

ST3047: Butler-Fourth Improvements Project

Sustainability Commission

Project Update

September 28, 2023



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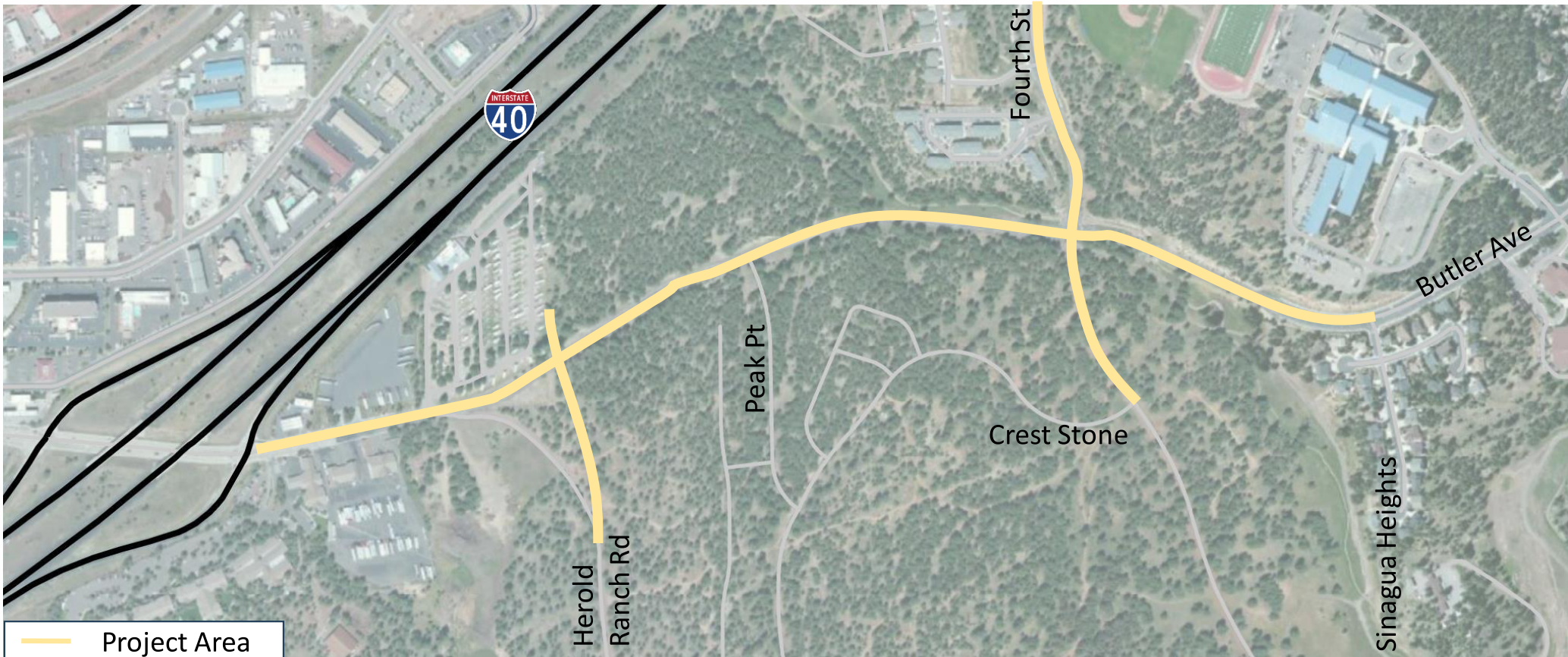
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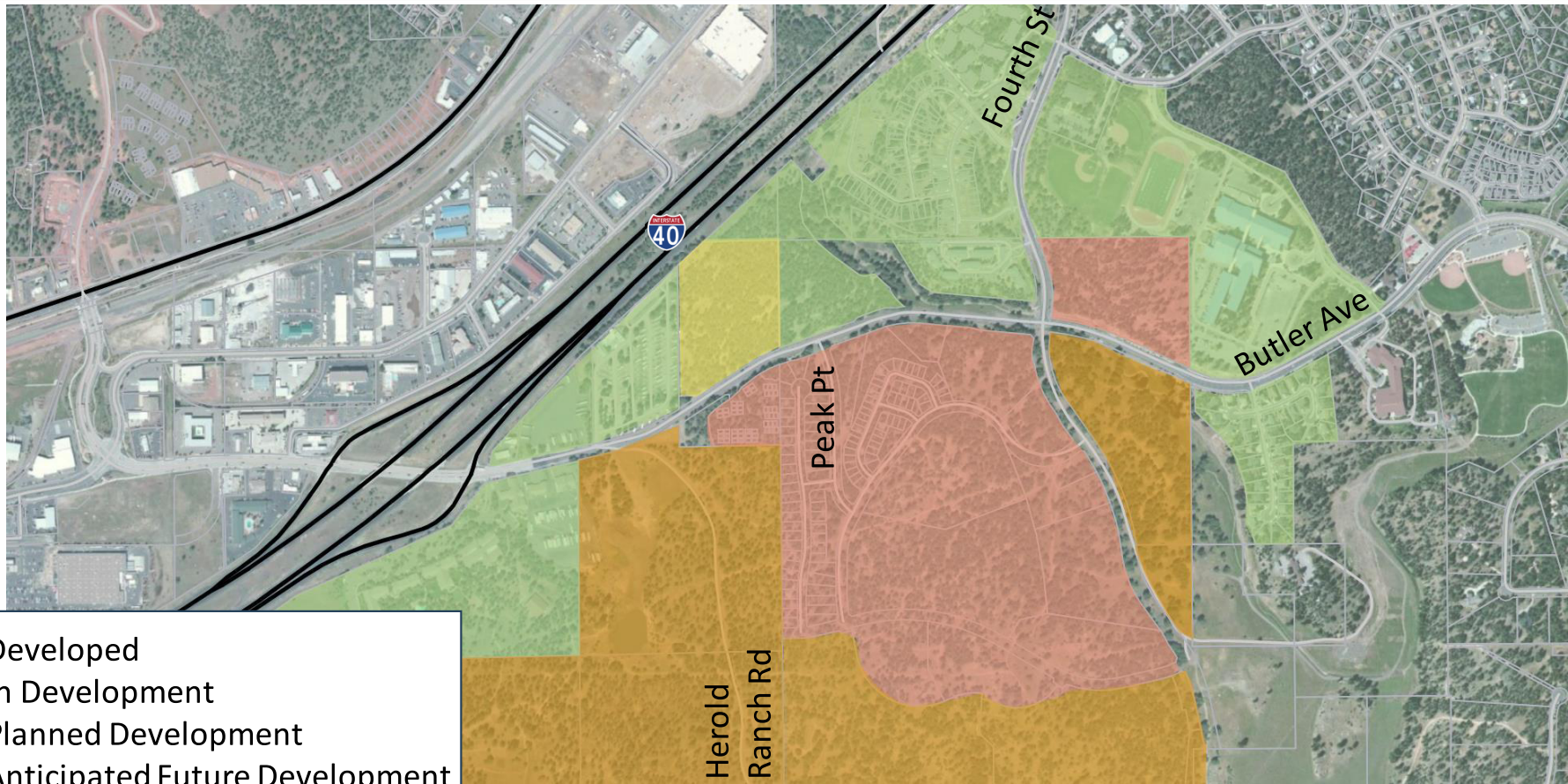
Project Limits



