

# KIMBALL JUNCTION

AREA PLAN  
State Route 224



## Kimball Junction and S.R. 224 Area Plan

*Summit County, Utah*

May 2021



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**Contents**

**Executive Summary** ..... **x**

**1 Introduction**..... **1**

    1.1 Study Area and Background ..... 2

**2 Planning Context**..... **4**

**3 Problems and Opportunities Framework**..... **4**

    3.1 Problems in the Study Area ..... 5

    3.2 Opportunities in the Study Area ..... 5

**4 Alternatives Development and Screening Process**..... **6**

    4.1 Screening Criteria..... 6

**5 Level 1 Screening**..... **7**

    5.1 Fatal-flaw Screening Questions for Level 1 Screening ..... 7

    5.2 Problems, Opportunities, and Goals Screening Questions for Level 1 Screening ..... 7

**6 Level 2 Screening**..... **8**

    6.1 Level 2 Screening Matrix..... 8

**7 Traffic Conditions**..... **13**

    7.1 Existing Traffic Conditions..... 13

    7.2 No-build Traffic and Safety Conditions in 2050..... 15

    7.3 Hypothetical Test of Eliminating Traffic Signals at Ute Boulevard and Olympic Parkway..... 19

**8 Existing and Future Transit Service in the Kimball Junction Area**..... **20**

**9 Active Transportation in the Kimball Junction Area** ..... **26**

**10 Health in Transportation Corridor Planning Framework**..... **28**

**11 Alternatives Development Process** ..... **30**

    11.1 Universe of Alternatives to be Evaluated ..... 30

        11.1.1 Group A: I-80/S.R. 224 Interchange Alternatives with Improvements Focused on I-80 and the I-80 Frontage ..... 31

        11.1.2 Group B: Alternatives Focused on Improvements along S.R. 224 ..... 39

        11.1.3 Group C: Alternatives That Combine Improvements on I-80 and along S.R. 224 ..... 41

        11.1.4 Group D: Stand-alone Surface Street Improvement Alternatives ..... 56

        11.1.5 Other Features Brainstormed during the Workshop ..... 63

    11.2 Summary of Universe of Alternatives ..... 64

    11.3 Policy Solutions ..... 67

        11.3.1 Demand-management Solutions..... 67

        11.3.2 Additional Operational Improvements ..... 67

**12 Alternatives Screening Evaluation** ..... **68**

    12.1 Level 1 Screening Evaluation..... 68

    12.2 Level 2 Screening Evaluation..... 68

    12.3 Level 1A Screening Evaluation Results ..... 69

        12.3.1 Alternatives Dismissed during Level 1A (Fatal-flaw) Screening ..... 69

        12.3.2 Alternatives Dismissed during Level 1B Screening ..... 75

        12.3.3 Alternatives Moving Forward into Level 2 Screening..... 77

<b>13</b>	<b>Level 2 Screening Evaluation and Alternatives Refinement Process .....</b>	<b>91</b>
13.1	Level 2A Screening Evaluation Results .....	91
13.1.1	Level 2A Model Scenarios .....	91
13.1.2	Level 2A Screening Results for the No-build Alternative .....	92
13.1.3	Level 2A Screening Results for Alternatives 1, 2, and 3.....	92
13.1.4	Level 2B Screening Evaluation Results and Comparison of Alternatives.....	103
<b>14</b>	<b>Wildlife Considerations .....</b>	<b>119</b>
<b>15</b>	<b>Public and Study Partner Coordination and Outreach.....</b>	<b>124</b>
15.1	Stakeholders .....	125
15.2	Study Partner and Public Participation Process .....	125
15.2.1	Study Goals, Problems and Opportunities – Study Partner Participation.....	125
15.2.2	Study Goals, Problems, and Opportunities – Public Survey #1.....	126
15.2.3	Screening Criteria Workshop – Study Partner Participation .....	131
15.2.4	Alternatives Development Workshop – Study Partner Participation .....	132
15.2.5	Level 1 Screening Workshop – Study Partner Participation .....	132
15.2.6	Level 2 Screening – Public Participation Public Survey #2.....	132
15.2.7	Summit County Council Outreach.....	138
15.2.8	Overall Public Participation Conclusions.....	138
<b>16</b>	<b>Study Recommendations .....</b>	<b>139</b>
<b>17</b>	<b>Additional Next Steps .....</b>	<b>141</b>
17.1	Outstanding Issues for Future Consideration.....	141
17.2	Future Studies .....	143

**Tables**

Table 6-1.	Level 2 Screening Criteria and Measurements .....	9
Table 7-1.	Vehicle Delay and Level of Service at Intersections during the Weekday Peak Hour under the Existing Conditions .....	14
Table 7-2.	Projected Travel Times during the Weekday PM Peak Hour under the 2050 No-build Conditions .....	16
Table 7-3.	Vehicle Delay and Level of Service at Intersections during the Weekday Peak Hours under the 2050 No-build Conditions .....	18
Table 7-4.	Existing and 2050 No-build Level of Service at the I-80/S.R. 224 Interchange with Hypothetical Test of Eliminating Traffic Signals at Ute Boulevard and Olympic Parkway Compared to Signals “On” .....	19
Table 12-1.	Alternatives Dismissed during Level 1A (Fatal-flaw) Screening.....	70
Table 13-1.	Level 2A Screening Evaluation Results.....	93
Table 13-2.	Refinements to Alternatives 1 and 3 Based on the Travel Demand Model.....	95
Table 13-3.	Level 2 Screening Evaluation Matrix .....	105
Table 13-4.	Level 2B Traffic Screening.....	112
Table 13-5.	Environmental Criteria Screening.....	115
Table 13-6.	Cost Estimates for Alternatives 1, 2, and 3 in Today’s (2021) Dollars .....	118

## Figures

Figure 1-1. Study Area for the Kimball Junction and S.R. 224 Area Plan .....	2
Figure 4-1. Overview of the Kimball Junction Area Plan’s Alternatives Development and Screening Process .....	6
Figure 7-1. Traffic Patterns and Problems during the PM Peak Hour for Existing/2050 .....	15
Figure 7-2. Travel Time Increases during the PM Peak Hour from the Existing Conditions to 2050 .....	16
Figure 8-1. Bus Routes in the Kimball Junction Area .....	21
Figure 8-2. Kimball Junction Circulator .....	22
Figure 8-3. Route 10 (White) Electric Xpress .....	23
Figure 8-4. PC-SLC Connect .....	24
Figure 9-1. Active Transportation in the Kimball Junction Area .....	27
Figure 10-1. UDOT’s Quality of Life Framework .....	29
Figure 11-1. Alternative A-1 (1 of 2) .....	32
Figure 11-2. Alternative A-1 (2 of 2) .....	32
Figure 11-3. Alternative A-2 .....	34
Figure 11-4. Alternative A-3 .....	36
Figure 11-5. Alternative A-3 with Optional Transit/HOV-only Road .....	37
Figure 11-6. Supplemental Information on Alternative A-3 Provided by Summit County Personnel during the Workshop .....	38
Figure 11-7. Alternative B-1 and Examples of Grade-separated Intersections with Pedestrian Feature Enhancements Similar to Alternative B-1 .....	40
Figure 11-8. Alternative C-1 Examples .....	42
Figure 11-9. Alternative C-2 .....	44
Figure 11-10. Alternative C-3 .....	45
Figure 11-11. Alternative C-4 .....	47
Figure 11-12. Alternative C-5 .....	49
Figure 11-13. Alternative C-6 .....	51
Figure 11-14. Alternative C-7 .....	53
Figure 11-15. Alternative C-8 with Optional Transit Ramps .....	55
Figure 11-16. Alternatives D-1, D-2, D-10, D-11, and D-12 .....	57
Figure 11-17. Alternatives D-3 and D-9 .....	57
Figure 11-18. Alternatives D-6 and D-7 .....	58
Figure 11-19. Alternatives D-4 and D-8 .....	58
Figure 11-20. Alternative D-5 .....	59
Figure 11-21. Alternative D-13 .....	60
Figure 11-22. Alternative D-14 .....	61
Figure 11-23. Alternative D-15 .....	62
Figure 11-24. Alternative D-16 .....	63
Figure 12-1. Through Traffic Volume in the Kimball Junction Area .....	78
Figure 12-2. Park City Transit System Map .....	80
Figure 12-3. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (1 of 4) .....	83
Figure 12-4. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (2 of 4) .....	84
Figure 12-5. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (3 of 4) .....	85

Figure 12-6. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (4 of 4)..... 86

Figure 12-7. Alternative 2: Transit/HOV-only Interchange and Bypass Road Concept with Adjacent Trail and Extension of Olympic Parkway with a New Connection to S.R. 224 at Bear Cub Drive..... 87

Figure 12-8. Alternative 3: Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I-80 Interchange ..... 88

Figure 12-9. Alternative 4: Combination of Stand-alone Surface Street Improvements..... 89

Figure 13-1. Revised Alternative 1: Split Diamond with One-way Frontage Roads – West Half ..... 97

Figure 13-2. Revised Alternative 1: Split Diamond with One-way Frontage Roads – West Half with HOV Ramps ..... 98

Figure 13-3. Revised Alternative 1: Split Diamond with One-way Frontage Roads – East Half (1 of 2)..... 99

Figure 13-4. Revised Alternative 1: Split Diamond with One-way Frontage Roads – East Half (2 of 2)..... 100

Figure 13-5. Revised Alternative 3: Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I-80 Interchange ..... 101

Figure 14-1. Snyderville Basin Wildlife Map ..... 121

Figure 14-2. Wildlife Strikes in the Study Area (2018–2019)..... 123

**Appendices**

- Appendix A. Traffic Analysis
- Appendix B. Level 2 Screening Matrix
- Appendix C. Preliminary Environmental Impacts
- Appendix D. Cost Estimates and Assumptions
- Appendix E. Additional Public and Study Partner Coordination and Outreach Materials

**Acronyms and Abbreviations**

BRT	bus rapid transit
DDI	diverging diamond interchange
FHWA	Federal Highway Administration
GIS	geographic information systems
HOT	high-occupancy toll (lane)
HOV	high-occupancy vehicle
I-215	Interstate 215
I-80	Interstate 80
ITS	Intelligent Transportation Systems
LOS	level of service
NEPA	National Environmental Policy Act
PC-SLC Connect	Park City–Salt Lake City Connect
S.R.	state route
SPUI	single-point urban interchange
UDOT	Utah Department of Transportation
UTA	Utah Transit Authority

## **Glossary**

### **95th-percentile queue**

The queue length (in vehicles) that has only a 5% probability of being exceeded during the analysis period.

### **active transportation**

A means of getting around that is powered by human energy, primarily walking and bicycling.

### **at-grade intersection**

A location where a local road intersects a road or highway at the same elevation, or grade. This requires vehicles to stop on one road when vehicles on the other road have the right of way.

### **braided ramps**

Ramps that cross over each other.

### **build scenario**

Includes a large percentage of high-cost capital infrastructure improvements, such as interchange upgrades and major bottleneck reconstructions. Includes a small percentage of lower-cost projects that do not add much capacity to the region's transportation system unless combined. The build scenario assumes growth in demand and includes the capital improvements proposed in this study.

### **bus rapid transit (BRT)**

A high-quality, bus-based transit system that delivers fast and efficient service that could include dedicated lanes, busways, traffic signal priority, off-board fare collection, elevated platforms, and enhanced stations.

### **bypass road**

A road that bypasses a built-up area to let through traffic flow without interference from local traffic to reduce congestion in the built-up area.

### **circulator**

A local transit system that provides regular service within a closed loop.

### **conflict point**

The point at which a highway user crossing, merging with, or diverging from a road or driveway conflicts with another highway user using the same road or driveway.

### **conservation easement**

A voluntary legal agreement between a landowner and a land trust or government agency that permanently limits uses of the land in order to protect its conservation values.

### **diverging diamond interchange (DDI)**

An interchange that allows two directions of traffic to temporarily cross to the left side of the road. It moves high volumes of traffic through an intersection without increasing the number of lanes and traffic signals.

### **fatal flaw**

An event or condition that could cause an unanticipated problem or prevent an alternative from achieving its objectives and goals.

**fly-under ramp**

A ramp that tunnels under another road.

**flyover ramp**

A bridge that carries a road over another road.

**frontage road**

A road that parallels an interstate to relieve traffic congestion caused by local trips.

**grade-separated intersection**

A method of aligning a junction of two or more roadway axes at different heights (grades) so that they will not disrupt the traffic flow on other routes when they cross each other.

**gore**

A boundary intended to help organize and protect traffic when vehicles enter and exit roads. In the case of an off ramp, the gore area helps ensure safety by separating the off ramp from the through lanes on the highway and by informing drivers when they can safely merge on or off the off ramp. In the case of an on ramp, the gore area separates the on ramp from the lanes of the highway and indicates to the driver when it is safe or legal to merge and join the other traffic.

**half-diamond interchange**

A half diamond interchange is half of a standard diamond interchange, with only one on ramp and one off ramp off from the freeway.

**headway**

The distance between transit vehicles in a transit system measured in time.

**high-occupancy toll (HOT) lane**

Lanes that are open only to high-occupancy vehicles and vehicles that pay a toll to use the lanes.

**high-occupancy vehicle (HOV)**

A motor vehicle carrying more than a specified minimum number of people and therefore permitted to use a traffic lane reserved for such vehicles.

**Intelligent Transportation Systems (ITS)**

A technology, application, or platform that improves the quality of transportation or achieves other outcomes based on applications that monitor, manage, or enhance transportation systems.

**interchange**

A highway intersection that allows traffic to move freely from one highway to another without crossing another lane of traffic.

**intersection**

A place where two roads meet or cross each other.

**Level 1 screening**

The first step in a two-level screening process used to narrow the long list of alternatives so that the alternatives most likely to satisfy the study goals and objectives can be carried forward into the more-detailed screening process.



**Level 2 screening**

The second step in a two-level screening process that will then reduce the larger number of alternatives to a limited number of alternatives for detailed examination in an environmental review process.

**level of service (LOS)**

A qualitative measure of traffic conditions generally described in terms of speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

**mainline**

The principal route of a transportation system (as compared to ramps).

**maintenance of traffic**

A process of establishing a work zone and providing related transportation management and temporary traffic control on street and highway rights of way.

**median**

The reserved area that separates opposing lanes of traffic on divided roads, such as divided highways and freeways.

**metering**

The application of traffic control to freeway on ramps to limit the rate of vehicles entering the freeway.

**mobility**

The movement of people or goods.

**multimodal transportation**

The consideration of various transportation modes (such as walking, cycling, automobiles, and public transit) and connections among modes.

**no-build scenario**

A planning projection that anticipates what the future transportation system and operation will be like without any new transportation investments added beyond what is currently under construction. The no-build scenario assumes projected growth in demand (population and employment) but no future capital improvements.

**off ramp**

A short road that is used by vehicles to gradually slow down after leaving a highway.

**on ramp**

A means to get vehicles onto a controlled-access highway from an uncontrolled access road.

**open space**

Land that is not intensively developed for residential, commercial, industrial, or institutional use.

**peak hour**

A specific 60-minute interval of peak traffic flow used for an analysis. *Peak hour* can refer to an AM peak hour or a PM peak hour.

**peak hours**

Both the AM and PM peak hours (1 hour each) taken together.

**peak period**

A general window of peak traffic during the morning or afternoon. Peak periods can be longer than 1 hour. Typically, the AM peak period is between 6 AM and 9 AM, and the PM peak period is between 4 PM and 7 PM. This report uses the term *peak period* to describe queuing observations made beyond the peak hour.

**qualitative measures**

Measures that are descriptive and conceptual, based on traits and characteristics.

**quantitative measures**

Measures that can be counted, measured, and expressed using numbers.

**queuing**

Traffic behavior near a certain location where the travel demand exceeds the available capacity of the road or intersection. These locations can be red lights, stop signs, bottlenecks, or any design-based or traffic-based constriction in the traffic flow.

**roundabout**

A circular intersection with yield control of all entering traffic, channelized approaches, counterclockwise circulation, and appropriate geometric curvature to ensure that travel speeds on the circulatory road are typically less than 30 miles per hour.

**single-point diamond interchange (also, folded or collapsed diamond)**

A grade-separated interchange design in which all freeway ramps begin or end at a single signalized intersection on the arterial. In a diamond interchange, the streams of left-turning traffic cross each other.

**single-point urban interchange (SPUI)**

A grade-separated interchange design in which all freeway ramps begin or end at a single signalized intersection on the arterial. In a SPUI, the streams of left-turning traffic do not cross.

**slip ramp**

A connection between legs of an intersection that allows right-turning vehicles to bypass the intersection or a connection between an expressway and a parallel frontage road.

**split-diamond interchange**

A split-diamond interchange is a diamond interchange in which the two halves of the diamond are separated along the freeway by two lengths of frontage road. There might be additional intersections between the freeway on ramps and off ramps.

**Solutions Development process**

A process used by the Utah Department of Transportation that seeks to capture the unique context of an area or corridor and develop a set of solutions to meet its transportation needs. Solution sets could include things such as roadway improvements for cars, transit and/or active transportation, travel demand management, Intelligent Transportation Systems (ITS) improvements, and land use and other policy changes that would be implemented by local government partners.

**Texas U-turn**

A lane that allows vehicles to travel on one side of a one-way frontage road to perform a U-turn onto the opposite frontage road (typically crossing over or under a freeway).

**tight diamond interchange**

A diamond interchange is a common type of road junction, used where a controlled-access highway crosses a minor road. A tight diamond interchange has closely spaced ramp intersections with side-by-side left-turn lanes on the minor highway that extend beyond the first ramp intersection.

**transit priority**

Operational improvements that use technology to reduce dwell time at traffic signals for transit vehicles by holding green lights longer or shortening red lights.

**Transportation Demand Management**

A set of strategies aimed at maximizing traveler choices.

**Transportation Network Companies**

A business model that offers prearranged rides or car rentals for a fee, using an online application (app) via a mobile device to connect passengers or automobile renters with drivers and car owners.

**Transportation Systems Management**

A set of techniques used to increase the capacity of a transportation infrastructure without increasing its physical size.

**travel demand**

The number of vehicles that will use a given transportation element in the future.

**travel demand model**

A computer model used to estimate travel behavior and travel demand for a specific future timeframe, based on a number of assumptions.

**turbine-style interchange**

An interchange that has two or three levels with ramps forming a spiral around the interchange's center.

**VISSIM**

A complete software package for conducting traffic analyses, forecasts, and geographic information systems (GIS)-based data management at city, regional, or national levels. VISSIM consistently models all transport modes and their interactions in a unified network data model.

**weave**

Highway or roadway segments where the pattern of traffic entering and leaving at contiguous points of access results in vehicle paths crossing each other.

## Introduction

The *Kimball Junction and S.R. 224 Area Plan* identifies and evaluates future transportation improvements at the interchange of Interstate 80 (I-80) and State Route (S.R.) 224 and through the two at-grade intersections on S.R. 224 (Ute Boulevard and Olympic Parkway) in Summit County, Utah. The Utah Department of Transportation (UDOT), in partnership with Summit County, conducted this detailed transportation study using UDOT's *Solutions Development Process*.

## Solutions Development

Solutions Development is an innovative planning process developed by UDOT that seeks to capture the unique context of an area or corridor and develop a set of solutions to meet its transportation needs. Solution sets could include things such as roadway improvements for cars, transit and/or active transportation, travel demand management, Intelligent Transportation Systems improvements, and land use and other policy changes that would be implemented by local government partners.

The Solutions Development process integrates with the work of other UDOT divisions such as environmental, operations, and performance management to help ensure holistic solutions that match the area's unique context and needs. UDOT initiated the *Kimball Junction and S.R. 224 Area Plan* to develop a range of improvements to reduce congestion and improve multimodal travel and connectivity through the Kimball Junction area, including the two at-grade intersections on S.R. 224.

## Study Goals

UDOT and Summit County wish to accomplish the following:

- Create a community vision for improvements that address the problems and opportunities
- Identify mobility problems and opportunities at the Kimball Junction area
- Determine stand-alone surface street improvements and larger, more-complex transportation solutions for the Kimball Junction area
- Position the study area for successful and streamlined implementation of improvements
- Generate an environment of collaboration and communication between the study partners that lasts beyond the timeframe of the study

## Benefits

While it's not possible to study all the solutions in depth in order to determine one preferred option, using UDOT's Solutions Development process, the Area Plan analysis can be used to inform future environmental studies.



## Problems in the Study Area

The transportation problems in the study area are based primarily on (1) existing system deficiencies, including traffic backups at on and off ramps and intersections that are close together; (2) potential impacts to the existing system caused by a changing level and type of travel demand associated with projected growth in population, employment, tourism, and development in the Kimball Junction area; and (3) failures in the existing system with regard to mobility, congestion, access, and travel time reliability that have prompted the study partners' desire for changes to accommodate and encourage livability and a multimodal transportation system for the efficient movement of people, goods, and services.

Specifically, the *Kimball Junction and S.R. 224 Area Plan* study is a result of the following conditions:

- Traffic congestion during peak periods limits mobility to and from I-80 through Kimball Junction.
- Traffic congestion ebbs and flows depending on time of year and special events.
- Vehicles on the I-80 interchange ramps queue onto the I-80 and S.R. 224 mainlines.
- Travel time on S.R. 224 through the Kimball Junction area is unreliable.
- Transit vehicles don't have exclusive transit priority on S.R. 224 through the Kimball Junction area.

- The increase in travel demand from forecasted job, residential, and recreational growth might lead to decreased mobility.
- Safety, regional air quality, and quality of life might decline due to increased traffic.
- East-west mobility is lacking on S.R. 224 through the Kimball Junction area for all travel modes.
- Residences and businesses along S.R. 224 through the Kimball Junction area are often difficult to access.
- The current interchange and S.R. 224 shoulders don't adequately accommodate snow storage for snow plows, which affects safety and mobility.

## Opportunities in the Study Area

The intent of the *Kimball Junction and S.R. 224 Area Plan* study is to identify and analyze multimodal improvements to address congestion, mobility, safety, access, and travel time reliability for efficient movement of people, goods, and services at the Kimball Junction interchange and on S.R. 224 in the Kimball Junction area.

The Area Plan is specifically intended to improve capacity and multimodal transportation options in the Kimball Junction area and address the existing and long-term mobility needs of residents, commuters, and visitors between the I-80 interchange and the two at-grade traffic signals at Ute Boulevard and Olympic Parkway on S.R. 224.

## Alternatives Development and Screening Process

After defining the problems, opportunities, and goals of the desired study, the study team developed the universe of alternatives during an alternatives development workshop with the study partners. The universe of alternatives was then evaluated using a two-level screening process to ensure that only the most promising alternatives were carried forward for detailed analysis in a subsequent phase of study.

**Level 1** (initial) screening determined whether the alternatives had a “fatal flaw” or whether they did not meet the problems and opportunities of the study. The alternatives that had a fatal flaw or did not meet the problems and opportunities were dismissed from further consideration.

**Level 2** screening of the remaining alternatives included more-quantitative objectives as well as a comparative evaluation of technical screening criteria.

## Universe of Alternatives

Over 30 alternatives were developed and evaluated including bypass lanes, new interchange locations and configurations, intersection improvements, new transit/high-occupancy vehicle (HOV)-only access, and intersection and access point changes in the study area.

## Partner and Public Outreach Process

Partner and public outreach included six project partner meetings or workshops, updates to the Summit County Council, and two public surveys. The first public

meeting and survey covered the Area Plan process, transportation problems, opportunities, and goals in the study area. The comments received generally indicated that traffic congestion is the top issue in the area.

The second public meeting and survey reviewed the Level 1 screening results and asked the public for their feedback on the four alternative bundles moving into Level 2 screening. In addition, ongoing coordination with the study partners and other stakeholders occurred at key milestones during the life of the study.

## Level 1 Screening Results

Based on the Level 1 screening evaluation, four alternatives were moved forward into Level 2 screening. The four alternatives comprise “bundles” of the remaining alternatives that passed Level 1 screening.

## Level 2 Screening Process

During Level 2 screening, the partners evaluated the four alternatives against criteria that focus on how well each alternative meets the problems and opportunities for the study from a traffic perspective, the alternative’s impacts to the natural and built environment, public sentiment, estimated project costs, logistical considerations, and overall feasibility.

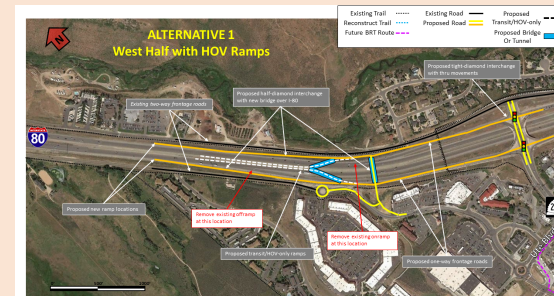
Based on the initial Level 2 screening traffic evaluation, Alternative 2, a transit/HOV-only bypass road through the interchange area’s southwest quadrant was removed from further study because it would not relieve the existing or forecasted future traffic problems in the study area. Alternatives 1, 3, and 4 are recommended for further study.

## Alternative 1: Split-diamond Interchange with One-way Frontage Roads

About 50% of interchange traffic uses Kimball Junction to access commercial, residential, and recreational locations. Alternative 1 consists of a split-diamond interchange with one-way frontage roads. The existing single-point urban interchange (SPUI) at Kimball Junction would be converted into a tight-diamond configuration, and the interchange would be split between the existing location at S.R. 224 and a new intersection with a bridge crossing I-80 to the west of S.R. 224. One-way frontage roads for both eastbound and westbound directions would connect the two intersections and tie into the on and off ramps for I-80. The one-way frontage roads along I-80 and the intermediate intersection would further disperse traffic and provide easier access to residential and commercial locations. Also, a pedestrian tunnel at Ute Boulevard and intersection improvements along S.R. 224 are proposed to move all users more efficiently through the area. This alternative is estimated to cost between \$54.2 million and \$74.4 million, depending on whether any stand-alone surface street improvements (shown below with Alternative 4) are implemented in conjunction with this alternative.

## Benefits

- The new split-diamond interchange provides direct access to Kimball Junction.
- One-way frontage roads separate local traffic.
- One-way frontage roads and the proposed intersection that crosses I-80 provide new access points and better traffic dispersion into Kimball Junction on the south side of I-80.
- Optional transit/HOV-only ramps are included in this alternative.
- A pedestrian tunnel is proposed under S.R. 224 at Ute Boulevard (similar to the existing tunnel at Olympic Parkway) to increase connectivity and comfort.



## Alternative 3: Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternative Connections to the I-80 Interchange

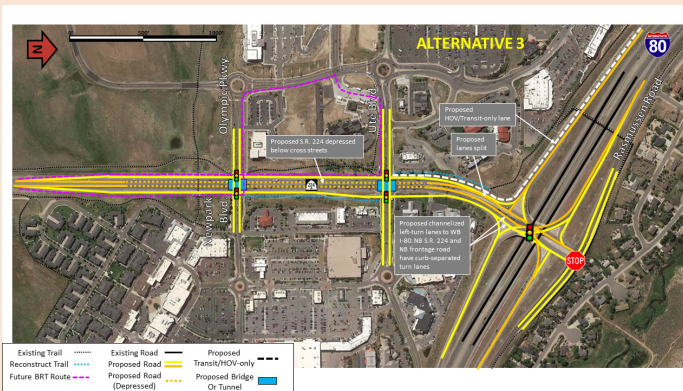
Traffic analysis shows that increased travel times are related to the lack of capacity of the intersections at Ute Boulevard and Olympics Parkway on S.R. 224. With Alternative 3, grade-separated intersections at Ute Boulevard and Olympic Parkway would help separate local and through traffic in the area.

Northbound S.R. 224 would remain at or close to its current location horizontally but would be depressed below the surface streets through Kimball Junction. Ramps would diverge from S.R. 224 south of Olympic Parkway to create a one-way frontage road system. Olympic Parkway and Ute Boulevard would tie into the frontage system at intersections, crossing over S.R. 224 on bridges.

Vehicles heading northbound on the frontage road to I-80 westbound would have a curb- or barrier-separated left-turn lane, a through lane, and a right-turn lane to access the existing I-80 eastbound on ramp. Vehicles heading northbound from S.R. 224 to I-80 eastbound would exit onto the northbound frontage road south of Olympic Boulevard to continue north and use the existing on ramp. This alternative is estimated to cost \$116.5 million. \$20 million of the construction cost is for a trench cover to prevent snow from building up in the depressed roadway.

### Benefits

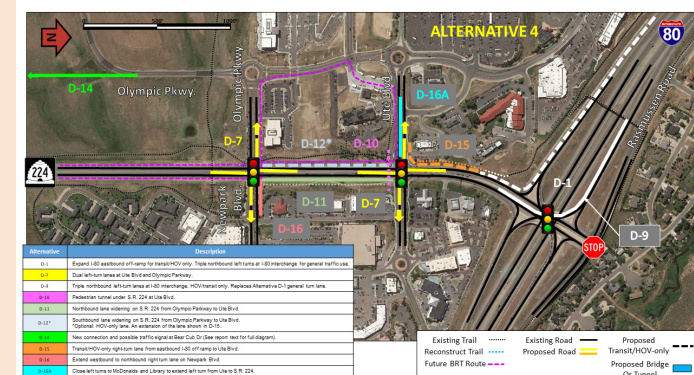
- Vehicles on mainline S.R. 224 connect directly to and from I-80, while ramps provide a bypass and maintain or improve east-west connectivity on Olympic Parkway and Ute Boulevard.
- Vehicles on the new S.R. 224 frontage roads have full access to turn onto Olympic Parkway, Newport Boulevard, and Ute Boulevard to access the surrounding businesses and have full access to I-80.
- By depressing the roadway through Kimball Junction, there would be fewer visual impacts.



## Alternative 4: Combination of Stand-alone Surface Street Improvements

Alternative 4 combines the stand-alone alternatives that passed Level 1 screening. The solution could be built as one project, as a suite of projects, or incrementally in a phased approach. If built as one project, the estimated cost is \$29.8 million. This alternative would minimize infrastructure changes by improving traffic flow at existing facilities. In addition, Alternative 4 adds active transportation, transit, and HOV elements to offset the larger footprint required with Alternatives 1 through 3. Alternative 4 consists of the following:

- D-1** Expand the I-80 eastbound off ramp for transit/HOV only. Include triple northbound left turns at the I-80 interchange
- D-7** Include dual left turns at Ute Boulevard and Olympic Parkway  
*A variation would be an outside northbound left-turn lane at Olympic Parkway, which would be used by HOV/transit vehicles only*
- D-9** Add an additional northbound left-turn lane at the existing single-point urban interchange for transit/HOV
- D-10** Build a pedestrian tunnel under Ute Boulevard
- D-11** Widen the northbound lane on S.R. 224 from Olympic Parkway to Ute Boulevard
- D-12** Widen the southbound lane on S.R. 224 from Olympic Parkway to Ute Boulevard  
*A variation would be to widen only for an HOV-only lane*
- D-14** Add a new connection and possibly a traffic signal at Bear Cub Drive
- D-15** Add a transit/HOV-only, right-turn lane from the eastbound I-80 off ramp to Ute Boulevard
- D-16** Extend the westbound-to-northbound right-turn lane on Newport Boulevard
- D-16A** Close left turns at McDonalds and the Richens building to extend the left turn from Ute Boulevard to S.R. 224 (This is a new alternative suggested by a partner participant at the October 16, 2020, Level 1 screening workshop.)



# 1 Introduction

This technical report documents the results of the *Kimball Junction and S.R. 224 Area Plan* (Area Plan), which was conducted to identify and evaluate future transportation improvements at the interchange of Interstate 80 (I-80) and State Route (S.R.) 224 and through the two at-grade intersections on S.R. 224 (Ute Boulevard and Olympic Parkway) in Summit County, Utah. The Utah Department of Transportation (UDOT), in partnership with Summit County, conducted this detailed transportation study.

The purpose of this Area Plan is to document the results of the study conducted using UDOT's Solutions Development process. Solutions Development is an innovative planning process developed by UDOT that seeks to capture the unique context of an area or corridor and develop a set of solutions to meet its transportation needs. Solution sets could include things such as roadway improvements for cars, transit and/or active transportation, travel demand management, Intelligent Transportation Systems (ITS) improvements, and land use and other policy changes that would be implemented by local government partners. The Solutions Development process integrates with the work of other UDOT divisions such as environmental, operations, and performance management. Integrating with these other areas helps ensure holistic solutions that match the area's unique context and needs. UDOT initiated the Area Plan to develop a range of improvements to reduce congestion and improve multimodal travel and connectivity through the Kimball Junction Area, including the two at-grade intersections on S.R. 224.

This technical report provides a study overview; a description of the problems and opportunities in the study area; a discussion of the alternatives that were developed by the study team in concert with the study partners; a description of the Level 1 and Level 2 screening processes, including screening criteria, measures, and results; and a discussion of public and partner outreach efforts and comments received. Finally, this technical report describes the alternatives recommended to move forward into future phases of study.

The alternatives developed as part of this study include stand-alone surface street improvements and larger, more-complex transportation solutions. This report presents a high-level description of the physical and operational aspects of the alternatives being considered. The alternatives range from modest investments in shared-use, multimodal roadway improvements to major investments in new interchange and intersection design in order to determine which mix of improvements achieves the greatest mobility and related benefits, balanced against costs and impacts to communities and the environment.

The alternatives evaluation process included developing screening criteria based on addressing the problems and opportunities and study goals, developing a full range of alternatives, and documenting the elimination of alternatives to limit the need for re-considering the full range of alternatives during future National Environmental Policy Act (NEPA) or state environmental processes.

### 1.1 Study Area and Background

**Study Area.** The current study area is the I-80 and S.R. 224 interchange and the two at-grade traffic signals at Ute Boulevard and Olympic Parkway, which are close to the interchange (see Figure 1-1). S.R. 224 is a gateway to world-class travel destinations and burgeoning residential and commercial developments. S.R. 224 serves as a primary artery into Park City's Old Town and to two of the major economic drivers in the region: Park City Mountain Resort and Deer Valley. Several key destinations

Figure 1-1. Study Area for the Kimball Junction and S.R. 224 Area Plan



Legend

 Area Plan Study Limits

### KIMBALL JUNCTION

#### AREA PLAN

State Route 224





are reached via S.R. 224 including Canyons Village at Park City, the Utah Olympic Park, the Swaner EcoCenter, and the Kimball Junction commercial centers. The study area contains a mix of highly developed, mixed-use residential, commercial, and retail businesses as well as open space and conservation easement lands bordering the commercial zone. In addition, S.R. 224 serves as a commuter corridor. S.R. 224 has many challenges starting with a relatively high average daily traffic of about 37,000 vehicles per day with many pedestrians and bicyclists.

**Study Background.** With this study, the study partners (UDOT and Summit County) wish to accomplish the following:

- Create a community vision for improvements that address the problems and opportunities
- Identify mobility problems and opportunities at the Kimball Junction area
- Determine stand-alone surface street improvements and larger, more-complex transportation solutions for the Kimball Junction area
- Position the study area for successful and streamlined implementation of improvements
- Generate an environment of collaboration and communication between the study partners that lasts beyond the timeframe of the study

The Area Plan will be established using the following approach:

1. Develop a community vision and Problems and Opportunities Statement once the study partners have received public input
2. Develop a set of alternatives for evaluation
3. Select the top three alternatives that are most technically, financially, and operationally feasible for concept design

The study partners evaluated a wide range of alternatives at a broad level against select measures that closely reflected the study goals and Problems and Opportunities Statement. Coordination points between the study team and the study partners included the collection of data, traffic operation analysis, and wildlife crash analysis. In addition, the study team held workshops with the study partners during development of the problems and opportunities and study goals, development of screening criteria, alternatives development, and the Level 1 and Level 2 screening evaluations.

The alternatives development and screening process described in this report will provide critical information about how well an alternative satisfies the study's opportunities and whether it's reasonable and feasible. The criteria used in the screening analyses will be used to generate measures that will let the study partners systematically and objectively identify reasonable alternatives.

## 2 Planning Context

A number of plans have been developed that relate to this Area Plan study, including local transportation plans, plans for the adjacent land use, and statewide plans. The following local and regional plans were considered during the area planning process:

- *S.R. 248 Corridor Plan/Corridor Improvement Project* – 2009
- *Park City Traffic and Transportation Plan* – 2011
- *S.R. 224 Corridor Study (“Dan’s to Jan’s”)* – 2012
- *Park City General Plan* – 2014
- *S.R. 224 Shared Shoulder* – implemented 2014
- *Snyderville Basin Long-range Transportation Plan* – 2014
- *Mountain Accord Phase 1* – 2015
- *Park City Travel Demand Management Plan* – 2016
- *Short-range Transit Plan* – 2016
- *Valley to Mountain (S.R. 224) Transit Project Alternatives Analysis* – 2018
- *Kimball Junction Master Plan* – 2019
- *Park City Forward* – ongoing

## 3 Problems and Opportunities Framework

The study team reviewed the planning documents listed above—notably the *Valley to Mountain (S.R. 224) Transit Project Alternatives Analysis* (S.R. 224 bus rapid transit, or BRT) and the *Kimball Junction Master Plan*—to initiate a list of problems to solve and a list of opportunities that could help solve the problems in the area. These problems and opportunities shaped the screening criteria by which potential alternatives were compared. The following problems and opportunities framework was developed by the study partners and vetted with the public through an online survey that was conducted during the spring of 2020 (see Section 15, Public and Study Partner Coordination and Outreach).

- The Problems and Opportunities Statement definition for a study is a critical step in that it guides the development and evaluation of alternatives.
- The screening and evaluation process is designed to build on the Problems and Opportunities Statement and the goals and objectives identified in the statement.
- The Problems and Opportunities Statement and screening and evaluation process will be developed with the study partners and with feedback from the public and stakeholders.
- The Problems and Opportunities Statement and screening criteria will be developed based on adopted policies, goals, and objectives in adopted planning documents, most notably the *Valley to Mountain (S.R. 224) Transit Project Alternatives Analysis* and the *Kimball Junction Master Plan*.

### 3.1 Problems in the Study Area

The transportation problems in the study area are based primarily on (1) existing system deficiencies, including traffic backups at on and off ramps and intersections that are close together; (2) potential impacts to the existing system caused by a changing level and type of travel demand associated with projected growth in population, employment, tourism, and development in the Kimball Junction area; and (3) failures in the existing system with regard to mobility, congestion, access, and travel time reliability that have prompted the study partners' desire for changes to accommodate and encourage livability and a multimodal transportation system for the efficient movement of people, goods and services. Specifically, the *Kimball Junction and S.R. 224 Area Plan* study is a result of the following conditions:

- Traffic congestion during peak periods limits mobility to and from I-80 through Kimball Junction.
- Traffic congestion ebbs and flows depending on time of year and special events.
- Vehicles on the I-80 interchange ramps queue onto the I-80 and S.R. 224 mainlines.
- Travel time on S.R. 224 through the Kimball Junction area is unreliable.
- Transit vehicles don't have exclusive transit priority on S.R. 224 through the Kimball Junction area.
- The increase in travel demand from forecasted job, residential, and recreational growth might lead to decreased mobility.
- Safety, regional air quality, and quality of life might decline due to increased traffic.
- East-west mobility is lacking on S.R. 224 through the Kimball Junction area for all travel modes.
- Residences and businesses along S.R. 224 through the Kimball Junction area are often difficult to access.
- The current interchange and S.R. 224 shoulders don't adequately accommodate snow storage for snow plows, which affects safety and mobility.

### 3.2 Opportunities in the Study Area

Based on the above problems the study partners are trying to solve, the intent of the *Kimball Junction and S.R. 224 Area Plan* study is to identify and analyze multimodal improvements to address congestion, mobility, safety, access, and travel time reliability for efficient movement of people, goods, and services at the Kimball Junction interchange and on S.R. 224 in the Kimball Junction area.

The Area Plan is specifically intended to improve capacity and multimodal transportation options in the Kimball Junction area and address the existing and long-term mobility needs of residents, commuters, and visitors between the I-80 interchange and the two at-grade traffic signals at Ute Boulevard and Olympic Parkway on S.R. 224.

In addition to the problems and opportunities that were established in the study area, other criteria were established to balance transportation and environmental goals and objectives. Input from the study partners and public was incorporated to develop the goals. The study team subsequently developed six Area Plan goals that provided guidance for the alternatives development process. Table 6-1 on page 9 lists the opportunity elements that are proposed by the study partners based on the corresponding goal for the Area Plan.

## 4 Alternatives Development and Screening Process

The alternatives development and screening process that was used for this study included several steps. After defining the problems, opportunities, and goals of the desired study, the next step was to develop the universe of alternatives during an alternatives development workshop with the study partners. The universe of alternatives was then evaluated using a two-level screening process to ensure that only the most promising alternatives were carried forward for detailed analysis in a subsequent phase of study.

**Level 1** screening determined whether the alternatives had a “fatal flaw” or whether they did not meet the problems and opportunities of the study. The alternatives that had a fatal flaw or did not meet the problems and opportunities were dismissed from further consideration.

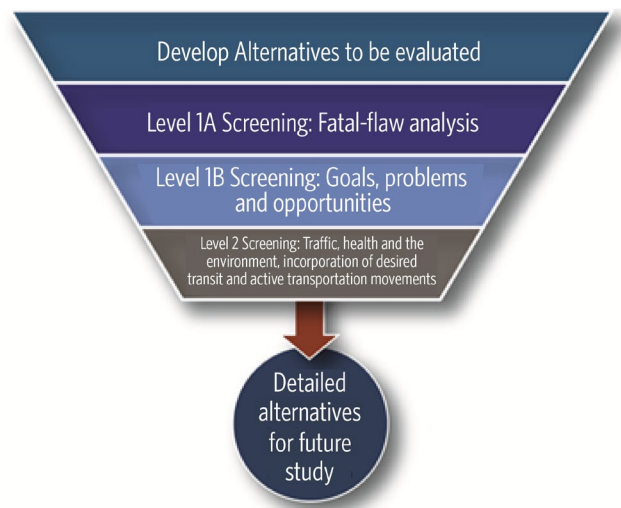
**Level 2** screening of the remaining alternatives will include more-quantitative objectives as well as a comparative evaluation of technical screening criteria.

### 4.1 Screening Criteria

The study team developed screening criteria to evaluate alternative concepts for meeting the objectives of the *Kimball Junction and S.R. 224 Area Plan* study. The team developed screening criteria in the following areas: capacity, accessibility, mobility, safety and comfort, community health and environment, multimodal connections, consistency with adopted plans, public acceptance, and innovative operational and maintenance techniques. These areas align with the six goals developed by the study partners. The study area’s goals and opportunities are the foundation of the evaluation criteria.

Specific performance measures were developed for some of the screening criteria so that the study team could more easily compare the alternatives against the screening criteria and against the study area’s problems and opportunities. These performance measures are either qualitative or quantitative assessments depending on the criteria and the availability of data at this stage of project development. ***Not all criteria were used at both levels of screening, and the study team concentrated on performance measures based on the amount of detail needed to make decisions about the alternative concepts at each level of screening.*** The study team applied these screening criteria to the alternative concepts as appropriate throughout the alternatives development process using the best information available at each level of screening.

Figure 4-1. Overview of the Kimball Junction Area Plan’s Alternatives Development and Screening Process



## 5 Level 1 Screening

During Level 1 screening, the study team evaluated alternatives at a low level of detail using mostly qualitative and fatal-flaw assessments. The Level 1 screening criteria included addressing the problem and opportunity elements described in Section 3, Problems and Opportunities Framework, and avoiding fatal flaws while working within the framework.

