Colorado Boulevard Corridor Study

PUBLIC MEETING #2 – August 24, 2023

Purpose of Today's Meeting

- Provide a brief study overview and update
- Present Colorado Blvd corridor build alternatives
- Gather feedback and answer questions

No recommendations have been made at this point in the study.

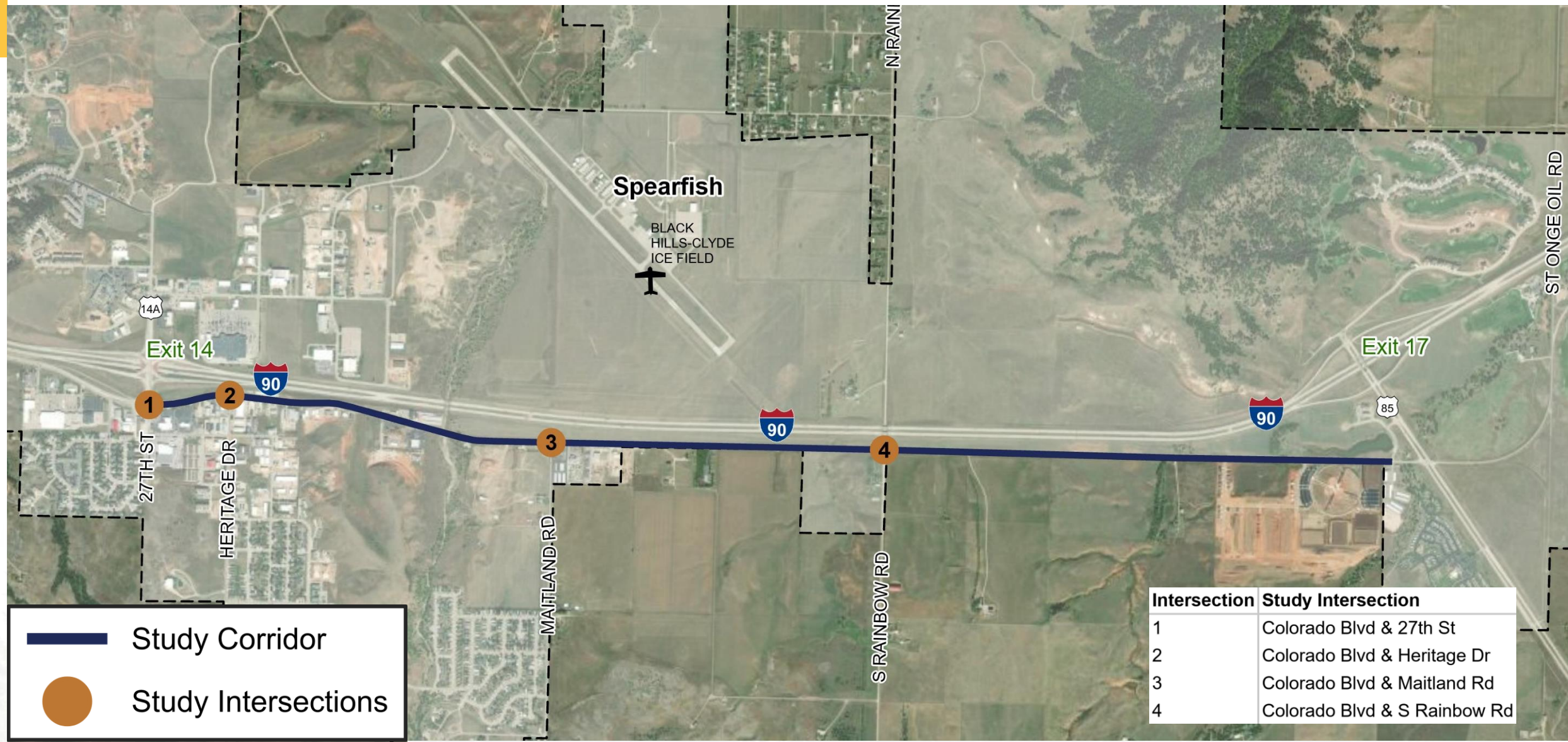
Your feedback will assist in the refinement, analysis, and development of recommendations in next phase of study.

Study Advisory Team

- City of Spearfish
- Lawrence County
- South Dakota Department of Transportation

LAWRENCE COUNTY
SOUTH DAKOTA
"Where Beauty and Adventure Meet"

Study Corridor



Intersection	Study Intersection
1	Colorado Blvd & 27th St
2	Colorado Blvd & Heritage Dr
3	Colorado Blvd & Maitland Rd
4	Colorado Blvd & S Rainbow Rd

Study Goals

Determine

the improvements needed over the next 20-30 years.

Create

build alternatives for the corridor.

Establish

a timeline for the improvements.

Develop

a long-range plan for the corridor

Study Schedule

Needs to Address

- Future Traffic Operations
- Crash History
- Lack of Multi-modal Facilities
- Access Management
- Roadway Geometrics
- Major Drainage Structures

Project Implementation

Timeline of Need

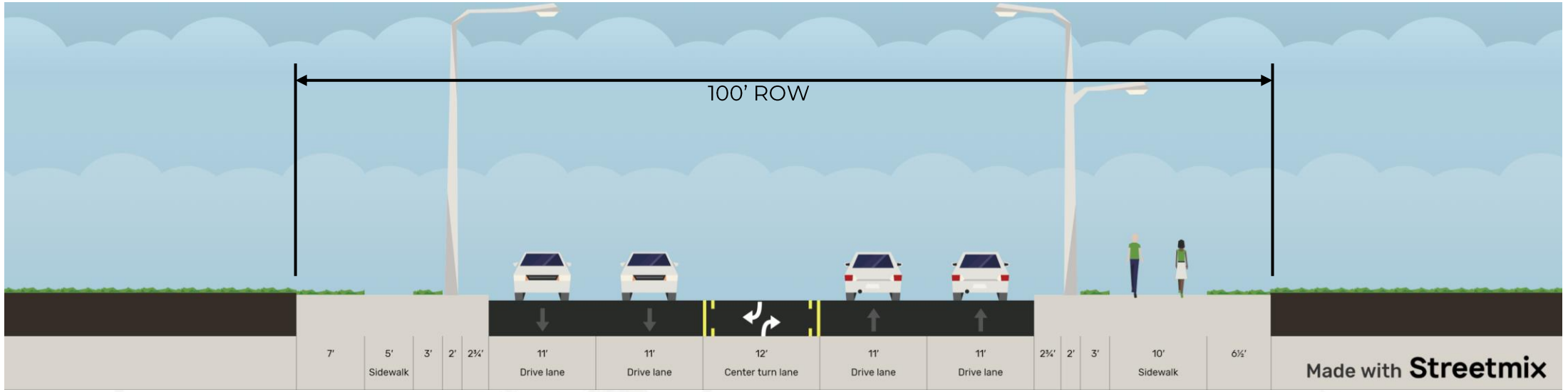
- Rainbow Road to Colorado Loop
  - 2024
- US85/CO Blvd intersection and Miller Creek structure
  - 2028 (SDDOT STIP)
- 27th Street to Heritage Drive
  - 2028*
- Heritage Drive to Maitland Road
  - 2032*
- Maitland Road to Rainbow Road
  - 2036*

Dates shown are based on timeline of need. Date of construction will be based on funding availability.

Corridor Build Alternatives

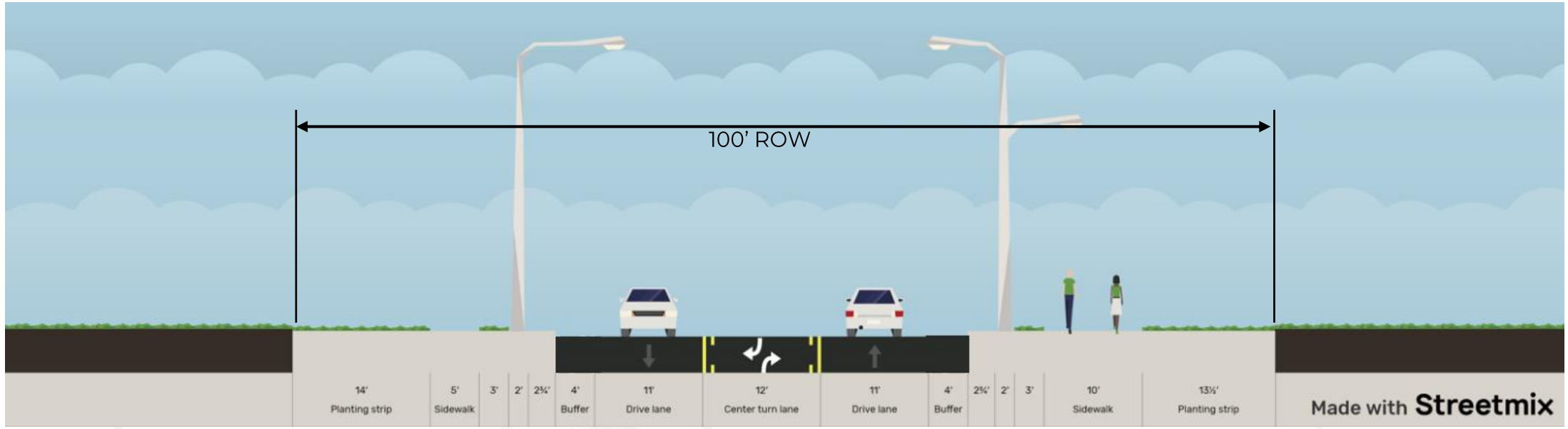
- **Segments**
  - **Number of Lanes**
  - Shared Use Path/Sidewalk
  - Bike Lanes
- Intersections

