



I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE

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AGENDA

- Project Overview
- Existing Conditions
- Environmental Screening
- Traffic Conditions
- Interchange Alternatives
- Next Steps

PROJECT OVERVIEW

I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE

BACKGROUND

FINAL REPORT
194 Corridor Study
Bismarck-Mandan Metropolitan Planning Organization

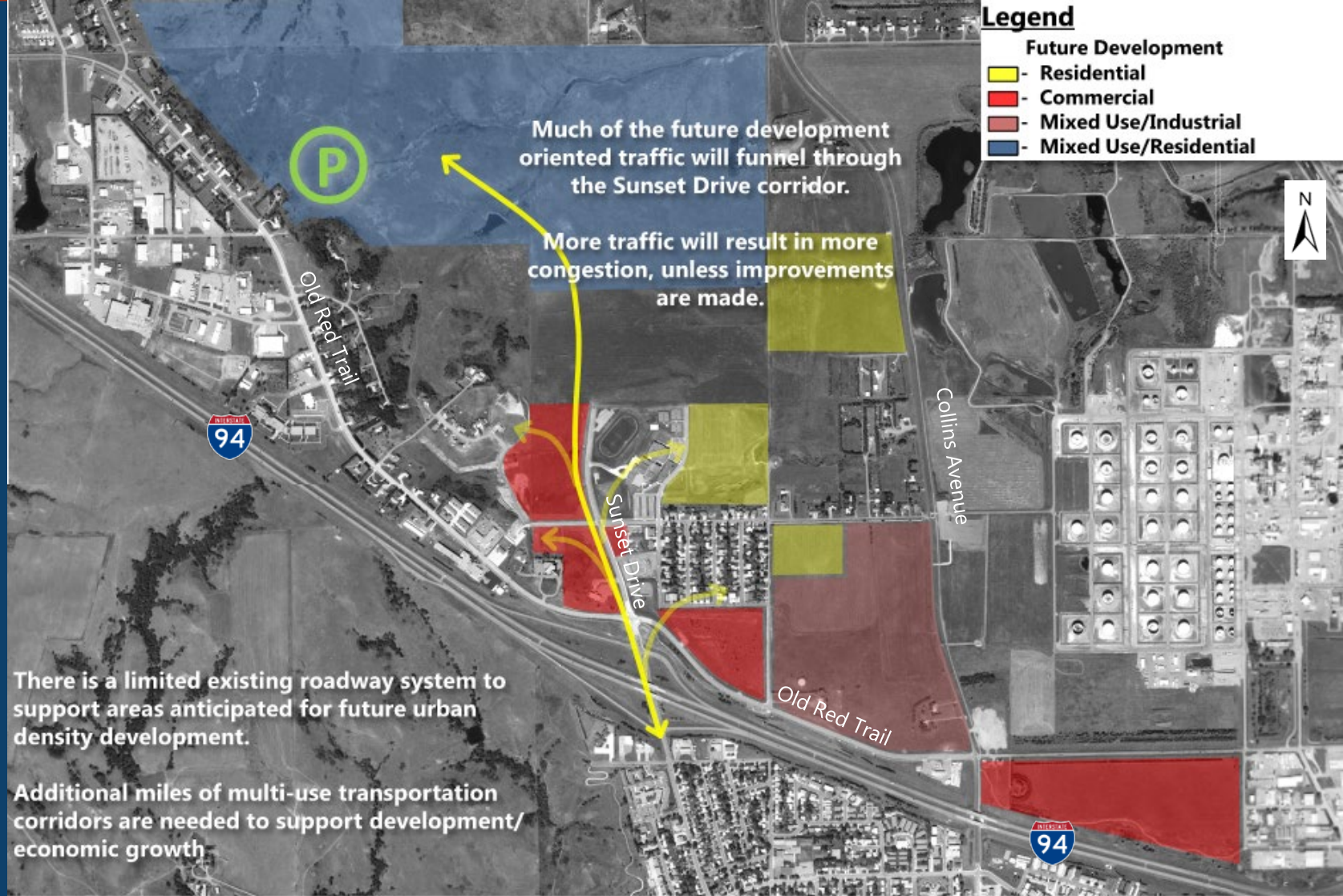
North Mandan
Subarea Transportation Study

August 2013



North Mandan Subarea Study

Bismarck-Mandan Metropolitan Planning Organization



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NEW DEVELOPMENTS

New developments have begun north of the project area with direct impact to the Sunset Drive Interchange.

These include:

- The new Mandan High School (opening fall of 2024).
- New developments (shown on map), north of I-94, include residential and commercial properties.



WHAT IS THE EXIT 152 PROJECT?

The project purpose is to develop an alternative interchange design that meets future travel demand and provides safe, efficient multimodal traffic operations with minimal impacts to right-of-way, environmental features and at a reasonable cost

WHY IS THE PROJECT NEEDED?

- Interchange configuration and design will not be able to meet future traffic demand without unacceptable delays.
- Accelerated pavement deterioration associated with additional traffic.
- Skewed on and off ramps have inadequate sight distance for vehicles.
- Existing vertical clearance is greater than 2 feet lower than NDDOT design standards require. This has caused multiple bridge hits, resulting in safety concerns, traffic delays and the need for emergency repairs.



WHAT ARE THE PROJECT LIMITS?

Project Limit Map



WHAT IS THE PROJECT TIMELINE?

Current Project Schedule



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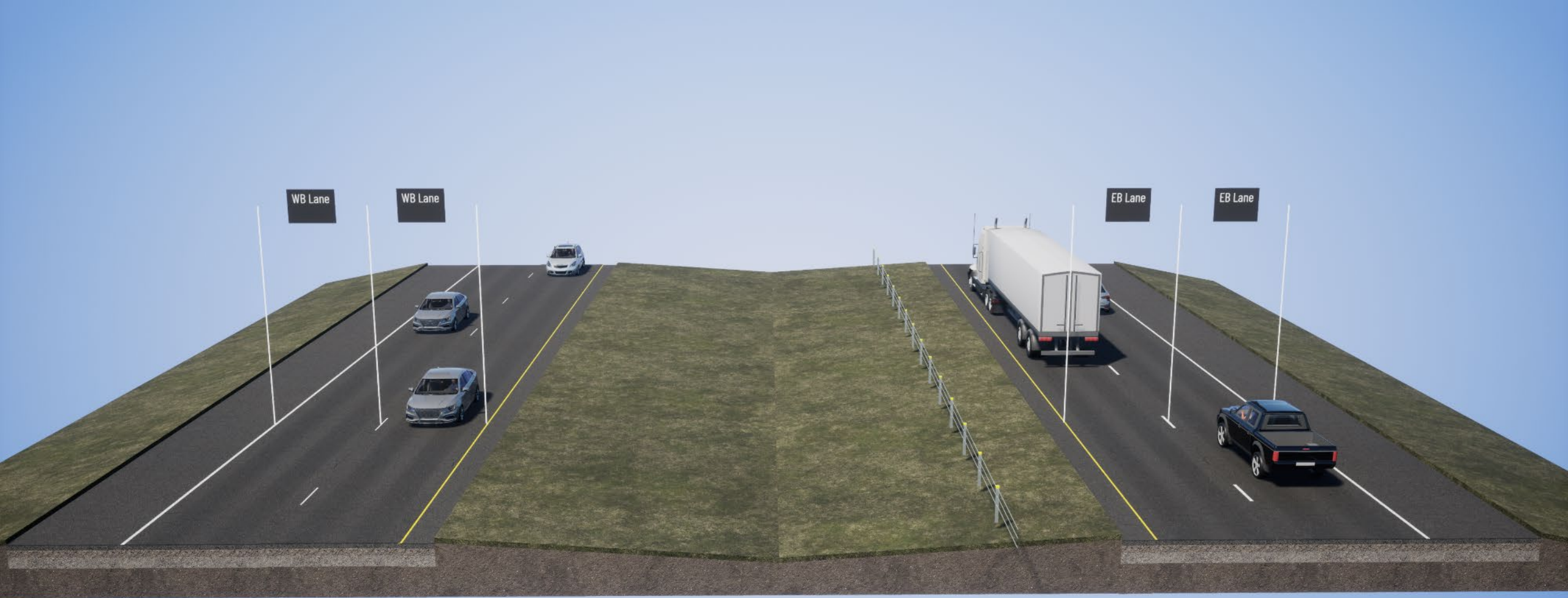
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Consultant: **Mead
& Hunt**

EXISTING CONDITIONS

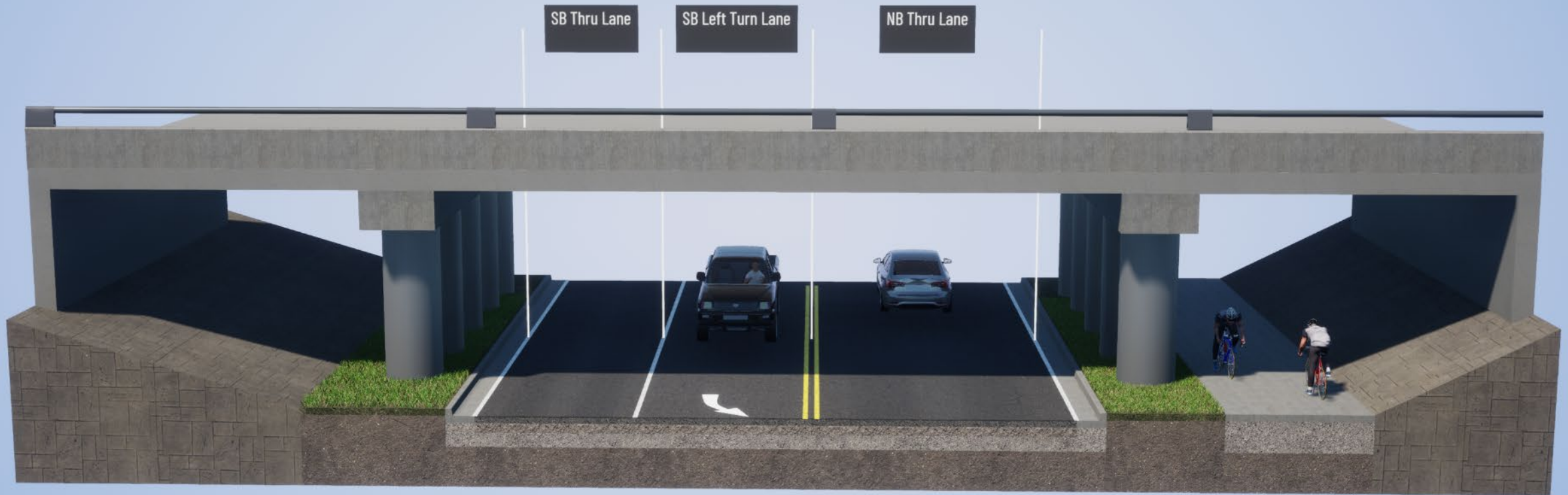
I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE



INTERSTATE 94

Existing Roadway Section East of Sunset Drive

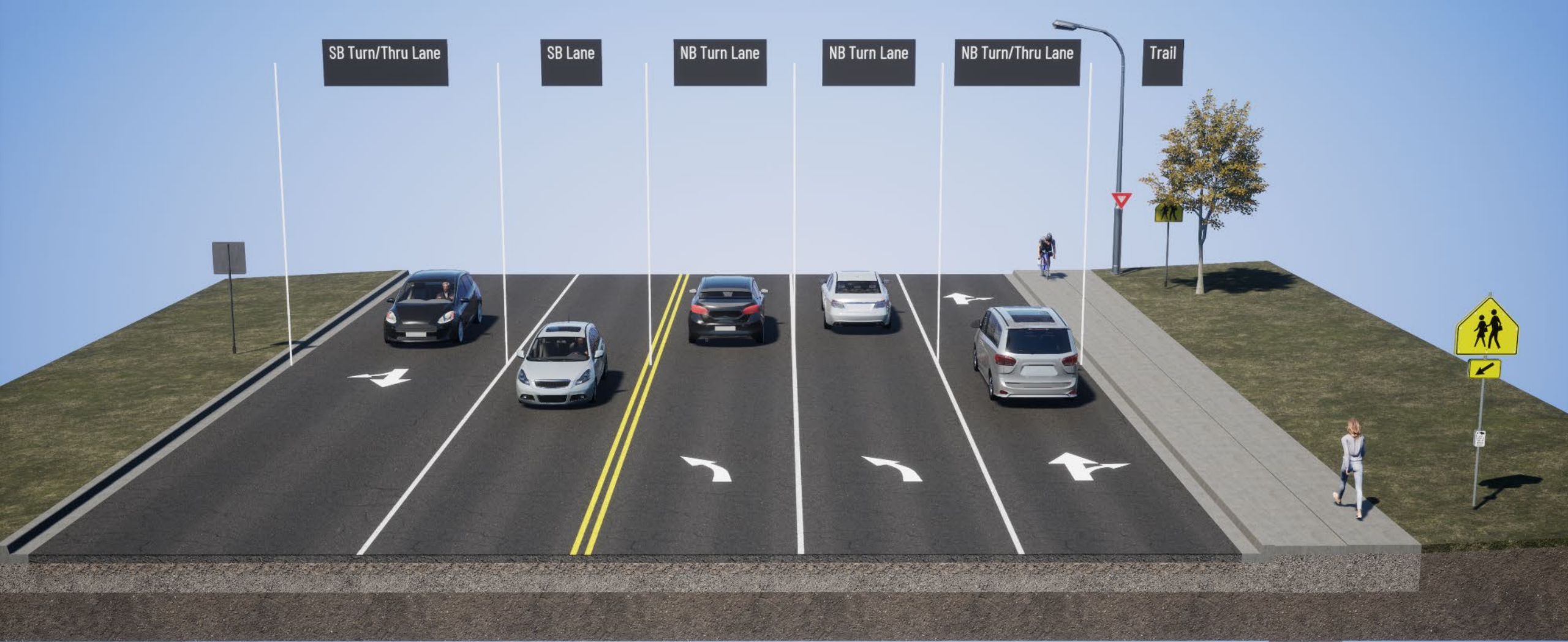




SUNSET DRIVE

Existing Roadway Section Beneath the
Interstate 94 overpass

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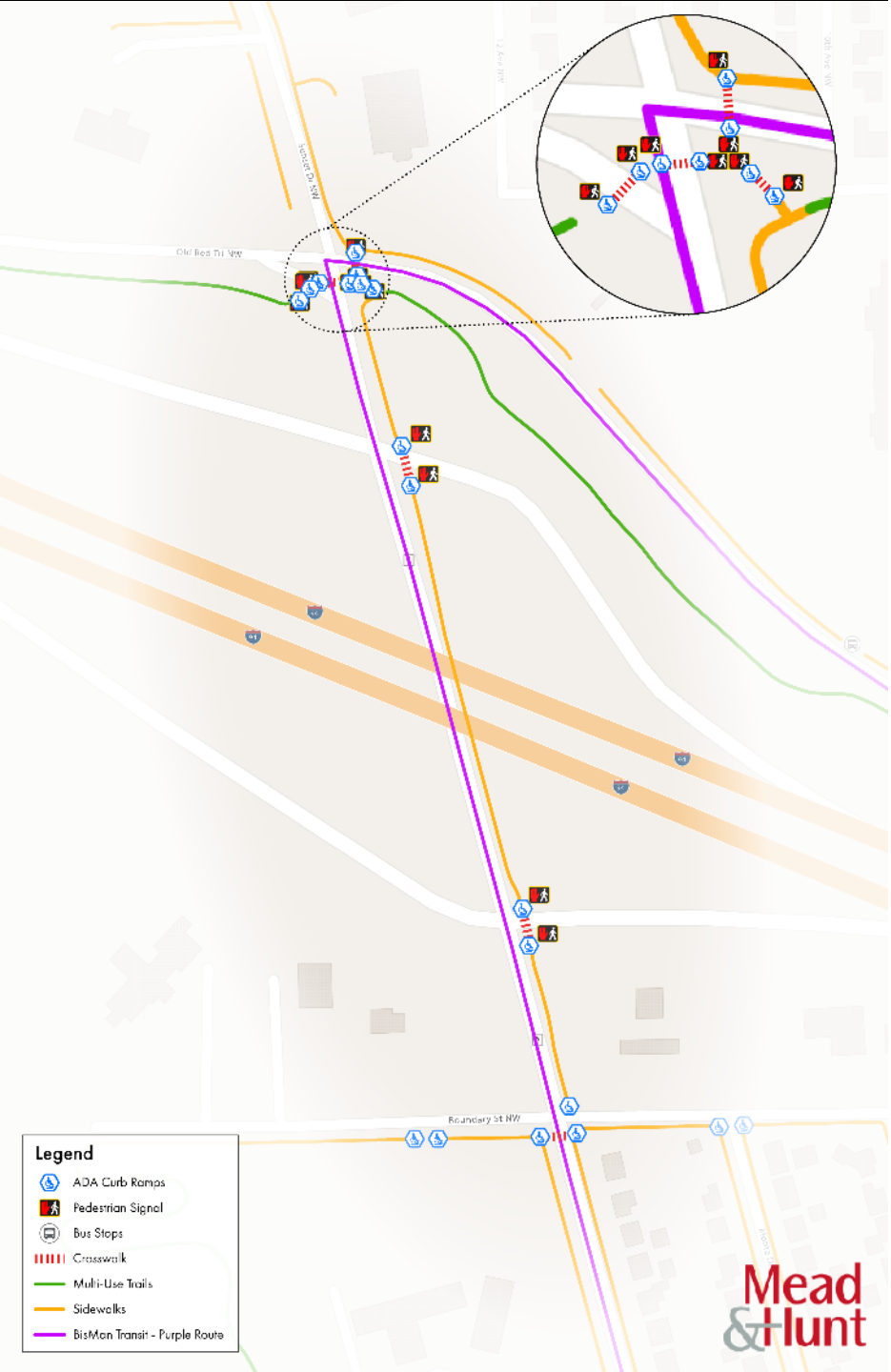


SUNSET DRIVE

Existing Roadway Section between
Interstate 94 WB ramps and Old Red Trail

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MULTI-MODAL OPTIONS



Bis-Man Transit provides bus service along Sunset Drive. The purple route provides service daily with stops at Walmart and the Mandan High School.



City of Mandan Parks and Recreation has a shared use path along the east side of Sunset Drive and along the south side of Old Red Trail.



City of Mandan also has sidewalk facilities north and south of the interchange to serve pedestrians in the area.

