

Butler-Fourth Improvements Project

Design Alternatives Discussion



BURGESS & NIPLE

Contents



- Introduction
 - Project Background
 - Project Goals
- Corridor Improvements
- Alternatives Overview
- Alternatives Matrix Scoring
- Commission and Committee Scoring
- Next Steps
- Council Direction



Project Team



City of Flagstaff Departments:

Capital Improvements

Transportation

Multimodal Planning

Sustainability

Water Services

Real Estate

Public Works

Parks, Recreation, Open Space,
Events (PROSE)

Stakeholders:

Mountain Line

Arizona Department of
Transportation

Commercial Properties



Project Limits





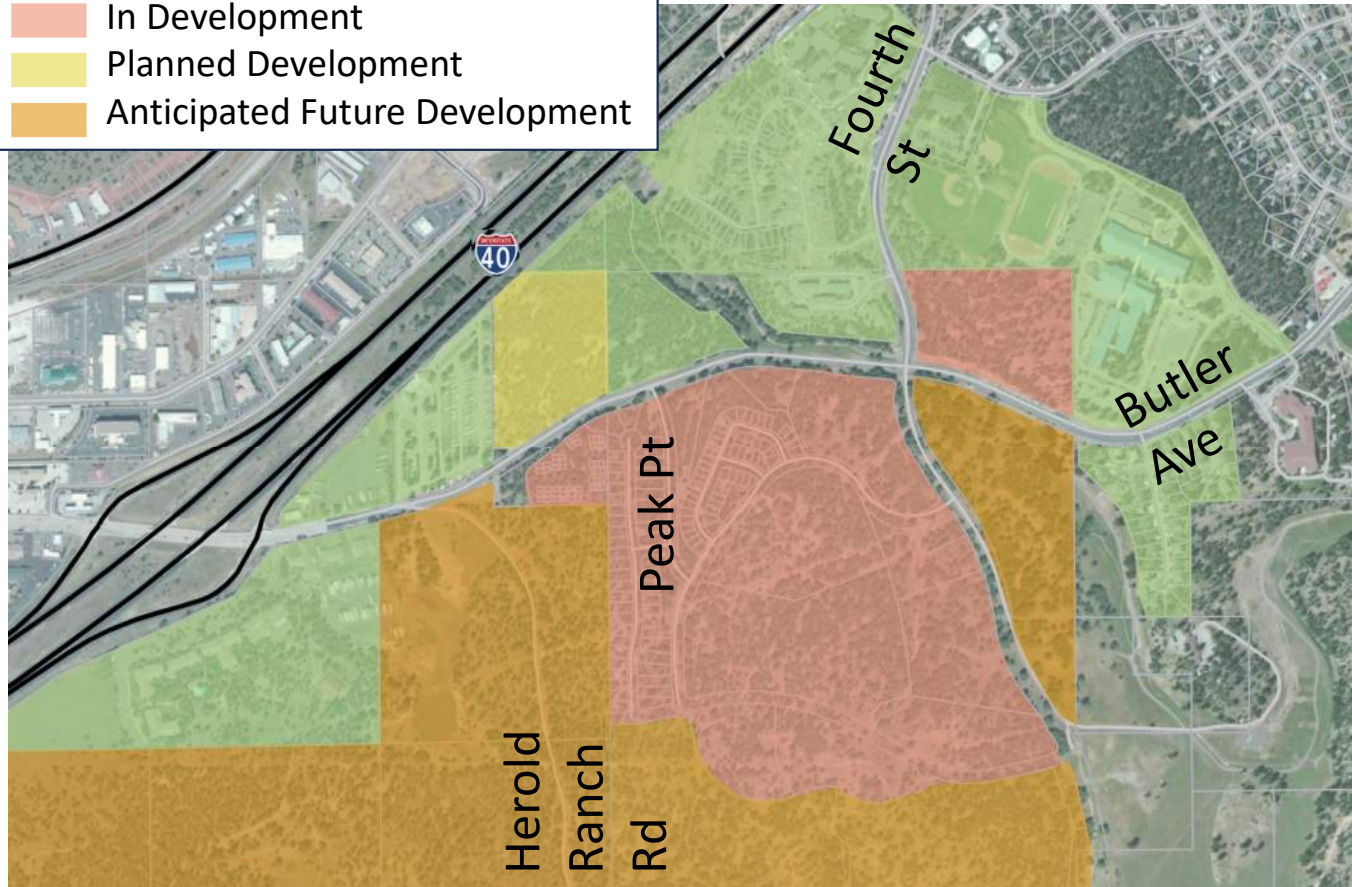
Project Background

- 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 Crest Stone 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
- Project is in Scoping/Outreach Phase



Project Background

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



Developments:

- Canyon Del Rio, North
- Canyon Del Rio, South
- The Bluffs of Flagstaff
- Woodshire on Butler
- Lofts on Butler
- Elkwood Apartments
- Juniper Point
- Symmetry
- State Trust Land



Project Goals



- Improved facilities for all modes and users of the corridor
- Adherence to:
 - 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: Only acceptable number of fatalities is zero