### 5.1 Fatal-flaw Screening Questions for Level 1 Screening

The following yes-or-no, fatal-flaw questions were used in Level 1 screening:

- Does the alternative cause irreconcilable environmental impacts?
- Does the alternative cause irreconcilable community impacts?
- Is the alternative impractical and infeasible?

Any alternative with a “yes” answer to a screening question was dismissed from continued study.

### 5.2 Problems, Opportunities, and Goals Screening Questions for Level 1 Screening

The study goals and problems and opportunities were the basis for the remaining Level 1 yes-or-no screening questions:

- Does the alternative improve interchange area capacity and vehicle mobility to/from I-80 and to/from S.R. 224 through the Kimball Junction area?
- Does the alternative maintain or improve multimodal travel options, health, and safety for pedestrians, cyclists, and transit users in the Kimball Junction area?
- Does the alternative support operation and reliability of the *Valley to Mountain (S.R. 224) Transit Project Alternatives Analysis* preferred alternative (side-running BRT) on both sides of S.R. 224?

Any alternative with a “no” answer to a screening question was dismissed from continued study.

## 6 Level 2 Screening

The purposes of Level 2 screening were to perform additional and more-detailed analysis to determine whether each alternative would meet the Problems and Opportunities Statement, compare how well the alternatives would perform, and preliminarily identify what impacts each alternative would have. Note that any alternatives advanced for study after Level 2 screening will require further environmental clearance in future study phases.

The Level 2 screening was a more-detailed evaluation of the alternatives that passed Level 1 screening. The Level 2 screening either added additional measures or expanded measures for each of the criteria from Level 1 screening and provided a method for comparing alternatives. Alternatives carried forward from Level 1 screening were reviewed and refined to add more definition to the proposed improvements, to better understand their operational benefits and costs, and to provide information so that the study team could further assess the alternatives in Level 2 screening. In addition, the first step in Level 2 screening also allowed the study team to further refine the alternatives before moving into the rest of the Level 2 screening evaluation.

### 6.1 Level 2 Screening Matrix

The Level 2 screening process further refined the reasonable alternatives by assessing the alternatives against study goals and opportunities in a primarily quantitative way, though some qualitative criteria were used. Table 6-1 lists the opportunity and objectives criteria and measurements that were used in Level 2 screening.

Table 6-1. Level 2 Screening Criteria and Measurements

Goal	Opportunities and Objectives Criteria	Measurements
<p><b>Move people and goods more efficiently through the Kimball Junction area.</b></p>	<p>Prevent off-ramp queues from I-80 to S.R. 224 from affecting operations and safety of the I-80 mainline.</p>	<p>Measure peak-hour queue lengths at the westbound and eastbound off ramps.</p>
	<p>Accommodate current and projected travel demand on S.R. 224 in the Kimball Junction area while minimizing the roadway footprint.</p> <p>Reduce person-delay of private (single-occupant or high-occupancy) vehicles navigating through the Kimball Junction area.</p>	<p>Quantitatively assess the alternative’s ability to reduce travel times for travel time pairs on S.R. 224 south of Kimball Junction to and from eastbound and westbound I-80.</p>
	<p>Improve the overall capacity of the Kimball Junction area by improving vehicular and transit networks.</p>	<p>Improve vehicle or person throughput at intersections during future (2050) peak hours. Measure overall intersection level of service as well as percent served.</p>
	<p><b>Improve mobility and comfort for all users to and around the Kimball Junction area through a connected network.</b></p>	<p>Maintain existing, and consider additional, grade-separated active transportation connections across I-80 and S.R. 224.</p>
<p>Enhance regional transit connectivity to the Kimball Junction Transit Center and future BRT facilities.</p>		<p>Measure changes in transit travel times for all routes that serve the Kimball Junction area.</p>
<p>Improve existing access deficiencies and accommodate future access needs.</p>		<p>Qualitatively assess whether the alternative includes or supports future congestion-management strategies such as Transportation Demand Management.</p>
<p>Improve vehicle mobility to and from the Kimball Junction area.</p>		<p>Quantitatively assess vehicle delay for movements into and out of Kimball Junction land uses via S.R. 224 and I-80.</p>

*(continued on next page)*

Table 6-1. Level 2 Screening Criteria and Measurements

Goal	Opportunities and Objectives Criteria	Measurements
<p><b>Provide a balanced transportation system that contributes to improved local and regional air quality, environmental sustainability, and community health.</b></p>	<p>Promote comfortable active transportation opportunities that connect existing and emerging land uses.</p>	<p>Qualitatively assess the alternative’s ability to accommodate safe travel by pedestrians and cyclists.</p>
	<p>Create a place where there are viable travel alternatives to using a car in order to improve mobility and contribute to improved local and regional air quality, environmental sustainability, and community health.            Minimize environmental, right-of-way, and utility impacts.</p> <p>Minimize impacts to public health while improving health-related activities and access and equity to public health facilities.</p>	<p>Qualitatively assess the ability of local residents and visitors to access community facilities both across and along S.R. 224            Alternative avoids impacts to existing neighborhoods, has minimal effect on community cohesion, and enhances the character of the area. Assess high-level measures of expected impacts to environmental resources including:</p> <ul style="list-style-type: none"> <li>▪ Acres of floodplains</li> <li>▪ Acres of conservation easements and open space</li> <li>▪ Acres of wetlands</li> <li>▪ Acres of biological resources</li> <li>▪ Acres of right-of-way impacts</li> <li>▪ Number of historic properties</li> <li>▪ Number of utility impacts</li> </ul> <p>Qualitatively assess vehicle-miles traveled reduction for improvement in air quality.</p> <p>Qualitatively assess increased physical activity achieved during everyday trips.</p> <p>Qualitatively assess improved access to health-related resources along S.R. 224.</p> <p>Qualitatively assess improved multimodal connectivity to Kimball Junction–area destinations.</p> <p>Measure distance traveled for accessibility to transit and active transportation facilities—what is available within ¼ mile—and assess physical barriers.</p> <p>Qualitatively assess transportation equity.</p>
	<p>Improve safety on S.R. 224 in the Kimball Junction area for all users.</p>	<p>Quantitatively assess the alternative’s ability to reduce conflict points (vehicle-to-vehicle, vehicle-to-cyclist/pedestrian) and crash rates (where <i>Highway Safety Manual</i> methodologies apply).</p>

(continued on next page)



Table 6-1. Level 2 Screening Criteria and Measurements

Goal	Opportunities and Objectives Criteria	Measurements
<b>Maintain consistency with adopted plans for the Kimball Junction area.</b>	Ensure that the alternative is consistent with planned land uses.	Alternative is consistent with adopted local and regional land use and transportation plans.  Alternative is compatible with other planned projects on S.R. 224 in the Kimball Junction area as identified in adopted planning studies for the area.
	Ensure that the alternative fits the character and scale of the community and is complementary to the landscape.	Assess community support for the alternative based on a public survey and meetings.  Qualitatively assess the suitability of the alternative within the scale of the community and the alternative's ability to enhance the study area's natural setting and character.
<b>Develop solutions that complement the evolving context and scale of the community.</b>	Ensure that the alternative is practical and implementable.	Measure the alternative's practicality and implementability with conceptual-level costs. Consider the alternative's constructability given available technology.
	Accommodate snow storage after plowing and other maintenance activities.	Qualitatively assess the alternative's ability to accommodate snow storage and other maintenance activities to ensure travelers' safety and mobility.
<b>Consider innovative operational technologies and accommodate maintenance needs.</b>	Include innovative operational technologies.	Qualitatively assess whether the alternative includes or supports future congestion-management strategies such as Transportation Systems Management, Intelligent Transportation Systems, or Transportation Network Companies.

Scoring: Low = 1 (poor), Medium = 2 (Acceptable), High = 3 (Good) **or** Low/Medium/High

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## 7 Traffic Conditions

Understanding the existing and forecasted traffic conditions along I-80 and S.R. 224 is helpful when reviewing interchange and physical improvements needed to improve multimodal operations at the I-80 interchange and on the roads. Specific analysis was completed to evaluate traffic conditions at key intersections during the AM and PM peak hours for a typical weekday. This section provides a brief summary of the existing and future (2050) traffic and safety conditions in the Kimball Junction area. For more detailed information about traffic and safety conditions in the Kimball Junction area, see Appendix A, Traffic Analysis.

### 7.1 Existing Traffic Conditions

To support the analysis, traffic data were collected in the study area to determine existing traffic volumes, traffic composition, and travel patterns. Traffic operations were evaluated using a microsimulation VISSIM model that was built and calibrated using the existing traffic data collected for the study. This type of model was used due to the proximity of intersections in the study area, vehicle queuing that currently spills back through multiple intersections, and the need to model and evaluate transit and active transportation operations. In addition, the microsimulation model allowed for evaluation of the I-80 mainline, on and off ramps, and arterial street systems and the interactions among them. The microsimulation model used was VISSIM version 10, build 8.

**Vehicle Travel Times.** Travel time data in the study area were collected using Bluetooth sensors currently deployed by UDOT along I-80 and S.R. 224. These sensors collect and aggregate anonymized Bluetooth and Wi-Fi signals from passing vehicles to provide real-time vehicle travel times. Data from the Bluetooth sensors were pulled over a 6-day period for midweek days during the first 2 weeks of February 2020 (February 4–6 and February 11–13) for the weekday AM and PM peak hours.

Travel times during the weekday AM and PM peak hours along the I-80 mainline in both directions were found to be relatively consistent; variations ranged from 3 to 41 seconds over the 6 days of data. The lack of variability indicates free-flow traffic conditions along the I-80 mainline, which was consistent with study team observations. Conversely, there is variability in the travel time on S.R. 224 in both directions. This indicates unstable traffic conditions, which result in fluctuations in travel times with changes in traffic conditions, volumes, and other environmental factors.

The Bluetooth travel time data were used to calibrate the VISSIM microsimulation traffic operations model. The following sections discuss the results from the existing weekday AM and PM peak-hour analyses.

**Vehicle Queuing.** Vehicle queuing was measured using queue counter data collected on every traffic movement at each intersection in 90-second intervals. The queue data over the AM and PM peak hours were calculated for the average and 95th-percentile queue lengths for each traffic movement. Vehicle queuing data in the Kimball Junction interchange area were visually verified during the weekday AM and PM peak periods during January 2020. Vehicle queues were most notable in the northbound direction during the weekday PM peak period and on the I-80 eastbound off ramp during the weekday AM peak hour. Aerial drone video of S.R. 224 and the I-80 ramps was captured by UDOT during March 2020 and was also used to visually verify and calibrate vehicle queues and traffic operations in the area.

During the weekday AM peak hour, the longest vehicle queues are currently on the I-80 eastbound right-turn off ramp movement to S.R. 224 and the southbound through movement on S.R. 224 at Ute

Boulevard and Olympic Parkway. These traffic movements have the highest volumes and were observed in the field as well as in the drone footage to have the longest vehicle queues as people travel inbound to Park City from the Salt Lake Valley to work and recreate during the weekday AM peak hour. During the weekday PM peak hour, the longest vehicle queues were observed on the northbound approach of the Olympic Parkway intersection on S.R. 224.

**Intersection Level of Service.** As shown in Table 7-1, traffic operates under acceptable conditions during the weekday AM peak hour. However, as seen in Table 7-1 and Figure 7-1 below, during the weekday PM peak hour, several of the Kimball Junction–area intersections operate at a level of service (LOS) of LOS E or LOS F, which indicates heavy vehicle delays with long vehicle queues and extended travel times.

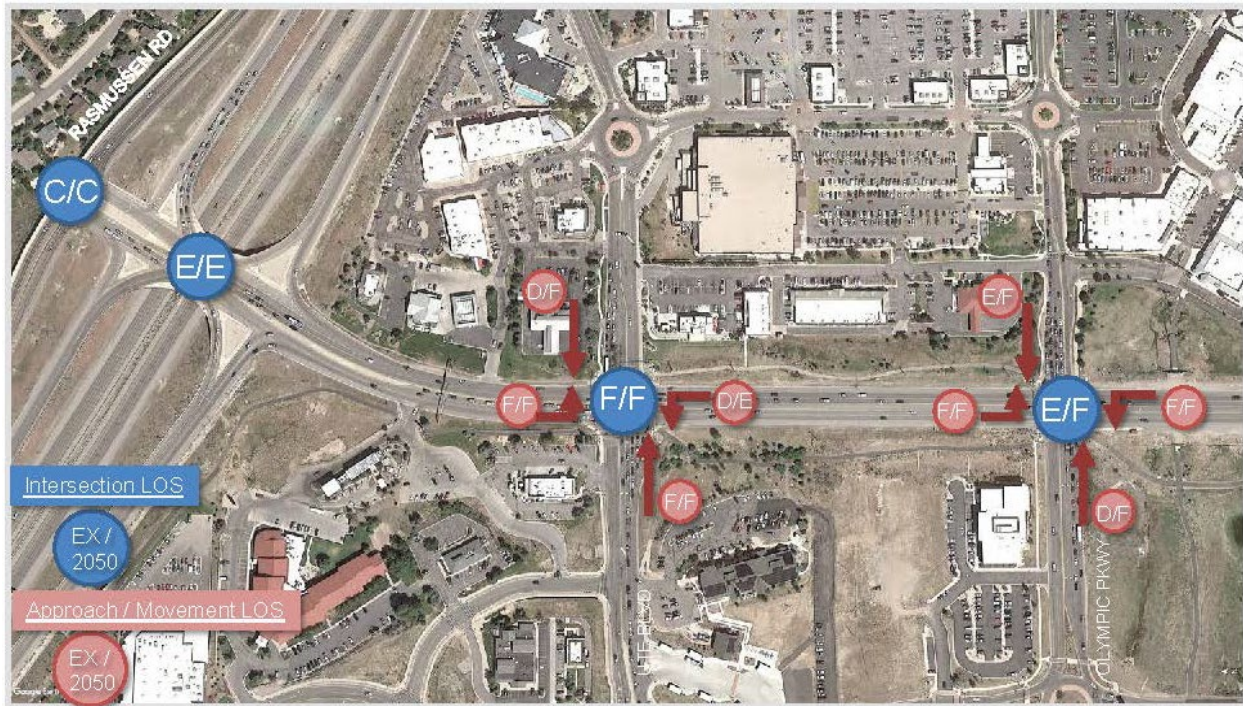
Table 7-1. Vehicle Delay and Level of Service at Intersections during the Weekday Peak Hour under the Existing Conditions

Location	Control Type	Vehicle Delay (seconds/vehicle)	Level of Service (worst movement)
<b>Weekday AM Peak Hour</b>			
Rasmussen Rd./S.R. 224	Stop-controlled	14	B (WBL)
I-80/S.R. 224 interchange	Traffic signal	30	C
Ute Blvd./S.R. 224	Traffic signal	43	D
Olympic Pkwy./S.R. 224	Traffic signal	42	D
<b>Weekday PM Peak Hour</b>			
Rasmussen Rd./S.R. 224	Stop-controlled	16	C (WBL)
I-80/S.R. 224 interchange	Traffic signal	56	E
Ute Blvd./S.R. 224	Traffic signal	92	F
Olympic Pkwy./S.R. 224	Traffic signal	70	E

WBL = westbound lane

As shown in Table 7-1 above, the three signalized intersections operate at LOS C and LOS D during the weekday AM peak hour. As shown in Table 7-1 above and Figure 7-1 below, the three signalized intersections operate at LOS E and LOS F during the weekday PM peak hour.

Figure 7-1. Traffic Patterns and Problems during the PM Peak Hour for Existing/2050



**Summary.** Traffic operates under acceptable conditions during the weekday AM peak hour. However, during the weekday PM peak hour, several of the study intersections operate at LOS E or LOS F, which indicates heavy vehicle delays with long vehicle queues and extended travel times. Traffic is expected to increase on S.R. 224 and on both sides of the Kimball Junction area by 2050.

## 7.2 No-build Traffic and Safety Conditions in 2050

The modeling work conducted for the 2050 no-build conditions included socioeconomic data inputs, made in close coordination with Summit County, to account for approved development plans (including increased totals for households and employment) at the Canyons Village and Dakota Pacific Real Estate development areas. In addition, the modeling work included the planned S.R. 224 BRT.

Traffic is expected to increase on S.R. 224 and on both sides of the Kimball Junction area by 2050. Traffic volumes during the weekday AM and PM peak hours are anticipated to increase by up to 31% by 2050 under the no-build conditions. This includes growth both on S.R. 224 for vehicles traveling between I-80 and Park City as well as on Ute Boulevard and Olympic Parkway as more development occurs in the Kimball Junction area.

**Vehicle Travel Times.** For the weekday AM peak-hour travel times, from I-80 eastbound to S.R. 224 southbound, an increase of just under 2 minutes is anticipated. This is caused primarily by vehicle queuing on the right turn from the I-80 eastbound off ramp and congestion between the I-80 and S.R. 224 interchange and the Ute Boulevard intersection. Minor increases in travel time are also expected on S.R. 224 northbound to I-80 westbound and on I-80 westbound to S.R. 224 southbound.

As shown in Table 7-2 and Figure 7-2 below, for the weekday PM peak-hour travel times, travel time on northbound S.R. 224 between Bobsled Boulevard and Olympic Parkway is anticipated to nearly double, from 3 minutes 46 seconds under the existing conditions to 7 minutes 24 seconds under the

2050 no-build conditions. This doubling would result in an additional 3 minutes 38 seconds of travel time on this segment of S.R. 224 in 2050.

Table 7-2. Projected Travel Times during the Weekday PM Peak Hour under the 2050 No-build Conditions

Segment	Length (miles)	Existing VISSIM Average Travel Time	No-build VISSIM Average Travel Time	Change in Travel Time
I-80 EB	1.9	1:44	1:45	+0:01
I-80 WB	1.9	1:44	1:45	+0:01
S.R. 224 NB to I-80 EB	1.1	2:20	2:41	+0:21
I-80 EB to S.R. 224 SB	1.1	2:09	2:21	+0:12
S.R. 224 NB to I-80 EB	1.5	2:49	3:02	+0:13
I-80 WB to S.R. 224 SB	1.5	5:16	5:52	+0:36
S.R. 224 NB	0.8	3:46	7:24	+3:38
S.R. 224 SB	1.8	1:00	0:59	-0:01

EB = eastbound; NB = northbound; SB = southbound; WB = westbound

Figure 7-2. Travel Time Increases during the PM Peak Hour from the Existing Conditions to 2050



This increase in travel time is attributed to the large increase of vehicles on the northbound approach traveling from The Canyons and Park City to I-80 as well as increases anticipated on the east and west sides of S.R. 224 at Kimball Junction due to growth in development. This increase in the number of vehicles will cause the Olympic Parkway intersection to be over capacity and unable to process all the vehicles during the weekday PM peak hour, subsequently causing long delays and vehicle queues traveling northbound. The other travel times in the area are anticipated to have smaller increases

between the existing and 2050 no-build conditions. However, note that, due to the over-capacity conditions occurring at Olympic Parkway, vehicles at the intersections to the north are being artificially metered and are not serving the actual traffic demand volumes. By remediating the traffic issues solely at the Olympic Parkway intersection, it is likely that the congestion points would be moved to either the Ute Boulevard or I-80 interchange, and similar overall travel times would be observed through the Kimball Junction area.

**Vehicle Queuing.** The greatest increase in vehicle queue length from existing to 2050 no-build conditions during the weekday AM is expected on the eastbound right movement at the I-80 interchange. The number of vehicles traveling from the Salt Lake Valley to Park City during the morning commute is anticipated substantially increase, which would lead to congestion and added travel times to vehicles traveling through the I-80 interchange. The average weekday AM peak-hour vehicle queue for the eastbound right turn during the 2050 no-build conditions is anticipated to be 1,520 feet with a 95th-percentile queue of nearly 3,000 feet.

Based on the current alignment of the interchange, a 3,000-foot-long queue would extend to the off ramp gore point (that is, the boundary point intended to help organize and protect traffic when vehicles exit the roadway), which could cause issues with drivers not being able to decelerate quickly enough from traveling on I-80 to the time they reach the back of the queue.

During the weekday PM peak hour, the greatest increases in vehicle queue lengths from existing to 2050 no-build conditions are anticipated to occur on the northbound approach of S.R. 224 at the Olympic Parkway intersection. This intersection is anticipated to operate over capacity during the 2050 no-build conditions and will not be able to serve the full vehicle demand during the weekday PM peak hour. At the other study intersections, vehicle queue lengths are also anticipated to increase; however, these intersections are not likely processing the actual projected vehicle demand due to the bottleneck occurring at the Olympic Parkway intersection.

**Intersection Level of Service.** The average weekday peak-hour vehicle delay and level of service summary is shown in Table 7-3 for the same intersections shown above in Table 7-1 under existing conditions. As shown in Table 7-3 below and Figure 7-1 above, the three signalized intersections are projected to operate at LOS D and LOS E during the weekday AM peak hour and at LOS E and LOS F during the weekday PM peak hour.

Table 7-3. Vehicle Delay and Level of Service at Intersections during the Weekday Peak Hours under the 2050 No-build Conditions

Location	Control Type	Vehicle Delay (sec/veh)	Level of Service (worst movement)
<b>Weekday AM Peak Hour</b>			
Rasmussen Rd/S.R. 224	Stop-controlled	30	D (WBL)
I-80/S.R. 224 interchange	Traffic signal	74	E
Ute Blvd/S.R. 224	Traffic signal	42	D
Olympic Parkway/S.R. 224	Traffic signal	71	E
<b>Weekday PM Peak Hour</b>			
Rasmussen Rd/S.R. 224	Stop-controlled	23	C (WBL)
I-80/S.R. 224 interchange	Traffic signal	59	E
Ute Blvd/S.R. 224	Traffic signal	>100	F
Olympic Parkway/S.R. 224	Traffic signal	>100	F

WBL = westbound lane

**Summary.** In the 2050 no-build conditions, severe congestion is anticipated to occur, particularly in the southbound direction of S.R. 224 during the AM peak hour and the northbound direction of S.R. 224 during the weekday PM peak hour. Average vehicle delay, vehicle travel times, and vehicle queue lengths are all anticipated to become worse between now and 2050 under the no-build conditions. Travel times during the PM peak hour are anticipated to double from the existing conditions for vehicles traveling northbound on S.R. 224 to I-80. The alternatives developed for the Kimball Junction area will aim to improve the future forecasted average vehicle delay, vehicle travel times, and vehicle queue lengths compared to the no-build conditions.



### 7.3 Hypothetical Test of Eliminating Traffic Signals at Ute Boulevard and Olympic Parkway

Initial existing and 2050 no-build traffic analysis indicated that the proximity of the signals at Ute Boulevard and Olympic Parkway disrupt traffic flow to and from the I-80/S.R. 224 interchange, leading to suboptimal performance. To test the ability of the interchange to absorb the full traffic demand without disruption from adjacent signals, a hypothetical scenario was created in the traffic model in which the signals at Ute Boulevard and Olympic Parkway were “turned off.” Essentially, vehicles were allowed to flow freely on S.R. 224 through the Ute Boulevard and Olympic Parkway intersections. Vehicles were also allowed to turn onto and from Ute Boulevard and Olympic Parkway without yielding right-of-way to vehicles on S.R. 224.

The results show that traffic performance at the I-80/S.R. 224 interchange under this hypothetical scenario with the signals turned off is similar to or slightly better than the existing conditions (Table 7-4). This result suggests that the interchange is capable of absorbing the full traffic demand and might even perform better without the vehicle queuing interference from Ute Boulevard and Olympic Parkway. Caution should be taken in interpreting these results since the scenario is a hypothetical only and does not account for the disruption that removing the signals would cause to access to and from Ute Boulevard and Olympic Parkway in their current configuration. However, this test suggests that different configurations of the two at-grade intersections might improve traffic performance at the I-80/S.R. 224 interchange.

Table 7-4. Existing and 2050 No-build Level of Service at the I-80/S.R. 224 Interchange with Hypothetical Test of Eliminating Traffic Signals at Ute Boulevard and Olympic Parkway Compared to Signals “On”

Period	Existing LOS		2050 No-build LOS	
	Signals On	Signals Off	Signals On	Signals Off
PM peak hour	D	C	D	D

## 8 Existing and Future Transit Service in the Kimball Junction Area

Because a primary goal of the *Kimball Junction and S.R. 224 Area Plan* study is to identify and analyze multimodal improvements to address congestion, mobility, safety, access, and travel time reliability for efficient movement of people, goods, and services at the Kimball Junction interchange and on S.R. 224 in the Kimball Junction area, it's important to understand the existing and future transit service offerings in the Kimball Junction area.

**Existing Transit.** The Kimball Junction area is well-served by local and regional transit. The Kimball Junction Transit Center is on the west side of S.R. 224 and is accessed via Ute Boulevard and Landmark Drive. The transit center has a small park-and-ride area and is served by Park City Transit, Utah Transit Authority (UTA), and Summit County shuttles. The Park City Transit and Summit County shuttles are fare-free, which can incentivize users to take shorter trips or chained trips via transit instead of private vehicles.

**Park City Transit.** As shown in Figure 8-1 below, three bus routes currently operate on S.R. 224 in the study area for the *Kimball Junction and S.R. 224 Area Plan*: Route 6 (Lime), which operates along the full distance of S.R. 224 (Kimball Junction Transit Center to Old Town); Route 7 (Pink), which operates on S.R. 224 between the Kimball Junction Transit Center and the Canyons Village Transit Hub; and Route 10 (White) (Electric Xpress), which also operates the full distance of S.R. 224 between the Kimball Junction Transit Center and Old Town. People can access the Kimball Junction area via transit from the Ecker Hill park-and-ride lot. Taking into account the combined Route 6, Route 7, and Route 10 services, buses leave the Kimball Junction transit center about every 10 to 15 minutes.

**Summit County Shuttles.** The Kimball Junction Circulator offers free rides in the Kimball Junction neighborhoods 7 days a week. Riders can flag down a vehicle anywhere along the route, which runs along Highland Drive near Jupiter Bowl and the Snyderville Basin Recreation Fieldhouse, and Landmark Drive by Tanger Outlets and the Kimball Junction Transit Center, among other locations, as shown in Figure 8-2 below. The purpose of the circulator is to move people throughout the Kimball Junction area to do their shopping and dining. They can either park once or use the bus to get to Kimball Junction and then take the circulator. In addition, the Trailside Loop Circulator offers free rides between the Kimball Junction Transit Center. The Circulator travels across S.R. 224 on Ute Boulevard to provide service to the Newpark area before continuing across the I-80 interchange and continuing along Bitner Road to serve the Trailside neighborhood.

# KIMBALL JUNCTION

## AREA PLAN

State Route 224

Figure 8-1. Bus Routes in the Kimball Junction Area

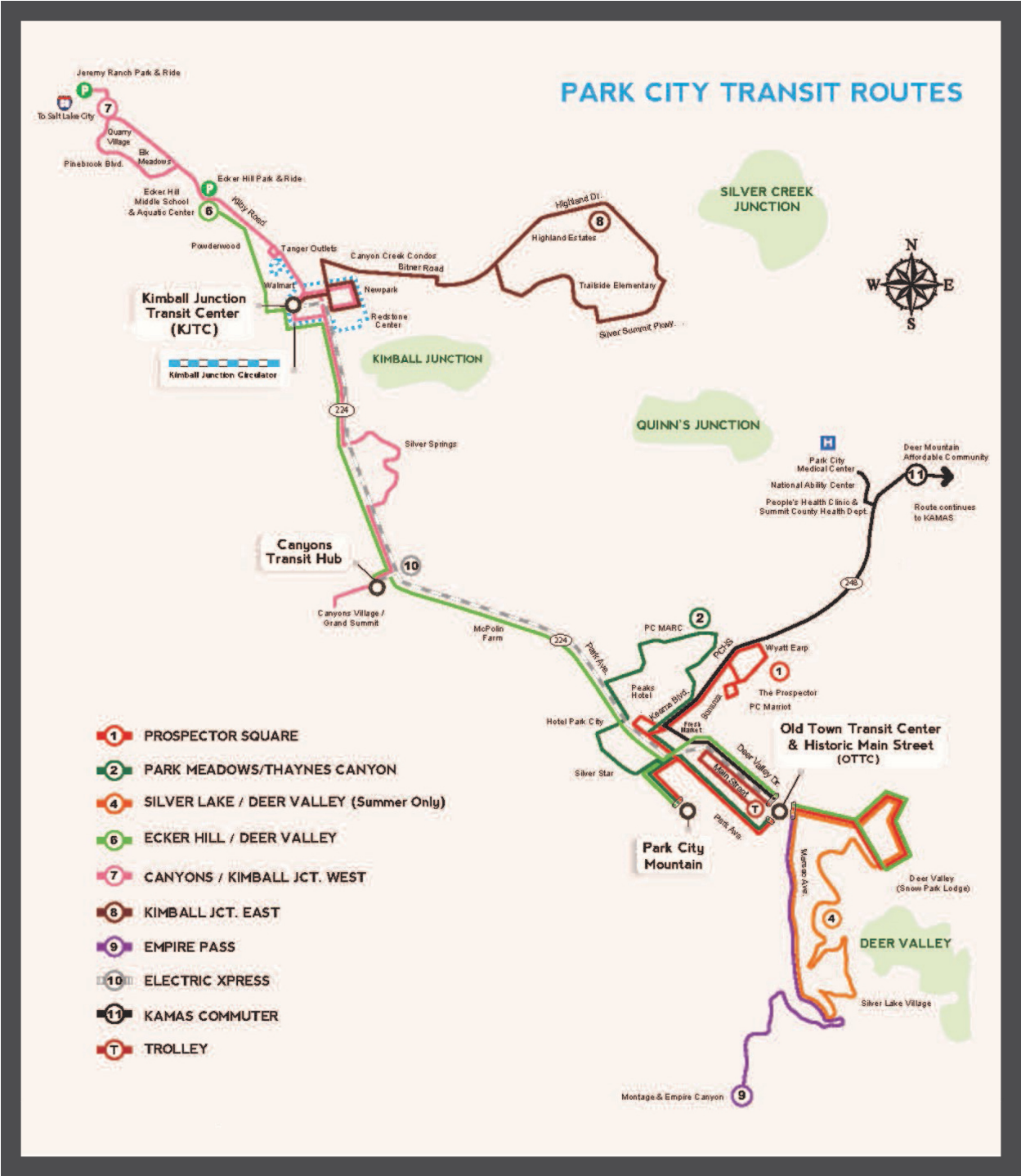
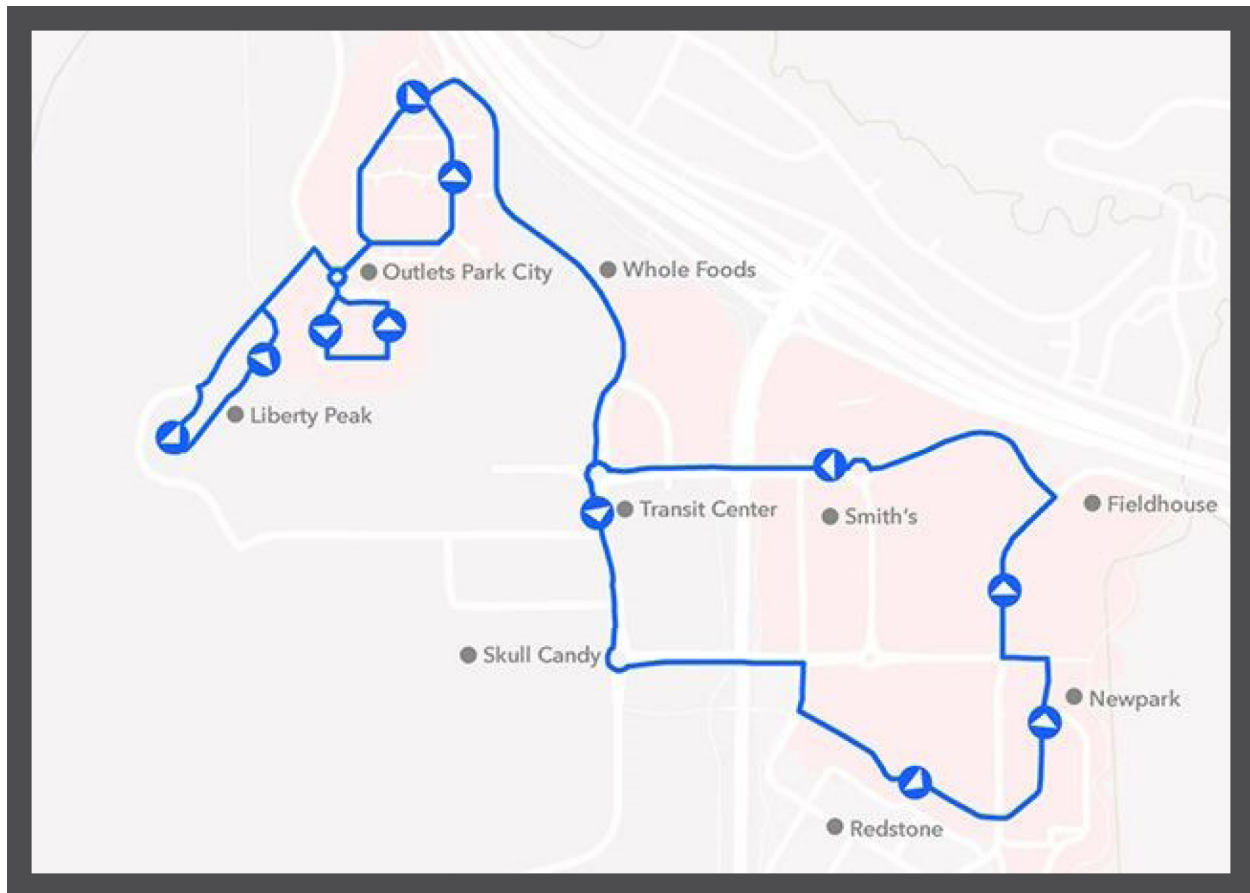


Figure 8-2. Kimball Junction Circulator



As shown above in Figure 8-1, one of the primary routes that would benefit from improvements in the Kimball Junction area is the Route 10 (White) Electric Xpress bus, which, during non-pandemic times, offers a 10-minute trip via S.R. 224 directly between Park City's Old Town Transit Center and the Kimball Junction Transit Center, located behind the Summit County Library. The Route 10 (White) Electric Xpress departs the Old Town Transit Center every 10 minutes, 7 days a week, from 7 AM to midnight. Stops include the Canyons Transit Hub, the Fresh Market grocery store, and the Kimball Junction Transit Center, with bus connections to the Park City–Salt Lake City Connect service (discussed on page 24) and neighborhood routes going to the Pinebrook, Jeremy Ranch, and Trailside Estates/Silver Summit residential areas.

Note that service for the Route 10 (White) Electric Xpress bus, as well as other bus routes in the Park City Transit system, has temporarily been reduced (through longer headways) during the pandemic because of reduced revenues (Figure 8-3 below). Summit County and Park City have planned for BRT along S.R. 224, which will add a dedicated lane in each direction of S.R. 224 exclusively for use by the Route 10 (White) Electric Xpress, other transit vehicles, school buses, and resort shuttles.

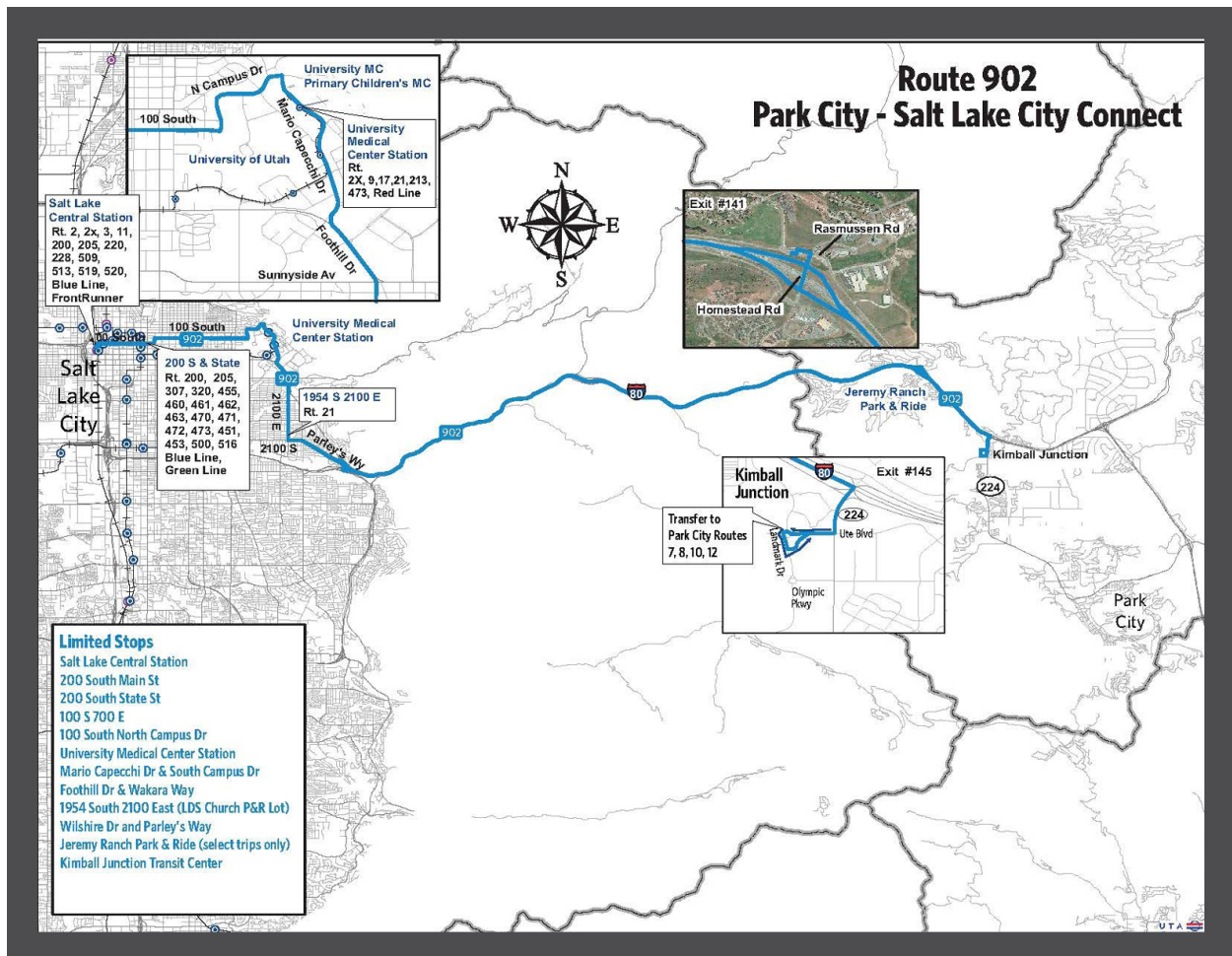
Figure 8-3. Route 10 (White) Electric Xpress



**Regional Commuter Service: PC-SLC Connect.** Park City’s transit service, most notably the Route 10 (White) Electric Xpress, has been designed to integrate with a regional commuter bus line—the Park City–Salt Lake City (PC-SLC) Connect—operated by UTA and jointly funded via a three-way agreement between UTA, Park City, and Summit County. During non-pandemic times, the PC-SLC Connect provides a minimum of eight round trips each day between Park City and Salt Lake City, with more during peak winter months. On average, more than 200 passengers per day rely on the PC-SLC Connect service.

The route serves the largest employer in the state—the University of Utah (including its large medical campus)—and is the only transit connection from the Salt Lake Valley to 20,000 rural Park City–area jobs. This service helps alleviate congestion and reduce the overwhelming demand for employee and guest parking at area alpine resorts and in Park City’s Old Town. PC-SLC Connect terminates near Park City at the Kimball Junction Transit Center where commuters to and from Salt Lake City and beyond can transfer to the Route 10 (White) Electric Xpress (Figure 8-4).

Figure 8-4. PC-SLC Connect



**Future Transit.** In the Kimball Junction area, transit service is expected to maintain an important role in moving people to and through the area. Existing levels of transit service in the Kimball Junction area are anticipated to be maintained or expanded in order to provide frequent and reliable service connecting the surrounding area.

Ongoing studies are being completed to determine how to best implement a BRT line that would connect the Kimball Junction area with The Canyons and Park City. It is currently anticipated that the BRT line would follow a similar route and frequency as the current Route 10 White (Electric Xpress), which runs with approximately 10-to-15-minute headways. The current studies are determining ways to make the Route 10 White (Electric Xpress) a more attractive option by providing exclusive bus-only lanes and other infrastructure improvements that allow for faster and more reliable service. Successfully implementing one or more of the alternatives evaluated in this study could improve transit connectivity in and through the Kimball Junction area, potentially leading to a higher percentage of users choosing transit as an option to navigate throughout the study area.

## 9 Active Transportation in the Kimball Junction Area

Because a primary goal of the *Kimball Junction and S.R. 224 Area Plan* study is to identify and analyze multimodal improvements to address congestion, mobility, safety, access, and travel time reliability for efficient movement of people, goods, and services at the Kimball Junction interchange and on S.R. 224 in the Kimball Junction area, it's important to understand active transportation in the Kimball Junction area.

The Kimball Junction area includes active transportation infrastructure to enable people to walk and bicycle within and to and from the area. Along S.R. 224, buffered multi-use trails, about 8 feet wide, are included on the east side of the road from Ute Boulevard south through the Kimball Junction area and extend nearly to Kearns Boulevard with multiple connections to other regional trails. On the west side of S.R. 224, a similar multi-use trail buffered by landscaping from the roadway runs continuously throughout the Kimball Junction area. To the north, this trail provides connections to the active transportation bridge crossing of I-80 as well as trails paralleling both sides of I-80 toward the east and west. South of Kimball Junction, the multi-use trail extends to Bear Hollow Drive and provides access to unpaved recreation trails west of the Kimball Junction area.

Intersection crossings for the multi-use trails in the Kimball Junction area are typically provided via people-actuated crosswalks at existing traffic signals. However, several grade-separated crossings are also provided in the study area. The pedestrian crossing bridge crosses I-80 about 800 feet west of the I-80 and S.R. 224 interchange. This bridge provides a connection from the retail and commercial space on the south side of I-80 to the neighborhoods on the north side of I-80 and Rasmussen Road. An undercrossing of I-80 also exists about 0.5 mile east of the interchange. On S.R. 224, an undercrossing of the highway is located about 200 feet south of the Olympic Boulevard intersection, and this undercrossing connects to trails along Bitner Road to Highland Road adjacent to the Swaner Nature Preserve. This undercrossing provides a connection between the retail and residential uses on the south side of the Redstone Center and the trails and open space on the west side of S.R. 224. These crossings help facilitate safe movements for people who are bicycling or walking across the major highways in the study area. However, they can also require out-of-direction travel for people, which could result in lower use compared to the at-grade crosswalks at Ute Boulevard or Olympic Parkway or along S.R. 224 crossing the interchange.

In the study area, Summit Bike Share provides short-term bicycle rentals at several stations in Kimball Junction along with others in the Canyons area, Park City, and other locations in Snyderville Basin. Launched by Summit County and Park City in 2017, the Summit Bike Share system offers bicycles to their users. Summit Bike Share is available 24/7 (excluding the winter season), with a network of 20 stations and 190 bicycles. In Kimball Junction, bicycle rental stations are located by the Basin Recreation Field House and the Newpark Plaza on the east side of S.R. 224. On the west side of S.R. 224, bicycle rental stations are located at the Outlets Park City (6699 N. Landmark Drive), farther east along Landmark Drive at Canyon Corners, and at the Kimball Junction Transit Center. All Summit Bike Share bikes are electric bicycles with single-ride fares of \$3 for a 30-minute ride. Monthly and annual memberships are available. Due to the amount of snowfall received in the Park City area, bicycles are typically available from late spring to late fall and are removed during the winter for safety and to preserve the equipment.