EXISTING RESOURCES

- Adjacent land use is developing as residential and commercial
- Sunset Park Walking Trail
- Environmental Justice
- Cultural Resources
- Old Red Trail - Section One
- Biological Resources








AQUATIC RESOURCES

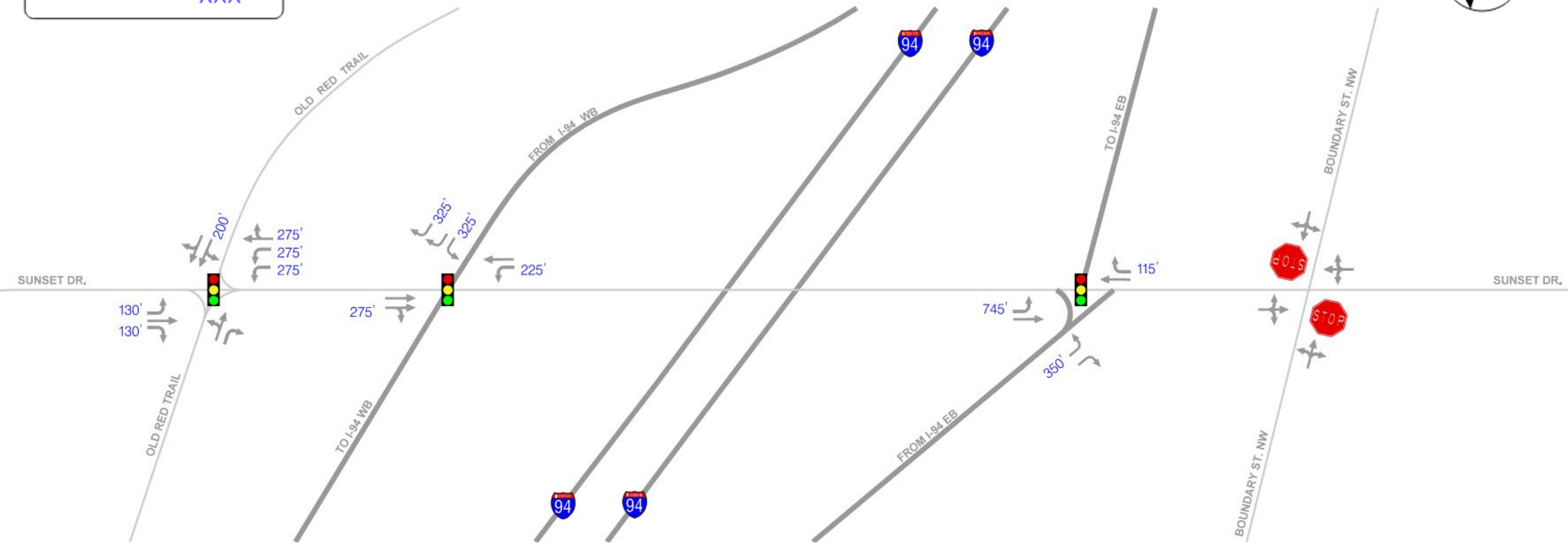
- Wetlands are located near, but not in the project area.
- The Missouri River is located east of the project area.
- There are no FEMA floodplains located in the project study area.



EXISTING LANE CONFIGURATIONS

LEGEND:

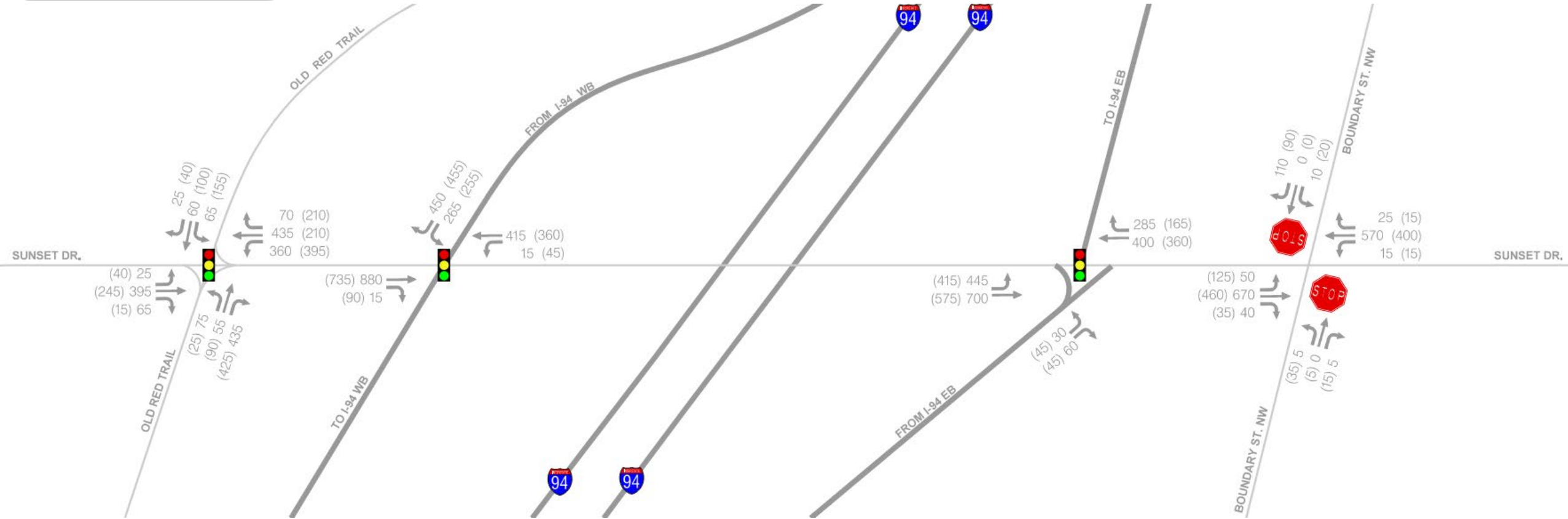
- ROADWAY 
- STOP CONTROL 
- TRAFFIC SIGNAL 
- LANE CONFIGURATION 
- STORAGE LENGTH 

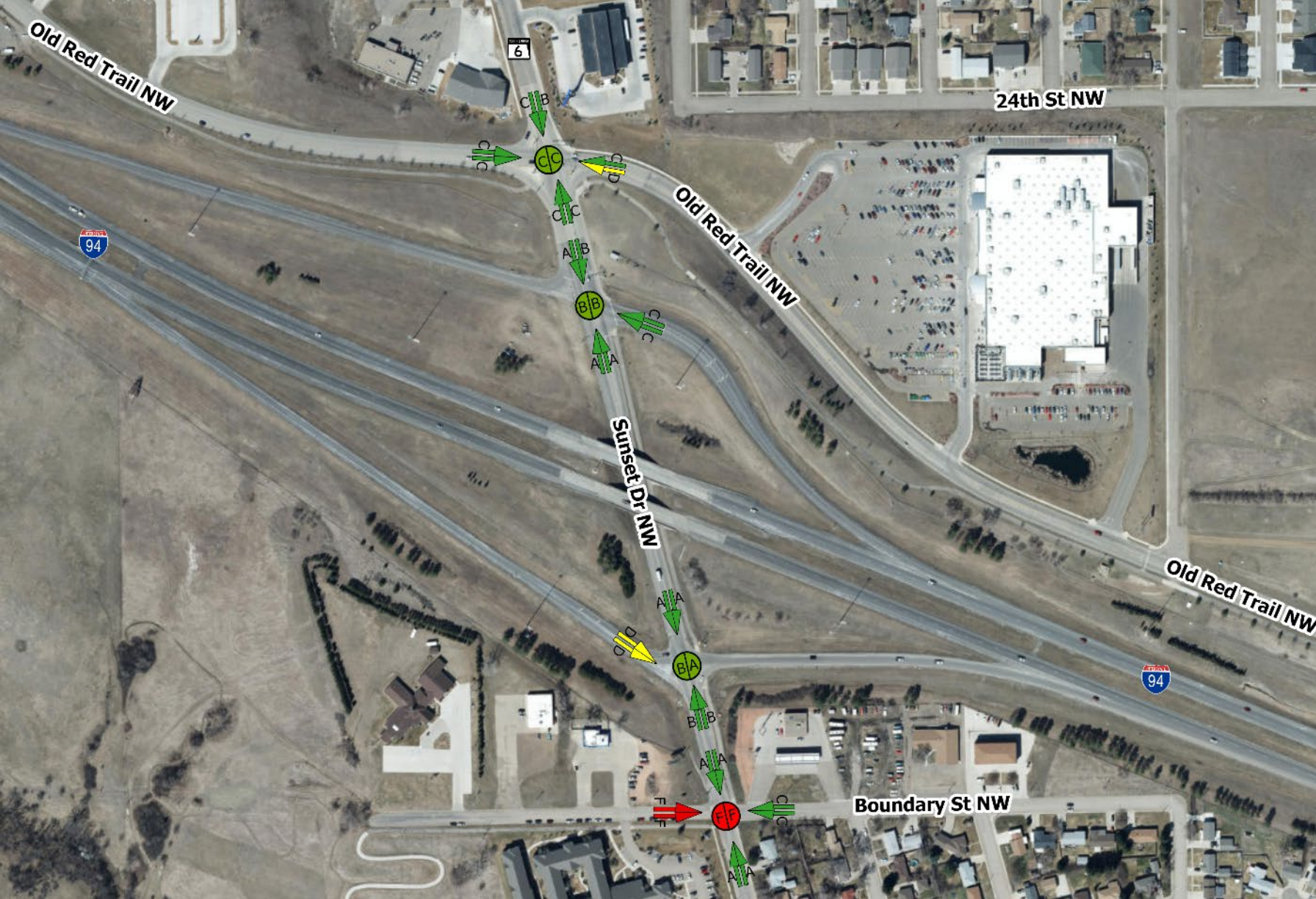


EXISTING PEAK HOUR VOLUMES

LEGEND:

- ROADWAY
- STOP CONTROL
- TRAFFIC SIGNAL
- VEHICLE MOVEMENT
- PEAK VOLUMES



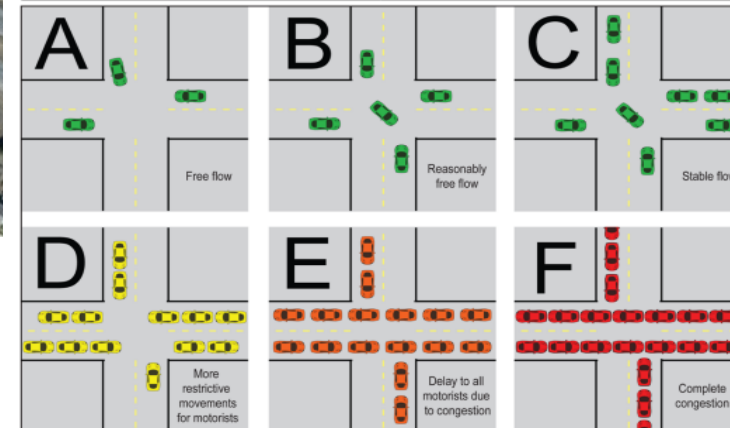


Legend

Level of Service

- A, B
- C
- D
- E, F

Level of Service (Signalized Intersections)	Average Vehicle Delay at Intersection (seconds)
A	≤10
B	>10 and <20
C	>20 and <35
D	>35 and <55
E	>55 and <80
F	>80



