SR-224 Corridor Study

Park City, Utah

Final Report
August 2012

Fehr & Peers DESIGNWORKSHOP Horrocks Engineers

CONTENTS


EAST
NORTH
248
224

1

Introduction

Context

SR-224 is the major north-south route that connects the heart of the Park City community including Main Street, Deer Valley Resort and Park City Mountain Resort with the Canyons Ski Resort, Kimball Junction, Interstate 80, and the Salt Lake Valley (See Context Map *Figure 1*). It is a state-owned facility that serves as the key artery into Old Town Park City and two of the major economic drivers in the region: Park City Mountain Resort and Deer Valley. SR-224 is also a key corridor in one of the potentially largest re-use projects in Park City, Bonanza Park. This corridor is also the single busiest route for Park City Transit.

The character of SR-224 changes considerably at the intersection with Kearns Blvd., where businesses front onto the street with little setback, the shoulders become minimal and the pedestrian / bicycle infrastructure is inadequate. While there are sidewalks on both sides, there is no buffer or park strip to protect the pedestrian from the more than 20,000 cars and trucks that travel the corridor on a daily basis.

Study Background

Over the last few years, members of the community have identified this route as a key corridor within Park City to be improved. Based upon input from the broader community, Park City initiated this corridor plan study by selecting a team of consultants to examine SR-224 and create a vibrant and sustainable corridor that provides efficient vehicular access north-south within the community linking residential, business, & civic areas; while providing an improved environment for pedestrians, bicyclists, transit users, and the businesses and residences along SR-224.

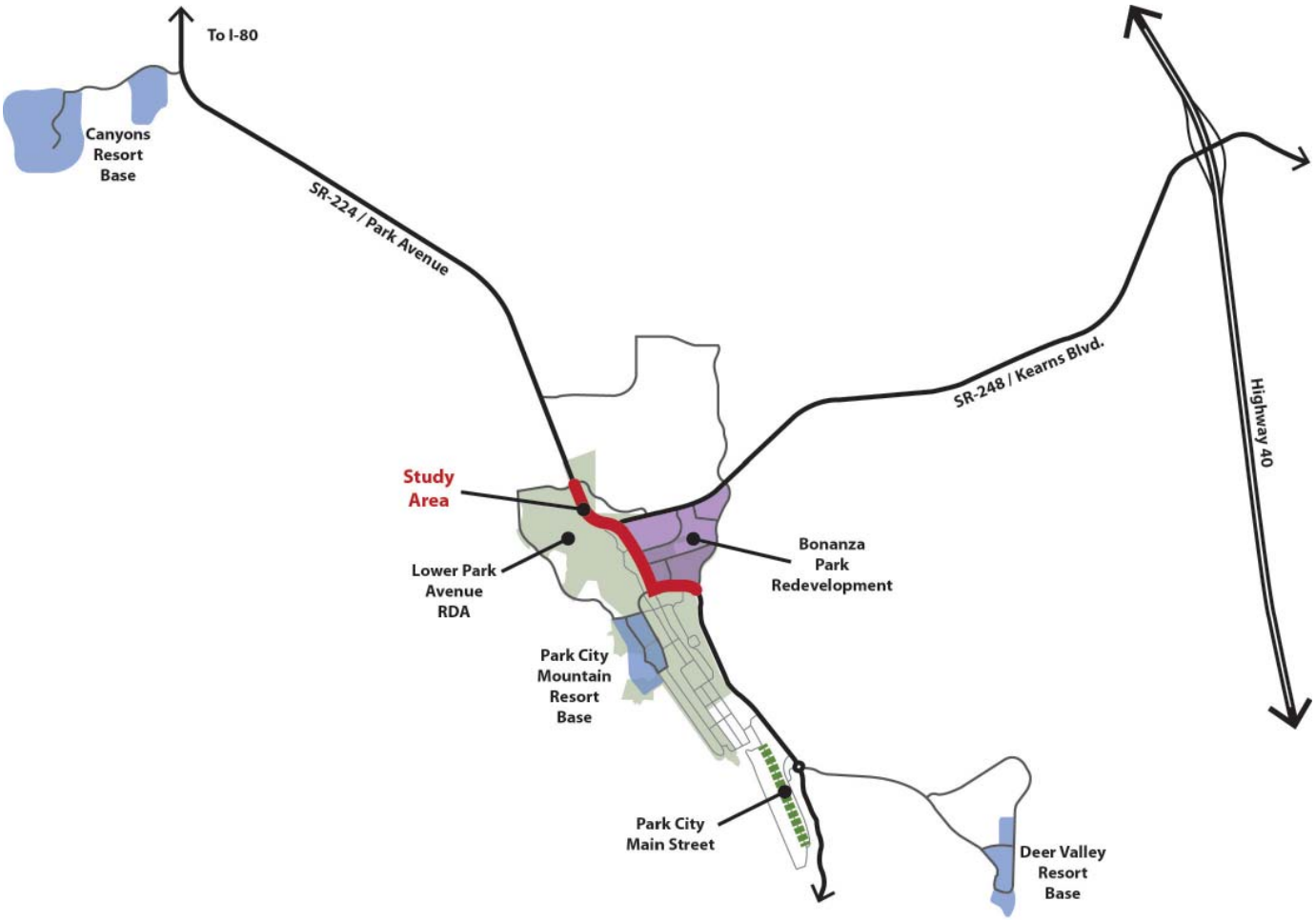

Figure 1. Context Map

The multi-disciplinary planning team that Park City selected is composed of Fehr & Peers (Prime Consultant and Transportation Planners), Design Workshop (Planners, Urban Designers and Landscape Architects) and Horrocks Engineers (Civil Engineering). This team worked to create the SR 224 Corridor Plan.

The study area as illustrated in *Figure 2*, is along SR-224 from the Thaynes Canyon Drive intersection to the Bonanza Drive intersection, and includes portions of Park Avenue and Deer Valley Drive.

The SR-224 Corridor Plan examines how to plan for all modes of travel along the corridor (vehicular, transit, pedestrian, and bicycle) in terms of both short term and long term recommendations.

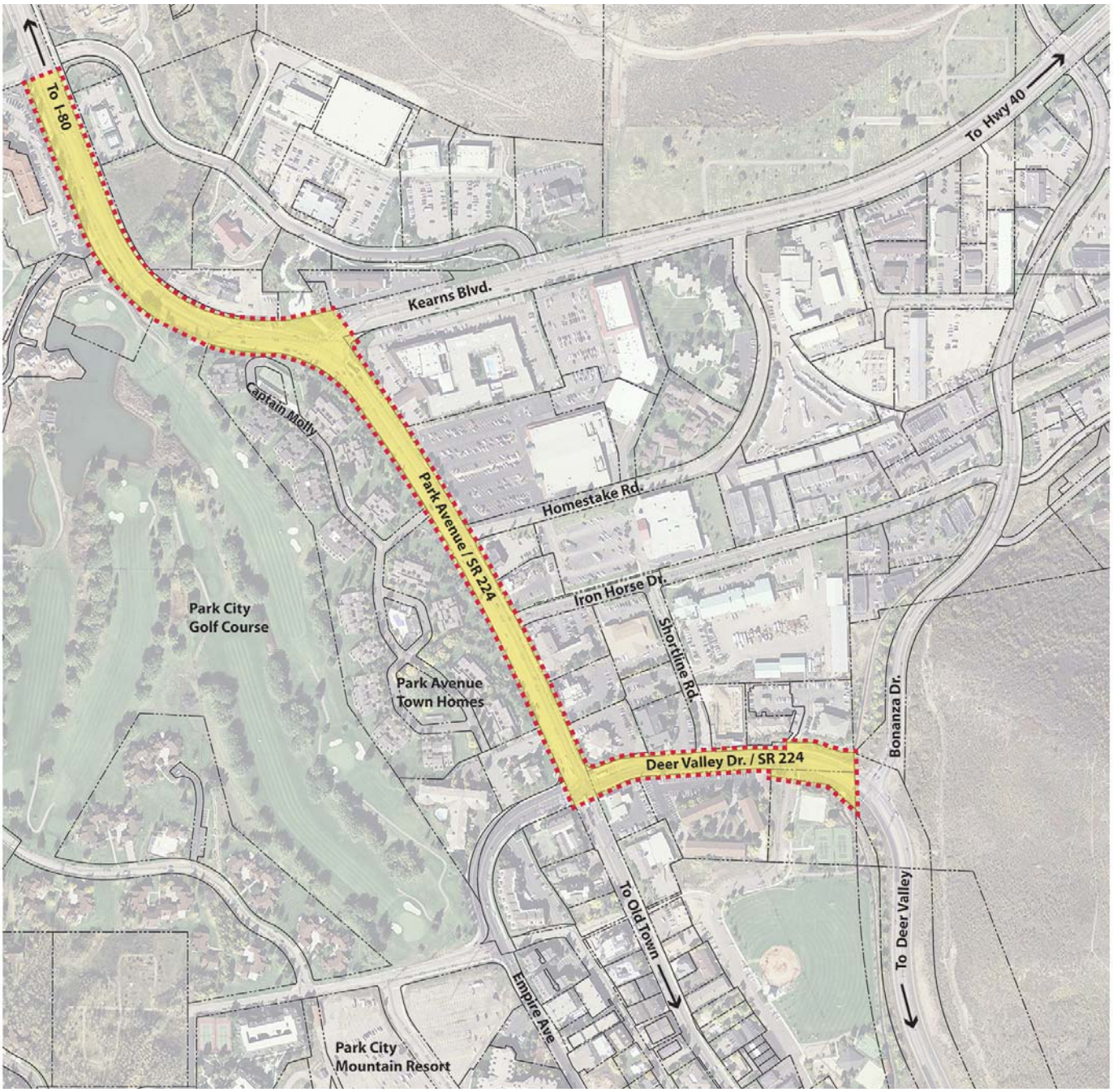

Figure 2. Study Area

The study also examines how to provide for bicycle and pedestrian facilities (such as sidewalks or bike paths), how to provide access and facilities for transit users, and how to provide efficient access for businesses along SR-224.

Study Process

The process that the study team used for developing the corridor plan consisted of the following steps:

1. Data gathering
2. Existing Conditions summary
3. Public Engagement
    a. One-on-one meeting
    b. Stakeholder workshops
    c. A public Open House
    d. On-line survey
4. Analysis
5. Recommendations
6. Phasing
7. Cost Estimates
8. Funding Options

Each of these steps are described in more detail in the subsequent sections. The SR-224 Corridor Plan is designed to provide a clear path for improvements to all users of the corridor, including drivers, transit users, cyclists and pedestrians. These improvements will also benefit the adjacent property owners and businesses that rely on the vitality of the corridor.

Study Breadth & Depth

The planning team developed and evaluated a variety of potential changes or improvements to the street itself as well as a variety of streetscape elements (including items such as berming, landscaping signage, wayfinding and trail alignments).

The plan supports how the SR 224 corridor can aid economic growth and redevelopment in this portion of Park City and how this primary gateway to Park City's Main Street can be improved for the community.

The plan includes short term, mid range and long term improvement projects that can be used for further study, be included in the Park City General Plan and be discussed with business owners and UDOT representatives.

The plan is also a guide for decision-makers, now and in the future, who will likely be confronted with issues to address on this corridor. There is an increasing multi-modal volume on the corridor with a fully built out right-of-way leaving a corridor envelope that has no room to grow. Future decision makers will need to make some difficult decisions regarding how the corridor should accommodate the future growth. This study looks beyond the low hanging fruit and identifies potential options for addressing challenges on the corridor and gives some early insight on what may need to be accomplished over the long term to address Bonanza Park and general development growth in the City. There will likely be impacts that affect a few property owners but will ultimately benefit many.

Park City passed a $15 million bond in November 2007 targeted towards walkability improvements. Called the "Walkable Community and Trails" bond (WALC), the program targets projects from a 2006 study as well as projects yet to be identified. The walkability study focused a lot of their efforts in the SR-224 Study area due to the disconnected nature of the non-motorized network in that area. There is significant community support for better non-motorized improvements in the SR-224 study area. In fact, this area ranked highest in community support for improvement funding. The projects identified in this study help complete Park City's non-motorized network and will provide a much better bicycle and pedestrian environment.


EAST
248

2

Existing Conditions

Traffic

Summary

SR-224 is one of only two “Gateway Corridors” that serve travel to and from Park City and is the main arterial into Park City from I-80. This road services Deer Valley Resort, Park City Mountain Resort as well as Historic Main Street in Park City. This stretch of road has been identified in the 2011 Park City Master Transportation Plan as high priority for future transportation investment. Multi-modal transportation is essential to Park City as it accommodates growing visitation, population and expectations from residents for more transportation options. Park City hopes to avoid traffic problems along the gateway corridor that may be in conflict with the quality of life that Park City residents and tourists alike enjoy by increasing connectivity and trails to encourage non-motorized travel along the corridor. The city also hopes that transportation enhancements along SR-224 will ensure that travel will not inhibit economic development opportunities.

Traffic Analysis

The traffic analysis performed for the SR-224 corridor study includes:

- Data Collection
- Methodology and Assumptions
- Access Inventory
- Operational Analysis

Data Collection

For the traffic analysis, the following data was collected:

- Peak hour counts from previous studies on the corridor including pedestrians. The traffic volumes used for this corridor study analysis were collected during peak PM hours between December 27 and December 28, 2010.

- An access inventory was performed detailing the frequency and location of each access within the study area.

- An Operational Safety Report (OSR) was requested from UDOT’s traffic and safety group.

- Video of the closed circuit TV (CCTV) camera located on the corner of Kearns and Park Avenue was collected from UDOT Traffic Operations Center (TOC).

- Traffic models and forecast tools that were developed for the Park City master plan were collected.

- A walking tour was conducted on February 6, 2012 with the project team and stakeholders.

Methodology and Assumptions

For the SR-224 traffic analysis, the following assumptions were used:

- Preliminary screening analysis was developed using the deterministic traffic analysis tool, Synchro. Preliminary roundabout analysis was completed using the Highway Capacity Manual (HCM) 2010 methodology. The results of this screening analysis are not presented in this report as more detailed micro-simulation was completed to quantify benefits.

- Detailed operational analysis of the phases was completed using the micro-simulation traffic analysis tool VISSIM.

- Existing conditions volumes are based on the PM peak hour traffic counts that were conducted December 27 – 28, 2010. This represents a typical busy ski-data in Park City.

• The results from the Park City master plan travel demand forecasting tool were not directly used for this analysis as the Bonanza Park redevelopment project was not captured in the tool's land use.

• To develop near-term scenario traffic volumes, a growth rate of 5% was applied to the traffic volumes that were used for the existing conditions analysis.

• Due to the inability to model the dynamic traffic signal control system that is in place on SR-224, timing plans used for the analysis were optimized using Synchro. This would most closely represent how the dynamic traffic signal control system functions.

Operational Safety Report

The Operational Safety Report (OSR) developed by UDOT's Traffic & Safety Operations Engineer shows that the rate is higher than expected for this section of SR-224, but that the severity of crashes is lower than expected.

The majority of crashes were rear-end and right-angle crashes, which are consistent with areas that have too many driveways (as described in the access inventory). The rear end crashes identified their main contributing factor as "following too closely", and the right angle crashes identified their main contributing factor as "'failure to yield the right-of-way' at non-signalized intersections or business accesses and 'disregard the traffic signal' at signalized intersections. A detailed summary of these crash rates, along with the entire OSR can be found in the Appendix.

The OSR recommended "that a comprehensive study be undertaken to develop various alternatives for improvements that can be implemented in this urban area, which is fully developed. Areas of concern should include any types of improvements that can be made to the existing signal systems, signal coordination and pedestrian improvements; additionally, the study should consider alternatives to develop an Access Management Plan that would consider the combining of various business accesses, as this type of existing scenario (based on the analysis of crash data) contributes to a large number of crashes, both vehicular and pedestrian related."

Access Inventory

The project team inventoried the existing accesses on the study corridor. There are 25 access points along the corridor (See *Figure 3)*. This equates to an access density of 33 accesses per mile, which is a high density for facilities like SR-224. These accesses create conflict points as well as side friction for vehicles traveling on SR-224. This reduces the roadways overall capacity, and increases friction and conflict points. The highest access density (11 accesses) is located along the east side of SR-224 between Kearns and Deer Valley Drive. Along that portion of roadway, accesses account for 44% of the total frontage. This contributes to the higher than expected crash rate reported in the Operational Safety Report.

UDOT defines this portion of SR-224 as an Access Category 7 (Community Rural-Importance). Minimum spacing requirements for Access Category 7 facilities are defined as follows:

• Minimum Signal Spacing: 1360 Feet

• Minimum Street Spacing: 300 Feet

• Minimum Driveway Spacing: 150 Feet

The intersections of Park Avenue / Deer Valley Drive and Bonanza / Deer Valley Drive are less than 1360' apart, which is less than the standard for this type of facility. Also, the distance between many of the

driveways is less than 150', which is also less than the standard.

Operational Analysis

Micro-simulation analysis of the study corridor was performed using the traffic analysis software VISSIM. Micro-simulation was used for the analysis as it accounts for the effects of queue spillback and signal progression. VISSIM was selected for this analysis due to:

- Availability of models produced for the Park City Master Plan.

- Ability to properly replicate operations of the Pedestrian Beacon (HAWK) located between Deer Valley Drive and Kearns.

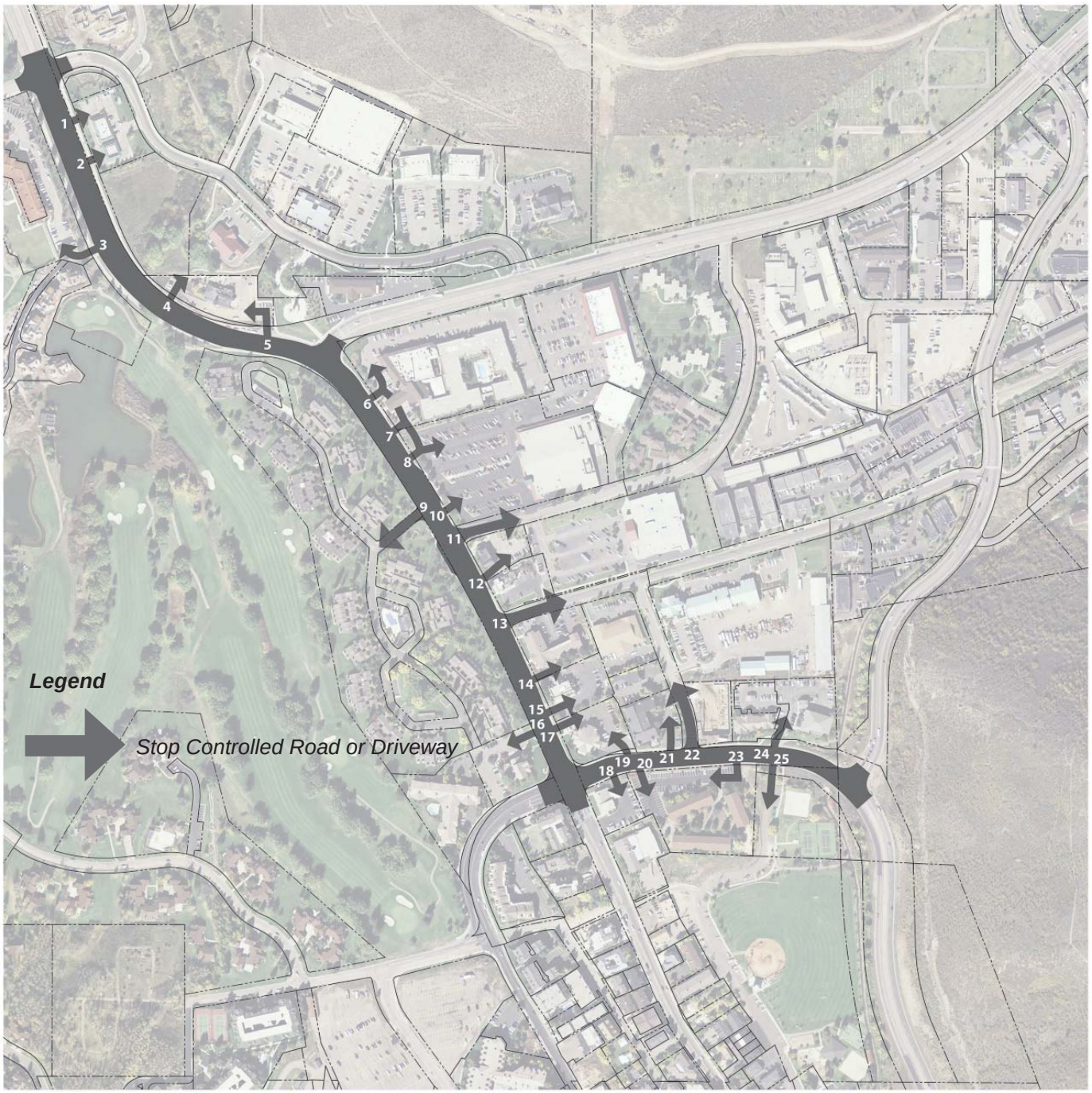

Figure 3. Corridor Access Points

• Ability to properly analyze multi-lane roundabout operations.

The existing conditions and near-term baseline analysis performed using the micro-simulation approach is presented in *Table 1 and Figure 4*. Delay and accompanying Level of Service (LOS) is presented. LOS is a grade-approach to describing traffic congestion. LOS D and better conditions are generally considered acceptable operations, while LOS E and LOS F are considered at or above capacity. The intersection at Park Avenue / Deer Valley Drive has particularly high delays for the northbound and eastbound approaches. The following are contributing factors to this high delay:

• Since the eastbound left and through lanes at the intersection are shared, eastbound and westbound through traffic is not allowed to move at the same time, which results in less efficient traffic flow. Reconfiguring this intersection to eliminate this conflict could improve intersection performance.

• As traffic exits the PCMR parking lots, many of the cars make an eastbound left turn at Park Avenue/ Deer Valley Drive. Since so many cars are making this turn, the queue from the intersection often spills back into the parking lots resulting in excessive delay for ski resort patrons headed towards Interstate 80.

• Much of the traffic exiting the Deer Valley ski resort also ends up making a westbound right turn at Park Avenue / Deer Valley Drive. This results in the same queuing and delay problems for these drivers as the eastbound lefts.

• There is also a lot of pedestrian activity at this location. This is especially true for the northern crosswalk, which conflicts with the congested movements previously described, resulting in more delay for the pedestrians and drivers alike. These conflicts present safety concerns.

• The HAWK beacon located north of this intersection experiences congestion that spills back into Park Ave / Deer Valley Drive. This causes delay for the northbound through, the westbound right and the eastbound left to increase.

The intersection at Deer Valley Drive / Bonanza Drive has high delays for drivers on northbound Deer Valley Drive and Southbound Bonanza Drive. The following are contributing factors to this high delay:

• Vehicles turning left from Bonanza Drive onto southbound Deer Valley Drive.

• Queue spillbacks from Park Avenue / Deer Valley Drive.