During the winter, snow can cause inaccessible conditions for the multi-use trails and sidewalks. Snow is typically plowed from the roads in the area onto the shoulders and adjacent landscaping. Snow can also be plowed onto sidewalks, which can discourage use. Snow is typically cleared from sidewalks after snow is removed from all streets in the area.



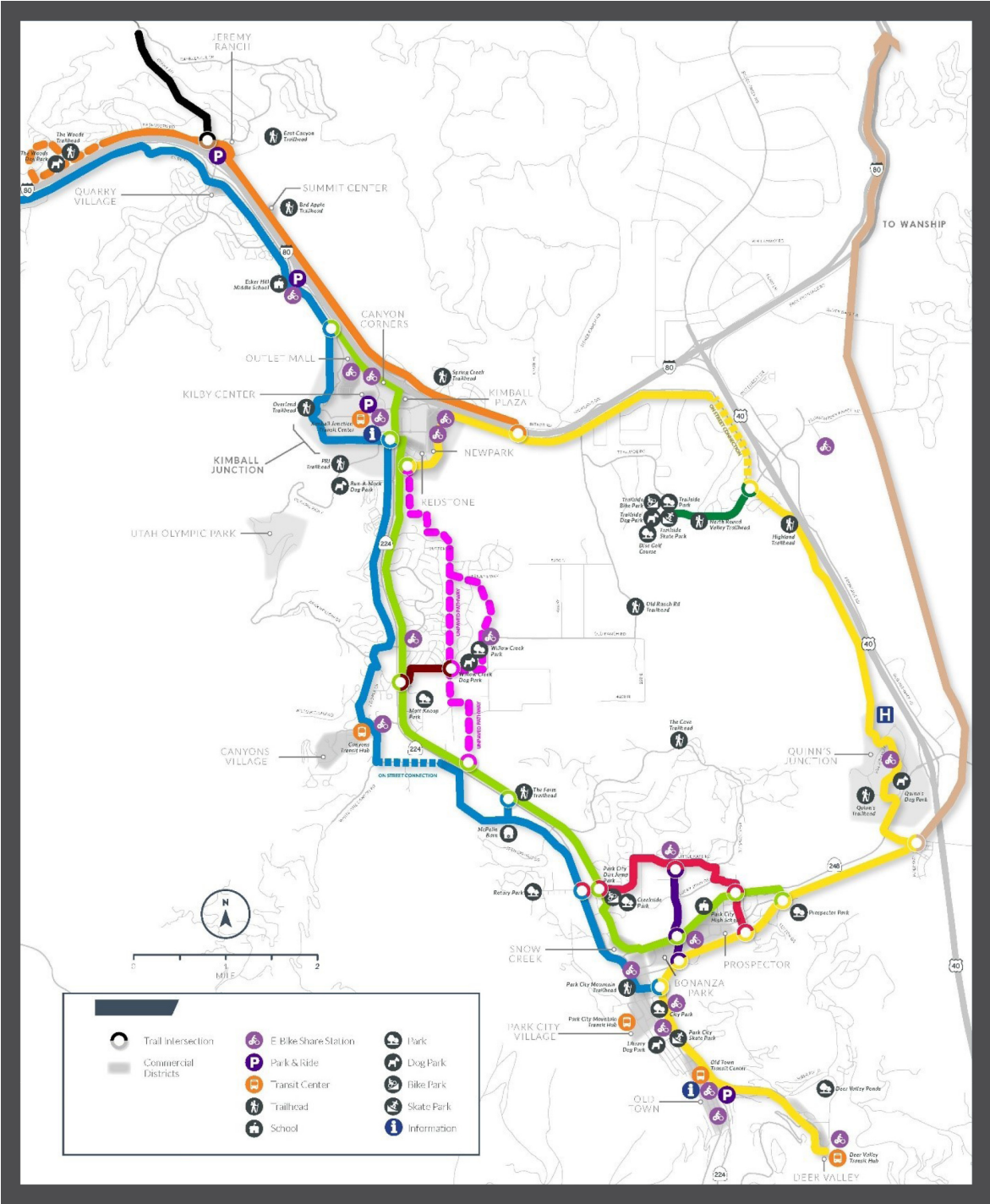
# KIMBALL JUNCTION

## AREA PLAN

State Route 224

As shown in Figure 9-1, S.R. 224 is the spine of Summit County’s regional active transportation network, connecting to over 500 miles of paved multiuse and mountain biking trails—on both ends of the study area—and linking the residential communities near Kimball Junction to developments and job centers in Park City and in between. The alternatives developed for the Kimball Junction area will include improved active transportation connections and amenities.

Figure 9-1. Active Transportation in the Kimball Junction Area



## 10 Health in Transportation Corridor Planning Framework

As part of an ongoing effort to raise the profile of the interaction of transportation infrastructure and health, the Federal Highway Administration (FHWA) recently released a new tool. The Health in Transportation Corridor Planning Framework can be found on [FHWA's Health in Transportation website](#). The tool offers a step-by-step and scalable framework for transportation professionals seeking to include health considerations into their corridor planning activities.

The Framework is intended to be used within an existing corridor planning process, not as a stand-alone or parallel process. It can also be used to inform planning activities at both the regional and project levels to support broad health goals. Summit County is an implementation test site for the Framework, so aspects of the Framework, including active transportation and access to health care facilities, safety, and equity, are being incorporated into the alternatives screening process for this Area Plan.

The Framework identifies four transportation and health priority areas and calls out six steps for evaluating alternatives and making decisions for transportation corridors through a health lens. The four priority areas are:

<b>Priority Area</b>	<b>Health Issue</b>
Active transportation	Obesity, body mass index, chronic disease
Air quality	Respiratory/pulmonary disease, asthma
Safety	Injury prevention, aging
Equity	All health issues

The six steps are:

- Define transportation and public health issues.
- Identify transportation and health needs, resources, and priorities.
- Develop goals and objectives that promote health in the community.
- Establish evaluation criteria that include public health.
- Develop and evaluate alternatives and their health impacts.
- Identify alternatives that support health in the community.

The Health in Transportation Corridor Planning Framework nicely aligns with UDOT's UVision Quality of Life Framework, shown in Figure 10-1 below. Utah's Transportation Vision is a process to collaborate with partnering agencies in order to establish a shared vision for transportation statewide while incorporating quality of life aspects into transportation planning, including the health of individuals and communities, recognizing the role of active transportation in mental and physical health as well as environmental conditions contributing to health, such as air quality and water quality.

UDOT's Solutions Development process also ties in the health context. Solutions development fosters study context by looking at transportation problems and opportunities from the standpoints of community, health, economics, natural environment, transportation, and risk and resiliency.

For this Area Plan, several of the study goals and measurements used to screen alternatives connect back to the Framework's four priority areas: active transportation, air quality, safety, and equity in an effort to identify alternatives that support health in the community. In addition, alternatives were developed to include active transportation features.

Figure 10-1. UDOT's Quality of Life Framework



## 11 Alternatives Development Process

An objective of the Area Plan process is to work with the study partners to analyze and develop a range of stand-alone surface street improvements and larger, more-complex solutions to improve capacity and multimodal transportation options in the Kimball Junction area and address the existing and long-term mobility needs of residents, commuters, and visitors between the I-80 interchange and the two at-grade traffic signals at Ute Boulevard and Olympic Parkway on S.R. 224.

The development of the Universe of Alternatives was the first step of the alternatives assessment and screening process. The Universe of Alternatives includes a wide array of ideas and suggestions for improvements to the Kimball Junction interchange area. These ideas were initiated by the study team, in concert with the study partners, and were based primarily on previous planning studies and through previous public and stakeholder input. Together with the study partners, the study team developed a wide range of potential solutions that could be implemented to address the study goals and identified problems and opportunities. Once the alternatives were screened to determine which alternative packages were most feasible for future study and possible implementation, another public survey was held during the winter of 2021 to vet the alternatives with the public (see Section 15, Public and Study Partner Coordination and Outreach).

The alternatives developed and evaluated include a wide range of potential solutions including bypass lanes, new interchange locations and configurations, intersection improvements, new transit/high-occupancy vehicle (HOV)-only access, and intersection and access point changes in the study area. Suggestions that were similar in nature were combined, then the improvement ideas were grouped into four general improvement categories:

- I-80/S.R. 224 interchange alternatives with improvements focused on I-80 and the I-80 frontage road
- Alternatives focused on improvements along S.R. 224
- Alternatives that combine improvements on I-80 and along S.R. 224
- Stand-alone surface street improvement alternatives

The list of potential solutions includes the conceptual-level alternatives, listed by category in the following sections, to be considered in Level 1 screening. Concept-level drawings for longer-term solutions, and a few short-term solutions as well, are also included below.

### 11.1 Universe of Alternatives to be Evaluated

The study team, in concert with the study partners, developed a wide range—or “universe”—of conceptual-level alternatives including both stand-alone surface street improvements and larger, more-complex solutions for Kimball Junction area. For this planning-level study, only conceptual-level drawings were completed in order to evaluate the alternatives against the Level 1 and Level 2 evaluation criteria presented in Sections 5 and 6. A more detailed definition of alternatives moving forward will be required in future phases of study.

The following sections describe the various alternatives and alternative options that were evaluated during the alternatives evaluation process.

### 11.1.1 Group A: I-80/S.R. 224 Interchange Alternatives with Improvements Focused on I-80 and the I-80 Frontage

Alternative A-1: Half-diamond interchange and tight-diamond interchange with thru movements and Texas U-turns

#### *Description*

Convert the existing S.R. 224 single-point urban interchange (SPUI) to a tight diamond with U-turn movements, coupled with two new half-diamond interchanges on either side of the existing S.R. 224 interchange, all interconnected with one-way frontage roads. One-way frontage roads will provide new access points into Kimball Junction on the south side of I-80.

A transit/HOV-only ramp option was included in this alternative. The new half-diamond interchange west of the S.R. 224 interchange could be modified as shown in Figure 11-1 and Figure 11-2 below to add I-80 median access ramps to and from the west for transit use.

#### *Advantages*

- Improvements are limited primarily to the existing I-80 right of way, especially if I-80 is shifted inward close to the median
- Diverts traffic between I-80 and Kimball Junction away from S.R. 224, freeing up capacity and improving operations on S.R. 224 with no S.R. 224 improvements
- Avoids sensitive land uses
- Retains the existing two-way frontage roads along I-80
- Removes traffic from the existing I-80 eastbound off ramp to S.R. 224, which should reduce the vehicle queuing length
- The addition of transit/HOV-only ramps would give transit a “back-door” entrance into Kimball Junction without ever mixing with S.R. 224 traffic, which would greatly improve transit time reliability

#### *Disadvantages*

- Might not divert enough traffic away from S.R. 224 to significantly improve S.R. 224 operations or might need to be combined with other S.R. 224 improvements to properly work
- Heavy northbound S.R. 224 to westbound I-80 traffic movement likely would not be dramatically improved
- This is a relatively expensive alternative that requires two new bridges and new wall-supported elevated roads
- The addition of transit/HOV-only ramps would add a substantial cost to the alternative

#### *Short Term / Phased Implementation*

A one-way frontage road configuration is generally an all-or-nothing strategy in order to achieve any meaningful benefits and to maintain access points. Therefore, no short-term, low-cost phases of this alternative are apparent.

Figure 11-1. Alternative A-1 (1 of 2)

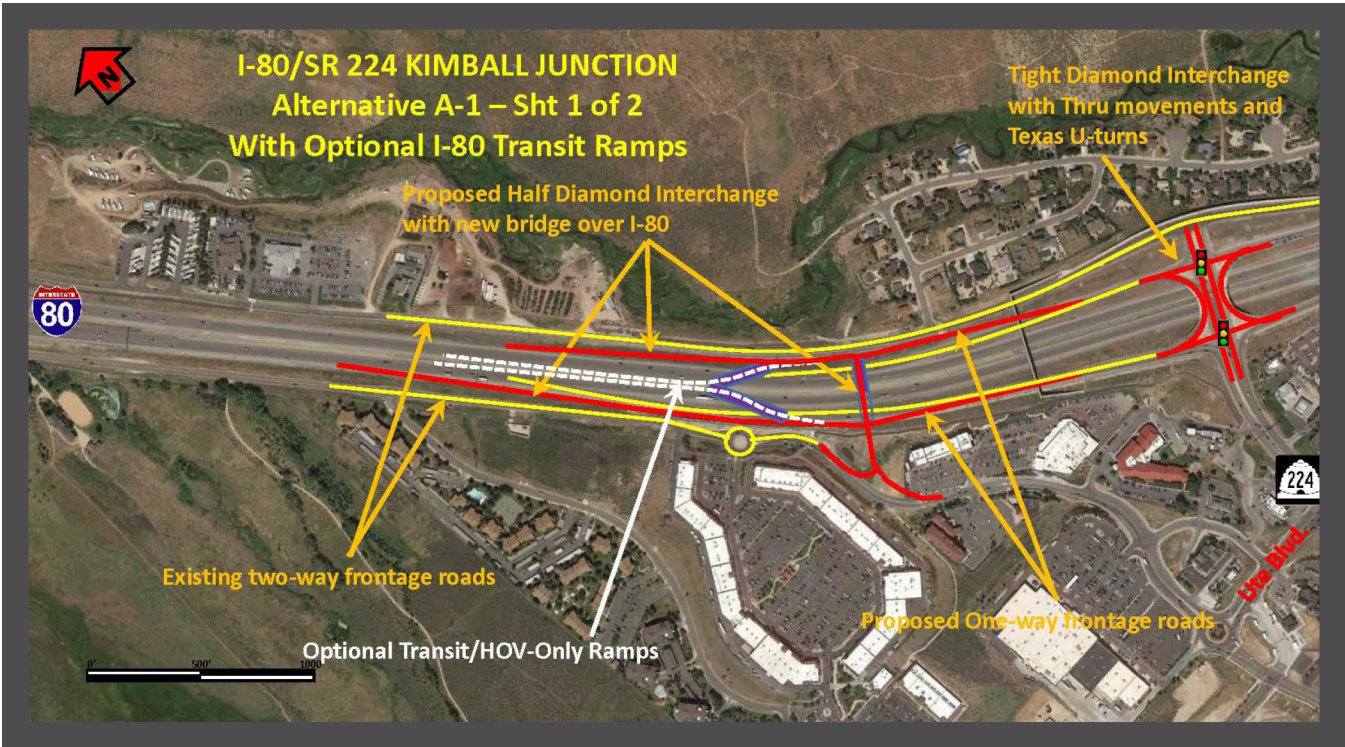
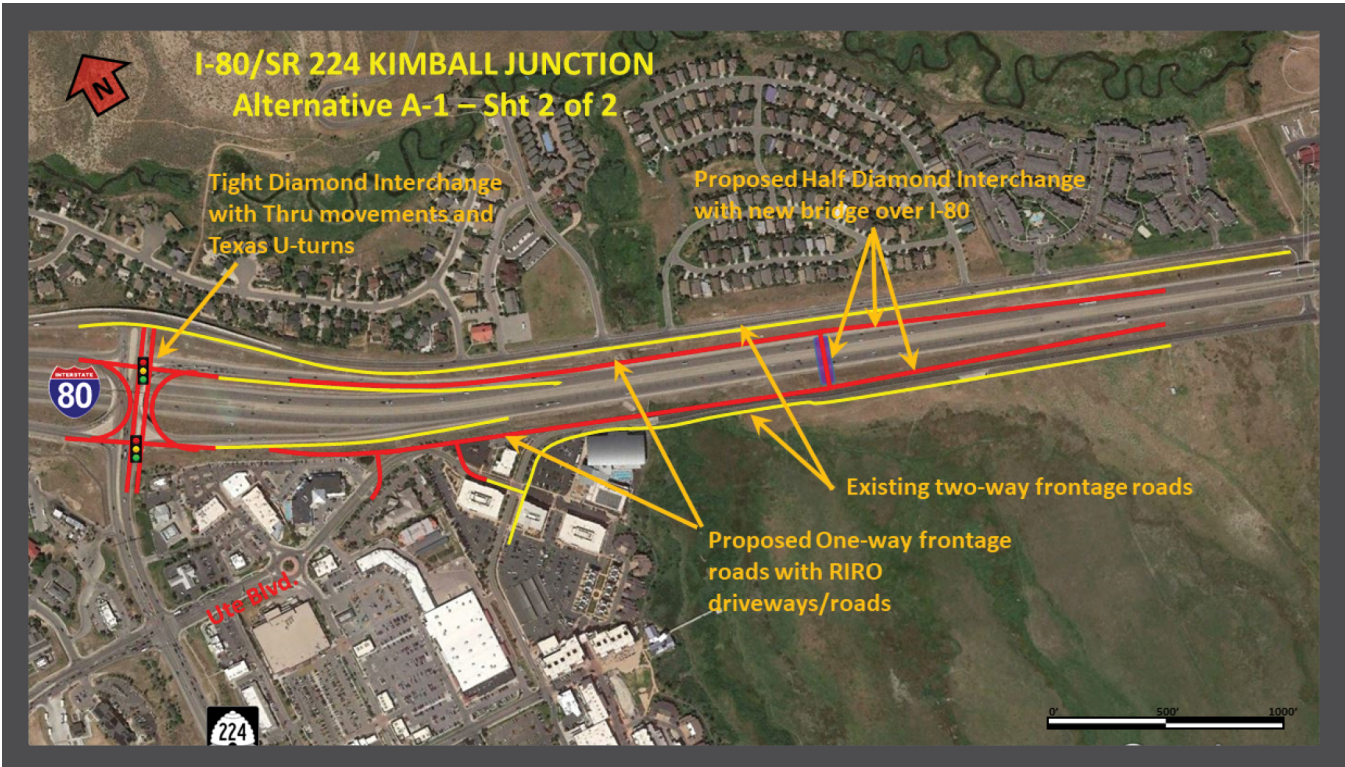


Figure 11-2. Alternative A-1 (2 of 2)



## Alternative A-2: Offset Single-point diamond interchange with direct ramps to elevated S.R. 224 bypass

### *Description*

Convert the existing S.R. 224 SPUI to an offset single-point diamond (also referred to as a folded or collapsed diamond), coupled with new eastbound and westbound I-80 to southbound S.R. 224 direct ramps to an elevated southbound S.R. 224 bypass along the west side of S.R. 224, and eastbound I-80 off and on slip ramps to the existing two-way frontage road system (Figure 11-3 below).

### *Advantages*

- Improvements along I-80 fit primarily within the existing I-80 right of way, especially if I-80 is shifted inward close to the median
- Diverts eastbound I-80 traffic to and from Kimball Junction away from S.R. 224, freeing up capacity and improving operations on S.R. 224
- Retains existing two-way frontage roads along I-80
- Removes traffic from the existing I-80 eastbound off ramp to S.R. 224, which should reduce the vehicle queuing length
- Traffic headed to Park City from I-80 is free-flowing and has no traffic signals
- Improved spacing between the I-80/S.R. 224 interchange signal and the S.R. 224/Rasmussen Road signal

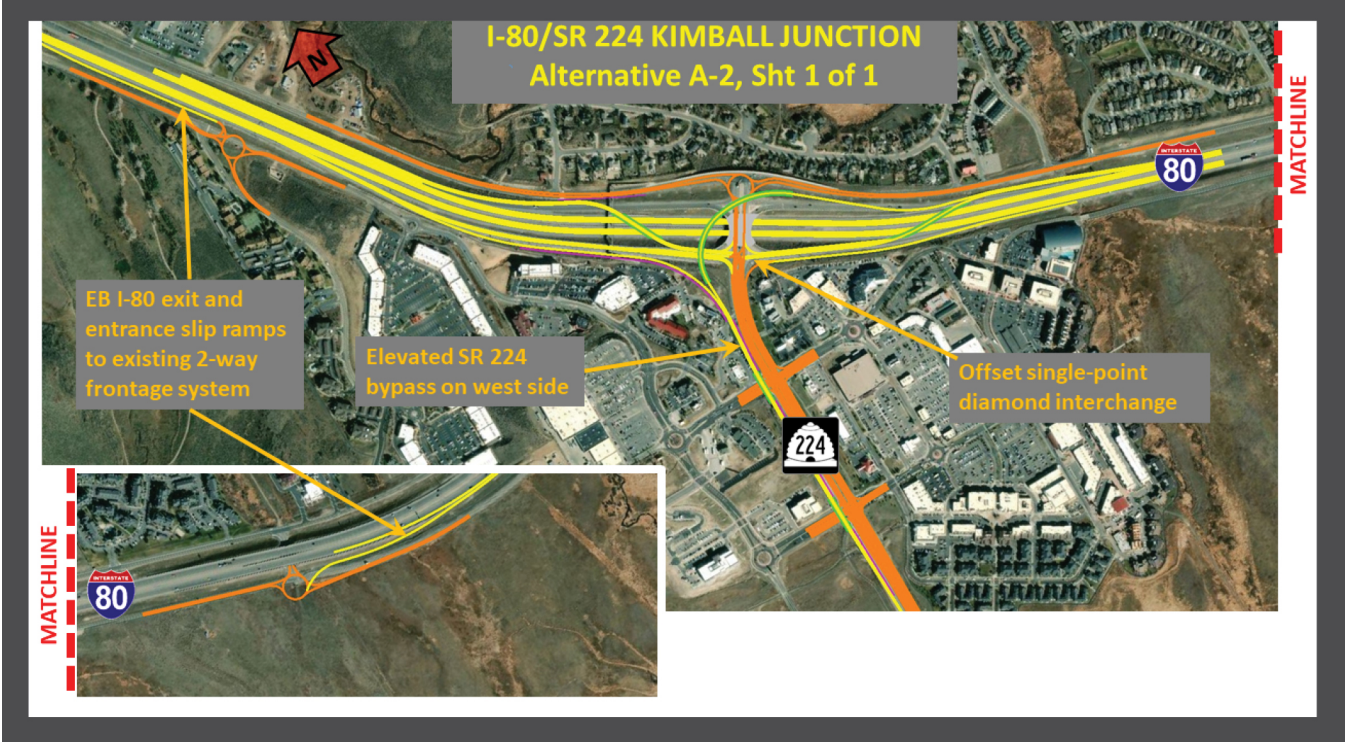
### *Disadvantages*

- Eastbound I-80 slip ramps might not divert enough traffic away from S.R. 224 to significantly improve S.R. 224 operations. Furthermore, since these ramps do not have reverse movements, FHWA might not permit interstate access.
- Heavy northbound S.R. 224 to westbound I-80 movement would likely not be dramatically improved
- The modified I-80 eastbound on ramp could directly encroach on a portion of the Swaner Nature Preserve
- Third-level elevated flyover at the interchange
- This is an expensive alternative that requires five new bridges and a wall-supported elevated southbound S.R. 224 bypass

### *Short Term / Phased Implementation*

- The proposed eastbound I-80 off and on slip ramps to the existing frontage road system could be built easily and with low cost, if they are deemed beneficial and can be permitted by FHWA
- The I-80 to southbound S.R. 224 system could be built independently, though for a high cost
- The interchange reconfiguration to the offset single-point diamond could be a separate phase, but only if that configuration produces significant operational benefits

Figure 11-3. Alternative A-2





## Alternative A-3: Bypass road

### *Description*

Construct an S.R. 224 bypass road through the southwest quadrant of the I-80/S.R. 224 interchange around the southwest edges of the Kimball Junction development and connect to I-80 with a new interchange about 1 mile west of the current S.R. 224 interchange (Figure 11-4 below).

A transit/HOV-only option was also considered for this alternative (Figure 11-5 below), which repurposes this new bypass alternative into a transit/HOV-only road that could connect to S.R. 224 south of Kimball Junction, and also provide “back-door” access to the transit center in Kimball Junction. HOVs, resort shuttles, and even school buses could also potentially use this bypass. With this alternative, some of the other S.R. 224 and I-80 interchange upgrades at Kimball Junction could also be incorporated to help with capacity and mobility issues at the Kimball Junction interchange area.

### *Advantages*

- Effectively separates the traffic between Park City and I-80 from the traffic generated by the Kimball Junction development while minimizing impacts to existing development
- Eliminating the Park City through traffic from Kimball Junction could make Kimball Junction a more walkable and transit-oriented neighborhood
- Retains existing two-way frontage roads along I-80
- Divides traffic from the existing I-80 eastbound off ramp to S.R. 224 to two separate ramps, which should reduce the vehicle queuing length
- Provides an alternate access point into the tech center planned west of S.R. 224
- If repurposed as a transit/HOV-only bypass road, provides a “back-door” transit/HOV access to the transit center in Kimball Junction, which could improve transit reliability and travel times
- Without knowing the cost of the new right of way, the study team assumes that the construction costs would be relatively low compared to other alternatives, since much of the construction would occur away from existing development and traffic

### *Disadvantages*

- Even with upgrades, the traffic circle would likely not accommodate the amount of traffic wanting to use the bypass road
- Requires new right of way through what is currently designated as conservation easement and open space
- Environmental mitigation and costs to acquire the right of way are unknown and therefore are a risk
- Owners of Kimball Junction–area businesses might believe that the bypass could reduce their drive-by business

## Short Term / Phased Implementation

- Generally, this alternative is an all-or-nothing strategy. Therefore, short-term, low-cost phases of this alternative are not likely
- The only exception could be that the bypass road is constructed only between S.R. 224 and the I-80 two-way frontage road, in the hope that the Park City through traffic might divert to the Homestead Road interchange, though it is highly unlikely that this design would operate well

## Other Notes

Per Summit County staff, this bypass alternative has been previously discussed during the Kimball Junction neighborhood planning process (Figure 11-6 below).

Figure 11-4. Alternative A-3

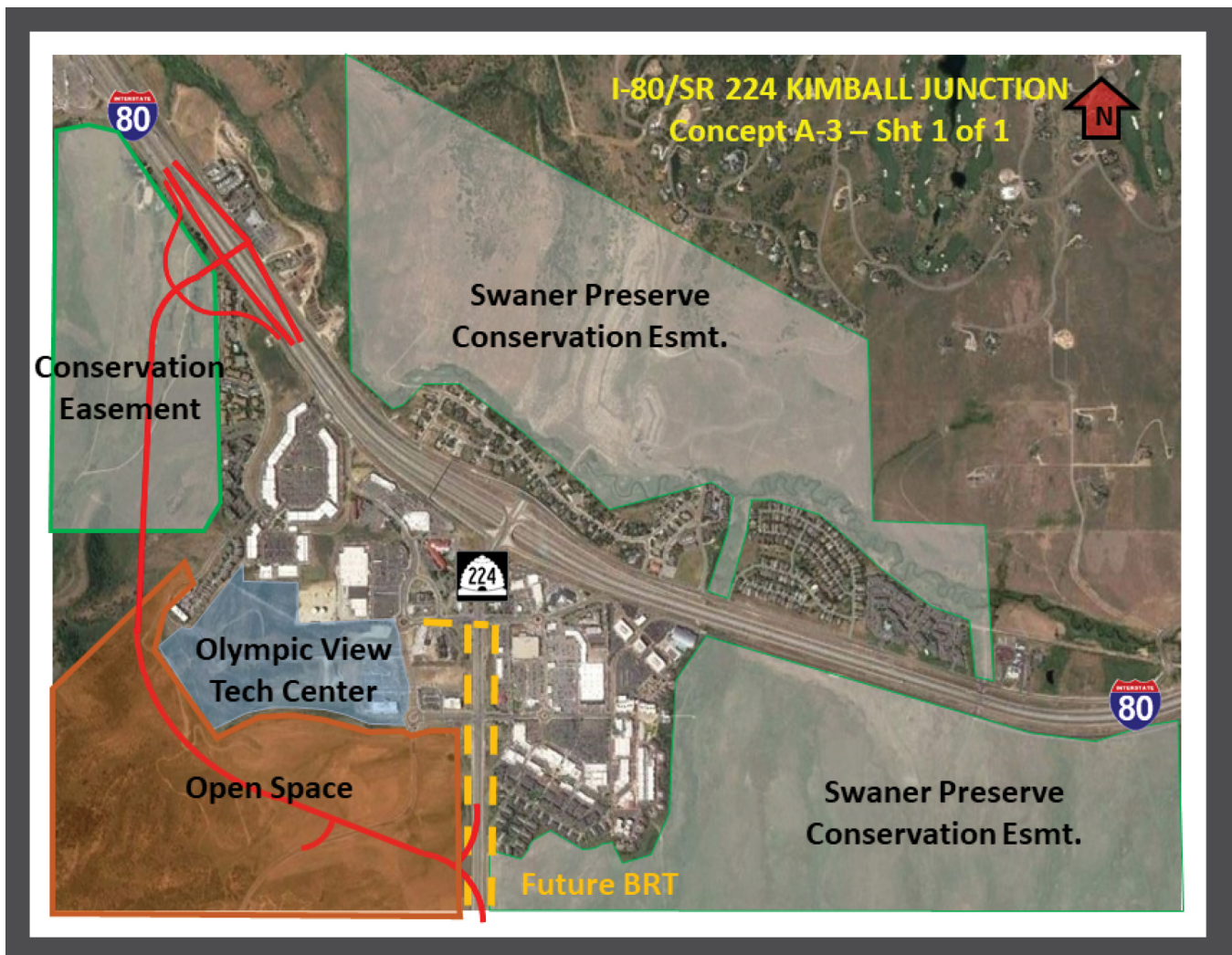
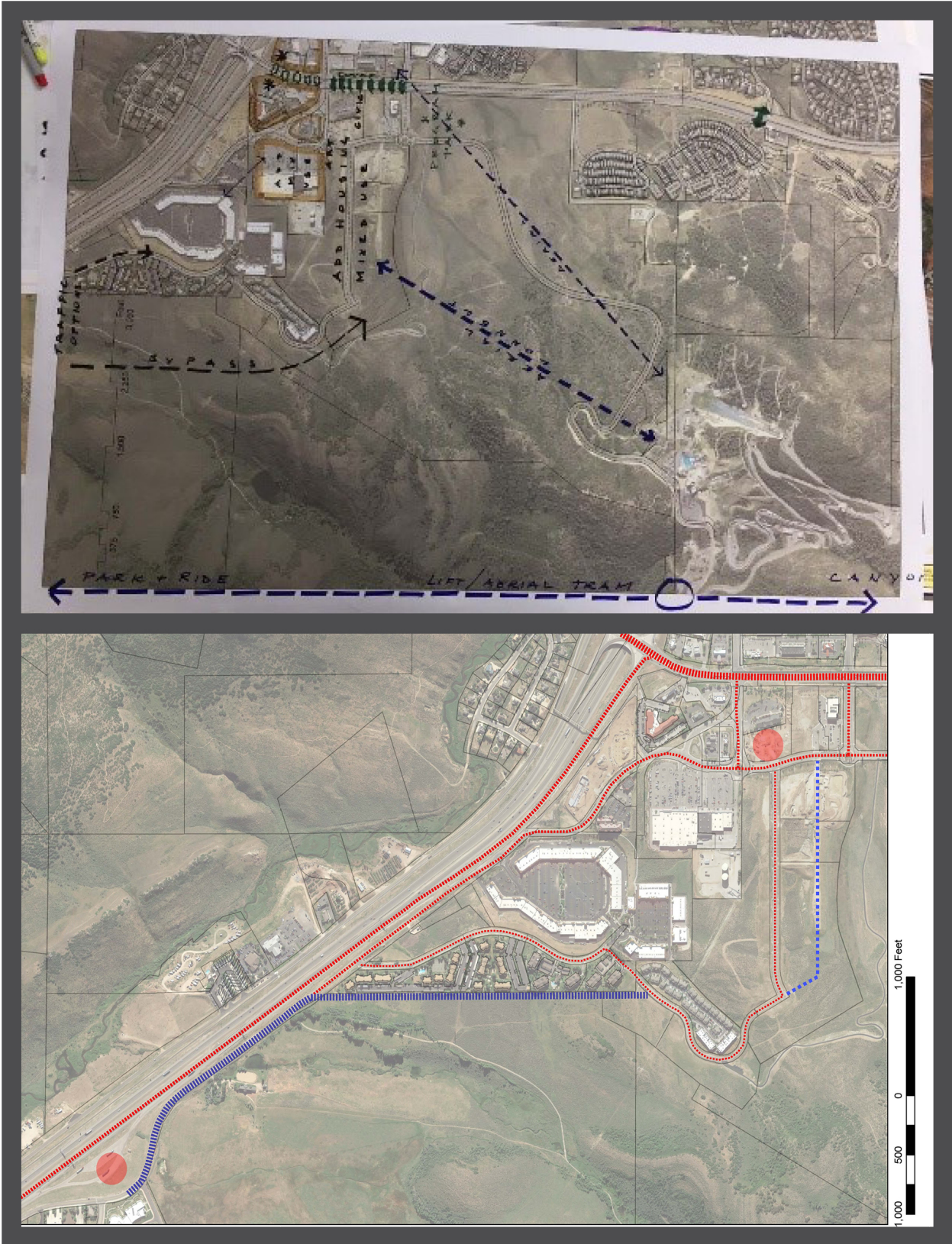


Figure 11-5. Alternative A-3 with Optional Transit/HOV-only Road



Figure 11-6. Supplemental Information on Alternative A-3 Provided by Summit County Personnel during the Workshop



## 11.1.2 Group B: Alternatives Focused on Improvements along S.R. 224

### Alternative B-1: Grade-separated intersections with enhanced pedestrian crossings

#### *Description*

Designed to provide improved pedestrian connectivity between the two halves of Kimball Junction, Alternative B-1 consists of grade-separated intersections with enhanced pedestrian crossing facilities at Ute Boulevard and Olympic Parkway. These grade-separated intersections could be signalized intersections or roundabout-style intersections and could either depress S.R. 224 under the intersections or elevate it over the intersections (Figure 11-7 below).

#### *Advantages*

- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a more walkable and transit-oriented neighborhood
- Significantly improves the pedestrian experience crossing S.R. 224, including both mobility and safety

#### *Disadvantages*

- Short weave area near the SPUI
- Depressing S.R. 224 could create drainage and snow-removal issues
- Elevating S.R. 224 could create snow-removal issues and visual and noise impacts
- Constructability and maintenance of traffic during construction would be challenging and impactful to S.R. 224 users
- Construction cost would be relatively high

#### *Short Term / Phased Implementation*

Generally, this alternative is an all-or-nothing strategy. Therefore, short-term, low-cost phases of this alternative are not likely.

#### *Other Notes*

This alternative could be combined with several of the I-80 alternatives being considered.

# KIMBALL JUNCTION

## AREA PLAN

State Route 224

Figure 11-7. Alternative B-1 and Examples of Grade-separated Intersections with Pedestrian Feature Enhancements Similar to Alternative B-1



### 11.1.3 Group C: Alternatives That Combine Improvements on I-80 and along S.R. 224

**Alternative C-1: Grade-separated intersections with enhanced pedestrian crossings and alternative connections to I-80**

#### *Description*

Identical to Alternative B-1 except combines with alternate connection methods at the I-80 interchange. Two possible examples are shown in the figure below, but others could also be possible (Figure 11-8 below).

A transit/HOV-only ramp option was included in this alternative. Similar to the graphics for each alternative, all transit/HOV-only lane potential connections are high-level schematic depictions of where the exclusive lanes appear to fit; however, the transit/HOV-only lanes are not associated with a specific transit route. If a specific alternative showing a potential transit/HOV-only lane connection passes the screening process, before being considered further, it would need to be designed as a viable option.

#### *Advantages*

- System solution designed to achieve improved operations on S.R. 224 but also at the interstate connection
- Stays mostly within existing public right of way
- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a more walkable and transit-oriented neighborhood
- Significantly improves the pedestrian experience crossing S.R. 224, including both mobility and safety
- For the most part, the transit/HOV-only lanes would likely lead to less delay and better travel times for transit vehicles; however, operations of specific transit routes in the study area in relation to the proposed transit/HOV-only lanes would be studied in subsequent phases

#### *Disadvantages*

- Depressing S.R. 224 could create drainage and snow-removal issues
- Elevating S.R. 224 could create snow-removal issues and visual and noise impacts
- Constructability and maintenance of traffic during construction would be challenging and impactful to the multimodal users in the study area
- More-complex designs with the interstate connection could be very challenging to build while traffic is operating
- Construction cost would be relatively high

#### *Short Term / Phased Implementation*

- If standalone benefits exist, only the interchange upgrades could be built
- Only the S.R. 224 improvements could be built (Alternative B-1)

### Other Notes

The Alternative C-1 examples shown below are only two possibilities. Several other interchange configurations could also be used, including several shown in this document.

Figure 11-8. Alternative C-1 Examples





## Alternative C-2: Elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80

### *Description*

Supplements the existing road system with an elevated northbound-only S.R. 224 bypass along the east side of S.R. 224 from north of Olympic Parkway to I-80, coupled with a new third-level northbound-to-westbound flyover at I-80 and a dedicated northbound-to-eastbound right turn to I-80. The existing S.R. 224 would be modified only to the extent necessary while accounting for removing the Park City northbound through traffic from that road (Figure 11-9 below).

A transit/HOV-only ramp option was included in this alternative. Similar to the graphics for each alternative, all transit/HOV-only lane potential connections are high-level schematic depictions of where the exclusive lanes appear to fit; however, the transit/HOV-only lanes are not associated with a specific transit route. If a specific alternative showing a potential transit/HOV-only lane connection passes the screening process, before being considered further, it would need to be designed as a viable option.

### *Advantages*

- Heavy northbound through movement has a dedicated free flow bypass of Kimball Junction to both directions of I-80
- Stays mostly within existing public right of way
- Constructability and maintenance of traffic during construction would not be significant, since much of the proposed improvements would be built outside of existing traffic
- For the most part, the transit/HOV-only lanes would likely lead to less delay and better travel times for transit vehicles; however, operations of specific transit routes in the study area in relation to the proposed transit/HOV-only lanes would be studied in subsequent phases

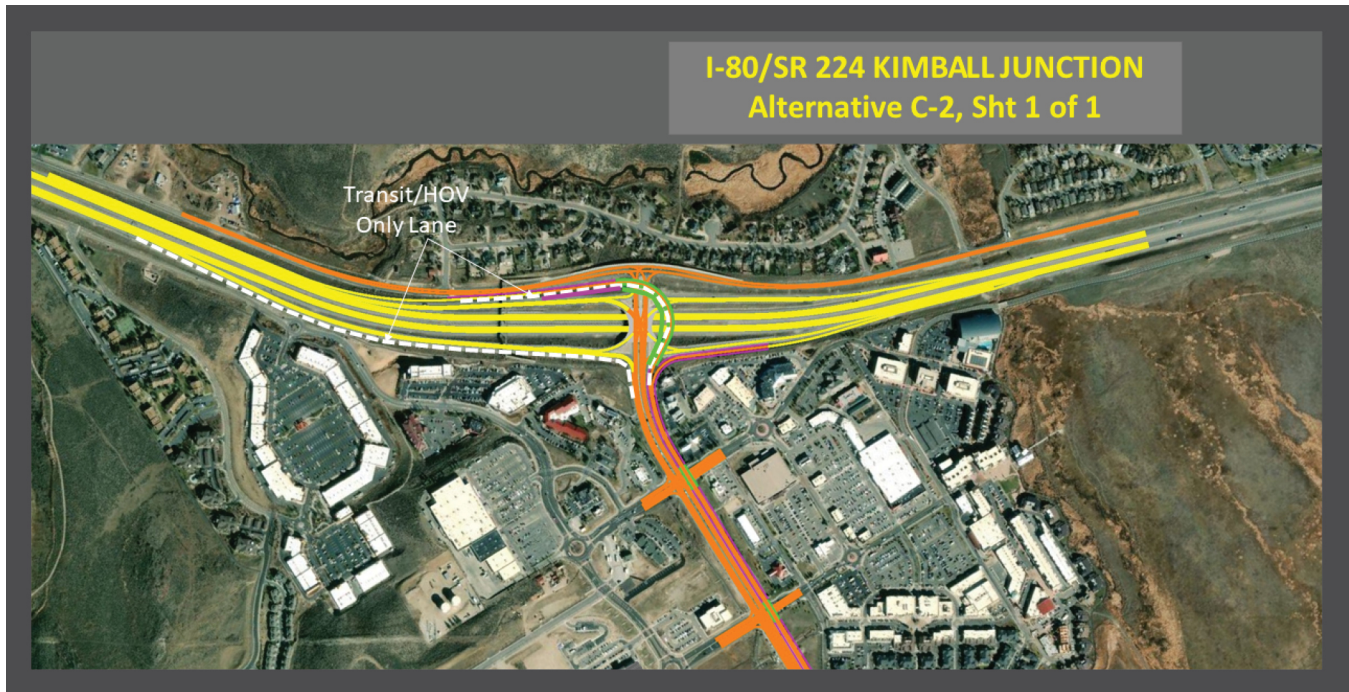
### *Disadvantages*

- Elevating S.R. 224 could create snow-removal issues and visual and noise impacts
- Third-level elevated flyover at the interchange
- Construction cost would be extremely high

### *Short Term / Phased Implementation*

This alternative is an all-or-nothing strategy. Therefore, short-term, low-cost phases of this alternative are not apparent.

Figure 11-9. Alternative C-2



## Alternative C-3: Elevated two-way S.R. 224 bypass with new third-level flyover, one-way frontage roads, and an interchange at Olympic Parkway

### Description

Elevated two-way S.R. 224 bypass road up the median of S.R. 224 from north of Olympic Parkway to I-80, coupled with a new third-level northbound-to-westbound flyover at I-80, one-way frontage roads from I-80 to Olympic Parkway, an interchange at Olympic Parkway with a northbound-to-southbound U-turn, and right-in/right-out connections to the one-way frontage roads at Ute Boulevard (Figure 11-10 below).

A transit/HOV-only ramp option was included in this alternative. Similar to the graphics for each alternative, all transit/HOV-only lane potential connections are high-level schematic depictions of where the exclusive lanes appear to fit; however, the transit/HOV-only lanes are not associated with a specific transit route. If a specific alternative showing a potential transit/HOV-only lane connection passes the screening process, before being considered further, it would need to be designed as a viable option.