Roadway Segments - 27th Street to Rainbow Road



Similar to… Lazelle Street West of Interstate

Roadway Segments - Rainbow Road to Colorado Loop



Similar to… Colorado Blvd (Between Christensen Dr & 27th St)

Roadway Segments

Summary

Road Segment	Number of Lanes	Segment Length	Traffic Operations	Comparative Predictive Safety	Comparative Construction Costs (2)	ROW Needs	Wetland & Floodplain Impacts
		Miles	Level of Service (AM/PM)	Percent Change in Crashes (1)	$2023	Acres	Acres
Segment 1 (Heritage Dr to Maitland Rd)	5-Lane	0.8	A/A	-6%	$13.1 M	0.41	(3)
Segment 2 (Maitland Rd to Rainbow Rd)	5-Lane	0.8	A/A	-5%	$6.3 M	0.07	
	5-Lane w/ Tetro Creek Ped Underpass				$6.9 M	0.36	
Segment 3 (Rainbow Rd to Aurora Ave)	3-Lane	0.7	A/A	0%	$3.8 M	0.00	
Segment 4 (Aurora Ave to Colorado Lp)	3-Lane	0.6	A/A	0%	$3.9 M	0.19	

(1) Crash reduction based on a comparison with the no-build alternative over the evaluation period of 2027-2050.
(2) Includes north shared use path costs for comparative purposes.
(3) Refer to the recreation path options for wetland and floodplain impacts.

Corridor Build Alternatives

- Segments
  - Number of Lanes
  - Shared Use Path/Sidewalk
  - Bike Lanes
- **Intersections**

27th Street Intersection

- Option T1 - Traditional Signal

27th Street Intersection

Traditional Signal with Capacity Improvements

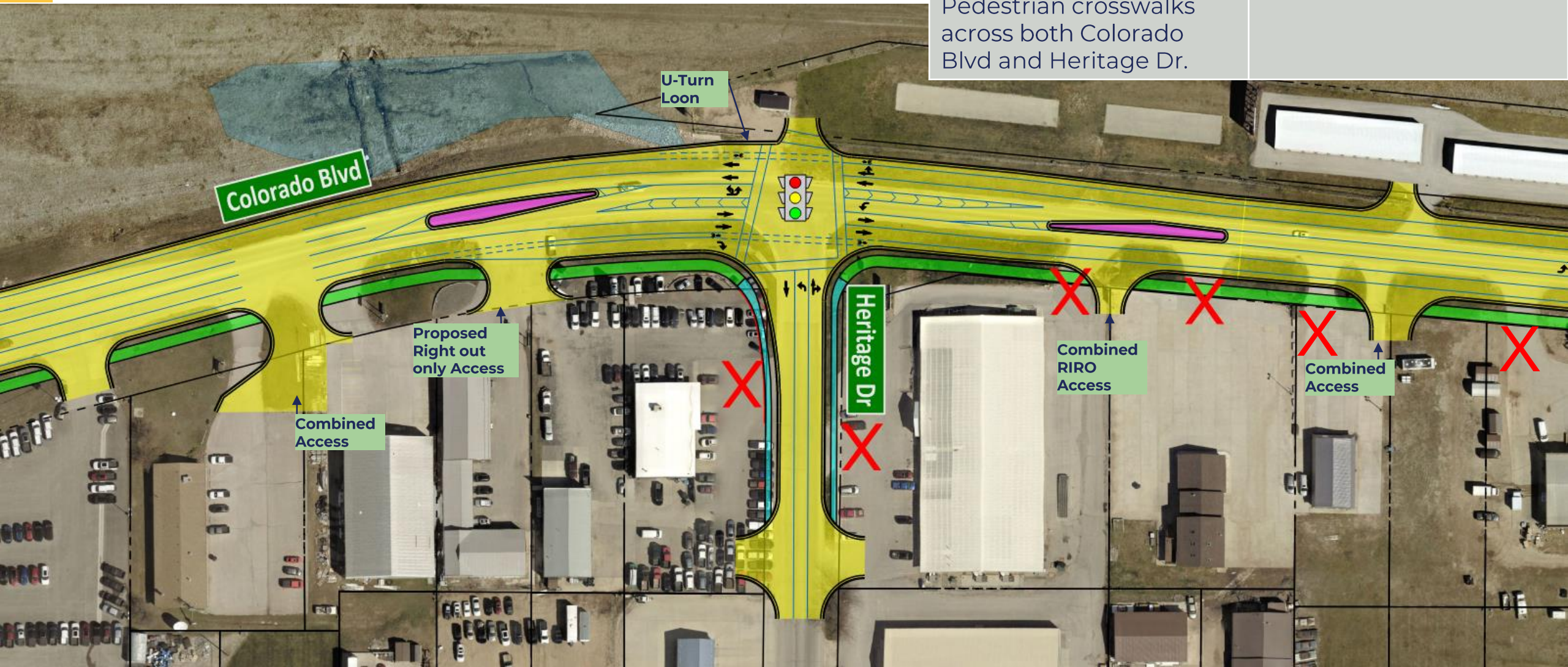
Heritage Drive Intersection

- Option 1 - Traditional Signal
- Option 2 – Continuous Green T

Heritage Drive Intersection

Option 1 – Traditional Signal

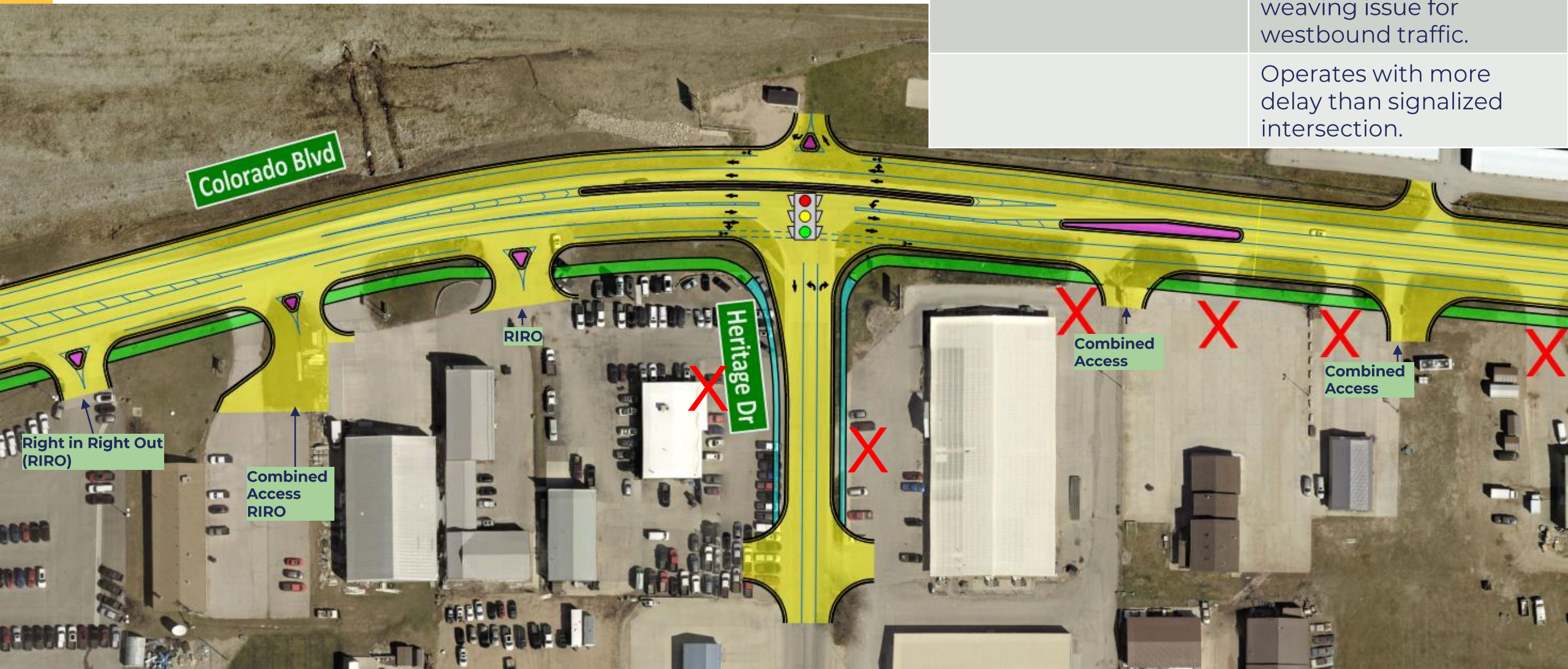
Advantages	Disadvantages
Familiar intersection type.	Right-in-Right-out at 2 driveways.
Provides opportunity for passenger cars to turn around.	
Pedestrian crosswalks across both Colorado Blvd and Heritage Dr.	