Additionally, observations were made from the UDOT Traffic Operations Center (TOC) during a heavy ski day on February 18, 2012. A UDOT traffic camera is located on the NE corner of Park Avenue/ Kearns Drive. The camera was panned to show the area between Kearns and Deer Valley Drive on SR-

TABLE 1. EXISTING - DECEMBER PM PEAK HOUR VEHICULAR DELAY AND LOS

Intersection	Existing Baseline		Near-Term Baseline	
	Delay	LOS	Delay	LOS
Park Ave / Kearns Blvd.	28	C	54	D
Park Ave / Deer Valley Dr.	49	D	88	F
Deer Valley Dr. / Bonanza	24	C	103	F

Source: Fehr & Peers, 2012

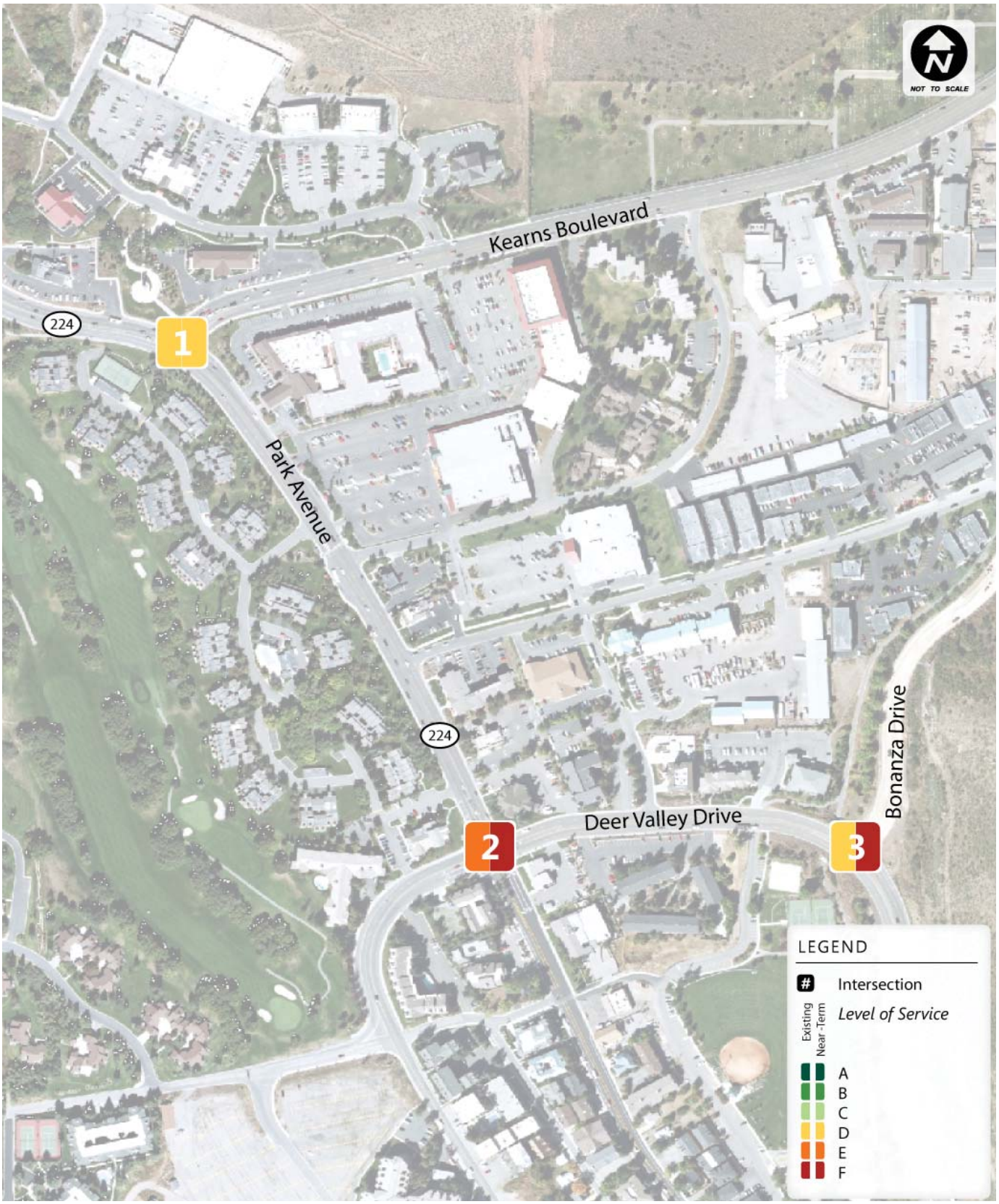

Figure 4. Level Of Service

224, and recorded from 4:00 to 6:00. Heavy traffic volumes were observed traveling northbound exiting the ski resorts. *Figure 5* shows one frame of the video illustrating the heavy traffic volumes.

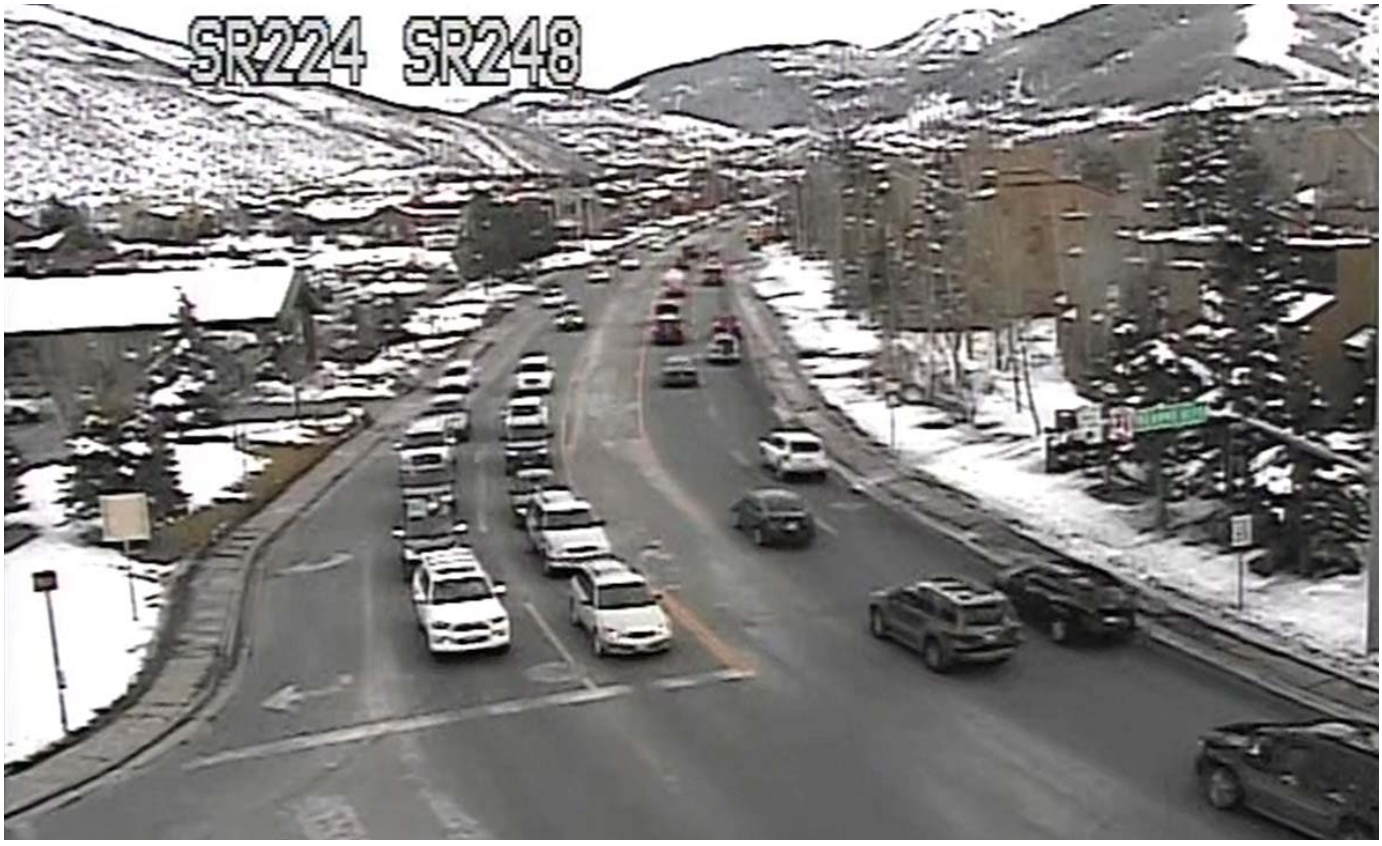

Figure 5. View from UDOT Traffic Camera.

Roads

The roadways in the study area consist of:

- Park Avenue from Thaynes Canyon Drive to Deer Valley Drive: This section of SR-224 consists of a 5-lane cross-section (two north bound lanes, two south bound lanes and one center median lane) with narrow shoulders and attached sidewalk. Park Avenue in this area is generally posted with a 35 mph speed limit, though there is a 40 mph zone that starts for north bound traffic just south of Thaynes Canyon Drive

- Deer Valley Drive from Park Avenue to Bonanza Drive: This section of SR-224 also consists of a 5-lane cross-section (two north bound lanes, two south bound lanes and one center median lane) with narrow shoulders and attached sidewalk. It is posted at 35 mph.

Transit

SR-224 through the study area is a primary transit route and includes two of the busiest stops in the network. These stops are located near the Lame Dog Dr. and Homestake Rd. intersections.

Regular hours are approximately 7:00am – 11:00pm with extra winter service and extended AM & PM hours for some stops. The current transit along the corridor during winter peak service times (approximately December – April) are listed in *Table 2* below. A diagram showing general summer and winter transit routes is illustrated on *Figure 6*.

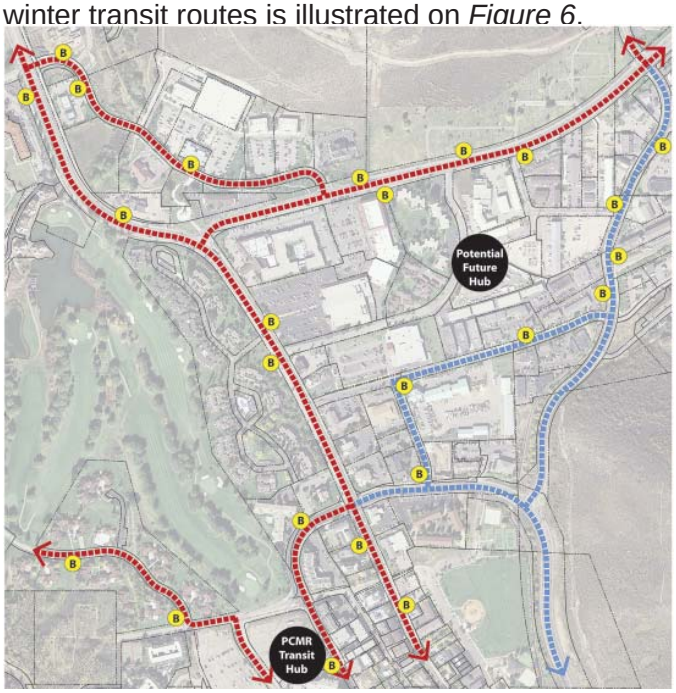

Figure 6. Summer (red) and Winter (blue)Transit Routes

TABLE 2
TRANSIT SERVICE

ID	Transit Location	Service Time From	Service Time To	Stops per Hour
1	Hotel Park City	7:44AM	11:44PM	8
2	Park Avenue Condo	7:20AM	11:55PM	10*
3	Fresh Market	7:04AM	11:04PM	15*

1. Stop located near the intersection of Thayne's Canyon and Park Avenue.
2. Stop located near the west side of the intersection of Park Avenue and Homestake Rd
3. Stop located near the east side of the intersection of Park Avenue and Homestake Rd
4. *Increased stops during Sundance Film Festival

Trails and Open Space

There are a wealth of trails and open space amenities surrounding the SR-224 study area (See *Figure 7*). Open space areas include the Park City Golf Course, City Park and the Park City Cemetery. The regional trails in the area include the Poison Creek Trail, Historic Union Pacific Rail Trail and the McLeod Creek trail along SR-224 that terminates near the intersection with Kearns Blvd. These regional trails connect to Park City Mountain Resort, Deer Valley and Canyons trail systems as well as Round Valley, Glendale and beyond.

A significant gap in the trail network exists in the study area along SR-224 from the intersection with Kearns Blvd. and extending up to and along Deer Valley Drive. Through this stretch of road, the sidewalks

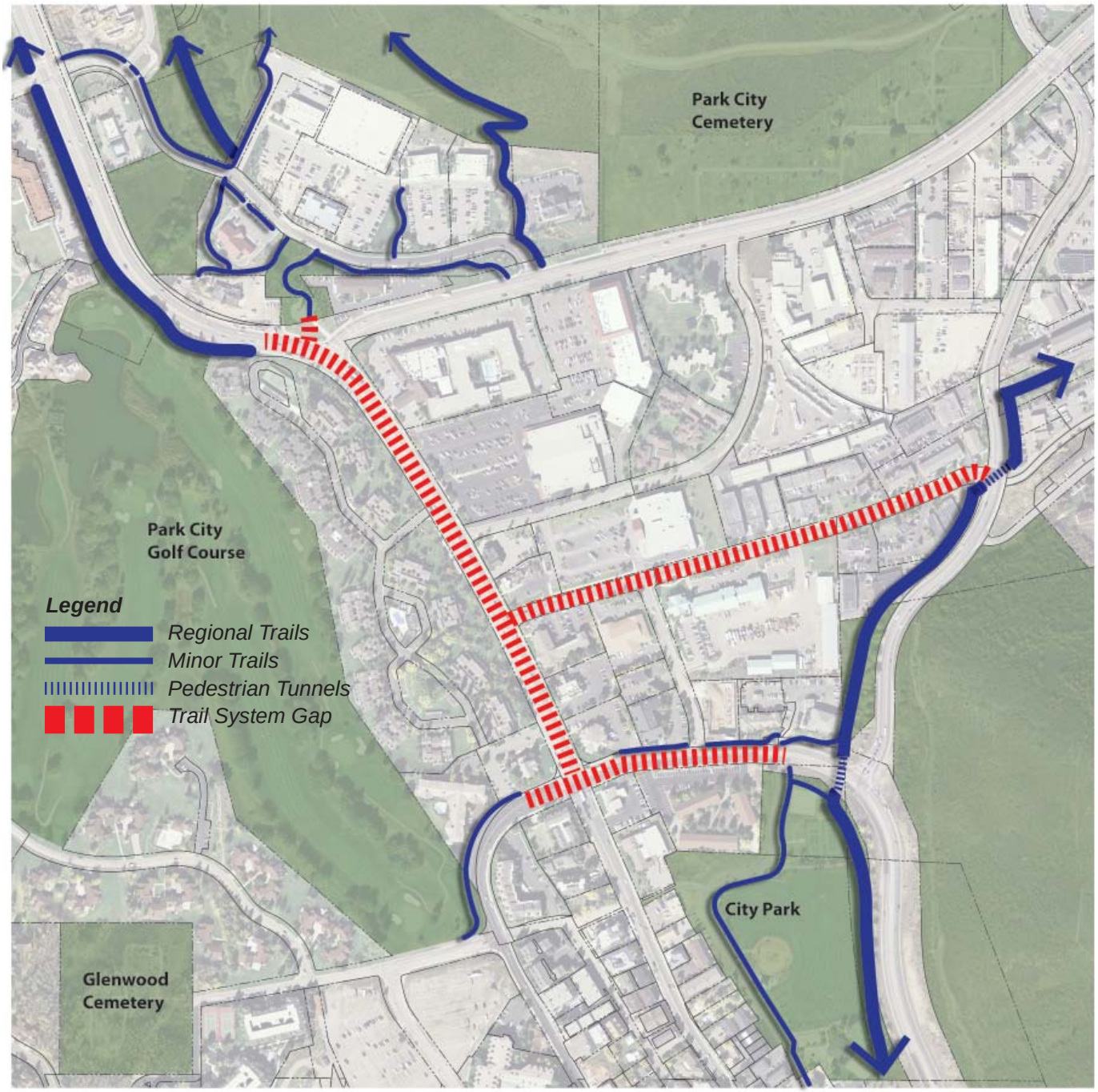

Figure 7. Trails and Open Space

are narrow and attached to the curb, positioning pedestrians and bicyclists extremely close to traffic. There are also no bicycle lanes in this location although the Walkable / Bikeable Neighborhood study designated SR-224 as a desirable primary bicycle corridor. The high volume of traffic combined with a lack of adequate shoulders forces bicyclists who are uncomfortable in traffic onto the narrow sidewalks creating conflicts with pedestrians. This is particularly troublesome for visitors to Park City who are renting bicyclists from Jan's and Cole's whose primary business is bike rentals

Figure 8. Cyclist

Figure 9. Narrow, Attached Sidewalks

HAWK Beacon

A HAWK beacon exists on SR-224 near Homestake Rd. The intent of this beacon was to provide a safe pedestrian crossing between Deer Valley Dr. and Kearns Blvd.

Figure 10. Hawk Beacon

Pedestrian Improvements Bond

In November of 2007 Park City residents approved a $15M bond for walking and biking improvements. The corridor known as 'Jan's to Dan's', which is the study area for this project, has been cited as a main concern for Park City residents who want a safe and convenient bicycle and pedestrian trail. Pedestrian counts indicate that this section of the corridor is highly traveled by pedestrians. The 2008 Trails Master Plan offers options for addressing pedestrian safety at intersections such as curb extensions (or bulb-outs), narrower turning radii, mid-block crossings and raised medians.

Pedestrians at the intersections along the corridor were measured in January 2011 during the Sundance Film Festival, representing a peak pedestrian condition for Park City. The results are shown in Figure 11.

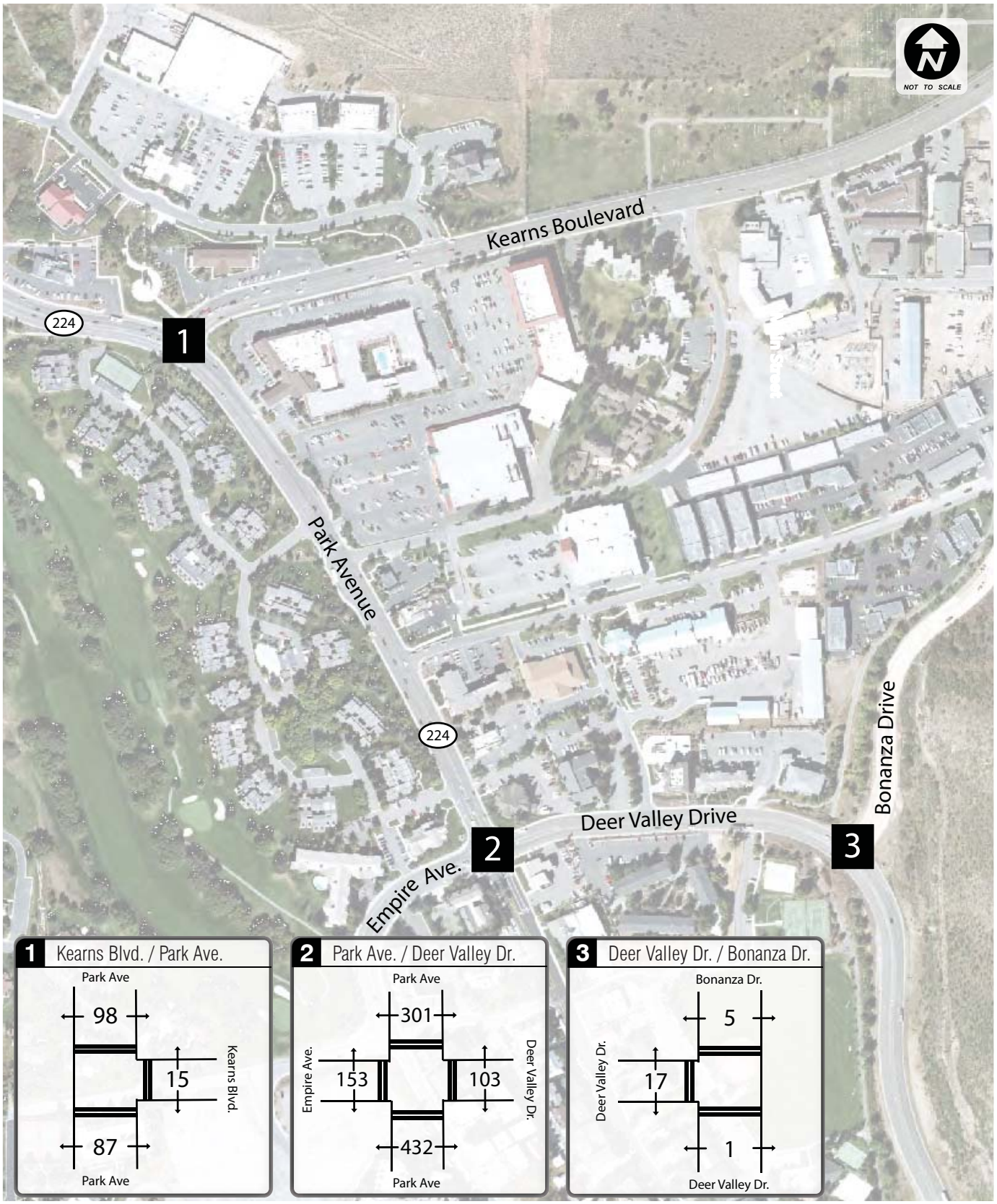

Figure 11. Pedestrian Counts

Land Use and Property Ownership

As shown in *Figure 13,* land uses on the west side of SR-224 from Thaynes Canyon Drive to Deer Valley Drive is primarily a residential condominium development with a small portion of commercial and recreational open space at the intersection of Thaynes Canyon and Snow Creek Drive. The north side of SR-224 from Deer Valley Drive to Bonanza is primarily commercial. The east side of SR-224 throughout the entirety of the study area is also commercial except for a small portion at the intersection of Thaynes Canyon and Snow Creek Drive, which is medium density residential.

Currently, there are no pending zoning applications in the study area. However, the Park City General Plan is currently being revised and the new Plan is expected in the fall of 2012 and may include changes to zoning and/or land uses.

The Bonanza Park Area Plan is currently in draft form and represents land use and transportation changes planned in the area between SR-224 and Bonanza Drive, and from Kearns Blvd. to Deer Valley Drive.

The conceptual layout (shown in *Figure 12*) proposes a network of trails and streets throughout the area. The transportation goal of the plan is to increase bicycle and pedestrian paths and promote a transit hub that would act as a transfer station for buses and a tram/gondola to Park City Mountain Resort.

The land use plans proposed at Bonanza Park could represent a considerable change in land use density and intensity. This could potentially impact interior circulation, add congestion at accesses onto SR-224, Deer Valley Drive, and Kearns Blvd., and increase the amount of bicyclists and pedestrians in the study area.

Alternatives for circulation in this area will be addressed in later phases of this study, in conjunction with a Form-Based-Code and Traffic Study that is being conducted by the City Planning Department.

Figure 12. Bonanza Park Area Plan (By Others)

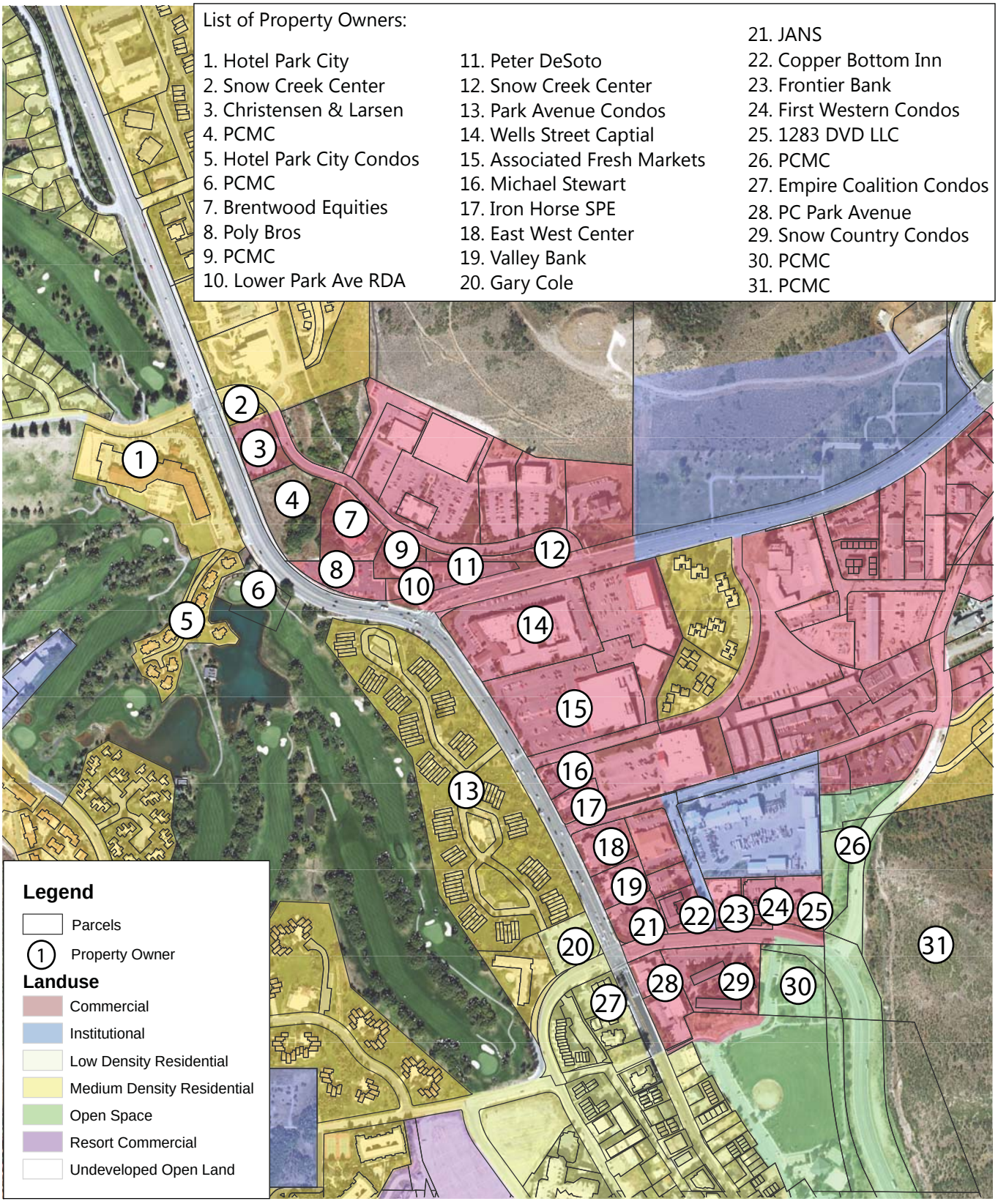

Figure 13. Land Use and Property Ownership

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Public Engagement Process

The study team decided early in the process that a smaller, stakeholder driven process would be the most appropriate for the SR-224 Corridor Plan.

