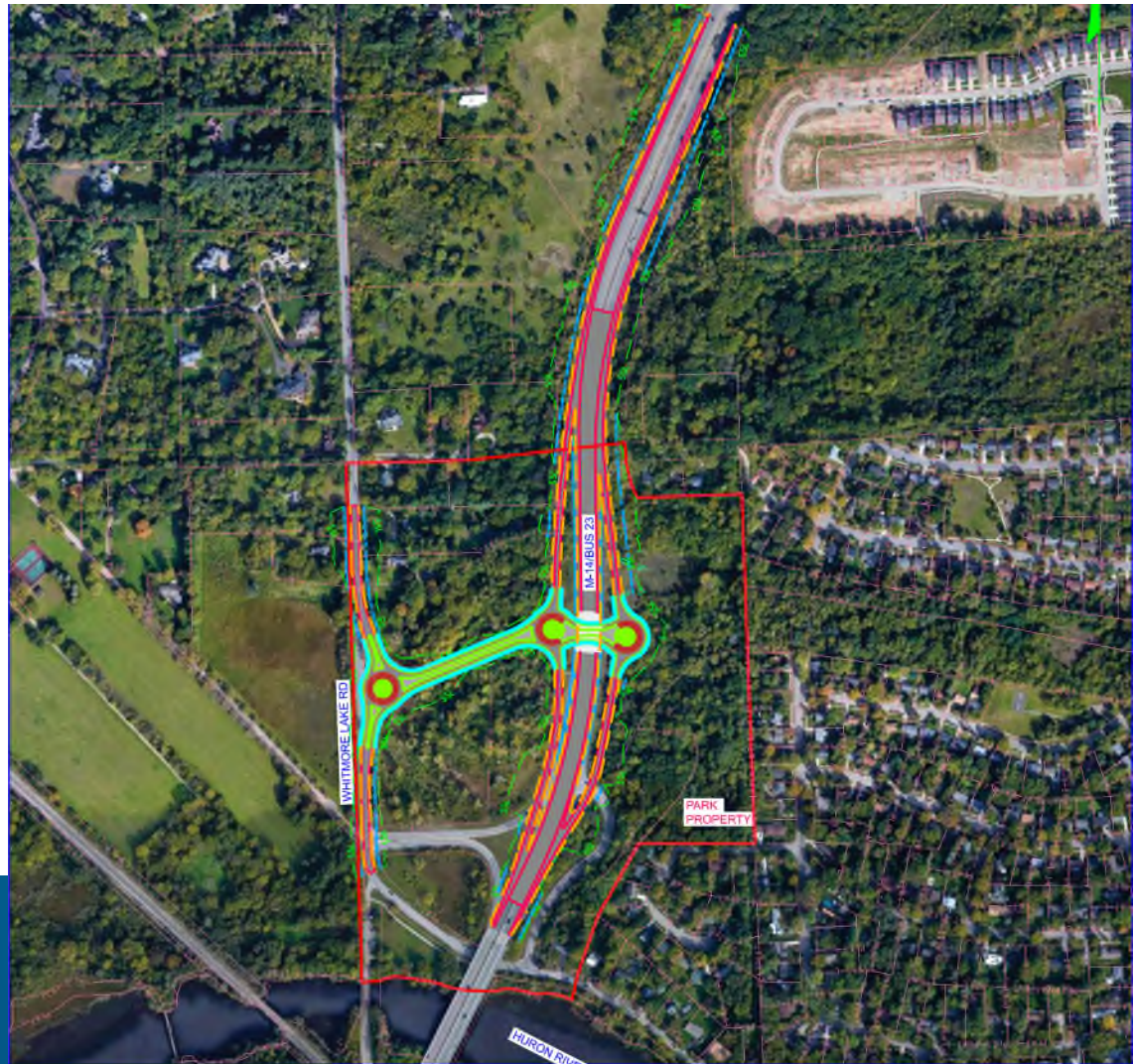
PEL Recommendations

Short-term: Close Eastbound Ramps



Long-term: Construct “Dual-Roundabout” alternative



Recommended Alternative (Dual Roundabout)

