



# I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE

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Be Legendary.

Transportation



# AGENDA

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- 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

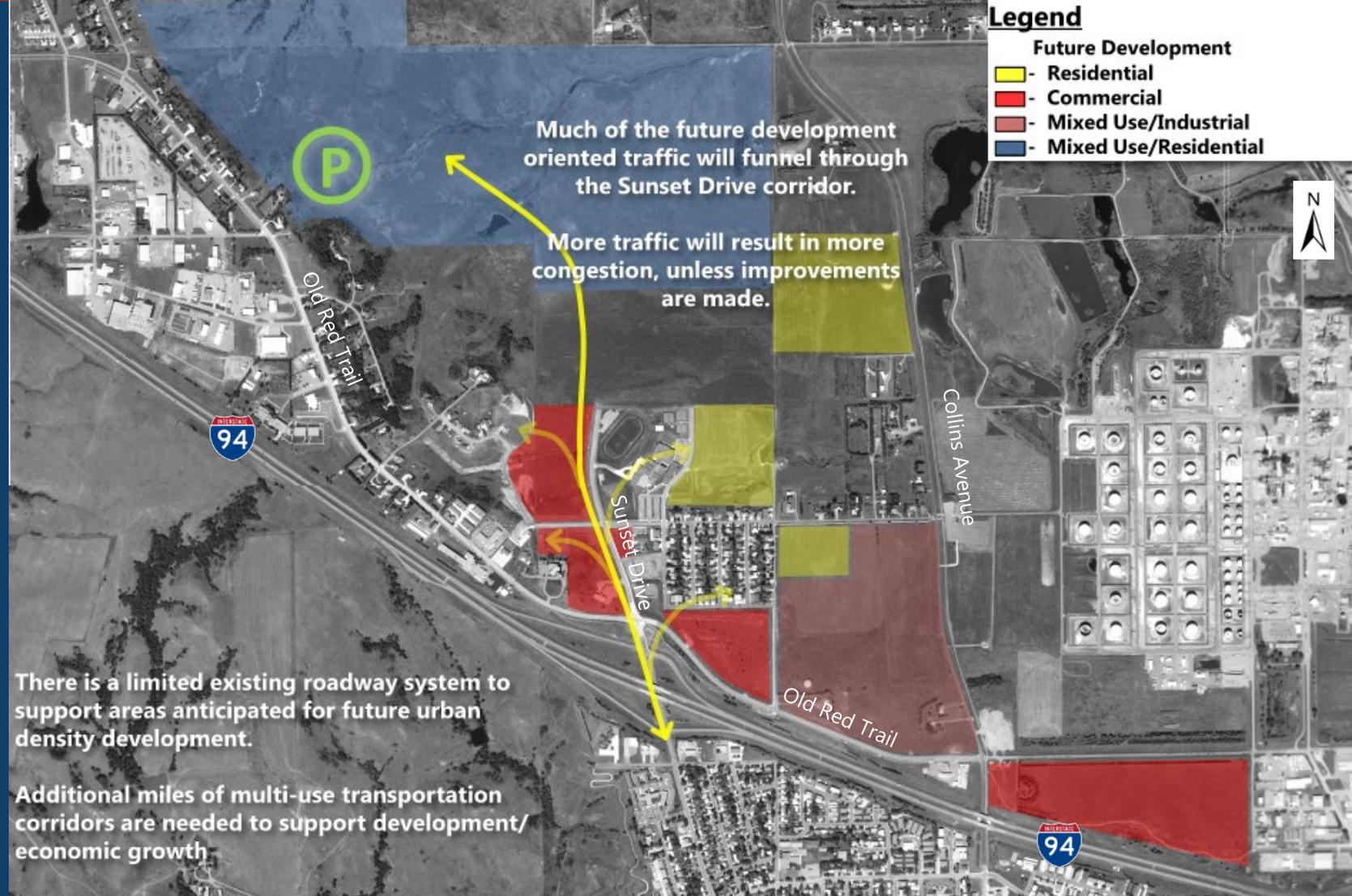


North Mandan Subarea Study

Bismarck-Mandan Metropolitan Planning Organization

## Legend

- - Residential
- - Commercial
- - Mixed Use/Industrial
- - Mixed Use/Residential



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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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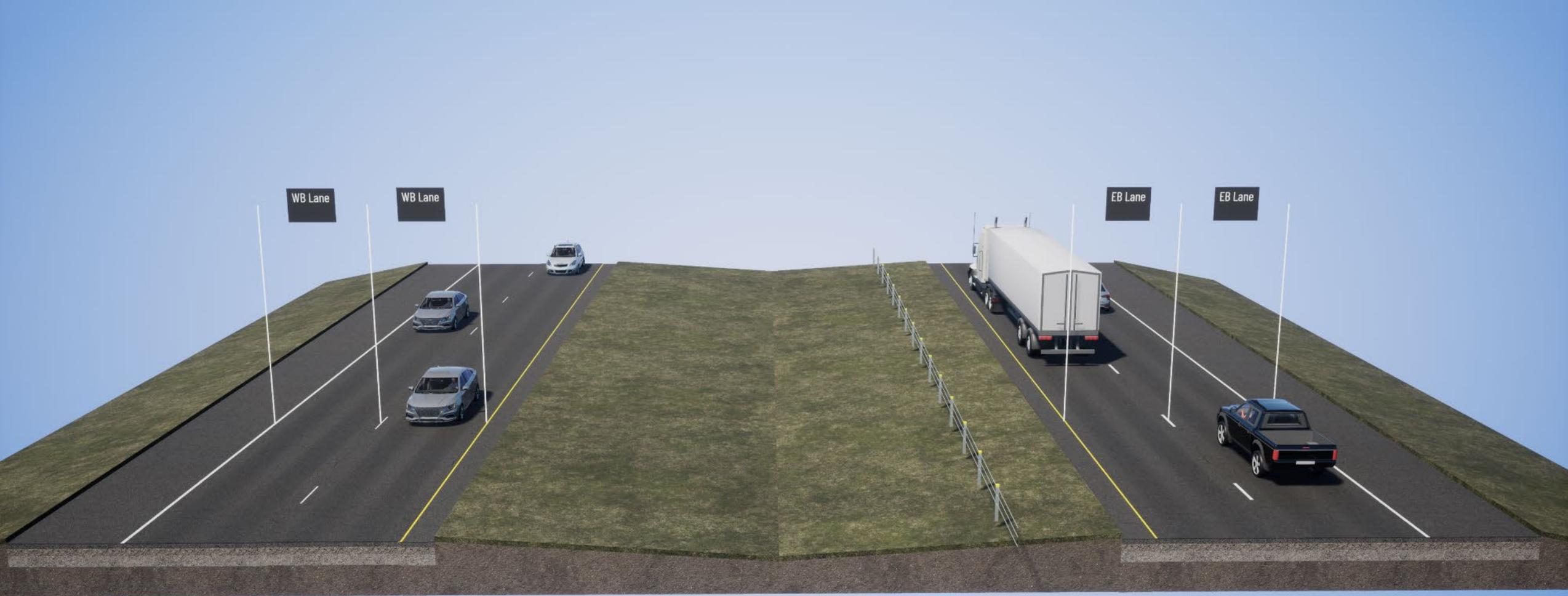
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Consultant: **Mead  
& Hunt**

# EXISTING CONDITIONS

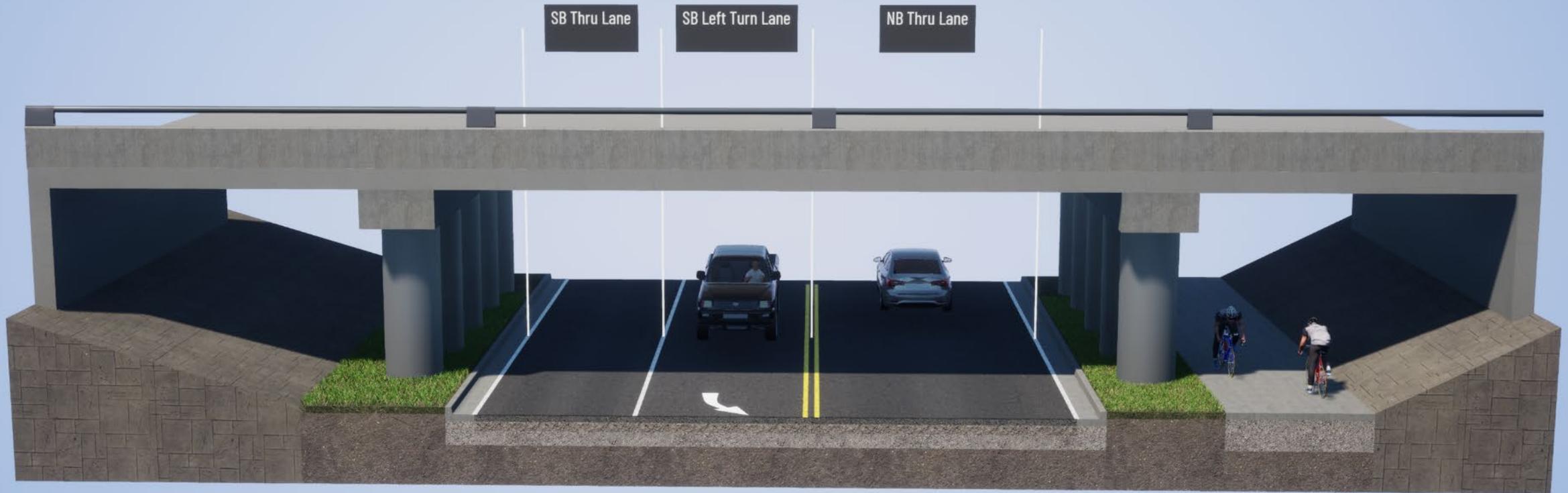
I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE



# INTERSTATE 94

Existing Roadway Section East of Sunset Drive

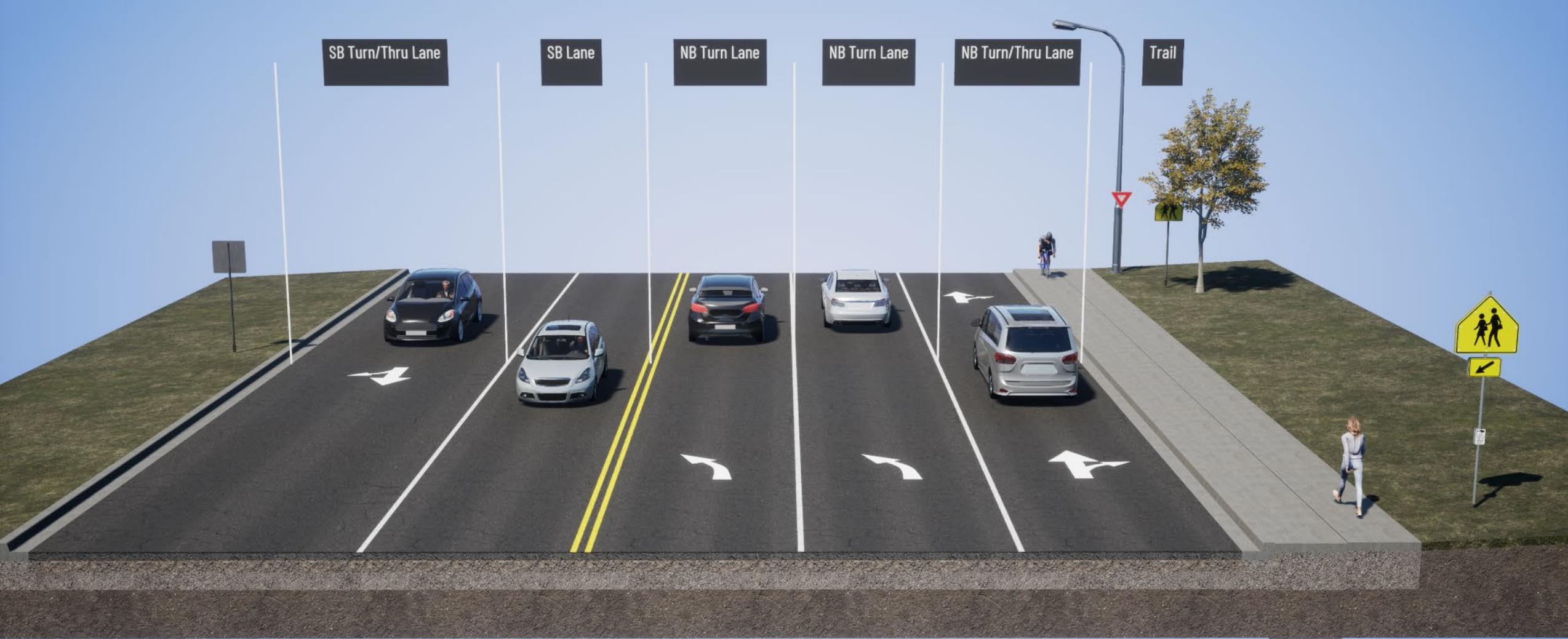




# SUNSET DRIVE

Existing Roadway Section Beneath the  
Interstate 94 overpass

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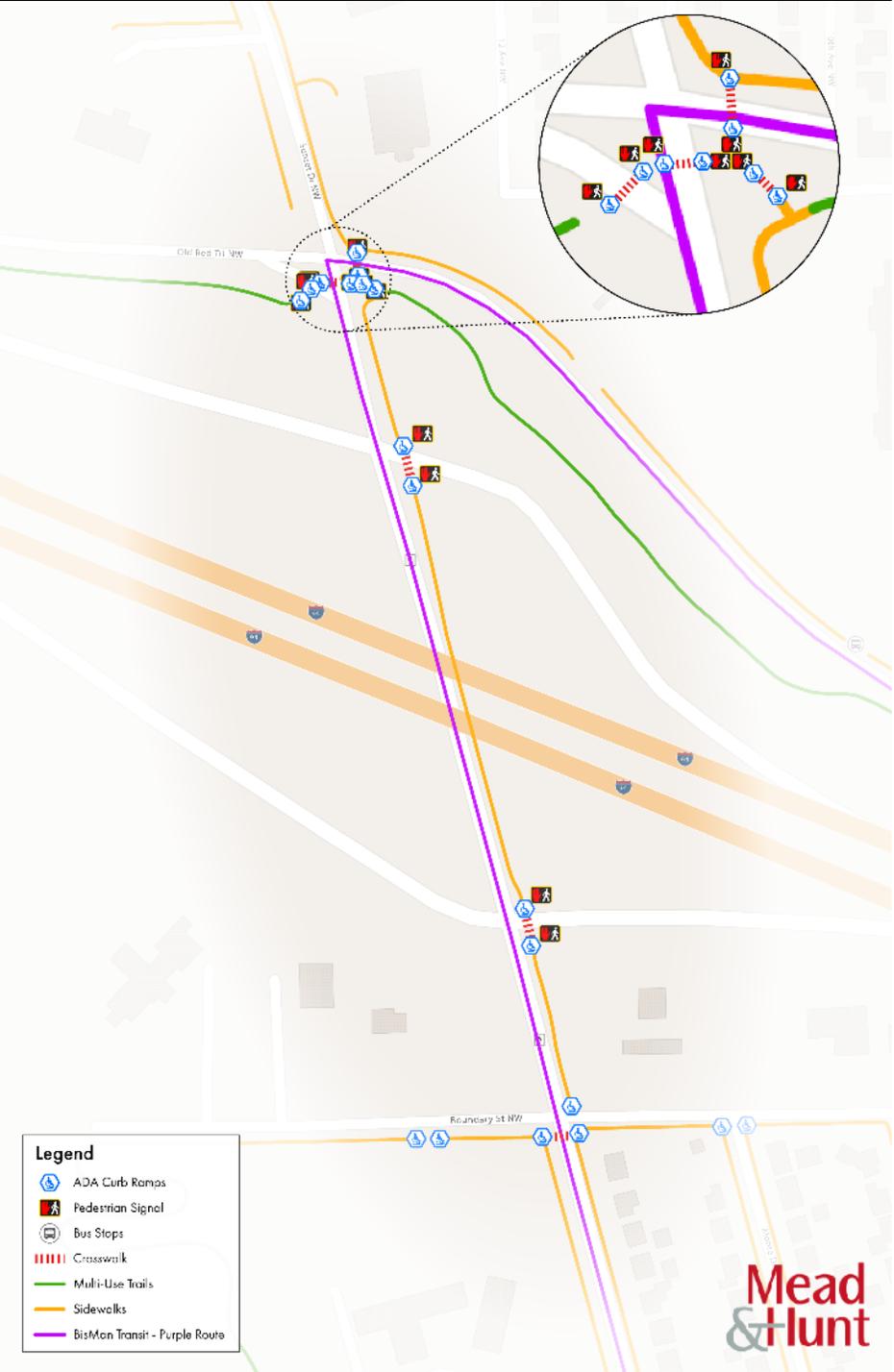


# SUNSET DRIVE

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

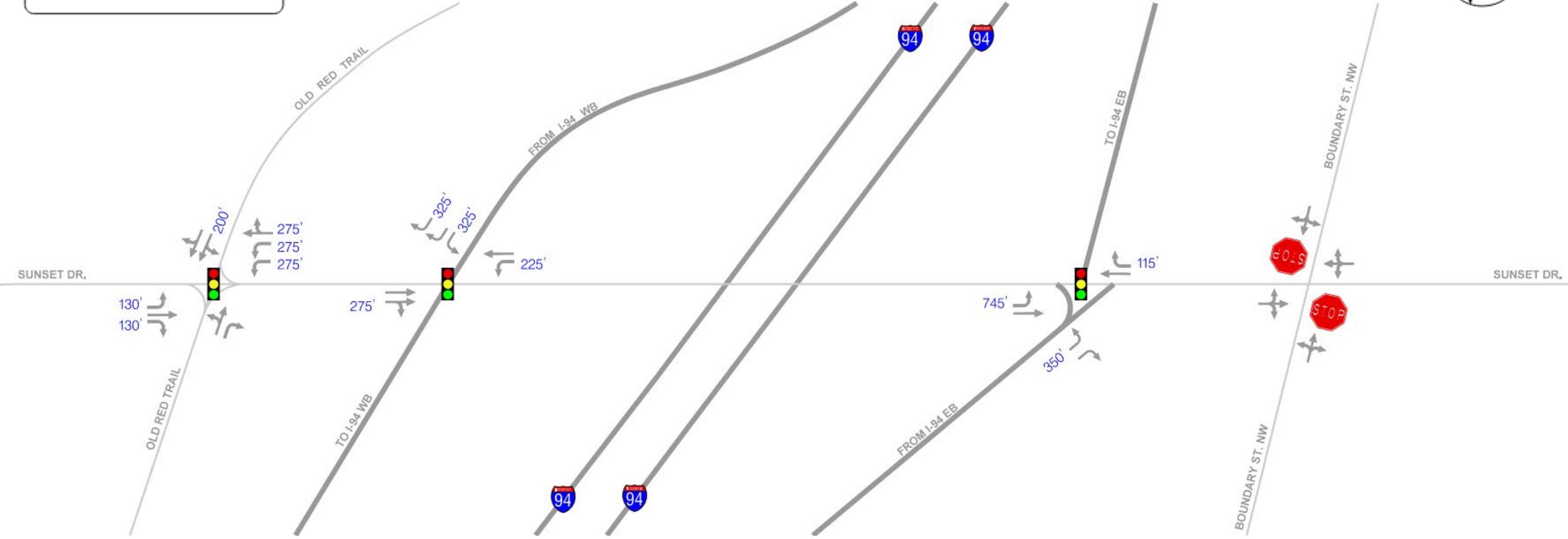
- Wetlands are located near, but not in the project area.
- The Missouri River is located east of the project area.
- There are no FEMA floodplains located in the project study area.