Project Background

- Widen existing two-lane section to four-lane section with median
 - Butler Ave from I-40 to Sinagua Heights Dr
 - Fourth St from Sparrow Ave to Whetstone Dr (Canyon Del Rio)
- Funded by Propositions 403 & 419 and Developer Contributions
- Butler Ave & Herold Ranch Rd intersection to become a roundabout
 - Access Control-Truck U-Turns
- Alternatives evaluated at Butler Ave/Fourth St intersection
- Scoping/Outreach Phase

Project Background

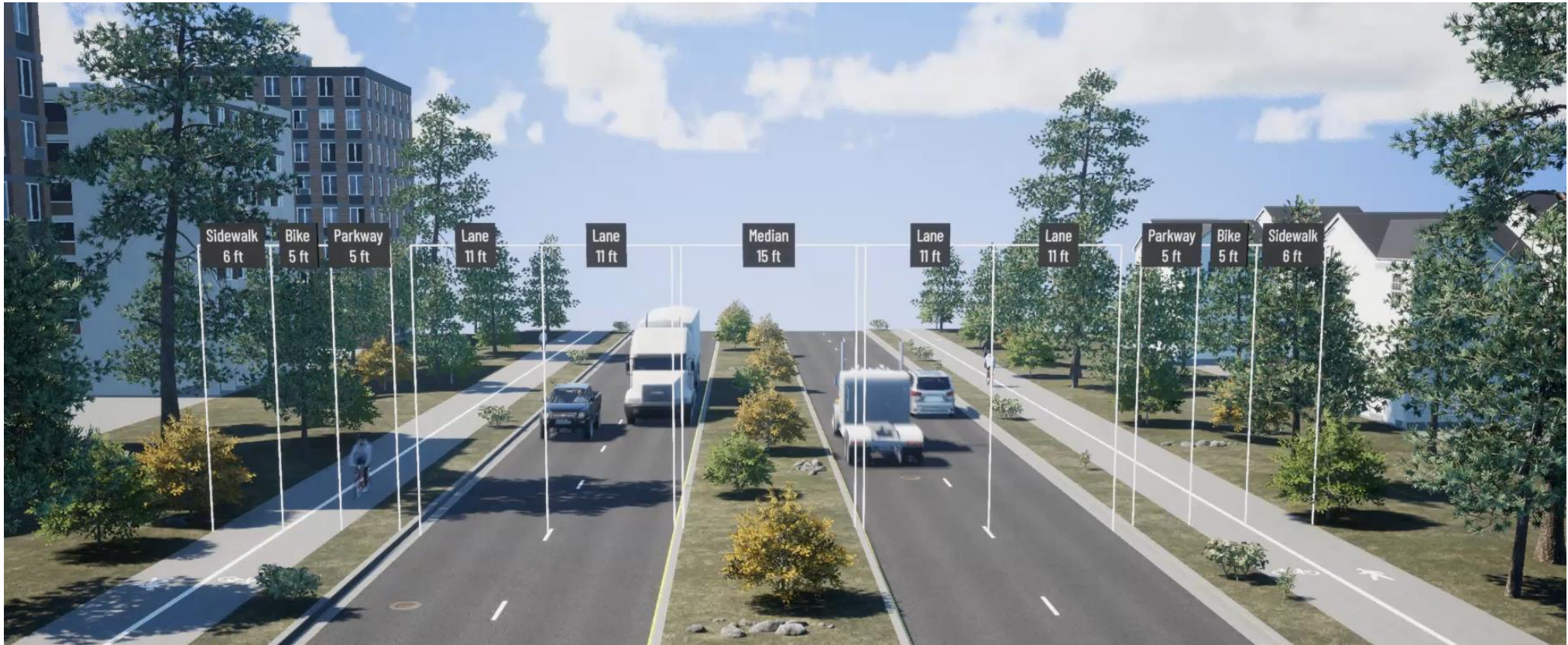


- Developed
- In Development
- Planned Development
- Anticipated Future Development