Heritage Drive Intersection

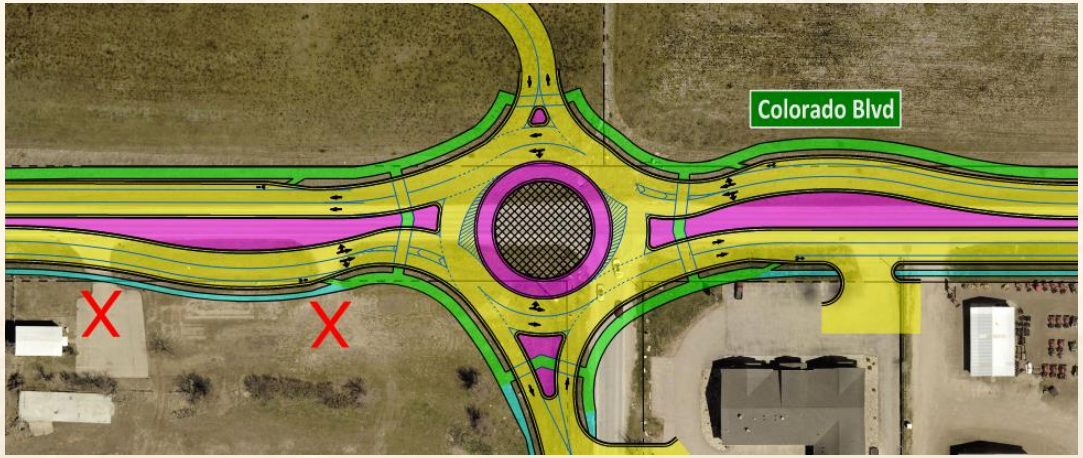
Option 2 – Continuous Green T

Advantages	Disadvantages
Westbound traffic doesn't need to stop.	Right-in-Right-out at 5 driveways.
	No pedestrian crosswalk across Colorado Blvd.
	Presents a potential weaving issue for westbound traffic.
	Operates with more delay than signalized intersection.



Maitland Road Intersection

- Option 1 - Traditional Signal



- Option 2 - Roundabout

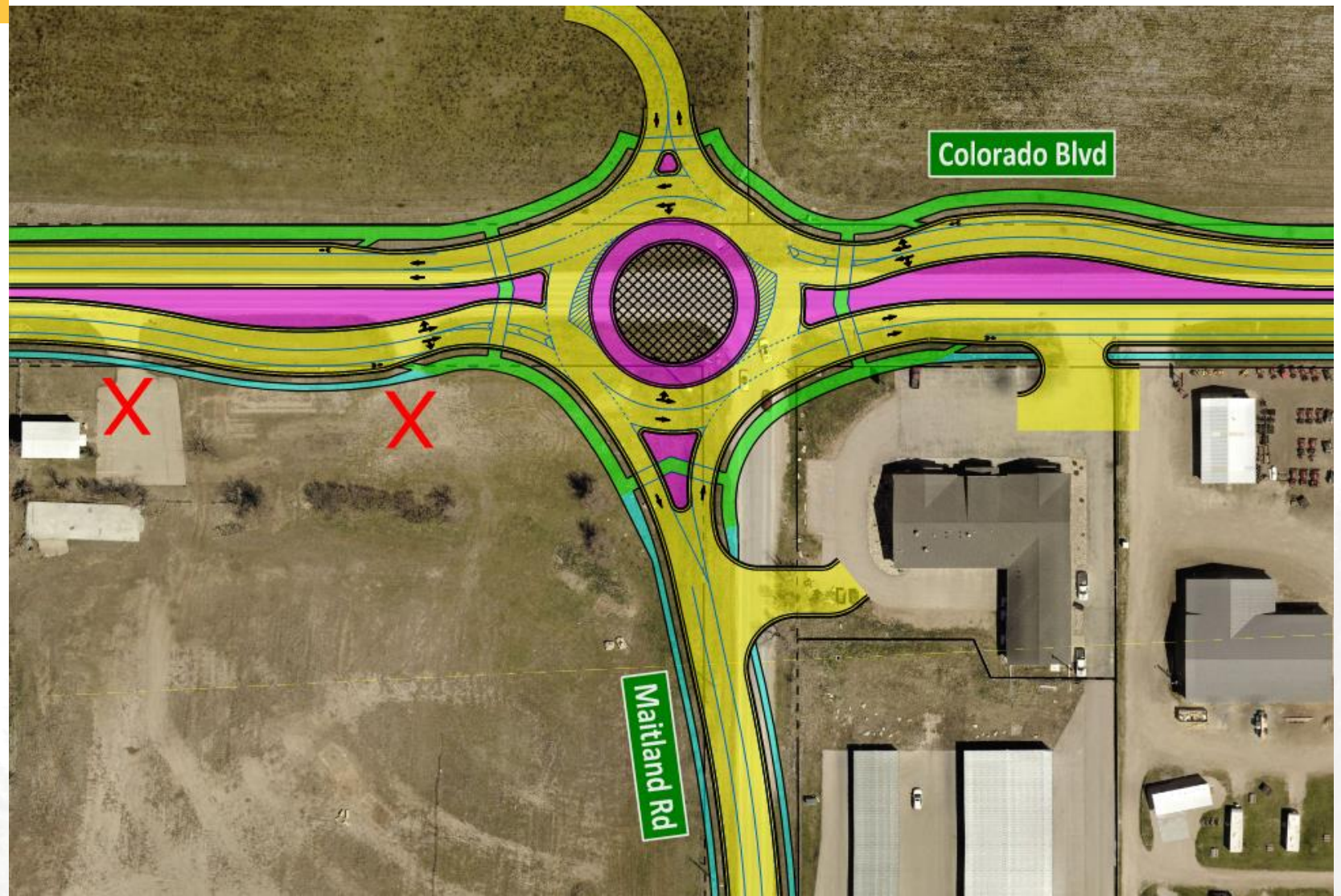
Maitland Road Intersection

Option 1 – Traditional Signal

Advantages	Disadvantages
Familiar intersection type.	Not enough space for large truck turn around.
Less expensive than roundabout.	Longer ped crosswalk distances.
	Higher fatal and injury crashes compared to roundabout.