# EXISTING LANE CONFIGURATIONS

**LEGEND:**

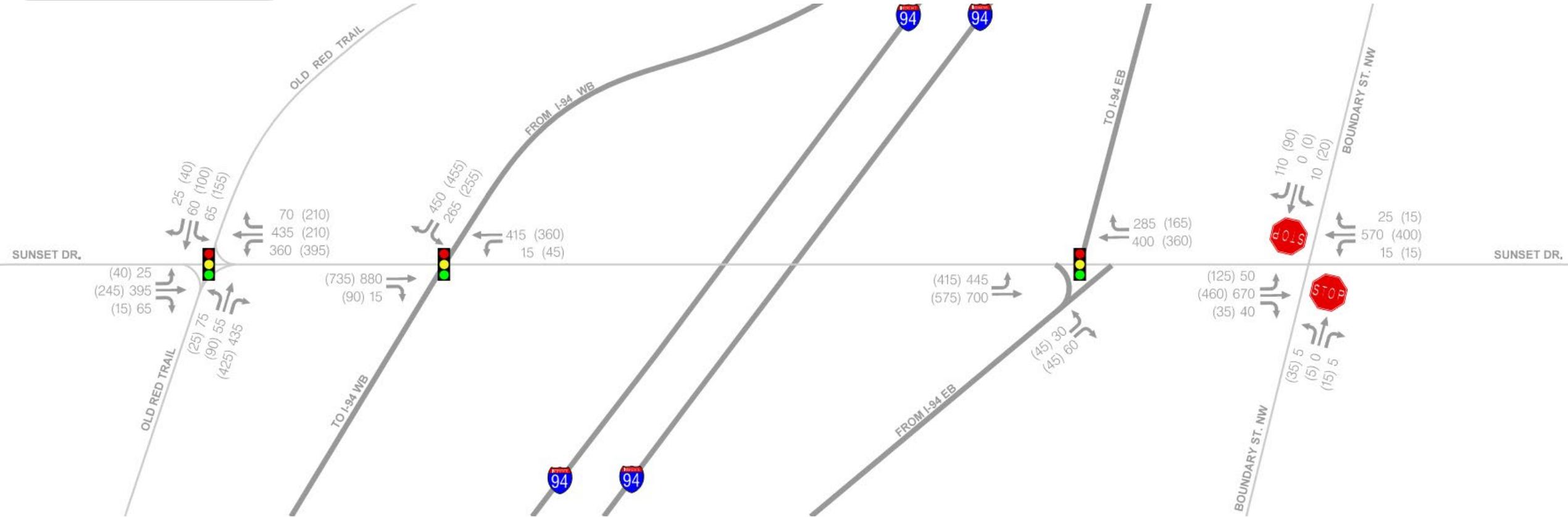
- ROADWAY 
- STOP CONTROL 
- TRAFFIC SIGNAL 
- LANE CONFIGURATION 
- STORAGE LENGTH 