"Stakeholder" generally means contiguous property owners or in the case of SR-224, business owners as well. Stakeholders also included the owner of the road, UDOT, as well as the two major attractions, Deer Valley and PCMR, just outside the corridor study limits. They will be directly affected by changes that occur and their understanding of the issues is important. Stakeholder buy-in to the outcomes and process is vital.

Given this premise, the study team took the approach of smaller scale engagement as opposed to large scale outreach efforts. Given the scale and number of affected owners, this proved to be the right approach. The effort can be grouped into three categories: one-on-one meetings, stakeholder meetings, and a single public open house.

One-on-One Meetings

The study team contacted several key stakeholders during the course of the project. The intent was to learn about their concerns and ideas in a setting more conducive to private conversations. The list of meetings ranged from meetings with the two ski area representatives, to UDOT, to key landowners. The meetings helped identify major issues and improvements that were eventually incorporated into the corridor recommendations. The meetings also helped the study team learn more about the historical traffic issues associated with SR-224, such as pre-recession traffic during peak ski "outloading".

Project Stakeholder Meetings

Three project stakeholder meetings were held during the course of the project. The first was a walking tour of the corridor, followed by a problem identification workshop and a solutions workshop.

Walking Tour

This meeting was held on February 6th and consisted of approximately 25 people ranging from staff, planning commission, city council, UDOT, interested citizens, members of the WALC committee and the consulting team. The tour helped demonstrate the proximity of traffic to the sidewalk, the frequency of driveways, and the lack of a comfortable walking and cycling environment. The Walking Tour was also successful in that everyone involved saw and experienced the same things. The tour was helpful to the study team because all the participants discussed all modes during the walk, and not just traffic. It was also key to have UDOT staff attend, in order for them to hear and experience the stakeholders' concerns. The following observations were made during the walking tour:

1. The Rite-Aid parking lot is frequently used to by-pass the Deer Valley Drive / Park Avenue intersection. Consider opportunities for public roads in this area.

2. Bike lanes are inadequate or non-existent.

3. Drivers are still getting use to the HAWK beacon (the sign is hard to read as well).

4. The transit stops create a significant amount of pedestrian traffic on both sides of SR-224.

5. Sidewalks adjacent to traffic lanes (without buffers) make pedestrians uncomfortable along SR-224. Wider sidewalks may be a good solution, rather than adding a park strip buffer (which generally have landscaping complications associated high salt, maintenance etc.).

6. Lane widths should be investigated along SR-224 (narrowing could reduce speeds and initiate entering into a heavy pedestrian area).

7. There is no safe way for cyclists on Deer Valley Drive to transition to the Poison Creek Trail / City Trail.

8. Drivers use the center median on Deer Valley Drive to maneuver around traffic queues at Park Avenue / Deer Valley Drive intersection.

9. Short Line is used frequently by transit drivers, but left turns out are challenging; they are limited to right turns out.

10. The Park Avenue / Deer Valley Drive intersection is difficult for pedestrians, due in part to the high volume of pedestrians and also the split phasing of the intersection cycle.

11. The Park Avenue / Deer Valley Drive intersection may need specific time-of-day signal timing plans to better handle traffic flows.

12. Chase Bank is the only business that is limited to SR-224 for its access; all other businesses have access from side streets.

13. Left turn time-of-day restrictions from Iron Horse are not well enforced.

14. The transit shelter on SR-224 is among the busiest in town and doubles as a gathering place. A heated building would be nice. The Bonanza Park plan includes a ski lift connection – possible to integrate ski lift/transit shelter together?

15. The Kearns Boulevard / SR-224 intersection is missing pedestrian crosswalk infrastructure (crosswalk, curb cuts) on its southern leg.

16. Moving buildings closer to the sidewalk could improve pedestrian conditions (to be considered via the Form Based Codes RFP).

17. Sidewalks on west side of SR-224 are in need of maintenance/repair and can be partially blocked with snow storage.

18. The walking path along Kearns Boulevard needs better access to Bonanza Park; consider wayfinding or trail treatments to guide trail users.

19. Pedestrians frequently walk through parking lots to avoid traffic on SR-224; find a way to accommodate them.

20. Consider encouraging Snow Creek Drive as a relief / alternate route.

21. Homestake Road needs sidewalks.

22. There is concern about pedestrian safety on potential pedestrian route through golf course.

23. Consider ways to reduce curb cuts on Park Avenue.

Problem Identification and Goals Workshop

The first stakeholder meeting was held on March 6th, 2012 at the City Library and attracted approximately 15 participants.

The group consisted of property owners along the corridor, representatives from the two ski areas, UDOT and City staff.

The purpose of the meeting was to learn about stakeholder issues along the corridor and to set goals addressing each issue.

Prior to the meeting the consultant team organized the workshop into a goal setting exercise with the following categories: ***Modes and Management***, ***Environment***, ***Community and Aesthetics*** and ***Economics***. The balance of the meeting consisted of stakeholder feedback focused on helping the study team populate a matrix of goals and associated strategies. (See *Figure 14*)

Modes and Management goals focused on person throughput, both now and in the future, especially as new development and redevelopment occurs. SR-224 is the recognized key gateway corridor to Park City. Throughput is meant for all modes, including cars, buses, cyclists, and pedestrians. Modes and management goals also include safety issues, such as conflict points arising from the high frequency of curb cuts on the east side.

Environment goals related to the direct impacts of a busy corridor in an urban setting. Goals developed by the stakeholders included noise reduction, runoff mitigation, auto emission reductions and a well-maintained facility.

Community and Aesthetic goals developed by the stakeholders included more qualitative items such as making the corridor safer, creating a more visually attractive gateway into Park City and also ensuring non-motorized connections are included in any future plans.

Economic goals related to fostering a positive and profitable business atmosphere. Businesses need traffic, but the traffic should not simply pass by at a high speed and thus not be enticed to stop and patron businesses. Traffic should also not be overly congested, which can have a negative impact to businesses along the corridor.

Problem Solutions Workshop

The second stakeholder meeting was held on May 8th, 2012 at the City Library. The agenda focused on preliminary corridor alternatives that the study team prepared in advance of the meeting.

The study team took the outcomes from the problem identification and goals workshop, conducted extensive transportation data collection and analysis and developed a phased series of recommendations.

These recommendations were presented to the committee in order to get their feedback and ideas on appropriateness, scale, effectiveness, and also to give them another chance to communicate to the

	VISION	STRATEGY	
	SMART Goal	**Strategy**	
Modes & Management	1. Increase pedestrian and bicycle safety.	***a. Provide ADA accessible pedestrian tunnels at high volume intersections (SR 224 / Kearns, SR 224 / Deer Valley Dr.)*** ***b. Provide trails separated from the curb with berms and landscape between the trail and the road*** c. Improve / add trail connections (near Dan's market) d. Add bike lanes	
Modes & Management	2. Accommodate existing and future through put for all modes. Manage peak hours and seasons.	***a. Reconfigure intersections (Roundabout, Quadrant)*** ***b. Reduce/manage vehicle speed*** ***c. Integrate a dedicated or time of day transit / HOV lane*** ***d. Maximize use of intermodal hub and parking garage in the Bonanza Park redevelopment.*** e. Increase the available right-of-way f. Use variable message signs to manage users expecations g. Add bike lanes h. Assume the implementation of a planned intermodal hub and parking garage in the Bonanza Park redevelopment. i. Reduce curb cuts j. Provide adequate infrastructure for day to day throughput and implement management stategies to handle peak loads.	

Figure 14. Study Goals and Metrics

	SMART Goal	Strategy	
Modes & Management	3. Increase Workforce transit use		
Environment	1. Ensure Plant Health and Proper Planting Strategies in the corridor	a. Utilize water and salt tolerant plants b. Plan snow storage areas	
Environment	2. Reduce Noise Pollution	a. Utilize berms and trees to reduce ambient noise b. Explore the use of quiet pavements to reduce ambient noise	
Environment	3. Improve air quality and reduce emissions	a. Reduce idling times through traffic signal timing and free flow intersections b. Integrate vegetation to absorb more CO_2 c. Model all alternatives for carbon emissions	
Environment	4. Clean and infiltate 100% of the storm water that falls within the right-of-way.	a. Utilize oil / water separators b. Utilize vegetated islands and swales to infiltrate water	

Figure 14. Study Goals and Metrics

	SMART Goal	Strategy	
Community & Aesthetics	1. Create a more welcoming gateway to downtown Park City to enhance visitor experience.	*a. Utilize trees, berms and a landscape median to slow cars and beautify the experience* *b. Integrate wide (8') plowable trails* *c. Explore golf course trail alignment* d. Integrate pedestrian scaled lighting (with LED bulbs) e. Make the planting strategy more consistent through the corridor to maintain some of the rural feel f. Increase parking and pedestrian wayfinding signage g. Utilize an elevated boardwalk or barrier to separate pedes from traffic. h. Improve and coordinate signage and wayfinding to reduce clutter	
Community & Aesthetics	2. Make the corridor feel safe	*a. Reduce curb cuts* b. Widen the right-of-way to incorporate more pedestrian infrastructure c. Reduce vehicular lane widths to integrate wider trails and bike lanes	

Figure 14. Study Goals and Metrics

	SMART Goal	Strategy	
Economics	1. Support future economic development	*a. Provide efficient accessiblity into adjacent properties* *b. Support surrounding land uses and Bonanza Park* *c. Investigate incentives for transit use* d. Provide a property tax abatement for business owners aimed at incentivizing improvements	
Economics	2. Contribute to a positive visitor experience so visitors will want to return again and again	*a. Create a pedestrian friendly environment that is convenient and encourages shopping* b. Minimize wait times by increasing throughput c. Calm traffic to calm people d. Maximize flow outbound, especially at peak times.	

Figure 14. Study Goals and Metrics

study team any additional solutions. The details of the recommendations are presented in *Chapter IV – Recommendations*.

The presentation and discussion occurred in two parts: “What we heard last time”, where the study team presented an organized series of tables identifying the goals and strategies from the previous meeting, followed by a presentation of the draft concepts in three distinct phases, or time periods, and then a discussion of the benefits and challenges to the concepts.

Feedback from the stakeholders was positive, constructive and focused on improving near-term conditions as well as looking forward to long term needs. The study team recognized that some of the concepts simply were not going to make it further and dropped them from future consideration. An example of this is a proposed multi-use trail between the city golf course and the Park Avenue condominiums. Conversely, stakeholders provided substantial validation to most of the other draft concepts. This meeting helped refine alternatives that were later presented to the broader public.

Public Open House

The last major outreach effort was an Open House held on May 22, 2012 in the Park City Council Chambers. Although billed as an “Open House”, this meeting consisted of three main elements. The meeting was advertised via press release, Park City public radio, the Park City website and by e-mail to all the stakeholders. Attendance was approximately 25 people, including City staff and media.

The first portion of the meeting was an open house format where the public could mingle with the study team and learn about the process and concepts on display. The second part of the meeting included a more formal presentation by the study team. The presentation explained the process of data, analysis, recommendations, benefits and impacts.

The last part of the meeting was a keypad polling exercise designed to provide the study team validation, or not, on the topics listed above. It also involved questions relating to visual and design preferences, which will help guide future land use decisions taking place along and near the study corridor. seventeen people participated in the polling.

The outcome of the questions, comments, keypad polling and individual discussions can be summarized by near-universal agreement that the corridor needed improvements, concerns about the timing of improvements and associated impacts. All agreed that while they didn’t necessarily like some of the impacts, they believed that the process to arrive at the recommendations was a fair and valid process.

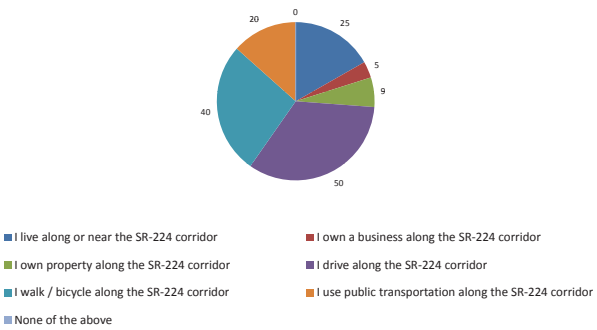
On-line Survey

The last outreach effort, following the Open House, was an on-line survey, hosted on the City website. This survey had the same questions as the kopen house eypad polling exercise. Thirty five people responded to the on-line survey and those results are combined with the open house polling results and are include on the following pages. Separated results for the open house and for the on-line survey are included in the appendix.

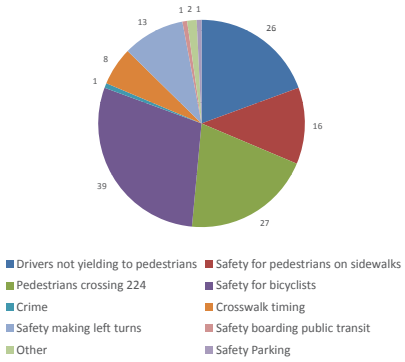
The agendas, and materials presented for all community engagement efforts are also included in the appendix.

Combined Open House Keypad Polling and On-Line Poll results

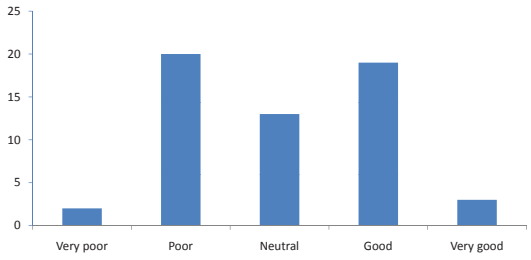
The following describes my relationship with the SR-224 corridor (Choose all that apply)



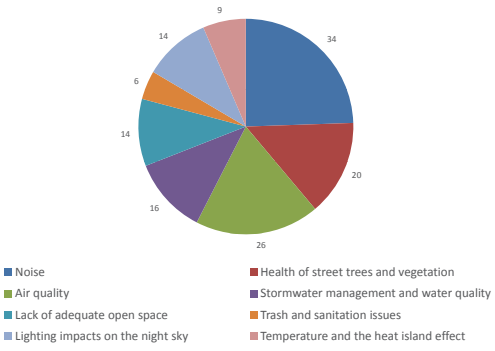
Which safety issues concern you most along SR-224? (Choose your top three)



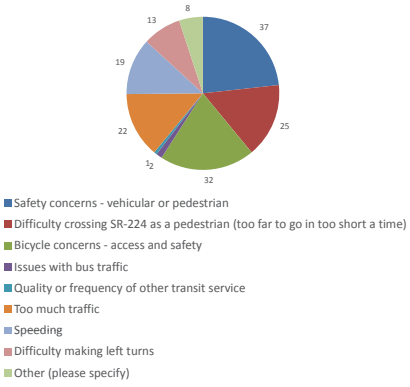
How would you rate the appearance of the SR-224 corridor today? (Choose one)



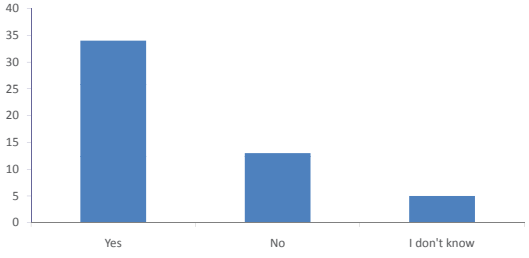
The most important environmental issues to address along SR-224 are the following (choose your top three)



Which transportation issues concern you most along SR-224? (Choose all that apply)

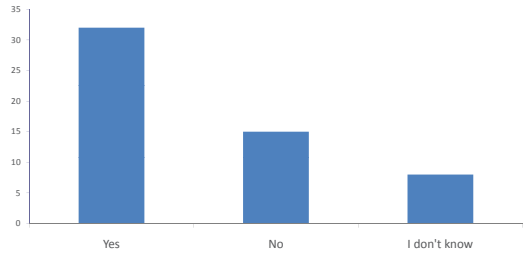


I would be in favor of installing a landscaped median along SR-224 in order to enhance traffic safety and improve the aesthetic quality of the corridor (choose one)



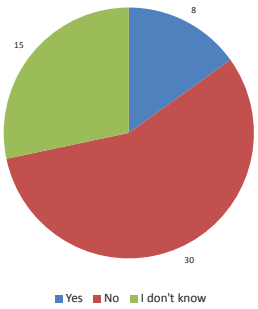
Combined Open House Keypad Polling and On-Line Poll results

I would be in favor of installing a roundabout at Park Avenue and Kearns as illustrated (Choose one)



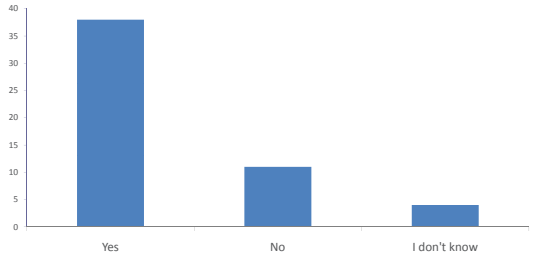
7

I would favor converting Park Avenue and Bonanza Drive to the one-way couplet as shown on the project exhibits (choose one)



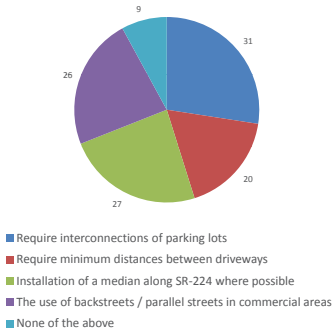
10

I would favor installing an underground pedestrian pathway (tunnel) underneath Park Avenue in order to provide safer crosswalk crossings along the corridor (Choose one)



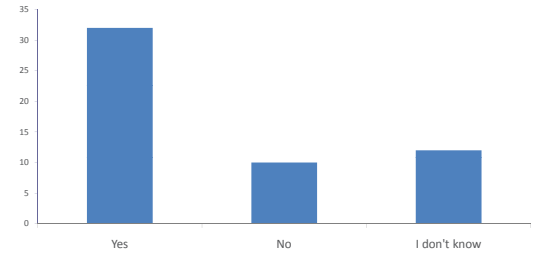
8

I would be in favor of including the following elements in an Access Management Plan for the SR-224 corridor (Check all that apply)



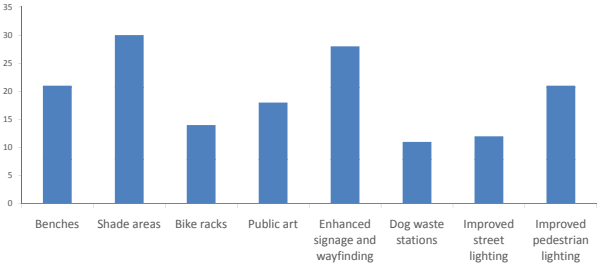
11

I would favor converting the intersections with Homestake and Lame Dog Way (along Park Avenue) to a single, realigned intersection and converting the hawk beacon pedestrian signal to a full-service traffic signal at this intersection, with pedestrian accommodations (Choose one)



9

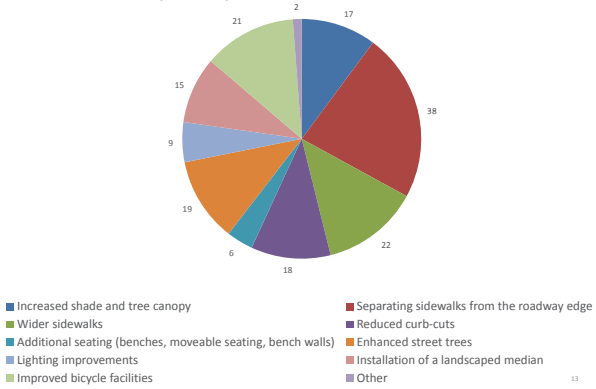
I believe future streetscape improvements along SR-224 should include the following elements (Choose all that apply)



12

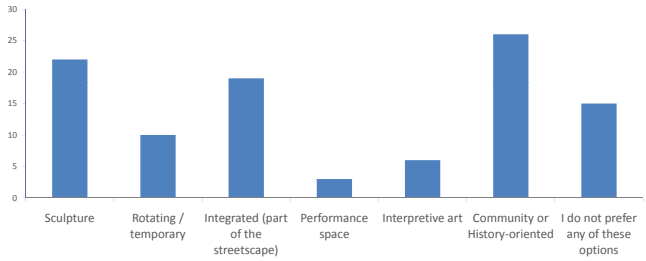
Combined Open House Keypad Polling and On-Line Poll results

What streetscape improvements do you think would have the most positive impacts on improving pedestrian safety and comfort? (Choose your top three)



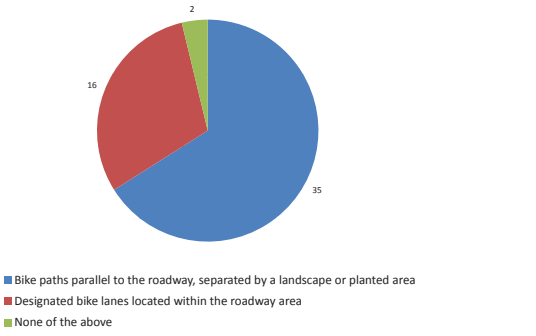
13

I would favor the following public art elements in the design of the SR-224 corridor (choose all that apply)



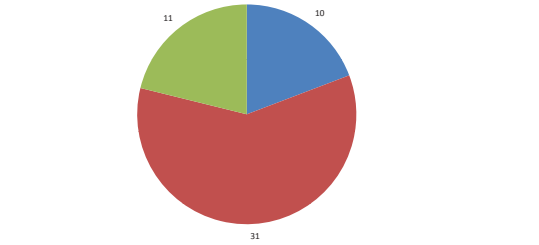
16

I would prefer creating the following type of bike paths / bike lanes along the SR-224 corridor (Choose one)



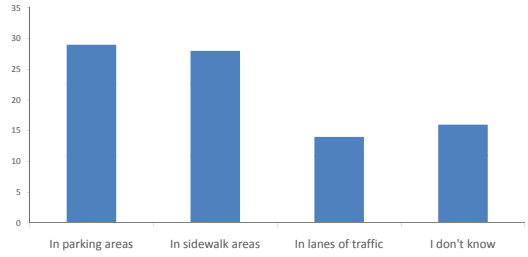
14

I believe driveways along SR-224 should (choose one):



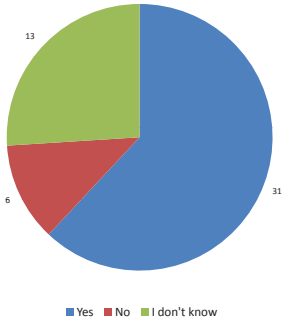
17

I would be in favor of using porous pavement as a sustainability strategy in the following locations along the SR-224 corridor (Choose all that apply)



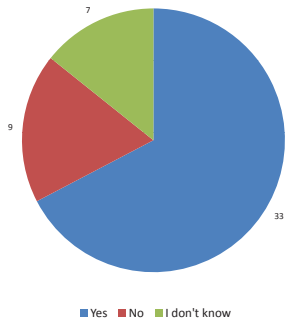
15

I believe the city should explore having new developments along SR-224 include right of ways for "back streets" or "parallel streets" in order to improve the overall circulation and transportation performance of the corridor (choose one)



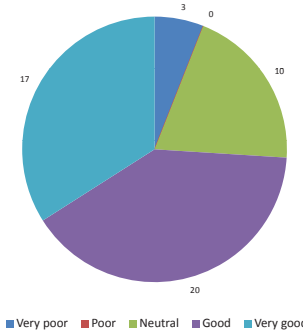
18

I would be in favor of requiring parking lots along the SR-224 corridor to be located behind or to the side of buildings that front the street (Choose one)



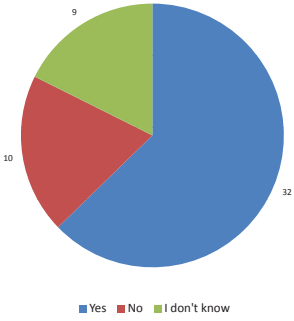
19

How would you rate the appearance of the SR-224 corridor following the completion of improvements during Future Conceptual Plan A, as illustrated (Choose one)



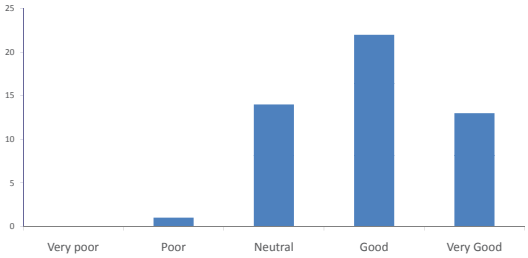
22

I would be in favor of spending city funds acquiring right of way for the expansion of SR-224 going forward, over the long term, as SR-224 redevelops (choose one)



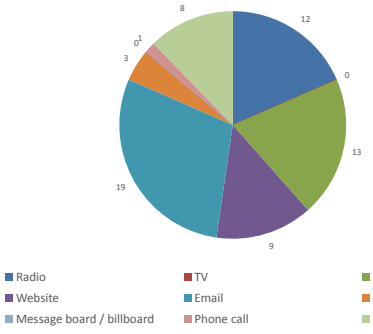
20

How would you rate the appearance of SR-224 following the completion of improvements during Phase 2, as illustrated (choose one)



21

How did you hear about this meeting? (Choose all that apply)



23


Aloha
Bienvenue
Bienvenido
Willkommen
Benvenuto
Bon Vindo
Welcome to the Blue World
Mabuhay
Karkommen
Feestelijk Inhalen
Bula Vinaka
Shalom
Shogotawn
Velkommen
Heavenly Village
LAKE TAHOE
Step into the Blue
Heavenly Village
LAKE TAHOE
Heavenly Village
LAKE TAHOE

4

RECOMMENDATIONS

Assumptions (All Phases)

Phase 1 improvements consist of projects that could be completed in the immediate future. Phase 2 improvements consist of projects that will require additional analysis and refinement prior to implementation. The Phase 2 projects will have higher costs and some ROW impacts. Also, concept development was completed for far-distant options along the corridor. These future development concepts will require even further revision and scrutiny prior to implementation.