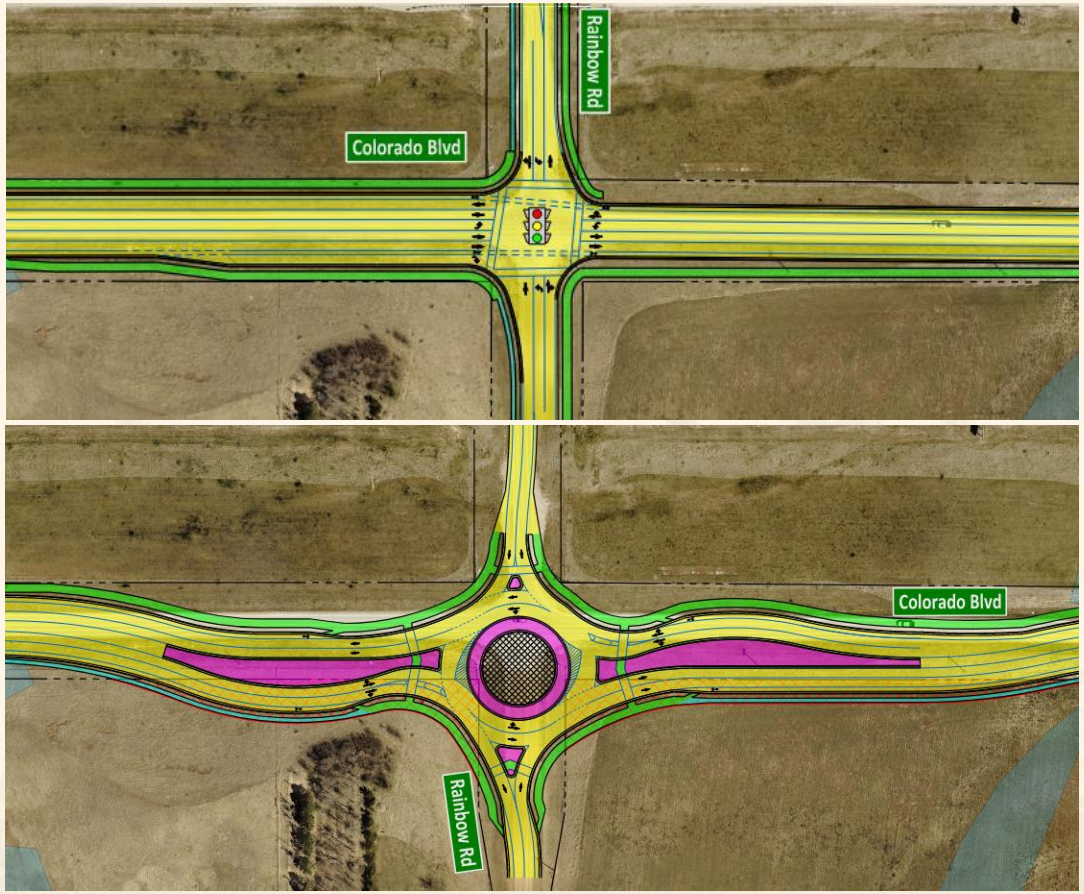
Maitland Road Intersection

Option 2 – Multilane Roundabout



Advantages	Disadvantages
Space for large truck turn around.	Right-in-Right-out for parcel access to SE of intersection.
Traffic calming.	More expensive than signal.
Reduced fatal and injury crashes compared to traditional signal.	Larger intersection footprint.
Reduced ped crossing distances.	

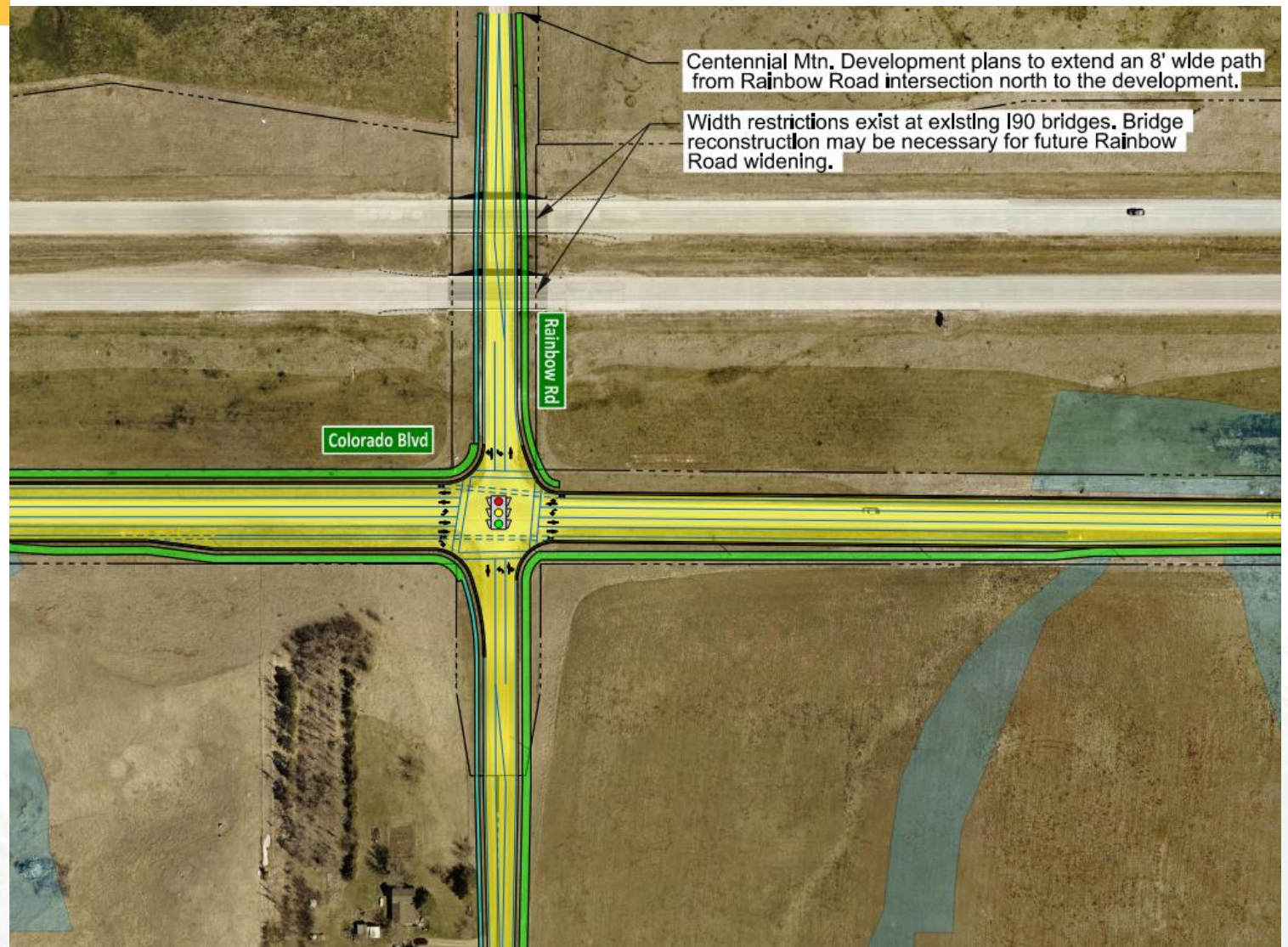
Rainbow Road Intersection



- Option 1 - Traditional Signal
- Option 2 - Roundabout

Rainbow Road Intersection

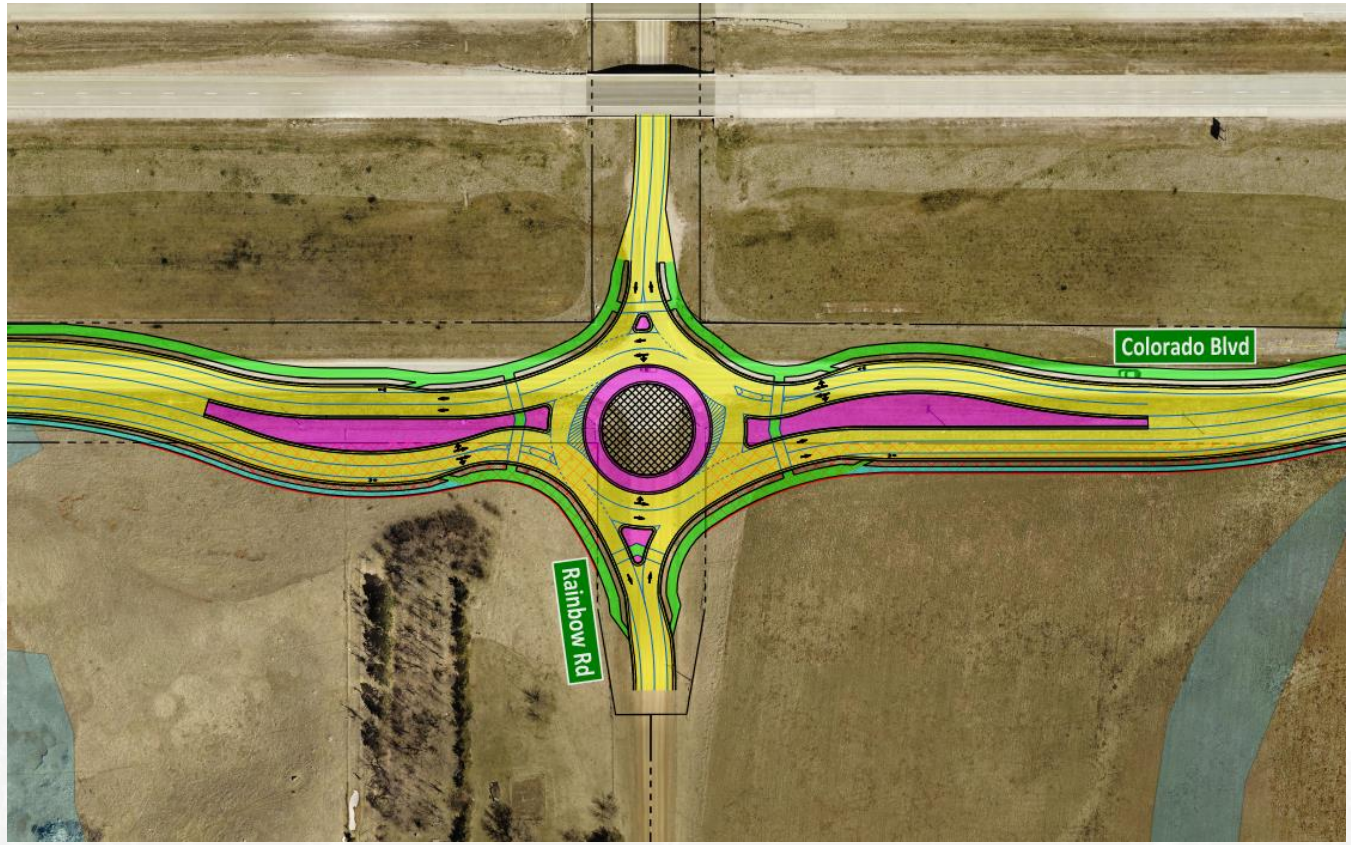
Option 1 – Traditional Signal



Advantages	Disadvantages
Familiar intersection type.	Requires I90 bridge replacements if NB/SB turn lanes were added.
Smaller intersection footprint.	Not enough space for large truck turn around.
	Longer ped crosswalk distances.
	Higher fatal and injury crashes compared to roundabout.
	More expensive than roundabout.