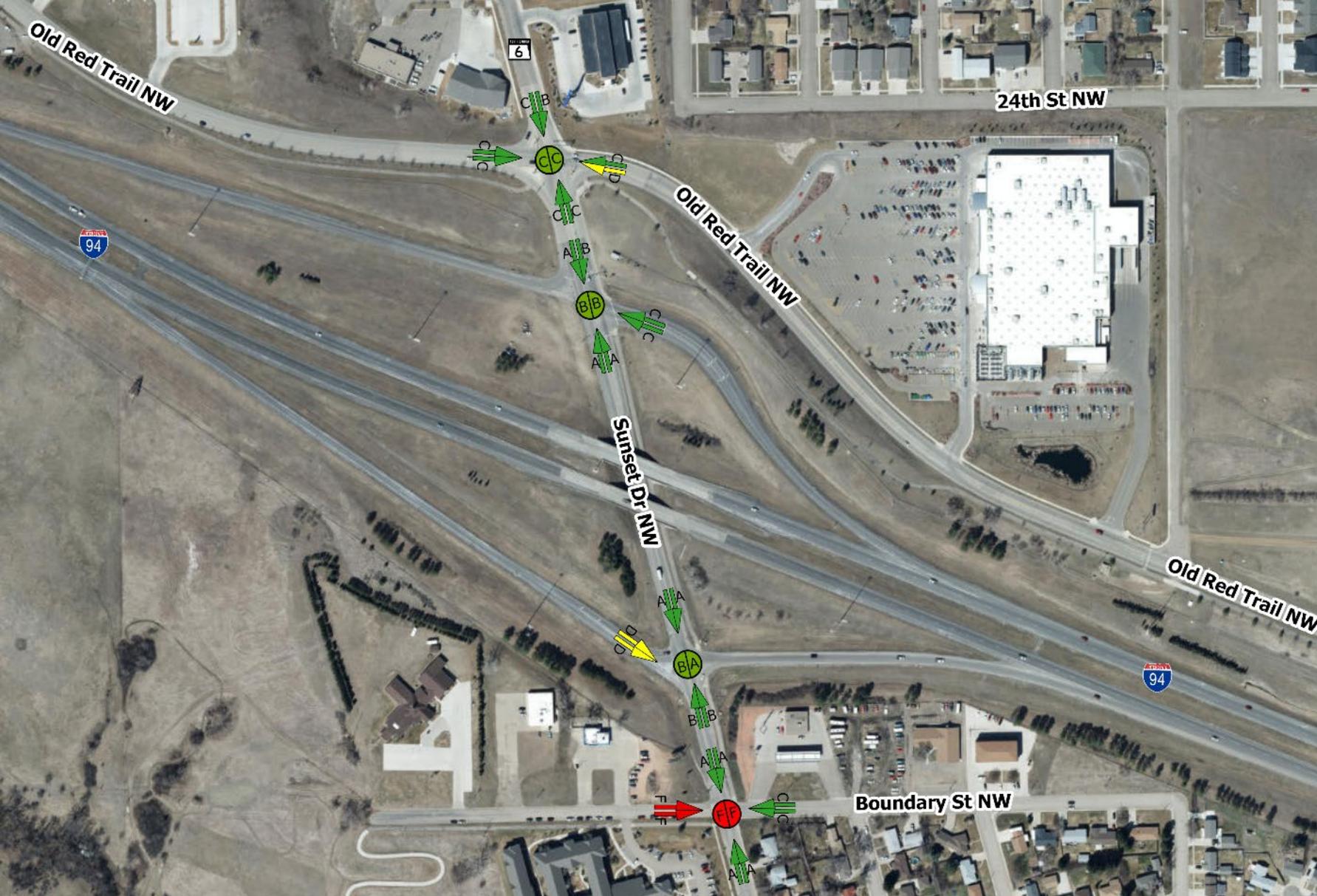


# EXISTING PEAK HOUR VOLUMES

**LEGEND:**

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



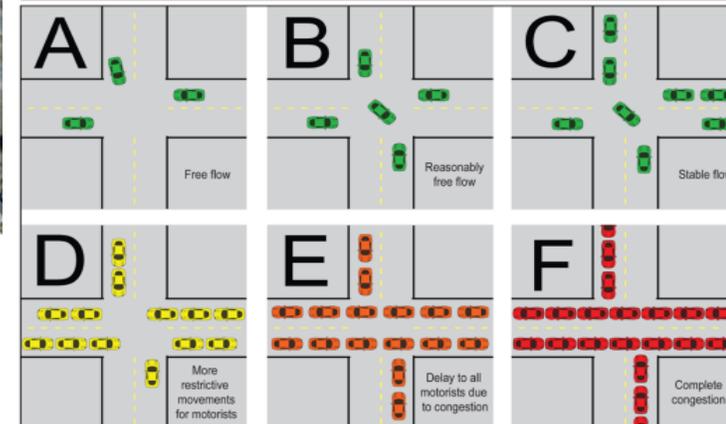


### Legend

#### 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:

Study Area

## Level of Service -Existing

Source: Level of Service Synchro 02/2023





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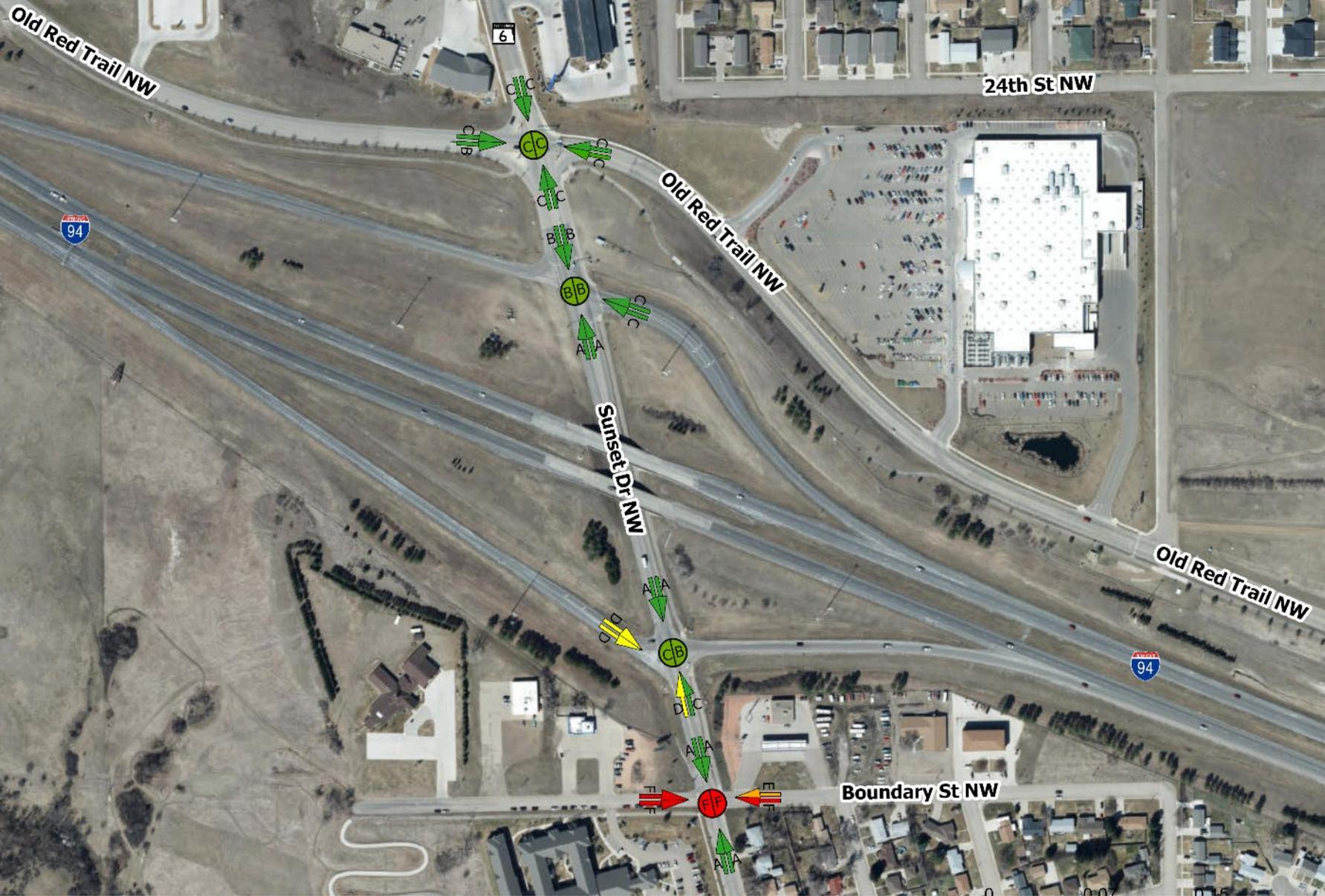
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Consultant: **Mead  
& Hunt**

# FUTURE TRAFFIC CONDITIONS

I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE

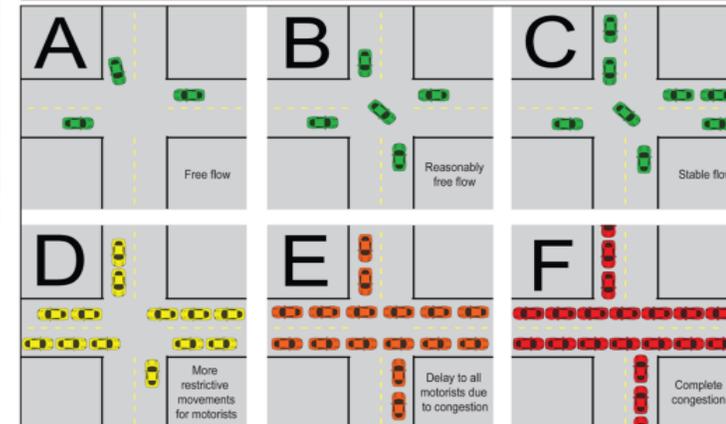


### Legend

#### Level of Service

- A, B
- C
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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