Level of Service
● A, B, C ● D ● E ● F

Approach LOS:
⇄ Northbound ⇄ Southbound ⇄ Eastbound ⇄ Westbound

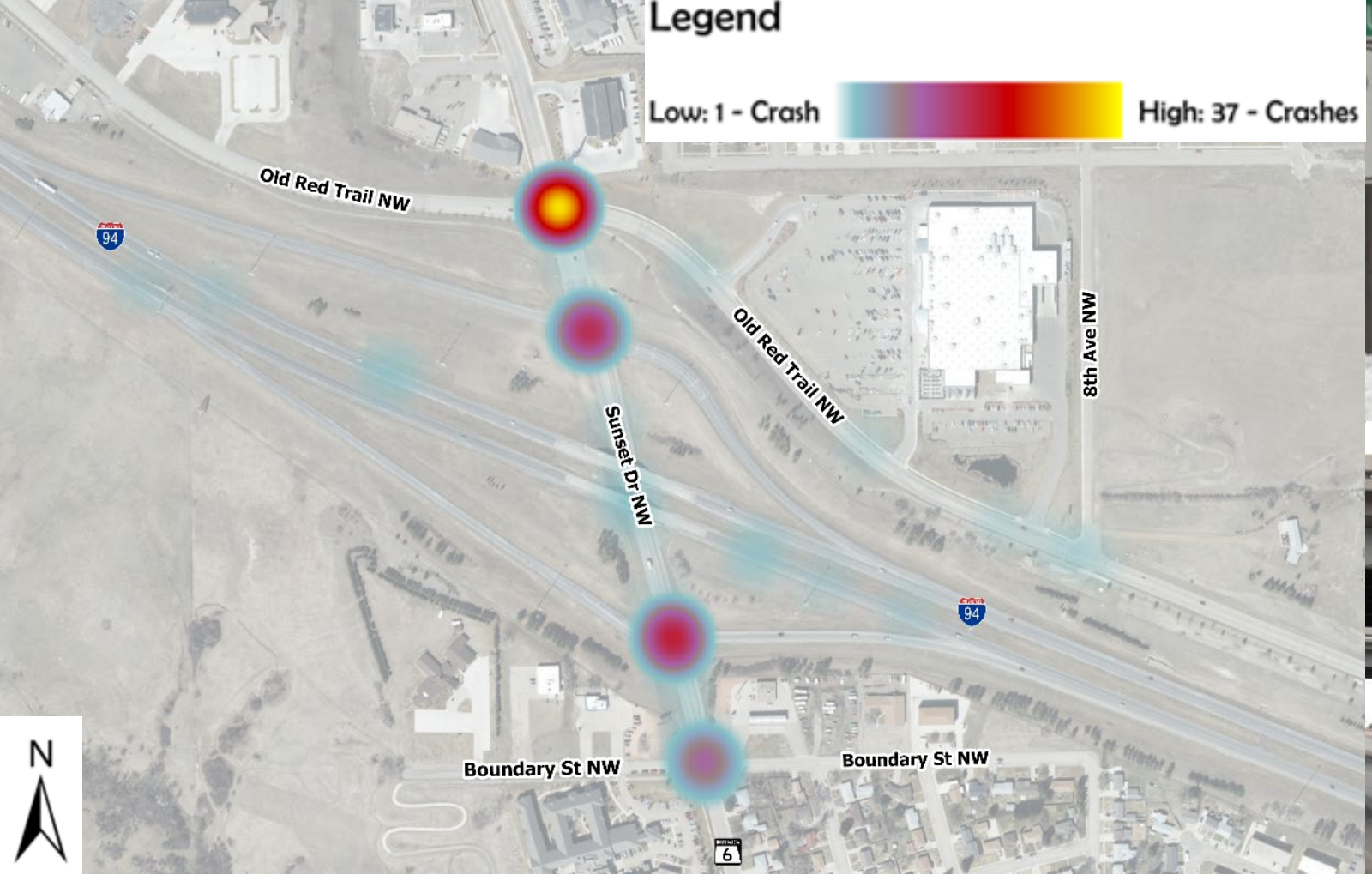
Overall LOS:
⇄ AM ⇄ PM

Study Area

Level of Service -Existing

Source: Level of Service Synchro 02/2023





CRASH MAP AT SUNSET DRIVE

Between Old Red Trail and Boundary Street

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FUTURE TRAFFIC CONDITIONS

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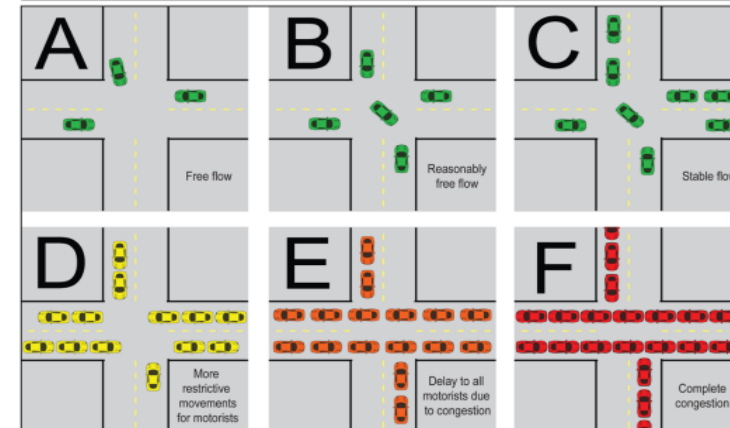


Legend

Level of Service

- A, B
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Level of Service (Signalized Intersections)	Average Vehicle Delay at Intersection (seconds)
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F	>80



Level of Service
● A, B, C ● D ● E ● F

Overall LOS:
 AM PM

Study Area

Approach LOS:
 AM PM Northbound
 AM PM Southbound
 AM PM Eastbound
 AM PM Westbound

Level of Service - 2030 No Build

Source: Level of Service Synchro 02/2023



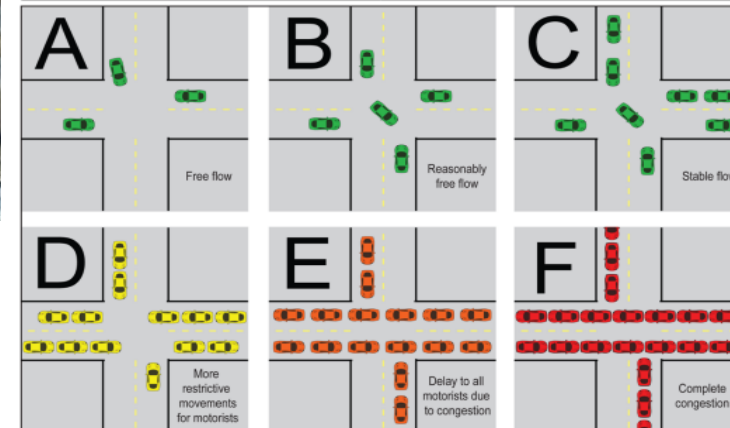


Legend

Level of Service

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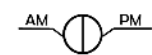
Level of Service

- A, B, C
- D
- E
- F

Approach LOS:

- Northbound
- Southbound
- Eastbound
- Westbound

Overall LOS:



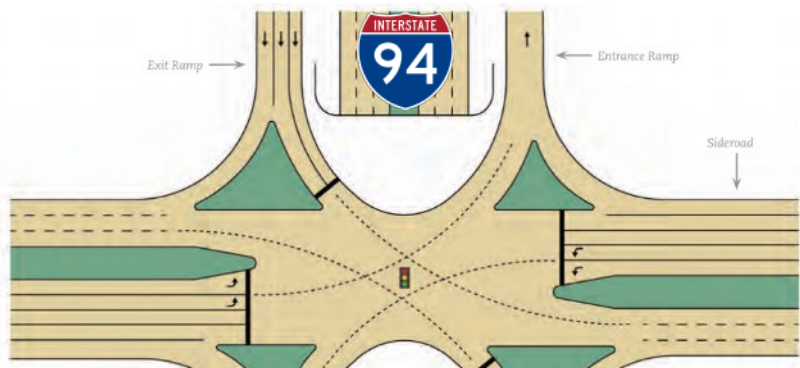
Study Area



Level of Service - 2045 No Build

Source: Level of Service Synchro02/2023





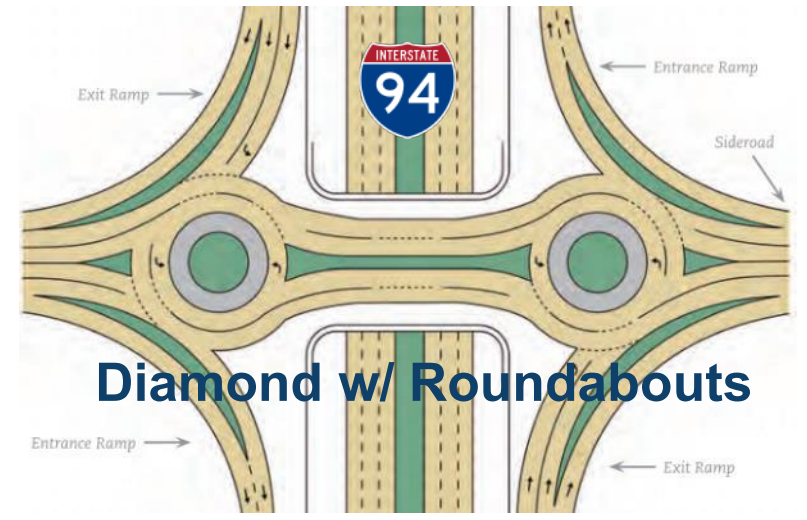
Single Point Urban



Partial Cloverleaf



Diverging Diamond

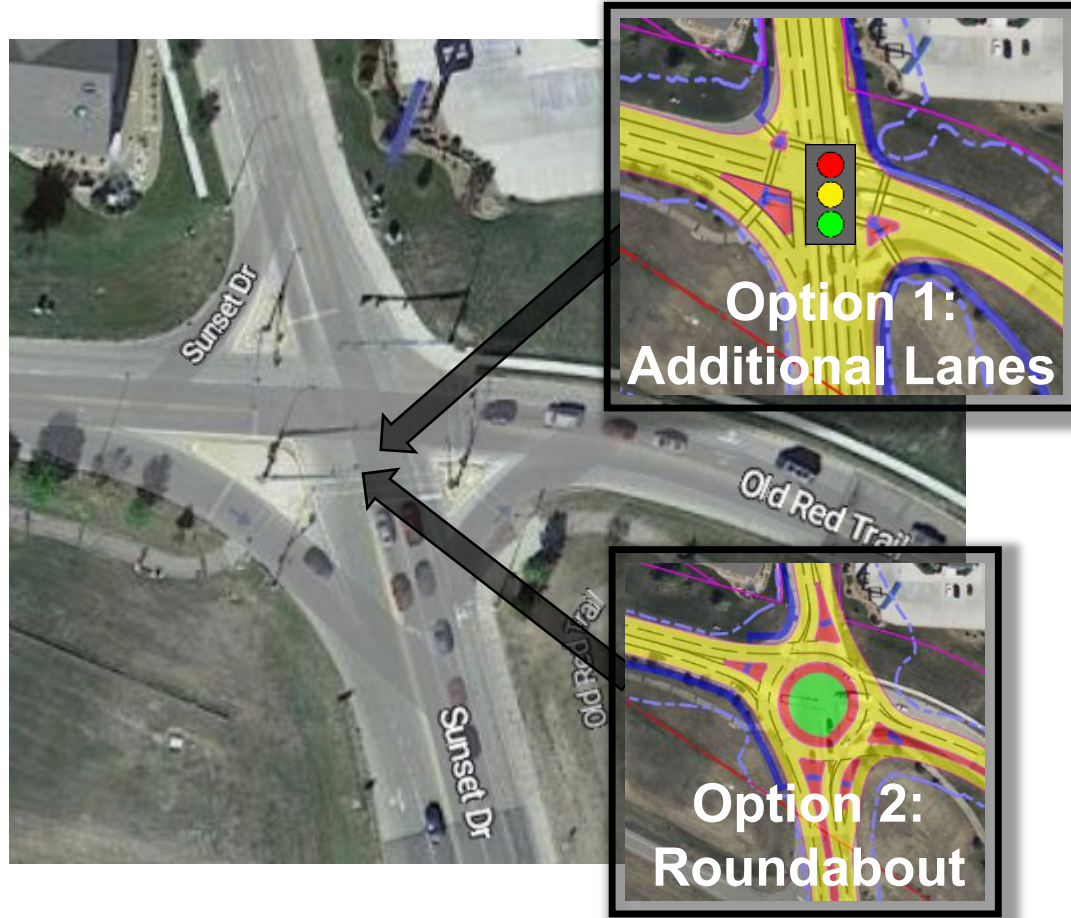


Diamond w/ Roundabouts

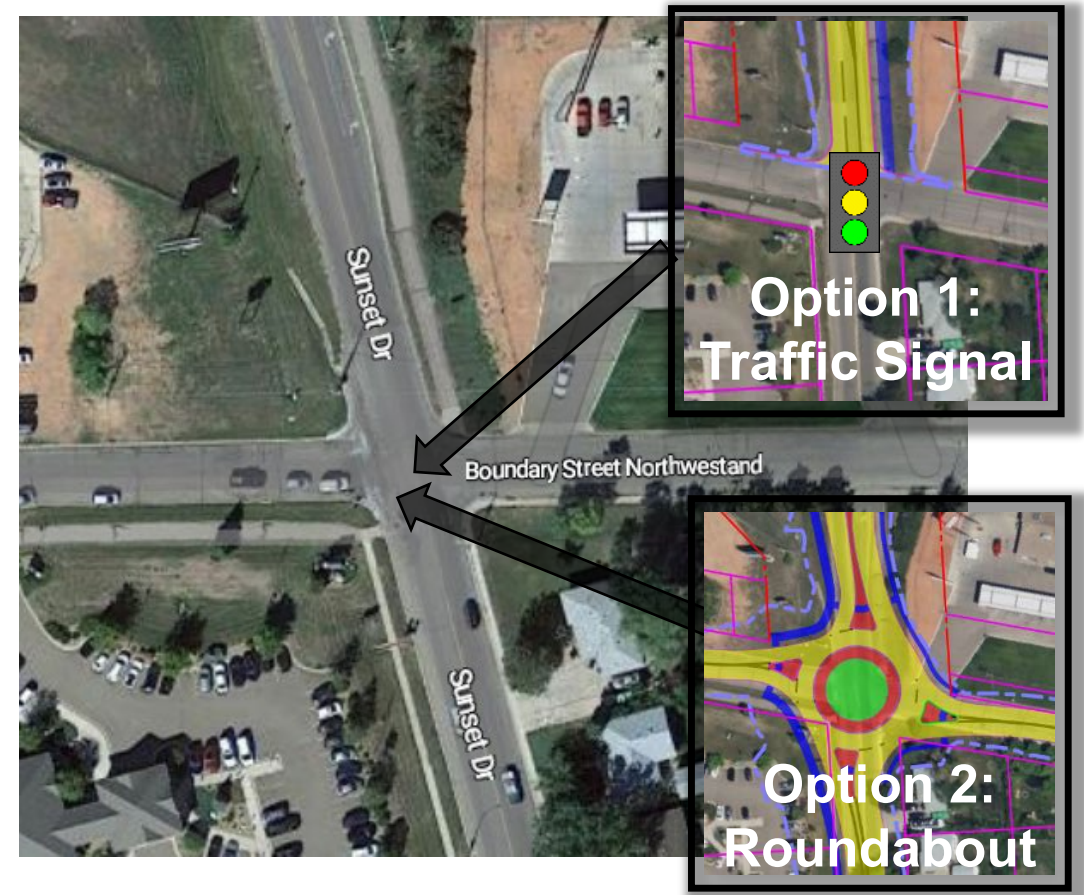
POTENTIAL ALTERNATIVES

Interstate 94 and Sunset Drive Interchange

OLD RED TRAIL NW



BOUNDARY ST. NW



POTENTIAL ALTERNATIVES

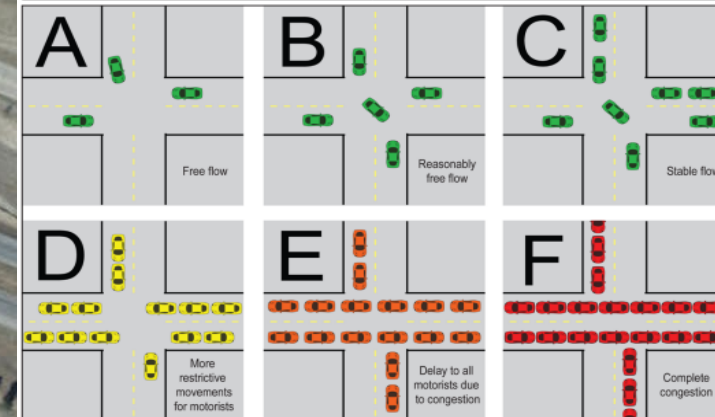
Old Red Trail NW and Boundary Street NW



Level of Service - 2030 Alternative Scenarios

Source: Level of Service Synchro 03/2023





Level of Service (Signalized Intersections)	Average Vehicle Delay at Intersection (seconds)
A	<10
B	>10 and <20
C	>20 and <35
D	>35 and <55
E	>55 and <80
F	>80



ID	2030	Alternative Scenario
1		Additional Turn Lanes
		Roundabouts

ID	2030	Alternative Scenario
2		Parclo
		DDI
		Roundabouts

ID	2030	Alternative Scenario
13		SPUI

ID	2030	Alternative Scenario
3		Parclo
		DDI
		Roundabouts

ID	2030	Alternative Scenario
4		Signalization
		Roundabouts

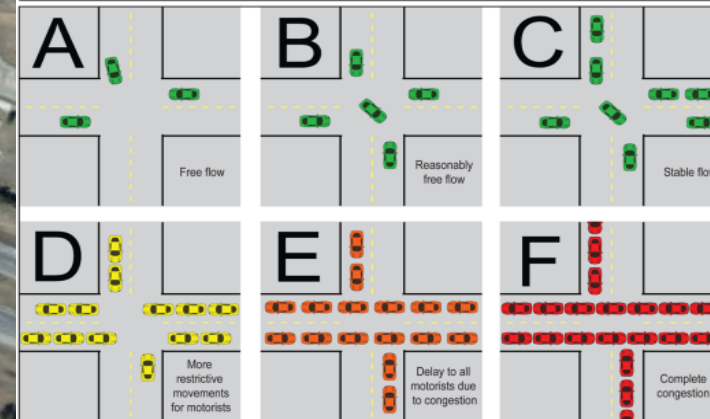


Level of Service - 2045 Alternative Scenarios

Source: Level of Service Synchro 03/2023



Level of Service (Signalized Intersections)	Average Vehicle Delay at Intersection (seconds)
A	<10
B	>10 and <20
C	>20 and <35
D	>35 and <55
E	>55 and <80
F	>80