- $45+ Million Cost
- Possible temporary parkland permitting needed
- New WB and EB ramps

- Maintains Community Connectivity
- Retains and enhances non-motorized access
- WB improvements

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Alternative 4 (Zoomed-In)

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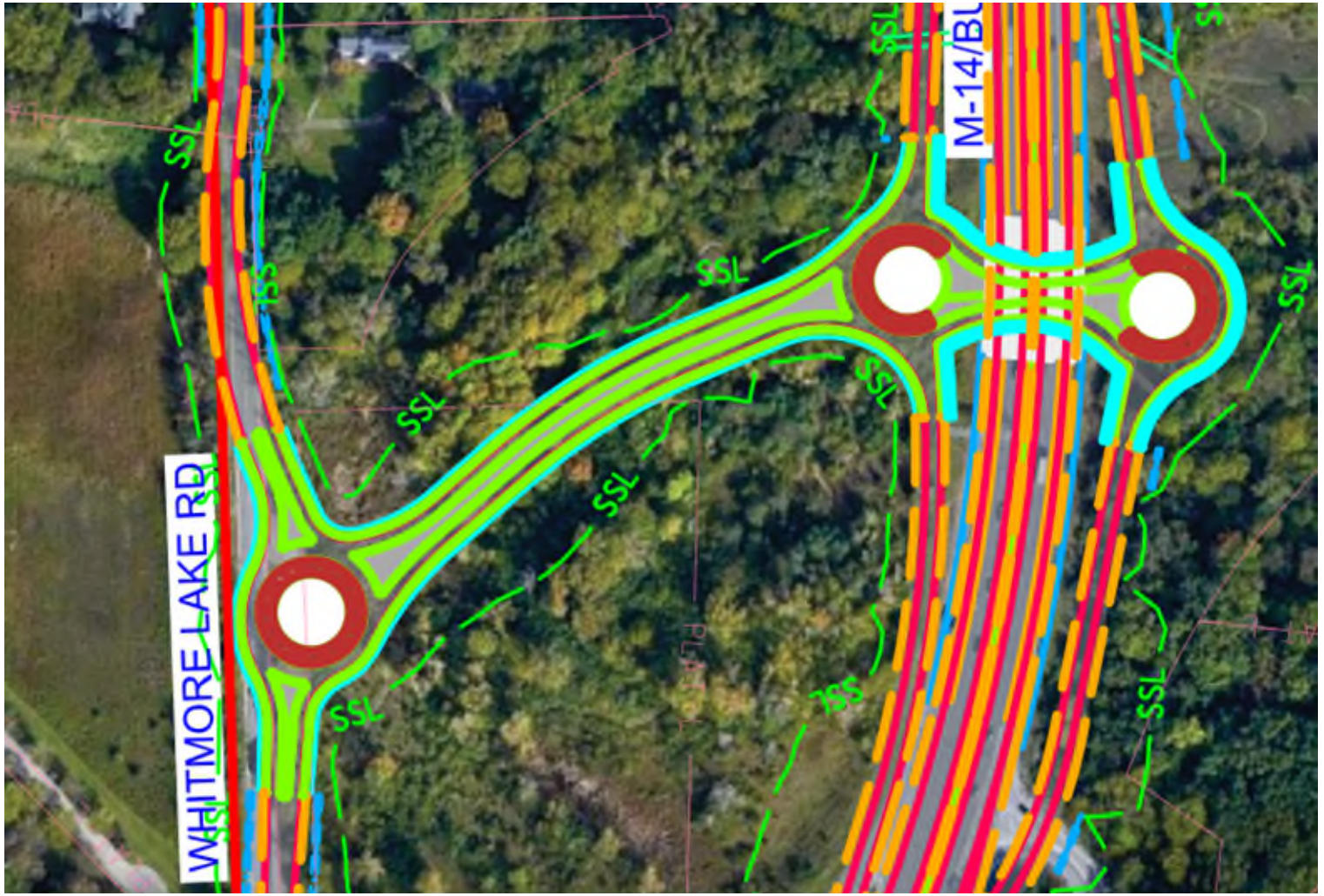