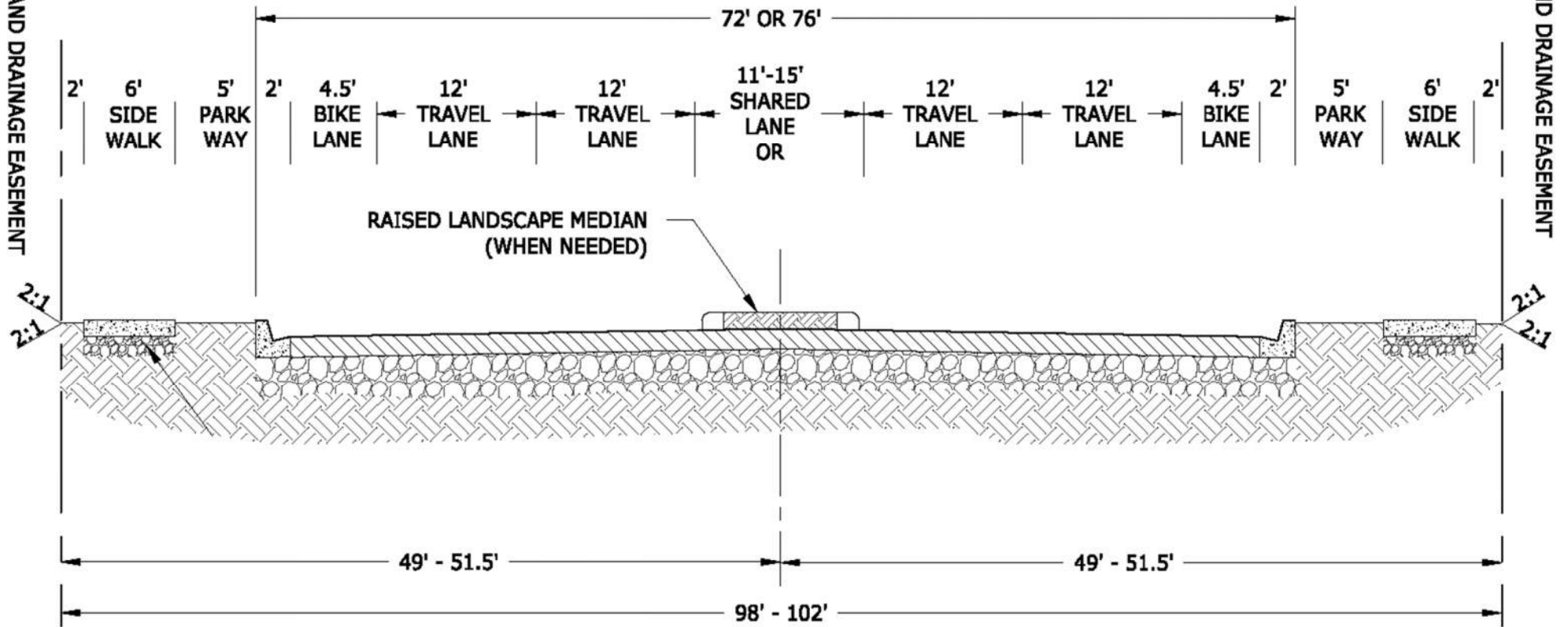


Corridor Typical Section



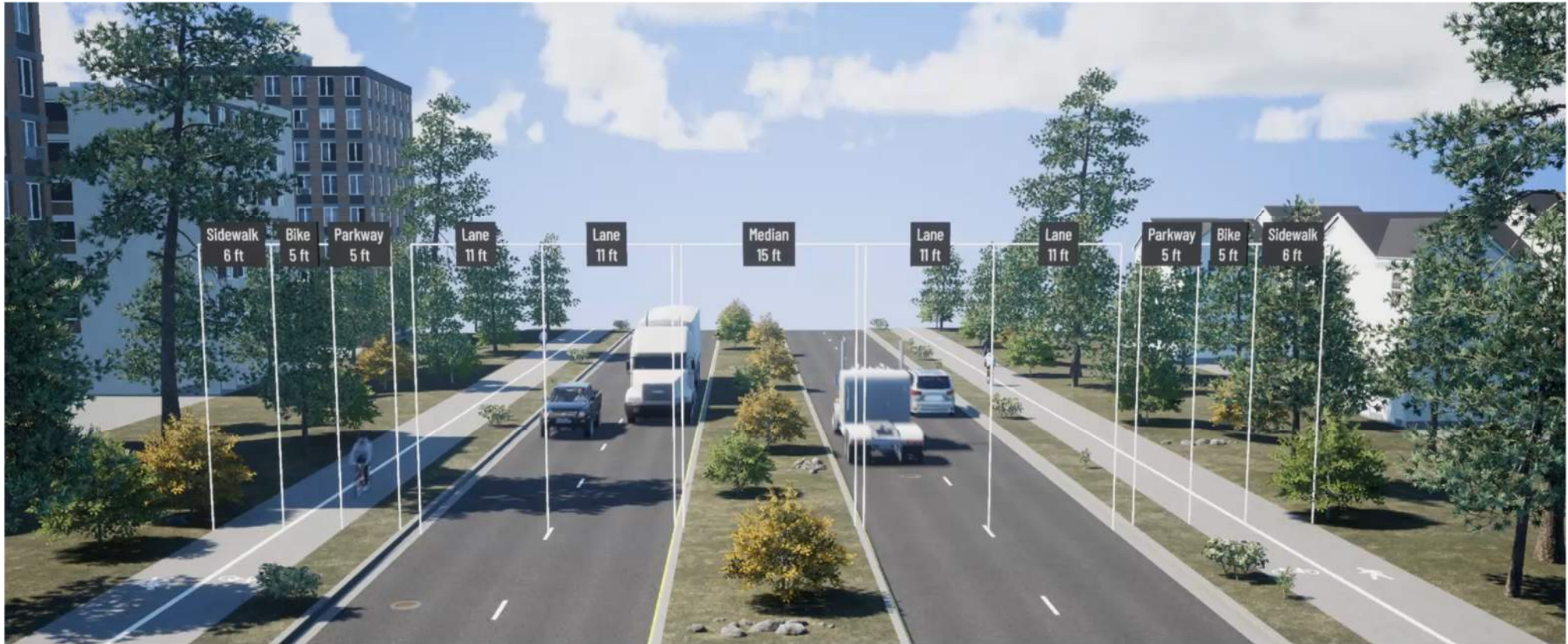
SLOPE AND DRAINAGE EASEMENT

SLOPE AND DRAINAGE EASEMENT





Corridor Typical Section





Bicycle and Pedestrian Treatments



- Off street bike lane and sidewalk
 - Directional Bike Lane

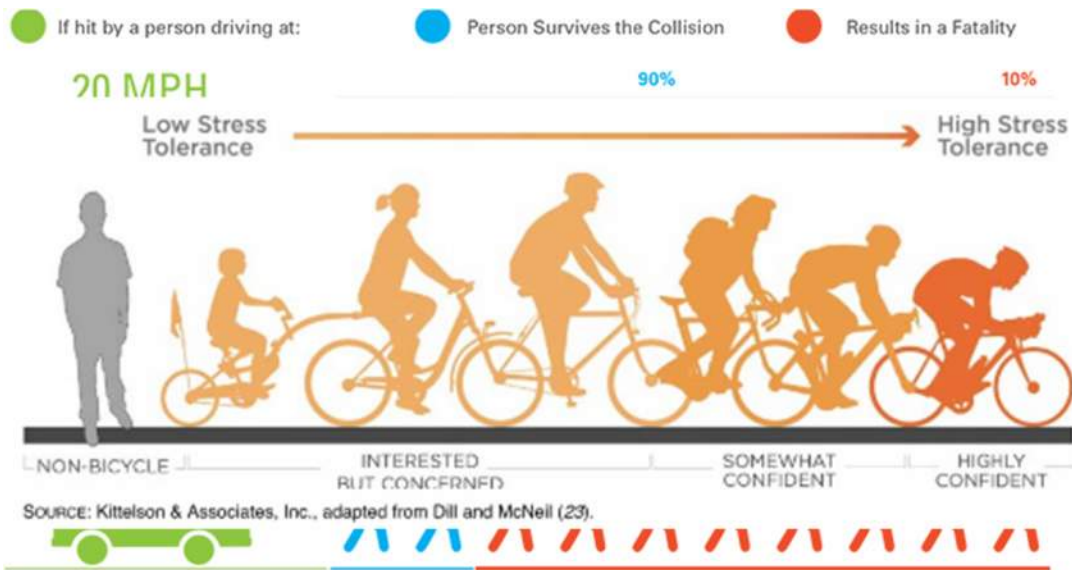
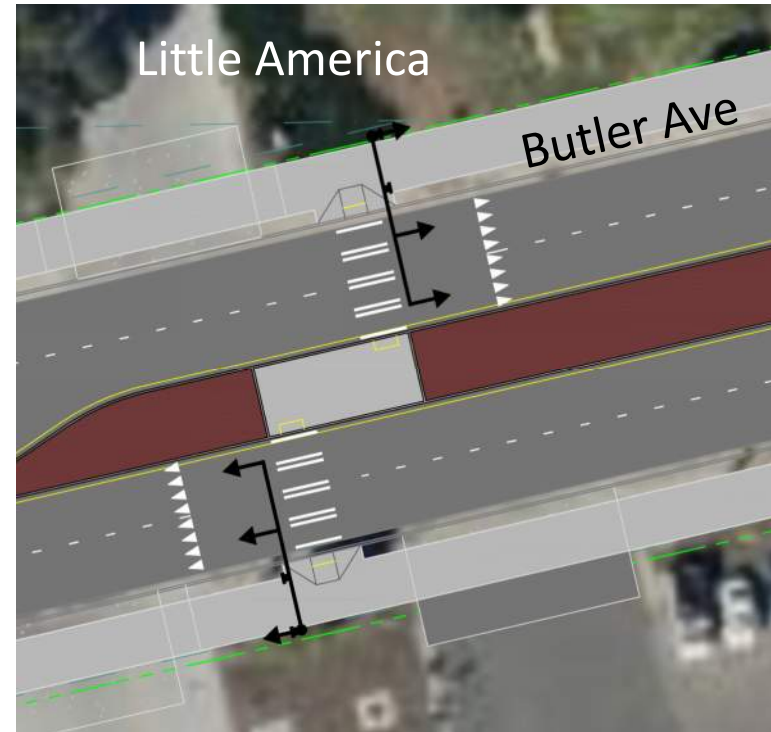