### Advantages

- Park City through movements do not intermix with Kimball Junction traffic
- One-way frontage roads maintain local access via right-in/right-out access
- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a much more walkable and transit-oriented development
- Minimal right-of-way impacts
- Constructability and maintenance of traffic during construction would be straightforward, since frontage roads could be built first before opening up the median to construct the bypass

- For the most part, the transit/HOV-only lanes would likely lead to less delay and better travel times for transit vehicles; however, operations of specific transit routes in the study area in relation to the proposed transit/HOV-only lanes would be studied in subsequent phases

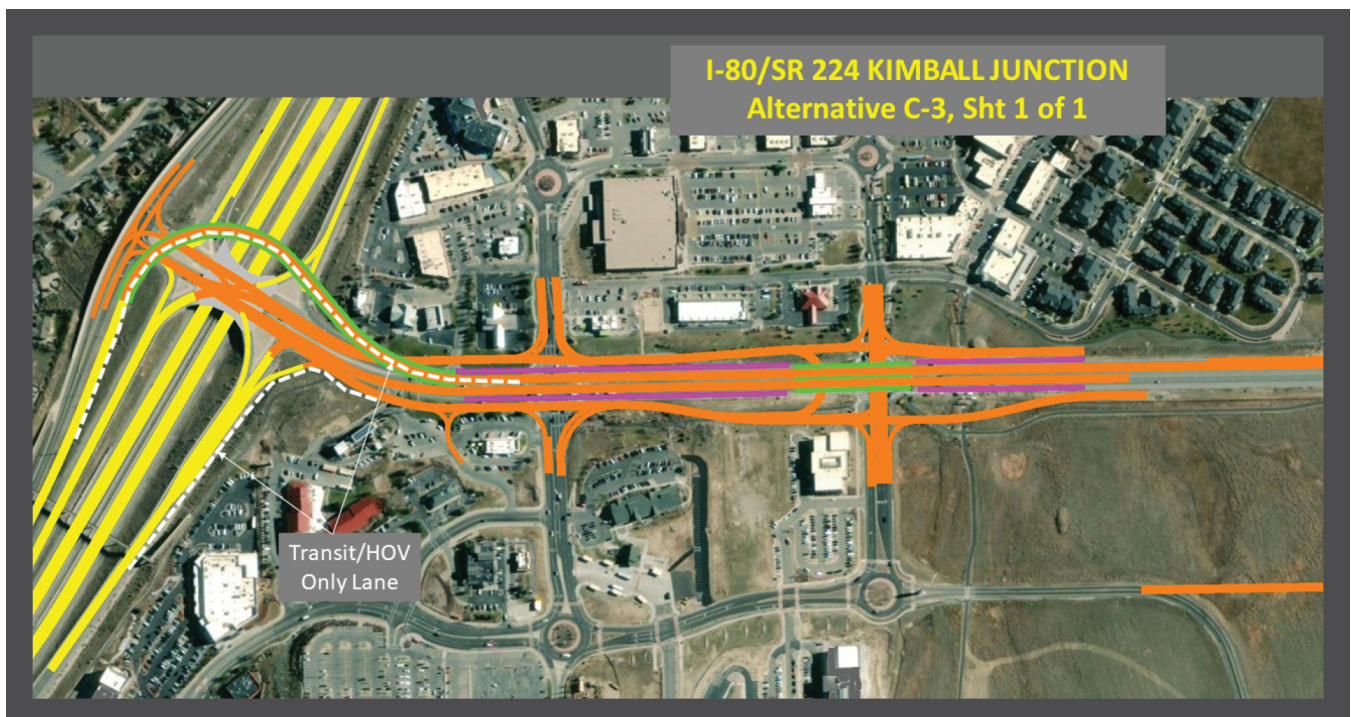
### *Disadvantages*

- Elevating S.R. 224 could create snow-removal issues and visual and noise impacts
- Discontinuous Ute Boulevard forces westbound traffic to Olympic Parkway. Eastbound Ute Boulevard traffic uses the frontage roads and U-turn
- Third-level elevated flyover at the interchange
- Construction cost would be relatively high
- Disrupting east-west connectivity would negatively impact transit routes and riders by decreasing connectivity and increasing travel times

### *Short Term / Phased Implementation*

It might be possible to construct only the S.R. 224 bypass portion of the design, assuming that the interchange can accommodate the increased traffic that is currently metered by the traffic signal systems. The flyover would be needed if the interchange fails (that is, the interchange movements operate at a level of service of LOS F).

Figure 11-10. Alternative C-3



## Alternative C-4: Variation of elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80

### *Description*

Alternative C-4 was brainstormed during the workshop and is a variant of Alternative C-3. All features of Alternative C-3 are the same, except that the I-80 eastbound-to-southbound through movement is shifted to a circular flyover next to the I-80 northbound-to-westbound flyover. This design allows adding a northbound-to-southbound U-turn just north of Ute Boulevard to redirect the westbound Ute Boulevard traffic to the U-turn, creating a complete pair of one-way frontage roads (Figure 11-11 below).

A transit/HOV-only ramp option was included in this alternative. Similar to the graphics for each alternative, all transit/HOV-only lane potential connections are high-level schematic depictions of where the exclusive lanes appear to fit; however, the transit/HOV-only lanes are not associated with a specific transit route. If a specific alternative showing a potential transit/HOV-only lane connection passes the screening process, before being considered further, it would need to be designed as a viable option.

### *Advantages*

- Park City through movements do not intermix with Kimball Junction traffic
- One-way frontage roads maintain local access via right-in/right-out access and dual U-turns
- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a more walkable and transit-oriented neighborhood
- Minimal right of way impacts
- Constructability and maintenance of traffic during construction would be straightforward, since frontage roads could be built first before opening up the median to construct the bypass
- For the most part, the transit/HOV-only lanes would likely lead to less delay and better travel times for transit vehicles; however, operations of specific transit routes in the study area in relation to the proposed transit/HOV-only lanes would be studied in subsequent phases

### *Disadvantages*

- Elevating S.R. 224 could create snow-removal issues and visual and noise impacts
- Ute Boulevard through traffic across S.R. 224 is redirected to the U-turn movements
- Third-level elevated flyover at the interchange
- Construction cost would be extremely high
- Disrupting east-west connectivity would negatively impact transit routes and riders by decreasing connectivity and increasing travel times

### *Short Term / Phased Implementation*

It might be possible to construct only the S.R. 224 bypass portion of the design, assuming that the interchange can accommodate the increased traffic that is currently metered by the traffic signal systems. The flyover(s) would be needed if the interchange fails.

Figure 11-11. Alternative C-4



## Alternative C-5: Variation of elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80

### *Description*

Alternative C-5 was also brainstormed during the workshop and is another variant of Alternative C-3. All features of Alternative C-3 are the same, except that the Ute Boulevard through movements have been restored, eliminating the need for U-turns along S.R. 224 (Figure 11-12 below).

A transit/HOV-only ramp option was included in this alternative. Similar to the graphics for each alternative, all transit/HOV-only lane potential connections are high-level schematic depictions of where the exclusive lanes appear to fit; however, the transit/HOV-only lanes are not associated with a specific transit route. If a specific alternative showing a potential transit/HOV-only lane connection passes the screening process, before being considered further, it would need to be designed as a viable option.

### *Advantages*

- Park City through movements do not intermix with Kimball Junction traffic
- One-way frontage roads maintain local access via right-in/right-out access
- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a more walkable and transit-oriented neighborhood
- Minimal right of way impacts
- Constructability and maintenance of traffic during construction would be straightforward, since frontage roads could be built first before opening up the median to construct the bypass
- For the most part, the transit/HOV-only lanes would likely lead to less delay and better travel times for transit vehicles; however, operations of specific transit routes in the study area in relation to the proposed transit/HOV-only lanes would be studied in subsequent phases

### *Disadvantages*

- Elevating S.R. 224 could create snow-removal issues and visual and noise impacts
- Third-level elevated flyover at the interchange
- Construction cost would be relatively high

### *Short Term / Phased Implementation*

It might be possible to construct only the S.R. 224 bypass portion of the design, assuming that the interchange can accommodate the increased traffic that is currently metered by the traffic signal systems. The flyover would be needed if the interchange fails.

Figure 11-12. Alternative C-5



## Alternative C-6: S.R. 224 median trench with I-80 tunnel

### *Description*

Uses the S.R. 224 median trench concept but then continues the I-80 northbound-to-westbound movement through a tunnel under I-80 (Figure 11-13 below).

A transit/HOV-only ramp option was included in this alternative. Similar to the graphics for each alternative, all transit/HOV-only lane potential connections are high-level schematic depictions of where the exclusive lanes appear to fit; however, the transit/HOV-only lanes are not associated with a specific transit route. If a specific alternative showing a potential transit/HOV-only lane connection passes the screening process, before being considered further, it would need to be designed as a viable option. A variation of this alternative would use the I-80 median as a dedicated transit lane with a dedicated transit lane off I-80 through the intersection.

### *Advantages*

- Heavy northbound through movement has a dedicated free-flow bypass of Kimball Junction to westbound I-80
- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a more walkable and transit-oriented neighborhood
- Avoids an elevated third level of the I-80 interchange
- One-way frontage roads maintain local access via right-in/right-out access
- Through traffic to Park City uses a tunnel from I-80 that returns to street level after Olympic Parkway
- For the transit option, transit and local traffic would remain at street level, with a bicycle/pedestrian bridge over S.R. 224
- For the most part, the transit/HOV-only lanes would likely lead to less delay and better travel times for transit vehicles; however, operations of specific transit routes in the study area in relation to the proposed transit/HOV-only lanes would be studied in subsequent phases
- Improved pedestrian features would be included at the intersections and on both sides of S.R. 224

### *Disadvantages*

- Depressing S.R. 224 could create drainage and snow-removal issues
- Constructability and maintenance of traffic during construction would be straightforward along S.R. 224, since frontage roads could be built first before opening up the median to construct the bypass. However, tunneling under I-80 would severely impact traffic.
- The constructability issues for a tunnel in this location are largely unknown. During the study team's preliminary consideration of the tunnel, it appears that roughly 3 miles of I-80 would need to be reconstructed to get the new bridge from the tunnel over to westbound I-80. This would require thousands of square feet of new walls along I-80 as well as an interchange that would probably be three levels high.
- Due to lane taper considerations for a tunnel, the same amount of right of way would be required for a grade-separated design, a tunnel, or a cantilevered upper section. Even though the right of



way required would be the same, the costs vary greatly among the options, with the tunnel and cantilevered designs costing much more than the grade-separated option.

- Construction cost would be extremely high

### *Short Term / Phased Implementation*

It might be possible to construct only the S.R. 224 bypass portion of the design, assuming that the interchange can accommodate the increased traffic that is currently metered by the traffic signal systems. The tunnel would be needed if the interchange fails.

Figure 11-13. Alternative C-6



## Alternative C-7: S.R. 224 median trench with depressed I-80 eastbound-to-southbound movement

### *Description*

Similar to Alternative C-6, which uses the S.R. 224 median trench concept, but instead uses a depressed I-80 eastbound-to-southbound movement to route traffic into the trench (Figure 11-14 below).

A transit/HOV-only ramp option was included in this alternative. Similar to the graphics for each alternative, all transit/HOV-only lane potential connections are high-level schematic depictions of where the exclusive lanes appear to fit; however, the transit/HOV-only lanes are not associated with a specific transit route. If a specific alternative showing a potential transit/HOV-only lane connection passes the screening process, before being considered further, it would need to be designed as a viable option.

### *Advantages*

- Heavy southbound through movement has a dedicated free-flow bypass of Kimball Junction from eastbound I-80
- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a more walkable and transit-oriented neighborhood
- Avoids an elevated third level of the I-80 interchange
- One-way frontage roads maintain local access via right-in/right-out access
- For the most part, the transit/HOV-only lanes would likely lead to less delay and better travel times for transit vehicles; however, operations of specific transit routes in the study area in relation to the proposed transit/HOV-only lanes would be studied in subsequent phases
- Constructability and maintenance of traffic during construction would be straightforward along S.R. 224, since frontage roads could be built first before opening up the median to construct the bypass. Constructing the depressed, grade-separated movement for the eastbound-to-northbound movement at I-80 would be challenging but not overly difficult.

### *Disadvantages*

- Depressing S.R. 224 could create drainage and snow-removal issues
- Does not address the heavy northbound-to-westbound through traffic
- Construction cost would be relatively high

### *Short Term / Phased Implementation*

It might be possible to construct only the S.R. 224 bypass portion of the design, assuming that the interchange can accommodate the increased traffic that is currently metered by the traffic signal systems. The grade-separated crossing would be needed if the interchange fails (that is, the interchange movements operate at a level of service of LOS F).

Figure 11-14. Alternative C-7



## Alternative C-8: S.R. 224 median trench with turbine-style I-80 interchange

### *Description*

The workshop discussions focused on trying to add high-capacity northbound-to-westbound and eastbound-to-southbound traffic movements at the I-80 interchange, but adding a third-level elevated flyover is not desired by the study partners because it could have visual and noise impacts on adjacent neighborhoods. Tunneled “fly-under” ramps under the existing I-80 interchange would likely be cost-prohibitive, and their constructability is unknown. Alternative C-8 uses the same S.R. 224 median trench or elevated concept as Alternative C-7 but, instead of constructing a third level of the I-80 interchange, it converts the I-80 interchange into a Turbine-style configuration where these free-flow traffic movements can all be accommodated within the existing two levels of the interchange.

A transit/HOV-only lane option was also included in this alternative. Given the unique geometry of this turbine-style interchange, it might be possible to add staggered transit/HOV-only ramps into this design as shown in Figure 11-15 below.

### *Advantages*

- Heavy Park City through movements to and from I-80 do not need to stop as they pass through Kimball Junction
- Separating the Park City through traffic from Kimball Junction local traffic could make Kimball Junction a much more walkable and transit-oriented development
- Avoids constructing a third level of the I-80 interchange
- One-way frontage roads maintain local access via right-in/right-out access
- Constructability and maintenance of traffic during construction would be straightforward along S.R. 224, since frontage roads could be built first before opening up the median to construct the bypass. Reconstructing the I-80 interchange would have some impacts, but many of the next bridges could be built outside of existing traffic.
- Staggered transit/HOV-only ramps on the interchange might improve transit vehicle travel times

### *Disadvantages*

- Depressing S.R. 224 could create drainage and snow-removal issues
- Construction cost would be relatively high
- From the connection points on S.R. 224 to the Kimball Junction Transit Center, transit vehicles would likely travel in mixed-flow traffic on S.R. 224 and Ute Boulevard, which could be a drawback to this alternative unless dedicated transit lanes can be incorporated in this section of S.R. 224 and/or Ute Boulevard. These details would need to be determined during future phases of project development.

### *Short Term / Phased Implementation*

It might be possible to construct only the S.R. 224 bypass portion of the design, assuming that the interchange can accommodate the increased traffic that is currently metered by the traffic signal systems. However, the I-80 interchange would need to be converted to the turbine-style interchange at some point, especially if the transit/HOV-only access through the interchange is desired by the study partners.

Figure 11-15. Alternative C-8 with Optional Transit Ramps



### 11.1.4 Group D: Stand-alone Surface Street Improvement Alternatives

Figure 11-16 through Figure 11-20 below show Alternatives D-1 through D-12. These alternatives could be implemented as one project, as a suite of projects, or incrementally in a phased approach.

**Alternative D-1:** Triple northbound left turns at I-80 interchange. Expand I-80 eastbound off ramp for transit/HOV only.

**Alternative D-2:** Consolidate left turns. East/west left turns allowed only at Ute Boulevard, and north/south left turns allowed only at Olympic Parkway. Dual left-turn lanes would likely be needed.

**Alternative D-3:** Ute Boulevard right-in/right-out and widen S.R. 224. Restrict Ute Boulevard to right-in/right-out, widen S.R. 224 to Olympic Parkway, and dual lefts at Olympic Parkway.

**Alternative D-4:** Ute Boulevard bridge and right-in/right-out. Grade-separate Ute Boulevard with right-in/right-out to and from S.R. 224 (informal bow-tie intersection).

**Alternative D-5:** Elevated intersection(s). Elevate intersection at Ute Boulevard and possibly Olympic Parkway as well.

**Alternative D-6:** Diverging diamond interchange

**Alternative D-7:** Dual left turns at Ute Boulevard and Olympic Parkway

**Alternative D-8:** Add northbound left-turn lane at Olympic Parkway a transit/HOV-only lane as it directly ties into S.R. 224 BRT route

**Alternative D-9:** Add an additional northbound left turn-lane at the existing SPUI for transit/HOV. (There appears to be space using the existing bridge width.) This alternative is similar to Alternative D-1 but incorporates the transit/HOV-only aspect.

**Alternative D-10:** Add a pedestrian tunnel at Ute Boulevard, similar to existing tunnel at Olympic Parkway

**Alternative D-11:** Northbound lane widening on S.R. 224 from Olympic Parkway to Ute Boulevard

**Alternative D-12:** Southbound lane widening on S.R. 224 from Olympic Parkway to Ute Boulevard

# KIMBALL JUNCTION

## AREA PLAN

State Route 224

Figure 11-16. Alternatives D-1, D-2, D-10, D-11, and D-12

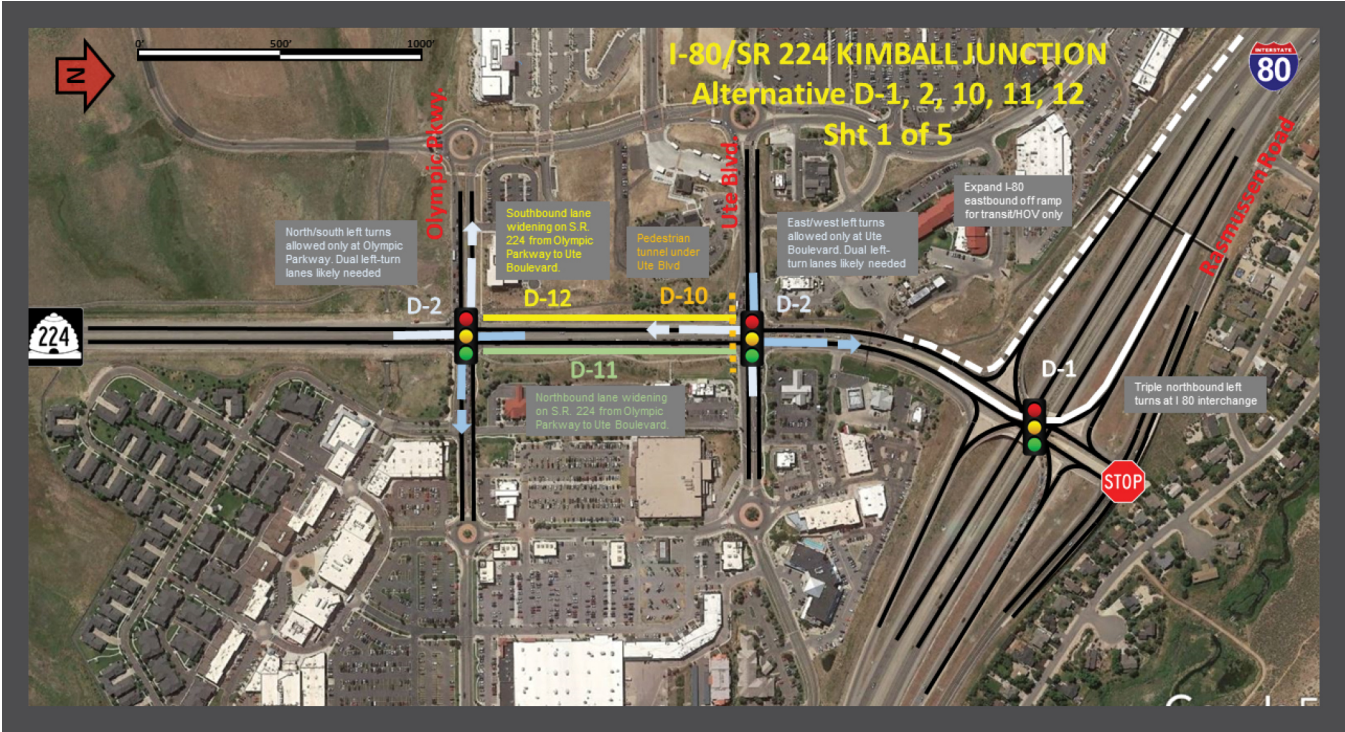
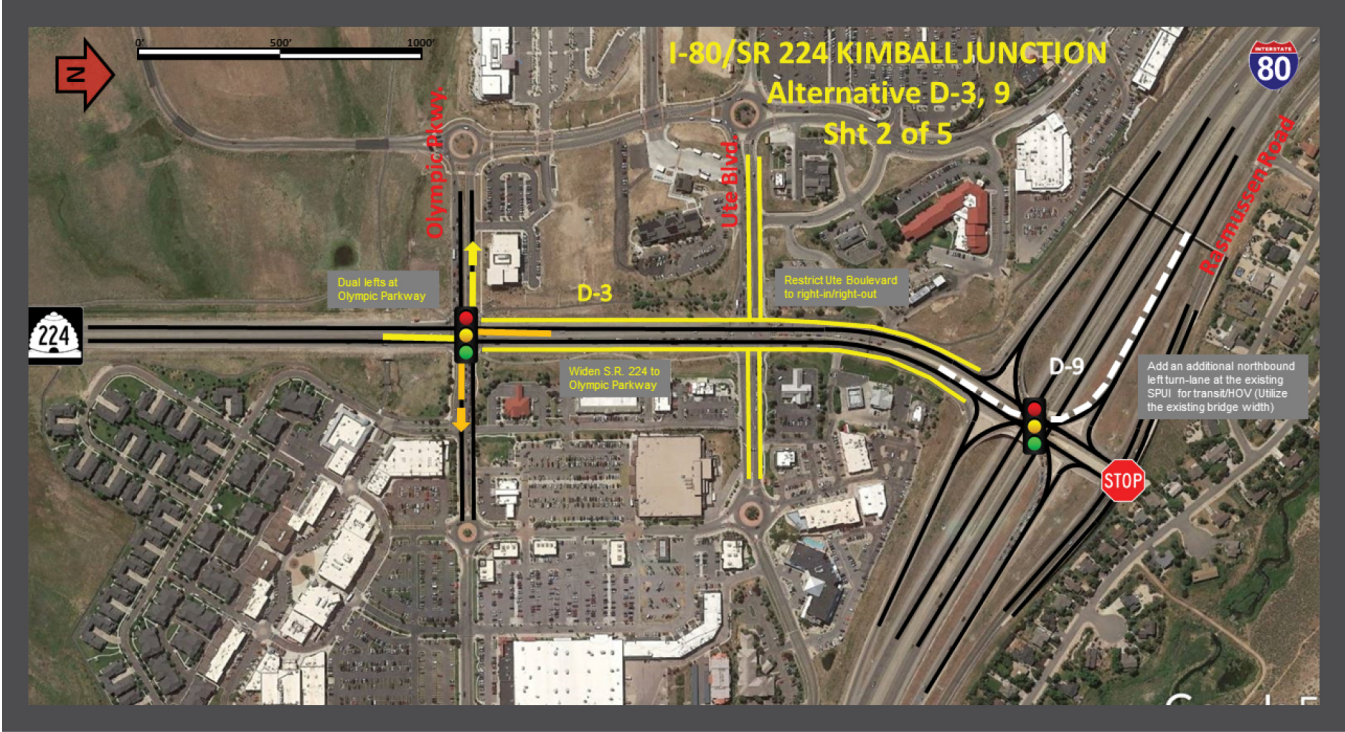


Figure 11-17. Alternatives D-3 and D-9



# KIMBALL JUNCTION

## AREA PLAN

State Route 224

Figure 11-18. Alternatives D-6 and D-7

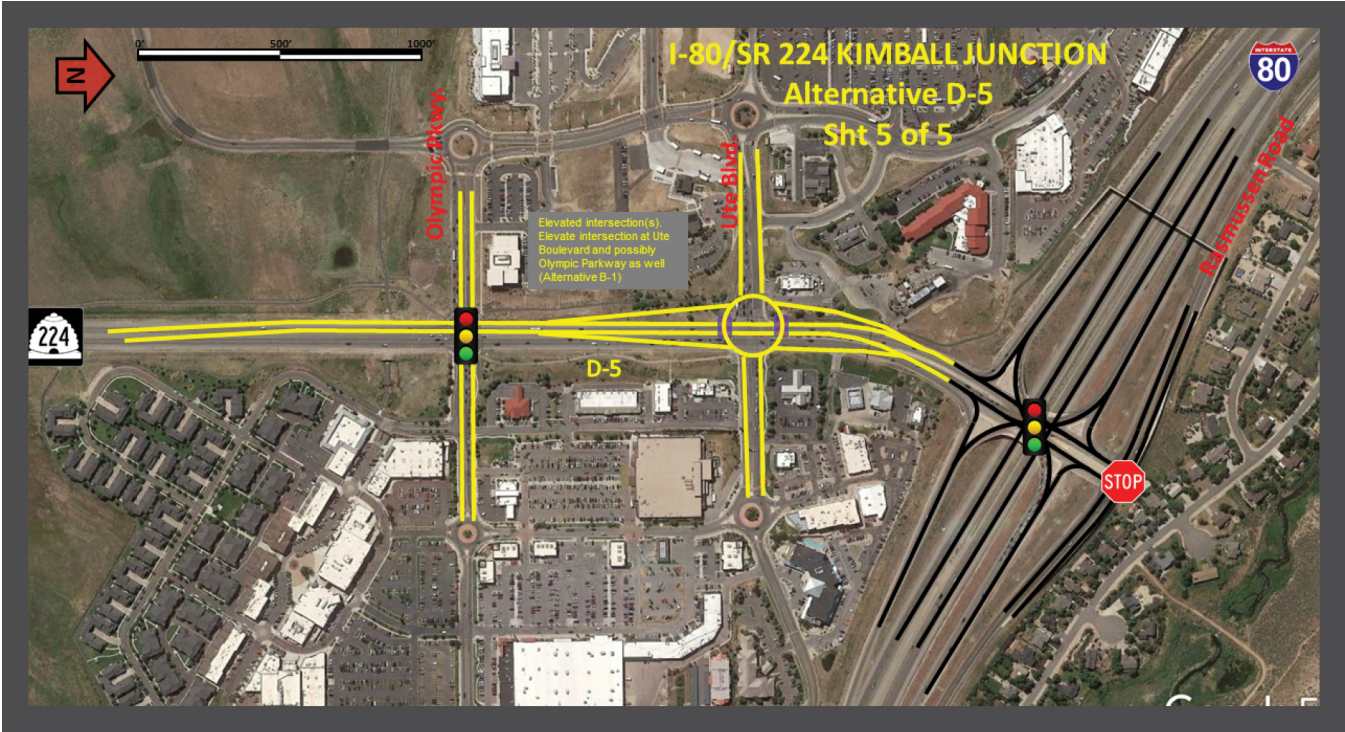


Figure 11-19. Alternatives D-4 and D-8





Figure 11-20. Alternative D-5



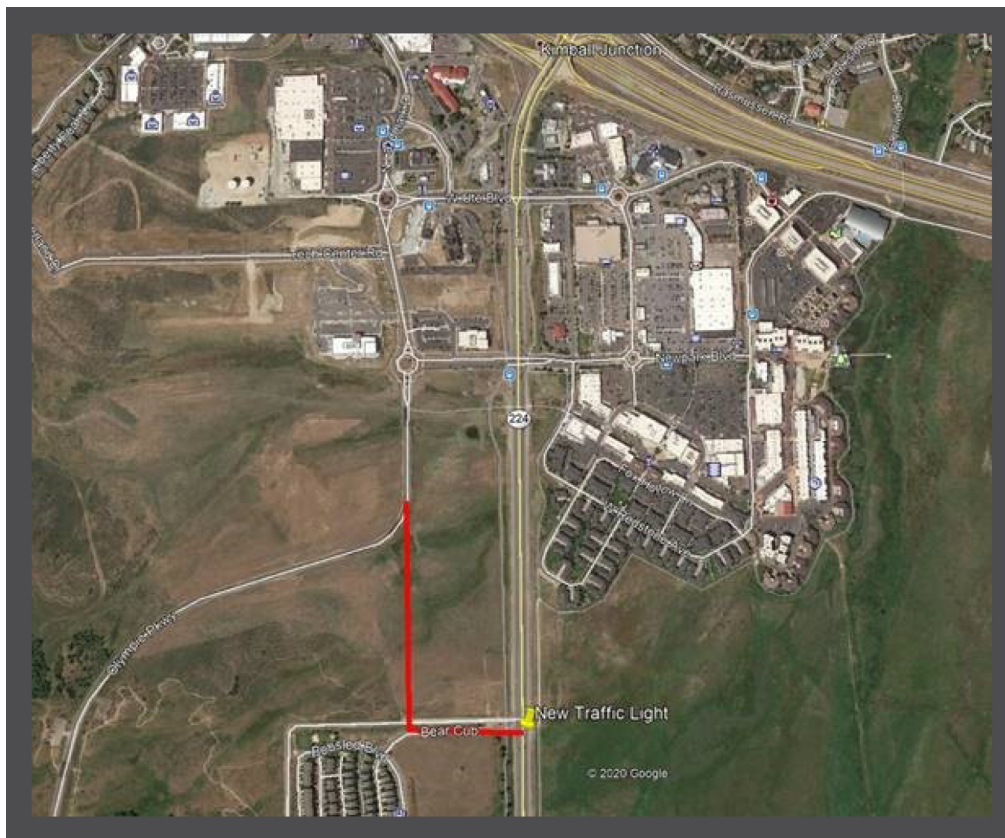
**Alternative D-13:** Bypass lanes. Similar to Alternative A-2, construct direct-connect (bypass) lanes for the eastbound I-80 to southbound S.R. 224 and northbound S.R. 224 to westbound I-80 through movements. The bypass lanes would start south of Olympic Parkway (just north of Bear Cub Drive) and continue to their respective I-80 connections. The northbound S.R. 224 to westbound I-80 portion would require a flyover bridge south of Olympic Parkway and also a flyover bridge over I-80

Figure 11-21. Alternative D-13



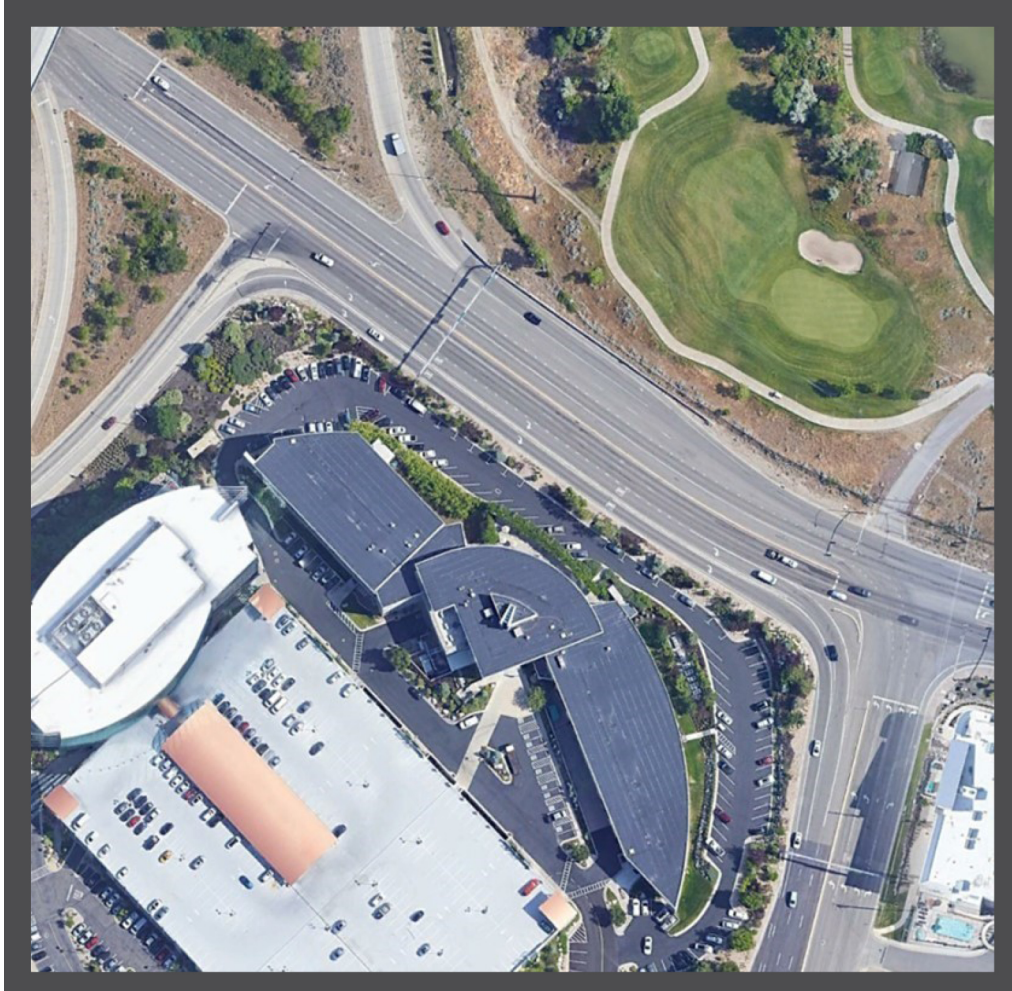
**Alternative D-14:** New Connection and possible traffic signal at Bear Cub Drive: Build straight-line spur off of Olympic Parkway at the bend and connect to Bear Cub Drive with a new traffic signal at Bear Cub Drive and S.R. 224. This could offer drivers coming from locations on the east side of S.R. 224 a parallel option to S.R. 224 and could reduce the S.R. 224 traffic burden. Additionally, this new connection could accommodate buses traveling from the Kimball Junction Transit Center to points south, allowing buses to bypass the congestion on S.R. 224 at Kimball Junction (Figure 11-22).

Figure 11-22. Alternative D-14



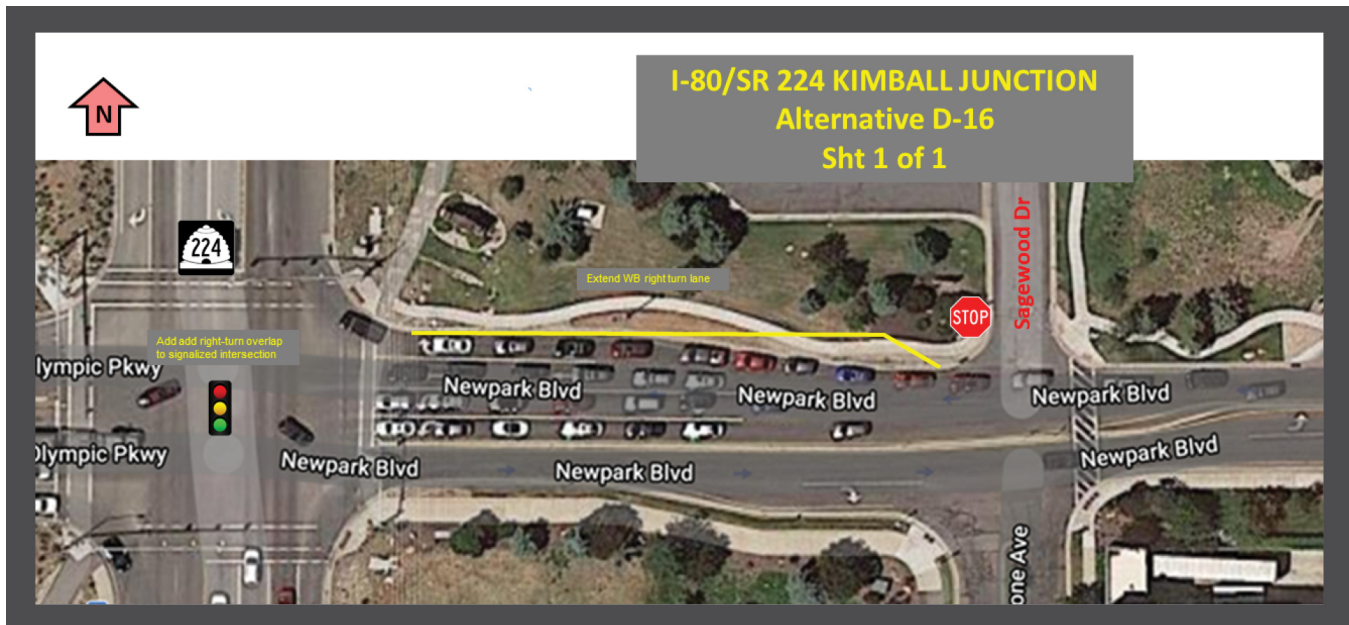
**Alternative D-15:** Incorporate a transit/HOV-only right-turn lane from the eastbound I-80 off ramp to Ute Boulevard. This concept would be similar to the dedicated right-turn lane from the northbound Interstate 215 (I-215) off ramp to southbound 3000 East in Salt Lake County (I-215/6200 South interchange), as shown in Figure 11-23.

Figure 11-23. Alternative D-15



**Alternative D-16:** Extend westbound to northbound right-turn lane on Newpark Blvd. This alternative would provide more vehicle storage for the westbound right-turn lane on Newpark Blvd. between S.R. 224 and Redstone Avenue. As shown in Figure 11-24, the right-turn lane is heavily used so any additional storage that could be provided will help keep the through lanes accessible. This alternative could also include a signal adjustment to add right-turn overlap which would allow the right-turn lane to clear while the opposing left turn is in progress.

Figure 11-24. Alternative D-16



## 11.1.5 Other Features Brainstormed during the Workshop

- Use the I-80 median as a dedicated transit lane
- Dedicated transit lane off I-80 through the intersection
- Add a roof structure over the S.R. 224 trench concepts to keep snow out of the trench, but keep it open air to avoid long tunnel ventilation. This could also serve as a pedestrian promenade.
- Alternatives C-6 and C-7 could be merged together

## 11.2 Summary of Universe of Alternatives

Alternative Name	Alternative Description
<b>Group A: I-80/S.R. 224 Interchange Alternatives with Improvements Focused on I-80 and the I-80 Frontage</b>	
<b>Alternative A-1:</b> Half-diamond interchange and tight-diamond interchange with thru movements and Texas U-turns	Convert the existing SPUI to a tight diamond with U-turn movements, coupled with two new half-diamond interchanges on either side of the existing S.R. 224 interchange, all interconnected with one-way frontage roads. One-way frontage roads will provide new access points into Kimball Junction on the south side of I-80. A transit/HOV-only ramp option was included in this alternative.
<b>Alternative A-2:</b> Offset single-point diamond interchange with direct ramps to elevated S.R. 224 bypass	Convert the existing SPUI to an offset single-point diamond (also referred to as a folded or collapsed diamond), coupled with new eastbound and westbound I-80 to southbound S.R. 224 direct ramps to an elevated southbound S.R. 224 bypass along the west side of S.R. 224, and eastbound I-80 off and on slip ramps to the existing two-way frontage road system.
<b>Alternative A-3:</b> Bypass road	Construct an S.R. 224 bypass road through the southwest quadrant of the I-80/S.R. 224 interchange around the southwest edges of the Kimball Junction development and connect to I-80 with a new interchange about 1 mile west of the current S.R. 224 interchange. A transit/HOV-only option was also considered for this alternative, which repurposes this new bypass alternative into a transit/HOV-only road that could connect to S.R. 224 south of Kimball Junction, and also provide “back-door” access to the transit center in Kimball Junction.
<b>Group B: Alternatives Focused on Improvements along S.R. 224</b>	
<b>Alternative B-1:</b> Grade-separated intersections with enhanced pedestrian crossings	Designed to provide improved pedestrian connectivity between the two halves of Kimball Junction, Alternative B-1 consists of grade-separated intersections with enhanced pedestrian crossing facilities at Ute Boulevard and Olympic Parkway. These grade-separated intersections could be signalized intersections or roundabout-style intersections and could either depress S.R. 224 under the intersections or elevate it over the intersections.
<b>Group C: Alternatives That Combine Improvements on I-80 and along S.R. 224</b>	
<b>Alternative C-1:</b> Grade-separated intersections with enhanced pedestrian crossings and alternative connections to I-80	Identical to Alternative B-1 except combines with alternate connection methods at the I-80 interchange. Two possible examples are shown in the figure below, but others could also be possible. A transit/HOV-only ramp option was included in this alternative.
<b>Alternative C-2:</b> Elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80	Supplements the existing road system with an elevated northbound-only S.R. 224 bypass along the east side of S.R. 224 from north of Olympic Parkway to I-80, coupled with a new third-level northbound-to-westbound flyover at I-80 and a dedicated northbound-to-eastbound right turn to I-80. The existing S.R. 224 would be modified only to the extent necessary while accounting for removing the Park City northbound through traffic from that road. A transit/HOV-only ramp option was included in this alternative.
<b>Alternative C-3:</b> Elevated two-way S.R. 224 bypass with new third-level flyover, one-way frontage roads, and an interchange at Olympic Parkway	Elevated two-way S.R. 224 bypass road up the median of S.R. 224 from north of Olympic Parkway to I-80, coupled with a new third-level northbound-to-westbound flyover at I-80, one-way frontage roads from I-80 to Olympic Parkway, an interchange at Olympic Parkway with a northbound-to-southbound U-turn, and right-in/right-out connections to the one-way frontage roads at Ute Boulevard. A transit/HOV-only ramp option was included in this alternative.

(continued on next page)

Alternative Name	Alternative Description
<b>Alternative C-4:</b> Variation of elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80	A variant of Alternative C-3. All features of Alternative C-3 are the same, except that the I-80 eastbound-to-southbound through movement is shifted to a circular flyover next to the I-80 northbound-to-westbound flyover. This design allows adding a northbound-to-southbound U-turn just north of Ute Boulevard to redirect the westbound Ute Boulevard traffic to the U-turn, creating a complete pair of one-way frontage roads. A transit/HOV-only ramp option was included in this alternative.
<b>Alternative C-5:</b> Variation of elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80	Alternative C-5 is another variant of Alternative C-3. All features of Alternative C-3 are the same, except that the Ute Boulevard through movements have been restored, eliminating the need for U-turns along S.R. 224. A transit/HOV-only ramp option was included in this alternative.
<b>Alternative C-6:</b> S.R. 224 median trench with I-80 tunnel	Uses the S.R. 224 median trench concept but then continues the I-80 northbound-to-westbound movement through a tunnel under I-80. A transit/HOV-only ramp option was included in this alternative.
<b>Alternative C-7:</b> S.R. 224 median trench with depressed I-80 eastbound-to-southbound movement	Similar to Alternative C-6, which uses the S.R. 224 median trench concept, but instead uses a depressed I-80 eastbound-to-southbound movement to route traffic into the trench. A transit/HOV-only ramp option was included in this alternative.
<b>Alternative C-8:</b> S.R. 224 median trench with turbine-style I-80 interchange	Alternative C-8 uses the same S.R. 224 median trench or elevated concept as Alternative C-7 but, instead of constructing a third level of the I-80 interchange, it converts the I-80 interchange into a Turbine-style configuration where these free-flow traffic movements can all be accommodated within the existing two levels of the interchange. A transit/HOV-only lane option was also included in this alternative.
<b>Group D: Stand-alone Surface Street Alternatives</b>	
Alternative D-1	Triple northbound left turns at I-80 interchange. Expand I-80 eastbound off ramp for transit/HOV only.
Alternative D-2	Consolidate left turns. East/west left turns allowed only at Ute Boulevard, and north/south left turns allowed only at Olympic Parkway. Dual left-turn lanes would likely be needed.
Alternative D-3	Ute Boulevard right-in/right-out and widen S.R. 224. Restrict Ute Boulevard to right-in/right-out, widen S.R. 224 to Olympic Parkway, and dual lefts at Olympic Parkway.
Alternative D-4	Ute Boulevard bridge and right-in/right-out. Grade-separate Ute Boulevard with right-in/right-out to and from S.R. 224 (informal bow-tie intersection).
Alternative D-5	Elevated intersection(s). Elevate intersection at Ute Boulevard and possibly Olympic Parkway as well.
Alternative D-6	Diverging diamond interchange.
Alternative D-7	Dual left turns at Ute Boulevard and Olympic Parkway.
Alternative D-8	Add northbound left-turn lane at Olympic Parkway a transit/HOV-only lane as it directly ties into S.R. 224 BRT route.
Alternative D-9	Add an additional northbound left turn-lane at the existing SPUI for transit/HOV. (There appears to be space utilizing the existing bridge width). This alternative is similar to Alternative D-1 but incorporates the transit/HOV-only aspect.
Alternative D-10	Add a pedestrian tunnel at Ute Boulevard, similar to existing tunnel at Olympic Parkway.
Alternative D-11	Northbound lane widening on S.R. 224 from Olympic Parkway to Ute Boulevard.
Alternative D-12	Southbound lane widening on S.R. 224 from Olympic Parkway to Ute Boulevard.