**Overall LOS:**  
 AM PM

**Study Area**

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

## Level of Service - 2030 No Build

Source: Level of Service Synchro 02/2023



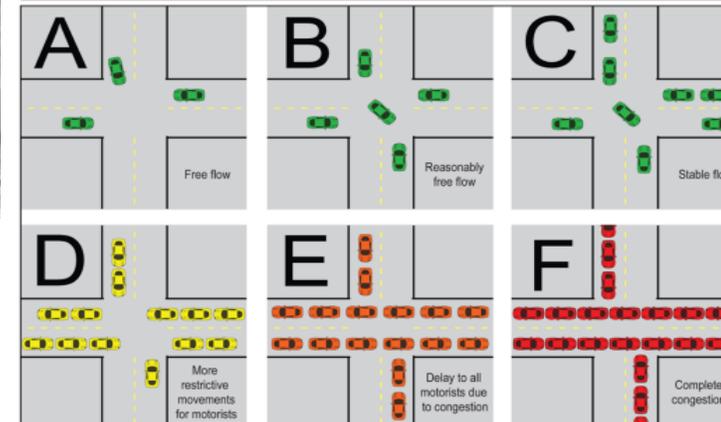


### Legend

#### 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:



#### Study Area



## Level of Service - 2045 No Build

Source: Level of Service Synchro02/2023





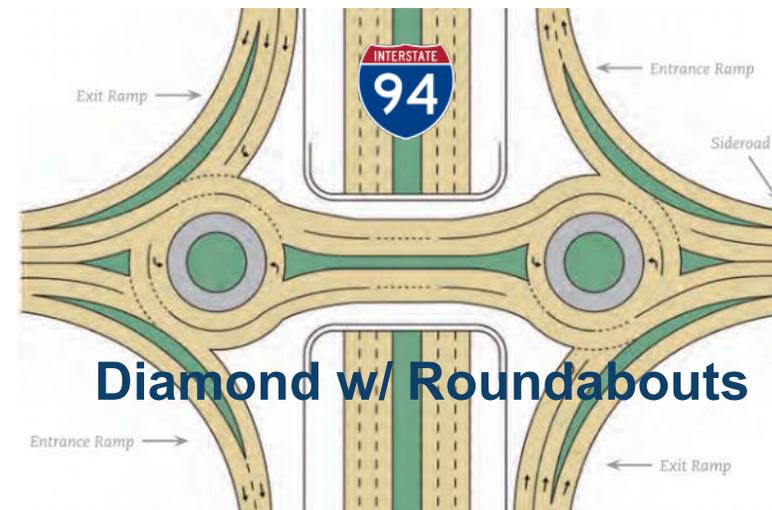
**Single Point Urban**



**Partial Cloverleaf**



**Diverging Diamond**



**Diamond w/ Roundabouts**

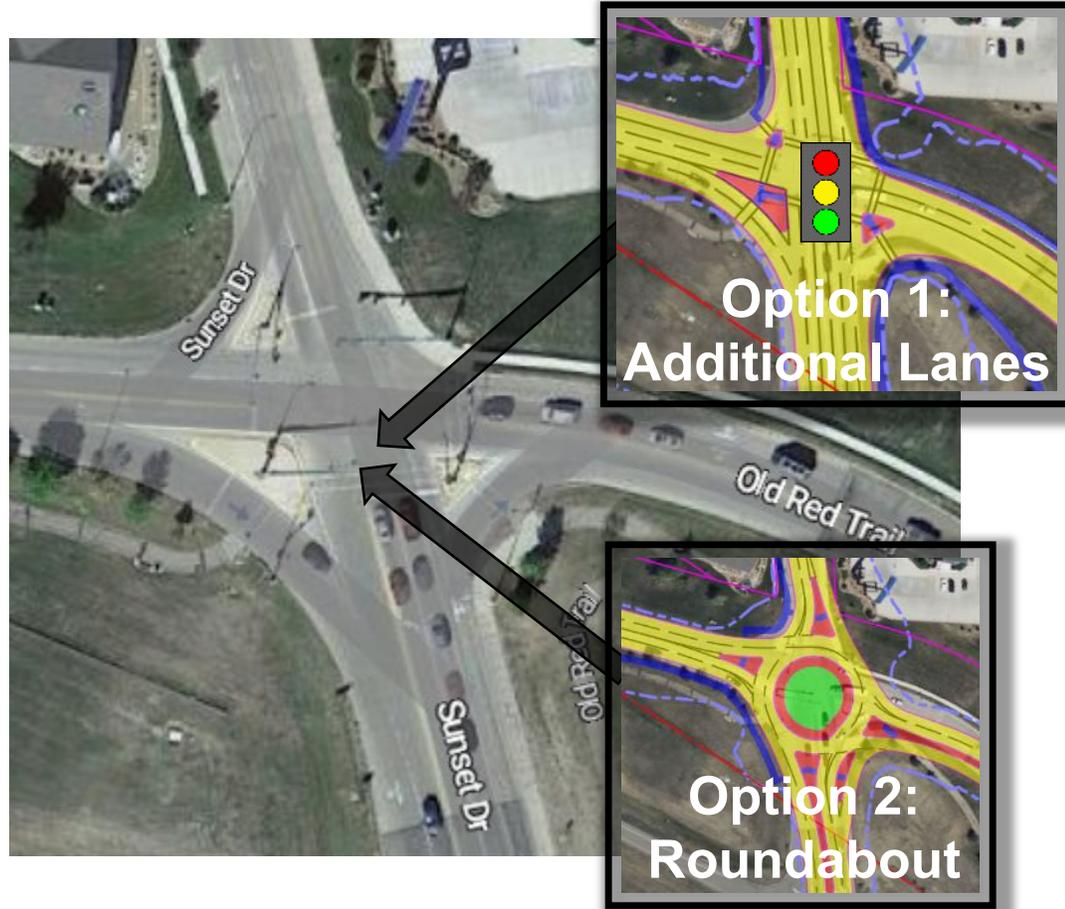
# POTENTIAL ALTERNATIVES

Interstate 94 and Sunset Drive Interchange

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# OLD RED TRAIL NW



# BOUNDARY ST. NW



## POTENTIAL ALTERNATIVES

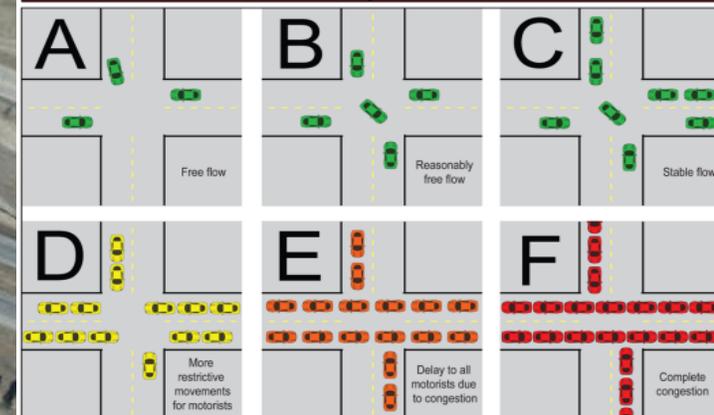
Old Red Trail NW and Boundary Street NW

# 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	CC	Additional Turn Lanes
	AA	Roundabouts

ID	2030	Alternative Scenario
2	BB	Parclo
	CC	DDI
	BB	Roundabouts

ID	2030	Alternative Scenario
13	CC	SPUI

ID	2030	Alternative Scenario
3	AA	Parclo
	BB	DDI
	AA	Roundabouts

ID	2030	Alternative Scenario
4	AA	Signalization
	AA	Roundabouts

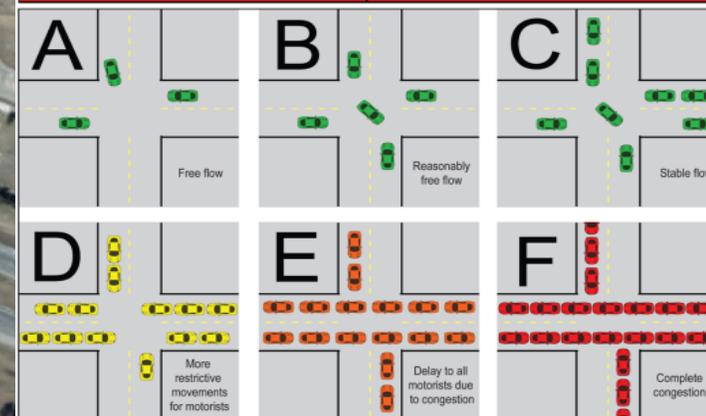


# Level of Service - 2045 Alternative Scenarios

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



ID	2045	Alternative Scenario
1		Additional Turn Lanes
		Roundabouts

ID	2045	Alternative Scenario
2		Parclo
		DDI
		Roundabouts

ID	2045	Alternative Scenario
13		SPUI

ID	2045	Alternative Scenario
3		Parclo
		DDI
		Roundabouts

ID	2045	Alternative Scenario
4		Signalization
		Roundabouts

# ALTERNATIVES

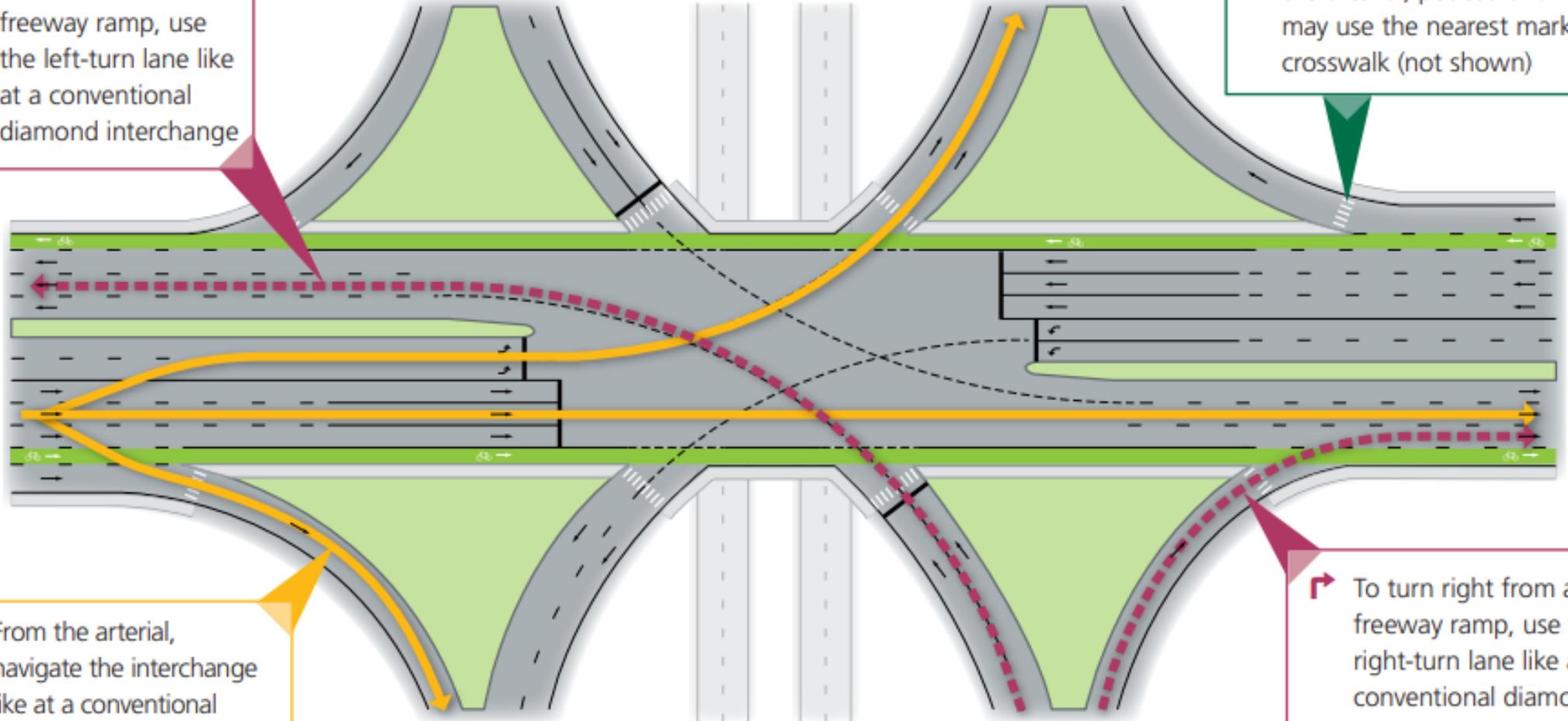
I-94 INTERCHANGE (EXIT 152) SUNSET DRIVE



🚲 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

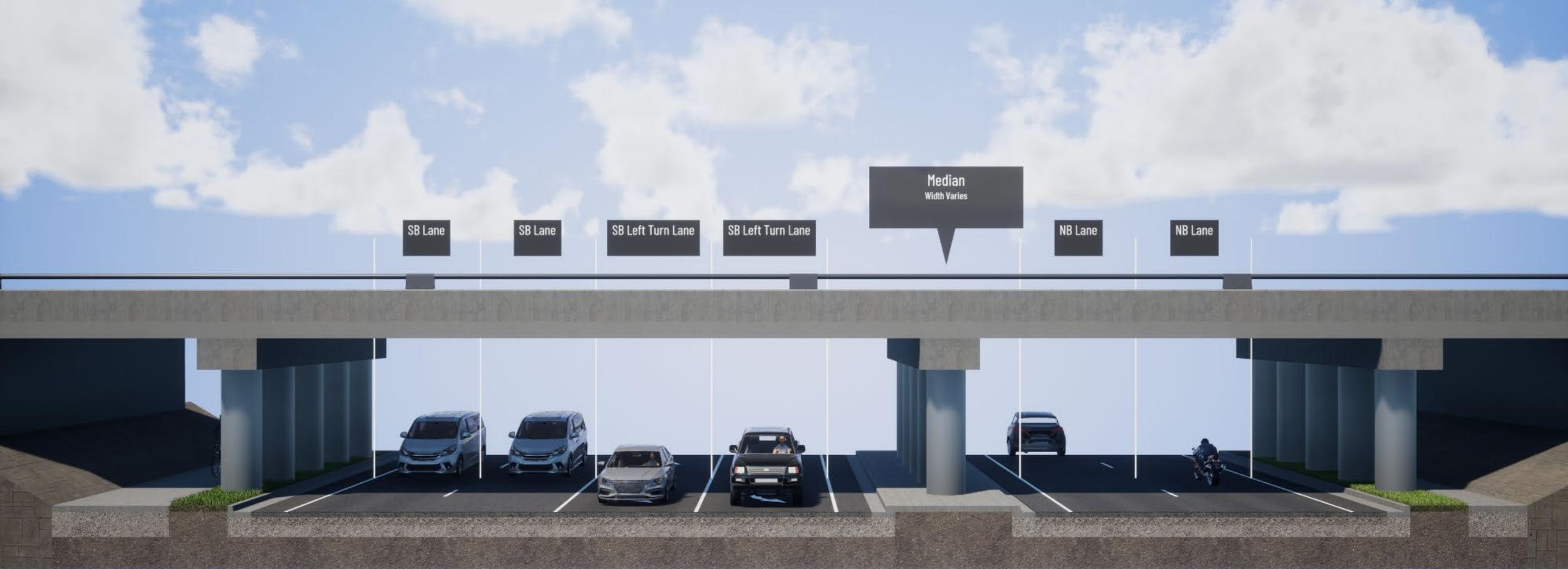
- █ Roadway
- █ Raised Median
- █ Truck Apron
- █ Concrete Curb & Gutter
- █ Trail/Sidewalk
- █ New Bridges
- - - Construction Limits
- █ ROW Impacts
- ~ ~ ~ Retaining Wall
- ⦿ Traffic Signal