Image credit: San Francisco MTA Vision Zero Action Plan, Feb 2015



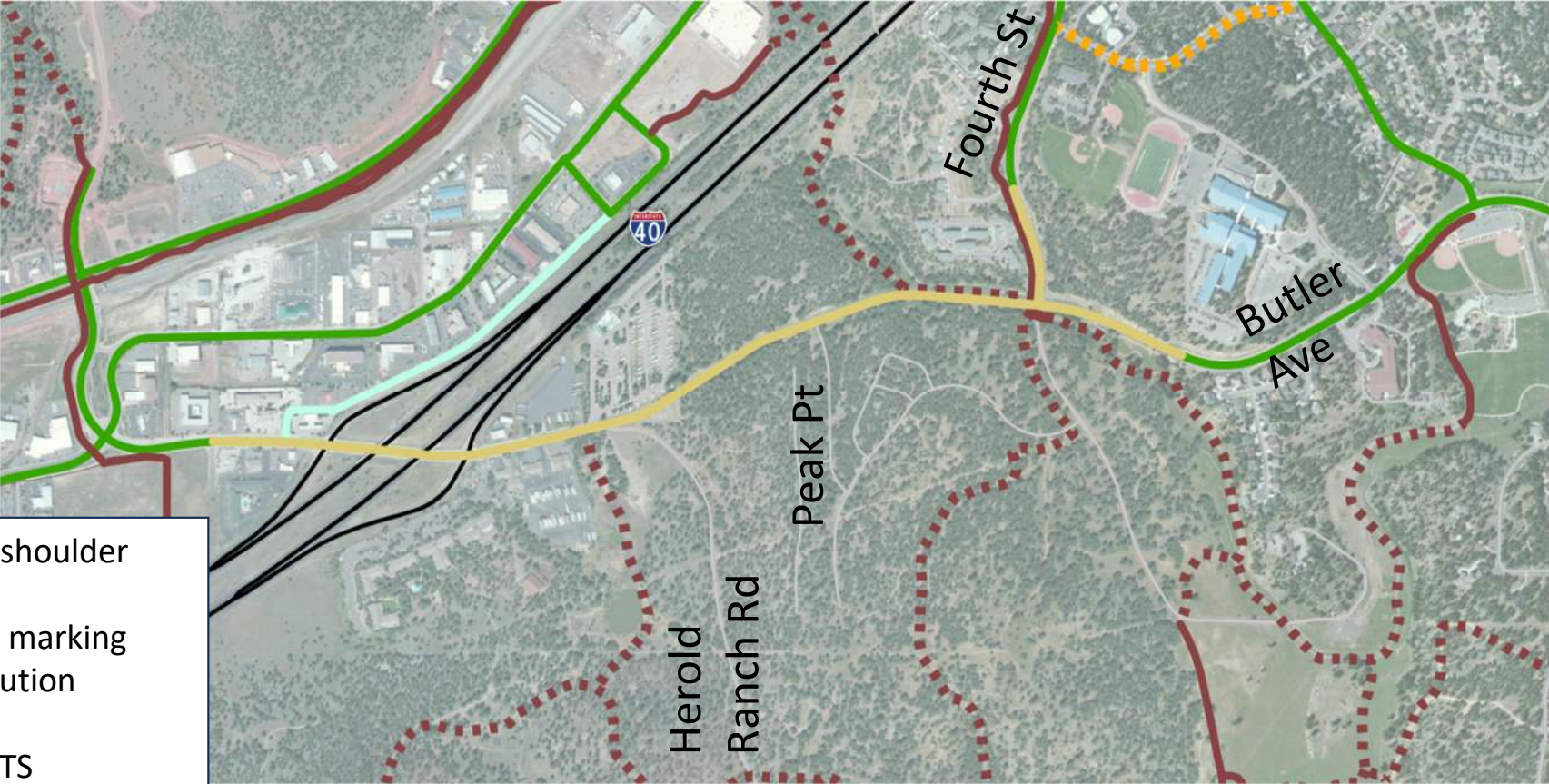
Bicycle and Pedestrian

- Midblock crossings with rapid flashing beacons (RFBs)
- Accessible push buttons/signals





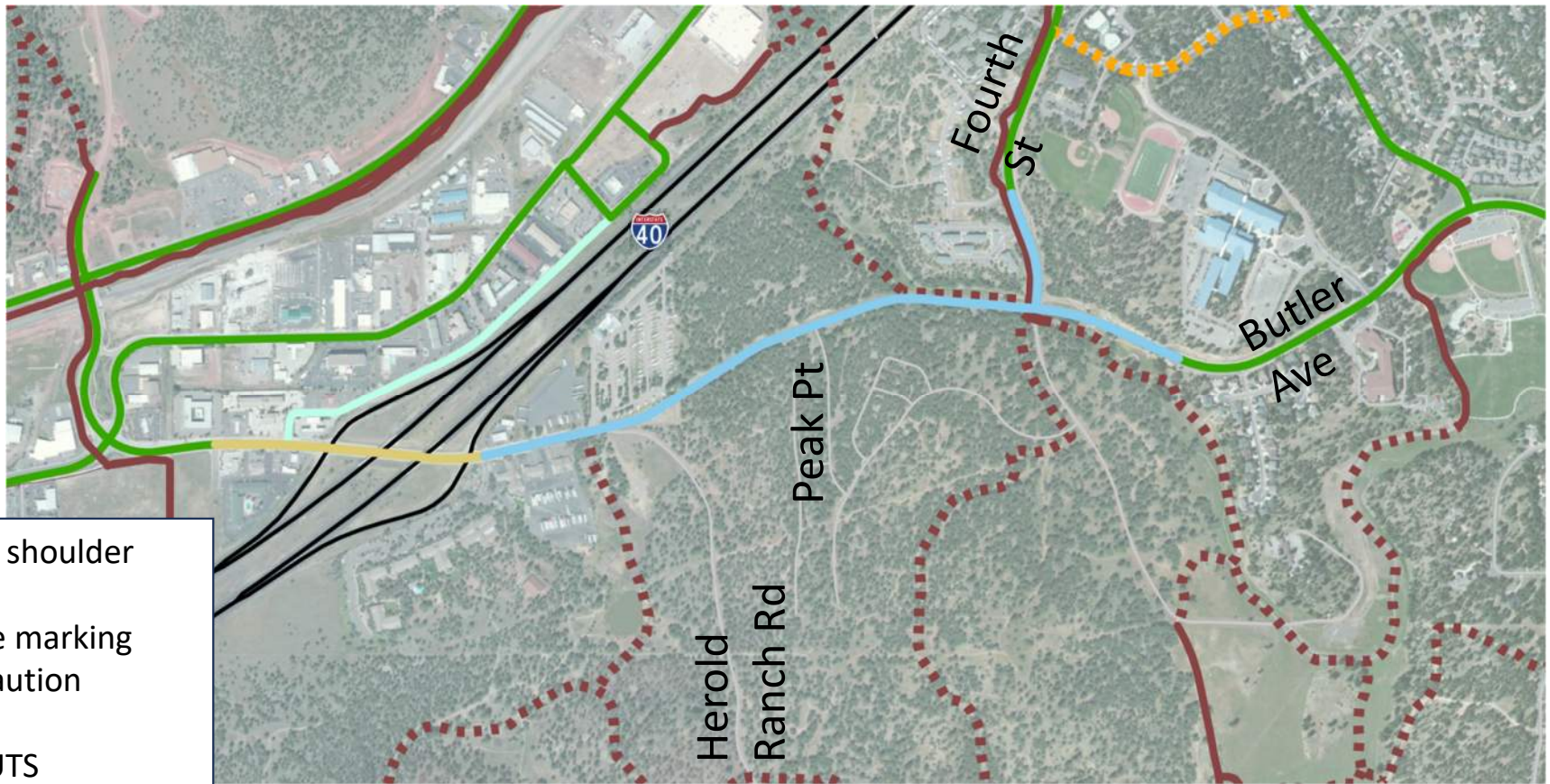
Existing Bicycle and Pedestrian Network



- Bike lane or shoulder
- Bike route
- Shared Lane marking
- Ride with caution
- Paved FUTS
- Unpaved FUTS



Proposed Bicycle and Pedestrian Network







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



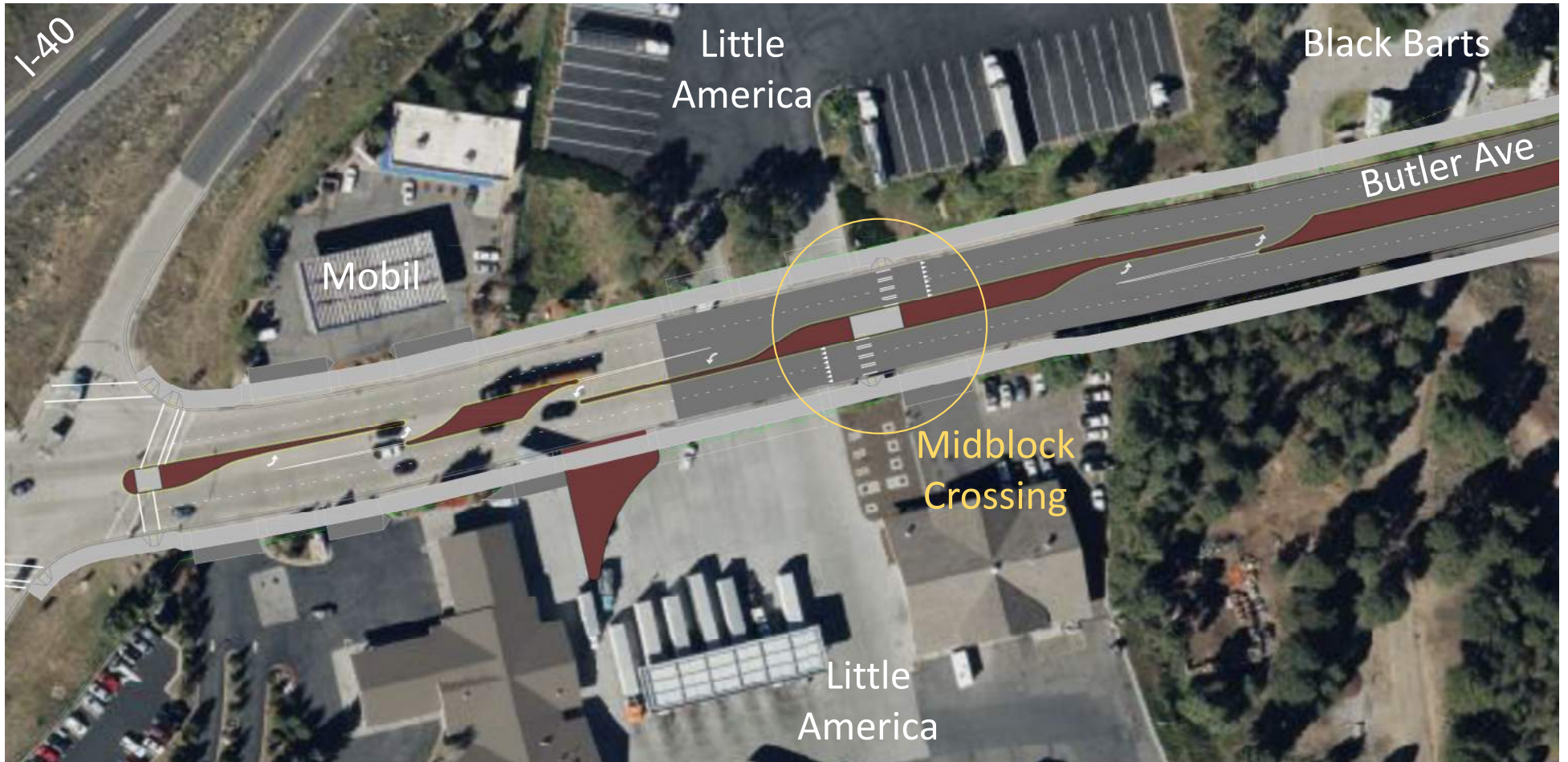
Pedestrian and Transit Facilities



-  Existing Bus Stop
-  Future Bus Stop
-  Proposed Bike/Ped Crossing
-  Project Area