(continued on next page)

Alternative Name	Alternative Description
Alternative D-13	Construct direct-connect (bypass) lanes for the eastbound I-80 to southbound S.R. 224 and northbound S.R. 224 to westbound I-80 through movements. The northbound S.R. 224 to westbound I-80 portion would require a flyover bridge south of Olympic Parkway and also a flyover bridge over I-80.
Alternative D-14	New Connection and possible traffic signal at Bear Cub Drive: Build straight-line spur off of Olympic Parkway at the bend and connect to Bear Cub Drive with a new traffic signal at Bear Cub Drive and S.R. 224.
Alternative D-15	Incorporate a transit/HOV-only right-turn lane from the eastbound I-80 off ramp to Ute Boulevard.
Alternative D-16	Extend westbound to northbound right-turn lane on Newpark Blvd.



## 11.3 Policy Solutions

A variety of strategies, when used in combination, can effectively improve congestion and mobility. Some strategies involve enhancing the transportation system via (1) capacity improvements and multimodal measures such as grade separations, added lanes, and HOV/transit ramp bypasses to mitigate congestion or (2) operational improvements such as one-way streets, access management, and HOV/transit bypass lanes or roads. Other strategies such as demand management and further operational improvements can help manage travel demand. The following demand-management and operational-improvement ideas would require policy decisions from UDOT and Summit County.

### 11.3.1 Demand-management Solutions

Park City and Summit County have already instituted many demand-management solutions in the Kimball Junction area, including a robust network of pedestrian and bicycle facilities and a subsidized free-fare bus system. Other strategies that should be considered by the study partners are:

- Public education campaign on driving
- Parking strategies including (dynamic) parking pricing (keeping in mind that local residents won't want to pay for parking in their own community)
- Using the HOV lanes also as high-occupancy toll (HOT) lanes
- Time-of-day pricing (again, keeping in mind that local residents won't want to pay to drive in their own community)
- Rideshare matching, including subsidizing transit network companies, such as Uber and Lyft, with multiple riders ending and starting trips around the Kimball Junction Transit Center/Ecker View park-and-ride during peak periods
- Vanpools

### 11.3.2 Additional Operational Improvements

In addition to the demand-management solutions proposed above, the study partners should also consider the following additional operational improvements:

- Advanced signal systems
- Signal retiming and/or optimization
- Signal priority for buses
- Changeable lane assignments

## 12 Alternatives Screening Evaluation

The preliminary alternatives identified during the process described in Section 11.1, Universe of Alternatives to be Evaluated, were assessed using a two-step screening process to determine which alternatives were reasonable, were practicable, and should be considered for further study in subsequent phases.

### 12.1 Level 1 Screening Evaluation

**Level 1A.** Level 1A screening qualitatively evaluated alternatives for a fatal flaw. The purpose of Level 1A screening was to identify alternatives that had a fatal flaw, based on the following yes-or-no, fatal-flaw questions:

- Does the alternative cause irreconcilable environmental impacts?
- Does the alternative cause irreconcilable community impacts?
- Is the alternative impractical and infeasible?

Any alternative with a “yes” answer to a screening question was dismissed from continued study.

**Level 1B.** Alternatives that were not screened out during the Level 1A fatal-flaw analysis were moved forward into Level 1B screening. The study goals, problems, and opportunities were the basis for the remaining Level 1B yes-or-no screening questions. All Level 1B screening questions were given equal weight.

- Does the alternative improve interchange area capacity and vehicle mobility to/from I-80 and to/from S.R. 224 through the Kimball Junction area?
- Does the alternative maintain or improve multimodal travel options, health, and safety for pedestrians, cyclists, and transit users in the Kimball Junction area?
- Does the alternative support operation and reliability of the *Valley to Mountain (S.R. 224) Transit Project Alternatives Analysis* preferred alternative (side-running BRT) on both sides of S.R. 224?

Any alternative with a “no” answer to a screening question was dismissed from continued study.

### 12.2 Level 2 Screening Evaluation

Level 2 screening involved a primarily quantitative analysis to identify the reasonable alternatives to be studied further in future phases of project development. In part, Level 2 screening considered alternatives’ impacts to the natural and built environment.

The alternatives-development and screening process is designed to be dynamic throughout the Area Planning process. If a new alternative or refinement of an alternative was developed or arose later in the process, it was subjected to the same screening process as all of the other alternatives, as described in this report.

Similar to Level 1 screening, Level 2 screening involved a two-step process.

**Level 2A.** Level 2A screening consisted primarily of travel demand modeling and public opinion. Travel demand modeling is a macro-level modeling tool that provides a systematic process for translating demand and supply into projections for future travel demand. The travel demand model can evaluate changes in travel by people who are already on the road. It can evaluate diversions to a new road connection or transit service, diversions due to increased congestion, as well a new land use that will divert existing travel. The travel demand model was a good first step in evaluating how well the alternatives will divert and disperse traffic in the Kimball Junction area.

**Level 2B.** Alternatives that moved forward from Level 2A screening were further evaluated from a traffic perspective using a micro-level traffic simulation model that allowed the study team to realistically simulate and balance roadway capacity as well as traffic and transportation demand. In addition, the alternative's impacts to the natural and built environment, estimated project costs, logistical considerations, and overall feasibility were measured. Public opinion was gauged through an online public survey that gauges the public's and other stakeholders' ideas and opinions about alternatives that have moved forward into Level 2 screening.

## 12.3 Level 1A Screening Evaluation Results

Level 1A screening was the first major decision point at which alternatives were eliminated based on specific screening criteria. Level 1A screening qualitatively evaluated alternatives for a fatal flaw including irreconcilable environmental and/or community impacts. In addition, during Level 1A screening, the study team conducted the fatal-flaw screening and eliminated alternatives that were impractical and/or infeasible primarily because of at least one of the following three fatal flaws:

1. Insufficient merge/weave distance between Ute Blvd. and the I-80 interchange (in specific response to bridge or tunnel ramps off I-80)
2. "Extremely high" construction cost defined on a scale ranging from extremely low – low – relatively low – high – relatively high – extremely high
3. Construction would severely impact function of the I-80 mainline and/or the I-80 interchange

In addition, several alternatives were dismissed because of other irreconcilable issues, including traffic issues resulting from the alternative, traffic issues not being fixed by the alternative, and FHWA regulations.

### 12.3.1 Alternatives Dismissed during Level 1A (Fatal-flaw) Screening

The study team conducted the Level 1A screening evaluation and presented results to the study partners during a screening evaluation workshop. Table 12-1 summarizes the alternatives eliminated during the Level 1A screening evaluation, followed by further explanation by alternative below.

Table 12-1. Alternatives Dismissed during Level 1A (Fatal-flaw) Screening

Alternative	Fatal Flaw			Other Issues
	Merge/Weave	Extreme Cost <sup>a</sup>	Construction Impacts	
<b>A-2:</b> Offset single-point diamond interchange with direct ramps to elevated S.R. 224 bypass				FHWA does not allow slip ramps unless there is a strong, justifiable reason, considered on a case-by-case basis. Modifying access to the I-80 interstate via slip ramps to help alleviate a problem on the local system is not a justifiable reason. In addition, slip ramps violate driver expectations.
<b>A-3:</b> Bypass road (*general-purpose traffic option only)			X	Even with improvements, the traffic circle would likely not accommodate all of the general-purpose traffic choosing to use the bypass and exiting the new interchange from I-80. This would be an irreconcilable community impact. In addition, the new diamond interchange would have substantial short-term construction as well as permanent impacts to the north and south sides of I-80 in this area.
<b>B-1:</b> Grade-separated intersections with enhanced pedestrian crossings	X		X	
<b>C-1:</b> Grade-separated intersections with enhanced pedestrian crossings and alternative connections to I-80	X		X	
<b>C-2:</b> Elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80		X		Does not address AM backing onto I-80.
<b>C-4:</b> Variation of elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80		X		No cross-street access at Ute Blvd.
<b>C-6:</b> S.R. 224 median trench with I-80 tunnel		X	X	
<b>C-7:</b> S.R. 224 median trench with depressed I-80 eastbound to southbound movement	X		X	
<b>C-8:</b> S.R. 224 median trench with turbine-style I-80 interchange		X	X	
<b>D-4:</b> Ute Boulevard bridge and right-in/right-out (informal bow-tie intersection)	X		X	
<b>D-5:</b> Elevate intersections at Ute Boulevard and Olympic Parkway	X		X	

<sup>a</sup> Although exact costs aren't known at this time, the study team used the "extremely high" construction cost designation defined on a scale ranging from extremely low – low – relatively low – high – relatively high – extremely high as the threshold for being infeasible due to cost, especially when compared to other alternatives that achieve the same results for assumed less cost.

### Alternative A-2: Offset single-point diamond interchange with direct ramps to elevated S.R. 224 bypass

The alternative would be impractical or infeasible because it would be difficult to obtain FHWA approval for this nontypical interchange.

Slip ramps violate driver expectations.

Per FHWA, slip ramps are generally not permitted unless there is a strong, justifiable reason considered on a case-by-case basis. Modifying access to the I-80 interstate via slip ramps to help alleviate a problem on the local system is not a justifiable reason.

### Alternative A-3: Bypass Road (General-purpose Traffic Option)

Even with upgrades, due to site constraints, the traffic circle would be unable to handle the amount of general-purpose traffic expected to use this new interchange and bypass road, which would be an irreconcilable community impact due to the proximity to Ecker Middle School.

The new diamond interchange would have substantial impacts on each side of I-80, including extending Rasmussen road to the north, which would require realigning Rasmussen Road, acquiring property, and encroaching very close to the Hi-Ute barn to the south.

### Alternative B-1: Grade-separated intersections with enhanced pedestrian crossings

Due to short distance between Ute Boulevard and the eastbound I-80 SPUI ramps, it would be practically impossible to tie frontage roads into the mainline S.R. 224 while also providing enough merge distance. The resulting merge distance would be less than 200 feet, which is an insufficient length for this road. Drivers would not be given enough distance to filter into the desired turning lane in advance of the SPUI, leading to last-minute lane changes and an increased risk of crashes.

This alternative would involve construction challenges due to constructing the depressed tunnel area in conjunction with the frontage road. This extensive construction would severely affect the normal flow of traffic. Access in the Kimball Junction area would be disrupted while new connections are constructed, leading to closures and detours around the area.

### Alternative C-1: Grade-separated intersections with enhanced pedestrian crossings and alternative connections to I-80

Due to short distance between Ute Boulevard and the eastbound I-80 SPUI ramps, it would be practically impossible to tie frontage roads into mainline S.R. 224 while also providing enough merge distance. The resulting merge distance would be less than 200 feet, which is an insufficient length for this road. Drivers would not be given enough distance to filter into the desired turning lane in advance of the SPUI, leading to last-minute lane changes and an increased risk of crashes.

Note that, during the screening process, the study partners and study team agreed that a new alternative that combines C-1 and C-7 with braided ramps and depressed connections under Ute Boulevard and Olympic Parkway would move into Level 2 screening because, when the two alternatives are combined, the merge issue and traffic problems would be resolved. When combined, the long-term improvements *might* be worth the shorter-term tradeoff of construction closures and detours.

### Alternative C-2: Elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80

Designated as having “extremely high” construction cost (defined on a scale ranging from extremely low – low – relatively low – high – relatively high – extremely high) due to the three-level structure and grade separation of Ute Boulevard and Olympic Parkway. The “extremely high” cost designation is the threshold for being infeasible due to cost—especially compared to other alternatives that would achieve the same results for less cost.

Does not address eastbound I-80 to southbound S.R. 224 traffic congestion issue. The eastbound off ramp would continue to back onto the I-80 mainline during the 2050 AM peak period.

### Alternative C-4: Variation of elevated northbound-only S.R. 224 bypass with new third-level flyover at I-80

Designated as “extremely high” construction cost (defined on a scale ranging from extremely low – low – relatively low – high – relatively high – extremely high) due to the dual, three-level structure and grade separation at Olympic Parkway. The “extremely high” cost designation is the threshold for being infeasible due to cost—especially compared to other alternatives that would achieve the same results for less cost.

No cross-street access at Ute Boulevard.

### Alternative C-6: S.R. 224 median trench with I-80 tunnel

Designated as “extremely high” construction cost (defined on a scale ranging from extremely low – low – relatively low – high – relatively high – extremely high) due to construction of the median trench on S.R. 224, the tunnel under I-80, and a three-level interchange structure. The “extremely high” cost designation is the threshold for being infeasible due to cost—especially compared to other alternatives that would achieve the same results for less cost.

Due to the elevation difference between Ute Boulevard and the existing SPUI, a tunnel under I-80 would require many thousands of feet of reconstruction of I-80 and many thousands of square feet of walls along I-80 along with a three-level interchange. A substantial section of I-80 would need to be reconstructed since the elevation difference between a tunnel at Ute Boulevard and a tunnel under I-80 would be about 50 feet. This difference in elevation would require nonstandard slopes and using a tunnel boring machine during construction. Open cutting would not be an option unless the interchange were closed. I-80 could be raised to make the grades meet the standard, but that would also require reconstructing the entire interchange to accommodate a raised I-80.

If full reconstruction of I-80 were required, maintenance of traffic (that is, temporary traffic control) during construction would require one lane in each direction, since the elevation of the mainline would change and the interchange would need to be closed during some work periods. Closing the interchange would be impractical and infeasible because it would prevent local and interstate through traffic.

This alternative would involve construction challenges due to constructing the depressed tunnel area in conjunction with the frontage road. This extensive construction would severely affect the normal flow of traffic. Access in the Kimball Junction area would be disrupted while new connections are constructed, leading to closures and detours around the area.

The study team took a high-level look at the alternative's geometry. The study team estimated that any S.R. 224 bridge and/or tunnel option would have a touchdown/daylight point very close to the SPUI (100 to 200 feet before the ramp termini), which would make it impossible for vehicles to weave into the correct turn lane. Therefore, in addition to cost, constructability, and in some cases a lack of resolving traffic issues due to construction closures, any option that bridges or tunnels under S.R. 224 **without** additional design elements to help vehicles safely filter into the correct lane at I-80 was eliminated.

### Alternative C-7: S.R. 224 median trench with depressed I-80 eastbound-to-southbound movement

Due to the short distance between Ute Boulevard and the eastbound I-80 SPUI ramps, it would be practically impossible to tie frontage roads into mainline S.R. 224 while also providing enough merge distance. The resulting merge distance would be less than 200 feet, which is an insufficient length for this road. Drivers would not be given enough distance to filter into the desired turning lane in advance of the SPUI, leading to last-minute lane changes and an increased risk of crashes.

Not all traffic problems would be solved, and there would be challenging construction impacts. The one-way frontage roads would need to be constructed first in order to shift traffic from the main S.R. 224 lanes and ultimately construct the depressed tunnel area. The frontage roads would not have enough capacity for all traffic, which would cause major delays during construction.

This alternative would involve construction challenges due to constructing the depressed tunnel area in conjunction with the frontage road. This extensive construction would severely affect the normal flow of traffic. Access in the Kimball Junction area would be disrupted while new connections are constructed, leading to closures and detours around the area.

Note that, during the October 16 workshop, the study partners agreed that a new alternative that combines C-1 and C-7 with braided ramps and depressed connections under Ute Boulevard and Olympic Parkway would move into Level 2 screening because, when the two alternatives are combined, the merge issue and traffic problems would be resolved. When combined, the long-term improvements **might** be worth the shorter-term tradeoff of construction closures and detours.

The study team took a high-level look at the alternative's geometry. The study team estimated that any S.R. 224 bridge and/or tunnel option would have a touchdown/daylight point very close to the SPUI (100 to 200 feet before the ramp termini), which would make it impossible for vehicles to weave into the correct turn lane. Therefore, in addition to cost, constructability, and in some cases a lack of resolving traffic issues due to construction closures, any option that bridges or tunnels under S.R. 224 **without** additional design elements to help vehicles safely filter into the correct lane at I-80 was eliminated.

### Alternative C-8: S.R. 224 median trench with turbine-style I-80 interchange

There would be constructability issues with the western Rasmussen Road connection with bridge over the on ramp due to the close proximity of Rasmussen Road and the existing on ramp. These constructability issues would occur because Rasmussen Road and the on ramp are currently the same elevation at this location. It would be difficult to construct the connection and maintain traffic because there is not enough separation to physically make the connection without realigning Rasmussen Road. This realignment would cause major right-of-way impacts north of Rasmussen and full reconstruction of the existing ramps. The right-of-way impacts would include purchasing several residences.

This alternative would involve construction challenges due to constructing the depressed tunnel area in conjunction with the frontage road. This extensive construction would severely affect the normal flow of traffic. Access in the Kimball Junction area would be disrupted while new connections are constructed, leading to closures and detours around the area.

This alternative would be extremely difficult to construct without closing the interchange for long periods.

The study team took a high-level look at the alternative's geometry. The study team estimated that any S.R. 224 bridge and/or tunnel option would have a touchdown/daylight point very close to the SPUI (100 to 200 feet before the ramp termini), which would make it impossible for vehicles to weave into the correct turn lane. Therefore, in addition to cost, constructability, and in some cases a lack of resolving traffic issues due to construction closures, any option that bridges or tunnels S.R. 224 **without** additional design elements to help vehicles safely filter into the correct lane at I-80 was eliminated.

## Alternative D-4

Due to the short distance between Ute Boulevard and the eastbound I-80 SPUI ramps, it would be practically impossible to tie frontage roads into mainline S.R. 224 while also providing a sufficient merge distance of more than 200 feet. In addition to the insufficient merge distance, if Ute Boulevard were bridged over S.R. 224, the resulting elevation of Ute Boulevard would make it impossible to meet UDOT's grade standards for tying in the ramps to and from the north. Drivers would not be given enough distance to filter into the desired turning lane in advance of the SPUI, leading to last-minute lane changes and an increased risk of crashes.

Not all traffic problems would be solved, since the SPUI would lack any design elements to handle the projected congestion during the PM peak period in 2050 for the northbound left turn.

There would be challenging construction impacts due to the elevation differences of the new roads compared to existing elevations.

## Alternative D-5

Due to short distance between Ute Boulevard and the eastbound I-80 SPUI ramps, it would be practically impossible to tie frontage roads into mainline S.R. 224 while also providing enough merge distance. The resulting merge distance would be less than 200 feet, which is an insufficient length for this road. Drivers would not be given enough distance to filter into the desired turning lane in advance of the SPUI, leading to last-minute lane changes and an increased risk of crashes.

Not all traffic problems would be solved, since the SPUI would lack any design elements to handle the projected congestion during the PM peak period in 2050 for the northbound left turn.

There would be challenging construction impacts due to constructing the depressed tunnel area in conjunction with the frontage road. This extensive construction would severely affect the normal flow of traffic. Access in the Kimball Junction area would be disrupted while new connections are constructed, leading to closures and detours around the area.



### 12.3.2 Alternatives Dismissed during Level 1B Screening

Alternatives that were not screened out during the Level 1A fatal-flaw analysis were moved forward into Level 1B screening. The study goals, problems, and opportunities were the basis for the remaining, mostly qualitative, Level 1B yes-or-no screening questions. All Level 1B screening questions described in Section 12.1, Level 1 Screening, were given equal weight.

Any alternative with a “no” answer to a screening question was dismissed from continued study. The following alternatives were dismissed during Level 1B screening.

#### Alternatives C-3 and C-5

Neither C-3 nor C-5 would maintain or improve multimodal travel options, health, and safety for pedestrians, cyclists, and transit users in the Kimball Junction area.

On further consideration, the study team and study partners agreed that both the C-3 and C-5 flyovers would have irreconcilable community impacts due to increased noise and decreased aesthetics under Level 1A screening.

C-3 would also reduce vehicle mobility by reducing existing east-west connectivity. Disrupting east-west connectivity would also negatively impact transit routes and riders by decreasing connectivity and increasing travel times.

#### Alternative D-2

D-2 would not maintain or improve multimodal travel options, health, and safety for pedestrians, cyclists, and transit users in the Kimball Junction area and might not readily support the operation and reliability of the preferred alternative (side-running BRT on both sides of S.R. 224) in the *Valley to Mountain (S.R. 224) Transit Project Alternatives Analysis* due to reduced transit connectivity.

From a capacity and mobility perspective, D-2 would likely be effective only in the short term and would need to be replaced later.

D-2 would also reduce vehicle mobility by reducing existing east-west connectivity. Disrupting east-west connectivity would also negatively impact transit routes and riders by decreasing connectivity and increasing travel times.

#### Alternative D-3

D-3 would not maintain or improve multimodal travel options, health, and safety for pedestrians, cyclists, and transit users in the Kimball Junction area due to lack of east-west connectivity.

D-3 would reduce vehicle mobility by reducing existing east-west connectivity. Disrupting east-west connectivity would also negatively impact transit routes and riders by decreasing connectivity and increasing travel times.

#### Alternative D-6

D-6 would not adequately meet any of the Level 1B screening questions.

The extremely close proximity of Rasmussen Road and the short distance between ramps would limit the diverging diamond interchange (DDI) connection to Rasmussen Road. Due to the short distances, the DDI would be geometrically constrained.

### Alternative D-8

On its own, D-8 would not adequately meet any of the Level 1B screening objectives.

Heavy traffic movements to and from an interstate favor a DDI concept, but the extremely close proximity of Rasmussen Road and the short distance between ramps would limit a DDI's operational performance.

### Alternative D-9

D-9 was initially dismissed because it's similar to D-1 but would have fewer advantages from a traffic perspective.

D-9 would not improve interchange-area capacity and vehicle mobility to/from I-80 and to/from S.R. 224 through the Kimball Junction area to the extent that D-1 would.

D-9 was added to a combined D alternative to connect into a HOV/transit-only third lane.

### Alternative D-13

D-13 would not maintain or improve multimodal travel options, health, and safety for pedestrians, cyclists, and transit users in the Kimball Junction area.

The study partners believe that D-13 would disrupt walkability for pedestrians and cyclists in the Kimball Junction area.

### 12.3.3 Alternatives Moving Forward into Level 2 Screening

Based on the Level 1 screening evaluation, four alternatives were moved forward into Level 2 screening. The four alternatives comprise “bundles” of remaining alternatives that passed Level 1 screening.

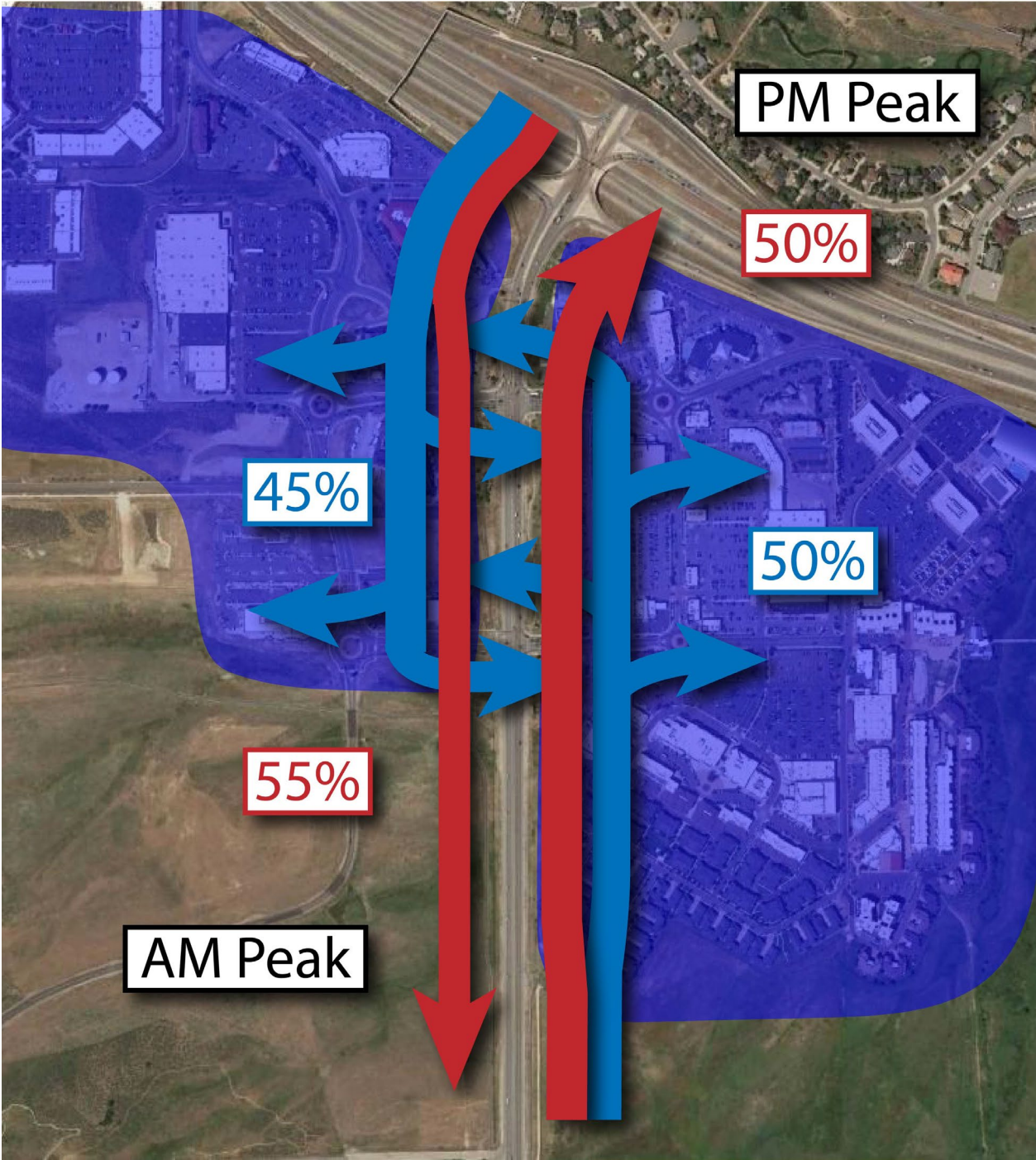
All alternatives moving forward include multimodal elements. Per Summit County’s 2019 *Active Transportation Plan*, all existing and planned pedestrian and bicycle trails are included in the alternatives described and shown below. Additional multimodal connections will be further defined in the next phase for those alternatives that are recommended to move forward for further study based on Level 2 screening. The following alternatives are moving forward into Level 2 screening.

#### Alternative 1: Half-diamond interchange and tight-diamond interchange with thru movements and Texas U-turns and pedestrian tunnel at Ute Boulevard (Alternative A-1+D-10 with possibility to incrementally add D-7, D-11, and D-12)

Alternative 1 would convert the existing S.R. 224 SPUI to a tight diamond interchange with U-turn movements, coupled with two new half-diamond interchanges on either side of the existing S.R. 224 interchange, all interconnected with one-way frontage roads. One-way frontage roads would provide new access points into Kimball Junction on the south side of I-80. Optional transit/HOV-only ramps are included in this alternative. The new half-diamond interchange west of the S.R. 224 interchange could be modified to add I-80 median access ramps to and from the west for transit use. This alternative includes a pedestrian tunnel at Ute Boulevard, similar to the existing tunnel at Olympic Parkway, to increase pedestrian and bicyclist connectivity and safety in the area. As shown in Figure 12-1 below, about 50% of the interchange traffic is accessing Kimball Junction land uses. Therefore, this alternative disperses interchange traffic to two half-diamond interchanges that provide direct access to Kimball Junction. Moreover, the one-way frontage roads further disperse traffic to the surrounding land uses.

Alternative 1 will be considered incrementally. It will be screened initially as A-1a (A-1 plus D-10). Depending on the results of the screening, D-7 would be added and screened, and another iteration could add D-11 and D-12 (A-1b). D-7 adds dual left turns at Ute Boulevard and Olympic Parkway, and another variation of this adds an outside northbound left-turn lane at Olympic Parkway, which would be used by HOV/transit vehicles only if the optional transit/HOV-only ramps are included at the interchange. The incremental addition of D-11 (northbound lane widening on S.R. 224 from Olympic Parkway to Ute Boulevard) and D-12 (southbound lane widening on S.R. 224 from Olympic Parkway to Ute Boulevard) could be tested if the initial improvements don’t meet the Level 2 screening measures for capacity improvements.

Figure 12-1. Through Traffic Volume in the Kimball Junction Area



The alternative will also be screened with the inclusion of the optional I-80 transit ramps in addition to the D alternatives (A-1 with optional I-80 transit ramps) (Figure 12-3 through Figure 12-6 beginning on page 83).

## Alternative 2: Transit/HOV-only Bypass Road concept with adjacent trail and extension of Olympic Parkway with a new connection to S.R. 224 at Bear Cub Drive (Alternative A-3 with D-14)

Alternative 2 would construct a transit/HOV-only bypass road through the southwest quadrant of the I-80/S.R. 224 interchange around the southwest edges of the Kimball Junction development and would connect to I-80 about 1 mile west of the current I-80 and S.R. 224 interchange. This alternative would offer an alternative bypass for transit and HOV vehicles to and from I-80 to the west to improve travel times and lessen congestion at Kimball Junction. The alternative offers a bypass for transit vehicles between the Ecker Hill park-and-ride lot and the Kimball Junction Transit Center.

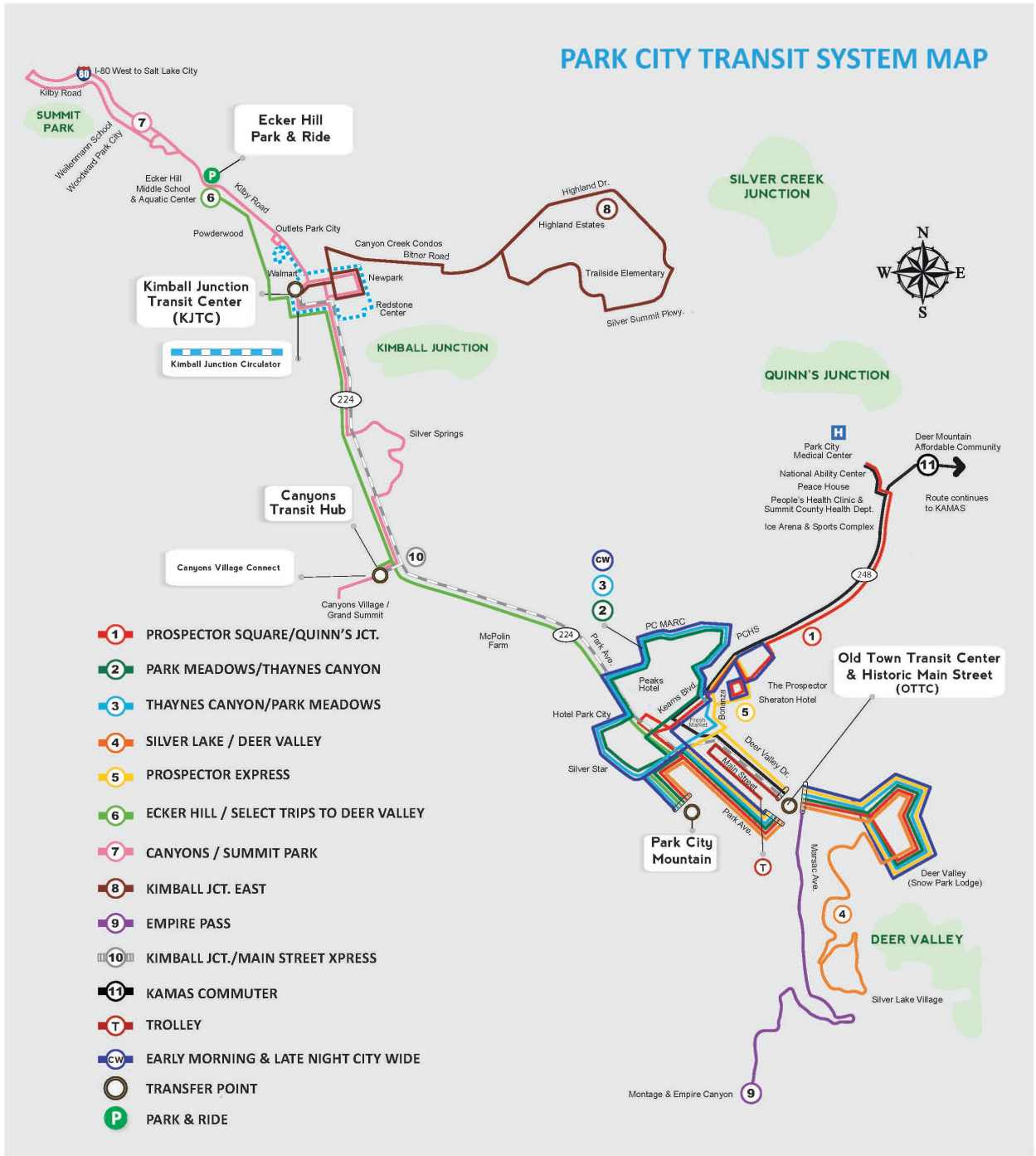
An HOV occupancy study conducted on S.R. 224 just south of Kimball Junction found that HOVs made up 20% to 30% of traffic in the peak direction of flow during both the morning and afternoon. Therefore, it's reasonable to assume that this alternative would relieve some of the traffic that currently uses the Kimball Junction interchange, but because this bypass would be limited to transit/HOV-only, it's assumed that the traffic circle in this area, when improved, would adequately accommodate the additional transit and HOV traffic.

In addition to the transit and HOV-only vehicles, resort shuttles and school buses could also potentially use this bypass. Center-median exits from I-80 would be used by the transit and HOV vehicles, and non-HOV users would not be able to use the bypass, though the issues of compliance with and enforcement of the HOV-only exits and roads would need to be studied and resolved. Level 2 screening will determine whether the transit/HOV-only demand is high enough to benefit the Kimball Junction interchange area. As shown in Figure 12-2 below, this alternative would directly benefit local Park City Transit routes 6 and 7, as well as UTA's Park City–Salt Lake City Connect bus service, which is shown in Figure 8-4 on page 24.

Alternative 2 would realign Alternative A-3, as shown in Figure 11-4 on page 36, to encroach less on the conservation easement parcel compared to what was initially shown when the bypass concept was first developed. In addition, the center-median exits were moved nearer to the existing park-and-ride lot compared to the interchange shown in Figure 11-4.

Alternative D-14, a new connection and possible traffic signal at Bear Cub Drive, was added to the alternative since the proposed bypass would serve HOVs in addition to transit and, therefore, points south and destinations other than the Kimball Junction transit center could be served more directly. Alternative 2 would include a realignment of the adjacent Millennium Trail on the west side of the proposed new bypass road as well as a new pedestrian crossing at the northern end of the bypass road (Figure 12-7 on page 87). The exact connection from the proposed bypass road to the Kimball Junction Transit Center is flexible and would be determined in later phases of project development.

Figure 12-2. Park City Transit System Map



### Alternative 3: Grade-separated intersections with enhanced pedestrian crossing facilities at Ute Boulevard and Olympic Parkway and alternate connections to the I-80 interchange (Alternative C-7+C-1/C-2 plus braided ramp)

Alternative 3 combines features from the eliminated Alternatives C-1 and C-7. The grade-separated intersections at Ute Boulevard and Olympic Parkway from C-1 were incorporated with the braided ramp concepts from C-7. This helps to solve issues from the individual alternatives that caused them to be eliminated, while the braided ramp concept resolves the tight weaving distance that would exist between the northbound frontage road and northbound S.R. 224.

As shown in Figure 12-1 on page 78, about 50% of the interchange traffic is going south toward Park City. Therefore, this alternative provides a bypass for through traffic at Kimball Junction, thereby lessening congestion around the Kimball Junction area land uses. Northbound S.R. 224 would remain at or close to its current location horizontally, but it would be depressed below the surface streets through Kimball Junction. Ramps would diverge from S.R. 224 south of Olympic Parkway to create a one-way frontage road system. Olympic Parkway and Ute Boulevard would tie into the frontage system at intersections, crossing over S.R. 224 on bridges. Vehicles on mainline S.R. 224 would connect directly to and from I-80 heading down Parley's Canyon. Vehicles on the frontage roads would have full access to turn onto Olympic Parkway, Newpark Boulevard, and Ute Boulevard to access the surrounding businesses, and would have full access to I-80 using the braided ramps.

For vehicles heading northbound on the frontage road to I-80 westbound, the northbound frontage system would have a curb or barrier-separated left-turn lane and a through lane. Separated turn lanes would eliminate the traffic weaving in the short distance where the frontage road and S.R. 224 are at the same elevation. A limitation of this alternative is that the left-turn lane on the frontage road side would prevent traffic on S.R. 224 from continuing north to Rasmussen Road. Any through traffic would need to take the northbound frontage road.

Vehicles heading northbound from S.R. 224 to I-80 eastbound would pass underneath the Ute Boulevard bridge and then exit on the right. The ramp would go underneath the northbound frontage road in a tunnel before climbing up to existing grade on the east side of the frontage road. The ramp would turn to parallel the I-80 eastbound on ramp that exits from the frontage road, and would then merge onto the ramp. This would allow vehicles on northbound S.R. 224 to access I-80 eastbound without exclusively needing to use the frontage road.

The new layout with braided ramps would allow direct but separated connections to I-80 from mainline S.R. 224 and the frontage roads, thereby eliminating the need for a short weave between Ute Boulevard and the SPUI that caused Alternatives C-1 and C-7 individually to be removed. Depressing mainline S.R. 224 and separating out some of the through traffic would allow east-west connectivity on Olympic Parkway and Ute Boulevard to be maintained or improved. In addition, by depressing the roadway, concerns about the visual impacts of elevated roads or above-grade bridges through Kimball Junction can be reduced (Figure 12-8 on page 88).

## Alternative 4: Combination of stand-alone surface street improvements (combined D alternatives)

Alternative 4 combines the stand-alone alternatives that passed Level 1 screening (Figure 12-9 on page 89). The solution could be built as one project, as a suite of projects, or incrementally in a phased approach. This alternative would minimize infrastructure changes by improving traffic flow at existing facilities. In addition, Alternative 4 adds active transportation, transit, and HOV elements to offset the larger footprint required with Alternatives 1 through 3. Alternative 4 consists of the following:

- D-1** Expand the I-80 eastbound off ramp for transit/HOV only. Include triple northbound left turns at the I-80 interchange.
- D-7** Include dual left turns at Ute Boulevard and Olympic Parkway  
*A variation would be an outside northbound left-turn lane at Olympic Parkway, which would be used by HOV/transit vehicles only*
- D-9** Add an additional northbound left-turn lane at the existing single-point urban interchange for transit/HOV
- D-10** Build a pedestrian tunnel under Ute Boulevard
- D-11** Widen the northbound lane on S.R. 224 from Olympic Parkway to Ute Boulevard
- D-12** Widen the southbound lane on S.R. 224 from Olympic Parkway to Ute Boulevard  
*A variation would be to widen only for an HOV-only lane*
- D-14** Add a new connection and possibly a traffic signal at Bear Cub Drive
- D-15** Add a transit/HOV-only, right-turn lane from the eastbound I-80 off ramp to Ute Boulevard
- D-16** Extend westbound-to-northbound right-turn lane on Newpark Boulevard
- D-16A** Close left turns at McDonalds and the Richens building to extend the left turn from Ute Boulevard to S.R. 224 (This is a new alternative suggested by a partner participant at the October 16, 2020, Level 1 screening workshop.)