Project Goals

- Improved facilities for all modes and users of the corridor
- Regional Plan
 - Increase roadway capacity to follow approved development and zoning
- Carbon Neutrality Plan
- Active Transportation Master Plan
- Flagstaff in Motion 2023, A Community Transit Plan
- Achieve highest level of safety for all users
 - Vision Zero Alignment

Corridor Typical Section



Bicycle and Pedestrian Treatments

- Off street bike lane and sidewalk
 - Directional Bike Lane
 - Protected intersection crossings

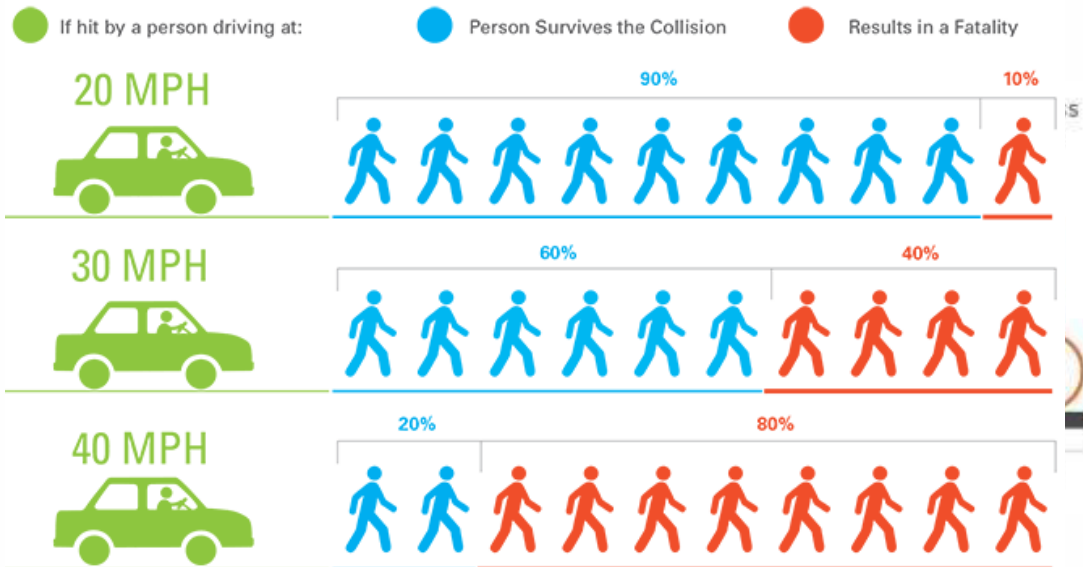
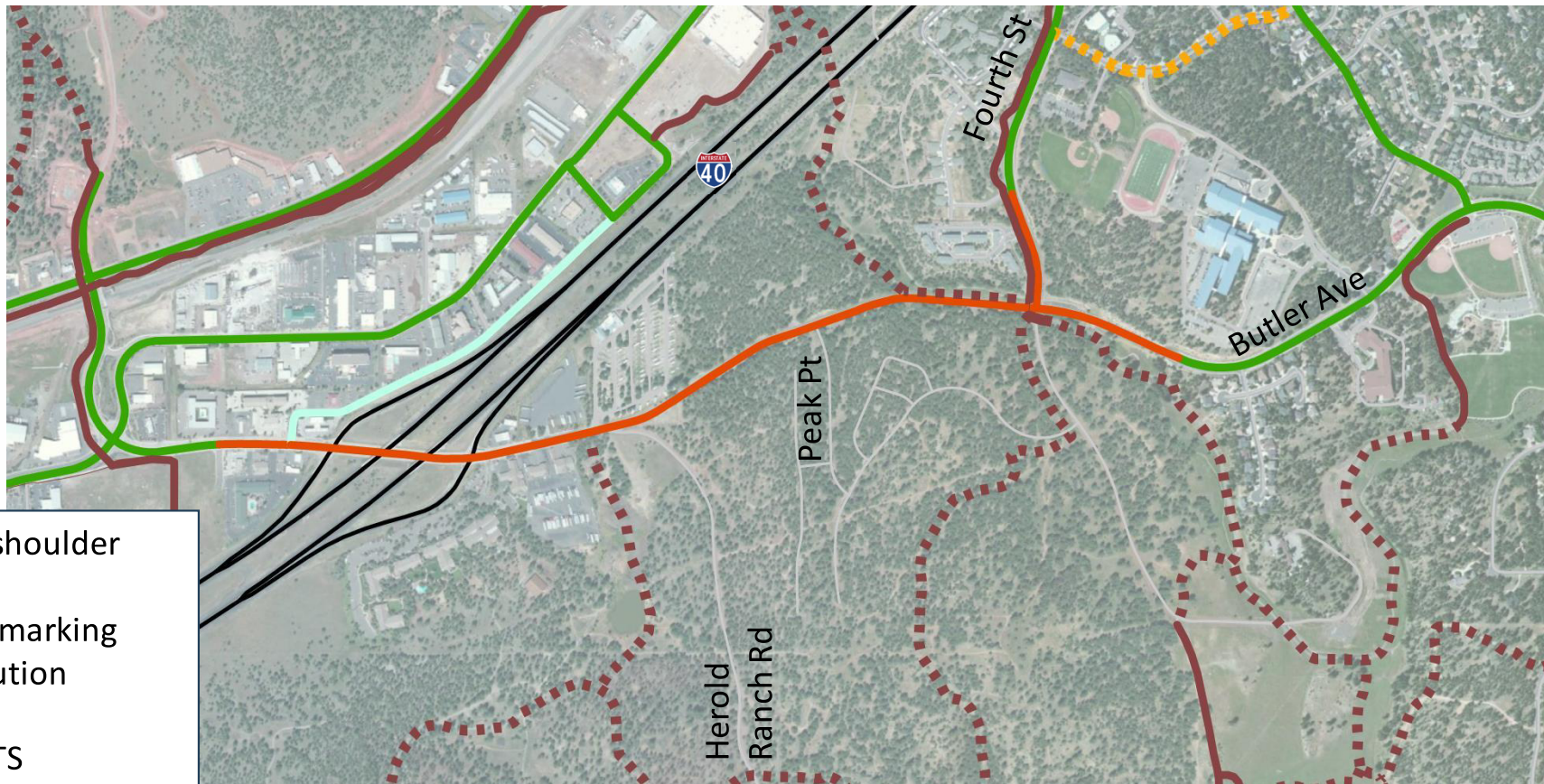