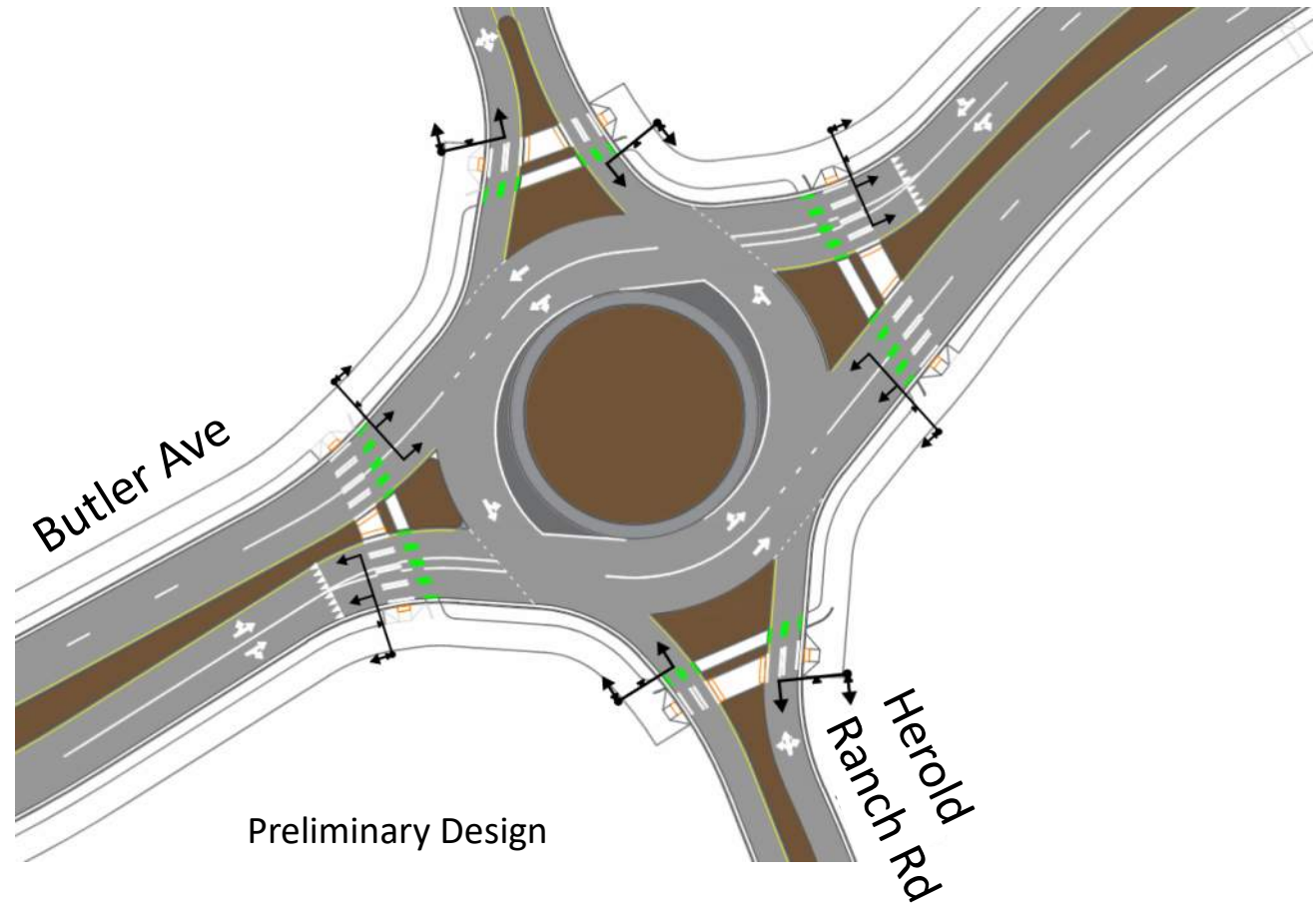
Median Treatments





Herold Ranch Roundabout

- Two through lanes east-west
- One through lane north-south
- Accommodates semi-truck U-turns
- Rapid Flashing Beacon (RFB) for pedestrian crossings



Butler-Fourth Intersection Alternatives Selection





Alternative Evaluation Timeline

Alternatives
Workshop

Identified intersection types to analyze
Roundabout versus signal
11 total Alternatives

Screening Meeting

Selected 3 Alternatives to move forward based on modal accommodation and compliance with City standards

Project Team Evaluation

Ranked alternatives using Project Team criteria
Selected project team preferred Alternative

Alternative D

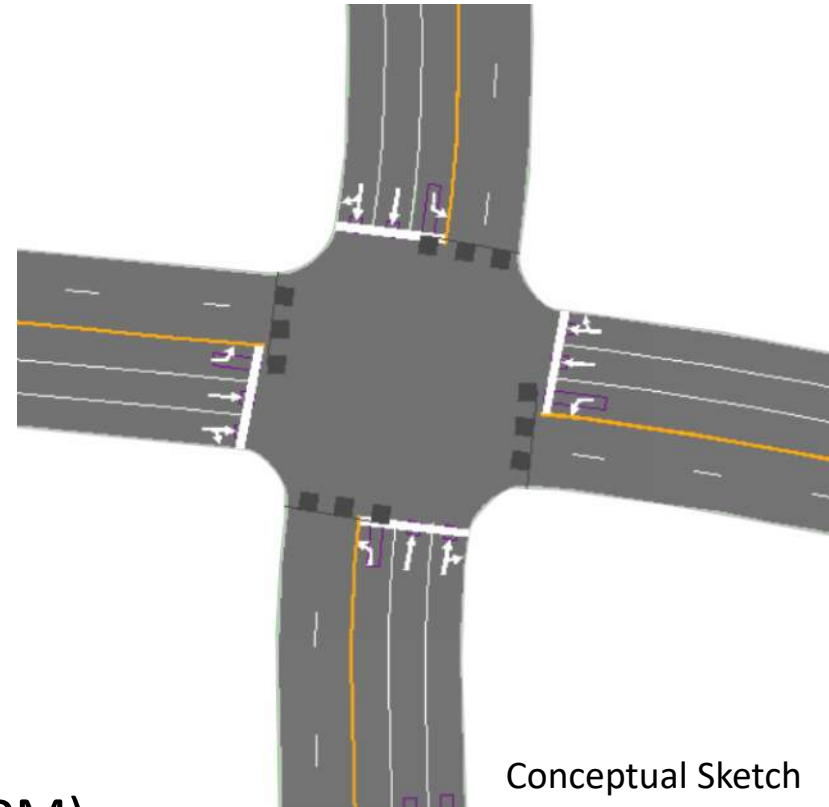
Analyzed additional alternative based on input from Commissions, Committees, and public



Additional Evaluated Alternatives

5x5 Signalized

- Benefits:
 - Small intersection footprint
 - Reduced ped/bike crossing lengths
 - Protected intersection features
- Drawbacks:
 - Queuing Lengths
 - Significant Delays
 - LOS F for 6 movements, LOS E for 3 movements, and average LOS F/F (AM/PM)
 - Does not meet City standards