Figure 12-3. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (1 of 4)

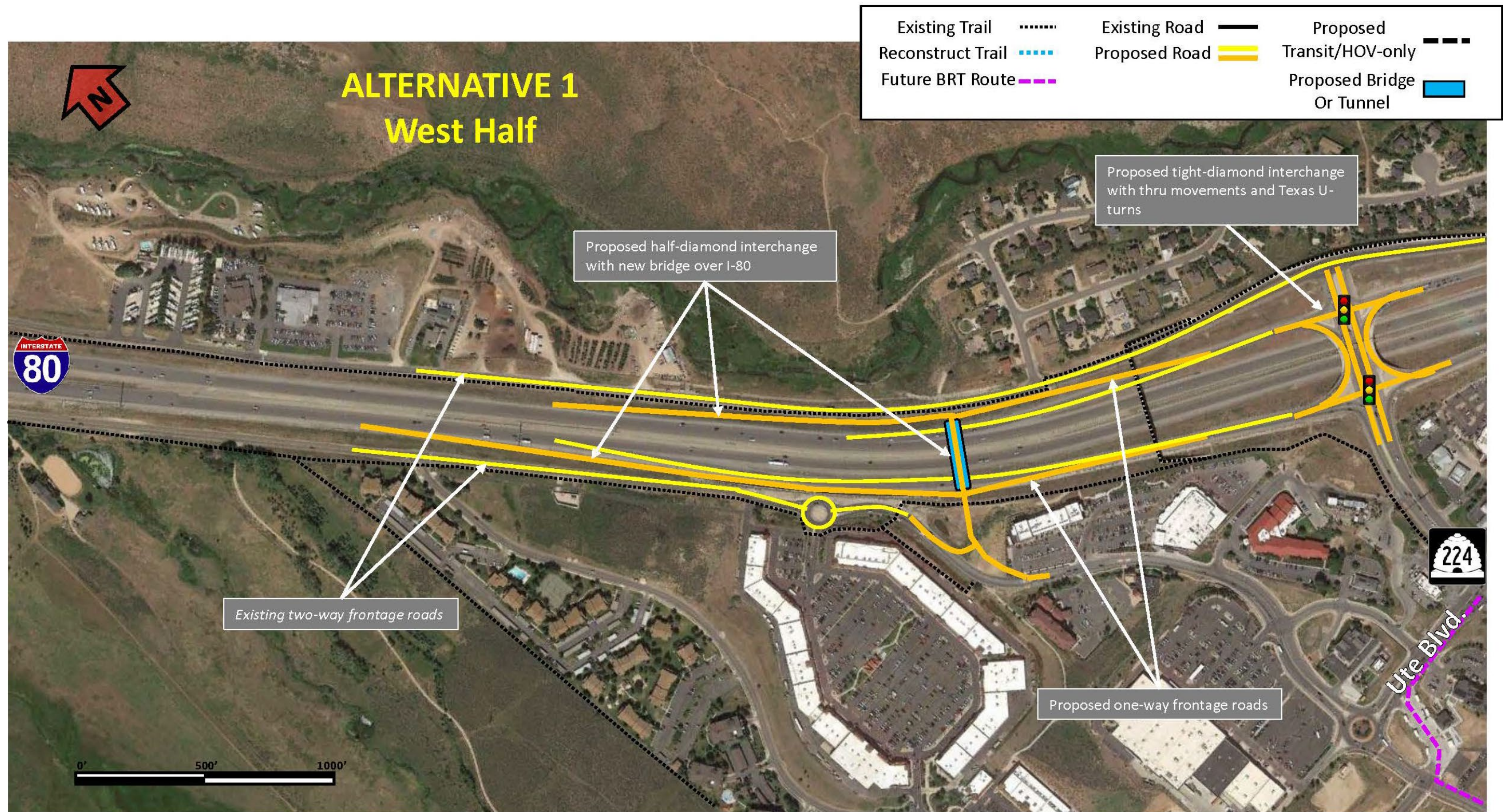


Figure 12-4. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (2 of 4)

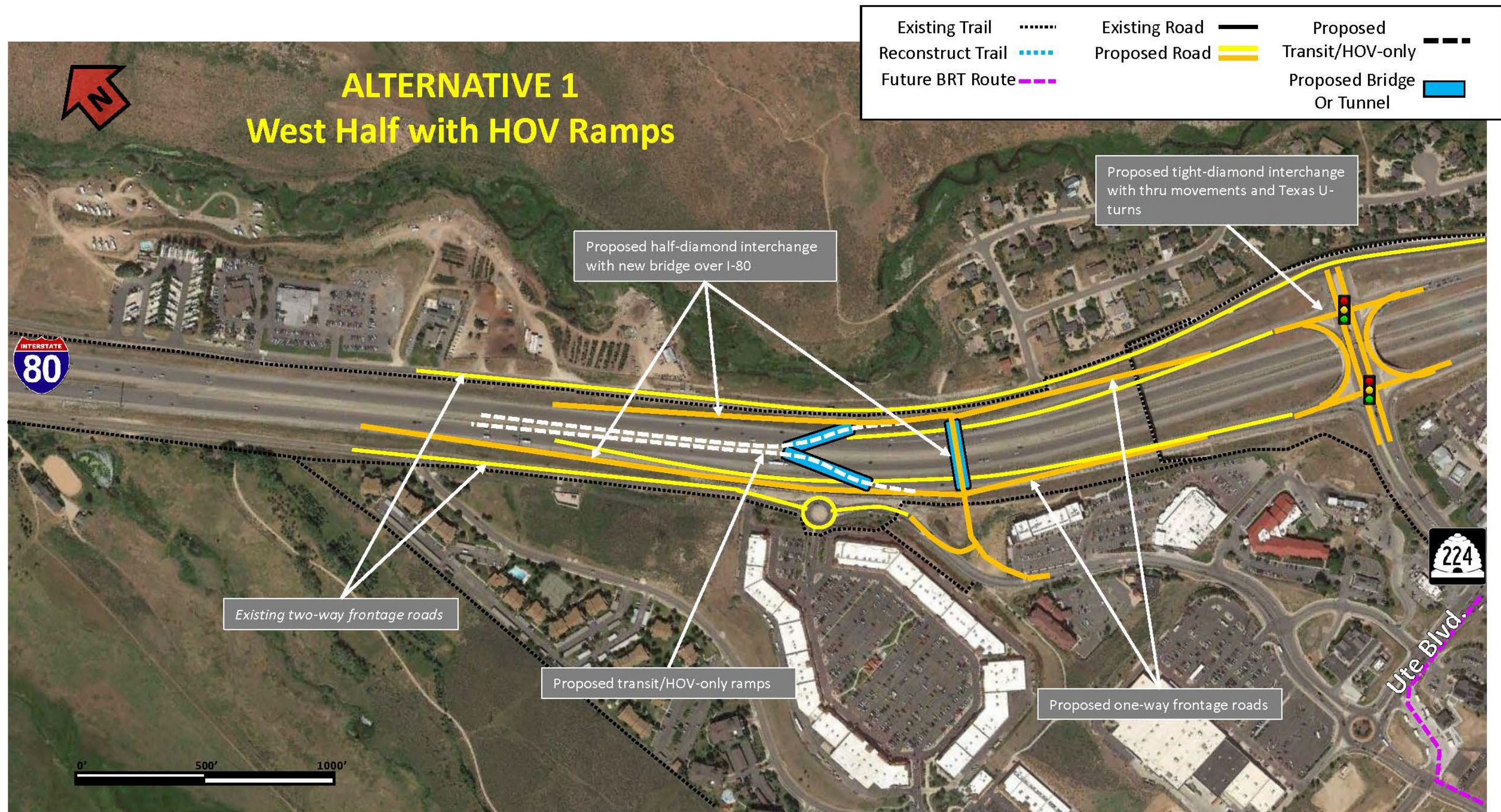


Figure 12-5. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (3 of 4)

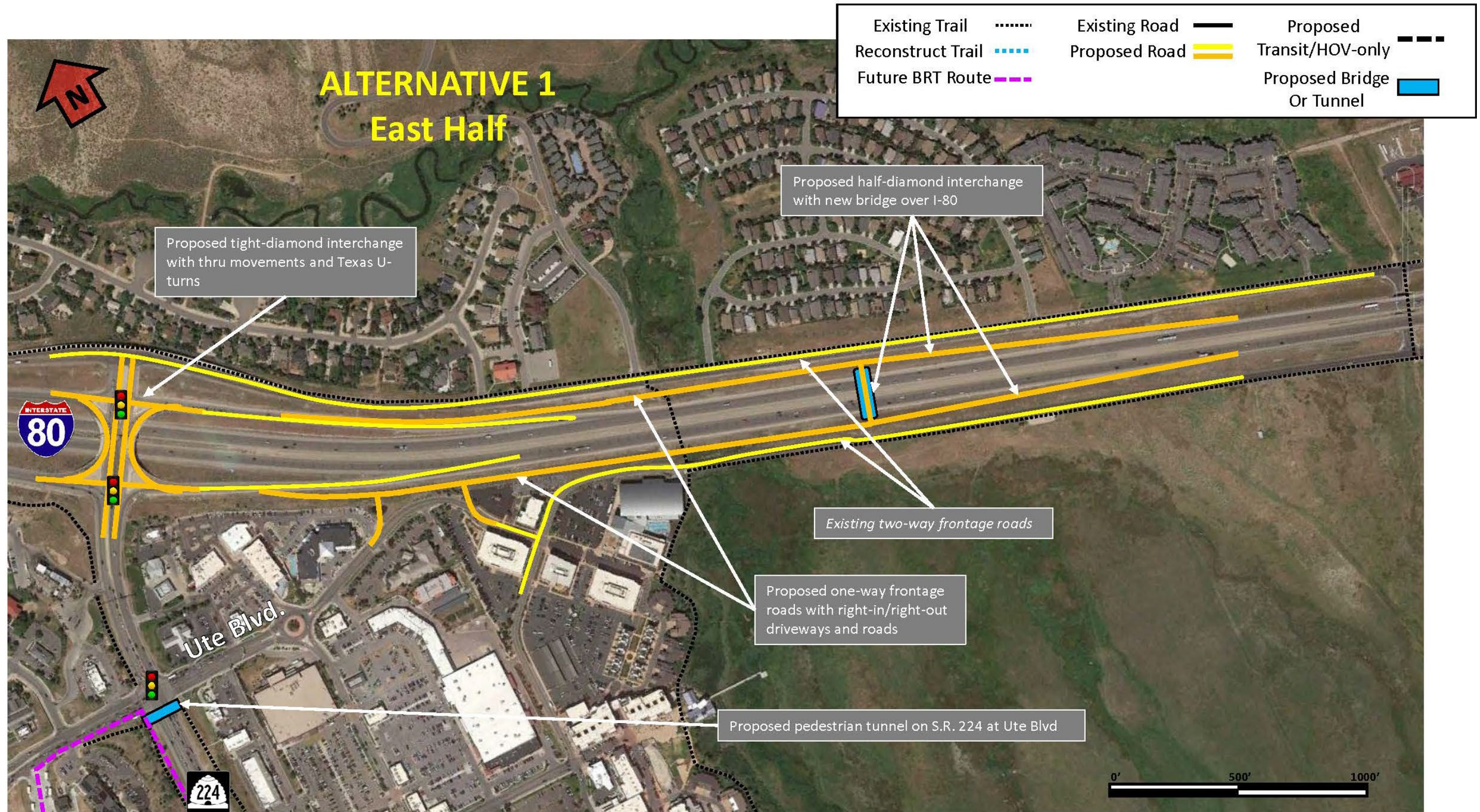


Figure 12-6. Alternative 1: Half-diamond Interchange and Tight-diamond Interchange with Thru Movements and Texas U-turns and Pedestrian Tunnel at Ute Boulevard (4 of 4)

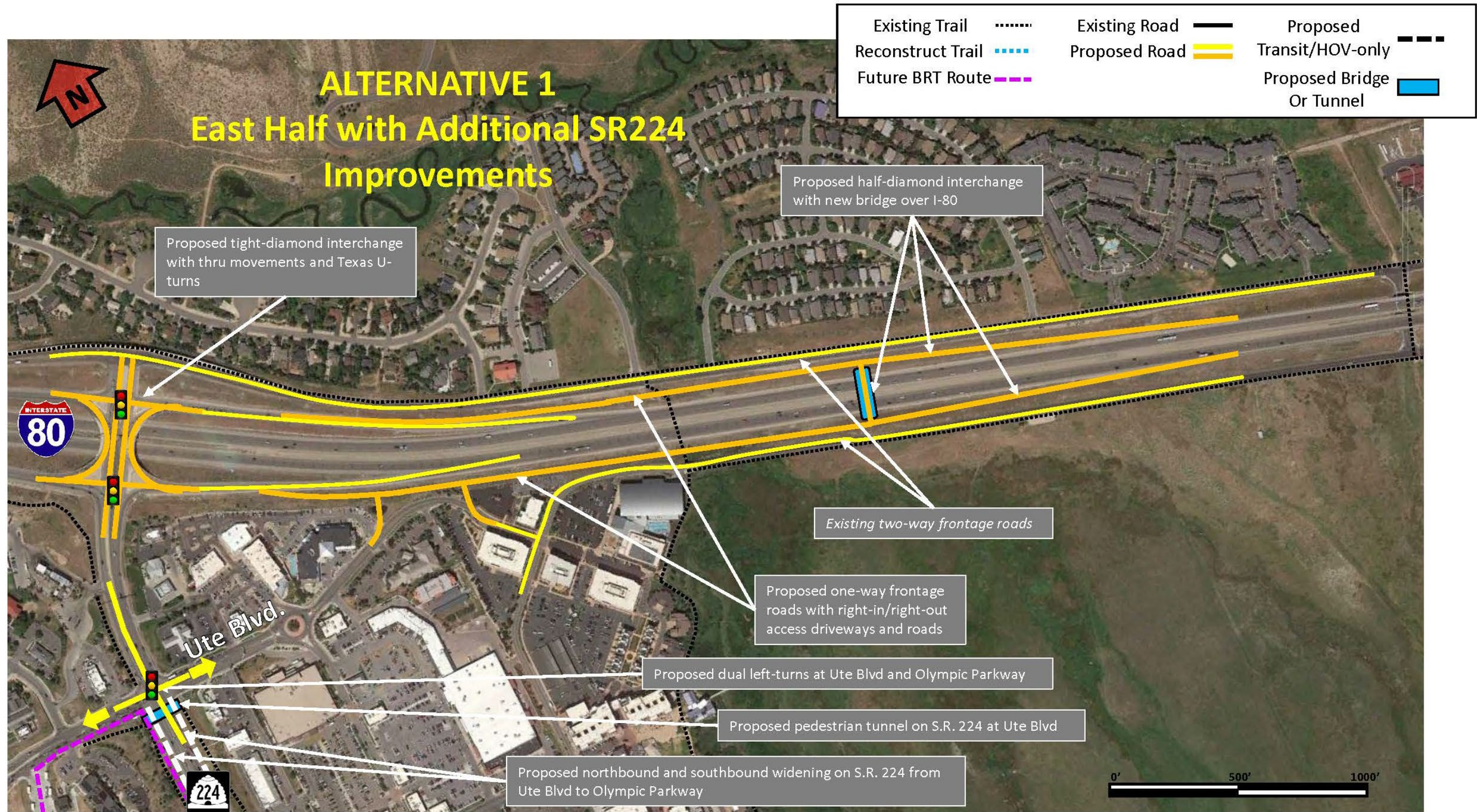


Figure 12-7. Alternative 2: Transit/HOV-only Interchange and Bypass Road Concept with Adjacent Trail and Extension of Olympic Parkway with a New Connection to S.R. 224 at Bear Cub Drive

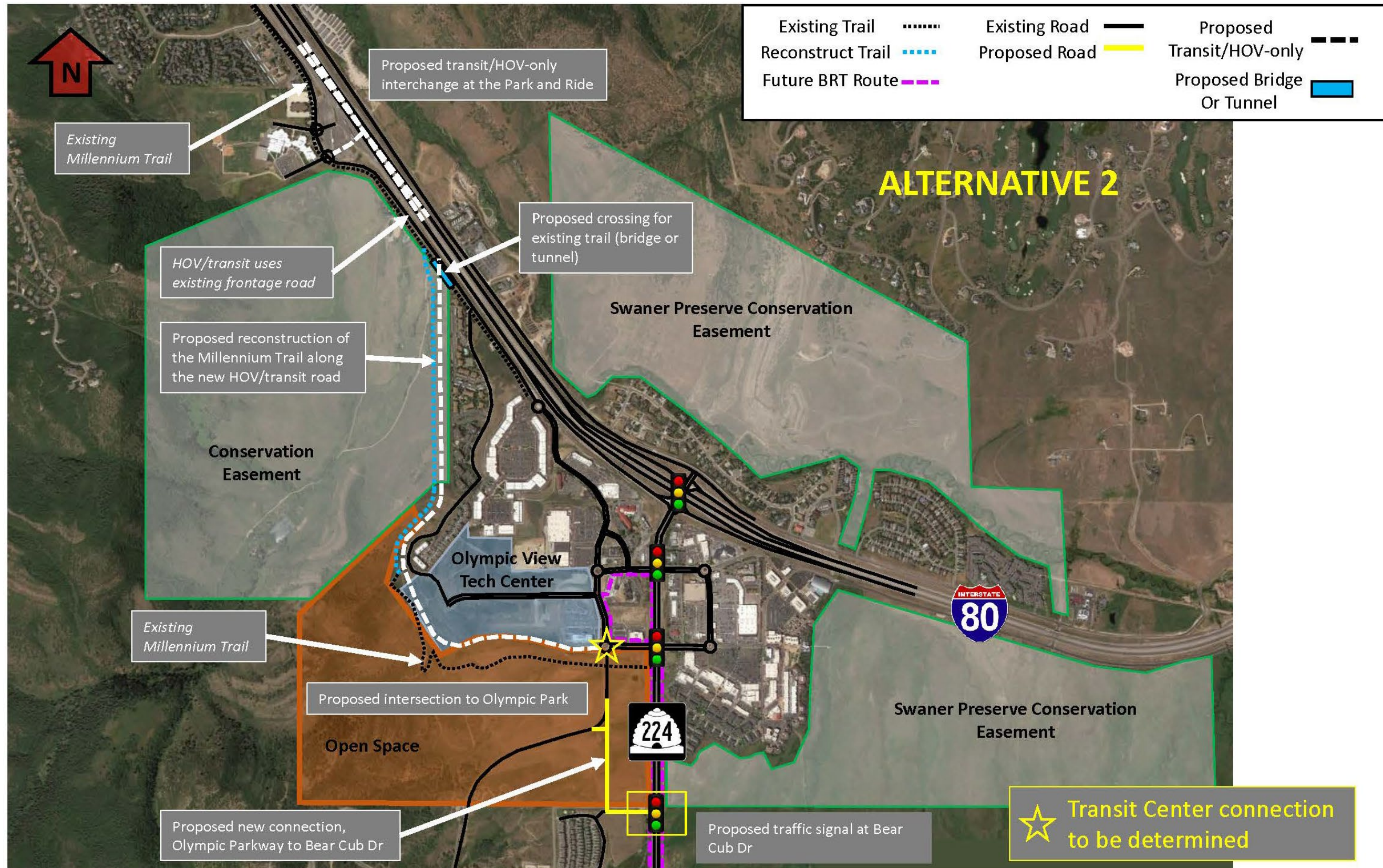


Figure 12-8. Alternative 3: Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I-80 Interchange

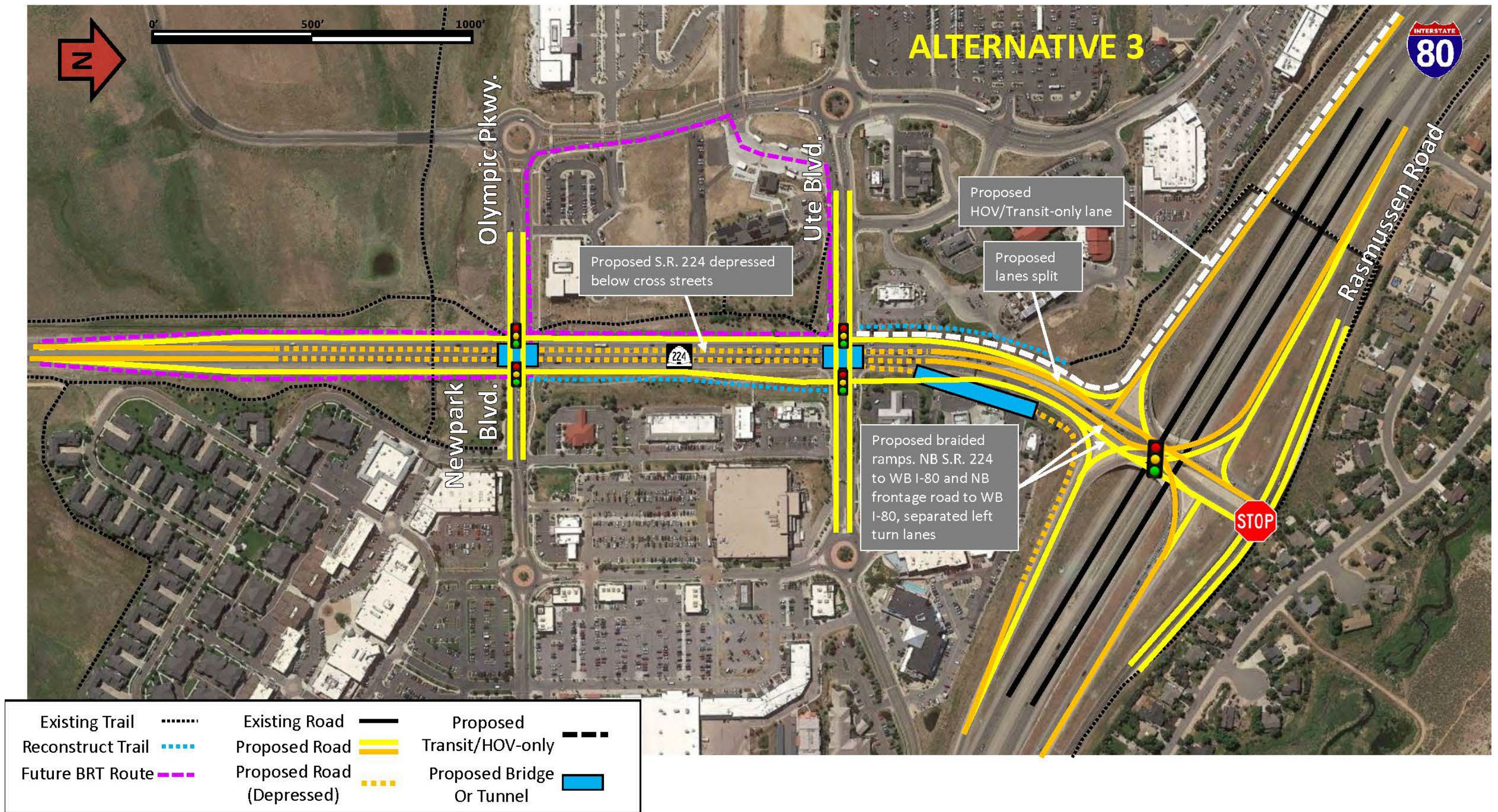
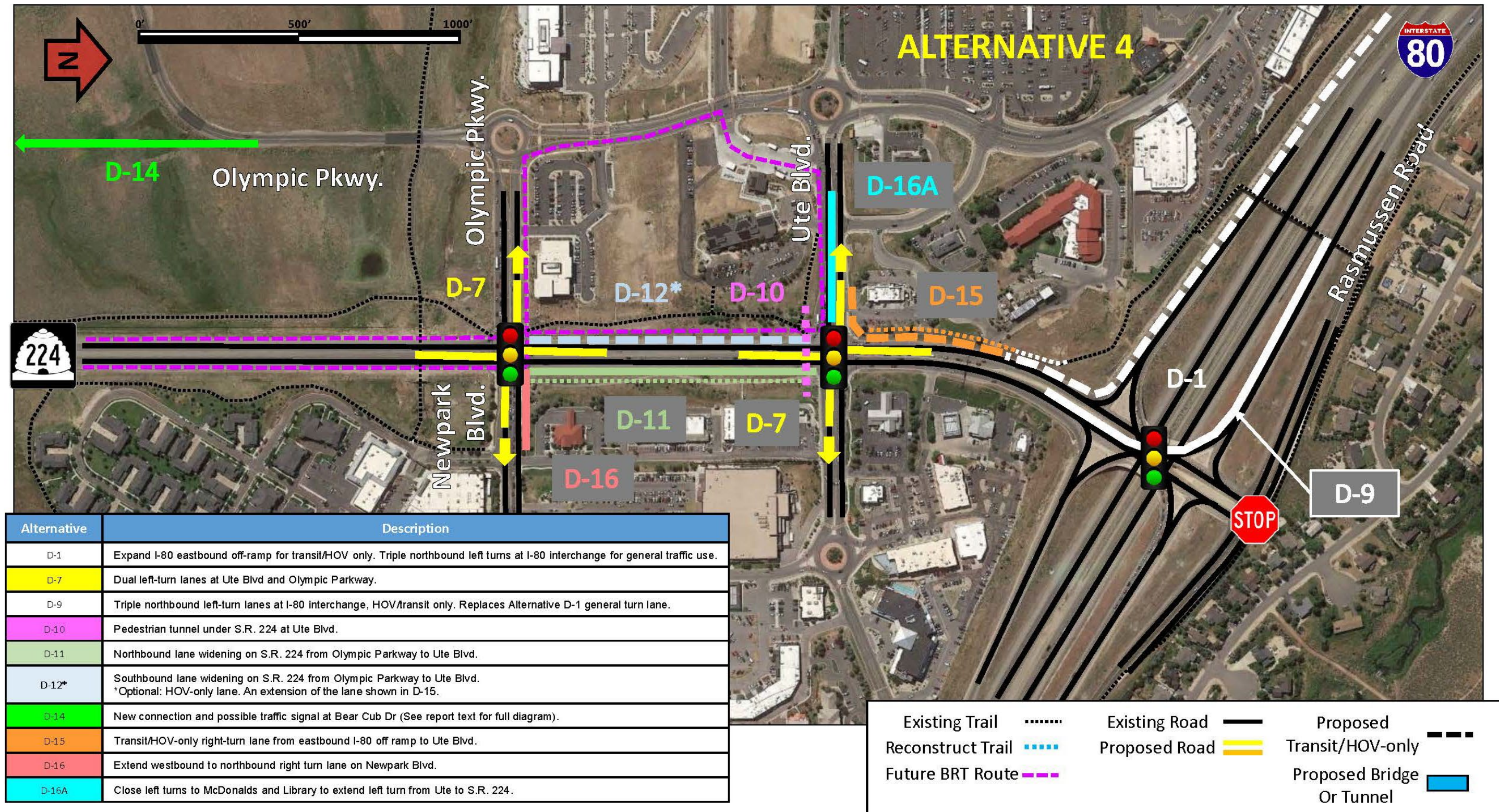


Figure 12-9. Alternative 4: Combination of Stand-alone Surface Street Improvements



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## 13 Level 2 Screening Evaluation and Alternatives Refinement Process

The purpose of Level 2 screening was to determine which alternatives are most reasonable for moving into future phases of study to streamline a future environmental process. During Level 2 screening, the partners collectively evaluated the alternatives that passed Level 1 screening against criteria that focus on how well each alternative meets the problems and opportunities for the study from a traffic perspective, the alternative's impacts to the natural and built environment, public sentiment, estimated project costs, logistical considerations, and overall feasibility.

At this level of study, the study team made conservative assumptions about roadway widths and the number of lanes. An additional 10-to-20-foot buffer area was added to the alternatives to account for walls, if necessary, as well as cut-and-fill slopes.

### 13.1 Level 2A Screening Evaluation Results

Similar to Level 1 screening, the Level 2 screening followed a two-step approach. The first step in Level 2 screening was to run the travel demand model for the 2050 No Build Alternative and Alternatives 1, 2, and 3 to determine whether, on a macro level, the screening measurements would be improved enough to indicate that further analysis via VISSIM in Level 2B screening was prudent. VISSIM is a microscopic multi-modal traffic flow simulation software that simulates complex vehicle interactions realistically on a microscopic level. Alternative 4 was not screened using the travel demand model since the elements that make up Alternative 4 are almost entirely composed of intersection lane improvements which are too small for a travel demand model to measure and are more suited to VISSIM analysis. Therefore, Alternative 4 was automatically advanced to Level 2B screening.

#### 13.1.1 Level 2A Model Scenarios

In order to assess the impact of planned projects on the regional transportation system, three scenarios were created for the travel demand model used in Level 2A screening: a 2020 base year, the 2050 "no-build" scenario, and the 2050 "build" scenario. The 2050 no-build and build scenarios are distinguished by the following characteristics:

- The **2050 no-build scenario** assumes no additional capacity projects in the study area but does assume that all currently planned transportation projects outside the study area are completed.
- The **2050 build scenario** assumes the same future population growth and land use changes as the no-build scenario but includes the additional road capacity that would be added to the regional transportation network as a result of completing all currently planned transportation projects (whether currently planned as part of this Area Plan or in other transportation plans).

### 13.1.2 Level 2A Screening Results for the No-build Alternative

The No-build Alternative is included as a means of comparing the operational benefits that would result from the improvements being considered.

As shown in Table 13-1, the No-build Alternative doesn't meet the problems and opportunity objectives for the study area. With the No-build Alternative, eastbound backing onto I-80 would occur, affecting operations and safety of the I-80 mainline. In addition, travel times on both northbound S.R. 224 during the PM peak hour and on southbound S.R. 224 during the AM peak hour would be slow to very slow. Mobility to and from I-80 and to and from S.R. 224 through Kimball Junction would be low; traffic would operate at LOS F, as would the east-west movements at Ute Boulevard and Olympic Parkway. Nonetheless, the No-build Alternative gives the study team a baseline measure by which to compare the build alternatives.

### 13.1.3 Level 2A Screening Results for Alternatives 1, 2, and 3

Based on the Level 2A screening results shown in Table 13-1, Alternative 2 was removed from further study. As shown in the table, travel demand modeling indicates that Alternative 2 would not relieve the existing or forecasted future traffic problems in the study area. Primarily, even if Alternative 2 were constructed, vehicles would still likely back onto the I-80 mainline, travel time through Kimball Junction would remain somewhat slow, and vehicle mobility through Kimball Junction would remain at LOS F. It's important to note that there is no way to code the travel demand model with the assumption that Alternative 2 was open to transit/HOV-only traffic only. Therefore, the model was run with the assumption that all traffic could use Alternative 2. Even under those circumstances, the model indicates that the alternative would struggle to relieve the existing or forecasted future traffic problems in the study area, and therefore it's reasonable to assume that, as a transit/HOV-only facility, the alternative would fare even worse than shown in Table 13-1.

It's important to note that, in addition to Alternative 2 failing Level 2A screening from a traffic perspective, the alternative did not have partner or public support. During the second public survey held to gauge community support and input regarding the alternatives being screened, Alternative 2 received the lowest overall rating among the four alternatives. There was almost universal community rejection for the alternative running through the edge of the Hi-Ute conservation easement. In addition, survey respondents didn't think that Alternative 2 would solve congestion or traffic build-up, felt that there were potential safety risks near Ecker Middle School, and felt that the alternative would reduce recreation options instead of expanding them by replacing trails with an HOV lane. See Section 15, Public and Study Partner Coordination and Outreach, for more details regarding public comments in relation to Alternative 2.

Table 13-1. Level 2A Screening Evaluation Results

Level 2A Screening				Travel Demand Model Results										
Criteria	Measure	2050 No Build Metric	2050 No Build Results	2050 No Build		Alternative 1			Alternative 2*			Alternative 3		
				Surrogate Measurement	Surrogate Value	Surrogate Value	Change	Expected Effect on Measure	Surrogate Value	Change	Expected Effect on Measure	Surrogate Value	Change	Expected Effect on Measure
Prevent off-ramp queues from I-80 to SR-224 from affecting operations and safety of the I-80 mainline	Measure peak-hour queue lengths at the westbound and eastbound off ramps	EB AM Off-Ramp Queue (95th)	2970 ft (Backing onto mainline)	EB I-80 Off-Ramp Daily Vol (vpd)	20600	13,100	Significant decrease	Backing likely eliminated	19000	Slight decrease	Backing likely persists	21200	Slight increase	Backing could be eliminated b/c of volume drop on SR-224
		WB AM Off-Ramp Queue (95th)	455 ft (No backing on mainline)	WB I-80 Off-Ramp Daily Vol (vpd)	8400	8500	Slight increase	Likely still no backing	8400	No change	Likely still no backing	8600	Slight increase	Likely still no backing
Reduce person delay of private vehicles navigating through Kimball Junction	Qualitatively assess the alternative's ability to reduce travel time pairs on SR-224 south Kimball Junction to and from eastbound and westbound I-80	SR-224 Northbound PM Travel Time	10:05 (Very slow travel)	PM NB V/C btwn Ute & SPUI	1.25	0.9	Marginal decrease	Likely somewhat slow TTs	1.14	Slight decrease	Likely slow TTs	0.59	Significant decrease	TTs much improved
		SR-224 Southbound AM Travel Time	6:00 (Slow travel)	PM SB V/C btwn Ute & SPUI	1.24	0.87	Marginal decrease	Likely somewhat slow TTs	1.15	Slight decrease	Likely slow TTs	0.45	Significant decrease	TTs much improved
Improve vehicle mobility to/from I-80 and to/from S.R. 224 through Kimball Junction	Improve vehicle or person throughput at intersections during future (2050) peak hours measuring overall intersection LOS	Ute Blvd PM LOS	LOS F	Entering Daily Vol (vpd)	62000	53,600	Marginal decrease	Likely LOS E or F	56400	Marginal decrease	Likely LOS E or F	37900	Significant decrease	Likely improves LOS
		Olympic Pkwy PM LOS	LOS F	Entering Daily Vol (vpd)	61700	61,100	Slight decrease	Still LOS F	58000	Slight decrease	Still LOS F	29400	Significant decrease	Likely improves LOS
Improve vehicle mobility to and from the Kimball Junction area.	Qualitatively assess vehicle delay for movement into and out of Kimball Junction land uses via S.R. 224 and I-80	Ute Blvd EB/WB PM LOS	LOS F / LOS F	Ute Blvd EB/WB PM V/C	0.49/0.25	0.46 /0.21	Slight decrease	Still LOS F	0.36 /0.24	Marginal decrease	Still LOS F	0.64 /0.27	Increase	May have improved LOS b/c of volume drop on SR-224
		Olympic Pkwy EB/WB PM LOS	LOS F / LOS F	Olympic Pkwy EB/WB PM V/C	0.49/0.66	0.49/0.61	Slight decrease	Still LOS F	0.33 /0.62	Slight decrease	Still LOS F	0.34 /0.59	Marginal decrease	May have improved LOS b/c of volume drop on SR-224
<b>Recommendation</b>				Move forward to detailed VISSIM analysis with D-series improvements to Ute & Olympic					Most surrogates indicate measures will not improve. Do not move forward to detailed VISSIM analysis			Move forward to detailed VISSIM analysis		
				Rating: 2					*Assumes GP use of bypass road, so alternative benefits likely overstated Rating: 1			Rating: 3		

Rating  
 3 = High (Good), 2 = Medium (Acceptable), 1 = Low (Poor)

\* Note: Alternative 4 was not screened using the travel demand model since the elements that make up Alternative 4 are almost entirely composed of intersection lane improvements which are too small for a travel demand model to measure and are more suited to VISSIM analysis. Therefore, Alternative 4 was automatically advanced to Level 2B screening.

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## Alternatives 1 and 3 Refinement

As shown in Table 13-1 above, Alternatives 1 and 3 showed enough travel demand and traffic improvements during the Level 2A screening analysis to warrant further analysis in the Level 2B screening process. Using the Level 2A screening evaluation results, the study team took steps to further refine elements of the alternatives prior to the Level 2B screening analysis. Refinements included removing underutilized or redundant elements to minimize costs and community impacts and maximize traffic and multimodal benefits. Based on the Level 2A screening results, the study team made the following refinements to Alternatives 1 and 3 prior to Level 2B screening (Table 13-2).

Table 13-2. Refinements to Alternatives 1 and 3 Based on the Travel Demand Model

Alternative	Refinement	Reason for Refinement
Alternative 1	Remove new east half-diamond interchange and ramps.	<ul style="list-style-type: none"> <li>These ramps experience very little use because they are largely a redundant and slower alternative to existing S.R. 224 on and off ramps.</li> <li>The new westbound off ramp, in particular, attracts zero model volumes because it does not offer new access to any land that cannot be accessed faster by going straight to the off ramp to S.R. 224.</li> <li>Likewise, the new east bridge experiences zero model volumes because there are no driveways on the new north-side one-way frontage road to attract trips across the bridge.</li> <li>The new eastbound on ramp does present a more direct way for some Kimball Junction traffic to go eastbound on I-80; however, this volume is minimal (less than 600 vehicles per day) and can easily be absorbed by the existing S.R. 224 eastbound on ramp.</li> </ul>
Alternative 1	Remove the existing west S.R. 224 on and off ramps and consolidate movements to the new ramps for the west half-diamond interchange.	Although the existing ramps do carry some volume, the combined ramps simplify freeway access and should be able to accommodate traffic volumes since local access is split between the new bridge and S.R. 224.
Alternative 1	Remove both Texas U-turns.	Because the proposed one-way frontage roads do not have any access points between the new bridges and S.R. 224 that would generate traffic to utilize the turnarounds, the study team removed both Texas U-turns.
Alternative 3	Remove the tunnel branching off to the eastbound I-80 on ramp.	<ul style="list-style-type: none"> <li>This tunnel attracts only 200 daily trips in the travel demand model since S.R. 248 is the more direct path for trips originating south of Kimball Junction and looking to head east on I-80.</li> <li>Most travel to east I-80 appears to be generated at Kimball Junction itself, and these drivers would be using the S.R. 224 frontage road rather than the tunnel.</li> <li>The low number of drivers wanting to make a right turn onto the ramp from the tunnel can be absorbed by the S.R. 224 frontage road system.</li> </ul>

The combined effect of the changes to Alternative 1 is a split-diamond interchange with one-way frontage roads. Ramps to and from the west connect to the new bridge. Ramps to and from the east connect to S.R. 224. One-way frontage roads serve traffic in between. Removing the extra ramps eliminates the closely spaced entry and exit gores. Alternative 1 is also less complicated as a split-diamond concept.

Figure 13-1 through Figure 13-5 below show the revised schematics for Alternatives 1 and 3 based on the information above.

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Figure 13-1. Revised Alternative 1: Split Diamond with One-way Frontage Roads – West Half

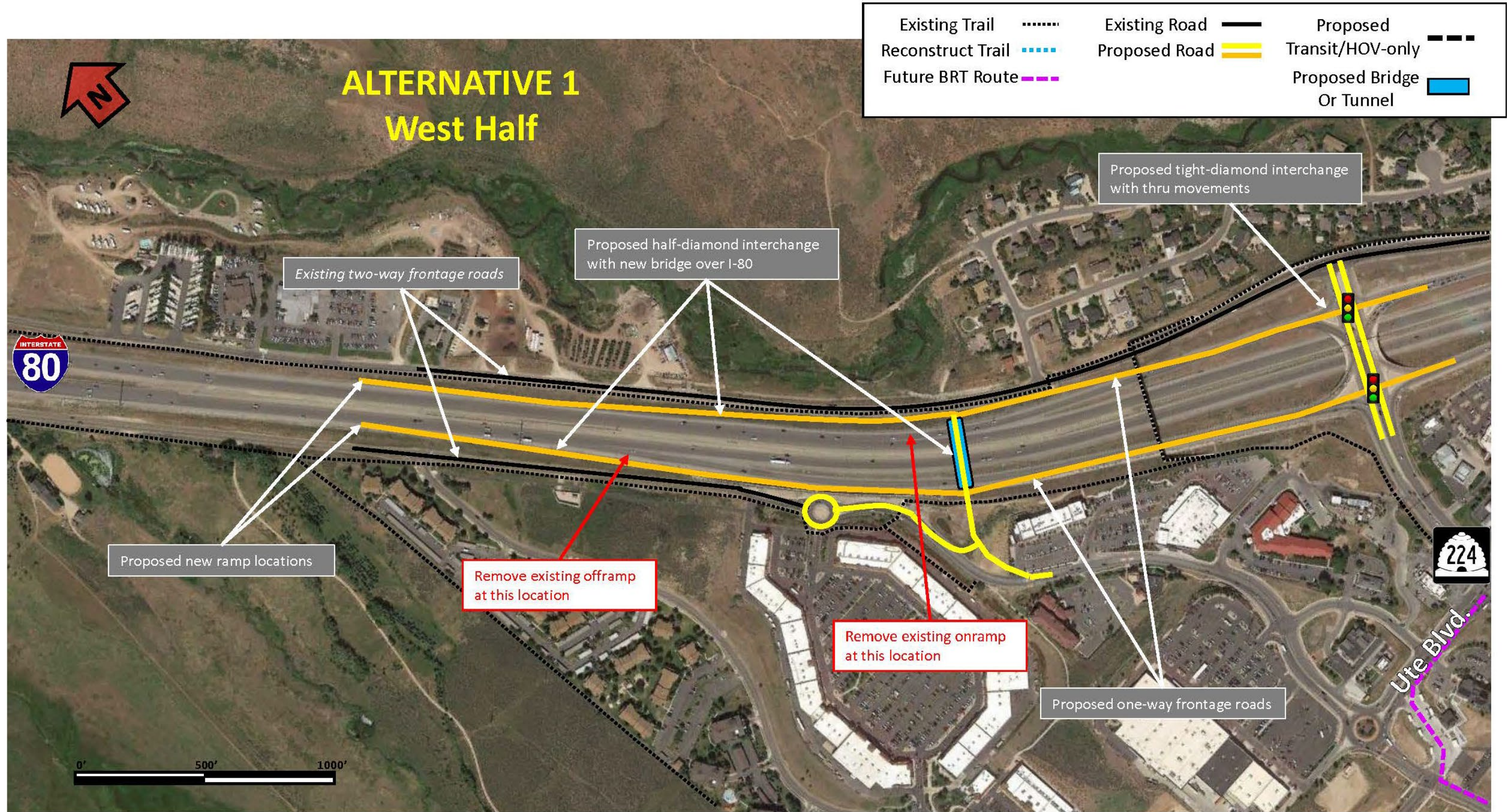


Figure 13-2. Revised Alternative 1: Split Diamond with One-way Frontage Roads – West Half with HOV Ramps

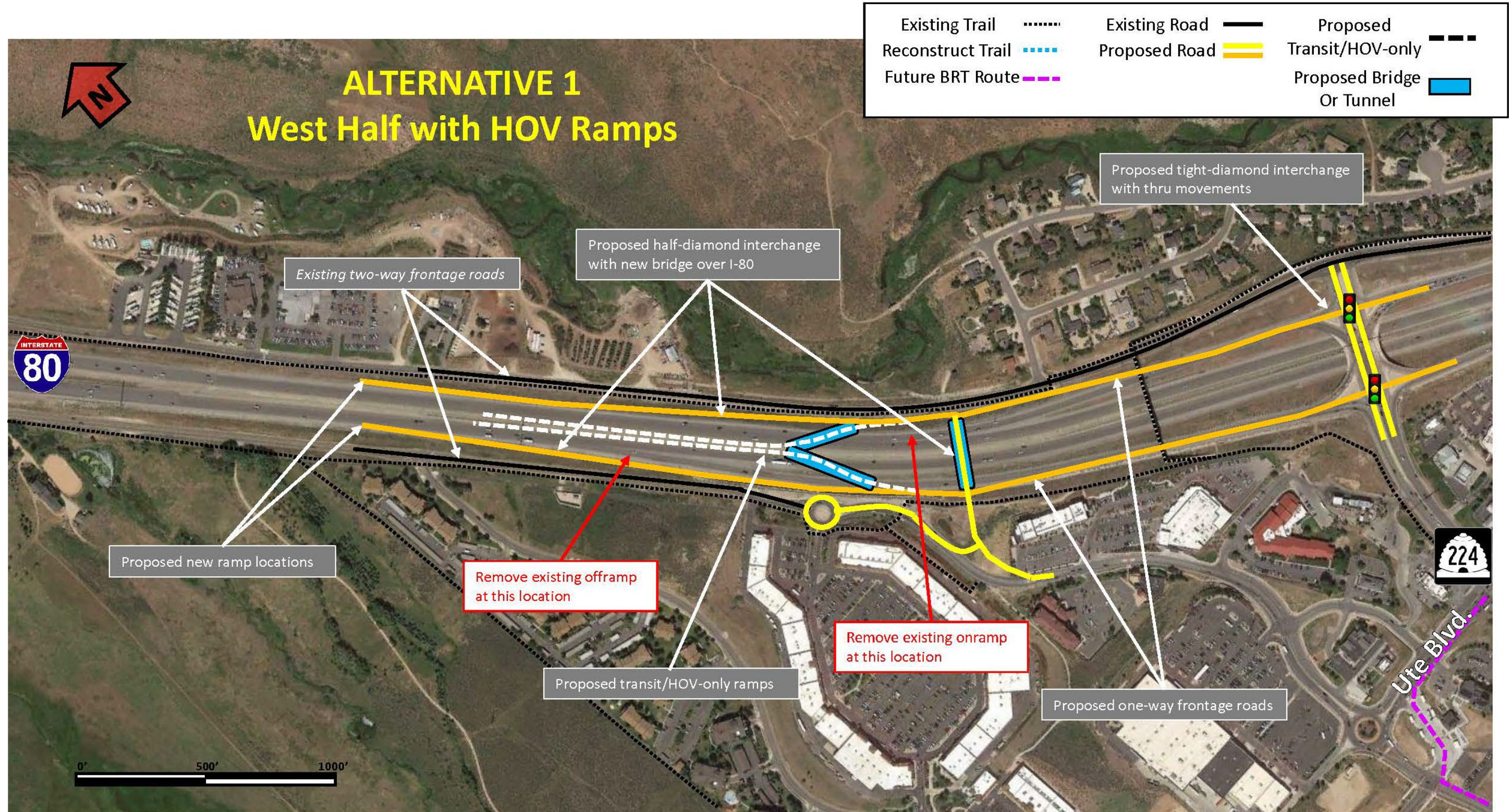




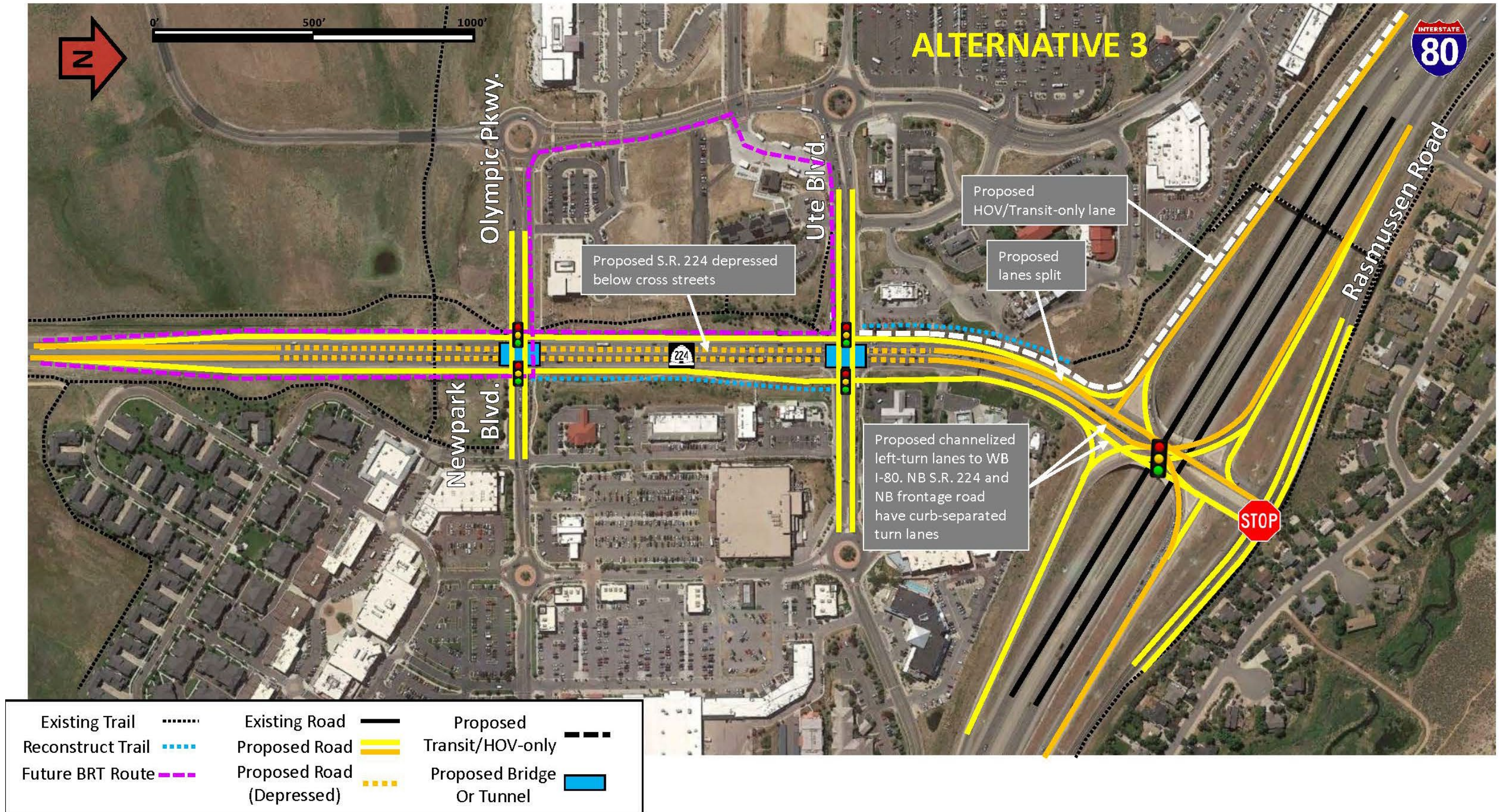
Figure 13-3. Revised Alternative 1: Split Diamond with One-way Frontage Roads – East Half (1 of 2)



Figure 13-4. Revised Alternative 1: Split Diamond with One-way Frontage Roads – East Half (2 of 2)



Figure 13-5. Revised Alternative 3: Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I-80 Interchange



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### 13.1.4 Level 2B Screening Evaluation Results and Comparison of Alternatives

The three remaining alternatives were evaluated based on both qualitative and quantitative measures tied to the study area goals that allowed the study team and study partners to compare the alternatives and determine the most appropriate alternatives to be advanced to future phases of study. As shown in Table 13-3, in many categories, the three alternatives ranked similarly. In other cases, each alternative had both advantages and disadvantages. A brief summary of the screening results relative to each study area goal follows. The full results of the Level 2 screening are included in Appendix B, Level 2 Screening Matrix. Because Alternative 2 was eliminated during Level 2A screening, it was not carried through the Level 2B screening process, although it was included in the public survey since Level 2A screening was conducted at the same time as the survey.