Image credit: San Francisco MTA Vision Zero Action Plan, Feb 2015

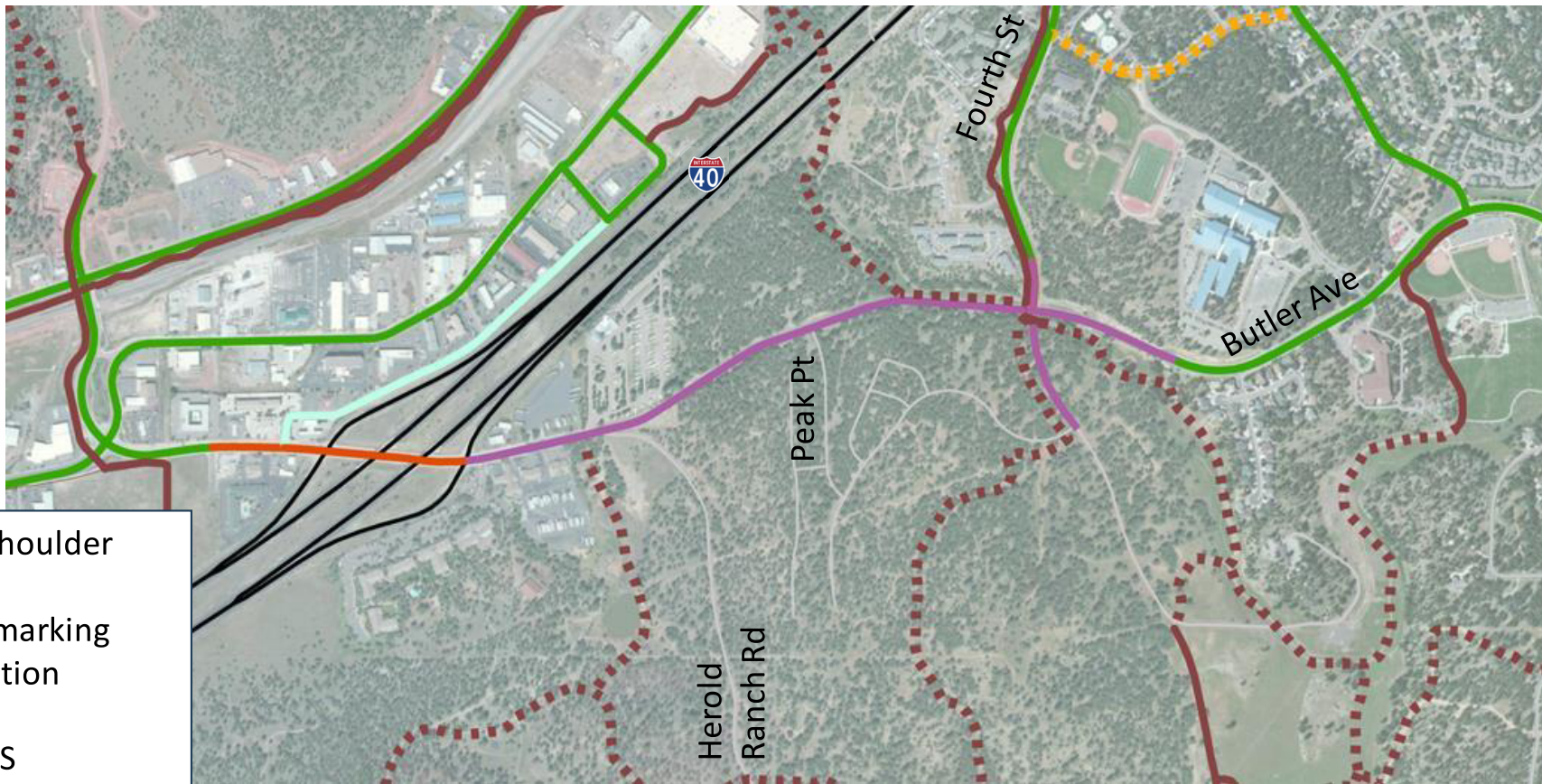


Bicycle and Pedestrian Treatments



-  Bike lane or shoulder
-  Bike route
-  Shared Lane marking
-  Ride with caution
-  Paved FUTA
-  Unpaved FUTA
-  ST3047 Buffered Path

Bicycle and Pedestrian Treatments



-  Bike lane or shoulder
-  Bike route
-  Shared Lane marking
-  Ride with caution
-  Paved FULTS
-  Unpaved FULTS
-  ST3047 Buffered Path

Pedestrian and Transit Treatments



Butler-Fourth Intersection Alternatives Selection



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Alternative Evaluation Timeline