ALTERNATIVES

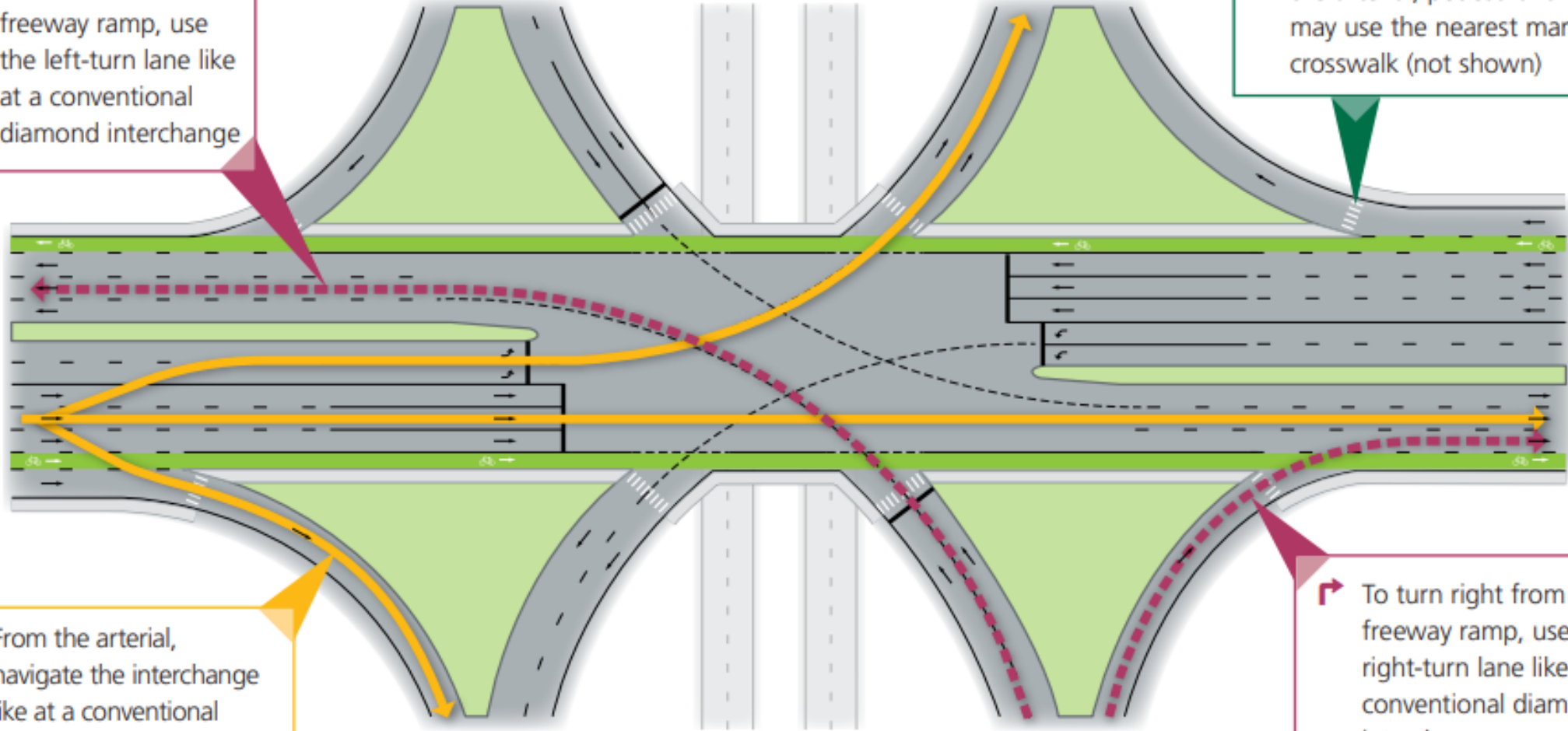
I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE



🚲 Depending on their level of comfort, cyclists may navigate the intersection using vehicle or pedestrian paths

🚶 Pedestrians use marked crosswalks to safely cross the freeway ramps. At SPUIs, crosswalks are not provided across the arterial. To cross the arterial, pedestrians may use the nearest marked crosswalk (not shown)

↶ To turn left from a freeway ramp, use the left-turn lane like at a conventional diamond interchange



➕ From the arterial, navigate the interchange like at a conventional diamond interchange

↷ To turn right from a freeway ramp, use the right-turn lane like at a conventional diamond interchange

Note: For simplicity, only two directions of traffic are shown. Opposing traffic follows similar routes.

Single Point Interchange Alternative #1 Layout



Traffic:
Meets Level of Service
for future demand

Right-of-Way:
.06 Acres (Signalized)
0.68 Acres (Roundabouts)

Estimated Cost:
\$21.9 M (Signals)
\$24.4 M (Roundabouts)

Environmental:
Wetlands:
.06 Acres
Floodplain:
None
Cultural:
None

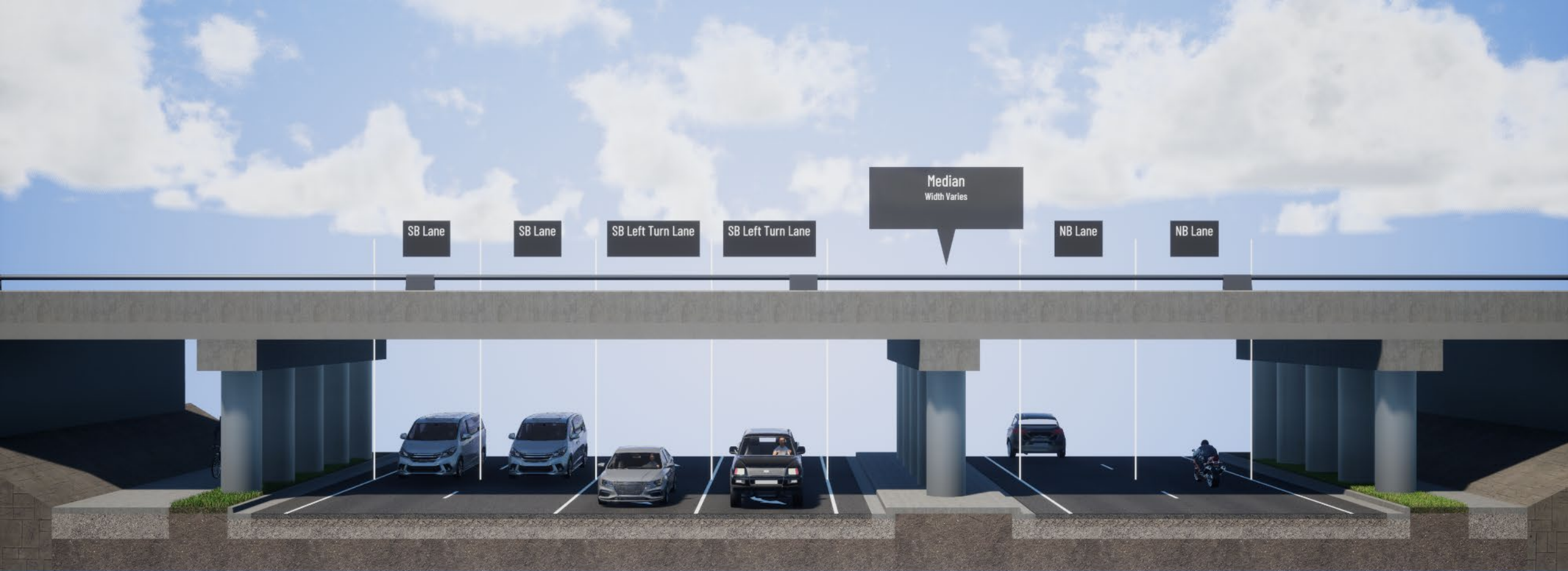
- █ Roadway
- █ Raised Median
- █ Truck Apron
- █ Concrete Curb & Gutter
- █ Trail/Sidewalk
- █ New Bridges
- - - Construction Limits
- █ ROW Impacts
- ~ ~ ~ Retaining Wall
- ⦿ Traffic Signal

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SUNSET DRIVE – ALTERNATIVE #1

Proposed Roadway Section Beneath the
Interstate 94 overpass



Partial Cloverleaf Interchange Alternative #2



Traffic:
Meets Level of Service
for future demand

Right-of-Way:
1.29 Acres (Signalized)
1.47 Acres (Roundabouts)

Estimated Cost:
\$20.8 M (Signals)
\$24.1 M (Roundabouts)

Environmental:
Wetlands:
0.02 Acres
Floodplain:
None
Cultural:
None



SUNSET DRIVE – ALTERNATIVE #2

Proposed Roadway Section Beneath the
Interstate 94 overpass

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🚲 Depending on their level of comfort, cyclists may navigate the intersection using vehicle or pedestrian paths

🚶 Pedestrians use marked crosswalks to safely navigate the interchange

↑ To continue straight on the arterial, follow lane markings and traffic signals to cross to the left side of the arterial, and then cross to the right side after passing through the interchange

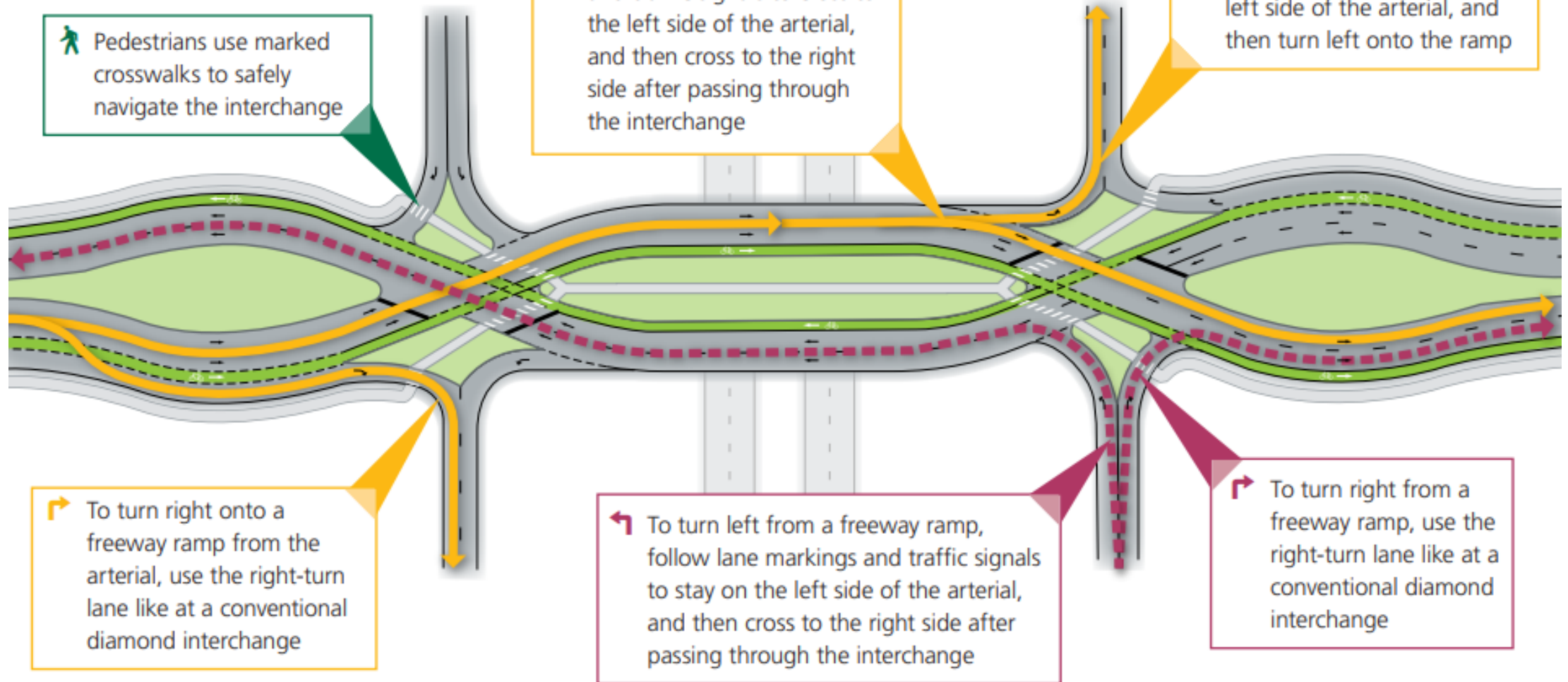
↩ To turn left onto a freeway ramp from the arterial, follow lane markings and traffic signals to cross to the left side of the arterial, and then turn left onto the ramp