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Table 13-3. Level 2 Screening Evaluation Matrix

Kimball Junction and S.R. 224 Area Plan  
 Level 2 (Final Screening) Evaluation Matrix

Rating  
 3 = High, 2 = Medium, 1 = Low

ALTERNATIVE		Revised Alternative 1		Revised Alternative 3		Alternative 4	
Alternative Characteristics		Split Diamond with One-way Frontage Roads and optional HOV Ramps		Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I 80 Interchange		Combination of Stand-alone Surface Street Improvements	
Evaluation Criterion	Measure	Rating	Detail	Rating	Detail	Rating	Detail
Prevent off-ramp queues from I-80 to S.R. 224 from affecting operations and safety of the I-80 mainline.	Measure peak-hour queue lengths at the westbound and eastbound off ramps	3	I-80 ramp queues don't back onto mainline	3	I-80 ramp queues don't back onto mainline	3	I-80 ramp queues don't back onto mainline
Accommodate current and projected travel demand on S.R. 224 in the Kimball Junction area while minimizing the roadway footprint.	Quantitatively assess the alternative's ability to reduce travel times for travel time pairs on S.R. 224 south of Kimball Junction to and from eastbound and westbound I-80.	2	Some peak direction through traffic travel time savings from no build (~10 sec AM and 5:10 PM)	3	Considerable peak direction through traffic travel time savings from no build (~2 min AM and 6:20 PM)	3	Considerable peak direction through traffic travel time savings from no build (~1:10 AM and 6:10 PM)
Reduce person-delay of private (single-occupant or high occupancy) vehicles from navigating through the Kimball Junction area.							
Improve the overall capacity of the Kimball Junction area by improving vehicular and transit networks.	Improve vehicle or person throughput at intersections during future (2050) peak hours. Measure overall intersection level of service as well as percent served.	2	Intersection LOS E at I-80 AM peak (no improvement over No Build) and E at Ute Boulevard PM peak (slight improvement over No Build)	2	Intersection LOS E at Olympic Parkway PM peak (slight improvement over No Build)	3	Intersection LOS C or D at all intersections AM peak and PM peak
Maintain existing, and consider additional, grade-separated active transportation connections across I-80 and S.R. 224.	Measure directness of safe and comfortable routes for people bicycling and walking to major destinations in the Kimball Junction area.	3	Proposed pedestrian tunnel on S.R. 224 at Ute Boulevard will increase connectivity and comfort	2	Trails are impacted but could be reconstructed. Depending on trench cover - pedestrian promenade could be included but directness of pedestrian travel not yet determined	3	Proposed pedestrian tunnel on S.R. 224 at Ute Boulevard will increase connectivity and comfort
Enhance regional transit connectivity to the Kimball Junction Transit Center and future BRT facilities.	Measure changes in transit travel times for all routes that serve the Kimball Junction area.	2	Transit elements included, although operation of transit elements require further study. Alternative adds dual left turns, which could aid transit but also could add volume which could negate benefits. In general, the level of detail for transit design isn't enough to make transit "awesome" at this point in design; however, transit elements are not precluded.	3	Transit elements included, makes left turns to WB I-80 and NB S.R. 224 easier. Because this alternative offers a bypass to Kimball Junction, transit vehicles going to points south could use bypass. While transit details require additional study, this alternative may offer the best transit throughput and reliability.	2	Adds 3rd lane going south, which could be used by transit vehicles. In general, the level of detail for transit design isn't enough to make transit "awesome" at this point in design; however, transit elements are not precluded.
Improve existing access deficiencies and accommodate future access needs.	Qualitatively assess whether the alternative includes or supports future congestion-management strategies such as Transportation Demand Management.	2	HOV ramps but no HOV elements connecting to S.R. 224; also considered active transportation and transit. Ultimately, policy changes should be enacted to further support TDM and other congestion-management strategies.	2	Has one HOV element (HOV right turn lane at SPUI); also considered active transportation and transit. Ultimately, policy changes should be enacted to further support TDM and other congestion-management strategies.	3	Has the highest HOV benefits with left/right HOV at SPUI; also considered active transportation and transit. Ultimately, policy changes should be enacted to further support TDM and other congestion-management strategies.

Table 13.3. Level 2 Screening Evaluation Matrix (continued)

Kimball Junction and S.R. 224 Area Plan  
 Level 2 (Final Screening) Evaluation Matrix

Rating  
 3 = High, 2 = Medium, 1 = Low

ALTERNATIVE		Revised Alternative 1		Revised Alternative 3		Alternative 4	
Alternative Characteristics		Split Diamond with One-way Frontage Roads and optional HOV Ramps		Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I 80 Interchange		Combination of Stand-alone Surface Street Improvements	
Evaluation Criterion	Measure	Rating	Detail	Rating	Detail	Rating	Detail
Improve vehicle mobility to and from the Kimball Junction area.	Quantitatively assess vehicle delay for movements into and out of Kimball Junction land uses via S.R. 224 and I-80.	3	In the AM peak period, marginal improvement in delay compared to No Build conditions. Reduces delay by over half in the PM peak period when No Build conditions are the worst.	3	In the AM peak period, a five second improvement in delay compared to No Build conditions. In the PM peak period when No Build conditions see the highest travel delay of 145 sec/vehicle, reduced that delay by over half the time seen under No Build conditions	3	In the AM peak period, delay was the same as with No Build conditions. In the PM peak period when No Build conditions see the highest travel delay of 145 sec/vehicle, reduced that delay by over half the time seen under No Build conditions
Promote comfortable active transportation opportunities that connect existing and emerging land uses.	Qualitatively assess the alternative's ability to accommodate safe travel by pedestrians and cyclists.	2	Proposed pedestrian tunnel on S.R. 224 at Ute Boulevard will increase connectivity and comfort	2	Trails are impacted but would be reconstructed. Depending on trench cover - pedestrian promenade could be included but directness of pedestrian travel not yet determined	2	Proposed pedestrian tunnel on S.R. 224 at Ute Boulevard will increase connectivity and comfort
Create a place where there are viable travel alternatives to using a car in order to improve mobility and contribute to improved local and regional air quality, environmental sustainability, and community health.	Qualitatively assess the ability of local residents and visitors to access community facilities both across and along S.R. 224.	2	Provides new direct access to Kimball Junction from I-80	3	Segregates through traffic from local traffic, simplifying local access.	2	Improves traffic flow at existing facilities; dual lefts at Ute Boulevard and Olympic Parkway
	Alternative avoids impacts to existing neighborhoods, has minimal effect on community cohesion, and enhances the character of the area. Assess high-level measures of expected impacts to environmental resources including: (1) acres of floodplains, (2) acres of conservation easements and open space, (3) acres of wetlands, (4) TES habitat by occurrence, (5) acres of right-of-way impacts, (6) number of historic properties, (7) feet of electrical line impacts, (8) feet of stream impacts, (9) acres of FPPA-regulated farmland, and (10) feet and number of trails.	2	Per the environmental screening tab, medium impacts. Impacts the most trails and most wetlands.	2	Per the environmental screening tab, medium impacts. Impacts the most right-of-way.	2	Per the environmental screening tab, medium impacts. Impacts the most open space.



Table 13.3. Level 2 Screening Evaluation Matrix (continued)

Kimball Junction and S.R. 224 Area Plan  
 Level 2 (Final Screening) Evaluation Matrix

Rating  
 3 = High, 2 = Medium, 1 = Low

ALTERNATIVE		Revised Alternative 1		Revised Alternative 3		Alternative 4	
Alternative Characteristics		Split Diamond with One-way Frontage Roads and optional HOV Ramps		Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I 80 Interchange		Combination of Stand-alone Surface Street Improvements	
Evaluation Criterion	Measure	Rating	Detail	Rating	Detail	Rating	Detail
Minimize environmental, right-of-way, and utility impacts.	Qualitatively assess vehicle-miles traveled reduction for improvement in air quality.	2	Less delay and less idling from LOS improvement leads to improved air quality. No likely significant reduction in vehicle-miles traveled.	3	Less delay and less idling from LOS improvement leads to improved air quality; vehicles on mainline S.R. 224 don't stop at Ute Boulevard and Olympic Parkway. No likely significant reduction in vehicle-miles traveled.	2	Less delay and less idling from LOS improvement leads to improved air quality. No likely significant reduction in vehicle-miles traveled.
	Qualitatively assess increased physical activity achieved during everyday trips.	3	Improved access across S.R. 224 due to proposed pedestrian tunnel at Ute Boulevard	3	Trails are impacted but would be reconstructed. Depending on trench cover - pedestrian promenade could be included which could offer green space for physical activity.	3	Improved access across S.R. 224 due to proposed tunnel at Ute Boulevard
Minimize impacts to public health while improving health-related activities and access and equity to public health facilities.	Qualitatively assess improved access to health-related resources along S.R. 224.	3	New pedestrian tunnel at Ute Boulevard offers another access point to Redstone area; provides direct access to Kimball Junction	3	Offers better east-west connectivity	3	Dual lefts may make access to Redstone area easier. New pedestrian tunnel at Ute Boulevard offers another access point to Redstone area.
	Qualitatively assess improved multimodal connectivity to Kimball Junction—area destinations.	2	Adds active transportation, transit and HOV amenities but not detailed enough at this level to assess big improvements	2	Adds active transportation, transit and HOV amenities but not detailed enough at this level to assess big improvements	2	Adds active transportation, transit and HOV amenities but not detailed enough at this level to assess big improvements
	Measure distance traveled for accessibility to transit and active transportation facilities—what is available within ¼ mile—and assess physical barriers.						
Qualitatively assess transportation equity.	2	Adds active transportation, transit and HOV amenities; policy changes can also improve this	2	Adds active transportation, transit and HOV amenities; policy changes can also improve this	2	Adds active transportation, transit and HOV amenities; policy changes can also improve this	
Improve safety on S.R. 224 in the Kimball Junction area for all users.	Quantitatively assess the alternative's ability to reduce conflict points (vehicle-to-vehicle) and crash rates (where <i>Highway Safety Manual</i> methodologies apply).	1	Adds new conflict points via new split diamond interchange configurations	2	S.R. 224 tunnel removes some conflict points but adds new conflict points at the split intersections making for no reduction	2	No reduction due to no change to the existing number of conflict points
	Quantitatively assess the alternative's ability to reduce conflict points (vehicle-to-cyclist/pedestrian) and crash rates (where <i>Highway Safety Manual</i> methodologies apply).	2	New pedestrian tunnel at Ute Boulevard reduces conflict point	1	No reduction	2	New pedestrian tunnel at Ute Boulevard reduces conflict point

Table 13.3. Level 2 Screening Evaluation Matrix (continued)

Kimball Junction and S.R. 224 Area Plan  
 Level 2 (Final Screening) Evaluation Matrix

Rating  
 3 = High, 2 = Medium, 1 = Low

ALTERNATIVE		Revised Alternative 1		Revised Alternative 3		Alternative 4	
Alternative Characteristics		Split Diamond with One-way Frontage Roads and optional HOV Ramps		Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I 80 Interchange		Combination of Stand-alone Surface Street Improvements	
Evaluation Criterion	Measure	Rating	Detail	Rating	Detail	Rating	Detail
Ensure that the alternative is consistent with planned land uses.	Alternative is consistent with adopted local and regional land use and transportation plans.	2	No transformative change; new pedestrian tunnel at Ute Boulevard adheres to Summit County active transportation plans	3	Offers better east-west connectivity, which aligns to Kimball Junction Neighborhood Plan. The trench covering offers potential for promenade. Better east-west connectivity offers benefits to proposed new tech center ingress/egress.	2	No transformative change; offers benefits to proposed new tech center ingress/egress and new pedestrian tunnel at Ute Boulevard adheres to Summit County active transportation plans
	Alternative is compatible with other planned projects on S.R. 224 in the Kimball Junction area as identified in adopted planning studies for the area						
Ensure that the alternative fits the character and scale of the community and is complementary to the landscape.	Assess community support for the alternative based on a public survey and meetings.	2	Mixed reaction to Alternative 1, survey respondents thought the traffic configuration was complicated, respondents felt that this alternative would improve ingress/egress at Kimball Junction and I-80 but may not reduce congestion, positive reception for pedestrian tunnel	3	Received highest overall rating from respondents, general sentiment is that this alternative is least impactful with greatest benefits, positive reception for pedestrian tunnel, some concern that this alternative would affect character of the community, less visual impacts through Kimball Junction by depressing roadway	2	Second lowest rating (after Alternative 2, which didn't get through Level 2A screening), respondents didn't like phased approach of short term improvements, respondents didn't think this alternative would solve the congestion and mobility problems
	Qualitatively assess the suitability of the alternative within the scale of the community and the alternative's ability to enhance the corridor's natural setting and character.						
Ensure that the alternative is practical and implementable.	Measure the alternative's practicality and implementability with conceptual-level costs.	2	Moderate cost	1	Very high cost	3	Low cost compared to other alternatives, especially given possible incremental approach
	Consider the alternative's constructability given available technology.	3	Constructible, can be phased to reduce construction impacts	2	Constructible though details for depressing roadway and potentially covering roadway need to be considered	3	Should be easy to construct and can be phased, which will reduce construction impacts
Accommodate snow storage after plowing and other maintenance activities.	Qualitatively assess the alternative's ability to accommodate snow storage and other maintenance activities to ensure travelers' safety and mobility.	3	Snow storage can be accommodated	2	Snow plowing and storage may be challenging due to depressed roadway	3	Snow storage can be accommodated

Table 13.3. Level 2 Screening Evaluation Matrix (continued)

Kimball Junction and S.R. 224 Area Plan  
 Level 2 (Final Screening) Evaluation Matrix

Rating  
 3 = High, 2 = Medium, 1 = Low

ALTERNATIVE		Revised Alternative 1		Revised Alternative 3		Alternative 4	
Alternative Characteristics		Split Diamond with One-way Frontage Roads and optional HOV Ramps		Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I 80 Interchange		Combination of Stand-alone Surface Street Improvements	
Evaluation Criterion	Measure	Rating	Detail	Rating	Detail	Rating	Detail
Include innovative operational technologies.	Qualitatively assess whether the alternative includes or supports future congestion-management strategies such as Transportation Systems Management, Intelligent Transportation Systems, or Transportation Network Companies.	2	Can support future congestion management strategies from a policy level	2	Can support future congestion management strategies from a policy level	2	Can support future congestion management strategies from a policy level
		52		54		57	

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## Move people and goods more efficiently through the Kimball Junction Area

Several evaluation criteria and measures were used to evaluate capacity and traffic operations for the three alternatives. The primary capacity and operations problems that were evaluated were:

- Prevent off-ramp queues from I-80 to S.R. 224 from affecting the operations and safety of the I-80 mainline.
- Accommodate current and projected travel demand on S.R. 224 in the Kimball Junction area while minimizing the roadway footprint and reduce person-delay of private (single-occupant or high-occupancy) vehicles from navigating through the Kimball Junction area.
- Reduce person-delay of private (single-occupant or high-occupancy) vehicles from navigating through the Kimball Junction area.
- Improve the overall capacity of the Kimball Junction area by improving vehicle and transit networks.
- Improve vehicle mobility to and from the Kimball Junction area.

As shown in Table 13-4, capacity and operation improvements for Alternatives 1, 3, and 4 were determined via several measures and compared to the No-build Alternative as well as to each other during the Level 2B screening process. From a traffic standpoint, all three alternatives are functional alternatives with clear improvement over the No-build Alternative. All three alternatives would alleviate I-80 ramp queues backing onto the mainline. Alternative 3 would provide the greatest travel time savings on S.R. 224 to and from eastbound and westbound I-80 in both the AM and PM peak periods. Alternative 4 would provide the second-best travel time savings in both directions. Alternatives 3 and 4 offer the most improvement for vehicle or person throughput at intersections during future (2050) AM peak hours. In the future peak PM hours, Alternative 4 offers the most intersection improvement.

Finally, average vehicle delay into and out of Kimball Junction land uses via S.R. 224 and I-80 was considered in the traffic model. In the AM peak period, Alternatives 1 and 3 would provide a 5-second improvement in delay compared to No-build Alternative, while delay with Alternative 4 would be the same as the No-build Alternative. However, in the PM peak period when No-build Alternative would have the highest travel delay of 145 seconds per vehicle, all three build alternatives would reduce that delay by over half the time compared with the No-build Alternative, with Alternative 3 providing 5 fewer seconds of delay (60 seconds) compared to Alternatives 1 and 4 (65 seconds).

Table 13-4. Level 2B Traffic Screening

		<i>Measure peak-hour queue lengths at the westbound and eastbound off ramps.</i>		<i>Quantitatively assess the alternative's ability to reduce travel times for travel time pairs on S.R. 224 south of Kimball Junction to and from eastbound and westbound I-80.</i>		<i>Improve vehicle or person throughput at intersections during future (2050) peak hours. Measure overall intersection level of service as well as percent served.</i>		<i>Quantitatively assess vehicle delay for movements into and out of Kimball Junction land uses via S.R. 224 and I-80.</i>			
		<b>I-80 Ramp Queues Backing to Mainline (Yes/No)</b>	<b>Screening Result</b>	<b>Traffic Travel Time Savings from No Build (mm:ss)</b>	<b>Screening Result</b>	<b>Intersection LOS</b>			<b>Screening Result</b>	<b>Average Vehicle Delay In/Out of Kimball Junction (sec/veh)</b>	<b>Screening Result</b>
						<b>Ute Blvd</b>	<b>Olympic Pkwy</b>	<b>I-80</b>			
<b>AM</b>	<b>No Build</b>	Yes - EB I-80		--		C	C	E		40	
	<b>Alt 1</b>	No	3	0:10	2	C	C	E	2	35	3
	<b>Alt 3</b>	No	3	2:00	3	C	C	C	2	35	3
	<b>Alt 4</b>	No	3	1:10	2	D	C	D	3	40	3
<b>PM</b>	<b>No Build</b>	No		--		F	F	D		145	
	<b>Alt 1</b>	No	3	5:10	2	E	D	C	2	65	3
	<b>Alt 3</b>	No	3	6:20	3	D	E	C	2	60	3
	<b>Alt 4</b>	No	3	6:10	3	D	D	D	3	65	3

Rating  
 3 = High (Good), 2 = Medium (Acceptable), 1 = Low (Poor)

## Improve mobility and comfort for all users to and around the Kimball Junction area through a connected network

Measures to address active transportation connections and regional transit connectivity were considered for all three alternatives. Alternative 1 includes transit elements, although operation of transit elements requires further study. Alternative 1 adds dual left turns, which could aid transit but also could add volume which could negate benefits by causing the transit vehicles to get stuck in more traffic. Alternative 3 includes transit elements and makes left turns to westbound I-80 and northbound S.R. 224 easier. Because Alternative 3 offers a bypass to Kimball Junction, transit vehicles going to points south could use the bypass, thereby improving transit time and reliability. Alternative 4 adds a third southbound lane on S.R. 224 through the study area, which could be used by transit vehicles. In general, the level of detail for transit design at this point of study isn't enough to make large differences in transit connectivity; however, transit elements are not precluded.

Both Alternatives 1 and 4 include a proposed pedestrian tunnel under S.R. 224 at Ute Boulevard, which would increase connectivity and comfort for pedestrians and bicyclists. Alternative 3 could provide enhanced multimodal connectivity, depending on the ultimate design solution for the proposed depressed roadway and trench cover. If the cover over the depressed part of S.R. 224 is structural enough to be turned into a plaza or walkway, a new crossing could possibly be located on top of it, and the trail traffic from Olympic Parkway and Ute Boulevard could also be directed there.

## Provide a balanced transportation system that contributes to improved local and regional air quality, environmental sustainability, and community health

Several measures were considered to determine how each alternative would minimize environmental, right-of-way, and utility impacts as well as impacts to public health while improving health-related activities and access to public health facilities.

### *Community support*

Responses gathered during the second public survey showed a mixed reaction to Alternative 1. Generally, respondents felt that the traffic configuration of Alternative 1 was too complicated and would be difficult to navigate, and respondents were unsure that traffic to and from S.R. 224 would be addressed by Alternative 1. Alternative 3 received the highest overall rating from the public among the four alternatives (Alternatives 1–4), keeping in mind that Alternative 2 was presented to the public in the survey, received the least-favorable responses overall, and was eliminated during the concurrent Level 2A travel demand modeling screening. The general sentiment was that Alternative 3 would be the least impactful and would yield the greatest benefit. Respondents had some concern that Alternative 3 would take away from the character of the community; however, multiple responses indicated that the community and its demands are growing and that Alternative 3 was appropriately sized for the growing traffic and access issues.

Alternative 4 received the second-lowest overall ranking among all the alternatives after Alternative 2. This was primarily because many survey participants did not think that Alternative 4 would solve the overall problems of reducing congestion and improving mobility in Kimball Junction. Moreover, respondents were hesitant to drag out construction over several years. They were under the impression that, because the alternative consists of a suite of phased improvements that could be made in the short term, typically because they would cost less to construct, it would not offer a long-term solution. See Section 15, Public and Study Partner Coordination and Outreach, for more details regarding study partner and community support for the alternatives.

### *Environmental criteria*

The high-level environmental impact data sources used in the Level 2B evaluation were readily available data from U.S. Census, file review, and county and municipality planning documents. Both quantitative and qualitative measures were used to evaluate the potential for the alternatives being evaluated to adversely affect natural and built environment resources.

As shown in Table 13-5, all three alternatives would have similar impacts in terms of the environmental screening measures, and none of the alternatives appear to have any fatal flaws with regard to the environmental resources that were considered at this level of analysis. Perhaps the most notable difference is that Alternative 1 would impact over twice as many feet and number of trails compared to Alternatives 3 and 4. Because trails are a federally regulated resource under Section 4(f) (unless for a transportation use) and because Summit County's trail system is an important amenity to the community, impacts to the trail system and the ability to mitigate impacts to trails should be considered during the next phase of study.

Based on National Wetland Inventory mapping, both Alternatives 1 and 3 would have more than 0.5 acre of impacts to potentially jurisdictional wetlands. Additional wetland surveys, including a wetland delineation if necessary, would need to be conducted during the next phase of study. A Department of the Army Nationwide Permit would be required for wetland impacts under the 0.5-acre threshold, a Letter of Permission would be required for wetland impacts between 0.5 and 1 acre, and an Individual Permit would be required for impacts greater than 1 acre. Appendix C, Preliminary Environmental Impacts, includes maps showing the impacts to the various environmental resources, as well as right-of-way impacts, included in the Level 2 screening by alternative. Note that the right-of-way impacts were calculated based off Summit County parcel and ownership data. A more accurate aerial survey would need to be conducted during the next phase of study.



Table 13-5. Environmental Criteria Screening

Kimball Junction and S.R. 224 Area Plan  
 Level 2 (Final Screening) Evaluation Matrix

Rating  
 3 = High, 2 = Medium, 1 = Low

ALTERNATIVE			Revised Alternative 1		Revised Alternative 3		Alternative 4	
Alternative Characteristics			Split Diamond with One-way Frontage Roads and optional HOV Ramps		Grade-separated Intersections with Enhanced Pedestrian Crossing Facilities at Ute Boulevard and Olympic Parkway and Alternate Connections to the I 80 Interchange		Combination of Stand-alone Surface Street Improvements	
Evaluation Criterion	Measure	Ratings thresholds	Rating	Detail	Rating	Detail	Rating	Detail
Environmental Issues	Acres of floodplains	less than 1 acre = 3, 1 acre -10 acres = 2, more than 10 acres = 1	2	1.33	3	0.5	3	0
	Acres of open space	less than 0.5 acre = 3, 0.5 acre - 2 acre = 2, over 2 acres = 1	2	0.54	2	0.55	1	2.15 (Florence Gilmore open space)
	Acres of wetlands (NWI mapping)	less than 1/2 acre = 3, 1/2 acre - 1 acre = 2, over 1 acre = 1	1	0.74 (over 1/2 acre requires individual permit)	1	0.55 (over 1/2 acre requires individual permit)	2	0.32 (less than 1/2 acre)
	TES habitat by occurrence	less than 5 occurrences = 3, 5-15 occurrences = 2, Over 15 occurrences = 1	2	14	2	14	2	14
	Acres of right-of-way impacts	15 acres or less = 3, 16 acres to 20 acres = 2, over 20 acres = 1	3	11 (use 15 acres as cut off for 3)	2	18 (use 15 acres as cut off for 3)	3	15 (use 15 acres as cut off for 3)
	Feet of electrical line impacts		3	0	3	0	3	0
	Feet of stream impacts	less than 200 feet = 3, 200 feet - 399 feet = 2, over 400 feet = 1	3	0	3	0	1	405
	Acres of FPPA-regulated farmland	less than 25 acres = 3, 26 acres - 50 acres = 2, over 50 acres = 1	1	84	2	33	2	29
	Number of historic properties		3	0	3	0	3	0
Feet and number of trails	less than 2500 ft = 3, 2500 ft - 4999 ft = 2, over 5,000 ft = 1	1	6400 ft (7 trails)	2	2,743 ft (3 trails)	3	2,050 ft (4 trails)	
			No fatal flaws that would eliminate alternative		No fatal flaws that would eliminate alternative		No fatal flaws that would eliminate altern	

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### *Health-related activities and access*

Alternatives 1, 2, and 3 would all reduce vehicle delay and idling from level of service improvement at intersections. Less delay and less idling leads to less emissions, which contributes to improved air quality. Although none of the alternatives are likely to lead to a significant reduction in vehicle-miles traveled, both Alternatives 1 and 3 provide improved access across S.R. 224 due to the proposed pedestrian tunnel under Ute Boulevard, which could entice people to get out of their vehicles and walk to Kimball Junction land uses. In addition, with Alternative 3, the ability for transit vehicles to potentially bypass Kimball Junction for points south could encourage people to take transit into Park City, which could contribute to fewer vehicle-miles traveled and improved air quality. Alternative 3 offers improved east-west connectivity, which would improve access to the Redstone area and consequently improve access to the University of Utah Redstone health center located in Redstone. All three alternatives would add active transportation, transit, and HOV amenities, which could improve health-related activities and access, though additional policy changes can also improve this.

### Maintain consistency with adopted land use and transportation plans for the Kimball Junction area

An overall goal for the study area was to ensure that the alternatives were consistent with planned land uses and planned transportation projects in the area. Although neither Alternative 1 nor Alternative 4 offer transformative change to the Kimball Junction area, both would add the new proposed pedestrian tunnel under Ute Boulevard, which adheres to the Summit County active transportation plan. In addition, Alternative 4 offers benefits to the proposed new tech center planned west of S.R. 224 via improved ingress and egress at Ute Boulevard and Olympic Parkway due to new dual left-turn lanes and extended left-turn lanes. Alternative 3 also offers benefits to the proposed new tech center via better ingress and egress on Ute Boulevard and Olympic Parkway. In addition, depending on how the trench is covered as part of Alternative 3, a structural cover could be turned into a plaza and provide a reimaged Kimball Junction neighborhood.

### Develop solutions that complement the evolving contest and scale of the community

Cost estimates were developed to ensure that the alternatives were practical and implementable. As shown in Table 13-6, capital costs were generated for each of the alternatives in today's (2021) dollars. Alternative 3 would be the most expensive at about \$116.5 million dollars. Alternative 1 ranges from about \$54 million to about \$74 million, depending on what additional short-term alternative options are added to the alternative. Alternative 4 is estimated to cost just under \$30 million if all of the proposed D Alternative elements are built together. As shown in Table 13-6, the individual D elements that comprise Alternative 4 were broken out since this alternative is proposed as a phased implementation. See Appendix D, Cost Estimates and Assumptions, for data and assumptions used to develop the cost estimates.

Table 13-6. Cost Estimates for Alternatives 1, 2, and 3 in Today's (2021) Dollars

	Construction Cost (Roadway, structures, earthwork, drainage, utilities) with contingencies	Preliminary Engineering (PE) and Construction Engineering (CE)	Right-of-way Costs	Project Total
Alternative 1	\$ 35,006,275	\$ 7,001,255	\$ 12,218,580	\$ 54,226,110
Alt 1 + D-10	\$ 38,436,970	\$ 8,030,464	\$ 13,794,610	\$ 60,262,044
Alt 1 + D-10, D-7	\$ 41,563,542	\$ 14,051,886	\$ 16,563,262	\$ 72,178,690
Alt 1 + D-10, D-7, D-11, D-12	\$ 42,269,110	\$ 14,889,871	\$ 17,189,577	\$ 74,348,558
Alternative 3 + D-10	\$ 78,896,044	\$ 16,122,279	\$ 21,450,280	\$ 116,468,603
Alternative 4 (All D-alts built)	\$ 18,506,730	\$ 3,701,346	\$ 7,638,165	\$ 29,846,241
D-1	\$ 3,652,560	\$ 1,095,768	\$ 75,417	\$ 4,823,745
D-7	\$ 3,126,572	\$ 937,972	\$ 3,507,420	\$ 7,571,964
D-9	\$ 1,465,622	\$ 732,811	\$ 1,488,718	\$ 3,687,151
D-10	\$ 3,430,695	\$ 1,029,209	\$ 1,576,030	\$ 6,035,934
D-11	\$ 1,596,614	\$ 798,307	\$ 495,638	\$ 2,890,559
D-12	\$ 1,653,154	\$ 826,577	\$ 753,761	\$ 3,233,492
D-14	\$ 4,027,161	\$ 1,208,149	\$ -	\$ 5,235,310
D-16	\$ 66,633	\$ 33,317	\$ 258,096	\$ 358,046
D-16A	\$ 107,294	\$ 53,647	\$ 377,233	\$ 538,174
D-1 and D-15 (Constructed together)	\$ 4,211,450	\$ 1,263,435	\$ 658,357	\$ 6,133,242
D-7 and D-11 and D-12 (Constructed together)	\$ 3,832,140	\$ 1,149,642	\$ 4,133,735	\$ 9,115,517
D-11 and D-12 (Constructed together)	\$ 2,031,900	\$ 1,015,950	\$ 1,249,399	\$ 4,297,249

## Consider innovative operational technologies and accommodate maintenance needs

Measures were considered to ensure that snow plowing and snow storage could be accommodated and to assess whether an alternative would include or support future congestion-management strategies. Alternative 3 would likely be the most challenging from a snowplowing and snow storage perspective due to the trench. The cost estimate for this alternative assumes that the trench would be covered, which would help snow and ice from accumulating in the trench, yet snowplowing on either end of the depressed roadway could be challenging. Finally, any of the alternatives can support future congestion-management strategies. Ultimately, such strategies would need to be put in place via policy commitments from the study partners.

## 14 Wildlife Considerations

Humans aren't the only beings that cross S.R. 224. As shown in the Snyderville Basin Wildlife Map in Figure 14-1 below (taken from Summit County's adopted 2015 General Plan), wildlife migration routes and habitat are found in the Area Plan study area. Deer, moose, and elk cross S.R. 224 daily, though data show that most wildlife strikes are south of the study area, closer to St. Mary's Catholic Church and the "white barn." A 2019 report found that S.R. 224 between Kimball Junction and the S.R. 248 intersection is the fifth-most-dangerous spot in Utah for vehicle-wildlife collisions.<sup>1</sup> In response, UDOT reduced the speed limit to 45 miles per hour for this 2-mile stretch of S.R. 224. Data indicate that lower speeds somewhat reduce the number of vehicle-wildlife collisions. However, UDOT and Summit County realize that more needs to be done to prevent vehicle-wildlife collisions on S.R. 224.

As shown in Figure 14-2 below, wildlife strike problem areas in the study area are more frequent on I-80 through the areas of Alternatives 1 and 3. Alternatives 3 and 4 also include a portion of S.R. 224 that has a few recorded mule deer strikes.

In 1975, Utah was the first state in the country to install a wildlife crossing (near Beaver, Utah). Since then, UDOT has installed multiple wildlife crossings, including a recently installed wildlife overpass on I-80 about 6 miles west of Kimball Junction at Parley's Summit—UDOT's largest wildlife overpass to date. In addition, wildlife fencing associated with the Parley's Summit wildlife overpass installed along I-80 will soon be completed to Kimball Junction.

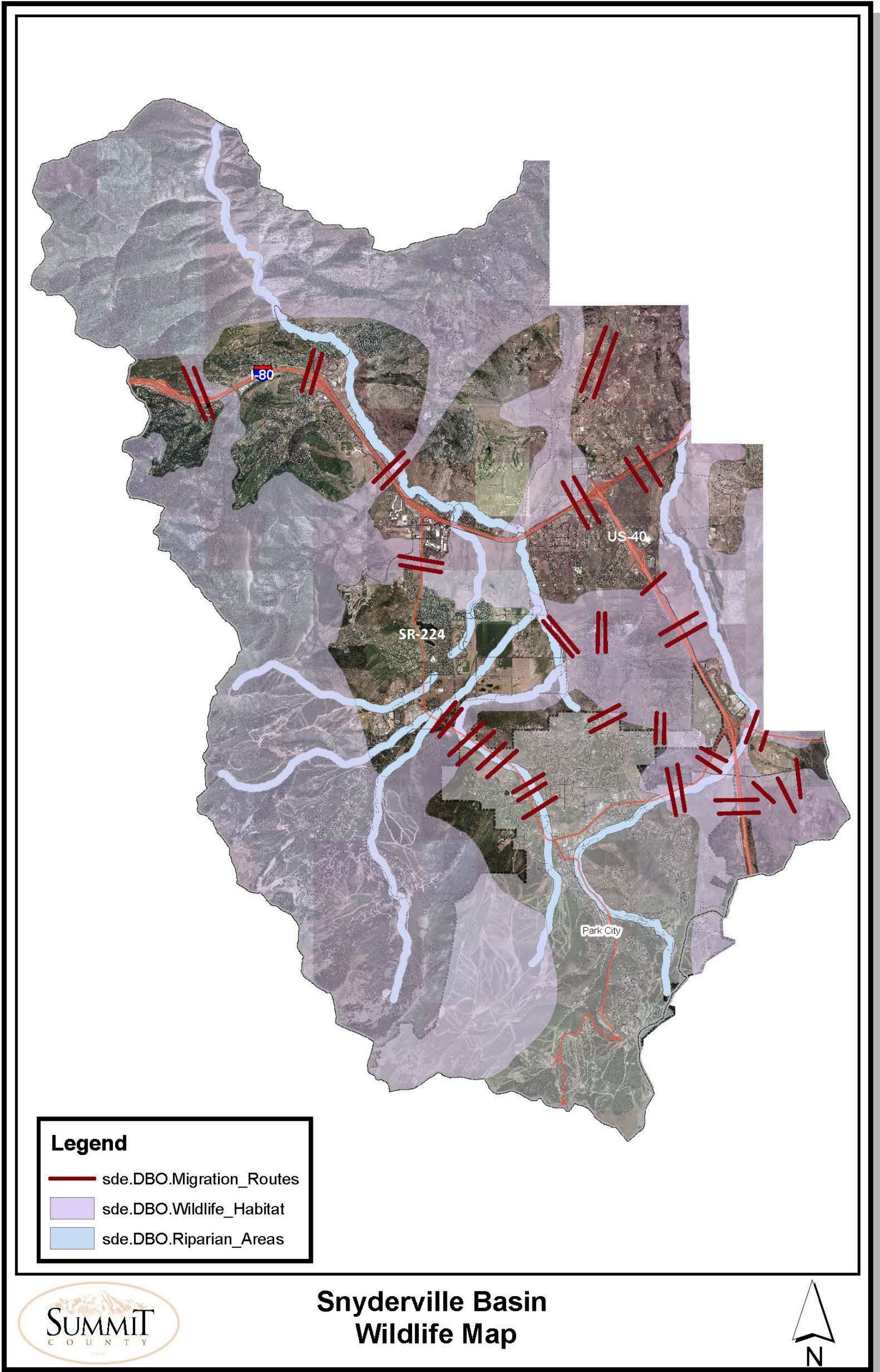
At this level of study, wildlife crossings or prevention features were not designed as part of each alternative, though all of the alternatives developed during this study and recommended for future study could accommodate wildlife crossings or crossing prevention features, such as cattle guards. Cattle guards are an important wildlife mitigation feature that should be considered during the environmental phase of this project. Through this study, UDOT and Summit County were able to detail the location of wildlife strikes in relation to the footprint of alternatives that will be further developed through future study, and the study partners will continue to analyze the need and effectiveness of installing future crossings or prevention features during a future phase of study.

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<sup>1</sup> Patricia Cramer, PhD, Emanuel Vásquez, and Allison Jones, *Identification of Wildlife-vehicle Conflict Priority Hotspots in Utah: Summary Report*, November 2019. Prepared for UDOT Research Division

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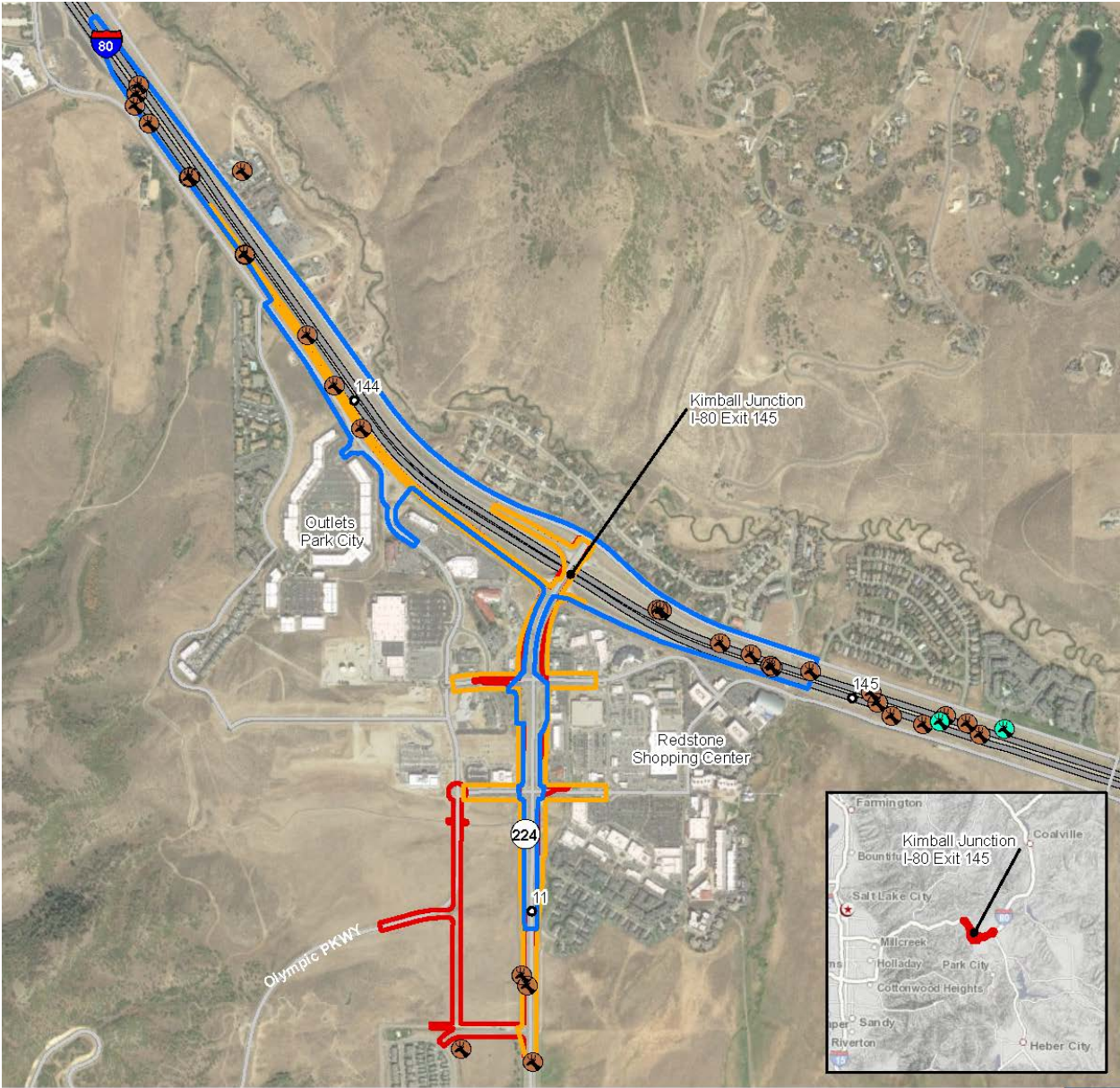
Figure 14-1. Snyderville Basin Wildlife Map



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Figure 14-2. Wildlife Strikes in the Study Area (2018–2019)



Legend

- Mile points
- Elk
- Mule Deer
- Alternative 1 Refined Boundary
- Alternative 3 Refined Boundary
- Alternative 4 Boundary

### KIMBALL JUNCTION

#### AREA PLAN

State Route 224



## 15 Public and Study Partner Coordination and Outreach

The Area Plan approach to transportation decision-making considers environmental, historical, cultural, and feasibility issues early in the planning process. Public engagement gives the community the opportunity to be part of the process and guide the study team to acceptable, informed decisions. Additionally, it provides a more efficient progression of identifying, evaluating, and selecting preferred solutions and improvements that can be implemented successfully into the future.