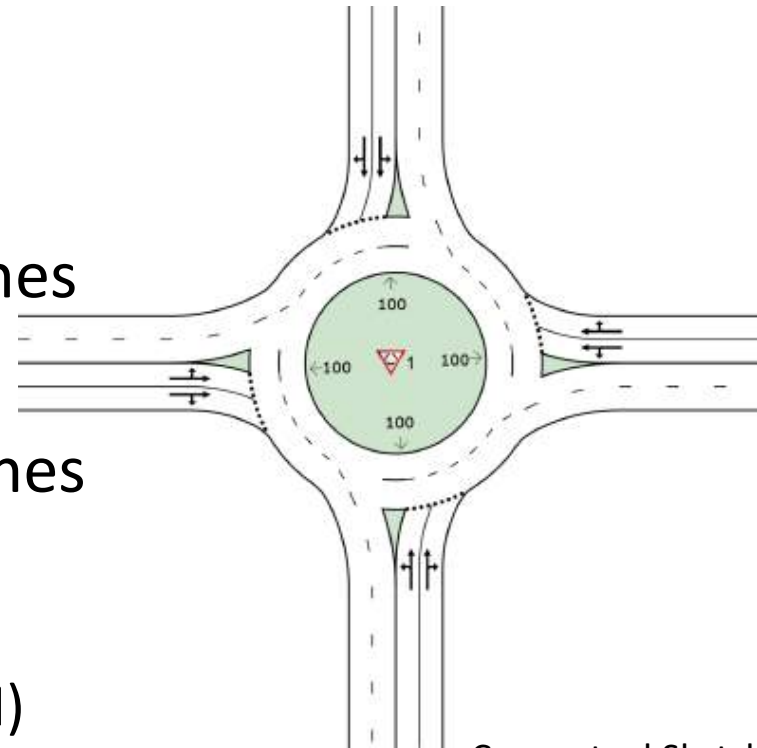


Additional Evaluated Alternatives



2x2 Roundabout

- Benefits:
 - Reduced pedestrian crossing lengths
 - Reduced likelihood of high severity crashes
- Drawbacks:
 - Increased likelihood of low severity crashes
 - Significant Delays
 - LOS F for 1 movement, LOS E for 5 movements, and average LOS D/B (AM/PM)
 - Does not meet City Standards



Conceptual Sketch

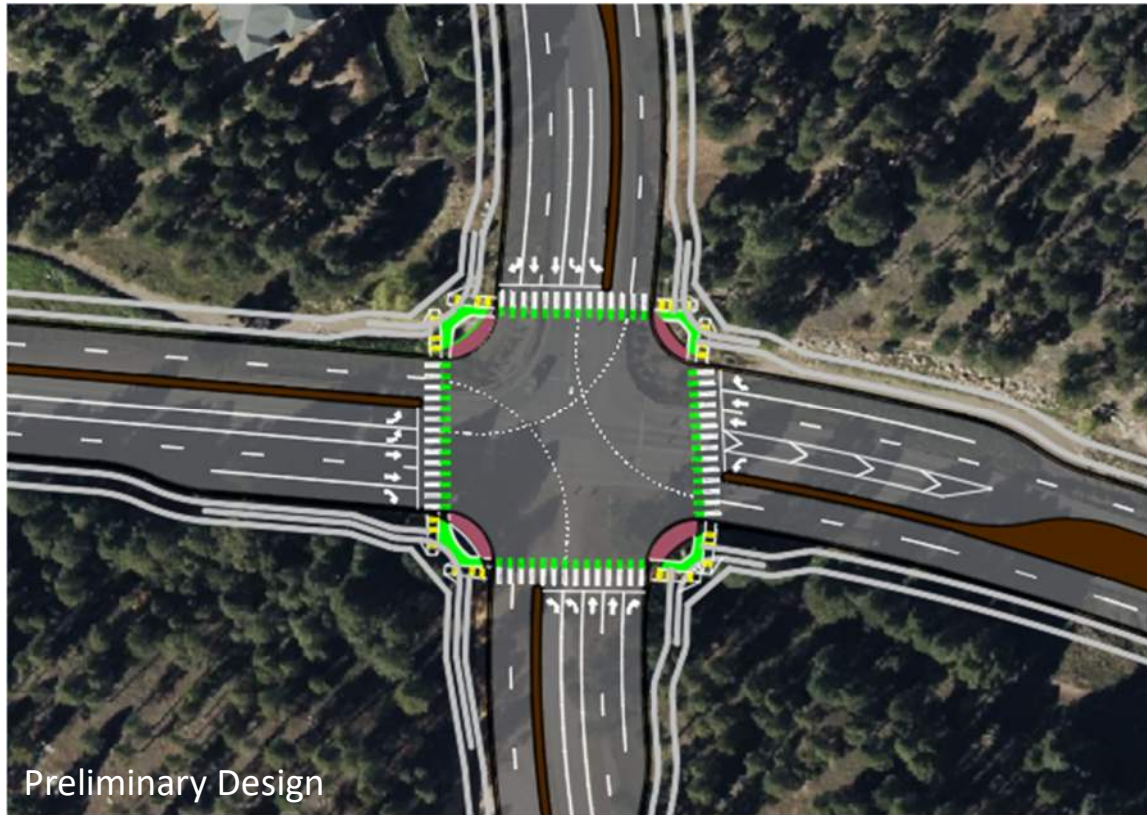
Candidate Alternatives

- Three initial alternatives advanced towards preferred alternative selection
- Additional optimized roundabout introduced following outreach





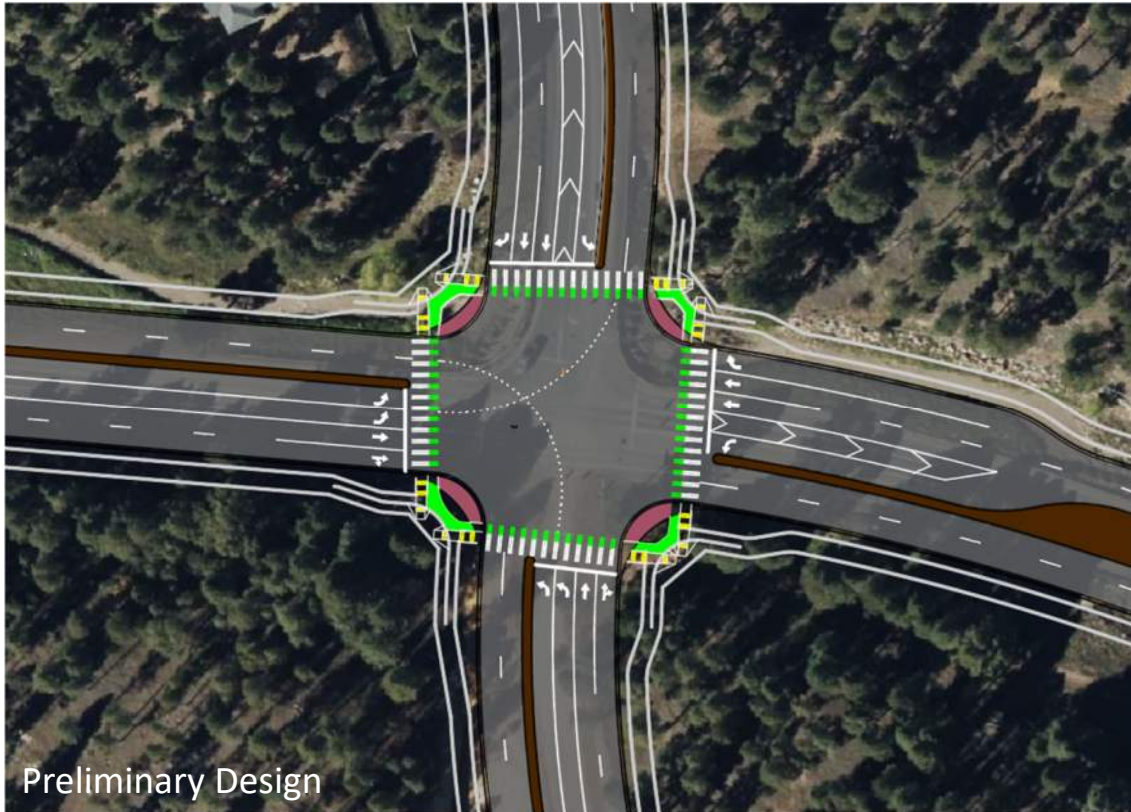
Alternative A – 7x7 Intersection



- Dual left-turn lanes in all directions except for westbound
- Designated right-turn lanes in all directions
- Protected intersection features
- Level of Service (LOS) C, 102' pedestrian crossing