- Initial Alternatives Workshop
- 11 total alternatives evaluated
- Initial Screening meeting down to 3
- Project Team identified preferred alternative using multiple category evaluation

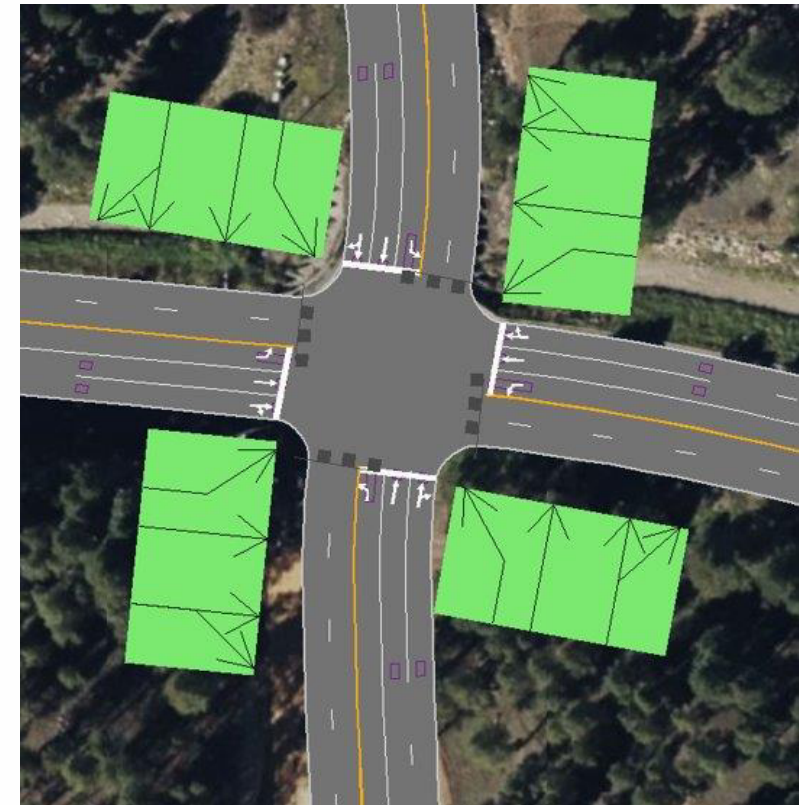
Additional Evaluated Alternatives – 5x5 Signalized

Benefits:

- Small intersection footprint
- Reduced ped/bike crossing lengths
- Protected intersection features

Drawbacks:

- Queuing Lengths
- Significant Delays
 - Does not meet City Standards



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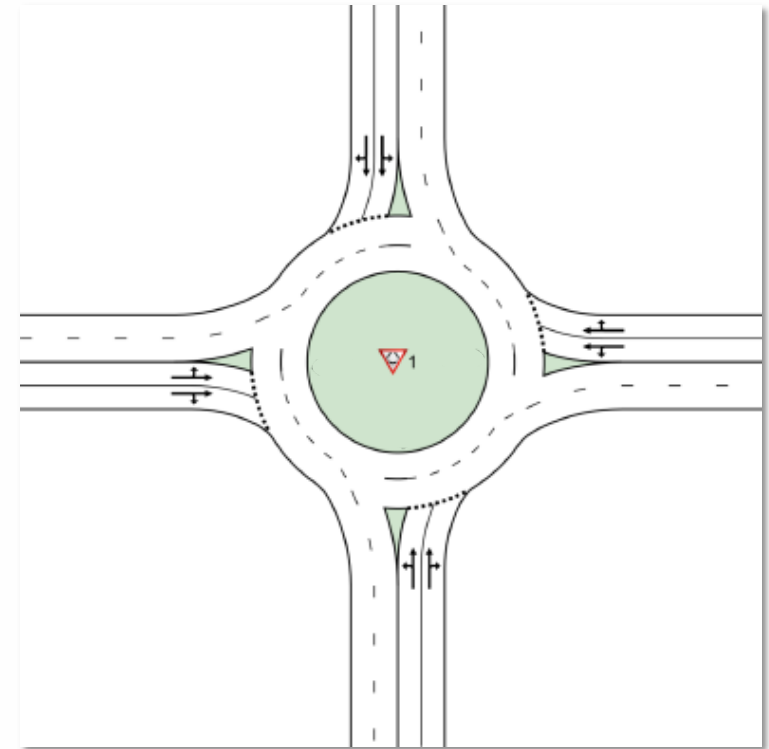
Additional Evaluated Alternatives – 2x2 Roundabout

Pros:

- Reduced pedestrian crossing lengths
- Reduced likelihood of high severity crashes

Cons:

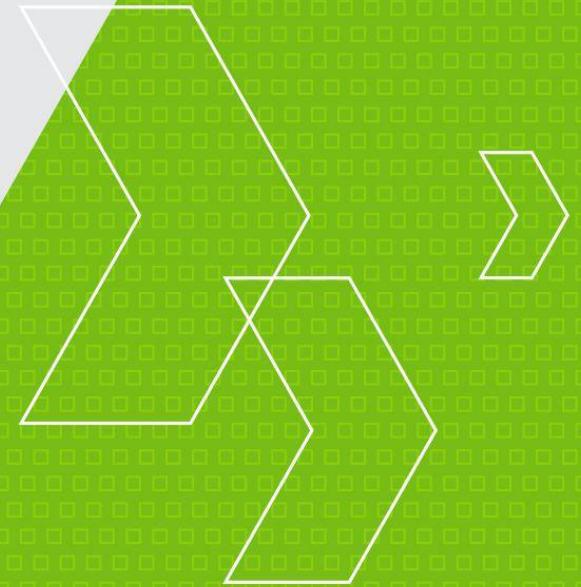
- Increased low severity crashes
- Significant Delays
 - Does not meet City Standards