↪ To turn right onto a freeway ramp from the arterial, use the right-turn lane like at a conventional diamond interchange

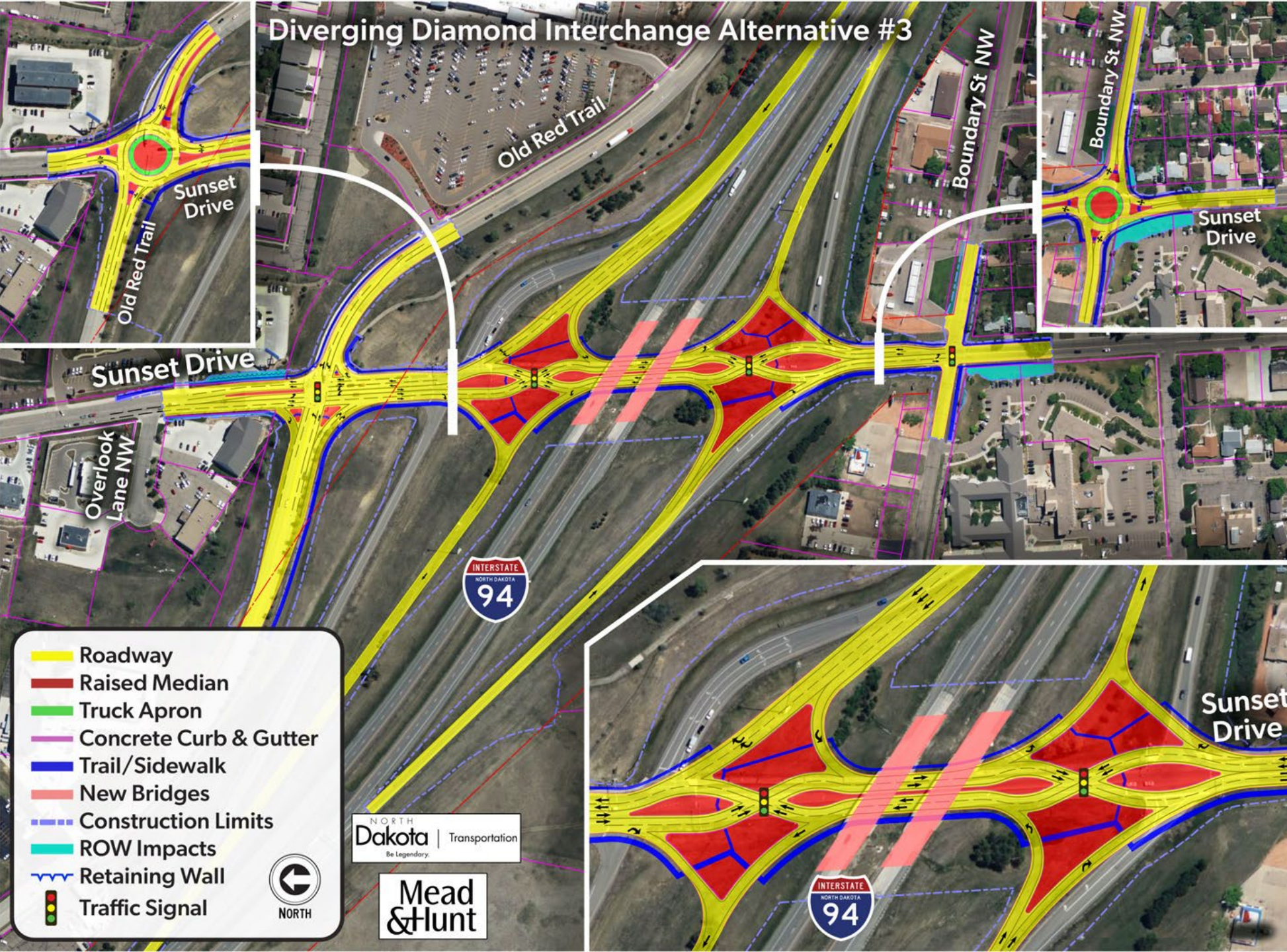
↩ To turn left from a freeway ramp, follow lane markings and traffic signals to stay on the left side of the arterial, and then cross to the right side after passing through the interchange

↪ To turn right from a freeway ramp, use the right-turn lane like at a conventional diamond interchange

Note: For simplicity, only two directions of traffic are shown. Opposing traffic follows similar routes.



Diverging Diamond Interchange Alternative #3



Traffic:
Meets Level of Service
for future demand

Right-of-Way:
0.40 Acres (Signalized)
0.39 Acres (Roundabouts)

Estimated Cost:
\$26.1 M (Signals)
\$26.4 M (Roundabouts)

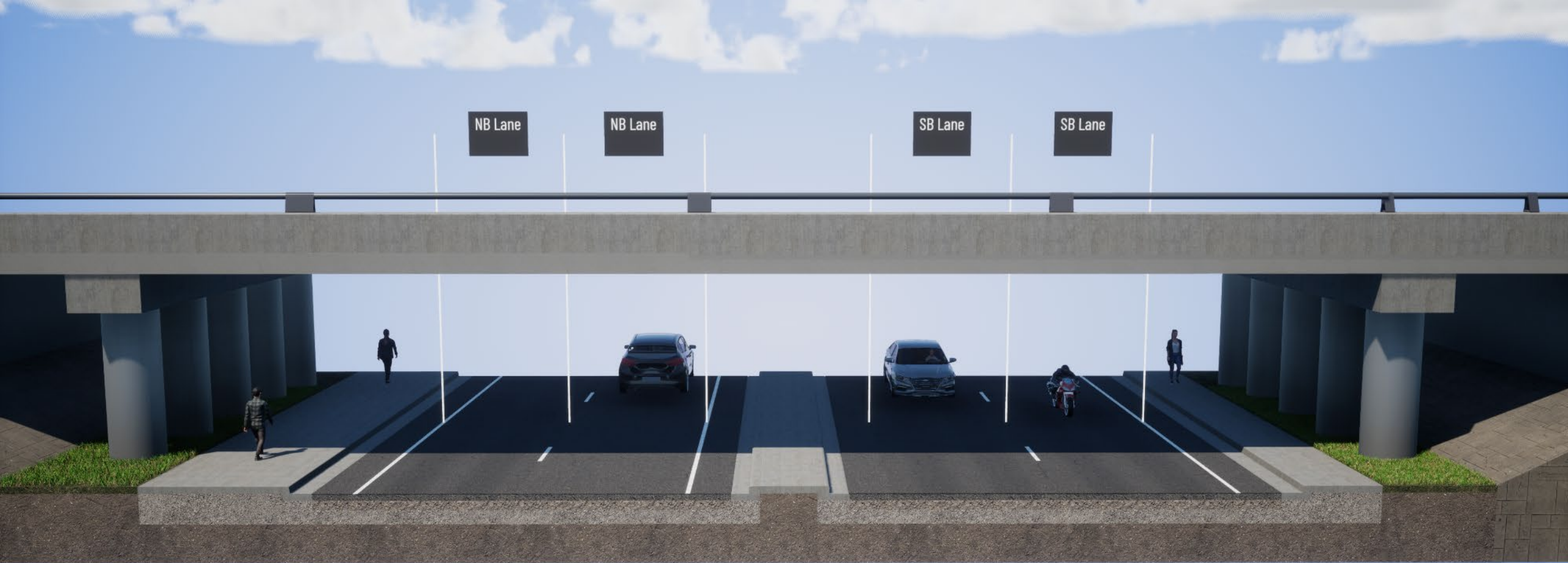
Environmental:
Wetlands:
0.07 Acres (Signalized)
0.06 Acres (Roundabouts)
Floodplain:
None
Cultural:
None

- █ Roadway
- █ Raised Median
- █ Truck Apron
- █ Concrete Curb & Gutter
- █ Trail/Sidewalk
- █ New Bridges
- - - Construction Limits
- █ ROW Impacts
- ~ ~ ~ Retaining Wall
- ● ● Traffic Signal

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SUNSET DRIVE – ALTERNATIVE #3