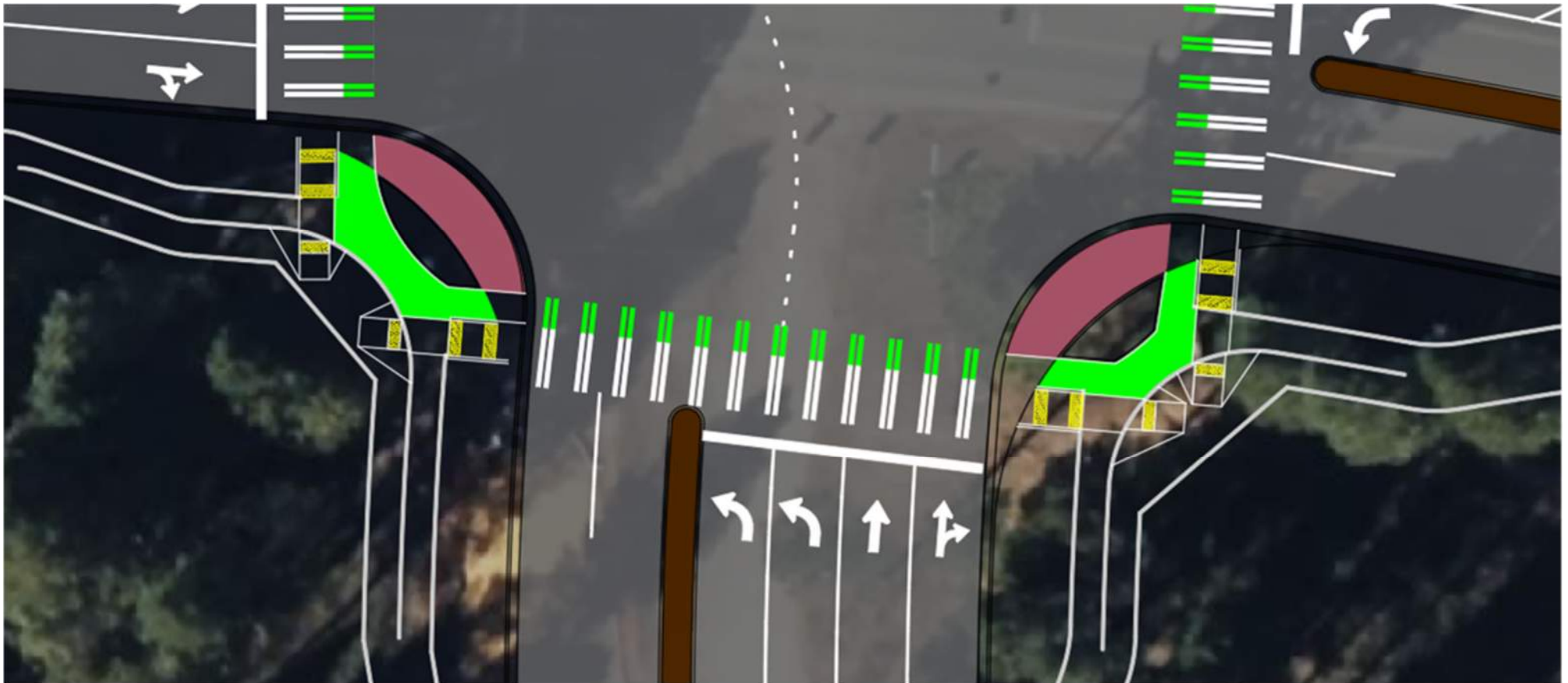
Alternative B – 6x6 Intersection



- Dual left-turn lanes in the north and east-bound directions
- Designated right-turn lane in the south and westbound directions
- Protected intersection features
- LOS D, 102' pedestrian crossing

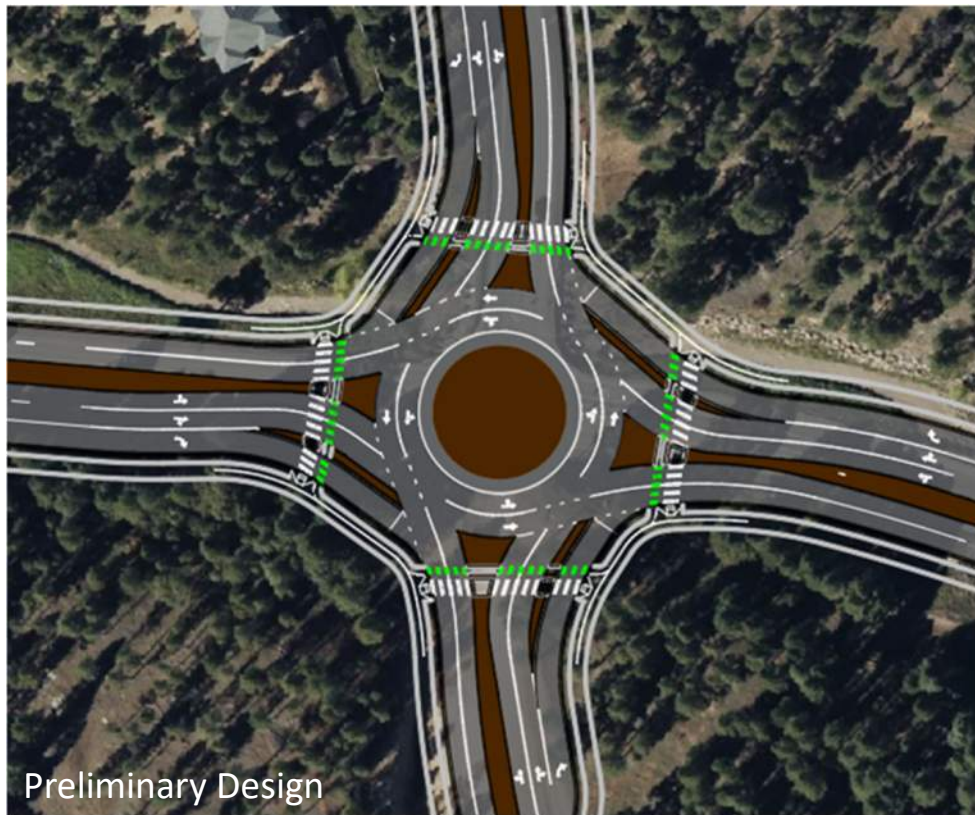


Alternative B – Intersection Crossings





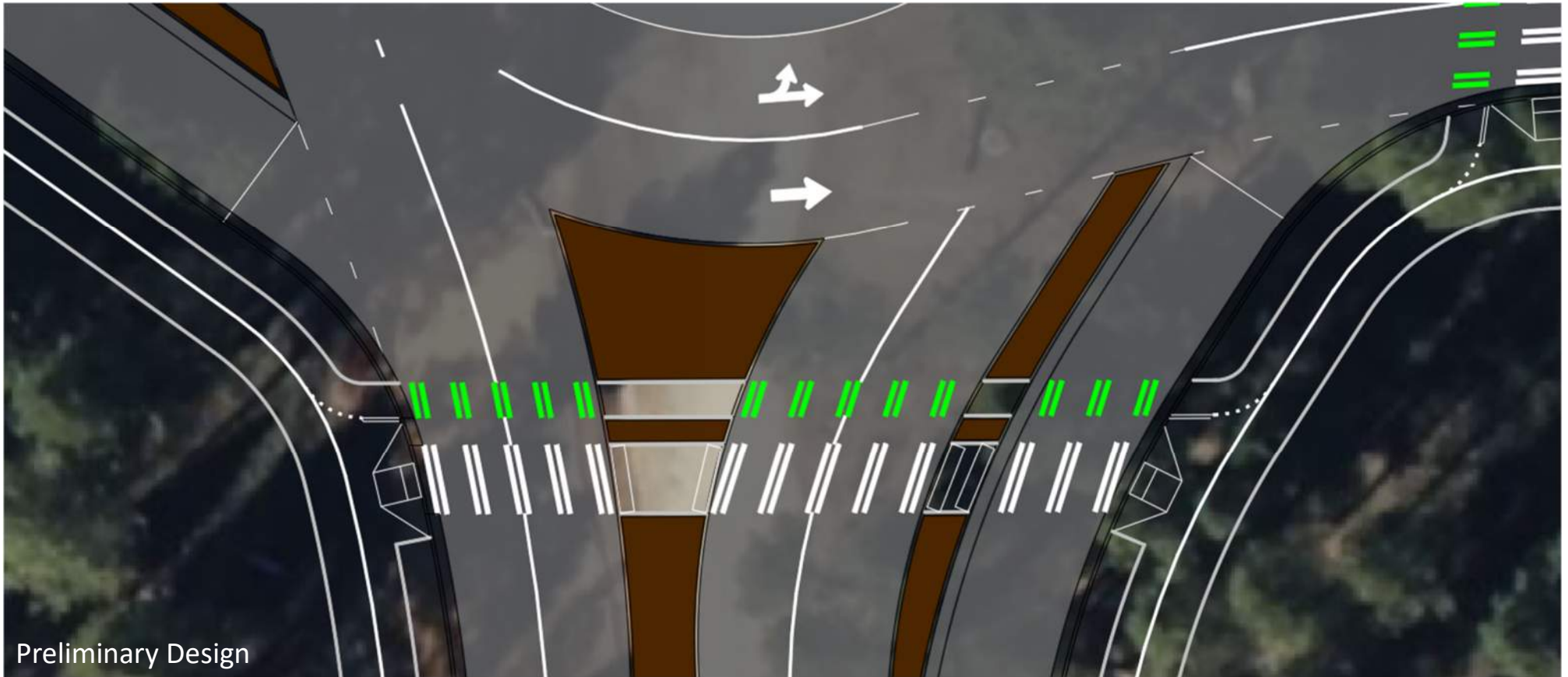
Alternative C – 2x2 Roundabout



- Features channelized right-turn lanes
- 2 circulating lanes
- Rapid Flashing Beacon (RFB) for pedestrian crossings
- Will evaluate raised crosswalks at channelized lanes
- LOS B, 104' pedestrian crossing



Alternative C – Intersection Crossings



Preliminary Design



Project Team 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 Impacts	5	3	3	3
Total score:	15	19	21	24