Rainbow Road Intersection

Option 2 – Multilane Roundabout



Advantages	Disadvantages
Space for large truck turn around.	Larger intersection footprint.
Traffic calming.	More ROW acquisition required.
Reduced fatal and injury crashes compared to traditional signal.	
Reduced ped crossing distances.	
Less expensive than signal.	

Intersection Options

Comparative Matrix

Intersection	Concept No. & Description	2050 Traffic Operations	Comparative Predictive Safety	Comparative Construction Costs (2)	ROW Needs	Wetland Impacts	Private Business Access Restrictions	Other Considerations
		Level of Service (AM/PM)	Percent Change in Crashes (1)	$2023	Acres	Acres	No. of Drives	
27th St Intersection	T1 - Traditional Signal with Capacity Improvements	C / C	-5%	$1.4 M	0.00	0.01	-	A Leading Pedestrian Interval (LPI) can be added to enhance pedestrian safety. Signal operations would operate with slightly more delay but still operate at an acceptable LOS C threshold.
Heritage Dr Intersection	H1 - Traditional Signal	B / A	-34%	$2.5 M	0.02	0.00	RIRO at 2 drive	Provides opportunity for passenger cars to turn around. Familiar intersection type. Pedestrian crosswalk across both Colorado Blvd and Heritage Dr.
	H2 - Continuous Green Tee	B / B	-39%	$2.5 M	0.02	0.00	RIRO at 5 drives	Operates with more delay than signalized intersection. Presents a potential weaving issue due to the close proximity between the Heritage Drive and 27th Street intersections Pedestrian crosswalk only across Heritage Dr. More restrictions on surrounding private driveways.
Maitland St Intersection	M1 - Traditional Signal	B / A	-6%	$2.2 M	0.00	0.06	-	Familiar intersection type.
	M2 - Roundabout	A / A	-18% to +3%	$2.7 M	0.00	0.07	RIRO at 1 drive	Provides opportunity for large trucks to turn around. Traffic calming. Reduced fatal and injury crashes compared to traditional signal. Crossing distances lower for pedestrians with splitter islands that allow pedestrians to focus on one direction at a time. Larger intersection footprint.
Rainbow Rd Intersection	R1 - Traditional Signal	B / B	-38%	$3.8 M	0.00	0.00	-	NB/SB turn lanes needed on Rainbow Road at end of planning horizon. Requires I90 bridge replacements if turn lanes were added. Familiar intersection type.
	R2 - Roundabout	B / B	-38% to -23%	$3.5 M	0.81	0.00	-	Provides opportunity for large trucks to turn around. Traffic calming. Reduced fatal and injury crashes compared to traditional signal. Crossing distances lower for pedestrians with splitter islands that allow pedestrians to focus on one direction at a time. Larger intersection footprint.

(1) Crash reduction based on a comparison with the no-build alternative over the evaluation period of 2027-2050. Roundabout intersections have a range of results since the proposed configuration is a hybrid of a single/multi-lane roundabout.
(2) Includes north shared use path costs for comparative purposes.

Corridor Build Alternatives

- **Segments**
  - Number of Lanes
  - **Shared Use Path/Sidewalk**
  - Bike Lanes
- Intersections

Recreation Path Options

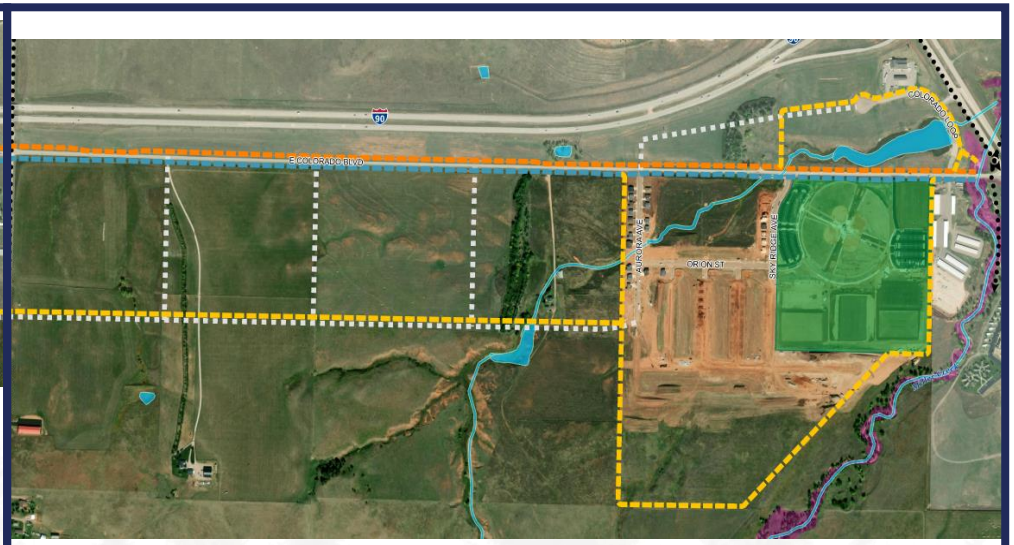
Segments & Options

Proposed Recreation Path Option

- North Option Alignment
- South Option Alignment
- Offset Option Alignment

Segment 1
27th Street to False Bottom Creek

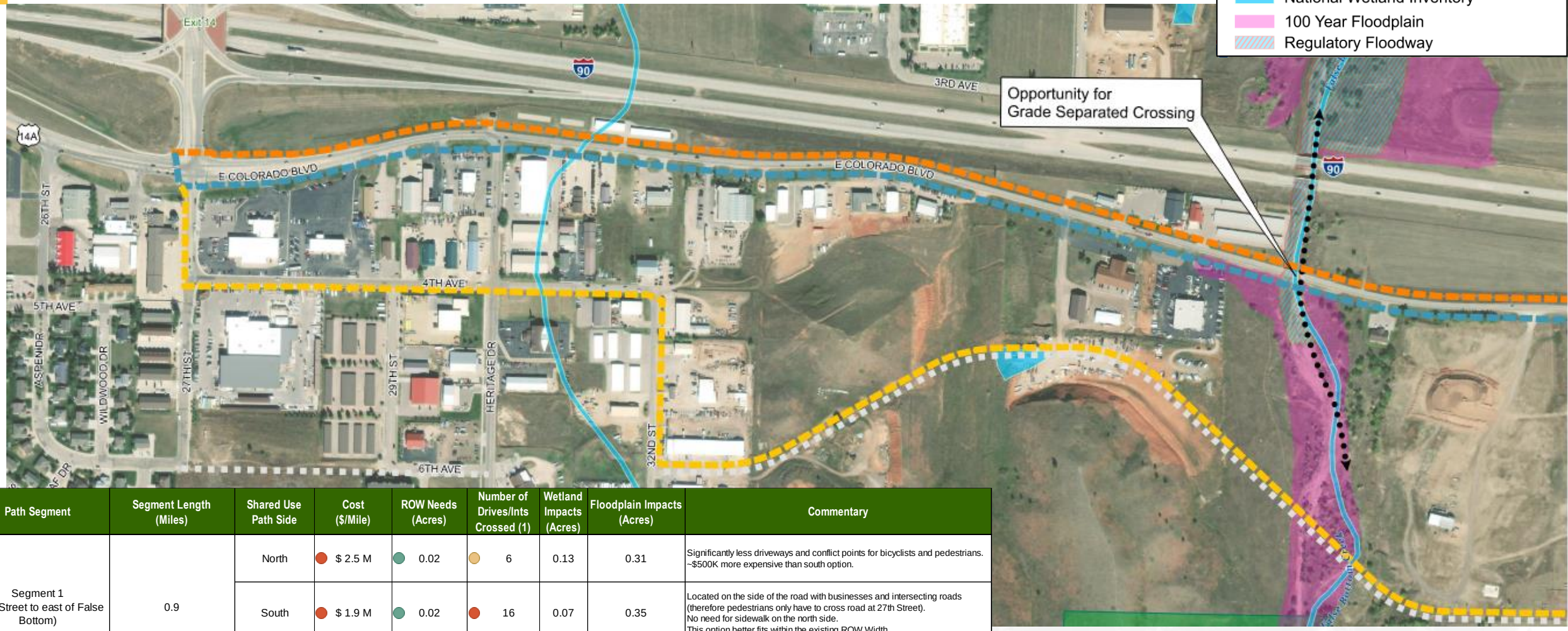
Segment 2
False Bottom Creek to Rainbow Road