Traffic

The same methodologies and approaches used to develop the existing conditions analysis were employed to analyze the recommended phases. The Synchro analysis performed for this study served as a screening methodology to develop alternatives. The Synchro results are not presented in this analysis as more detailed micro-simulation was completed. The VISSIM analysis served to improve confidence in the recommendations and to quantify the operational benefits that could be expected from these investments.

Land Use

For the traffic analysis, it was assumed that the land use in the study area would remain generally unchanged for the existing and near-term scenarios. Since the ultimate land use and traffic generation from the Bonanza Park redevelopment are still in development, the impacts of this planned development were not included in this analysis. A 5% growth was applied to the December 2010 traffic counts to develop the near-term volumes. Longer range forecasts were not part of the project scope and were not analyzed in detail.

Photo: Lake Tahoe Redevelopment, NV. Pedestrian walkways separated from a State Highway.

Attributes

Intersection Improvements:

1. The eastbound lane geometry at Park Avenue / Deer Valley Drive (coming from Empire Avenue) is re-configured from a single left, shared thru-left and single right turn to dual left turn lanes and a shared thru-right. This enables the signal to be re-timed, allowing eastbound and westbound through movements to go at the same time like a traditional intersection. This should allow the intersection to operate more efficiently and be less counter-intuitive for pedestrians. Since this location experiences high levels of delay and pedestrian volumes, this improvement would help increase efficiency and pedestrian safety.

2. The southbound right turn at Park Avenue / Deer Valley Drive is converted to a "right-turn overlap" condition (See *Figure 15*). This would allow the southbound right turn to operate just like the westbound right turn at this same location. A new signal head for this movement will be required that gives southbound right turning vehicles a "green arrow" indication while the eastbound left operates. This improvement will increase capacity by allowing right turning vehicles to go without stopping while the eastbound left turns are moving.

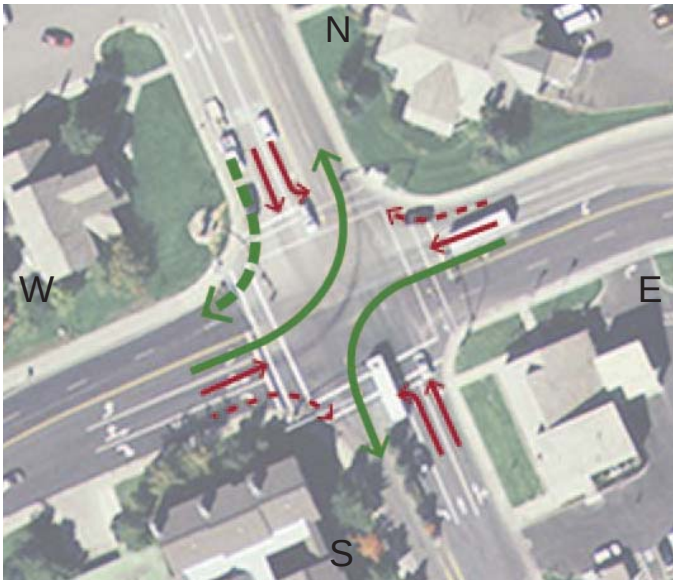


Figure 15. Right Turn Overlap Diagram

4. A pedestrian tunnel (See Figure 16) is located on the north leg (Jan's to Cole's) of Park Ave / Deer Valley Drive. This eliminates pedestrian conflicts with the westbound right turn as well as the southbound right turn, thereby continuing to improve capacity for both of those movements and improve safety for pedestrians. The crosswalks on the east, west and south legs of the intersection remain in place.

A North – South tunnel along the west side of the intersection is not recommended at this time because the number of pedestrians using this crosswalk are significantly lower than the number of pedestrians crossing the northern side of the intersection. Also, removing the pedestrian conflicts with eastbound and southbound right turns at the intersection is less critical than removing the conflict for the westbound right turn, as is accomplished with the Jan's to Cole's tunnel. This opportunity should be re-evaluated at the completion of Phase 1

Figure 16. DVD/SR-224 Pedestrian Tunnel

5. The pedestrian (HAWK) beacon located mid-block on Park Avenue between Deer Valley Drive and Kearns Blvd. is eliminated and replaced with a new fully-signalized intersection that is a result of realigning Lame Dog Rd. with Homestake Rd. (See Figure 17) The new signalized intersection serves

Figure 18. Proposed Phase I Improvements

both roadways as well as the pedestrians currently using the HAWK signal. A benefit of this conversion is the elimination of the offset left turns currently in place at that intersection.

Figure 17. Lame Dog Rd. Re-Alignment

Trail Improvements:

1. A 10 foot wide trail (See Figure 19) is illustrated on the west side of SR-224 from the Kearns Blvd. intersection to Deer Valley Drive. This trail will need to be located in an easement negotiated with the Park Avenue Home Owners Association (HOA) board. Initial discussions with an HOA representative indicates that there is potential for an agreement to be made.

Figure 19. Trail in Easement

2. An eight foot wide trail is proposed on the east side of SR-224 from Kearns Blvd. to Deer Valley Drive. This trail will be more difficult to fit in due to existing buildings and other encroachments but there is still an opportunity to separate the trail from the street and introduce more landscaping.

3. A third trail is proposed on the north side of Deer Valley Drive to connect SR-224 with the Poison Creek Trail and pedestrian tunnel. This trail will be widened to 10 feet to provide a safer multi-use condition.

Curb-cut Consolidation:

1. Figure 20 illustrates the elimination of five curb-cuts to reduce friction along the corridor and improve vehicular and pedestrian safety. The businesses associated with each proposed curb-cut reduction has an existing alternate access point.

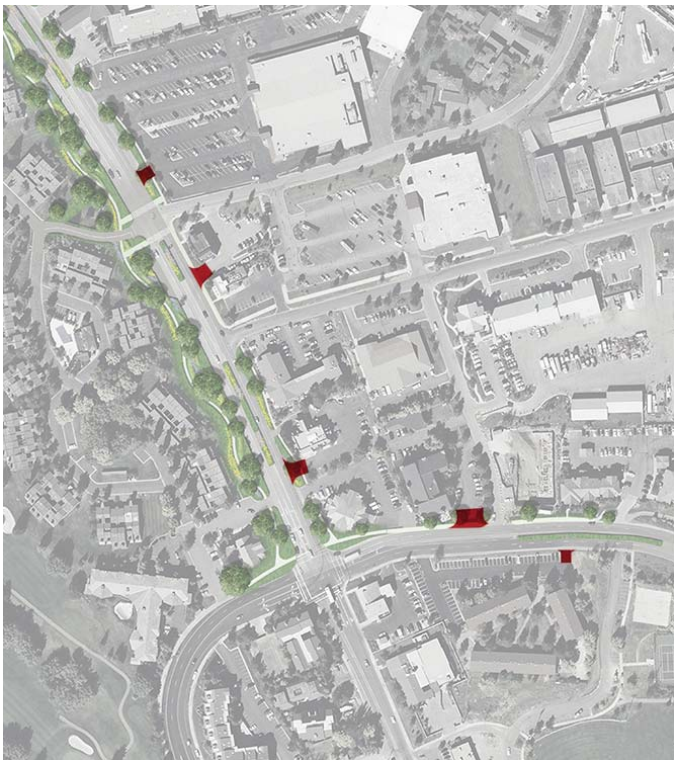


Figure 20. Curb-cut Consolidation

UDOT policy requires a new access permit with each change in access use (not just transfer of ownership). Access consolidation can occur

through redevelopment of these properties as part of the UDOT access permit process. A critical step in ensuring this process is successful is to inform developers of the access permit process. This should be done by City staff as building permit applications are submitted for properties along this corridor and other state routes.

It has been identified that accesses along Iron Horse Drive immediately adjacent to SR-224 have been problematic. At times, traffic backs up from the accesses onto SR-224. Although Iron Horse Drive is not within the study area, it is recommended that access management and consolidation be considered at this location as well. Further study should take place to identify potential solutions.

Signage and Wayfinding Improvements:

1. A Variable Message Signs (VMS) should be implemented along Deer Valley Dr. and upon exiting Park City Mountain Resort on Empire Dr. This system will provide real time traffic/travel time information for exiting traffic. In addition, a smart phone "App" should be created providing this information and other wayfinding in the area.

2. A signage and wayfinding program should be implemented along the trail to establish clearer links to regional trail systems and City landmarks.

Landscape Improvements:

1. Along with trail improvements, a fair amount of grading will need to be done to cut in the trails and to establish noise reducing berms. Tree, shrub and groundcover plantings should also be installed along the western edge to improve corridor aesthetics.

2. Landscaped medians should be considered along sections of SR-224 to carry the aesthetic established along the corridor between Kimball Junction and the study area. The design of these medians should take into account snow removal and maintenance practices.

Phase 1 improvements could be implemented in the immediate near-future as they don't require substantial ROW or design effort.

Benefits

Improved Traffic Conditions

For the proposed Phase I improvements, analysis was performed using VISSIM to quantify the operational benefits that could be expected from these changes in near-term conditions. *Table 3* shows the anticipated phase 1 results.

The analysis shows that the Phase 1 improvements will provide acceptable LOS (LOS D or better)

TABLE 3. PHASE 1 - PM PEAK HOUR VEHICULAR DELAY AND LOS

Intersection	Existing Baseline		Existing Phase 1		Near-Term Baseline		Near-Term Phase 1	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Park Ave / Kearns Blvd.	28	C	19	B	54	D	21	C
Park Ave / DVD	49	D	32	C	88	F	39	D
DVD / Bonanza	24	C	20	B	103	F	24	C

1. Near LOS threshold (55.0 seconds is boundary between LOS D and LOS E)

Source: Fehr & Peers, 2012

under existing traffic conditions. Additionally, reducing the congestion at Park Ave / Deer Valley Drive will result in substantial improvements at the other study intersections. These improvements are a direct result of queue reduction and improved progression. The Phase I improvements will also provide acceptable delay for the near term conditions, with all study intersections operating at LOS D or better. This suggests that Phase II may not be necessary in the near-term (5% growth).

Improved pedestrian and vehicular safety

Pedestrian and vehicular safety will be improved by re-aligning Lame Dog Dr., reducing curb-cut conflict points, reducing left turn access with landscape medians, improving pedestrian and bicycle trails and by installing a pedestrian tunnel at SR-224/ Deer Valley Drive.

Improved Aesthetics

By detaching pedestrian trails, installing berms and more landscaping, reducing curb-cuts and installing landscaped medians, the corridor aesthetic will be improved. An enhanced gateway experience will be created and the proposed improvements will unify the look of the corridor by creating a setting that is more reflective of conditions that exist along SR-224 west of the study area.

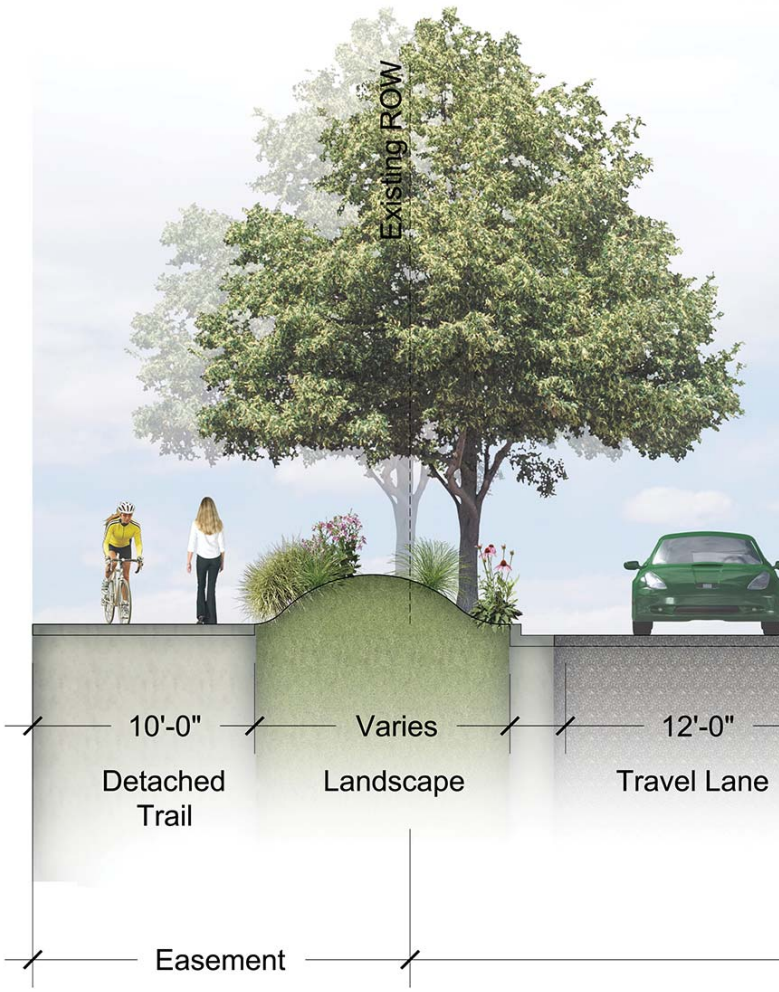
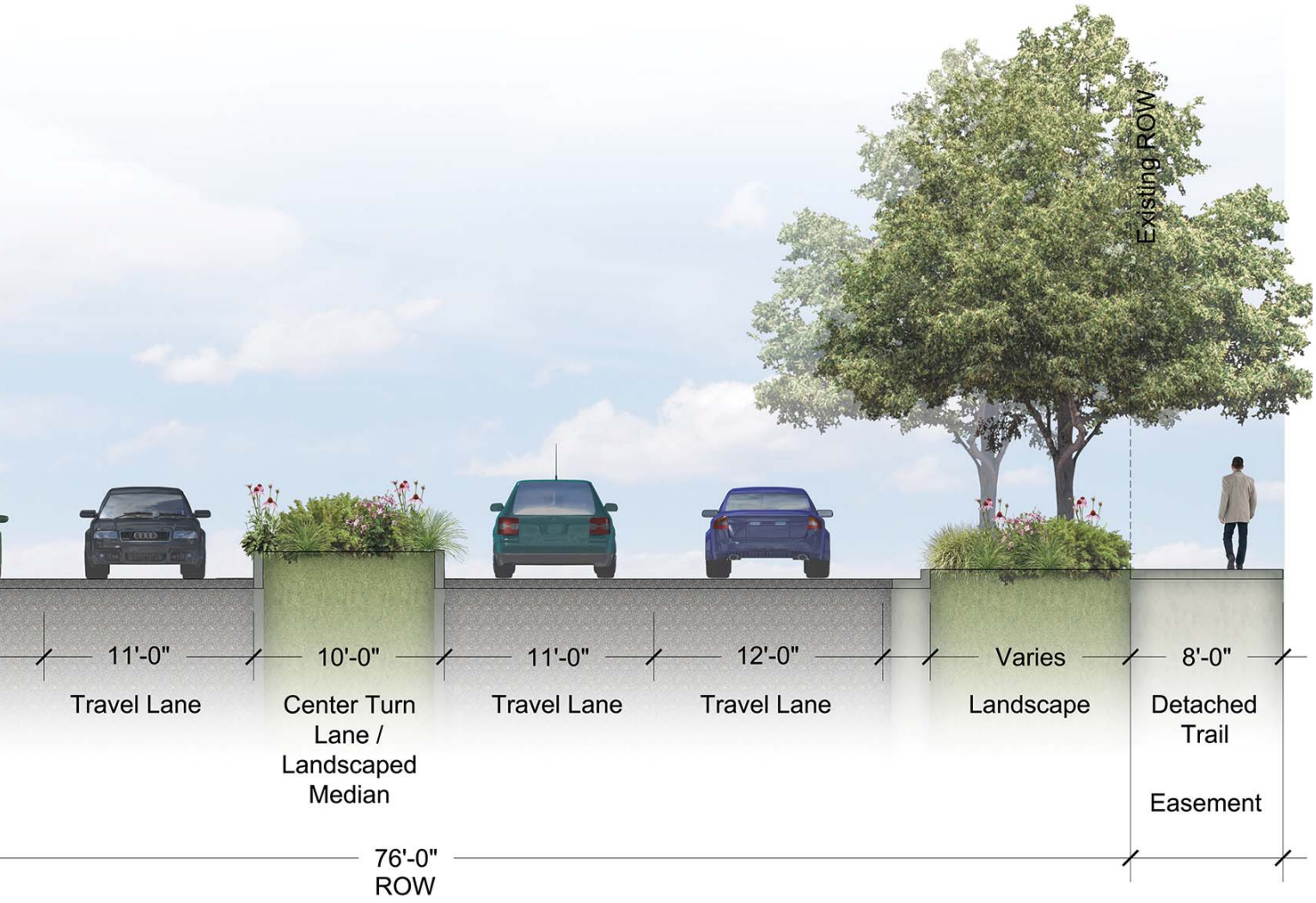


Figure 21. Proposed Phase I Street Section

Considerations

The primary considerations for improvements outlined in Phase 1 include:

- Cooperative easement agreement(s) will need to be established between the City, Park Avenue Condo's and other land owners on the east side of the corridor.
- There are turning restrictions created by the installation of landscaped medians.
- Striping/signing changes will need to be implemented on the eastbound approach at Park Ave / Deer Valley Drive.
- One new signal head (Type IV) will need to be installed to accommodate the right-turn overlaps.
- Opportunity to partner with upcoming water projects
- Funding is available using remaining WALC bond (approx. $7 million)



• A more detailed plan and engineering study will be needed to determine the feasibility of the pedestrian tunnel. The study will need to include space requirements, ADA requirements, and existing utilities to determine if, where and how a tunnel will fit.

• The signal timing plan will need to be revised at Park Ave / Deer Valley Drive to accommodate the recommended changes.

• Due to limited space curb-to-curb, no bike lanes are proposed within the Right-of-Way.

• Any construction will need an environmental assessment for regulated soils.

• A policy should be developed with the Bonanza Park plan for parking lot and access consolidation during the redevelopment.

Attributes

Intersection Improvements:

The intersection at Park Ave / Kearns Blvd. would be re-configured into a multi-lane roundabout (See *Figure 22)* with a pedestrian tunnel to serve pedestrian and cyclist traffic who wish to cross the intersection.

Figure 22. Park Ave./Kearns Blvd.. Roundabout

Signage and Wayfinding Improvements:

The roundabout implementation is a good opportunity to create a gateway element and landscape improvements in conjunction with the intersection improvements. This intersection is a front door to the urbanized area in Park City and a grand gateway statement will signal an arrival to town.

Trail Improvements:

A pedestrian and bicycle tunnel is proposed for the roundabout area to provide a safe route from both sides of SR-224 to the north side of the intersection. The roundabout could potentially be open in the middle to allow light and air through. This concept needs to be studied in much greater detail to satisfy engineering, safety and public works challenges.

The Phase II roundabout improvement is mid-range time horizon improvement and is anticipated to be 5-10+ years away from design and implementation.

Benefits

Improved Traffic Conditions

As Phase II is not likely to occur in the immediate future, analysis was only performed for the near-term growth volumes. *Table 5* illustrates the results for the phase II improvements.

The roundabout improvement will be sufficient to ensure that the study intersections will operate at acceptable LOS under near-term growth conditions. Delay at the Park Avenue / Kearns Blvd. intersection is significantly lower than near-term Phase I improvements, resulting in a LOS B.

As the development plans at Bonanza Park continue to be developed, the phase II analysis should be revisited to ensure that the proposed improvements will accommodate the traffic generated by the project. Additionally, further refinement of the

TABLE 4. PHASE 2 - PM PEAK HOUR VEHICULAR DELAY AND LOS

Intersection	Near-Term Baseline		Near-Term Phase 2	
	Delay	LOS	Delay	LOS
Park Ave / Kearns Blvd.	54	D	14	B
Park Ave / Deer Valley Dr.	88	F	40	D
Deer Valley Drive / Bonanza	103	F	24	C

Source: Fehr & Peers, 2012

Figure 23. Proposed Phase II Improvements

proposed roundabout layout and geometry should be done through an iterative design process.

At UDOT's request, a high-growth sensitivity analysis was performed to evaluate at what point the Phase II improvements would fail. It was found that the roundabout at Park Avenue / Kearn's would exceed the LOS D threshold at some point between 15-20% growth over the December 2010 traffic volumes. It was also found that the intersection at Park Avenue / Deer Valley Drive would exceed LOS D before the roundabout.

Improved Trail Connectivity

The pedestrian tunnel under the roundabout improves connectivity to regional trails, businesses, residences and regional open space assets. Phase I and II improvements combine to fill the gap in trail connectivity (See proposed improvements in red on *Figure 24*) identified in the Existing Conditions section of this document.

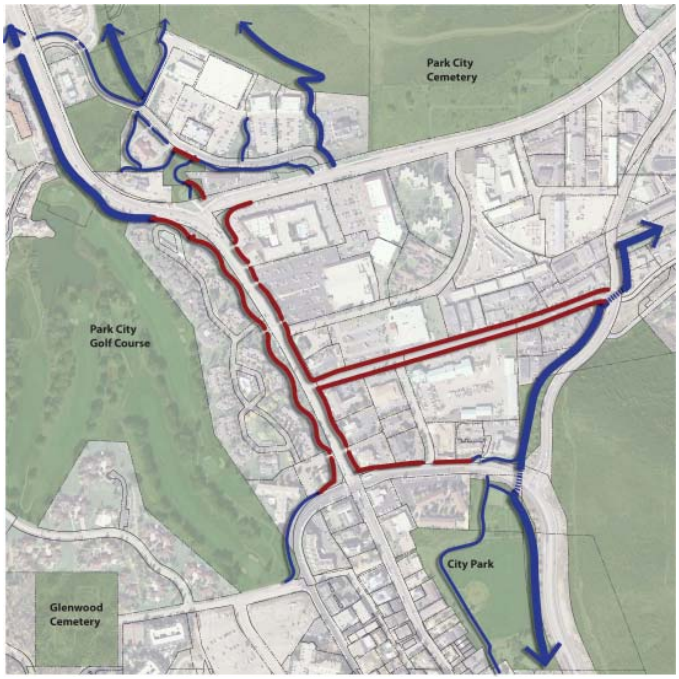


Figure 24. Trail connectivity

Improved Gateway aesthetics

The SR-224/Kearns intersection is a major gateway to Park City and is a marker that you have arrived in the urbanized area of town. Aesthetic improvements here will make a big impact on first and last impressions of the City.

Considerations

The primary considerations for improvements outlined in Phase II include:

- Securing funding for the design and implementation of the roundabout and pedestrian tunnel.

- Based on the conceptual level planning in this document, it appears that there will be some encroachment to the Reid Building parking (which appears to be in the SR-248 Road Right-Of-Way), the Yarrow Hotel property (approximately 3,600 square feet of impacted landscape area) and the Park Avenue Condominiums property (approximately 1,200 square feet of impacted landscape area). The pedestrian tunnel may also impact the Park Avenue Condominium property. Further study will be needed to determine the extent of that impact.

- One access location at the Reid Building and Squatters Restaurant may need to be converted to a right-in / right-out configuration.

- Subgrade utilities will likely be impacted on further investigation and engineering.

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Attributes

The concept drawing illustrated are intended to coincide with the redevelopment of the Bonanza Park area and to alleviate future traffic congestion associated with Bonanza Park and other developments that occur within the next 25+ years. The concepts are very conceptual in nature and will require a significant amount of additional planning and analysis as the need for greater capacity arises.

Traffic volumes associated with this concept will likely vary considerably based on the final outcomes of the Bonanza Park Area Plan study development process that is currently on-going.

This conceptual plan envisions the following Attributes:

- A widened corridor (See *figure 25 and 28*) with up to three travel lanes in each direction, bike lanes in each direction and a generous central median turn lane.

- A second roundabout (See *Figure 26*) at the SR-224 / Deer Valley Drive intersection. The pedestrian tunnel at this location would be re-configured to work with the roundabout geometry.

- All curb cuts will be consolidated into the three locations identified in the preliminary Bonanza Park Area Plan (See *Figure 12*).

- The Phase I trail will remain and a new 10 foot wide multi-use trail will be added to the east side of SR-224.

Benefits

Increased Corridor Capacity

Corridor capacity is increased for all modes with the increase in travel lanes, bike lanes, a multi-use trail and a second roundabout.