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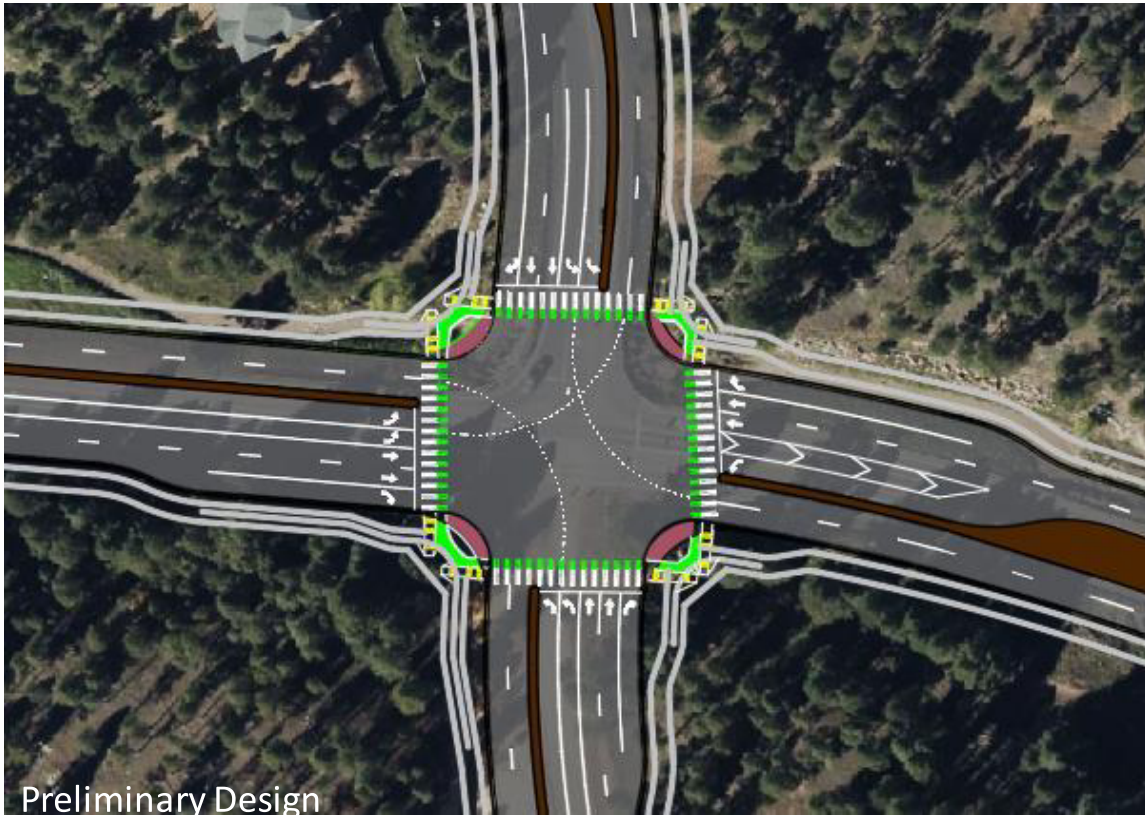
Candidate Alternatives

Three initial alternatives advanced towards preferred alternative selection



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Alternative A – Butler-Fourth 7x7 Intersection



Preliminary Design

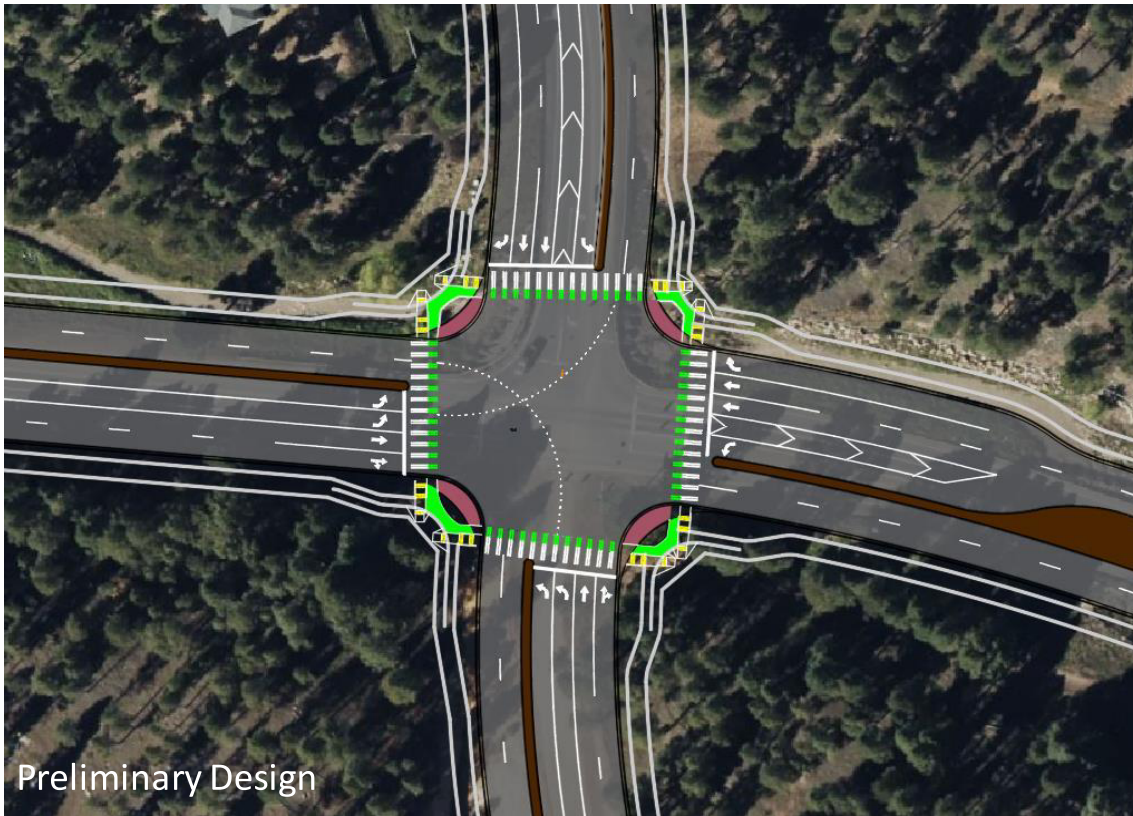
- Dual left-turn lanes in all directions except for westbound
- Designated right-turn lanes in all directions
- Protected intersection features