Segment 3
Rainbow Road to Miller Creek

Recreation Path Options

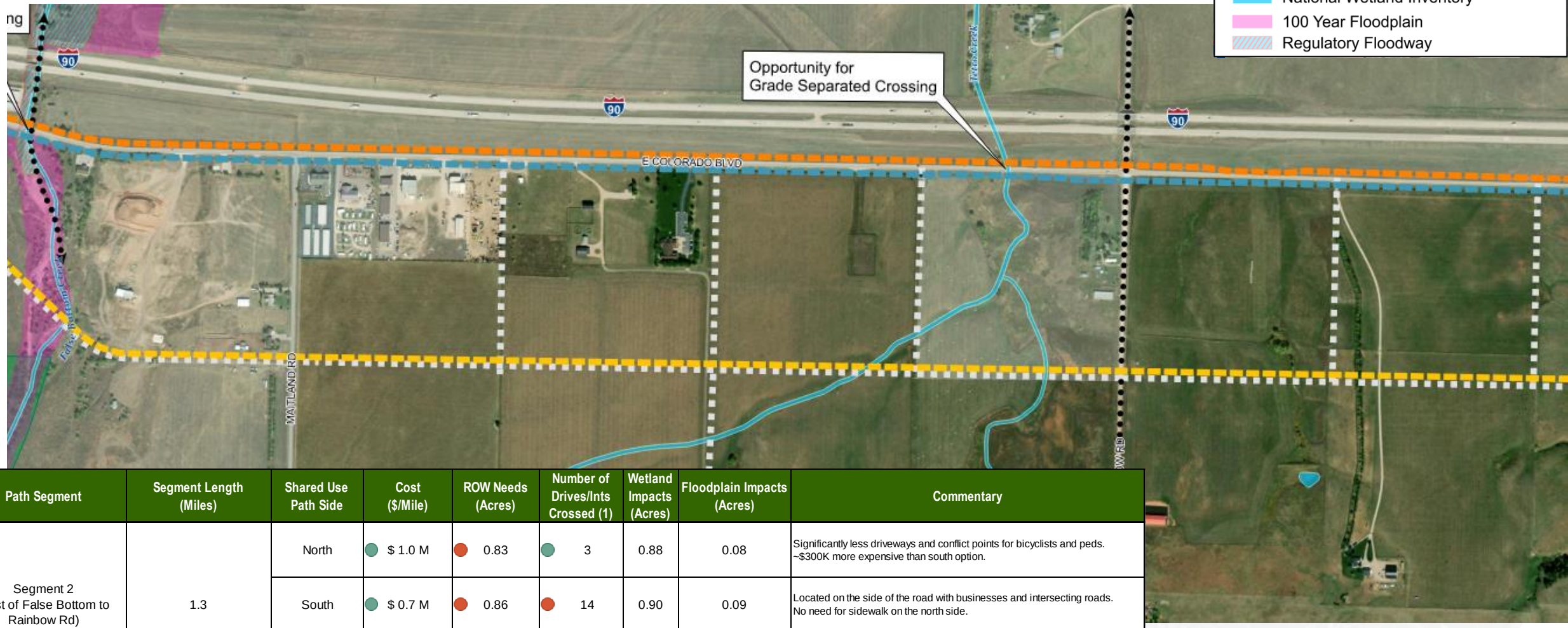
Segment 1 - 27th Street to False Bottom Creek



Path Segment	Segment Length (Miles)	Shared Use Path Side	Cost ($/Mile)	ROW Needs (Acres)	Number of Drives/Ints Crossed (1)	Wetland Impacts (Acres)	Floodplain Impacts (Acres)	Commentary
Segment 1 (27th Street to east of False Bottom)	0.9	North	$ 2.5 M	0.02	6	0.13	0.31	Significantly less driveways and conflict points for bicyclists and pedestrians. ~$500K more expensive than south option.
		South	$ 1.9 M	0.02	16	0.07	0.35	Located on the side of the road with businesses and intersecting roads (therefore pedestrians only have to cross road at 27th Street). No need for sidewalk on the north side. This option better fits within the existing ROW Width.
		Off Alignment	$ 2.0 M	(2)	10	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress. Delayed construction since secondary E-W roadway is developer driven.

Recreation Path Options

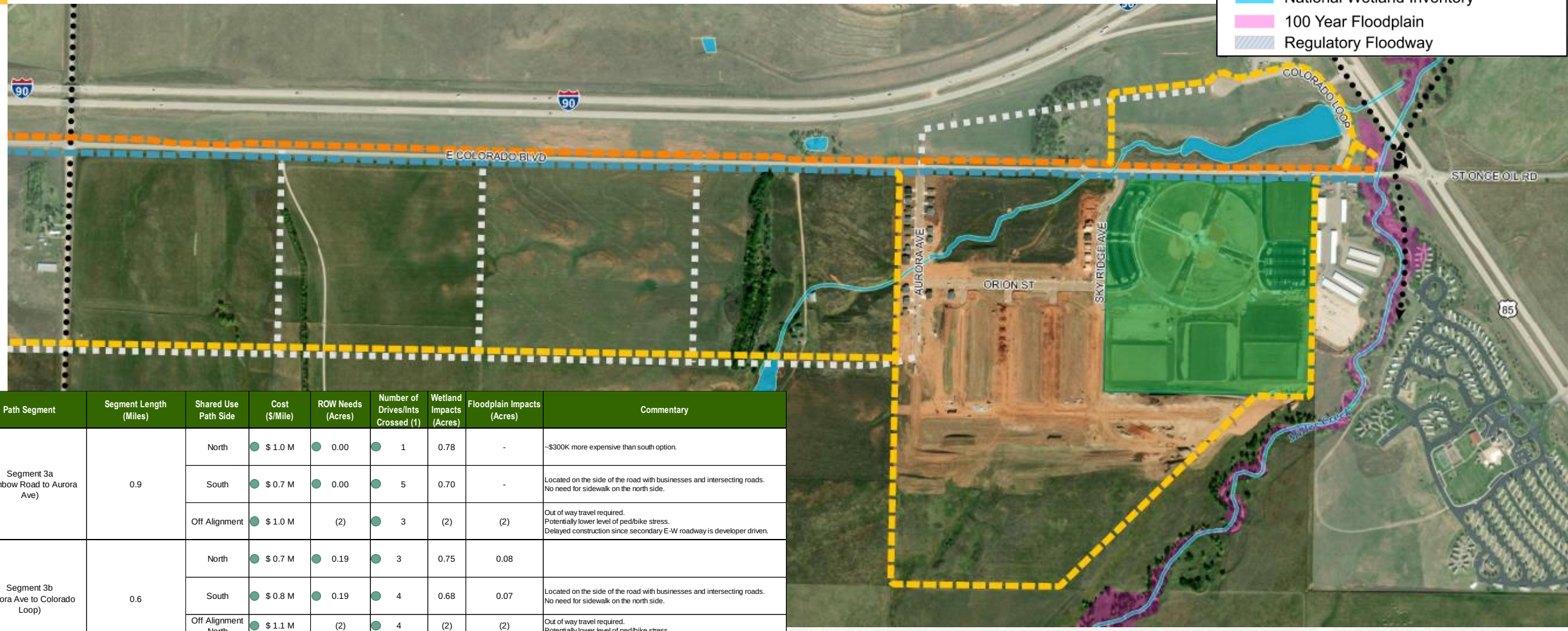
Segment 2 - False Bottom Creek to Rainbow Road



Path Segment	Segment Length (Miles)	Shared Use Path Side	Cost ($/Mile)	ROW Needs (Acres)	Number of Drives/Ints Crossed (1)	Wetland Impacts (Acres)	Floodplain Impacts (Acres)	Commentary
Segment 2 (east of False Bottom to Rainbow Rd)	1.3	North	$ 1.0 M	0.83	3	0.88	0.08	Significantly less driveways and conflict points for bicyclists and peds. ~$300K more expensive than south option.
		South	$ 0.7 M	0.86	14	0.90	0.09	Located on the side of the road with businesses and intersecting roads. No need for sidewalk on the north side.
		Off Alignment	$ 1.0 M	(2)	5	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress. Delayed construction since secondary E-W roadway is developer driven.