Improved corridor Aesthetics and Gateway Experience

This concept plan illustrates a boulevard style road with aesthetics reflective of conditions on SR-224 west of the study area, which are more in line with a welcoming and lush landscape.

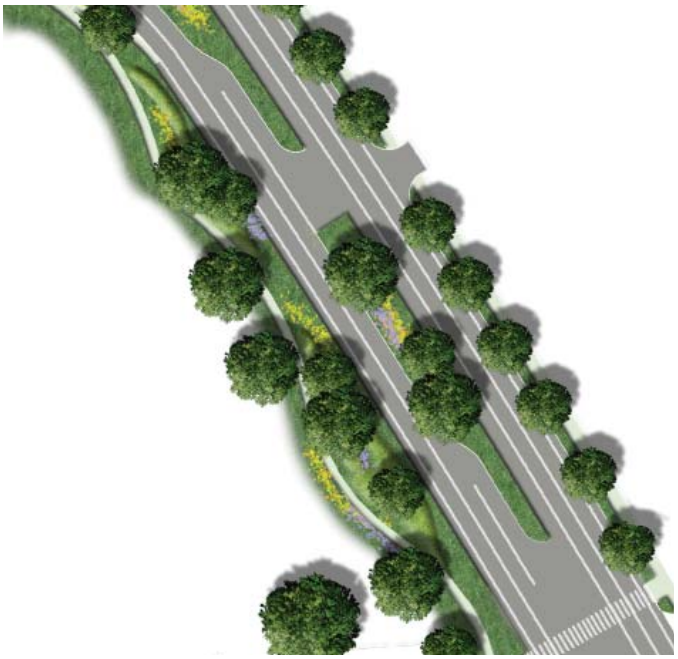


Figure 25. Widened Road Corridor Concept

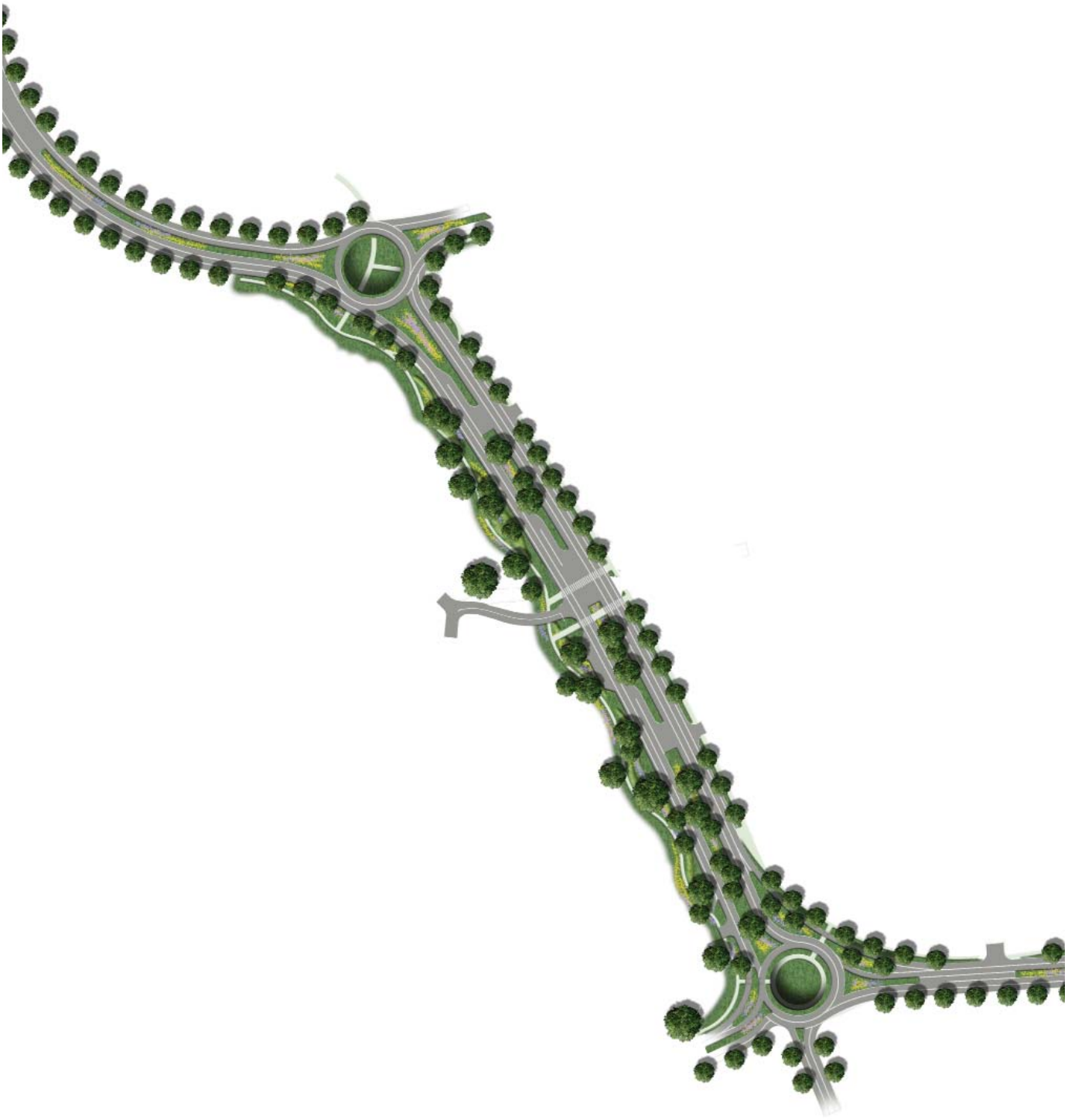


Figure 27. Future Development Concept Drawing

Figure 26. Roundabout Concept

Improved Safety

Consolidated access points along the corridor will improve vehicular and pedestrian safety by reducing conflict points.

Improved Deer Valley Drive / SR-224 Intersection

The proposed roundabout may improve conditions at this intersection. Further evaluation is necessary as the Bonanza Park Redevelopment plan is further developed. This design should be revisited as part of that project's Traffic Impact Study.

The intersection improvement in this concept was not evaluated to quantify operational improvements because timing of implementation is not known and demand volumes are difficult to predict. The current uncertainty about the traffic generated by the development at Bonanza Park would make any future volume prediction inaccurate. As the Bonanza Park redevelopment is refined, further analysis of Phase II improvements and beyond should be initiated prior to implementation.

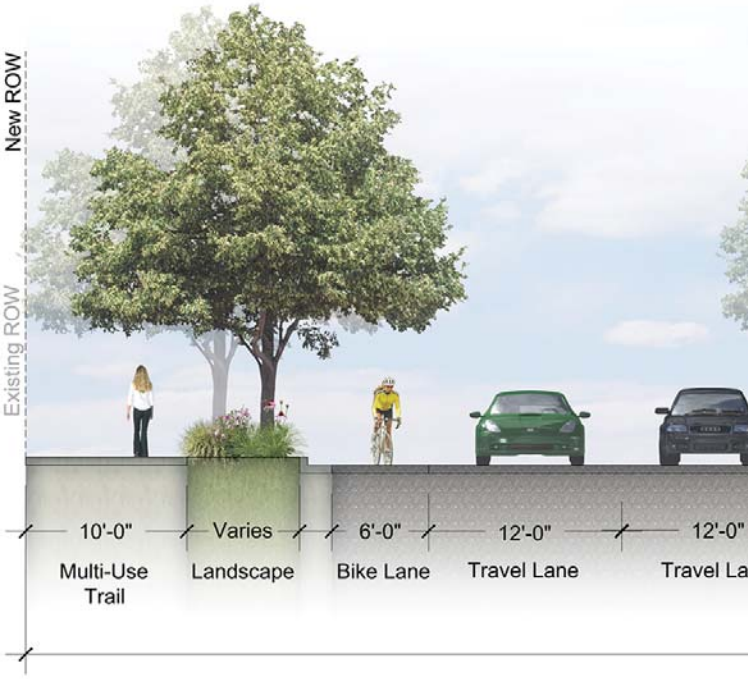
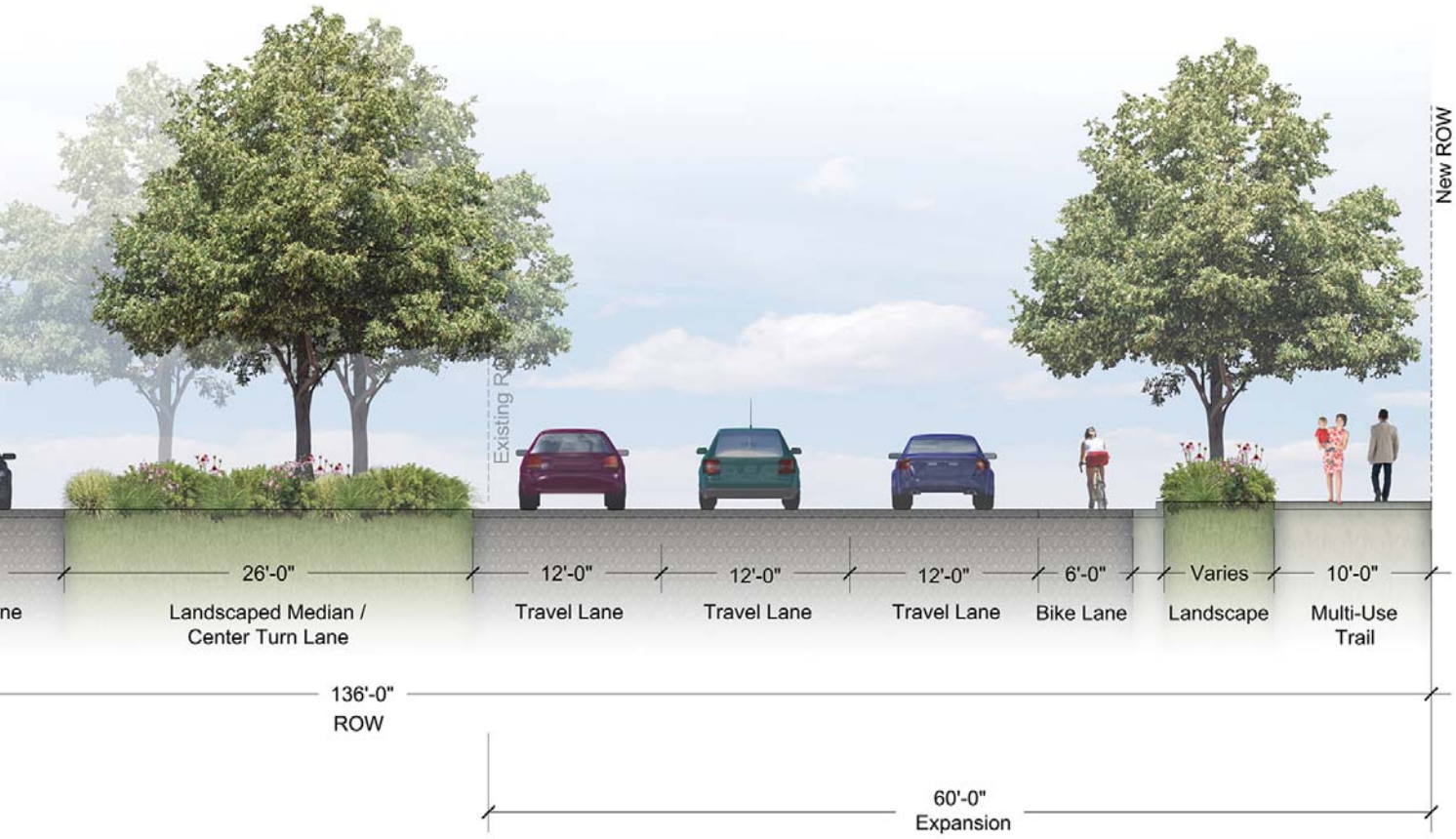


Figure 28. Development Concept A Street Section

Considerations

The primary considerations for improvements outlined in this concept include:

- This concept will require the acquisition of a significant amount of Right-of-Way. The R.O.W. would need to be acquired as land values ascend and properties turn over. For instance, the current intersection of Park Avenue / Deer Valley Drive has improved properties on all four corners. A roundabout here would require further study and may necessitate the purchase of the improved property. This can be expensive and will take time.



• Costs will be high for the installation of a new roundabout, new roadway, landscaping and utility work.

Attributes

This development concept, as illustrated in *Figure 29,* is a radical idea for the Bonanza Park area road system including SR-224 and Bonanza Dr. This idea envisions a couplet system with one-way travel going south-bound on SR-224 from Kearns Blvd.. to Deer Valley Drive and one-way travel on Bonanza Dr. going north-bound from Deer Valley Drive to Kearns Blvd..

This concept essentially moves all peak inbound traffic onto SR-224 and all peak outbound traffic onto Bonanza Dr.

Benefits

Increased Capacity without Right-of-Way Expansion

One of the more intriguing aspects of this concept is that you can increase corridor capacity by having three lanes of travel in each one-way section without an increase to the existing Right-of-Way. This can also be completed without increasing lane-miles in Park City, consistent with the Master Plan and City Council direction.

Improved Gateway Experience and Aesthetics

As illustrated in the street section on *Figure 30*, including three travel lanes in each direction still allows for a substantial amount of landscaping and pedestrian infrastructure to be installed. This relatively narrow road profile could perform well in terms of multi-modal throughput.

Traffic Balancing

Although further study would be required, this configuration could have the effect of enticing more outbound traffic towards Quinn's Junction and US 40, which may alleviate some traffic congestion in Kimball Junction.

Considerations

The primary considerations for improvements related to the this concept include:

- One-way traffic is not good for retail and business owners facing each corridor. The redevelopment of Bonanza Park may make this a moot point if a more internally focused development evolves and a grid of two-way streets is established internal to the couplet.

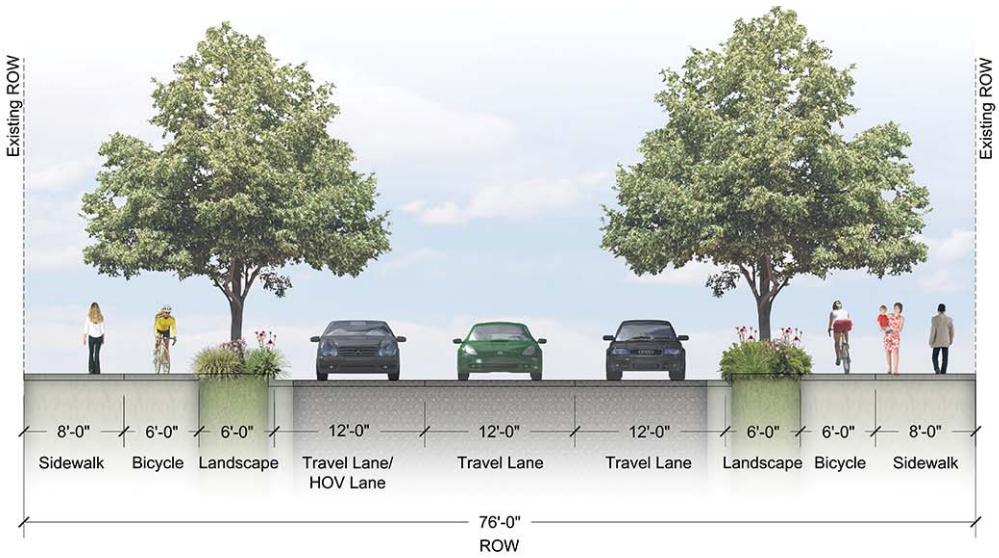


Figure 30. Development Concept B Street Section

- The implementation of this idea would be a major change to the recently completed Bonanza Drive project.

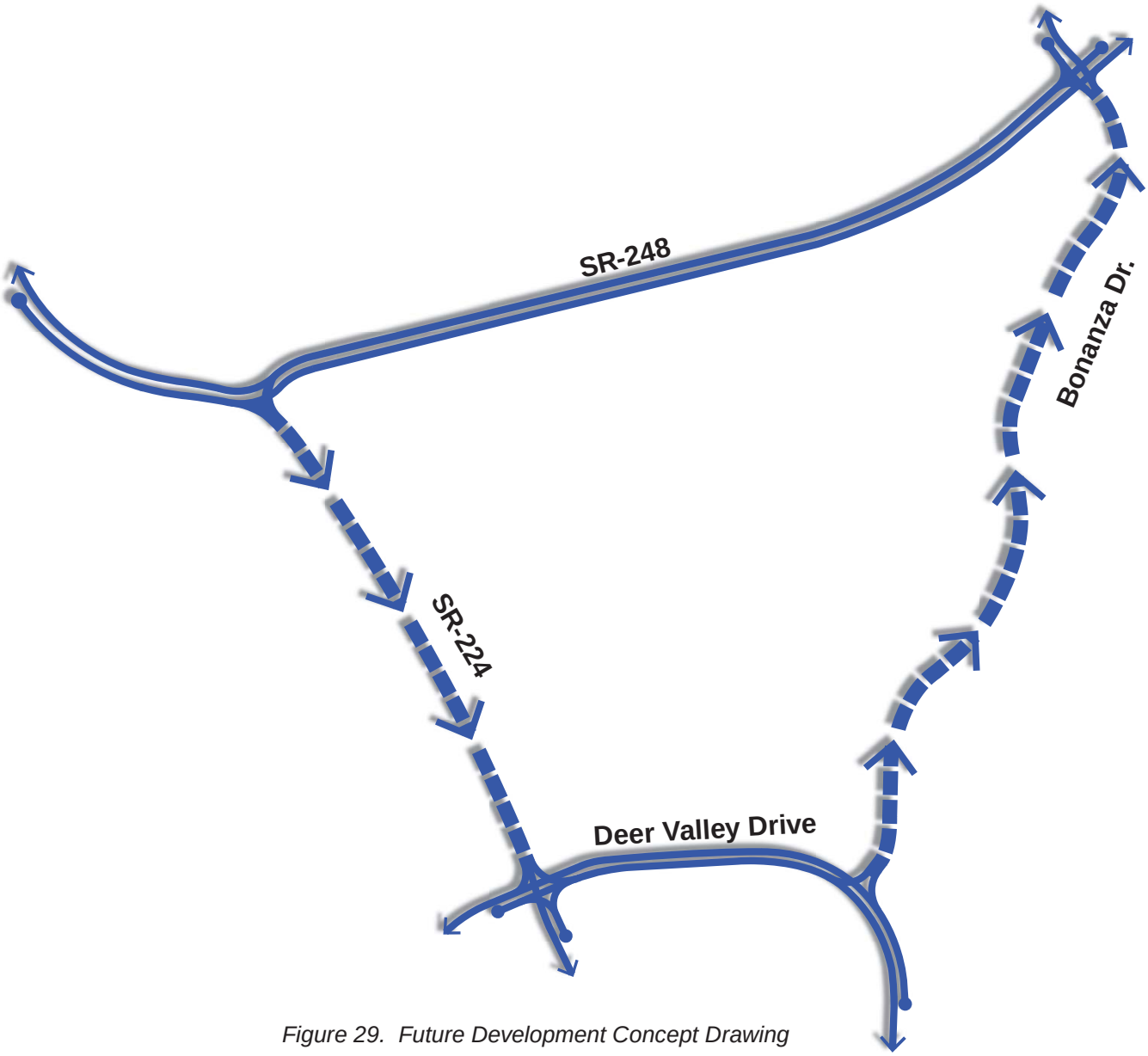


Figure 29. Future Development Concept Drawing


RED
LINE

5

Opinion of Probable Cost

Phase I Probable Cost

SR-224 Corridor Study - Phase 1

Cost Estimate - Concept Level

Prepared By: TCA	Date			Manually Input
Approximate Route Reference Post (BEGIN) =		(END) =		
Accumulated Mileage (BEGIN) =		(END) =		
Project Length =	0.000	miles	ft	
Current Year =	2012			
Assumed Construction Year =	2014			
Construction Items Inflation Factor =	1.24	2 yrs for inflation		
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	3.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	1.0%			
Items not Estimated (% of Construction) =	50.0%			
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #	Construction Items	Quantity	Unit Price	Unit	Cost	Remarks
1-1	Mobilization	1	$297,888.36	lump	$297,888	10% of construction cost
1-2	Public Information Services	1	$5,000.00	lump	$5,000	
1-3	Survey	1	$10,000.00	lump	$10,000	
1-4	Traffic Control	1	$148,944.18	lump	$148,944	5% of construction cost
			General Subtotal		**$461,833**	
	RIGHT OF WAY					
1-5	Right of Way Easements	67140	$6.00	sq ft	$402,840	30% of Land Value estimated at $20 per Sq Ft
			Right of Way Subtotal		**$402,840**	
	PHASE 1A - SEPARATED TRAIL					
1A-1	Sidewalk	2840	$23.50	sq yd	$66,740	trail
1A-2	Grading	7460	$2.00	sq yd	$14,920	
1A-3	Earthwork	2462	$10.00	cu yd	$24,620	
1A-4	Construct Berm/Import Topsoil	2829	$28.00	cu yd	$79,212	
1A-5	Trash Receptacles	5	$1,100.00	each	$5,500	
1A-6	Planting Box	6	$800.00	each	$4,800	
1A-7	Benches	4	$1,400.00	each	$5,600	
1A-8	Waiting Shelter	0	$15,000.00	each	$0	Utilize existing Shelters
1A-9	Bike Rack	4	$750.00	each	$3,000	
1A-10	Highway Lights	12	$4,000.00	each	$48,000	
1A-11	Trees	35	$400.00	each	$14,000	
1A-12	Shrubs	500	$35.00	each	$17,500	
1A-13	Irrigation System	1	$40,000.00	lump	$40,000	
1A-14	Turf Sod/Flowers	89467	$0.50	sq ft	$44,734	
1A-15	Landscape Boulders	30	$50.00	each	$1,500	
			Subtotal for Phase 1A		**$370,126**	
	PHASE1B- LAME DOG LN/HOMESTAKE RD/SR-224 INTERSECTION					
1B-1	HMA - 3/4 Inch	1,061	$80.00	ton	$84,900	7" HMA
1B-2	Untreated Base Course	587	$35.00	cu yd	$20,554	8" UTBC
1B-3	Granular Borrow	1,101	$19.00	cu yd	$20,919	15" GB
1B-4	Roadway Excavation	1,809	$9.00	cu yd	$16,281	
1B-5	Curb and Gutter Type B1	1,802	$16.75	ft	$30,184	
1B-6	Drainage Catch Basins	6	$3,000.00	each	$18,000	
1B-7	Drainage Manholes	2	$5,000.00	each	$10,000	
1B-8	Drainage Pipe	500	$50.00	ft	$25,000	
1B-9	Signing/Striping/Pavement Markings	1	$10,000.00	lump	$10,000	
1B-10	Trees	5	$400.00	each	$2,000	
1B-11	Landscaping	1	$30,000.00	lump	$30,000	
1B-12	Highway Lights	4	$4,000.00	each	$16,000	
1B-13	Pedestrian/Intersection Signalization	1	$110,000.00	lump	$110,000	Lame Dog/Homestake
1B-14	Relocate Utilities	1	$25,000.00	lump	$25,000	
			Subtotal for Phase 1B		**$418,837**	

	PHASE 1C - LANDSCAPED MEDIAN					
1C-1	Remove Asphalt Pavement	2282	$4.06	sq yd	$9,266	
1C-2	Roadway Excavation	380	$9.00	cu yd	$3,423	
1C-3	Type B4 Curb	3575	$14.90	ft	$53,268	
1C-4	Plowable End Section	12	$815.00	each	$9,780	
1C-5	Import Topsoil	1332	$28.00	cu yd	$37,296	
1C-6	Shrub Plantings	1200	$35.00	each	$42,000	
1C-7	Irrigation System	6	$3,500.00	each	$21,000	
1C-8	Trench/Bore Electrical Utility	6	$2,000.00	ft	$12,000	Water/Electricity
1C-9	Connect Water Utility	6	$2,000.00	ft	$12,000	
				Subtotal for Phase 1C	**$200,033**	
	PHASE 1D - PEDESTRIAN TUNNEL AT DEER VALLEY DRIVE					
1D-1	Roadway Excavation	4,000	$9.00	cu yd	$36,000	
1D-2	Sidewalk	1,088	$23.50	sq yd	$25,568	trail
1D-3	Roadway Reconstruction	5,088	$15.00	sq ft	$76,320	
1D-4	Pedestrian Tunnel	116	$3,000.00	cu yd	$348,000	
1D-5	Retaining wall	4,500	$75.00	sq ft	$337,500	
1D-6	Drainage Catch Basins	4	$3,000.00	each	$12,000	
1D-7	Drainage Manholes	1	$5,000.00	each	$5,000	
1D-8	Drainage Pipe	250	$50.00	ft	$12,500	
1D-9	Signing/Striping/Pavement Markings	1	$10,000.00	lump	$10,000	
1D-10	Landscaping	1	$50,000.00	lump	$50,000	
1D-11	Relocate 2 Signal Foundations	1	$115,000.00	lump	$115,000	
1D-12	Loop Water Line	1	$50,000.00	lump	$50,000	
1D-13	Realign Sewer Line (or Install Lift Station)	1	$500,000.00	lump	$500,000	
1D-14	Relocate Gas Line	1	$32,000.00	lump	$32,000	
1D-15	Relocate Phone Line	1	$20,000.00	lump	$20,000	
1D-16	Relocate Fiber Optic Line	1	$40,000.00	lump	$40,000	
1D-17	Transport Material Offsite	4,000	$30.00	cu yd	$120,000	
				Subtotal for Phase 1D	**$1,789,888**	
	PHASE 1E - DEER VALLEY DR. SIGNAL					
1E-1	Signal Improvements @ Deer Valley Dr.	1	$50,000.00	Lump	$50,000	
				Subtotal for Phase 1E	**$50,000**	
	PHASE 1F - VMS SYSTEM					
1F-1	VMS System	1	$150,000.00	Lump	$150,000	
				Subtotal for Phase 1F	**$150,000**	
				Phase 1 Subtotal	$3,440,716	
			Contingency For Items Not Estimated	(50%)	$1,720,358	
				Construction Subtotal	**$5,161,074**	
P.E. Cost				**P.E. Subtotal**	$413,000	8%
C.E. Cost				**C.E. Subtotal**	$516,000	10%
Right of Way				**Right of Way Subtotal**	$402,840	
Incentives				**Incentives Subtotal**	$0	
Miscellaneous				**Miscellaneous Subtotal**	$0	