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Alternative A – Butler-Fourth 7x7 Intersection



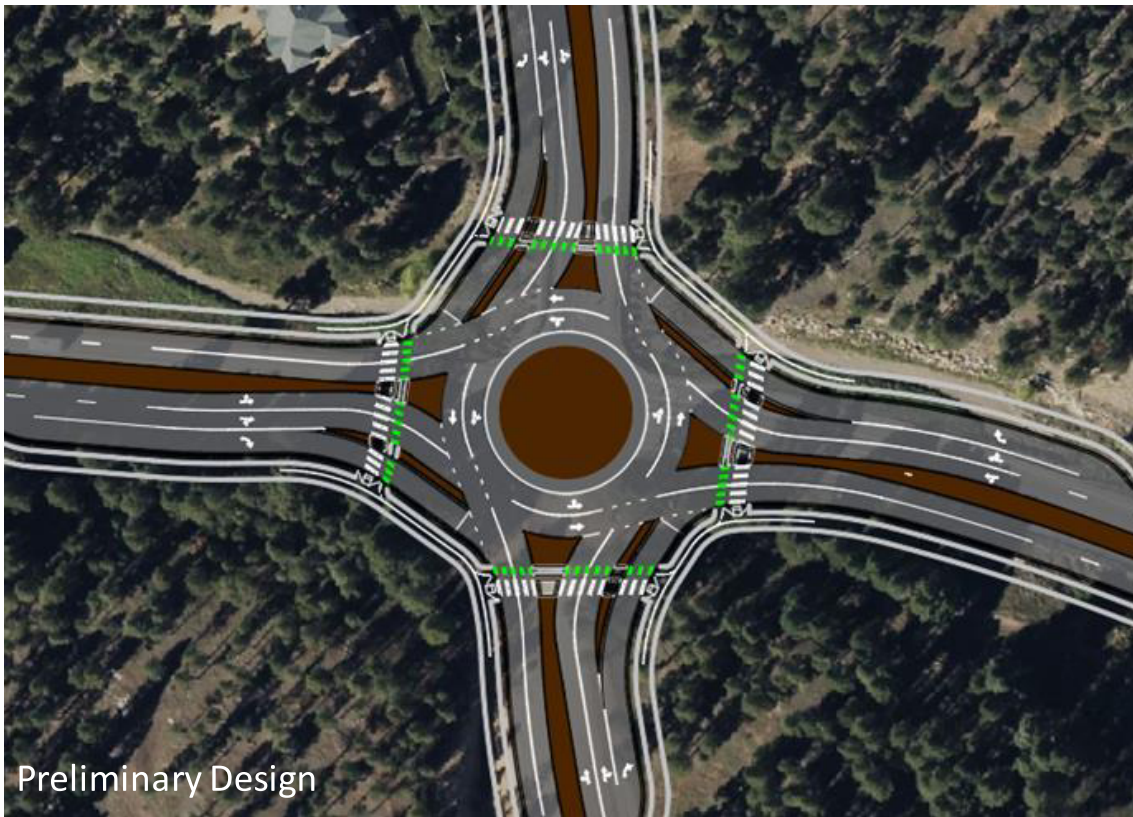
Alternative B – Butler-Fourth 6x6 Intersection



- Dual left-turn lanes in the north and east-bound directions
- Designated right-turn lane in the south and westbound directions
- Protected intersection features