The public outreach process was structured to ensure that all relevant factors were considered, including the community’s concerns and issues related to the study area’s mobility and connectivity. The study’s guiding themes and goals, as well as identified problems and opportunities, were used to develop potential alternatives and seek public input.

The study focused on the following goals and objectives:

- Create a community vision for improvements based on the social, environmental, economic, health, and natural contexts of the area.
- Build on past studies and adopted plans.
- Gather input on multimodal transportation solutions moving forward to improve overall quality of life for residents and visitors.
- Determine the short-term and long-term transportation priorities for the Kimball Junction area.

Partner and public outreach included six project partner meetings or workshops, updates to the Summit County Council, and two public surveys. The first public meeting and survey covered the Area Plan process, transportation problems, opportunities, and goals in the study area. The comments received generally indicated that traffic congestion is the top issue in the area.

The second public meeting and survey reviewed the Level 1 screening results and asked the public for their feedback on the four alternative bundles moving into Level 2 screening. In addition, ongoing coordination with the study partners and other stakeholders occurred at key milestones during the course of the study.

The following graphic shows the study approach and schedule as communicated to the study stakeholders.



## 15.1 Stakeholders

Meaningful public engagement hinges on gathering input from a wide spectrum of stakeholders and providing equal opportunity to express personal views or concerns. The study team's responsibility is then to balance these views and concerns in order to accurately make informed decisions and transparently communicate how these diverse concerns were considered.

The stakeholder groups for the Kimball Junction Area Plan included the study partners and the study area public.

**Study Partners.** A collaborative, multijurisdictional approach allowed the study team to draw from the collective knowledge and expertise of staff members and elected officials representing the study partners. Meetings with study partners included developing the study's guiding themes and goals and identifying the area's problems and opportunities. Once established, the study partners advanced evaluation criteria, the screening process, detailed alternatives, and final recommendations to UDOT and Summit County upon study completion.

The study partner steering committee consisted of representatives from the following entities:

- Mountainland Association of Governments (MAG)
- Park City
- Summit County
- Utah Department of Transportation (UDOT)
- Wasatch Front Regional Council (WFRC)

A workshop to develop guiding themes and goals and agree on the problems and opportunities in the study area was held with the study partner steering committee. In addition, two workshops at the beginning of each alternatives screening process (that is, Level 1 screening and Level 2 screening) were held with the study partner steering committee. The results of those workshops are described below. The study partners also met several other times at key milestones during the study.

**Study Area Public.** Public engagement efforts targeted local and regional residents, businesses, and commuters that use the Kimball Junction area, which connects to key destinations for recreational, tourism, commercial, and residential purposes. Two public surveys were administered to gather input and data about the state of traffic and mobility in the area as well as to gauge public sentiment toward the most promising alternatives developed for the study area.

## 15.2 Study Partner and Public Participation Process

Several engagement tools were used during the Area Plan process, including multiple study partner steering committee meetings, two study partner screening workshops, and two public surveys prior to Level 1 screening and during Level 2 screening.

### 15.2.1 Study Goals, Problems and Opportunities – Study Partner Participation

In February 2020, a workshop was held with the study partner steering committee to:

- Outline overarching study process goals
- Agree on problems in the study area
- Agree on opportunities in the study area
- Agree on themes and goals for the desired outcome in the study area

It was important to develop these objectives in concert with the study partners since ultimately these objectives would form the basis of the criteria by which alternatives would be screened. See Appendix E, Additional Public and Study Partner Coordination and Outreach Materials, for workshop notes and presentation and the foundation for outlining the Area Plan goals.

## 15.2.2 Study Goals, Problems, and Opportunities – Public Survey #1

As part of the process to develop and refine the study goals, problems, and opportunities, the first public survey was conducted during the spring of 2020. The study team developed a wide-ranging public survey that sought input on the guiding themes and goals as well as identified problems and opportunities that were discussed in the previously mentioned study partner workshop. The study team collected from the public participant-ranked criteria and open-ended comments about the state of traffic and mobility in the Kimball Junction area.

- The first public survey contained the following project information and opportunity for input:
- Study overview
- Study approach and timeline
- Demographics, including travel habits
- Six guiding themes with ranked ideas based on how important each idea was to the survey respondent
- Ranked problems and opportunities
- Request for comments

### Survey Outreach

UDOT and Summit County invited stakeholders to participate in the first public survey through a combination of email, social media, and paid and earned media. The following outreach methods were used:


- 1 *Park Record* display ad with 10,000 paid impressions
- 15 UDOT and Summit County social media posts
- 1 *Park Record* article, "[County in brief: UDOT asks for Kimball Junction input](#)"
- 2 Summit County radio spots on KCPW
- 1 Summit County email blast to key stakeholders in the area

May 4, 2020 | UDOT Facebook Post

**Utah DOT**  
May 4, 2020

Summit County Residents - As you #staysafestayhome, we want to hear from you about getting around Kimball Junction. How easy or hard is it for you to walk, bike or access public transit? Do you feel you get through the area easily by car? Fill out this brief survey to tell us what's important to you.  
<https://kimballjunctionareaplan.com/>

**KIMBALL JUNCTION AND S.R. 224 AREA PLAN**



**Public Survey**

The Utah Department of Transportation (UDOT), in partnership with Summit County, is preparing an Area Plan to develop and evaluate existing and future transportation solutions at the I-80 and S.R. 224 interchange and through the two at-grade traffic signals on S.R. 224 at Ute Boulevard and Olympic Parkway.

The study team wants your input regarding problems in the area and the goals proposed to address those problems.

Access the online survey at:  
<https://kimballjunctionareaplan.com/>

Survey comments will be accepted until May 30, 2020

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May 11, 2020 | Summit County Twitter Post

**Summit County, Utah**  
@SummitCountyUT

How easy or hard is it for you to walk, bike or access public transit in the Kimball Junction area? Do you feel you get through the area easily by car? Fill out this brief survey to tell us what's important to you.  
[kimballjunctionareaplan.com](https://kimballjunctionareaplan.com/) #KimballJunction #SummitCounty

**KIMBALL JUNCTION AND S.R. 224 AREA PLAN**



**Public Survey**

The Utah Department of Transportation (UDOT), in partnership with Summit County, is preparing an Area Plan to develop and evaluate existing and future transportation solutions at the I-80 and S.R. 224 interchange and through the two at-grade traffic signals on S.R. 224 at Ute Boulevard and Olympic Parkway.

The study team wants your input regarding problems in the area and the goals proposed to address those problems.

Access the online survey at:  
<https://kimballjunctionareaplan.com/>

Survey comments will be accepted until May 30, 2020

2:10 PM · May 11, 2020 · Hootsuite Inc.

## County in brief: \$40k ag grants available, libraries implement curbside pickup, UDOT asks for Kimball Junction input

News [FOLLOW NEWS](#) | May 7, 2020

### UDOT seeks Kimball Junction traffic input

Officials from the Utah Department of Transportation and Summit County are asking for community feedback about the traffic situation at Kimball Junction.

The online survey can be found at [kimballjunctionareaplan.com](https://kimballjunctionareaplan.com).

The goal is to create an area plan for the Interstate 80/S.R. 224 interchange that will stretch south to the traffic lights at Ute Boulevard and Olympic Parkway.

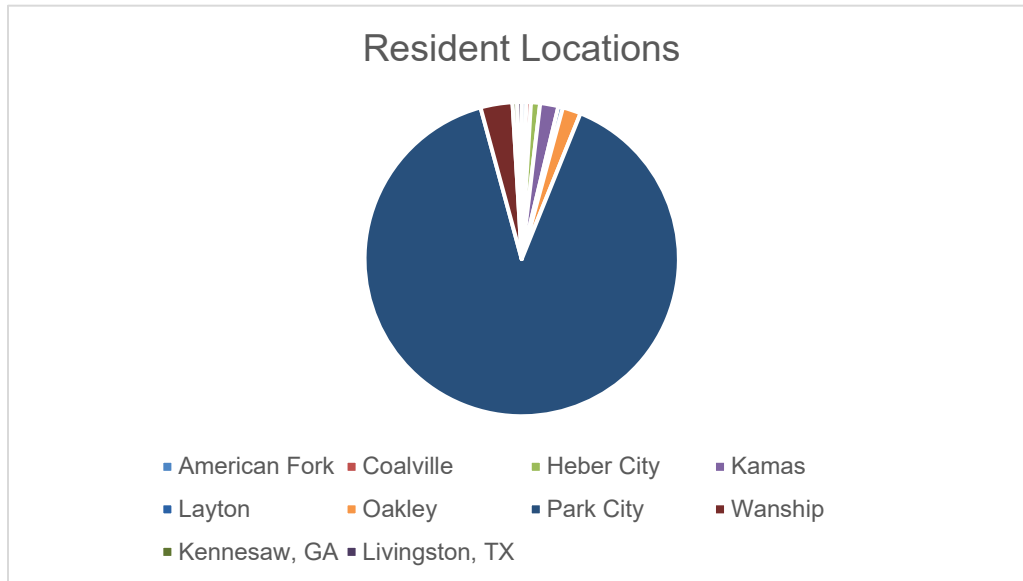
This study will be used to determine what sort of projects should be pursued in the future, though that timing is uncertain.

Officials have indicated the intersection will likely be redone in coming years, but that such a project is currently unfunded. Private matching funds or a successful Olympics bid would likely speed up the project's completion, they have said.

## Survey Statistics

The first public survey was administered for 5 weeks from May 4, 2020, through June 5, 2020, at <https://kimballjunctionareaplan.com>. The survey received 284 responses with 774 unique responses from participants.

Of the 284 responses, 214 responses provided a residential zip code, indicating that 97% of participants reside in Summit County.



The survey participants were asked to review the goals associated with each theme and the possible ways to meet these goals for the Kimball Junction area. Participants then ranked each idea from 0 (least importance) to 5 (most importance) in order to identify how important it is to meet the listed goal.

The six guiding themes are:

- **Theme 1:** Accessibility, connectivity, and land use
- **Theme 2:** Mobility to and from I-80 and S.R. 224 in the Kimball Junction area
- **Theme 3:** Community health and the environment
- **Theme 4:** Consistent with current adopted plans
- **Theme 5:** Accepted by local officials and the public
- **Theme 6:** Maintenance and operations

**Theme 1 Key Takeaways.** Participants prefer that key destinations such as shopping, work, trails and parks, and so on are easily accessible and appropriately blend in with the community. Participants are highly amenable to tunnels and bridges for active transportation purposes but were not in favor of amenities that require additional fees.

**Theme 2 Key Takeaways.** As ranked by participants, vehicle mobility, ramp queuing, and optimized capacity are top priorities for drivers in the area. These were the highest-ranked criteria in the entire survey. Participants are generally open to improved transit options in the area but are not in favor of amenities that require additional fees.

**Theme 3 Key Takeaways.** Participants have a highly favorable view of tunnels and bridges for active transportation and would like an improved user experience for all modes. Any changes to the area should blend in with the community. Participants prefer to access health-related facilities by vehicle.

**Theme 4 Key Takeaways.** Participants are in favor of shared mobility for single-occupancy drivers and public transportation and are generally open to Kimball Junction being the primary transit hub for the region. Active transportation opportunities should connect both existing and emerging land uses.

**Theme 5 Key Takeaways.** Participants are open to improved active transportation options that reduce conflict points with vehicles and are in favor of shared mobility for single-occupancy drivers and public transportation. Overall, participants generally prefer driving to access the area.

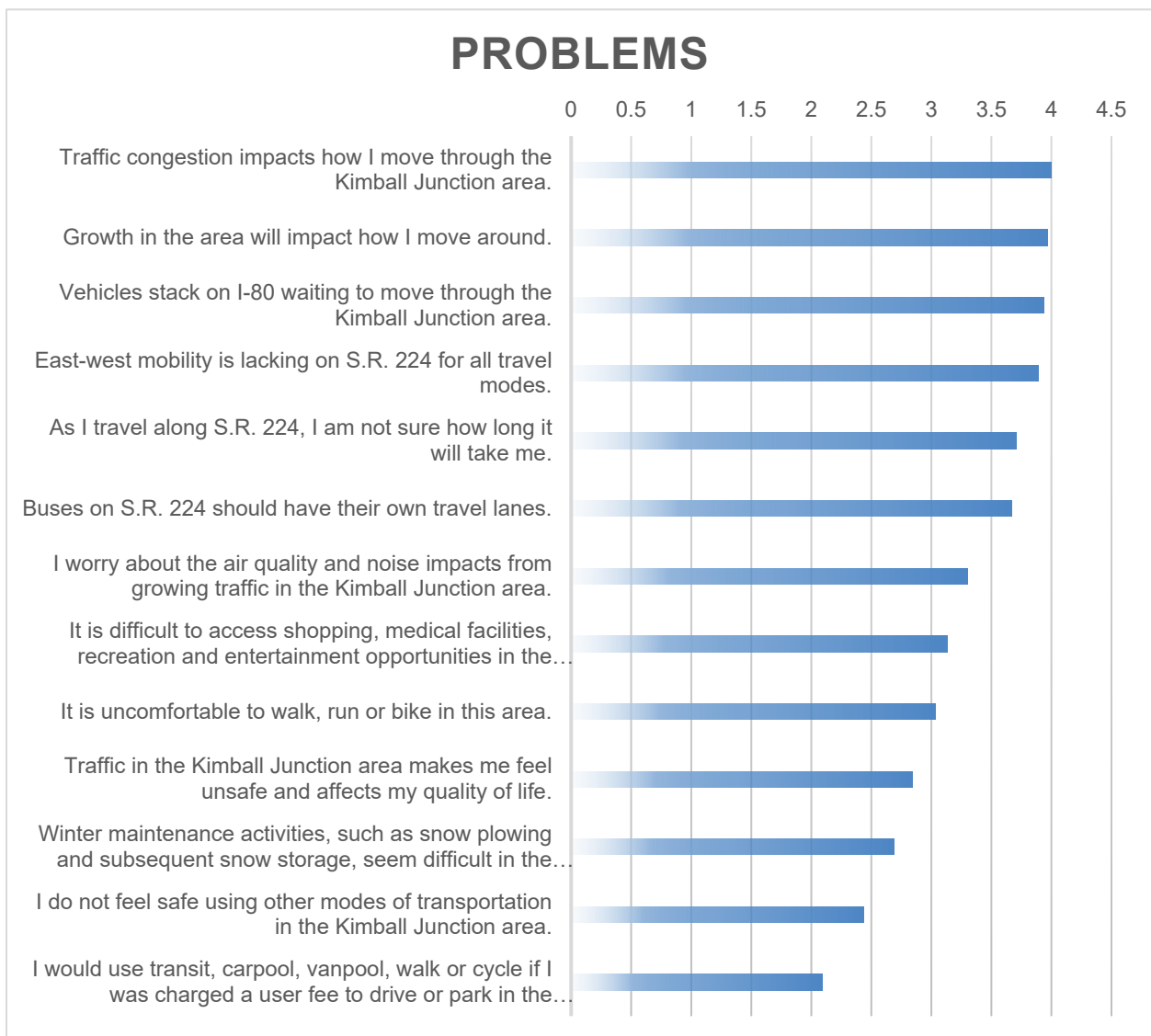
**Theme 6 Key Takeaways.** Participants prefer design options that reduce conflict points with vehicles and are in favor of shared mobility for single-occupancy drivers and public transportation.

Overall, based on their responses, participants prefer increased access for driving personal vehicles and improved traffic flow with synchronized lights and easy freeway access. Participants travel primarily for grocery shopping and errands; because of this, many stakeholders support a tunnel that would bypass Kimball Junction and would not require public transit instead of personal vehicles. Traffic congestion is an issue, and many participants view tourism and seasonal activities as a primary cause of congestion. Bringing tourists and out-of-county visitors from Salt Lake City to Summit County using public transportation seems a more viable option than having tourists and out-of-county visitors driving through the area in their private vehicles. Participants have very little interest in paying for parking or toll lanes.

In addition to the themes and goals, participants were asked to review the identified potential problems and rank each idea from 0 (least importance) to 5 (most importance).

**Potential Problems Key Takeaways.** Participants consider traffic congestion to be the primary problem in the area. They often expressed unease at the growth and development in the area and how it will affect mobility and access. Participants are unsure how long it will take to navigate the area when on personal errands and trips. Winter maintenance and using other modes of transportation rank relatively low as key problems for stakeholders in the area.

Since 97% of survey participants reside in Summit County, many of the responses and trends indicate a strong preference to improve traffic and mobility access in the Kimball Junction area for local residents. Many participants were in favor of improved public transit options for themselves, while many participants indicated a preference for public transit options geared toward tourists and out-of-county visitors. Local residents value the ability to easily navigate the Kimball Junction area for personal trips and view the presence of out-of-county travelers as a contributor to congestion and travel delays.





Additional key findings include the following:

- Participants have a wide array of conflicting opinions regarding both the problems and solutions for the area; however, there is continued support for options that would bypass Kimball Junction and also provide a separate access for Kimball Junction area uses.
- Participants support both increased interchange area capacity and improved transit connections. Most who are opposed to one favor the other.
- The survey found mixed responses for active transportation needs. Many participants maintain that there is no need for continued active transportation facilities; instead, the focus should be on alleviating traffic congestion.
- Local residents want to prioritize travel for local residents.
- Public transportation options should be easy and accessible.
- Participants prefer increased access for driving personal vehicles and improved traffic flow with synchronized lights and easy freeway access.
- Multiple respondents mentioned constructing a tunnel that would bypass Kimball Junction.
- Participants have a low interest in paying for parking, toll roads, or subsidized rideshare.
- Participants are concerned about continued development in the area.

For more information, see the public survey #1 report, appendices, and survey data in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials.

### 15.2.3 Screening Criteria Workshop – Study Partner Participation

The study team and study partners participated in a screening criteria workshop in June 2020. The objectives of the workshop were to update the group about the results of the first public survey regarding the study goals, problems, and opportunities in the study area and then use those results to develop alternative evaluation screening objectives and measures.

The initial screening criteria for both Level 1 and Level 2 screening were developed by the study team directly from the study goals, which form the purpose of the study. The criteria were verified in coordination with the study partner steering committee through a round-table discussion and a Menti exercise that was used to help the study partners see the group's immediate reactions to the proposed Level 1 screening criteria.

For more information, see the results of the Menti exercise in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials.

### 15.2.4 Alternatives Development Workshop – Study Partner Participation

In July 2020, the study team and study partners participated in an alternatives development workshop. The primary purpose of the workshop was to vet and further develop and brainstorm preliminary short-term and long-term alternative ideas for the Kimball Junction interchange area that would:

- Improve capacity and vehicle mobility to/from I-80 and to/from S.R. 224
- Maintain or improve multimodal options
- Support operation and reliability of future BRT on S.R. 224

Initial concepts were developed by the study team for both the I-80 interchange and S.R. 224. The study partner steering committee discussed and brainstormed new concepts or modified the initial concepts. From that meeting, a *Definition of Alternatives Report* was developed, and the study partners were asked to review the report before the study team started to screen alternatives. For more information, see the alternatives definitions and screening tech memo in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials.

### 15.2.5 Level 1 Screening Workshop – Study Partner Participation

In October 2020, the study team and study partners participated in a Level 1 screening workshop. Level 1 screening criteria were developed during the June 2020 screening criteria workshop. Prior to the October workshop, the study team conducted the Level 1A, or fatal-flaw, screening. For more information, see the Level 1A (fatal-flaw) screening evaluation results memo in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials.

This screening evaluation was presented to the study partner steering committee for discussion. Then, through round-table discussion and a Menti exercise, the study partner steering committee performed Level 1B screening, Problems and Opportunities screening. Because the Menti exercise allowed participants to see the group's immediate reactions, the study team and study partners were able to agree on alternatives that would move into Level 2 screening. For more information, see the Menti exercise results in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials.

### 15.2.6 Level 2 Screening – Public Participation Public Survey #2

As part of the Level 2 screening process, a second public survey was conducted during the winter of 2020. The second public survey asked participants to evaluate the four potential alternatives for the Kimball Junction area that made it through Level 1 screening into Level 2 screening.



## Survey Outreach

UDOT and Summit County invited stakeholders to participate in the second public survey through a combination of email, social media, and paid and earned media. The following outreach methods were used:

- 1 *Park Record* display ad with 10,000 paid impressions
- 13 UDOT and Summit County social media posts
- 1 *Park Record* article, [“Summit County is weighing Kimball Junction traffic solutions”](#)
- 2 KCPW posts, [“Summit Council considers traffic relief for Kimball Junction while public gives input”](#) and [“Kimball Junction survey deadline extended”](#)
- 1 Summit County email blast to key stakeholders in the area

Jan. 15, 2021 | UDOT Twitter Post

**Utah DOT** @UtahDOT

Summit County, we want your input! Last May, we asked about your experience getting around Kimball Junction and we used that feedback to design potential solutions for the area.

Take a look at what we've developed and let us know what you think: [kimballjunctionareaplan.com](http://kimballjunctionareaplan.com)

3:00 PM · Jan 15, 2021 · Twitter Web App

Jan. 22, 2021 | Summit County Twitter Post

**Summit County, Utah** @SummitCountyUT

Have you responded to the latest #KimballJunction survey? Last May we asked for your input about navigating Kimball Junction and used your feedback to design potential solutions in the area. Take a look at what we've developed. Let us know what you think. [kimballjunctionareaplan.com](http://kimballjunctionareaplan.com)

**KIMBALL JUNCTION AND S.R. 224 AREA PLAN**

**Public Survey**

The Utah Department of Transportation (UDOT), in partnership with Summit County, is preparing an Area Plan to develop and evaluate existing and future transportation solutions at the I-80 and S.R. 224 interchange and through the two at-grade traffic signals on S.R. 224 at Ute Boulevard and Olympic Parkway.

The study team wants your input about potential transportation improvement options in the Kimball Junction area.

Access the online survey at: <https://kimballjunctionareaplan.com/>

Survey comments will be accepted until Feb. 12, 2021

9:10 AM · Jan 22, 2021 · Hootsuite Inc.

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## Summit Council Considers Traffic Relief for Kimball Junction While Public Gives Input

By RICK BROUGH • FEB 4, 2021

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CREDIT SUMMIT COUNTY

The Summit County Council Wednesday reviewed four options for relieving congestion at Kimball Junction.

Council Members were not charged with making a recommendation, but they favored most the plan that would elevate the two cross streets

intersecting Highway 224.

Rick Brough reports their least favorite featured a route that would encroach on an open-space conservation easement at the Hi-Ute Ranch.

The Council's sentiments about the four options in UDOT's study mirror what the public has indicated so far in a survey conducted by the state. County Transportation Manager Caroline Rodriguez said the survey is still taking responses until Friday, Feb. 12th.

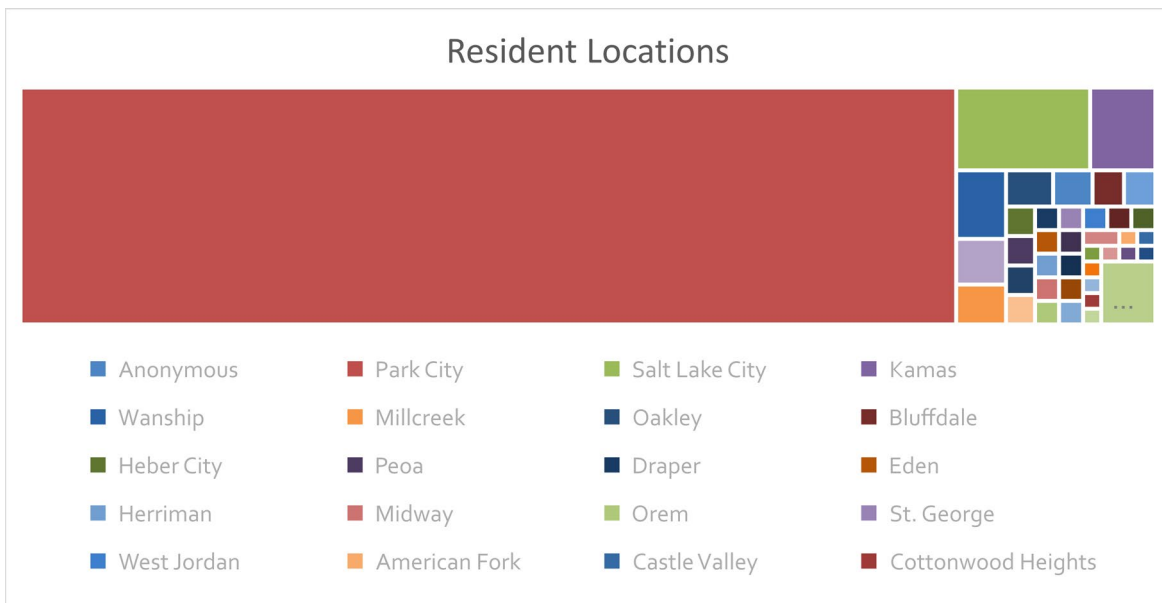
She said the survey has had nearly 570 responses. By far, the least preferred in the survey is Alternative Two, affecting Hi-Ute, which only 7% of respondents favored.

The most preferred, by 54%, is Alternative Three, the elevated crossings of Ute

## Survey Statistics

The second public survey was administered for 4 weeks from January 13, 2021, to February 12, 2021, at <https://kimballjunctionareaplan.com>. The second survey asked participants to evaluate four potential alternatives in the Kimball Junction area. It received 1,012 responses with 2,340 unique comments from participants.

About 947 of the 1,012 responses provided a residential zip code, indicating that 87% of participants reside in Summit County.

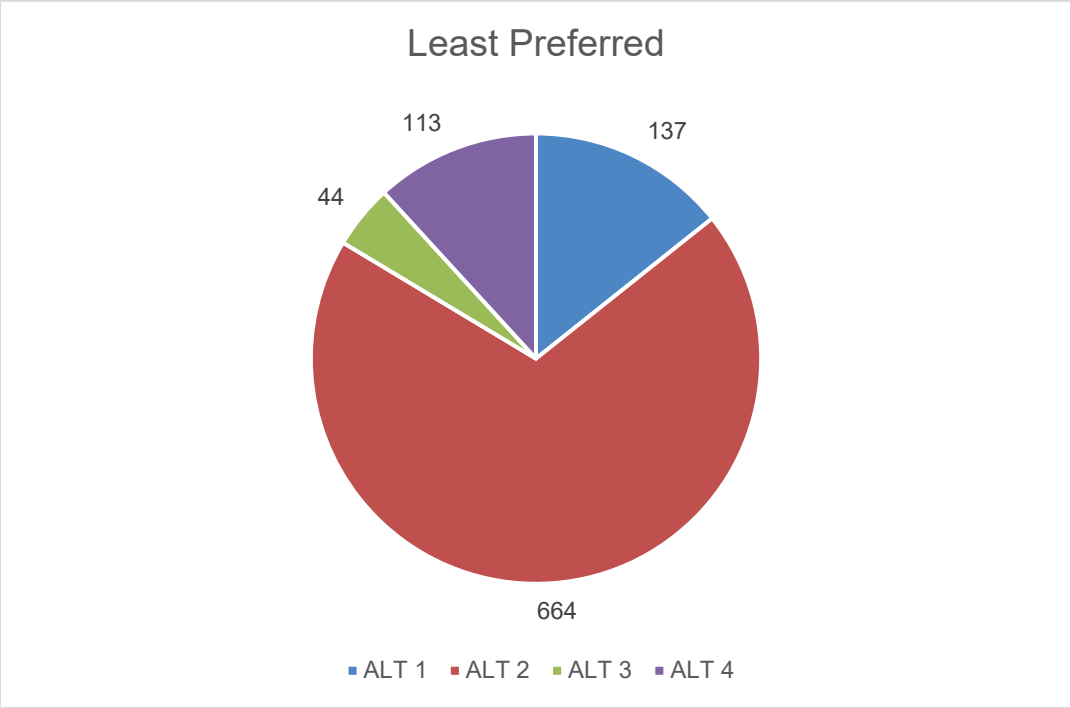
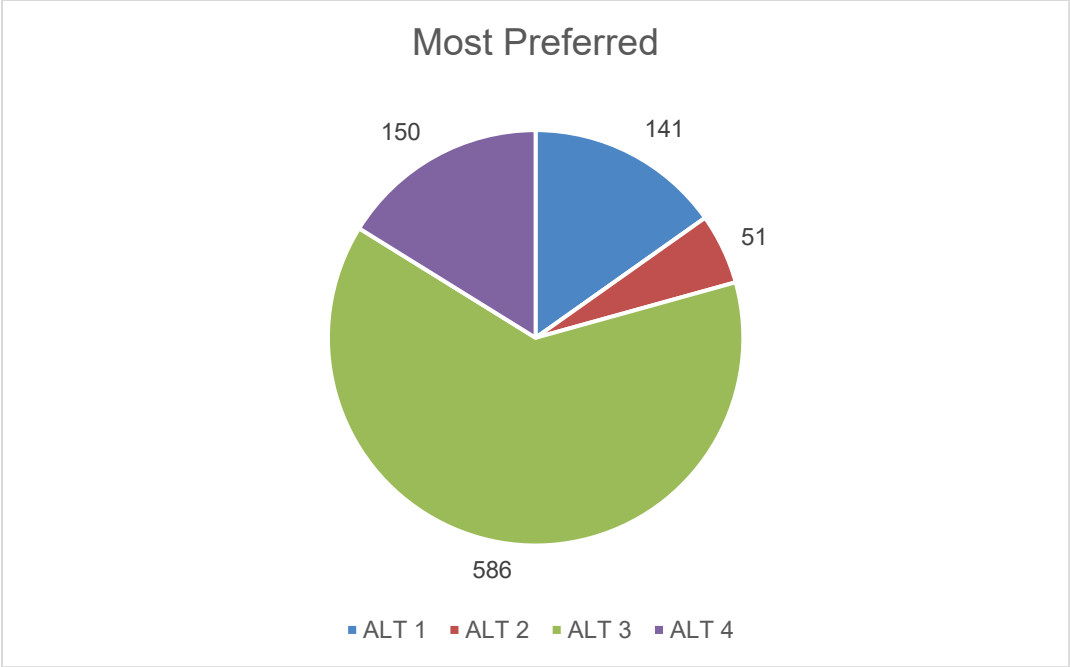


Based on the problems and opportunities in the study area and public comments received during the first public survey, the study team developed more than 30 short-term and long-term capacity improvements and multimodal modal transportation solutions. Four alternative “bundles” passed the Level 1 screening conducted by the study team and study partners. Community input was solicited on the four remaining solutions. Each alternative provided the following information:

- Alternative description
- Benefits
- Implementation phasing or limitations

The survey participants were asked to review the four alternatives and assess how suitable they felt each alternative was for the Kimball Junction area on a scale of 1 (poor) to 5 (excellent). In addition, participants were asked to rank each alternative according to the following criteria, which were developed based on the six guiding themes of the study:

- Improve commute
- Reduce automobile congestion in Kimball Junction
- Improve access to Kimball Junction businesses and health resources
- Improve multimodal transportation opportunities
- Promote safer walking and cycling in Kimball Junction
- Create viable travel alternatives
- Improve environmental sustainability and community health
- Fit the character and scale of the community



**Alternative 1 Key Takeaways.** Participants had a mixed reaction to Alternative 1. Participants generally commented that the traffic configuration is complicated, and they expect it will be difficult to navigate. Participants said that this alternative would improve ingress and egress at Kimball Junction but might not reduce congestion or improve mobility and access. Participants supported a pedestrian tunnel but doubted that Alternative 1 would reduce traffic congestion.

**Alternative 2 Key Takeaways.** This alternative received the lowest overall rating among the four alternatives; participants almost universally rejected any future projects that would go through the

conservation easement. Participants were concerned about potential safety risks near the middle school and reduced recreation options due to replacing trails as a result of adding an HOV lane. Many participants thought Alternative 2 would not reduce congestion or traffic buildups and that an HOV lane would take up more space than warranted.

**Alternative 3 Key Takeaways.** This alternative received the highest overall rating among the four alternatives; participants generally thought that this alternative would have the least impacts while providing the greatest overall benefit. Participants were receptive to the tunnel/trench concept under S.R. 224 but were concerned that this alternative would take away from the character of the community. However, multiple responses stated that the community and its demands are growing.

**Alternative 4 Key Takeaways.** This alternative received the second-lowest overall ranking among all four alternatives. Participants were hesitant to drag out construction over several years if it would not offer a long-term solution. Many participants thought that, ultimately, Alternative 4 would not solve the overall problems of reducing congestion and increasing mobility in the Kimball Junction area.

For more information, see the public survey #2 results and comment appendix in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials.

### 15.2.7 Summit County Council Outreach

The study team provided periodic updates to the Summit County council in the form of information packets at key milestones. The study team presented an overview of the entire study process as well as an overview of the four alternatives that would be evaluated in Level 2 screening in January 2021 at a council work session (for more information, see the full presentation in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials). Shortly after the presentation, the council drafted a letter to UDOT (also included in Appendix E) voicing support for Alternatives 3 and 4.

### 15.2.8 Overall Public Participation Conclusions

Overall, the community is highly engaged and passionate about future development of the Kimball Junction area and how development affects their ability to perform daily activities such as running errands or attending doctor's appointments as well as passionate about preserving the culture of the community. Local outreach platforms such as the *Park Record* and KCPW are key tools to connect with stakeholders since most residents and businesses regularly engage with these media.

Through the course of the public outreach process, more than 3,000 comments were received, mostly through the two public surveys. Additional comments outside the surveys were received from a few study area stakeholders including Dakota Pacific Real Estate, the owner of the former "Park City Tech Center" on the west side of S.R. 224 between Ute Boulevard and Olympic Parkway. These additional comments are included in Appendix E, Additional Public and Study Partner Coordination and Outreach Materials.

The vast majority of respondents said that traffic congestion is the chief concern that they want addressed. The public helped the study team and study partners develop goals for the study area and verified problems and opportunities.

Alternative 3 was overwhelmingly supported by participants during the Level 2 screening process with many stating that this is their preferred option that will move traffic most efficiently while still preserving the aesthetic value of the area.



## 16 Study Recommendations

Based on the results of the alternatives development and evaluation process, the study team recommends that all three alternatives be carried forward into future phases of study, namely UDOT's state environmental study process or the NEPA process.

**Alternative 1.** As shown in Figure 13-1 to Figure 13-4 above, Alternative 1 was simplified based on traffic information resulting from the Level 1A (travel demand model) screening. The resulting alternative is a split-diamond interchange. Ramps to and from the west connect to the new bridge. Ramps to and from the east connect to S.R. 224. One-way frontage roads serve traffic in between. Removing the extra ramps eliminates the closely spaced entry and exit gores. Alternative 1 is less complicated as a split-diamond concept. This configuration is simpler than what was initially provided to the stakeholders and public (since the travel demand modeling was part of Level 2 screening that occurred simultaneously with the public survey #2). Many comments pertaining to Alternative 1 stated that the alternative is too complicated and would not solve traffic problems. Given that the alternative has been simplified, coupled with traffic screening results showing that traffic would indeed improve with the alternative and the lower cost (\$54.2 million to \$74.4 million, depending on which, if any, of the D alternatives are added to the overall alternative package) of Alternative 1 compared to Alternative 3, the study team recommends this alternative be further refined and studied in a future phase.

**Alternative 3.** As described in Section 15, Public and Study Partner Coordination and Outreach, Alternative 3 is the preferred alternative of both the Summit County Council and the public at large as they see this as being the most transformative of all alternatives for both traffic in the study area as well as for the Kimball Junction area. Although this alternative is the most expensive of the three alternatives that were studied, the study team recommends that this alternative be further refined and studied in a future project phase. It's important to note that \$20 million of the estimated \$116.5 million construction cost is for covering the trench between Ute Boulevard and Olympic Parkway so that snow wouldn't build up in the depressed roadway. During a future phase of study, modifications to this trench cover should be considered. The opportunity for a more robust structural cover to act also as a pedestrian promenade and as an opportunity to enhance active transportation access between the east and west sides of S.R. 224 should be further explored. Conversely, a wider roadway footprint that could accommodate snow storage without the need for a trench cover could also be studied. However, with a wider footprint, the walls would need to be farther apart, which would increase right-of-way impacts and costs. In addition, the traffic signals at Ute Boulevard and Olympic Parkway would also be farther apart, since the signals are located on the frontage roads on either side of the trench. If extra width were added to the trench, the frontage roads and signals would also need to be moved farther to each side. Once the signals become too far apart, they stop functioning optimally.

**Alternative 4.** Alternative 4 is recommended for future study since many elements of this alternative could be implemented more quickly than either Alternatives 1 or 3 and because, in its entirety, the alternative would improve the current and forecasted future traffic problems. At \$29.8 million for all alternative elements, Alternative 4 is also the least expensive of the alternatives. When evaluating this alternative from a traffic perspective, the study team took an approach to first implement the D-series treatments that gave the "best bang for their buck." The study team found that traffic functioned at a satisfactory level with including only D-7 (dual left turns), D-10 (pedestrian tunnel at Ute Boulevard), and D-11 and D-12 (northbound and southbound lane widening on S.R. 224 between Ute Boulevard and Olympic Parkway). Note that the study team did not include D-14 (a new connection and possible traffic signal at Bear Cub Drive) in the traffic analysis of Alternative 4. However, D-14 was part of

Alternative 2 in the Level 2A travel demand modeling effort. In that analysis, the D-14 roadway extension carried about 4,000 vehicles per day. For context, that's less than a 10% reduction for S.R. 224. Therefore, D-14 doesn't appear to be a treatment that significantly reduces congestion. Moreover, D-14 didn't have overwhelming public support during the second public survey.

## 17 Additional Next Steps

Future design activities should continue to incorporate partner and public engagement to ensure that the next phases of project development consider all community concerns while offering stakeholders an opportunity to shape the look and feel of the Kimball Junction area. Additional environmental investigation is anticipated during future study phases and could require mitigation.

### 17.1 Outstanding Issues for Future Consideration

During the 2021 general session, the Utah legislature passed House Bill 433, *Amendments Related to Infrastructure Funding*, which allocates money for a Kimball Junction Environmental Impact Statement (EIS). However, the most pressing issue for the Kimball Junction area is the study partners' ability to secure funding for the identified improvements so that the capacity of roads in the study area can keep pace with the future travel demands. Other issues or ideas that would need to be studied in future phases of project development include:

- The continued development of the proposed tech center area, including the timing, density, land use mix, number of trips that are generated, and ingress and egress connections to transportation improvements in the study area, will be analyzed more closely during the more in-depth NEPA process.
- The applicability of using emerging technologies to alleviate congestion on S.R. 224 will be considered during the next phase of study.
- The number of property acquisitions resulting from the need for additional right-of-way required for transportation improvements was obtained from the Summit County geographic information systems (GIS) parcel data map viewer. An aerial survey that more accurately captures the existing right-of-way will be conducted during UDOT's state environmental study process or the NEPA process.
- Impacts to environmental resources such as noise will be studied during UDOT's state environmental study process or the NEPA process.
- Roundabouts to the east and west of Ute Boulevard and Olympic Parkway should be included in the traffic model in any future analysis.
- Although travel time was one of the screening criteria in this Area Planning process, future study should focus on comparing traffic among alternatives similarly. Travel time is "apples to apples," while level of service is not, since it excludes the free-flow movements in the grade-separated interchange.
- During Level 2B traffic screening, the study team made minor lane alignment changes to the traffic models to improve operations. The following changes are not included in the current alternative drawings but should be considered in a future phase of study. Note that some of these changes would likely add some extra pavement and cause additional right-of-way impacts.
  - Alternative 1:
    - Add a westbound left-turn lane at the west half interchange.
    - Add an eastbound right-turn lane at the west half interchange.
    - Currently, this alternative includes the D-11 and D-12 northbound and southbound widening on S.R. 224. Traffic modeling indicates that this is not necessary.

- Alternative 3:
  - Use one free-flow eastbound right-turn lane and two signal-controlled eastbound turn lanes at the I-80 interchange instead of two free-flow right-turn lanes and one signal-controlled eastbound right turn lane, since both signal-controlled right-turn lanes can access the S.R. 224 tunnel.
  - Align the northbound S.R. 224 frontage road lanes approaching the I-80 interchange so that the right lane is a right-turn-only lane onto I-80 eastbound and the left lane splits into the left-turn lane and the through lane at the interchange.
  - Provide dual southbound left-turn lanes at the Ute Boulevard intersection instead of a shared through/left-turn lane.
  - Provide northbound left-turn and right-turn lanes at the Ute Boulevard intersection instead of shared through/right-turn lane and shared through/left-turn lane.
  - Provide a southbound left-turn lane at the Olympic Boulevard intersection instead of a shared through/left-turn lane.
  - Provide northbound right-turn lanes at the Olympic Boulevard intersection instead of a shared through/right-turn lane.
- Alternative 4:
  - The study team took an approach to first implement the D-series treatments that gave the best “bang for the buck.” In doing so, the study team found that traffic functioned at a satisfactory level with including only D-7 (dual left turns), D-10 (pedestrian tunnel at Ute Boulevard), and D-11 and D-12 (northbound and southbound lane widening on S.R. 224 between Ute Boulevard and Olympic Parkway). During the next phase of study, UDOT should further test which improvements provide the greatest benefit.
  - Keep the I-80 configuration consistent with existing conditions instead of adding lanes (do not include D-1 turn lane additions).
  - Add separate northbound and southbound right-turn lanes at the Ute Boulevard intersection instead of using shared through/right-turn lanes.
  - Add a separate northbound right-turn lane at the Olympic Boulevard intersection instead of using a shared through/right-turn lane.
- Based on partner and public input given during the Level 2 screening process, the study team recommends that the following additional alternative element modifications be studied during the next phase of study:
  - Alternative 3:
    - Consider roundabouts rather than lights for the east-west connections at Ute Boulevard and Olympic Parkway and consider how the roundabouts work with pedestrians and bicycles.
    - Consider a flyover from S.R. 224 to westbound I-80.
    - Create a right-turn-only lane from I-80 eastbound that goes near the McDonald’s and connects directly to the Walmart area.

- Consider a one-way ring route that is raised over S.R. 224 around the four existing roundabouts (basically turn the four roundabouts into one giant roundabout). Ute Boulevard and Olympic Parkway would be over S.R. 224, and the big ring road would allow right turns only. This concept removes the frontage roads between Ute Boulevard and Olympic Parkway.
- Alternative 4:
  - Look at the I-80 parking area near the park-and-ride lot and provide a gap in the fence to access the transit system. UDOT will coordinate with FHWA about its viability.

## 17.2 Future Studies

This study provides the framework for the long-term implementation of improvements in the Kimball Junction area. Additional study, consistent with either UDOT's state environmental process or with NEPA, is necessary before improvements can be implemented. In either case, the next study will move forward using the information and recommendations from the recently completed study.

Separate project phases for elements of Alternative 4 and future elements of either Alternatives 1 or 3 might be implemented as funding is identified. Next steps include:

- During the 2021 general session, the Utah legislature passed House Bill 433, *Amendments Related to Infrastructure Funding*, which allocates money for a Kimball Junction Environmental Impact Statement (EIS). UDOT's state environmental study process or the NEPA process will be started in late 2021.
- Obtain an aerial survey for the study area.
- Further develop the three alternatives recommended for additional study and advance from conceptual to preliminary design.
- Complete environmental analysis of phased Alternative 4 project elements as well as either Alternative 1 or Alternative 3. Note that new alternatives could also arise during the environmental process.
- Complete final design.
- Obtain rights-of-way.
- Complete construction.

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