Cost Estimate		**2012**		**2014**
P.E.		**$413,000**		**$438,000**
Right of Way		**$403,000**		**$411,000**
Construction		**$5,161,000**		**$6,400,000**
C.E.		**$516,000**		**$547,000**
Incentives		**$0**		**$0**
Aesthetics		**$0**		**$0**
Change Order Contingency	**9%**	**$464,490**		**$576,000**
UDOT Oversight		**$0**		**$0**
Miscellaneous		**$0**		**$0**
	TOTAL	**$6,957,490**	**TOTAL**	**$8,372,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$6,957,490**	**TOTAL**	**$8,372,000**

Phase II Probable Cost

SR-224 Corridor Study - Phase 2

Cost Estimate - Concept Level

Prepared By: TCA	**Date**		Manually Input
Approximate Route Reference Post (BEGIN) =		(END) =	
Accumulated Mileage (BEGIN) =		(END) =	
Project Length =	0.000	miles	ft
Current Year =	2012		
Assumed Construction Year =	2020		
Construction Items Inflation Factor =	1.66	8 yrs for inflation	
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	3.0%		
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	1.0%		
Items not Estimated (% of Construction) =	50.0%		
Preliminary Engineering (% of Construction + Incentives) =	8.0%		
Construction Engineering (% of Construction + Incentives) =	10.0%		

Item #	Construction Items	Quantity	Unit Price	Unit	Cost	Remarks
2-1	Mobilization	1	$143,124.31	lump	$143,124	10% of construction cost
2-2	Public Information Services	1	$5,000.00	lump	$5,000	
2-3	Survey	1	$14,312.43	lump	$14,312	1% of construction cost
2-4	Traffic Control	1	$71,562.16	lump	$71,562	5% of construction cost
			General Subtotal		**$233,999**	
	PHASE 2A- ROUNDABOUT					
2A-1	HMA - 3/4 Inch	2,062	$80.00	ton	$164,960	7" HMA
2A-2	Untreated Base Course	1,141	$35.00	cu yd	$39,935	8" UTBC
2A-3	Granular Borrow	2,140	$19.00	cu yd	$40,660	15" GB
2A-4	Roadway Excavation	7,106	$9.00	cu yd	$63,954	
2A-5	Type B4 Curb	2,038	$14.90	ft	$30,366	
2A-6	Curb and Gutter Type B1	1,300	$16.75	ft	$21,775	
2A-7	Plowable End Section	1	$815.00	each	$815	
2A-8	Roundabout Apron	391	$45.00	sq yd	$17,595	8" Concrete, 4" UTBC
2A-9	Sidewalk	260	$23.50	sq yd	$6,110	Trail
2A-10	Pedestrian Tunnel 1	50	$3,000.00	ft	$150,000	
2A-11	Pedestrian Tunnel 2	60	$3,000.00	ft	$180,000	
2A-12	Retaining Wall	2,150	$70.00	sq ft	$150,500	
2A-13	Drainage Catch Basins	6	$3,000.00	each	$18,000	
2A-14	Drainage Manholes	2	$5,000.00	each	$10,000	
2A-15	Drainage Pipe	750	$50.00	ft	$37,500	
2A-16	Signing/Striping/Pavement Markings	1	$20,000.00	lump	$20,000	
2A-17	Import Topsoil	1,746	$28.00	cu yd	$48,893	
2A-18	Shrub Plantings	1,000	$35.00	each	$35,000	
2A-19	Irrigation System	4	$3,500.00	each	$14,000	
2A-20	Highway Lights	4	$4,000.00	each	$16,000	
2A-21	Loop Water Line	1	$20,000.00	lump	$20,000	
2A-22	Relocate Sewer Line	1	$40,000.00	lump	$40,000	
2A-23	Relocate Gas Line	1	$32,000.00	lump	$32,000	
2A-24	Relocate Phone Line	1	$20,000.00	lump	$20,000	
2A-25	Relocate Fiber Optic Line	1	$40,000.00	lump	$40,000	
2A-26	Transport Material Offsite	7,106	$30.00	cu yd	$213,180	
			Subtotal for Phase 2A		**$1,431,243**	
				Phase 2 Subtotal	$1,665,242	
			Contingency For Items Not Estimated	(50%)	$832,621	
				Construction Subtotal	**$2,497,863**	
P.E. Cost				**P.E. Subtotal**	$200,000	8%
C.E. Cost				**C.E. Subtotal**	$250,000	10%
Right of Way				**Right of Way Subtotal**		
Incentives				**Incentives Subtotal**		
Miscellaneous				**Miscellaneous Subtotal**		

Cost Estimate		2012		2020
P.E.		$200,000		$253,000
Right of Way		$0		$0
Construction		$2,498,000		$4,151,000
C.E.		$250,000		$317,000
Incentives		$0		$0
Aesthetics	1%	$25,000		$42,000
Change Order Contingency	9%	$227,070		$377,000
UDOT Oversight		$0		$0
Miscellaneous		$0		$0
	TOTAL	$3,200,070	TOTAL	$5,140,000

PROPOSED COMMISSION REQUEST	TOTAL	$3,200,070	TOTAL	$5,140,000

Future Development Concept A Probable Cost

SR-224 Corridor Study - Development Concept A (Widen SR-224)

Cost Estimate - Concept Level

Prepared By: TCA	Date		Manually Input
Approximate Route Reference Post (BEGIN) =		(END) =	
Accumulated Mileage (BEGIN) =		(END) =	
Project Length =	0.000	miles	ft
Current Year =	2012		
Assumed Construction Year =	2030		
Construction Items Inflation Factor =	2.71	18 yrs for inflation	
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	3.0%		
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	1.0%		
Items not Estimated (% of Construction) =	50.0%		
Preliminary Engineering (% of Construction + Incentives) =	8.0%		
Construction Engineering (% of Construction + Incentives) =	10.0%		

Item #	Construction Items	Quantity	Unit Price	Unit	Cost	Remarks
3-1	Mobilization	1	$383,115.96	lump	$383,116	10% of construction cost
3-2	Public Information Services	1	$5,000.00	lump	$5,000	
3-3	Survey	1	$38,311.60	lump	$38,312	1% of construction cost
3-4	Traffic Control	1	$191,557.98	lump	$191,558	5% of construction cost
	RIGHT OF WAY					
3-5	Lump Sum Estimate	1	$1,329,984.00	lump	$9,944,188	Taxable Market Value (2012)
	ROADWAY					
3-12	HMA - 3/4 Inch	8,502	$70.00	ton	$595,140	7" HMA
3-13	Untreated Base Course	4,704	$35.00	cu yd	$164,640	8" UTBC
3-14	Granular Borrow	8,821	$19.00	cu yd	$167,599	15" GB
3-15	Roadway Excavation	17,966	$9.00	cu yd	$161,694	
3-16	Type B4 Curb	5,307	$14.90	ft	$79,074	
3-17	Curb and Gutter Type B1	5,967	$16.75	ft	$99,947	
3-18	Plowable End Section	9	$815.00	each	$7,335	
3-19	Roundabout Apron	412	$45.00	sq yd	$18,535	8" Concrete, 4" UTBC
3-20	Sidewalk	1,034	$23.50	sq yd	$24,299	Trail
3-21	Signing and Striping	1	$30,000.00	lump	$30,000	
	STRUCTURES					
3-22	Pedestrian Tunnel 1	60	$3,000.00	ft	$180,000	
3-23	Pedestrian Tunnel 2	70	$3,000.00	ft	$210,000	
3-24	Pedestrian Tunnel 3 (Kearns Blvd)	66	$3,000.00	ft	$198,000	
3-25	Retaining Wall	12,525	$70.00	sq ft	$876,750	
	DRAINAGE					
3-26	Drainage Catch Basins	28	$3,000.00	each	$84,000	
3-27	Drainage Manholes	7	$5,000.00	each	$35,000	
3-28	Drainage Pipe	4,000	$50.00	ft	$200,000	
	LANDSCAPING					
3-29	Import Topsoil	4,132	$28.00	cu yd	$115,696	
3-30	Trees	13	$400.00	each	$5,200	
3-31	Shrub Plantings	2,550	$35.00	each	$89,250	
3-32	Irrigation System	8	$3,500.00	each	$28,000	
3-33	Waiting Shelter	2	$12,500.00	each	$25,000	
3-34	Highway Lighting	12	$4,000.00	each	$48,000	
	UTILITIES					
3-35	Loop Water Line	1	$15,000.00	lump	$15,000	
3-36	Relocate Sewer Line	1	$10,000.00	lump	$10,000	
3-37	Relocate Gas Line	1	$8,000.00	lump	$8,000	
3-38	Relocate Phone Line	1	$5,000.00	lump	$5,000	
3-39	Relocate Fiber Optic Line	1	$10,000.00	lump	$10,000	
3-40	Transport Material Offsite	17,000	$20.00	cu yd	$340,000	
			Phase 3 Alternate 1 Subtotal		$4,449,145	

	Contingency For Items Not Estimated (50%)	$2,224,573	
	Construction Subtotal	**$6,673,718**	
P.E. Cost	**P.E. Subtotal**	$534,000	8%
C.E. Cost	**C.E. Subtotal**	$667,000	10%
Right of Way	**Right of Way Subtotal**	$9,944,188	
Incentives	**Incentives Subtotal**		
Miscellaneous	**Miscellaneous Subtotal**		

Cost Estimate		**2012**		**2030**
P.E.		**$534,000**		**$909,000**
Right of Way		**$9,944,000**		**$11,895,000**
Construction		**$6,674,000**		**$18,066,000**
C.E.		**$667,000**		**$1,136,000**
Incentives		**$0**		**$0**
Aesthetics	**1%**	**$67,000**		**$181,000**
Change Order Contingency	**9%**	**$606,690**		**$1,642,000**
UDOT Oversight		**$0**		**$0**
Miscellaneous		**$0**		**$0**
	TOTAL	**$18,492,690**	**TOTAL**	**$33,829,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$18,492,690**	**TOTAL**	**$33,829,000**

Future Development Concept B Probable Cost

SR-224 Corridor Study - Future Development Alternative B (Couplet)

Cost Estimate - Concept Level

Prepared By: TCA	Date		Manually Input
Approximate Route Reference Post (BEGIN) =		(END) =	
Accumulated Mileage (BEGIN) =		(END) =	
Project Length =	0.000	miles	ft
Current Year =	2012		
Assumed Construction Year =	2030		
Construction Items Inflation Factor =	2.71	18 yrs for inflation	
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	3.0%		
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	1.0%		
Items not Estimated (% of Construction) =	50.0%		
Preliminary Engineering (% of Construction + Incentives) =	8.0%		
Construction Engineering (% of Construction + Incentives) =	10.0%		

Item #	Construction Items	Quantity	Unit Price	Unit	Cost	Remarks
3-1	Mobilization	1	$263,186.24	lump	$263,186	10% of construction cost
3-2	Public Information Services	1	$5,000.00	lump	$5,000	
3-3	Survey	1	$26,318.62	lump	$26,319	1% of construction cost
3-4	Traffic Control	1	$131,593.12	lump	$131,593	5% of construction cost
				General Subtotal	**$426,098**	
	RIGHT OF WAY- (fit within existing Right of Way)					
				Right of Way Subtotal	**$0**	
	BONANZA DRIVE- (Assume full reconstruction will be req'd)					
3-7	HMA - 3/4 Inch	5,171	$70.00	ton	$361,970	7" HMA
3-8	Untreated Base Course	2,861	$35.00	cu yd	$100,135	8" UTBC
3-9	Granular Borrow	5,365	$19.00	cu yd	$101,935	15" GB
3-10	Roadway Excavation	7,137	$9.00	cu yd	$64,233	
3-11	Curb and Gutter Type B1	10,300	$16.75	ft	$172,525	
3-12	Sidewalk	5,436	$23.50	sq yd	$127,749	
3-13	Drainage Catch Basins	26	$3,000.00	each	$78,000	
3-14	Drainage Manholes	5	$5,000.00	each	$25,000	
3-15	Drainage Pipe	3,000	$50.00	ft	$150,000	
3-16	Signing and Striping	1	$25,000.00	lump	$25,000	
3-17	Import Topsoil	2003	$28.00	cu yd	$56,078	
3-18	Trees	50	$400.00	each	$20,000	
3-19	Shrub Plantings	1250	$35.00	each	$43,750	
3-20	Irrigation System	20	$3,500.00	each	$70,000	
3-21	Highway Lights	26	$4,000.00	each	$104,000	
3-22	Signal Modifications	2	$50,000.00	each	$100,000	
3-23	Utility Relocates	1	$100,000.00	lump	$100,000	
				Subtotal for Phase 3 Bonanza Drive	**$1,700,374**	

	SR-224- (Assume full reconstruction will be req'd)					
3-24	HMA - 3/4 Inch	2,450	$70.00	ton	$171,500	7" HMA
3-25	Untreated Base Course	1,356	$35.00	cu yd	$47,460	8" UTBC
3-26	Granular Borrow	2,542	$19.00	cu yd	$48,298	15" GB
3-27	Roadway Excavation	3,803	$9.00	cu yd	$34,227	
3-28	Curb and Gutter Type B1	3,050	$16.75	ft	$51,088	
3-29	Sidewalk	4,744	$23.50	sq yd	$111,494	
3-30	Type B4 Curb	400	$14.90	ft	$5,960	
3-31	Drainage Catch Basins	15	$3,000.00	each	$45,000	
3-32	Drainage Manholes	2	$5,000.00	each	$10,000	
3-33	Drainage Pipe	2,000	$50.00	ft	$100,000	
3-34	Signing and Striping	1	$25,000.00	lump	$25,000	
3-35	Import Topsoil	1,186	$28.00	cu yd	$33,211	
3-36	Trees	40	$400.00	each	$16,000	
3-37	Shrub Plantings	750	$35.00	each	$26,250	
3-38	Irrigation System	12	$3,500.00	each	$42,000	
3-39	Highway Lights	16	$4,000.00	each	$64,000	
3-40	Signal Modifications	1	$50,000.00	each	$50,000	
3-41	Utility Relocates	1	$50,000.00	lump	$50,000	
			Subtotal for Phase 3 SR-224		**$931,488**	
			Phase 3 Alternate 2 Subtotal		$3,057,960	
			Contingency For Items Not Estimated	(50%)	$1,528,980	
			Construction Subtotal		**$4,586,940**	
P.E. Cost			**P.E. Subtotal**		$367,000	8%
C.E. Cost			**C.E. Subtotal**		$459,000	10%
Right of Way			**Right of Way Subtotal**		$0	
Incentives			**Incentives Subtotal**			
Miscellaneous			**Miscellaneous Subtotal**			

Cost Estimate		**2012**		**2030**
P.E.		**$367,000**		**$625,000**
Right of Way		**$0**		**$0**
Construction		**$4,587,000**		**$12,416,000**
C.E.		**$459,000**		**$781,000**
Incentives		**$0**		**$0**
Aesthetics	**1%**	**$46,000**		**$125,000**
Change Order Contingency	**9%**	**$416,970**		**$1,129,000**
UDOT Oversight		**$0**		**$0**
Miscellaneous		**$0**		**$0**
	TOTAL	**$5,875,970**	**TOTAL**	**$15,076,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$5,875,970**	**TOTAL**	**$15,076,000**

6

Funding Opportunities

Introduction

There are a variety of transportation modes that will be accommodated by the recommended improvements along SR-224. While this may appear to make implementation more complicated, it actually increases the pool of funding sources available. The good news is that SR-224 is a state facility, which opens up significant funding opportunities. Additionally, nearly all of the recommendations are multi-modal in nature, meaning that a variety of funding sources can and should be considered.

Currently, local, state and federal infrastructure funding is tight, with little relief on the horizon. However, there are still projects getting built, and those that are successful are those that have the most aggressive, and creative, "champions".

Rather than provide an exhaustive list of all possible funding programs, from private through Federal, the options in this report provide recommendations for funding related to the type of improvement.

Recent plans, such as the 2011 Short Range Transit Development Plan Update, have a comprehensive list of funding opportunities. Another excellent source is the Wasatch Front Regional Council's annual Transportation Improvement Program.

Although Park City is currently not part of a Metropolitan Planning Organization (MPO), this document is an excellent primer on project development and funding. The content is intended to spark ideas for funding but is not meant to be a prescriptive formula for success.

Park City staff does, and should continue to keep a careful and inquisitive perspective on all types of infrastructure funding opportunities, especially in the current political and fiscal environment.

Phase I

The Phase I projects are a wide-ranging collection of improvements which benefit all modes of travel to varying degrees.

- **Pedestrian tunnel at SR-224 / Deer Valley Dr. intersection:** This project is a good candidate to use funds from the Park City Walkability Bond. Close collaboration with UDOT will be necessary.

- **Variable Message System**:
UDOT, the two ski resorts and the City should be responsible for implementation of the Variable Message Signs (VMS), which benefits traffic management primarily during peak periods.

- **Park Avenue/Deer Valley Drive Signal Upgrade:**
UDOT Region 2 and Traffic Operations Center should be contacted to improve the traffic signal (to provide for right turn overlap) at the SR-224 and Deer Valley Drive intersection.

- **Sidewalks and landscaping:**
Similar to the recommended tunnel, the City's Bond should be considered for the sidewalk and landscaping improvements along SR-224. Negotiations regarding possible cost-sharing should begin soon with the Park Avenue Condominium regarding the west side sidewalk and landscaping improvements.

- **Lame Dog Road Realignment:**
UDOT and the City should develop a joint plan for the realignment of Lame Dog Rd. There is a potential opportunity to make this modification concurrent with a water line reconstruction. There will be benefits to all users of the corridor and funding from transit, UDOT, and City sources should be considered.

- **Access Consolidation:**
  The City, in conjunction with UDOT, should use the driveway consolidation plan to work with property owners.

Phase II

- **Kearns Roundabout:**
  The roundabout and associated pedestrian and bicycle tunnel at Kearns (SR-248) and SR-224 is a major project that may seem like a long way in the future. However, project development for a major project has to start early. It can take many years of continuing analysis, environmental clearance and property negotiations in order to line up funding. The first step is to continue to work with UDOT to demonstrate the benefits. Staff changes fairly frequently and it will take on-going communication to keep this project on track.

Future Phases

The two alternatives for long-term improvements on SR-224 are too preliminary to have funding recommendations associated with them. However, if further analysis and discussion result in a desire to start some cogs in motion to prepare for future conditions, there are some steps that can be taken:

- **Future Development Concept A (Corridor Widening):**
  The most important action is to have an ultimate agreed-upon right-of-way width coordinated with UDOT. During the course of natural business cycles, properties will eventually change hands, and/or redevelop and new setbacks can be negotiated. The big unknown for this concept is what the ultimate plan for the Bonanza Park area will be. That plan will likely include access changes to SR-224 as well as changes to future land uses that may or may not be consistent with the Phase III alternatives.

- **Future Development Concept B (Couplet):**
  This concept will be highly dependent on the outcome(s) of the Bonanza Park planning process. There may be internal circulation ideas within BOPA that make the initial concerns of the couplet concept more compatible in the future. Regardless, as redevelopment occurs and demands on SR-224 increase, it will take dedication to ensure that all implementation opportunities are recognized and acted upon.

Additional Funding Options

In addition to these recommended programs and partnerships, there are some additional grant programs that the City staff should consider that may be outside the normal funding discussions but can provide additional benefits if successful:

- **Community Development Block Grants (CDBG):**
  The primary objective of the CDBG Program is the development of viable urban communities by providing decent housing and suitable living environment and expanding economic opportunities, principally for persons of low and moderate income.

  Certain general eligibility requirements must be adhered to, and specific activities that directly benefit low and moderate-income residents must follow income limits set yearly by The Department of Housing and Urban Development (HUD). Eligible geographic areas must contain at least 32.5% low and moderate-income residents based on current U.S. Census data.

  Overall, at least 70% of all CDBG activities must benefit low and moderate-income residents. CDBG funds are administered and can be used for alternative transportation modes such as bicycle and pedestrian facilities like the sidewalk and transit stop improvements along SR-224,

since low-income residents are typically more reliant upon these modes.

• **Transportation Enhancement Program (TE):**
Park City was one of the early recipients of this UDOT-administered FHWA program. Clearly, the bike and pedestrian elements are eligible for this program. A State's TE funding is derived from a set-aside amount from its annual Surface Transportation Program apportionment. In 2005, the amount set-aside for TE was 10% of the State's STP apportionment (after application of the set-aside for the State Planning and Research program). After 2005, the TE set-aside became 10% or the amount set aside for TE in the State in 2005, whichever was greater. There is no single criterion or definition for what constitutes an "enhancement" project. While this program seems to be in a precarious position, it has survived several attempts at elimination so far.

• **Highway Safety Improvement Program (HSIP):**
Beginning in FY2006, safety improvement projects became funded through the new Highway Safety Improvement Program, which was established under SAFETEA-LU "to achieve a significant reduction in traffic fatalities and serious injuries on all public roads." These funds may be used to carry out any highway safety improvement project on any public road or publicly owned bicycle or pedestrian pathway or trail.

High priority projects under this program are railway-highway crossings, improvements on high-risk rural roads, and infrastructure needs related to highway safety improvement projects. This program may be a good source of funding for the Lame Dog Road realignment project. This funding source is programmed by UDOT Traffic & Safety group.

• TIGER:
Transportation Investments Generating Economic Recovery, is a USDOT competitive grant program funding infrastructure projects that promote economic competitiveness, improve energy efficiency, reduce greenhouse gas emissions and improve safety, quality-of-life and working environments in communities. Unlike last year, no planning grants will be awarded this year and all the funding will be for project implementation. Many of the projects recommended on SR-224 are good candidates.

• TIGGER:
Transit Investment Greenhouse Gas and Energy Reduction is an FTA competitive grant program that provides funding for:

1) capital investments that assist in reducing the energy consumption of a transit system and

2) capital investments that will reduce greenhouse gas emissions of a public transportation system.

The intersection improvements benefit transit, so Park City could make a strong case for these funds as part of an overall corridor program that will clearly reduce idling and congestion for all modes.

• TCSP:
Transportation Community & System Preservation is an FHWA grant program. Livability is a criterion that will be used to evaluate the candidate projects. Planning grants, implementation grants and research, could include transit projects. Complete streets, streetscaping, pedestrian/bike improvements or plans, implementation of transit-oriented development plans, traffic calming measures, and much more. This is a very flexible program. Projects must improve relationships among transportation, community,

and system preservation plans and practices. The funding for this program is managed by UDOT via FHWA.

• Safe Sidewalks Program:
The Utah State Legislature has recognized the need for adequate sidewalk and pedestrian safety devices, and state policy declares that pedestrian safety considerations shall be included in all state highway engineering and planning for all projects where pedestrian traffic would be a significant factor.

The Safe Sidewalks Program provides a legislative funding source for construction of new sidewalks adjacent to state routes where sidewalks do not currently exist and where major construction or reconstruction of the route, at that location, is not planned for 10 or more years. For a proposed sidewalk location to be considered for the Safe Sidewalks Program, it must be:

1) located adjacent to a State highway,

2) be located within an urban area or an area where the immediate environment of the project is of an urban nature, and

3) experience significant pedestrian traffic. A 25% local government match is required for this program. UDOT Traffic & Safety programs this funding source.

• Special Improvement Districts:
Cities and Counties in Utah may create SIDs for permanently improving the roadways, curb, gutter, and sidewalks on any city or county road. There are a couple criteria that must be met:

1) The project must be within a special improvement district as set up by the County Commission or City Council.

2) The cost of road improvements in any special road district except the intersection of roads within such districts shall be assessed upon the lots and lands abutting upon the roads.

Although setting up a SID for large scale transportation projects is unusual, these are unusual times and a SID should be explored, especially in light of the significant redevelopment of the BOPA area and also given that many properties can expect to be “turned over” due to their typical lifespan within the horizon of this report’s recommendations.