Commission & Committee Ranking

Commission/ Committee	No-Build	Alt A 7x7 Signalized Intersection	Alt B 6x6 Signalized Intersection	Alt C 2x2 Roundabout, Channelized Rights
Bicycle Advisory Committee	4	3	1	1
Pedestrian Advisory Committee	4	3	1	2
Sustainability Commission	4	3	2	1
Commission on Inclusion and Adaptive Living	4	3	1	2
Transportation Commission	4	3	1	2
Average Rank	4	3	1	2



Commission & Committee Scoring

Rank	No-Build	Alt A 7x7 Signalized Intersection	Alt B 6x6 Signalized Intersection	Alt C 2x2 Roundabout, Channelized Rights
1	0	0	16	10
2	0	3	9	13
3	0	22	1	2
4	25	0	0	0



Public Input



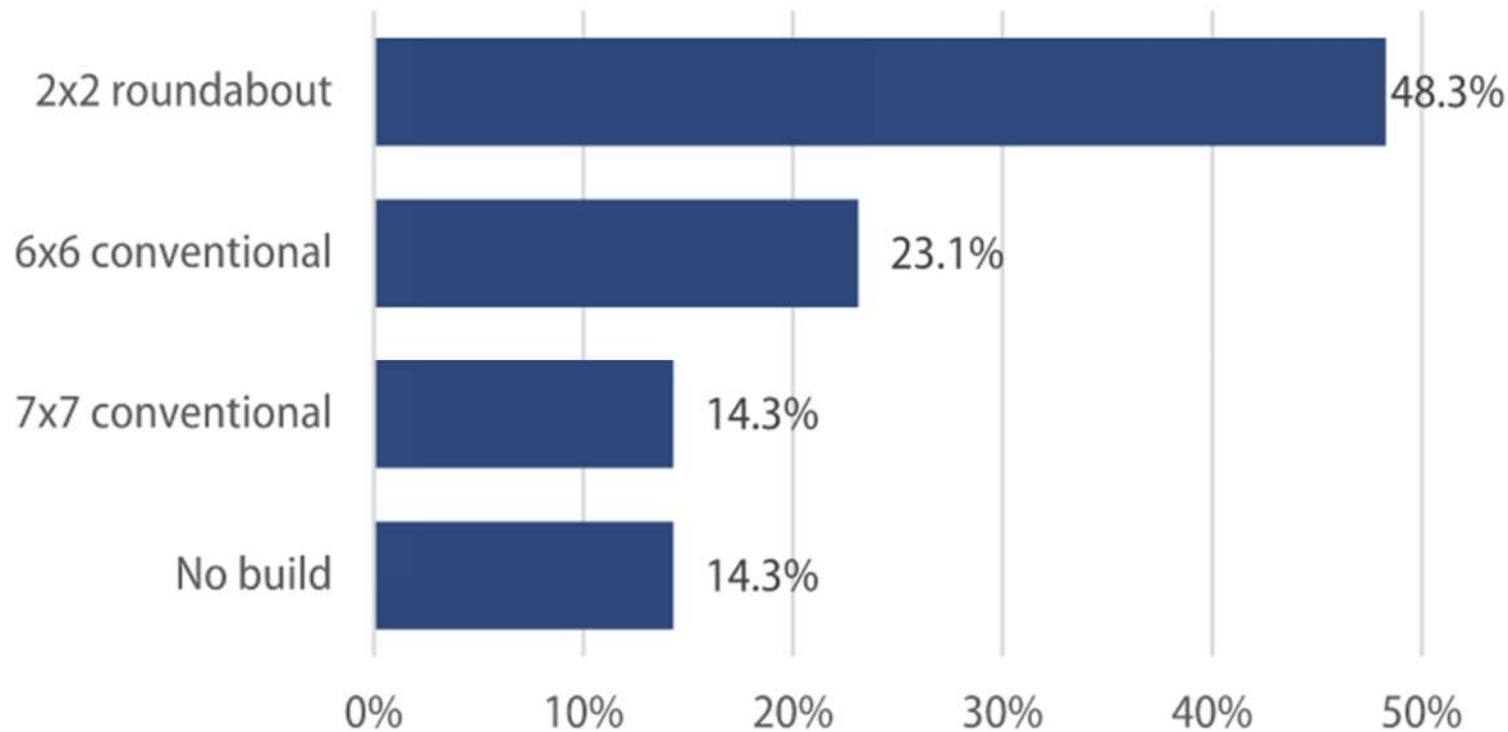
- Public Meeting was on October 18th at the Aquaplex
 - 112 attendees signed in
- Public Survey
 - 179 survey responses
 - <https://www.flagstaff.az.gov/DocumentCenter/View/77661/Butler-Fourth-Survey-Results-2023>
- Total of 235 residents interacted with project





Public Input – Survey Results

Respondents were asked to select their preferred intersection alternative for the Butler-Fourth intersection