Recreation Path Options

Segment 3 - Rainbow Road to Miller Creek



Path Segment	Segment Length (Miles)	Shared Use Path Side	Cost ($/Mile)	ROW Needs (Acres)	Number of Drives/Ints Crossed (1)	Wetland Impacts (Acres)	Floodplain Impacts (Acres)	Commentary
Segment 3a (Rainbow Road to Aurora Ave)	0.9	North	$ 1.0 M	0.00	1	0.78	-	~$300K more expensive than south option.
		South	$ 0.7 M	0.00	5	0.70	-	Located on the side of the road with businesses and intersecting roads. No need for sidewalk on the north side.
		Off Alignment	$ 1.0 M	(2)	3	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress. Delayed construction since secondary E-W roadway is developer driven.
Segment 3b (Aurora Ave to Colorado Loop)	0.6	North	$ 0.7 M	0.19	3	0.75	0.08	
		South	$ 0.8 M	0.19	4	0.68	0.07	Located on the side of the road with businesses and intersecting roads. No need for sidewalk on the north side.
		Off Alignment North	$ 1.1 M	(2)	4	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress.
		Off Alignment South	$ 2.0 M	(2)	5	(2)	(2)	Significant out of way travel required. Potentially lower level of ped/bike stress.

(1) includes future driveways and minor/major intersections
(2) ROW and environmental impact data unavailable for the off-alignment options.

Recreation Path Options

Comparative Matrix

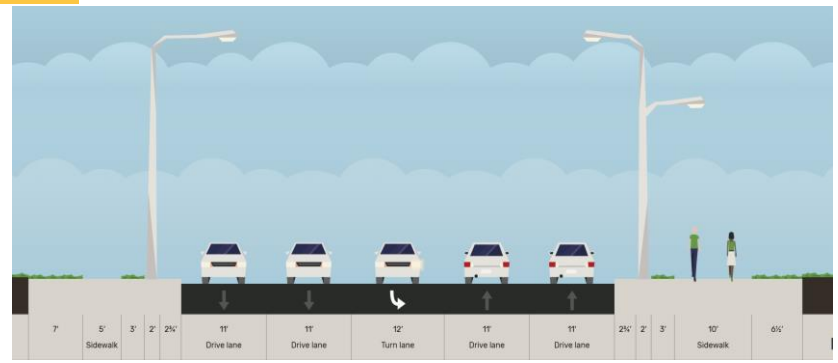
Path Segment	Segment Length (Miles)	Shared Use Path Side	Cost ($/Mile)	ROW Needs (Acres)	Number of Drives/Ints Crossed (1)	Wetland Impacts (Acres)	Floodplain Impacts (Acres)	Commentary
Segment 1 (27th Street to east of False Bottom)	0.9	North	$ 2.5 M	0.02	6	0.13	0.31	Significantly less driveways and conflict points for bicyclists and pedestrians. ~$500K more expensive than south option.
		South	$ 1.9 M	0.02	16	0.07	0.35	Located on the side of the road with businesses and intersecting roads (therefore pedestrians only have to cross road at 27th Street). No need for sidewalk on the north side. This option better fits within the existing ROW Width.
		Off Alignment	$ 2.0 M	(2)	10	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress. Delayed construction since secondary E-W roadway is developer driven.
Segment 2 (east of False Bottom to Rainbow Rd)	1.3	North	$ 1.0 M	0.83	3	0.88	0.08	Significantly less driveways and conflict points for bicyclists and peds. ~$300K more expensive than south option.
		South	$ 0.7 M	0.86	14	0.90	0.09	Located on the side of the road with businesses and intersecting roads. No need for sidewalk on the north side.
		Off Alignment	$ 1.0 M	(2)	5	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress. Delayed construction since secondary E-W roadway is developer driven.
Segment 3a (Rainbow Road to Aurora Ave)	0.9	North	$ 1.0 M	0.00	1	0.78	-	~$300K more expensive than south option.
		South	$ 0.7 M	0.00	5	0.70	-	Located on the side of the road with businesses and intersecting roads. No need for sidewalk on the north side.
		Off Alignment	$ 1.0 M	(2)	3	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress. Delayed construction since secondary E-W roadway is developer driven.
Segment 3b (Aurora Ave to Colorado Loop)	0.6	North	$ 0.7 M	0.19	3	0.75	0.08	
		South	$ 0.8 M	0.19	4	0.68	0.07	Located on the side of the road with businesses and intersecting roads. No need for sidewalk on the north side.
		Off Alignment North	$ 1.1 M	(2)	4	(2)	(2)	Out of way travel required. Potentially lower level of ped/bike stress.
		Off Alignment South	$ 2.0 M	(2)	5	(2)	(2)	Significant out of way travel required. Potentially lower level of ped/bike stress.

(1) includes future driveways and minor/major intersections
(2) ROW and environmental impact data unavailable for the off-alignment options.

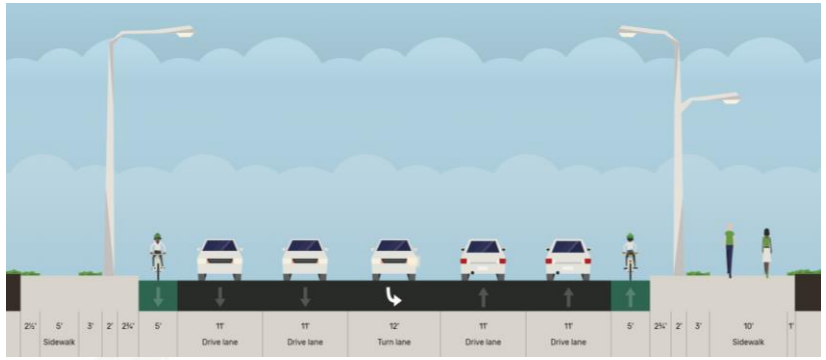
Corridor Build Alternatives

- **Segments**
  - Number of Lanes
  - Shared Use Path/Sidewalk
  - **Bike Lanes**
- Intersections

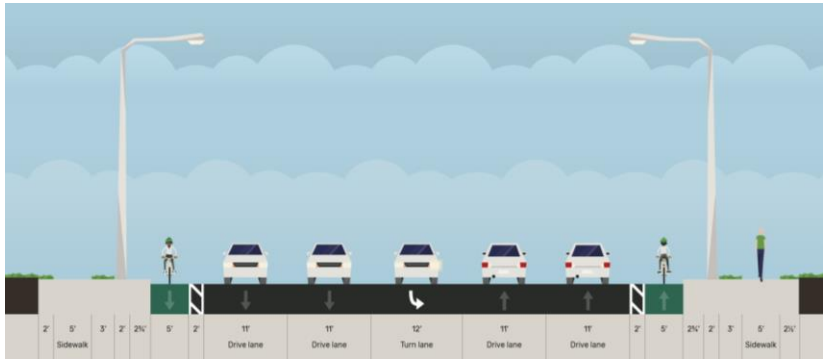
Bike Lane Options



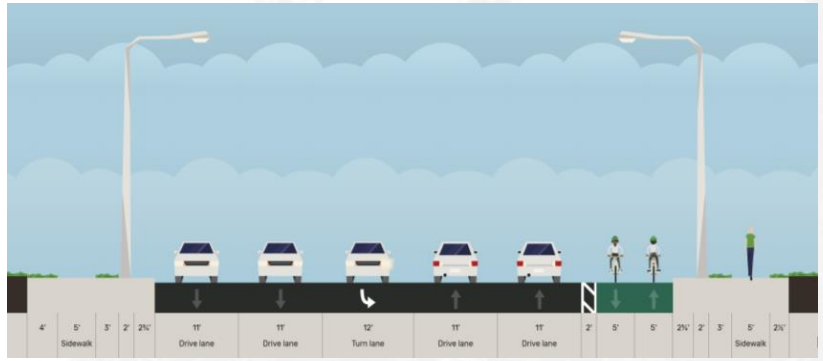
Option 1: No Bike Lanes
+ Rec Path
$319/Ft → $6.5 Million



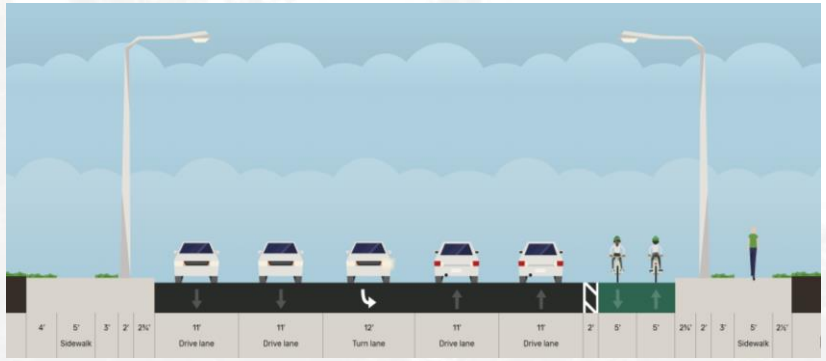
Option 2: Conventional Bike Lanes
+ Rec Path
$447/Ft → $9.1 Million