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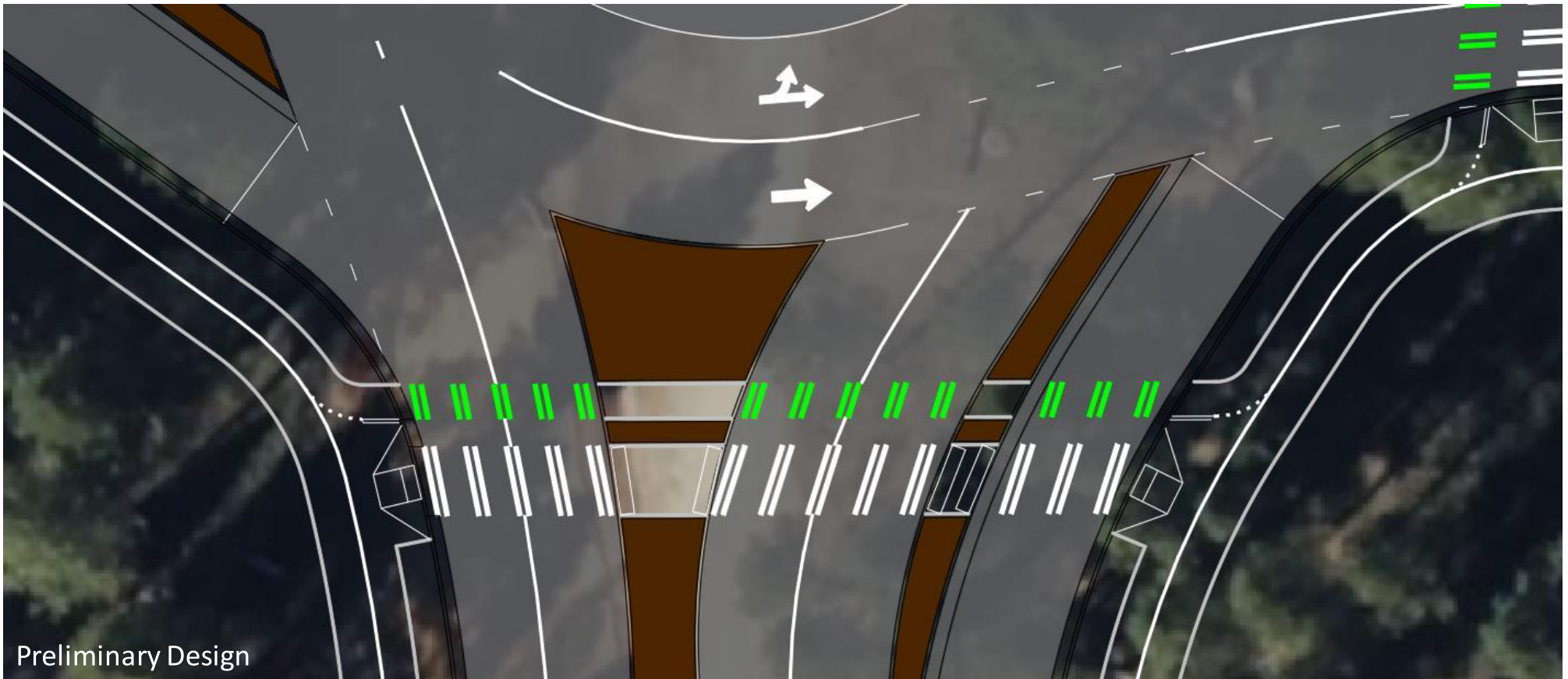
Alternative C – Butler-Fourth 2x2 Roundabout with channelized right turns



- Features channelized right-turn lanes
- 2 circulating lanes
- Rapid Flashing Beacon (RFB) for pedestrian crossings
- Will evaluate raised crosswalks at channelized lanes

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Alternative C – Butler-Fourth 2x2 Roundabout with channelized right turns



Preliminary Design

Review of Overall Matrix

Scoring Category	No-Build	ALT A: 7x7 Signalized Intersection	ALT B: 6x6 Signalized Intersection	ALT C: 2x2 Roundabout, Channelized Rights
1. Vehicular Operations	1	4	3	5
2. Truck Circulation	3	3	3	5
3. Transit Accommodation	3	1	3	3
4. Pedestrian/Bike Circulation	1	2	3	2
5. Predicted Crash Frequency (annual)	1	3	3	4
6. Pedestrian/Bike Interface	1	3	3	2
7. Cost and Land Impact Category	5	3	3	3
Total score:	15	19	21	24

Vehicular Operations

	No-Build	ALT A – 7x7 Intersection	ALT B – 6x6 Intersection	ALT C – 2x2 Roundabout, Channelized Rights
Level of Service (AM/PM)	<i>F/F</i>	<i>C/C</i>	<i>C/D</i>	<i>A/B</i>
Average Delay (sec.)	<i>91.35</i>	<i>31.30</i>	<i>37.15</i>	<i>11.05</i>
Annual Total Vehicle Miles Traveled (VMT)	1,256,492	1,254,988		
Annual Total Vehicle Hours Traveled (VHT)	116,243	115,784		
CO Emissions (g/hr)	<i>5,985</i>	<i>5,235</i>	<i>5,710</i>	<i>1,355</i>
NOx Emissions (g/hr)	<i>1,165</i>	<i>1,020</i>	<i>1,110</i>	<i>1,754</i>
Driver Expectation	Best	Good	Fair	Poor
Category Score	1	4	3	5

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Pedestrian and Bike Circulation

	No-Build	ALT A – 7x7 Intersection	ALT B – 6x6 Intersection	ALT C – 2x2 Roundabout, Channelized Rights
Pedestrian / Bike Comfort	Poor	Poor	Poor	Poor
Accessibility / Americans with Disabilities Act	Poor	Include all Current Standards		
Category Score	1	2	3	2

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Pedestrian and Bike Interface

	No-Build	ALT A – 7x7 Intersection	ALT B – 6x6 Intersection	ALT C – 2x2 Roundabout, Channelized Rights
Max Individual Crossing Length (ft)	70	94	94	30
Overall Crossing Length (ft)	70	94	94	118
Crossing Features	Crosswalks, No Landings	Stop Condition, Crosswalks		Rapid Flashing Beacons, Crosswalks
Vision Zero Alignment	Low	Fair	Fair	Good
Speeds	Faster	Faster	Faster	Slower
Medians / Refuge Islands	N/A	Partial	Partial	Full
Left Turn Phasing	Permissive	Protected	Protected	Eliminated
Ped/Bike Cross Section	Shoulder	Separated Path		
Protected Intersection Aspects	N/A	Pedestrian / Cycle Path Applied		
Intersection Lighting	Corners	Increased Lighting		
Category Score	1	3	3	2

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Sustainability Advisory Committee Ranking				

Questions

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Next Steps



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