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Recommended Alternatives

Close Eastbound Ramps

- No changes to WB ramps
- No parkland needed
- Can be done in 2024 - 2026

- Cost Effective
- Improves Safety

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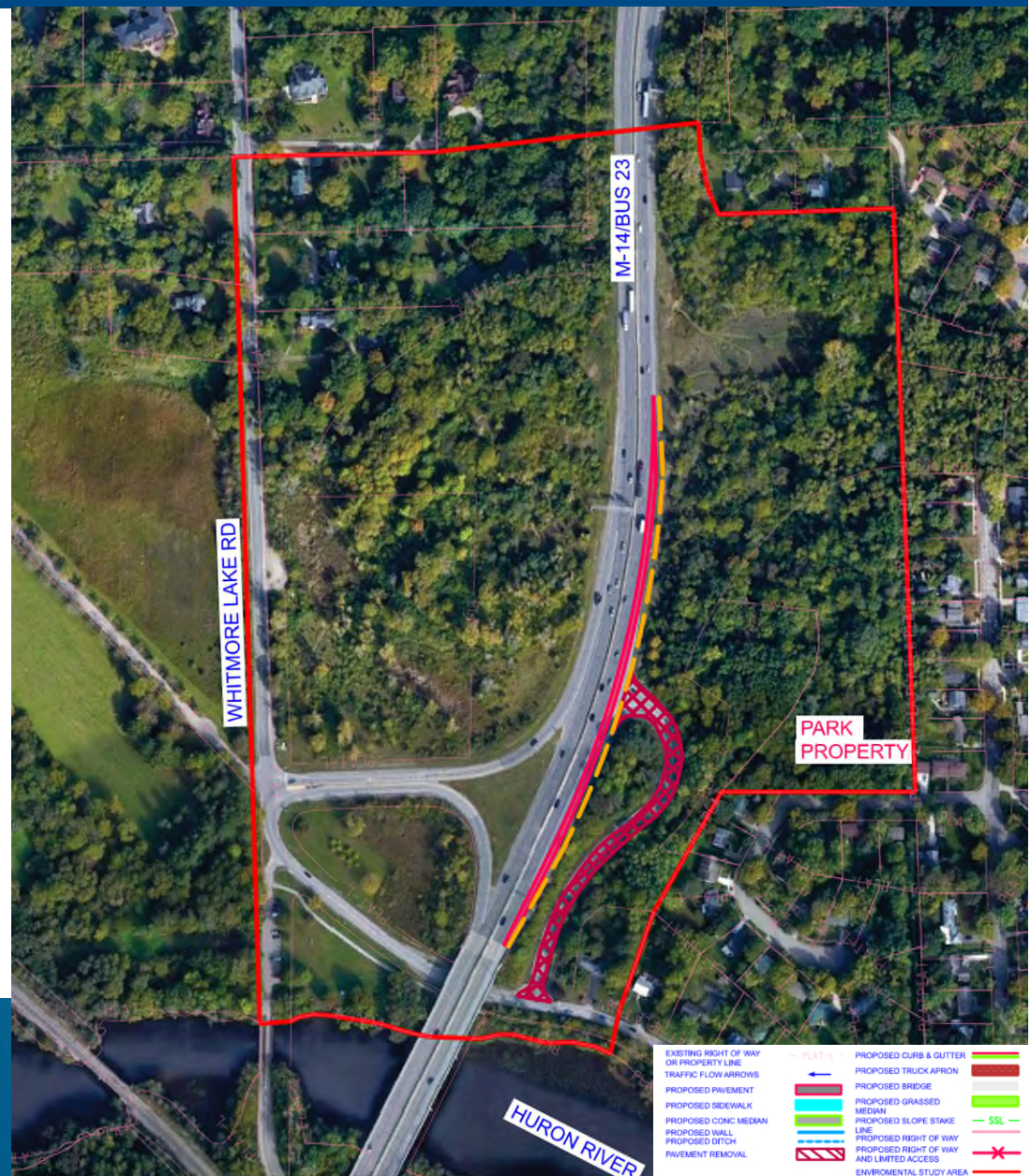
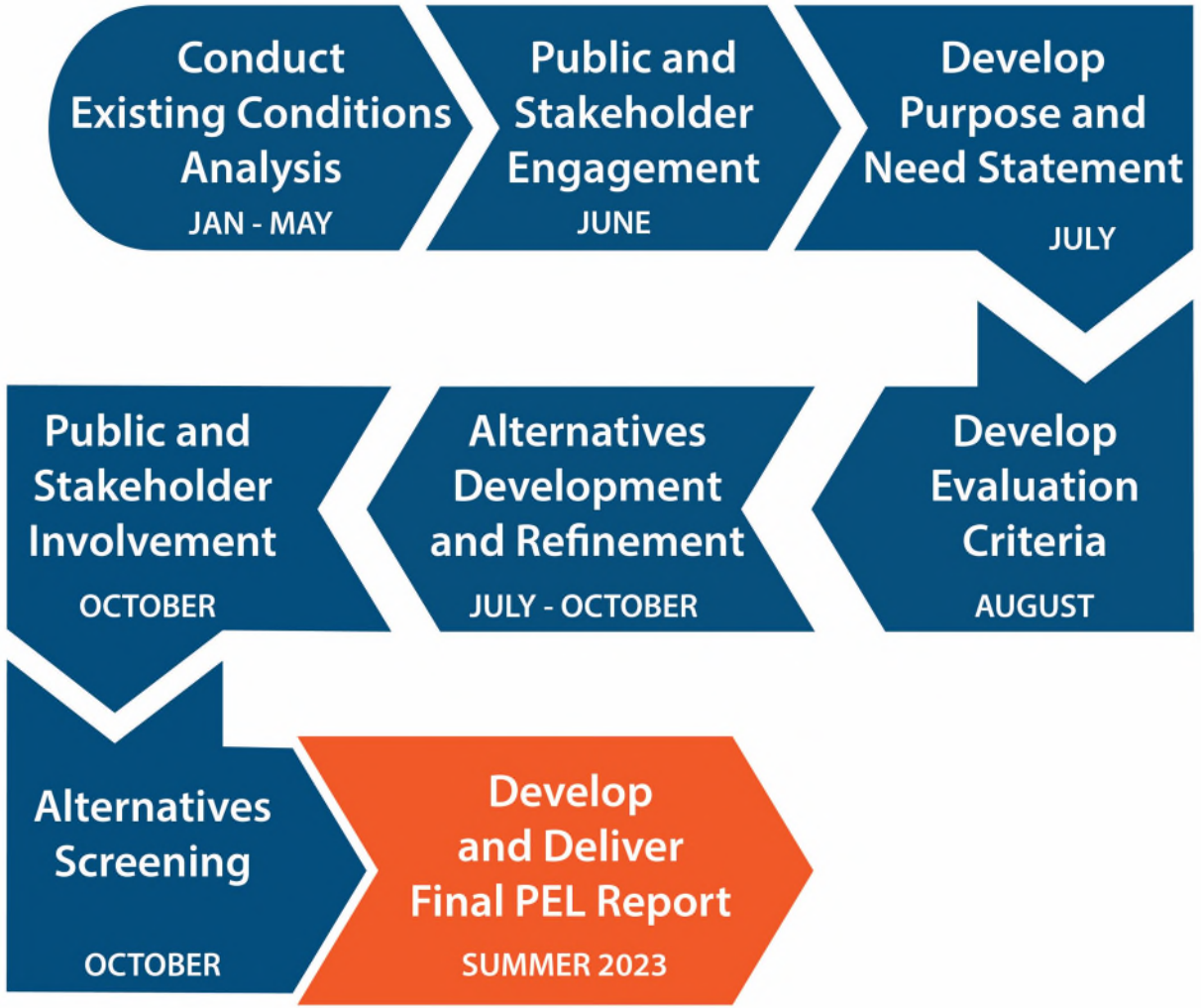


Next Steps



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