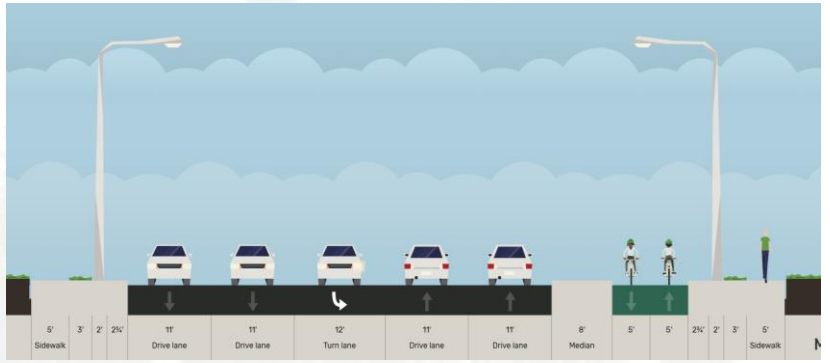
Option 3a: 1-way Buffered Bike Lanes
+ No Rec Path
$346/Ft → $7.1 Million



Option 3b: 2-way Buffered Bike Lanes
+ No Rec Path
$320/Ft → $6.5 Million



Option 3c: 2-way Buffered Bike Lanes
+ Rec Path
$473/Ft → $9.6 Million

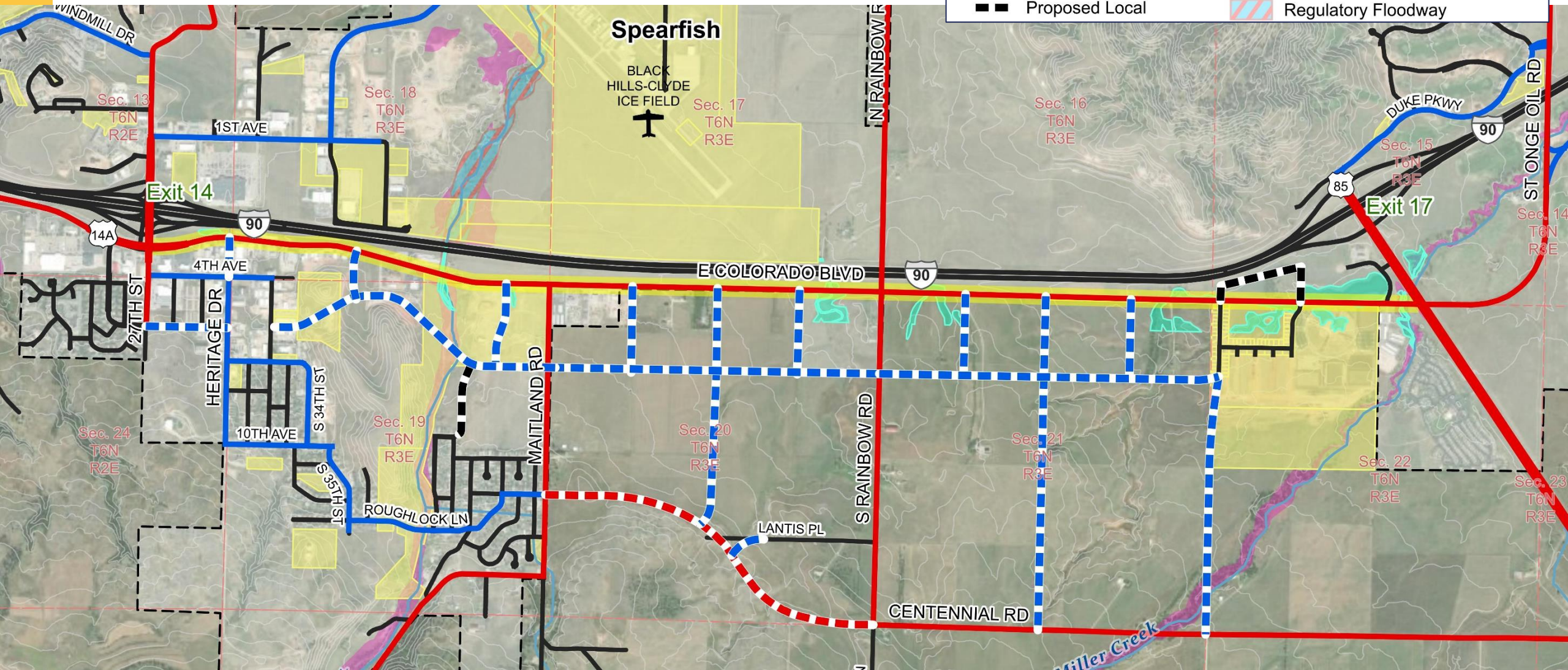


Option 4: 2-way Protected Bike Lanes
+ No Rec Path
$486/Ft → $9.9 Million

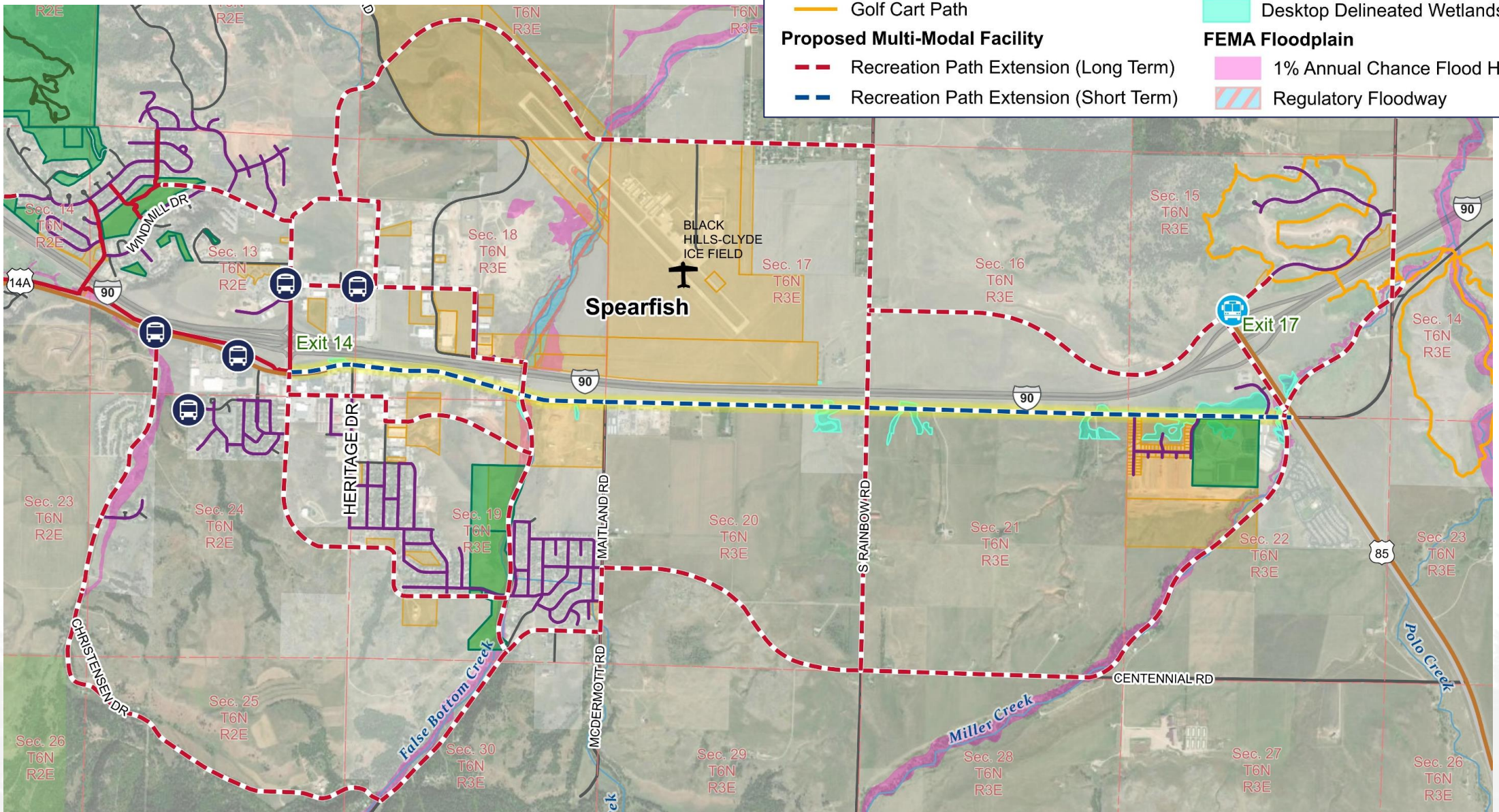
Future Transportation Network

- Roadway Network
- Future Multi-modal Network

Future Roadway Network



Future Multi-modal Network



Please provide your thoughts and feedback on…

- Corridor concepts & analysis

Opportunities to provide feedback:

- Handout/Comment card
- Boards
- Study contacts
- Website: www.ColoradoBlvdCorridorStudy.com

Next Steps

- Comments by September 24th
- Summarize and consider public feedback.
- Provide preliminary recommendations to Study Advisory Team.

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