• Robert Wood Johnson Foundation:
The Robert Wood Johnson Foundation provides $370 million in grants annually to projects that improve public health, including bicycle and pedestrian projects. The Foundation operates several programs around the theme of public health, including Active Living By Design and the Active Living Resource Center.


BONANZA DR

7

Action Plan

The key to success of any plan is a clear course of action. Recommendations are relatively easy compared with implementation. Above all, our experience has proven that there has to be a "champion" in order to follow through with all the necessary actions to get the recommendations built.

An Action Plan is outlined below that will give policy-makers and staff direction and suggestions for implementation. The Action Plan does not go into detail about the different funding sources available; that is discussed in more detail in a subsequent chapter.

Phase I Action Plan

- Pedestrian tunnel at Empire Drive intersection
  1) Survey the property

  2) Conduct feasibility level engineering, including concept layout, utility exploration, and more detailed discussion with the adjacent property owners. Engage UDOT Region Two staff early to ensure coordination.

  3) If it is determined that the project is physically feasible and if UDOT Region Two authorizes the project to move forward, develop implementation drawings.

- Park Avenue/Deer Valley Drive Signal Upgrade
  1) UDOT Region 2 and Traffic Operations Center (TOC) should be contacted to improve the traffic signal (to provide for right turn overlap) at the SR-224 and Empire intersection. The consultant team has already met with the TOC staff to discuss.

- Travel Time Variable Messaging (VMS)
  1) Similar to above, staff should contact UDOT Region 2 and the TOC staff to help identify funding and implementation. The consultant team has already met with the TOC staff to discuss.

- Homestake/Lame Dog Road Realignment, Sidewalks and Landscaping
  1) Survey the property for use in easement negotiations and design drawings

  2) These improvements should be combined as one single project. Staff should develop a more detailed proposal for the Park Avenue Condominium Board with intent to secure an easement along the west side of SR-224 for sidewalk and landscaping improvements. Concurrently, a more detailed engineering study should be conducted for the re-aligned intersection. This effort should be coordinated with UDOT Region Two staff since a new traffic signal will be part of the project.

  3) Additionally, opportunities to combine this project with a waterline reconstruction have been identified. These projects should be coordinated to be implemented concurrently.

- Access Consolidation
  1) The City, in conjunction with UDOT, should use the driveway consolidation plan to work with property owners as redevelopment occurs. A change in access use requires a new access permit from UDOT. This process should be followed with all redevelopment along the corridor. Short of a major reconstruction project, this is about the only opportunity to negotiate access issues. Specifically related to the driveway spacing concerns on Iron Horse Drive and SR-224, a median could be constructed approximately 100' from SR-224 on Iron Horse to reduce congestion and improve safety.

Phase II Action Plan – SR-224/SR-248 Roundabout

Unlike Phase I projects, the Phase II projects need to be integrated with the land use planning to account for the subsequent new trips and/or new circulation patterns that may result from the BOPA redevelopment planning effort.

- Assign new trips and traffic patterns resulting from BOPA to the traffic model;
- Continue to work with UDOT Region Two traffic staff to ensure project buy-in;
- Conduct detailed engineering including traffic, utilities, access, roadway layout.
- Implement the plan

One of the most important recommended actions is on-going coordination and communication with UDOT staff. UDOT's involvement varies by specific recommendation, but they will likely be involved with all. Staff should continue to engage UDOT at every opportunity. One strategy that has proven successful in other areas is to schedule a working group meeting quarterly with staff and UDOT and keep a "to do" list, with assignments, current.

8

APPENDIX

SR-224 Corridor Study: Walking Tour
February 6, 2012: 3 – 4:30 PM
Park City Public Works

AGENDA

1. Overview (10 minutes)

    a. Introductions
    b. Study overview (see below)
    c. Purpose of today's walking tour

2. Walking Tour (80 minutes)

    a. Stop #1: Short Line/Deer Valley Drive
    b. Stop #2: Park Ave/Deer Valley Drive
    c. Stop #3: SR-224/Iron Horse Drive
    d. Stop #4: SR-224/Kearns Boulevard
    e. Stop #5: SR-224/Thaynes Canyon
    f. Return to Public Works

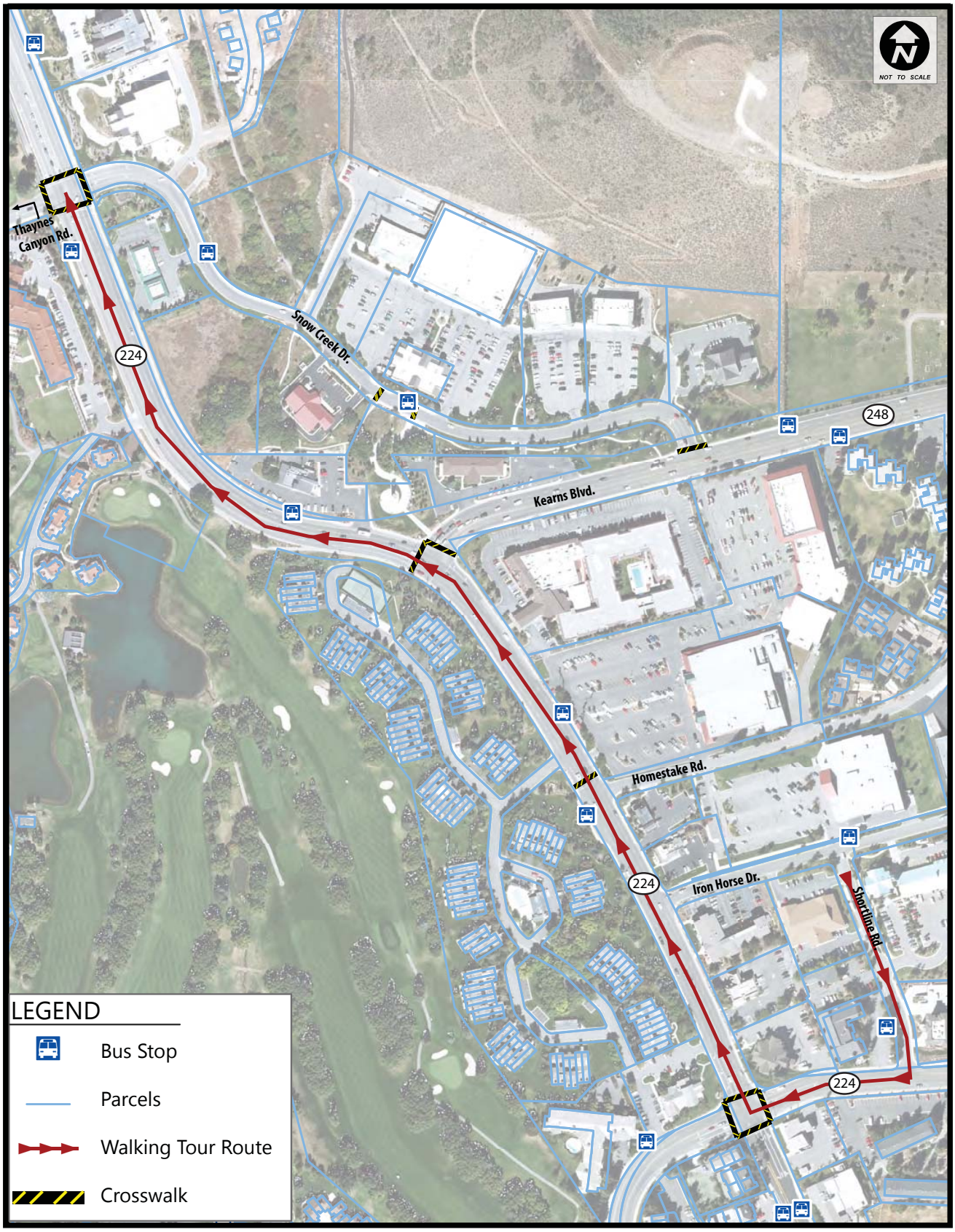
STUDY OVERVIEW

Analyze all transportation modes on SR-224 from Thaynes Canyon Drive to Bonanza Drive:

- How do we accommodate and encourage transit without negatively impacting vehicle traffic?
- How do we make SR-224 more inviting to cyclists and pedestrians, both along its length and across it?
- How can we take advantage of opportunities on either side of the SR-224 corridor to increase connectivity and better distribute bicycle, pedestrian, and vehicle traffic?

Study outcomes:

- Recommend a transportation alternative for all modes in the study area.
- Recommend bicycle and pedestrian improvements (including cost estimates) along the SR-224 corridor that can be funded using the walkability bond, and that meet the city's goals.


NOT TO SCALE
Thaynes Canyon Rd.
224
Snow Creek Dr.
248
Kearns Blvd.
Homestake Rd.
224
Iron Horse Dr.
Shortline Rd.
224
LEGEND
Bus Stop
Parcels
Walking Tour Route
Crosswalk

Park City Transportation Master Plan

GOALS:

- Park City will have a multimodal transportation system with complete streets and balanced availability of pedestrian, bicycle, transit and auto travel.
- Park City will have a complete and well-connected network of trails, bicycle lanes and sidewalks.

STRATEGIC OBJECTIVES (designed to address the above goals by 2040):

- Changes to individual street cross sections will be addressed on a case by case basis but will put city-wide emphasis on providing "complete street" infastructure that supports walking, biking, transit, and carpools over single occupant vehicles.
- All of the primary bicycle corridors identified in the Park City Transportation Master Plan will completed and open to use.
- At least 75% of the linear mileage of secondary bicycle corridords identified in the Park City Master Plan will be completed and open to use.
- Park City will establish roadway automobile capacity trigger points on major roadways (commercial collectors and arterials) that will require a proactive review of the roadway cross section with emphasis on providing "complete streets" which improve serving balanced modes of users either directly on the corridor or on parallel corridors.

Park City Transportation Master Plan Update and Walkability / Bikeable Neighborhood Study

OBJECTIVE:

Purpose of the study to "provide planning and design suggestions which will improve walking and biking in urban Park City. The intent is to establish a clear and detailed list of projects that will improve pedestrian and cyclist safety, connectivity and efficiency."

5 OVERARCHING GOALS:

- **Safety**: increased biking and pedestrian safety
- **Efficiency**: reducing vehicle trips and/or mitigating traffic
- **Enhance Regional Connections**: improving regional mobility along SR-224 & 248, Bonanza Drive, rail trail and other significant regional links
- **Enhance Local Connections**: improving intercity mobility and through neighborhoods
- **Cost and Maintenance**: reducing cost and/or providing the greatest value to taxpayers


0
250
500
1,000
Feet

SR-224 Corridor Matrix	VISION	STRATEGY		
	Goal	Strategies	Barriers	Potential Solutions
MODES	The corridor must accommodate future throughput.	Shuttles & trolleys Remote parking Raised medians		

SR-224 Corridor Matrix	VISION	STRATEGY		
	Goal	Strategies	Barriers	Potential Solutions
ENVIRONMENT	The corridor will better accommodate non-motorized transportation The corridor must capture 100% of the storm water that falls in the public right-of-way, clean it through bioswales, and infiltrate it into the ground.	Storm water management Noise reduction		

SR-224 Corridor Matrix	VISION	STRATEGY		
	Goal	Strategies	Barriers	Potential Solutions
ECONOMICS	The corridor must support future economic development by providing options for a balance of throughput and accessibility. The corridor must support a positive visitor experience by minimizing wait times (determine acceptable wait times as baseline condition), communicating traffic information seamlessly, etc.	Support surrounding land uses/ Bonanza Park Support tourism/ tourist experience Support future growth/ economic development capacity		

SR-224 Corridor Matrix	VISION	STRATEGY		
	Goal	Strategies	Barriers	Potential Solutions
COMMUNITY AND AESTHETICS	The corridor must support the walkability goals of the Bonanza Park district by providing multiple modes of transportation, ensuring pedestrian safety and providing convenient crossings. The corridor must act as a welcoming and visually appropriate gateway to Park City that meets or exceeds the expectations of visitors to a world-class resort destination and needs to support the Park City brand.	Link city with trails Gateway to Park City resort town Integrate with Bonanza Park		

SR-224 Corridor Study: Preliminary Alternatives Review
April 10, 2012: 10:00 to 12:00
Park City Council Chambers

Attendees

Brooks Robinson, Kent Cashel, Heinrich Deters, Katie Cattan, Matt Cassel, Jonathan Weidenhamer, Thomas Eddington, Tony Lau, Jon Nepstad, Maria Vyas, Lynn Jacobs, Terrall Budge.

Meeting Notes

- Park City staff need notes from the March 6 2012 Goals Workshop with Stakeholders. Fehr & Peers will distribute these via email.
- Tunnel at transit crossing on SR-224 may not be appropriate – other tunnel locations are connecting multi-use trails, whereas the SR-224 crossing connects people with at-grade transit stops (a tunnel at the transit crossing was not included as part of the matrix of alternatives).
- Park City has a revised plan for Bonanza Park. Some property owners in the area have indicated that they do not want to participate in the redevelopment.
- The proposed trail through the back of Park Ave Condos may be more useful in the future as the PCMR base area redevelops. Project team should evaluate how this trail might connect to other areas such as City Park or other trail networks.
- Among "Existing Right-of-Way" options, City staff is interested in consolidating 8' trails proposed on both sides of SR-224 into one wider trail on one side of SR-224 that can accommodate both cyclists and pedestrians.
- Including medians on SR-224 will require better persuasion of property/business owners than occurred on Bonanza Drive. Owners will need to get on board early in the process.
- Need an off-street trail link between SR-224 and Poison Creek Trail.
- Minimal support for couplets concept, but interest in replacing it with a reversible lanes concept.
- The roundabouts concept needs more detail in how accesses will be affected or relocated.
- For all concepts, project team needs to provide pros/cons of implementation: who is impacted, to what degree, and to what end?
- Major concerns about economic impacts to businesses associated with roundabouts.
- Fehr & Peers will continue to track down a representative from Fresh Market.
- General support among City staff for grade-separated intersection concepts at Park/Deer Valley Drive intersection, and also for Big Shift concept with landscaped median on SR-224. Interest in looking at grade-separated concepts at both SR-224 intersections. More detail is needed, especially on how other movements would operate, and how pedestrians would fare.
- Recommendations need to be phased, and indicate which options address problems now and which address problems which will occur in the future. Need an indication of how far each alternative gets the City, or how many years of functionality can be bought for how much money.

- Some alternatives may be addressing problems that only occur for short periods of time during part of the year, but those times are the key economic drivers for the City. We need to keep this in mind.
- Fehr & Peers will obtain 2030 network from Interplan (done).
- Stakeholders meeting: May 8 at 2pm. Fehr & Peers will work with Brooks to find a location and send out a calendar appointment.
- City staff may want to give City Council a “heads up” on proposed alternatives prior to the stakeholder meeting and open house.
- Public open house in late May.

SR-224 CORRIDOR STUDY

Name JOEL PRATT Email _____

Thank you for attending the meeting tonight. Please use the space below to tell the study team any additional thoughts or concerns you have:

CONCERNED ABOUT RAISED MEDIAN IN FRONT OF THE TOP-STOP & THE IMPACT ON SB LEFT TURNING VEHICLES INTO SOUTHERN ACCESS.

TRY TO MAKE LANDSCAPING AT TOPSTOP STAY INTACT.

PARK CITY

SR-224 CORRIDOR STUDY

Name Neal Krasnicle Email current name@comcast.net

Thank you for attending the meeting tonight. Please use the space below to tell the study team any additional thoughts or concerns you have:

Please find a way to make a Double Left Turn Lane from SR224 South on to Deer Valley Drive at the DV. Drive / Park Ave intesection,

Also - pedestrians prefer straight line side walks when they want to walk some where. Curved / Snake type Sidewalks Look good on paper.

PARK CITY

SR-224 CORRIDOR STUDY

May 8, 2012 Workshop - Attendees Sign In

Name	Representing	Phone	Email
Tony Lau	UDOT	801-887-3717	tlau@utah.gov
Amber Mortensen	UDOT	801-887-3624	akmortensen@utah.gov
Pete Park	Park Ave Condos	435-649-5105	pete@pclodge.com
Tim Brennwald	Powdr	801 865-3400	tbrennwald@powdr.com
Kent Cashel	Park City	435 - 615-5360	cashel@parkcity.org
Brooks Robinson	" "	435-615-5309	brooks@parkcity.org
Krista Parry	PCMR	435-647-5419	kristap@pcmr.com
Mike Sweeney	Brothers III & Treasure	801-244-9696	mesgold@yahoo.com
Catherine Cimos	Frontier Bank	435-200-6006	ccimos@frontierbankfsb.com
Mark J. Fischer	Bonanza Park area	435-640-6858	mark@fischernetwork.com
Jana Cole	Cole Sport	435-640-7377	jana.cole@colesport.com
Kyle Eggett	Yarrow hotel	435-659-7000	gm.yarrow@[illegible]
Shinn Spangenberg	Resident	435 645-7656	shinn@[illegible]
Jack Walzer	Jans Ltd.	435 640-4850	jackw@jans.com

SR-224 CORRIDOR STUDY

May 22, 2012 Open House - Sign In

Name	Phone	Email
Joel Pratt (Top Stop)	435-649-3689	
Pete Park Identity Prop	435-649-5105	
Russ Coburn JANS	435-602-8888	
Fern Lovett Baird	801-944-9444	fern@powderbeach.com
Mike Sweeney	801-244-9696	Treasure
Tom Oliver	435-940-1681	
Matt Twombly	615-5177	
Gary Cole	435-640-7877	
[illegible]	[illegible]	
Spencer Lace	615 5256	
Lisa Yoder	801-209-8757	lisa.yoder@comcast.net
Michael Barille	435.640.3188	MBARILLE@PLANWORKSDESIGN.com
Adam Cole - "Colesport"	435-649-4800	
Whit Logan - Local	" 640-4009	
Lee Whiting	435-655-1214	
Kent Cashel	435-615-5360	cashel@parkcity.org
Jon Weidenhamer	615 5069	jweidenhamer@ "
Neal Krasnick	801 368 2361	currentname@comcast.net
Mark Fischer	435-640-6858	mark@fischernetwork.com
Hope Melville	435 659 0773	hope@hmelville.com
Chris Hague	435-729-0194	Chris@skyduke.com
Shirin Spangenberg	435.645 7694	

L2 Data Collection

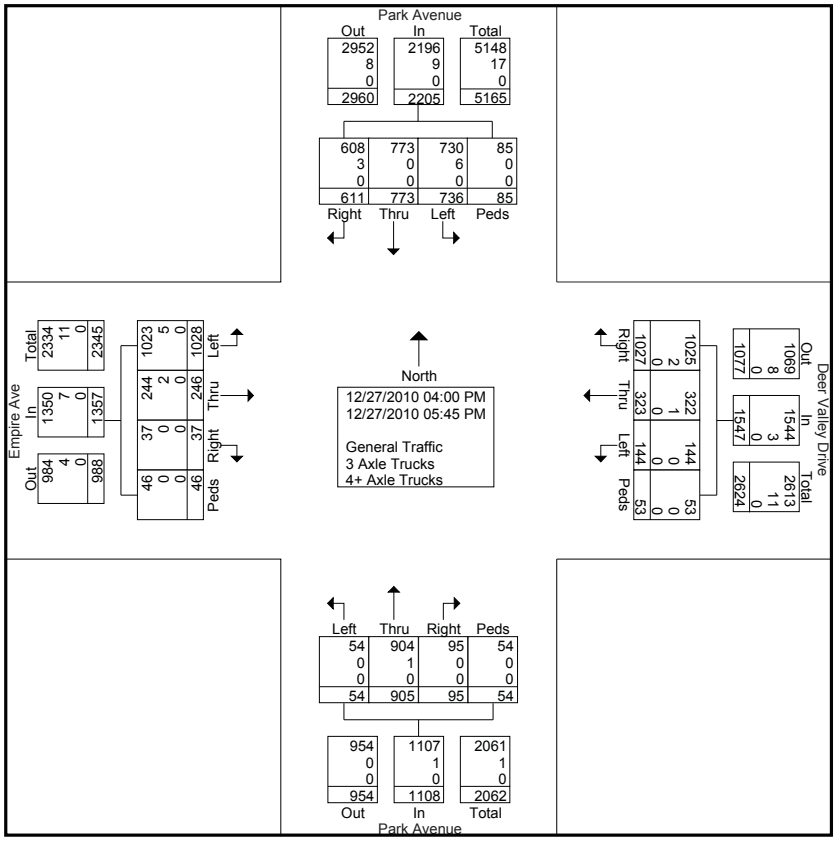
www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Park Ave / Deer Valley
City, State: Park City, Utah
Control: Signalized

File Name : Park Deer Valley PM
Site Code : 2
Start Date : 12/27/2010
Page No : 1

Groups Printed- General Traffic - 3 Axle Trucks - 4+ Axle Trucks

	Park Avenue From North					Deer Valley Drive From East					Park Avenue From South					Empire Ave From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	82	80	106	14	282	150	40	9	25	224	14	118	5	6	143	7	29	121	4	161	810
04:15 PM	102	98	104	19	323	119	32	21	7	179	21	96	6	8	131	2	31	124	0	157	790
04:30 PM	82	86	96	8	272	126	47	18	2	193	9	90	10	6	115	4	32	149	13	198	778
04:45 PM	61	105	79	9	254	112	44	26	4	186	17	103	5	15	140	3	29	157	8	197	777
Total	327	369	385	50	1131	507	163	74	38	782	61	407	26	35	529	16	121	551	25	713	3155
05:00 PM	64	109	84	8	265	129	35	14	1	179	11	135	6	5	157	2	32	138	10	182	783
05:15 PM	74	122	84	6	286	112	33	20	4	169	9	108	7	10	134	11	37	121	4	173	762
05:30 PM	74	83	81	13	251	141	27	16	4	188	6	162	10	1	179	4	34	107	3	148	766
05:45 PM	72	90	102	8	272	138	65	20	6	229	8	93	5	3	109	4	22	111	4	141	751
Total	284	404	351	35	1074	520	160	70	15	765	34	498	28	19	579	21	125	477	21	644	3062
Grand Total	611	773	736	85	2205	1027	323	144	53	1547	95	905	54	54	1108	37	246	1028	46	1357	6217
Apprch %	27.7	35.1	33.4	3.9		66.4	20.9	9.3	3.4		8.6	81.7	4.9	4.9		2.7	18.1	75.8	3.4		
Total %	9.8	12.4	11.8	1.4	35.5	16.5	5.2	2.3	0.9	24.9	1.5	14.6	0.9	0.9	17.8	0.6	4	16.5	0.7	21.8	
General Traffic	608	773	730	85	2196	1025	322	144	53	1544	95	904	54	54	1107	37	244	1023	46	1350	6197
% General Traffic	99.5	100	99.2	100	99.6	99.8	99.7	100	100	99.8	100	99.9	100	100	99.9	100	99.2	99.5	100	99.5	99.7
3 Axle Trucks	3	0	6	0	9	2	1	0	0	3	0	1	0	0	1	0	2	5	0	7	20
% 3 Axle Trucks	0.5	0	0.8	0	0.4	0.2	0.3	0	0	0.2	0	0.1	0	0	0.1	0	0.8	0.5	0	0.5	0.3
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



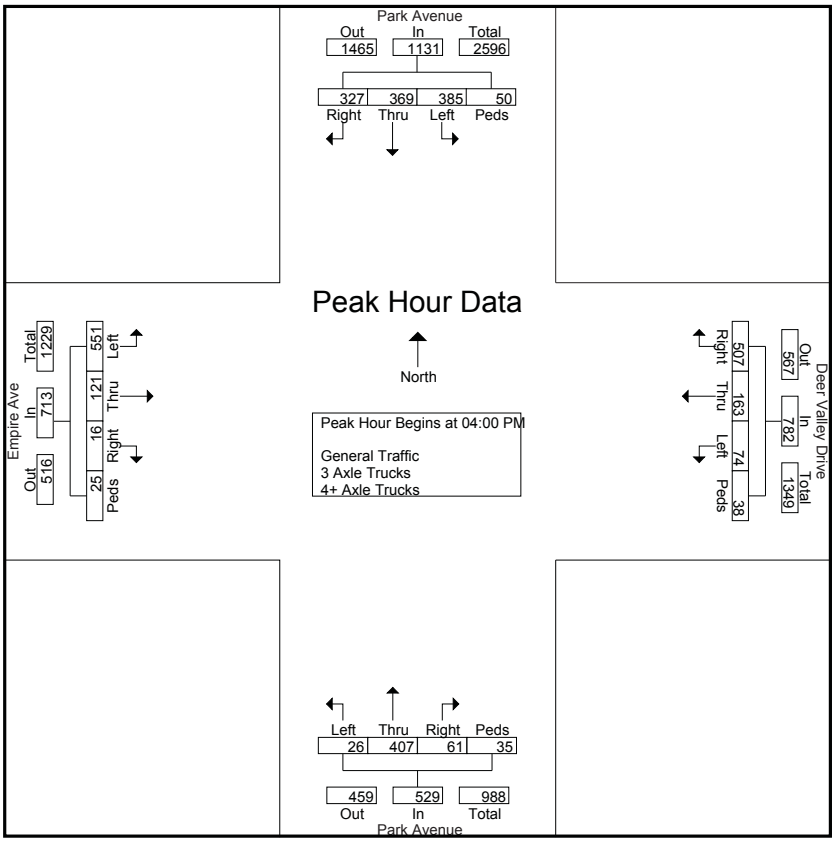
L2 Data Collection

www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Park Ave / Deer Valley
City, State: Park City, Utah
Control: Signalized