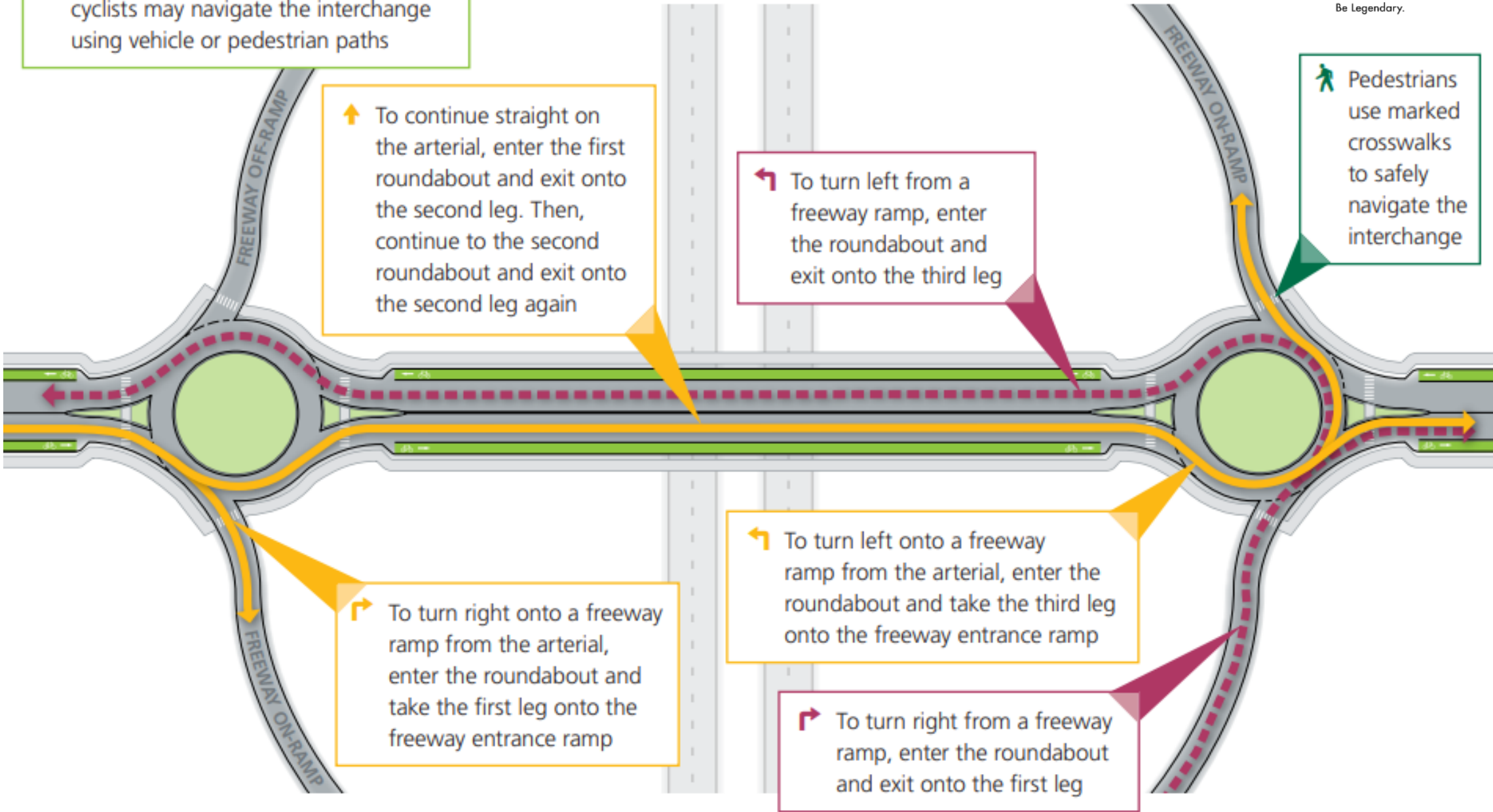
Proposed Roadway Section Beneath the
Interstate 94 overpass

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🚲 Depending on their level of comfort, cyclists may navigate the interchange using vehicle or pedestrian paths

🚶 Pedestrians use marked crosswalks to safely navigate the interchange



↑ To continue straight on the arterial, enter the first roundabout and exit onto the second leg. Then, continue to the second roundabout and exit onto the second leg again

↶ To turn left from a freeway ramp, enter the roundabout and exit onto the third leg

↷ To turn right onto a freeway ramp from the arterial, enter the roundabout and take the first leg onto the freeway entrance ramp

↶ To turn left onto a freeway ramp from the arterial, enter the roundabout and take the third leg onto the freeway entrance ramp

↷ To turn right from a freeway ramp, enter the roundabout and exit onto the first leg

Diamond w/ Roundabouts Interchange Alternative #4



Traffic:
Meets Level of Service
for future demand

Right-of-Way:
0.45 Acres

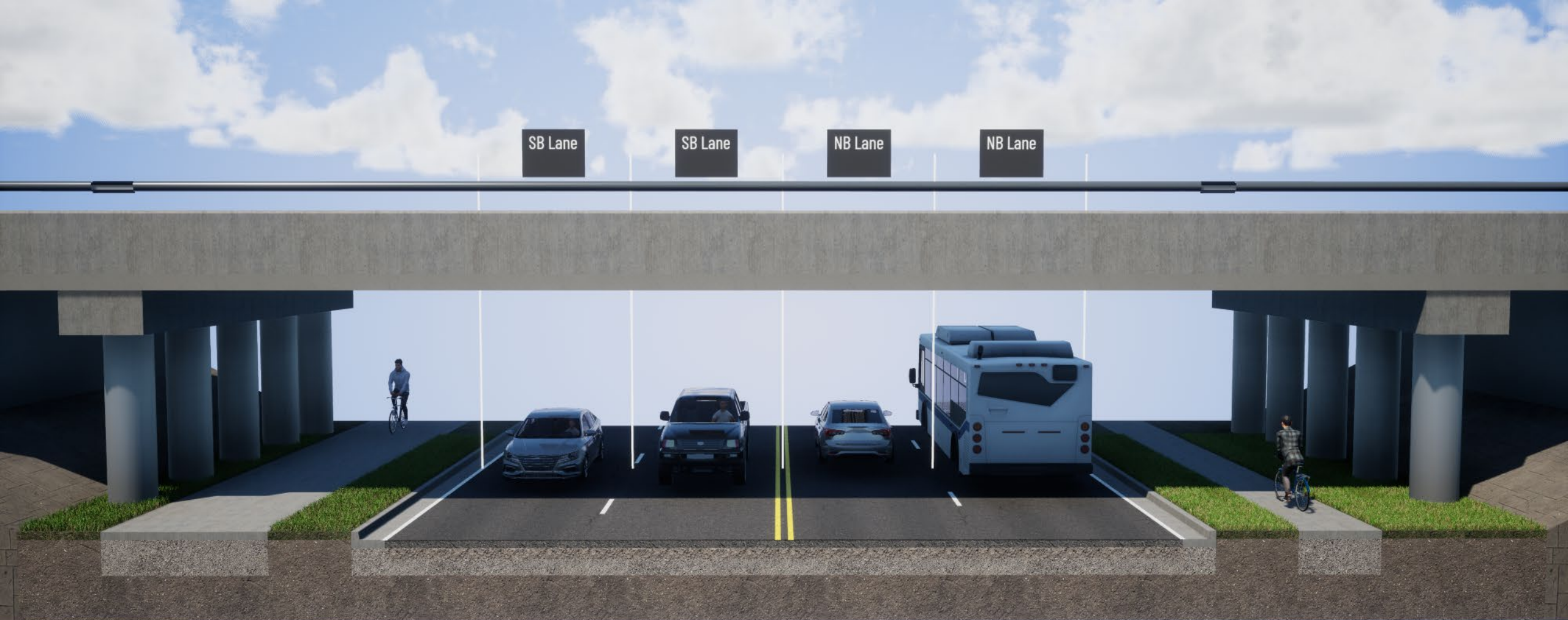
Estimated Cost:
\$23.9 Million

Environmental:
Wetlands:
0.03 Acres
Floodplain:
None
Cultural:
None

-  Roadway
-  Raised Median
-  Truck Apron
-  Concrete Curb & Gutter
-  Trail/Sidewalk
-  New Bridges
-  Construction Limits
-  ROW Impacts
-  Retaining Wall



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SUNSET DRIVE – ALTERNATIVE #4

Proposed Roadway Section Beneath the
Interstate 94 overpass

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Interchange Alternative	Right – of – Way	Wetland Impacts	Approximate Costs	Traffic Operations
Single Point Urban (SPUI)	Signals - 0.06 Acres Roundabouts - 0.68 Acres	Signals - 0.06 Acres Roundabouts - 0.06 Acres	\$21.9 M (Signals) \$24.4 M (Roundabouts)	★
Diverging Diamond (DDI)	Signals - 1.29 Acres Roundabouts - 1.47 Acres	Signals - 0.02 Acres Roundabouts - 0.02 Acres	\$26.1 M (Signals) \$26.4 M (Roundabouts)	★
Partial Cloverleaf	Signals - 0.40 Acres Roundabouts - 0.39 Acres	Signals - 0.07 Acres Roundabouts - 0.06 Acres	\$20.8 M (Signals) \$24.1 M (Roundabouts)	★
Diamond w/Roundabouts	0.45 Acres	0.03 Acres	\$23.9 Million	★

★ denotes traffic Operation meet LOS criteria for 2045 design year

ALTERNATIVE COMPARISON

NEXT STEPS

- Review of public input, refinement of alternatives, and completion of preliminary engineering feasibility study to determine alternatives for the proposed project.
- Complete ranking of alternatives and selection of a preferred alternative.
- 2nd Public Input Meeting to present rankings and preferred alternative.
- An environmental document will be prepared to further evaluate preferred alternatives.

QUESTIONS / COMMENTS

Written Statements or Comments about this project may be submitted by **May 5th** to:

Chris Rossmiller, Project Manager
Mead & Hunt, Inc.
600 South Second Street, Suite 120
Bismarck, ND 58504

Email: c.rossmiller@meadhunt.com

Note: ***“Public Input Meeting”*** in the email subject line

Pre-recorded Presentation:

Go to NDDOT website at www.dot.nd.gov
Click “Public Meetings” under Quick Links
Date April 20, 2023

[Sign in Sheet](#)

[NDDOT Title VI Public Participation Survey](#)

Thank you for attending the public information meeting regarding the proposed improvements to the Sunset Drive Interchange.