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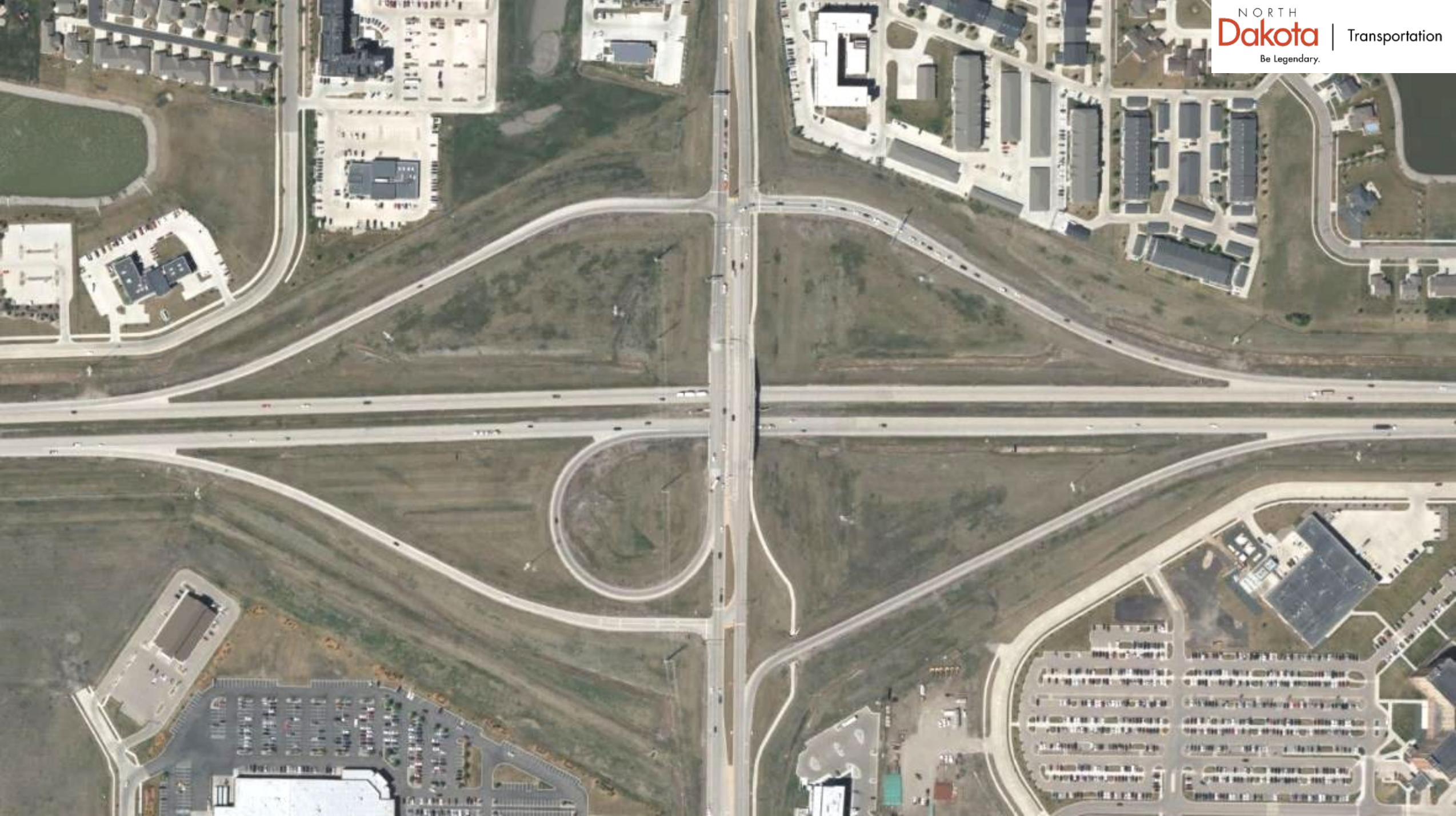


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# SUNSET DRIVE – ALTERNATIVE #1

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

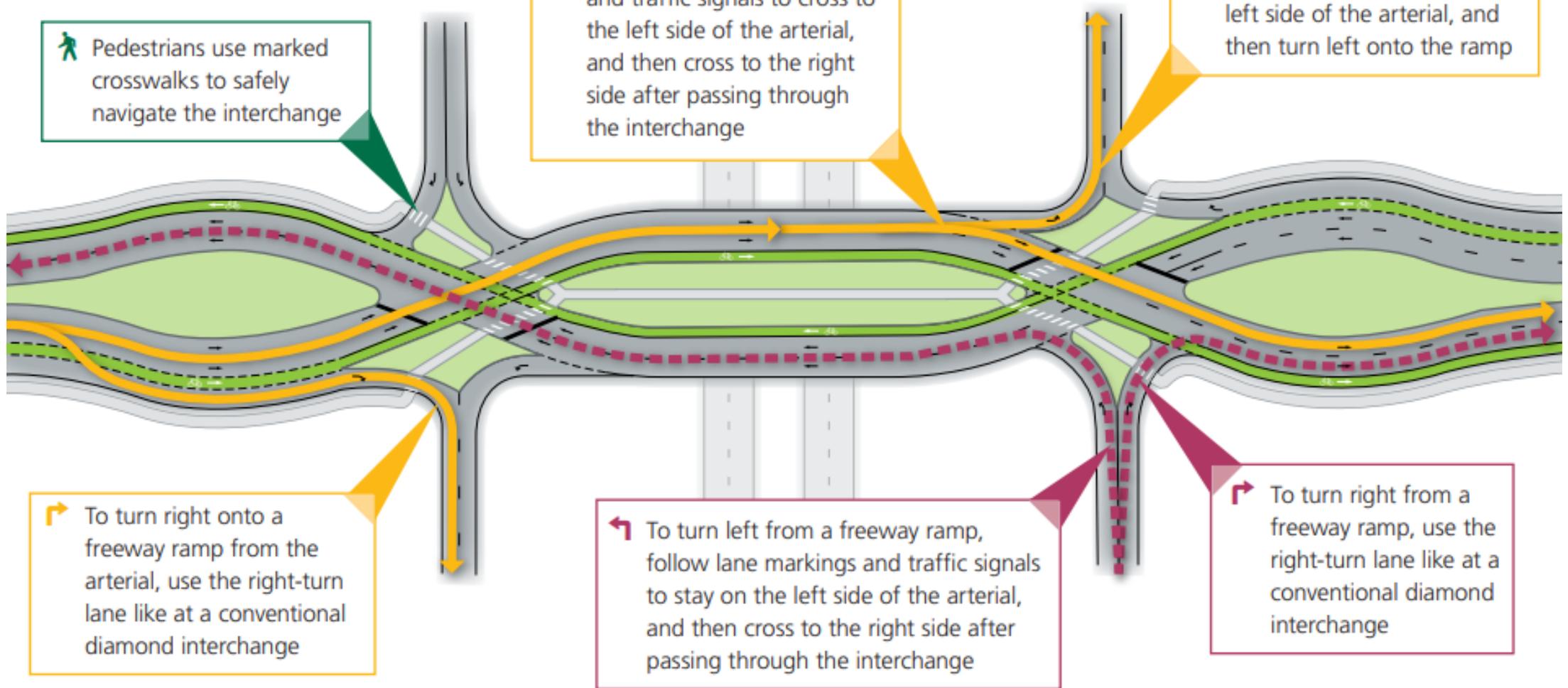
↩ To turn left onto a freeway ramp from the arterial, follow lane markings and traffic signals to cross to the left side of the arterial, and then turn left onto the ramp