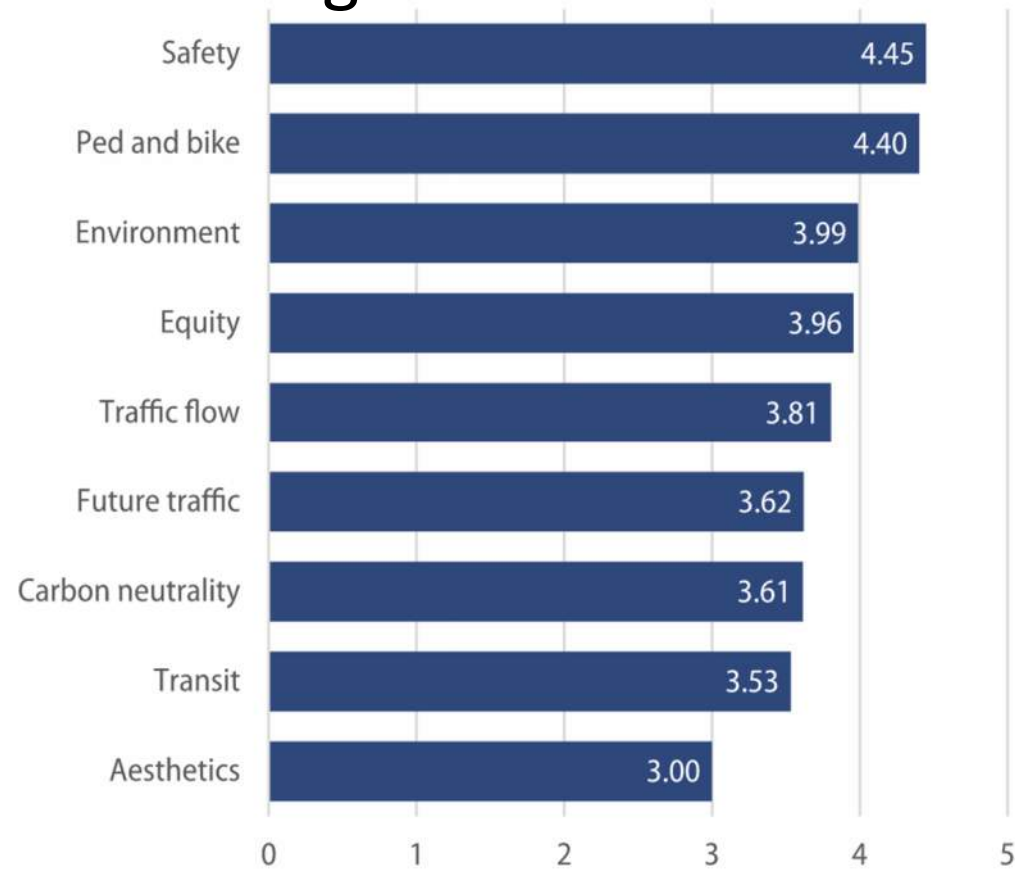




Public Input



Project Priorities – Average Score

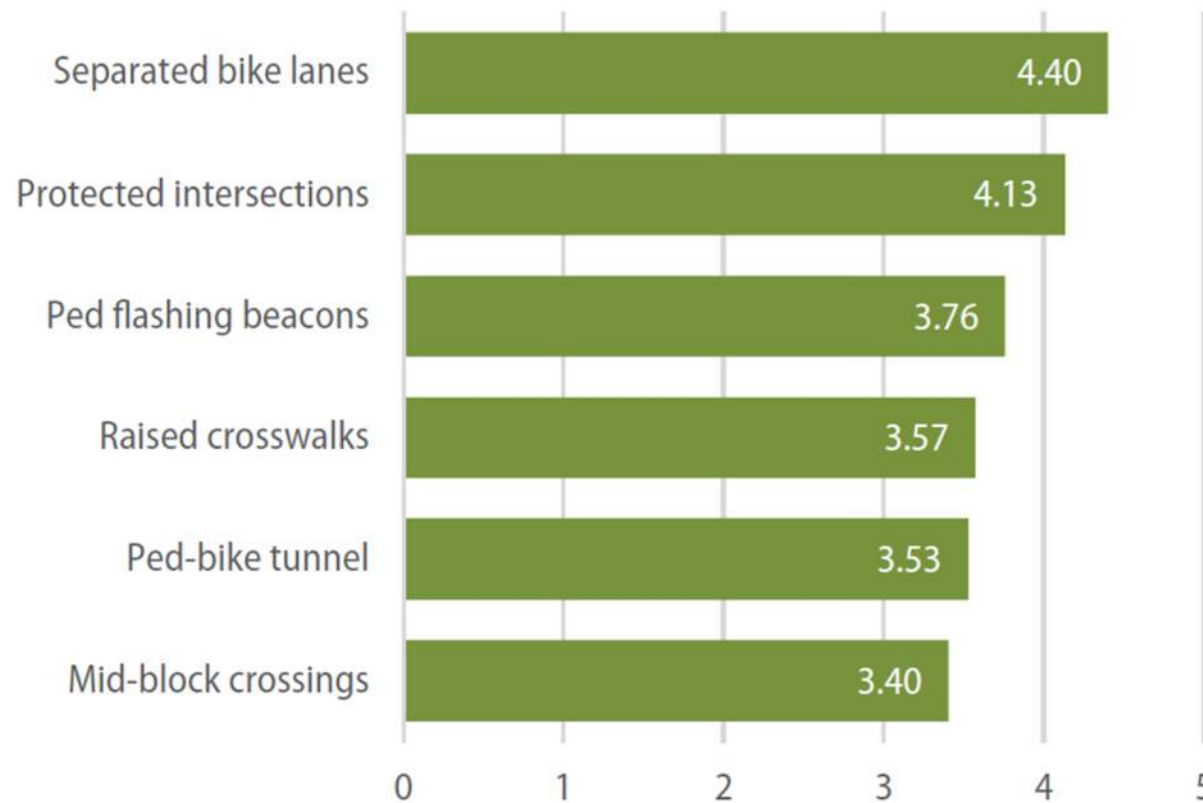




Public Input



Pedestrian and Bicycle Priorities – Average Score

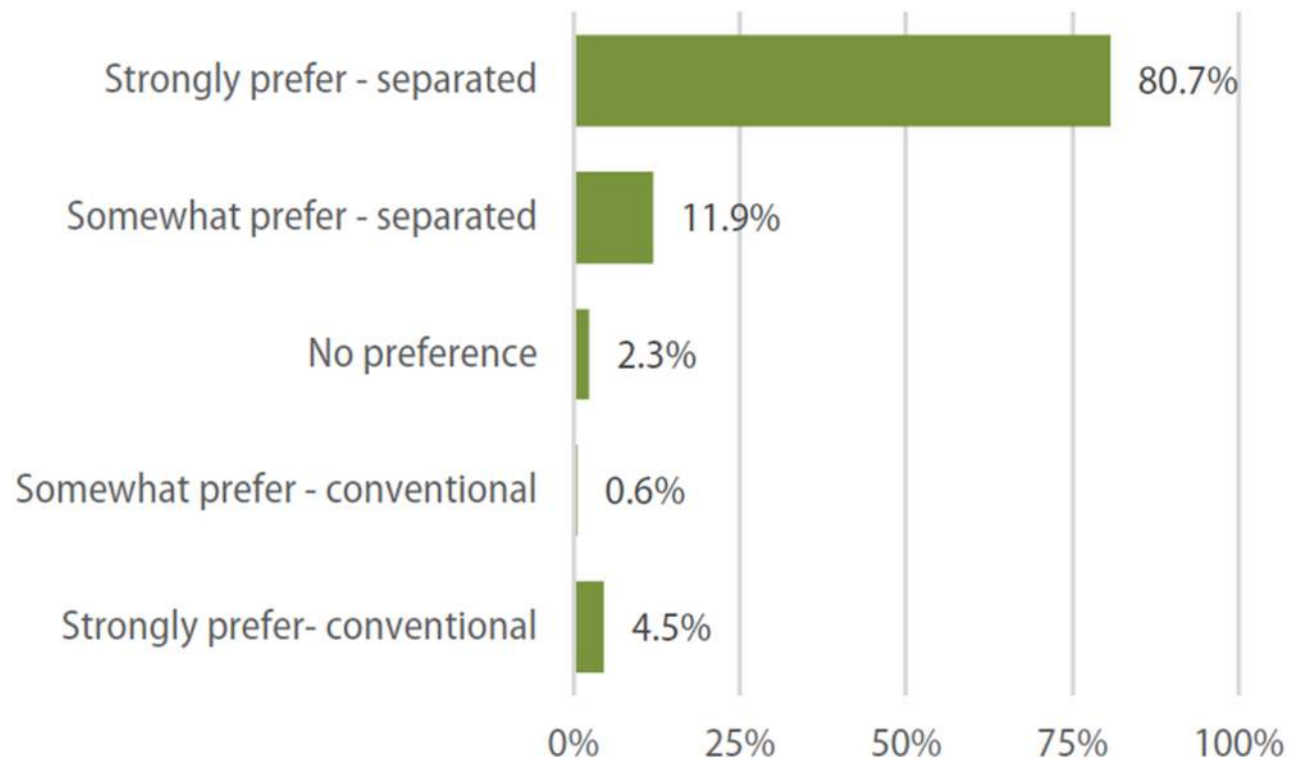




Public Input

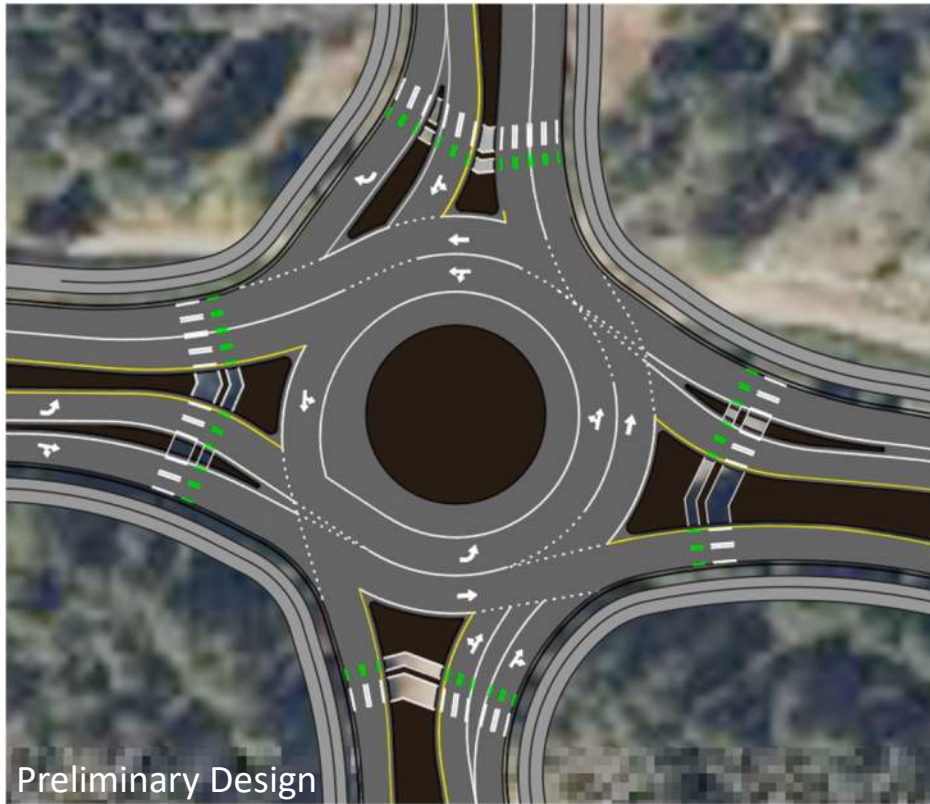


Preference for off-street bike lanes





Alternative D – 2x1.5 Roundabout



- Features channelized right-turn lane on southbound approach
- 2/1 circulating lane(s)
- Rapid Flashing Beacon (RFB) for pedestrian crossings
- Will evaluate raised crosswalks at channelized lanes
- LOS C, 86' pedestrian crossing



Project Team Review of Matrix

Scoring Category	No-Build	Alt A 7x7 Signalized Intersection	Alt B 6x6 Signalized Intersection	Alt C 2x2 Roundabout, Channelized Rights	Alt D 2x1.5 Roundabout
1. Vehicular Operations	1	4	3	5	4
2. Truck Circulation	3	3	3	5	5
3. Transit Accommodation	3	1	3	3	4
4. Pedestrian/Bike Circulation	1	2	3	2	4
5. Predicted Crash Frequency (annual)	1	3	3	4	4
6. Pedestrian/Bike Interface	1	3	3	3	3
7. Cost and Land Impacts	5	3	3	3	3
Total score:	15	19	21	25	27

Next Steps





Council Direction



- Roundabout versus Signal
 - Project team recommendation is Alternative D
- Roundabout
 - Bicycle and Pedestrian crossing configuration
 - Pedestrian refuge islands
- Grade Separated Pedestrian Crossings
 - Tunnel under Butler-Fourth
- Alternative to advance into design