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

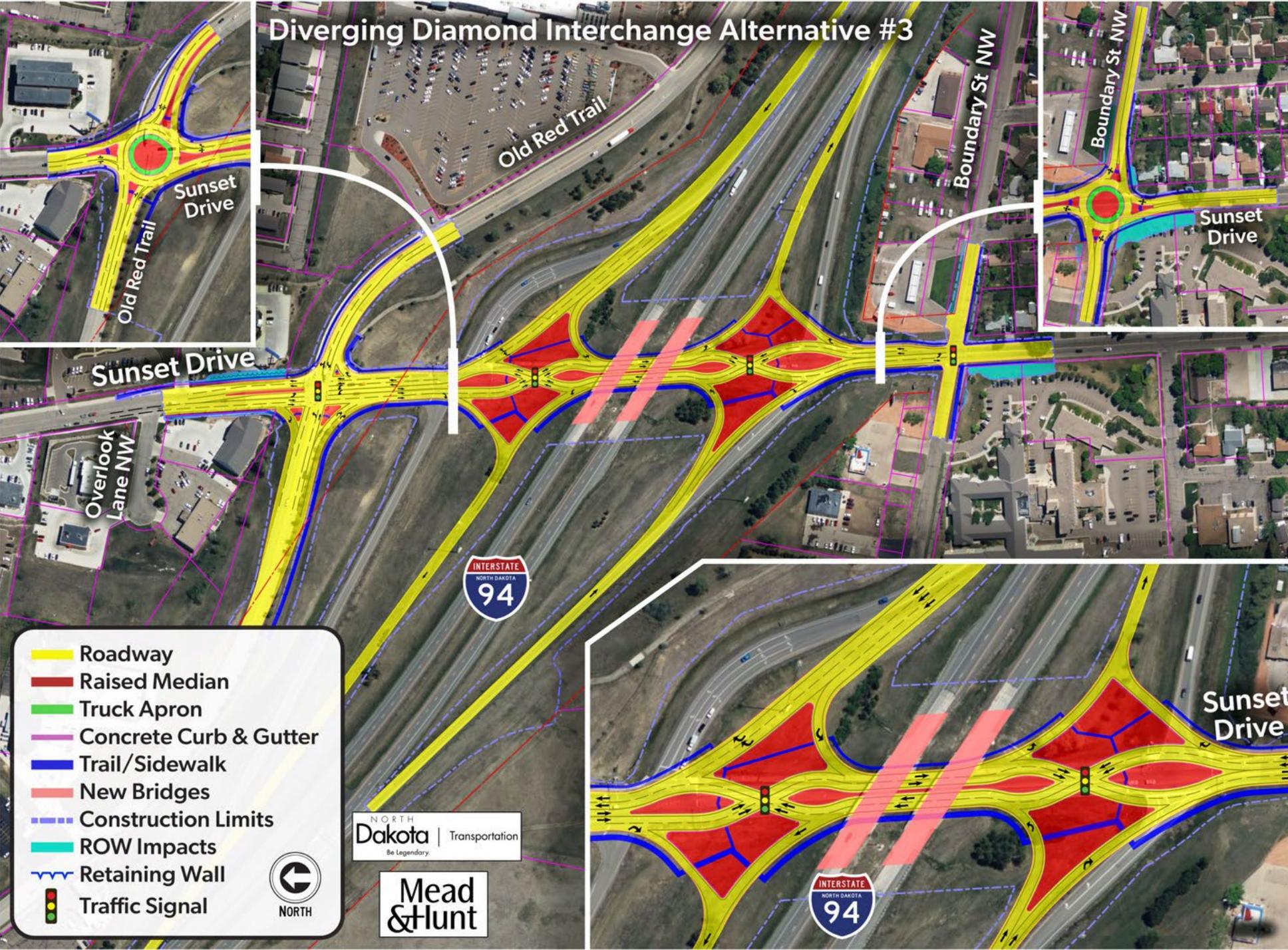
↩ To turn left from a freeway ramp, follow lane markings and traffic signals to stay on the left side of the arterial, and then cross to the right side after passing through the interchange

↪ 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)

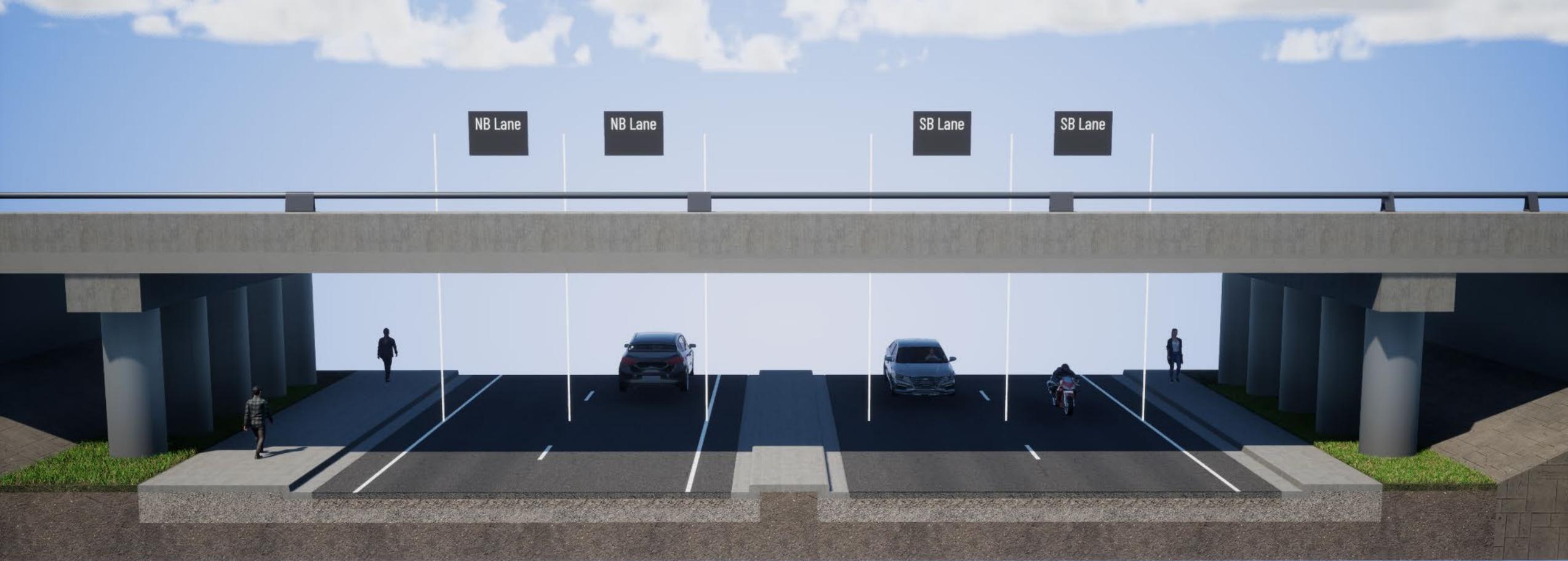
Environmental:  
Wetlands:  
0.07 Acres (Signalized)  
0.06 Acres (Roundabouts)  
Floodplain:  
None  
Cultural:  
None

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

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**Mead & Hunt**

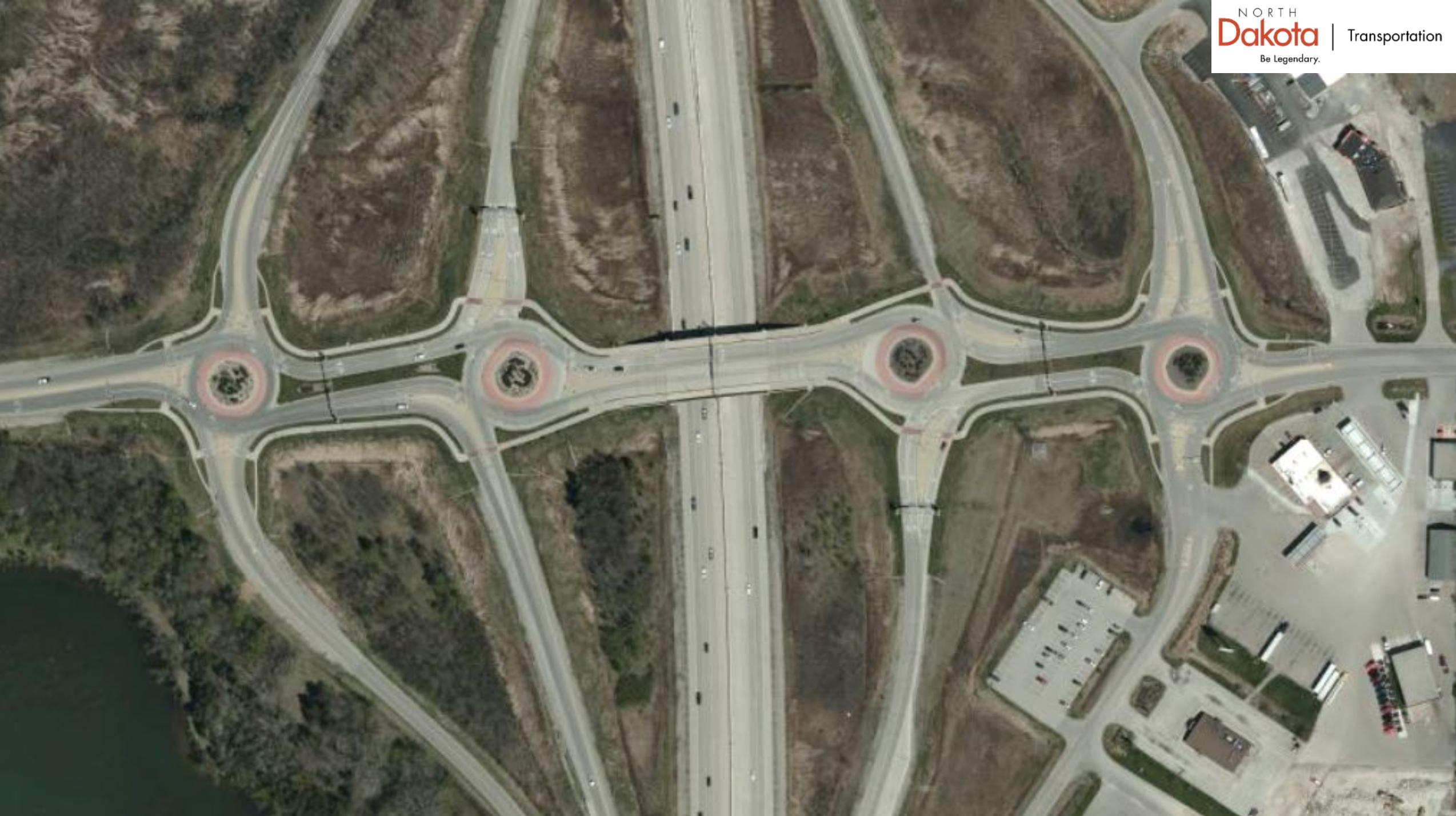
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*Be Legendary.*



# SUNSET DRIVE – ALTERNATIVE #3

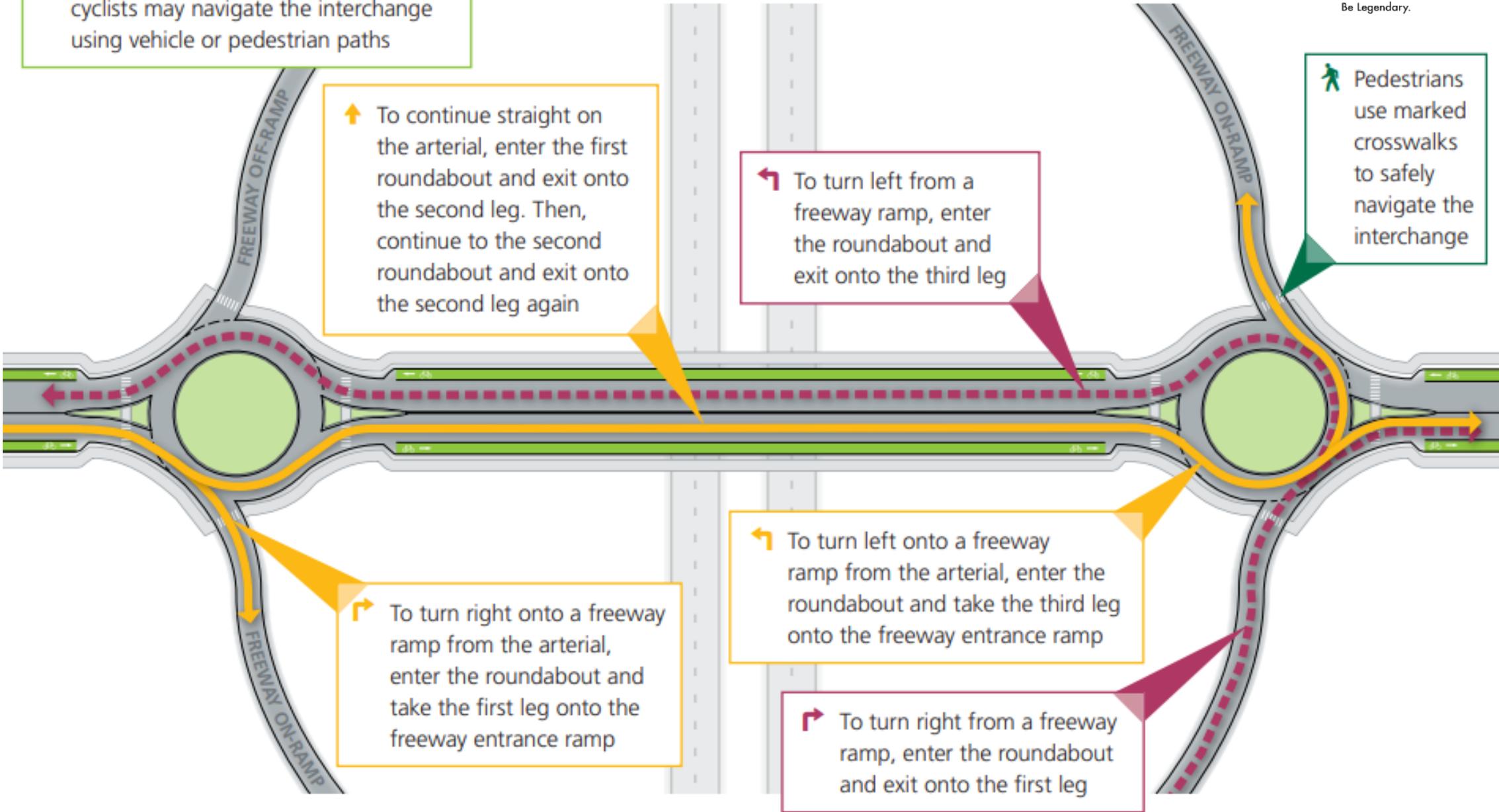
Proposed Roadway Section Beneath the  
Interstate 94 overpass

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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



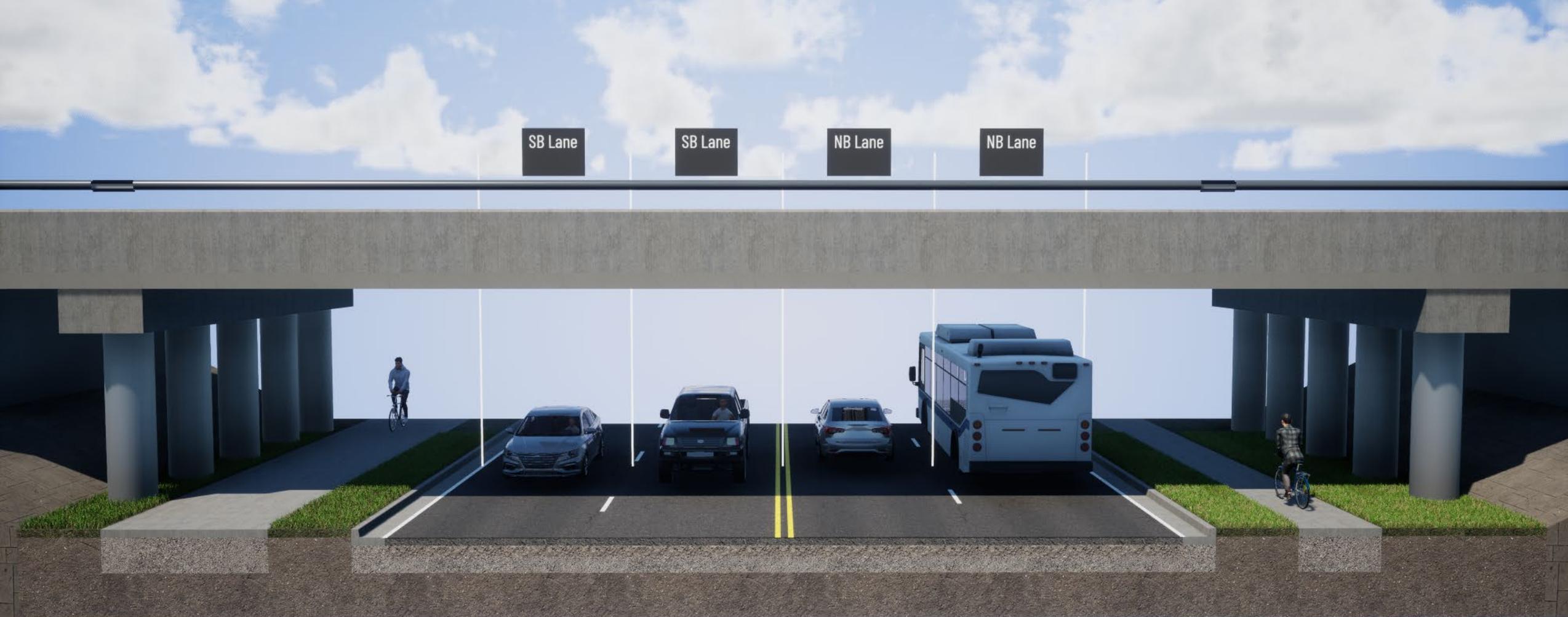
Traffic:  
Meets Level of Service  
for future demand

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
-   
NORTH



# 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
<b>Single Point Urban (SPUI)</b>	Signals - 0.06 Acres Roundabouts - 0.68 Acres	Signals - 0.06 Acres Roundabouts - 0.06 Acres	\$21.9 M (Signals) \$24.4 M (Roundabouts)	★
<b>Diverging Diamond (DDI)</b>	Signals - 1.29 Acres Roundabouts - 1.47 Acres	Signals - 0.02 Acres Roundabouts - 0.02 Acres	\$26.1 M (Signals) \$26.4 M (Roundabouts)	★
<b>Partial Cloverleaf</b>	Signals - 0.40 Acres Roundabouts - 0.39 Acres	Signals - 0.07 Acres Roundabouts - 0.06 Acres	\$20.8 M (Signals) \$24.1 M (Roundabouts)	★
<b>Diamond w/Roundabouts</b>	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.
- 2<sup>nd</sup> 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 5<sup>th</sup>** to:

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

Email: [c.rossmiller@meadhunt.com](mailto:c.rossmiller@meadhunt.com)

Note: ***"Public Input Meeting"*** in the email subject line

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