File Name : Park Deer Valley PM
Site Code : 2
Start Date : 12/27/2010
Page No : 2

	Park Avenue From North					Deer Valley Drive From East					Park Avenue From South					Empire Ave From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	82	80	**106**	14	282	**150**	40	9	**25**	**224**	14	**118**	5	6	**143**	**7**	29	121	4	161	**810**
04:15 PM	**102**	98	104	**19**	**323**	119	32	21	7	179	**21**	96	6	8	131	2	31	124	0	157	790
04:30 PM	82	86	96	8	272	126	**47**	18	2	193	9	90	**10**	6	115	4	**32**	149	**13**	**198**	778
04:45 PM	61	**105**	79	9	254	112	44	**26**	4	186	17	103	5	**15**	140	3	29	**157**	8	197	777
Total Volume	327	369	385	50	1131	507	163	74	38	782	61	407	26	35	529	16	121	551	25	713	3155
% App. Total																					
PHF	.801	.879	.908	.658	.875	.845	.867	.712	.380	.873	.726	.862	.650	.583	.925	.571	.945	.877	.481	.900	.974



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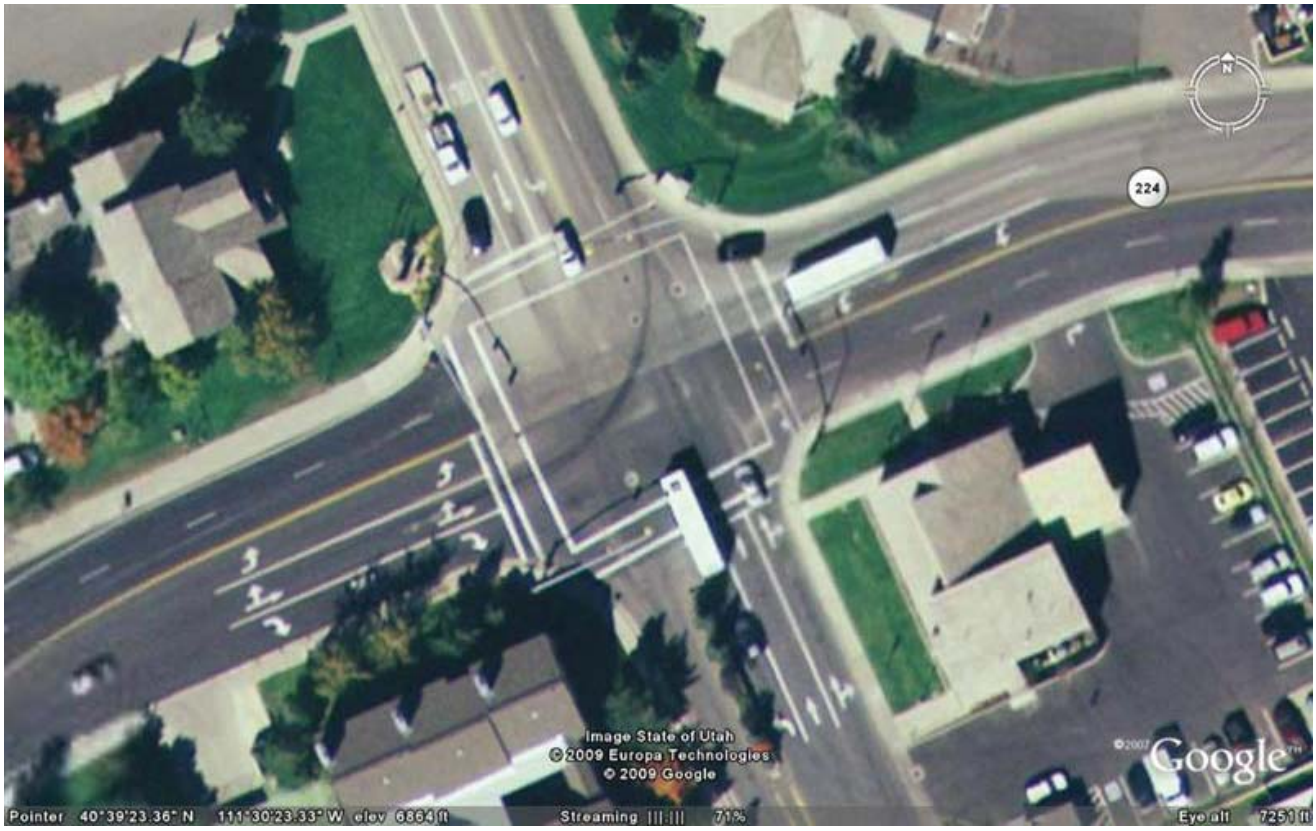
Project: PC0002
Intersection: Park Ave / Deer Valley
City, State: Park City, Utah
Control: Signalized

File Name : Park Deer Valley PM
Site Code : 2
Start Date : 12/27/2010
Page No : 3

Image 1



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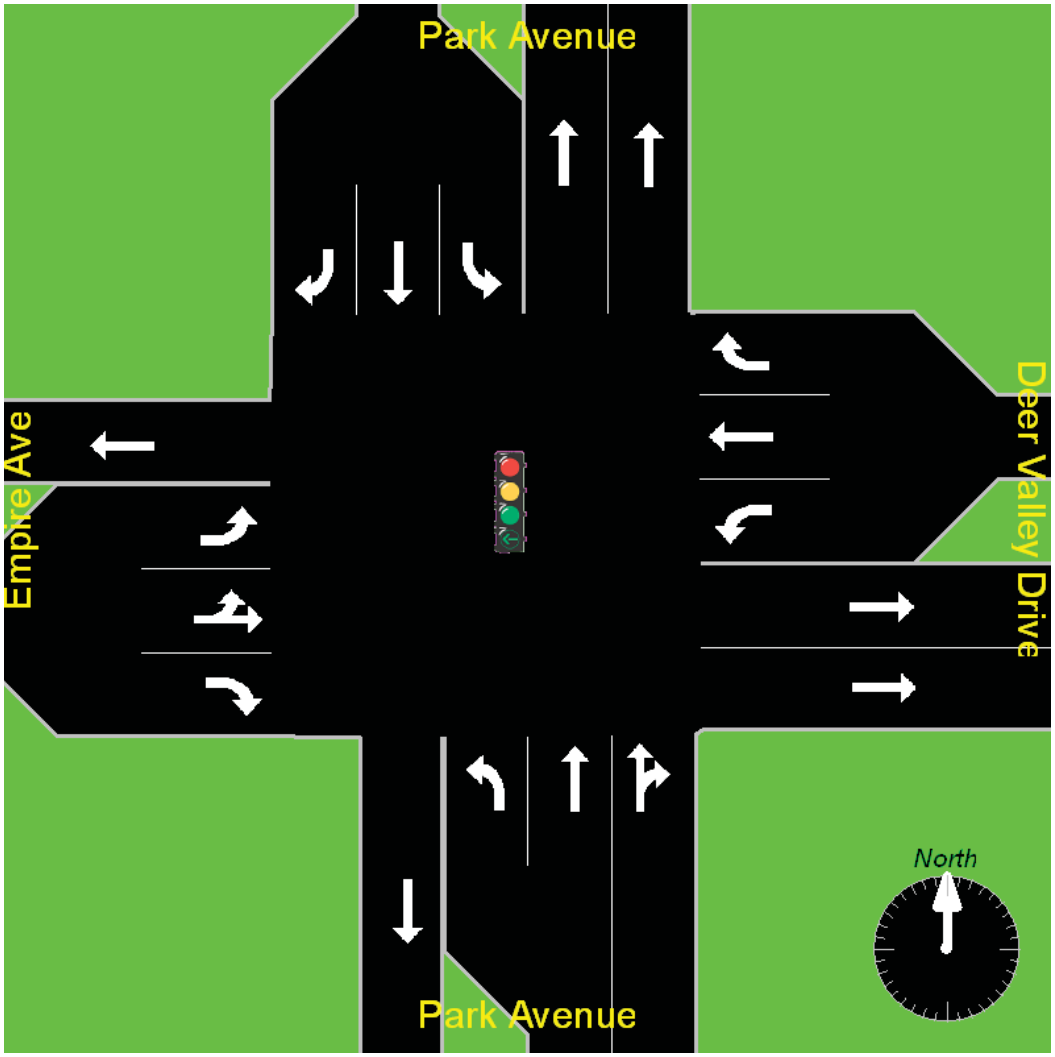
Project: PC0002
Intersection: Park Ave / Deer Valley
City, State: Park City, Utah
Control: Signalized

File Name : Park Deer Valley PM
Site Code : 2
Start Date : 12/27/2010
Page No : 4



L2 Data Collection

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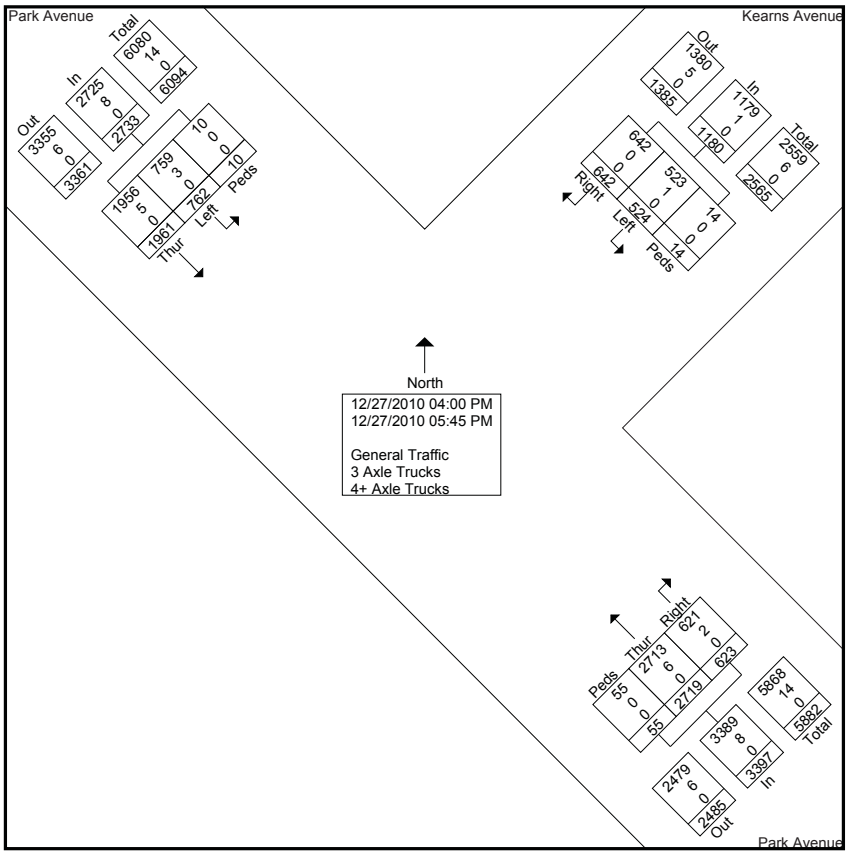
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Kearns Ave / Park Ave
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Park PM
Site Code : 1
Start Date : 12/27/2010
Page No : 1

Groups Printed- General Traffic - 3 Axle Trucks - 4+ Axle Trucks

	Park Avenue From Northwest				Kearns Avenue From Northeast				Park Avenue From Southeast				
Start Time	Thur	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thur	Peds	App. Total	Int. Total
04:00 PM	264	88	0	352	96	66	2	164	67	340	1	408	924
04:15 PM	252	103	5	360	70	41	0	111	77	296	1	374	845
04:30 PM	263	93	0	356	82	62	5	149	67	313	18	398	903
04:45 PM	258	83	1	342	96	67	0	163	69	313	4	386	891
Total	1037	367	6	1410	344	236	7	587	280	1262	24	1566	3563
05:00 PM	248	96	2	346	87	54	2	143	77	348	7	432	921
05:15 PM	253	118	0	371	71	67	1	139	66	375	9	450	960
05:30 PM	225	78	0	303	68	90	0	158	115	359	14	488	949
05:45 PM	198	103	2	303	72	77	4	153	85	375	1	461	917
Total	924	395	4	1323	298	288	7	593	343	1457	31	1831	3747
Grand Total	1961	762	10	2733	642	524	14	1180	623	2719	55	3397	7310
Apprch %	71.8	27.9	0.4		54.4	44.4	1.2		18.3	80	1.6		
Total %	26.8	10.4	0.1	37.4	8.8	7.2	0.2	16.1	8.5	37.2	0.8	46.5	
General Traffic	1956	759	10	2725	642	523	14	1179	621	2713	55	3389	7293
% General Traffic	99.7	99.6	100	99.7	100	99.8	100	99.9	99.7	99.8	100	99.8	99.8
3 Axle Trucks	5	3	0	8	0	1	0	1	2	6	0	8	17
% 3 Axle Trucks	0.3	0.4	0	0.3	0	0.2	0	0.1	0.3	0.2	0	0.2	0.2
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0



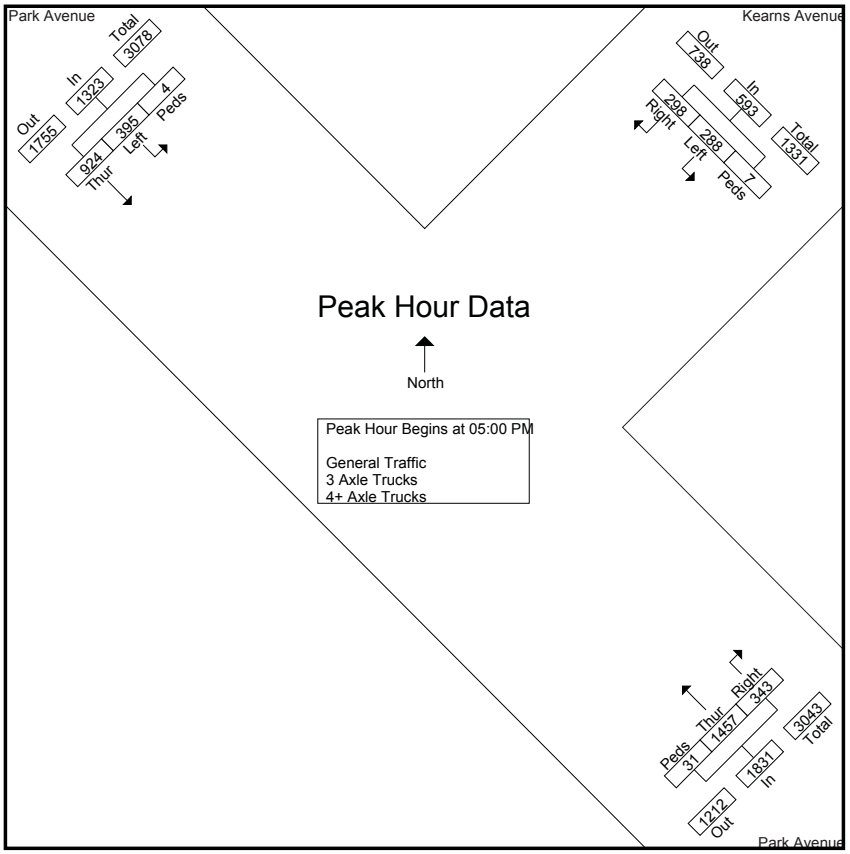
L2 Data Collection

www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Kearns Ave / Park Ave
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Park PM
Site Code : 1
Start Date : 12/27/2010
Page No : 2

	Park Avenue From Northwest				Kearns Avenue From Northeast				Park Avenue From Southeast				
Start Time	Thur	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thur	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	248	96	**2**	346	**87**	54	2	143	77	348	7	432	921
05:15 PM	**253**	**118**	0	**371**	71	67	1	139	66	**375**	9	450	**960**
05:30 PM	225	78	0	303	68	**90**	0	**158**	**115**	359	**14**	**488**	949
05:45 PM	198	103	2	303	72	77	**4**	153	85	375	1	461	917
Total Volume	924	395	4	1323	298	288	7	593	343	1457	31	1831	3747
% App. Total	69.8	29.9	0.3		50.3	48.6	1.2		18.7	79.6	1.7		
PHF	.913	.837	.500	.892	.856	.800	.438	.938	.746	.971	.554	.938	.976



L2 Data Collection

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Project: PC0002
Intersection: Kearns Ave / Park Ave
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Park PM
Site Code : 1
Start Date : 12/27/2010
Page No : 3

Image 1

L2 Data Collection

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Project: PC0002
Intersection: Kearns Ave / Park Ave
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Park PM
Site Code : 1
Start Date : 12/27/2010
Page No : 4

L2 Data Collection

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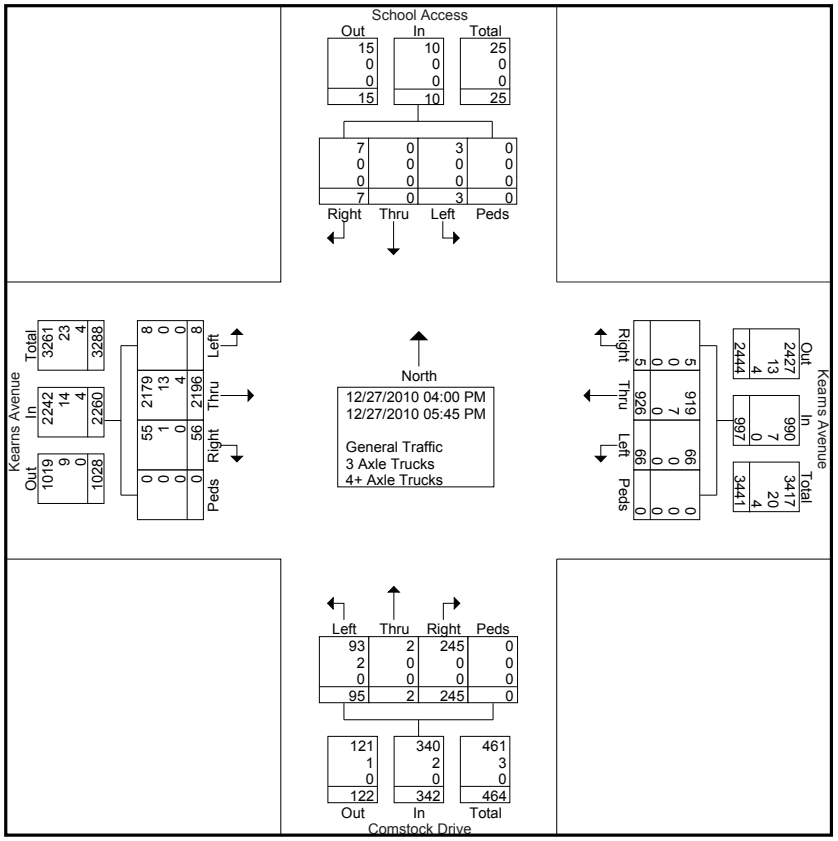
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Kearns Ave / Comstock Dr.
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Comstock PM
Site Code : 5
Start Date : 12/27/2010
Page No : 1

Groups Printed- General Traffic - 3 Axle Trucks - 4+ Axle Trucks

	School Access From North					Kearns Avenue From East					Comstock Drive From South					Kearns Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	153	10	0	163	17	1	18	0	36	8	239	1	0	248	447
04:15 PM	4	0	1	0	5	2	120	12	0	134	12	0	12	0	24	6	278	3	0	287	450
04:30 PM	2	0	0	0	2	1	120	6	0	127	27	0	11	0	38	6	268	3	0	277	444
04:45 PM	1	0	2	0	3	1	95	10	0	106	31	0	14	0	45	11	295	0	0	306	460
Total	7	0	3	0	10	4	488	38	0	530	87	1	55	0	143	31	1080	7	0	1118	1801
05:00 PM	0	0	0	0	0	1	105	4	0	110	39	0	8	0	47	5	287	1	0	293	450
05:15 PM	0	0	0	0	0	0	119	10	0	129	44	0	10	0	54	4	279	0	0	283	466
05:30 PM	0	0	0	0	0	0	105	12	0	117	35	0	9	0	44	9	266	0	0	275	436
05:45 PM	0	0	0	0	0	0	109	2	0	111	40	1	13	0	54	7	284	0	0	291	456
Total	0	0	0	0	0	1	438	28	0	467	158	1	40	0	199	25	1116	1	0	1142	1808
Grand Total	7	0	3	0	10	5	926	66	0	997	245	2	95	0	342	56	2196	8	0	2260	3609
Apprch %	70	0	30	0		0.5	92.9	6.6	0		71.6	0.6	27.8	0		2.5	97.2	0.4	0		
Total %	0.2	0	0.1	0	0.3	0.1	25.7	1.8	0	27.6	6.8	0.1	2.6	0	9.5	1.6	60.8	0.2	0	62.6	
General Traffic	7	0	3	0	10	5	919	66	0	990	245	2	93	0	340	55	2179	8	0	2242	3582
% General Traffic	100	0	100	0	100	100	99.2	100	0	99.3	100	100	97.9	0	99.4	98.2	99.2	100	0	99.2	99.3
3 Axle Trucks	0	0	0	0	0	0	7	0	0	7	0	0	2	0	2	1	13	0	0	14	23
% 3 Axle Trucks	0	0	0	0	0	0	0.8	0	0	0.7	0	0	2.1	0	0.6	1.8	0.6	0	0	0.6	0.6
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.2	0.1



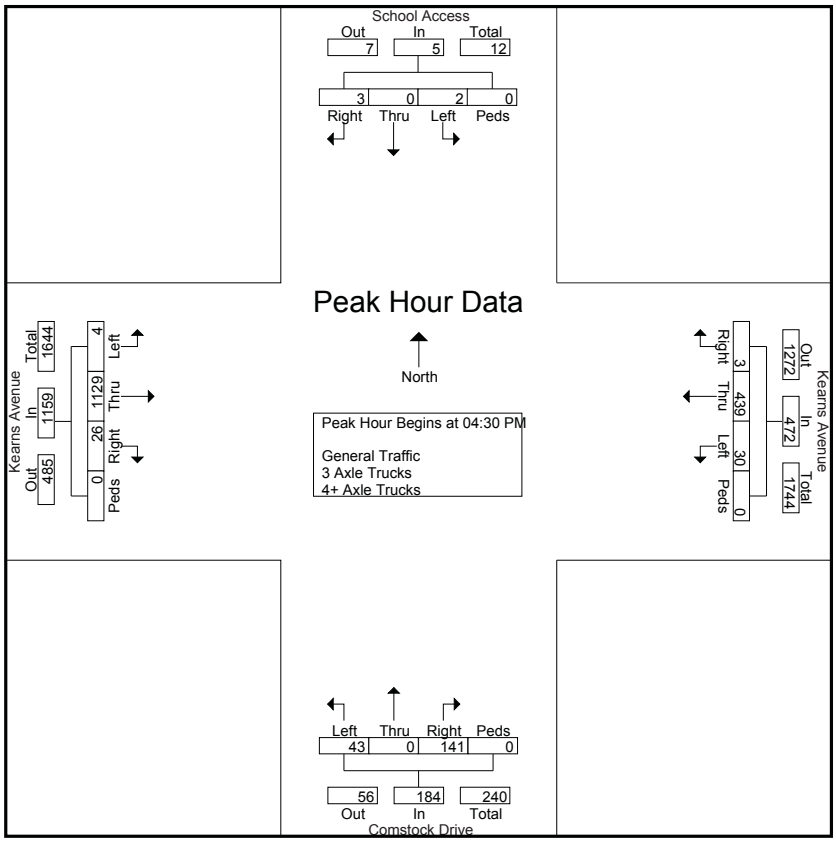
L2 Data Collection

www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Kearns Ave / Comstock Dr.
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Comstock PM
Site Code : 5
Start Date : 12/27/2010
Page No : 2

	School Access From North					Kearns Avenue From East					Comstock Drive From South					Kearns Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**2**	0	0	0	2	**1**	**120**	6	0	127	27	0	11	0	38	6	268	**3**	0	277	444
04:45 PM	1	0	**2**	0	**3**	1	95	**10**	0	106	31	0	**14**	0	45	**11**	**295**	0	0	**306**	460
05:00 PM	0	0	0	0	0	1	105	4	0	110	39	0	8	0	47	5	287	1	0	293	450
05:15 PM	0	0	0	0	0	0	119	10	0	**129**	**44**	0	10	0	**54**	4	279	0	0	283	**466**
Total Volume	3	0	2	0	5	3	439	30	0	472	141	0	43	0	184	26	1129	4	0	1159	1820
% App. Total	60	0	40	0		0.6	93	6.4	0		76.6	0	23.4	0		2.2	97.4	0.3	0		
PHF	.375	.000	.250	.000	.417	.750	.915	.750	.000	.915	.801	.000	.768	.000	.852	.591	.957	.333	.000	.947	.976



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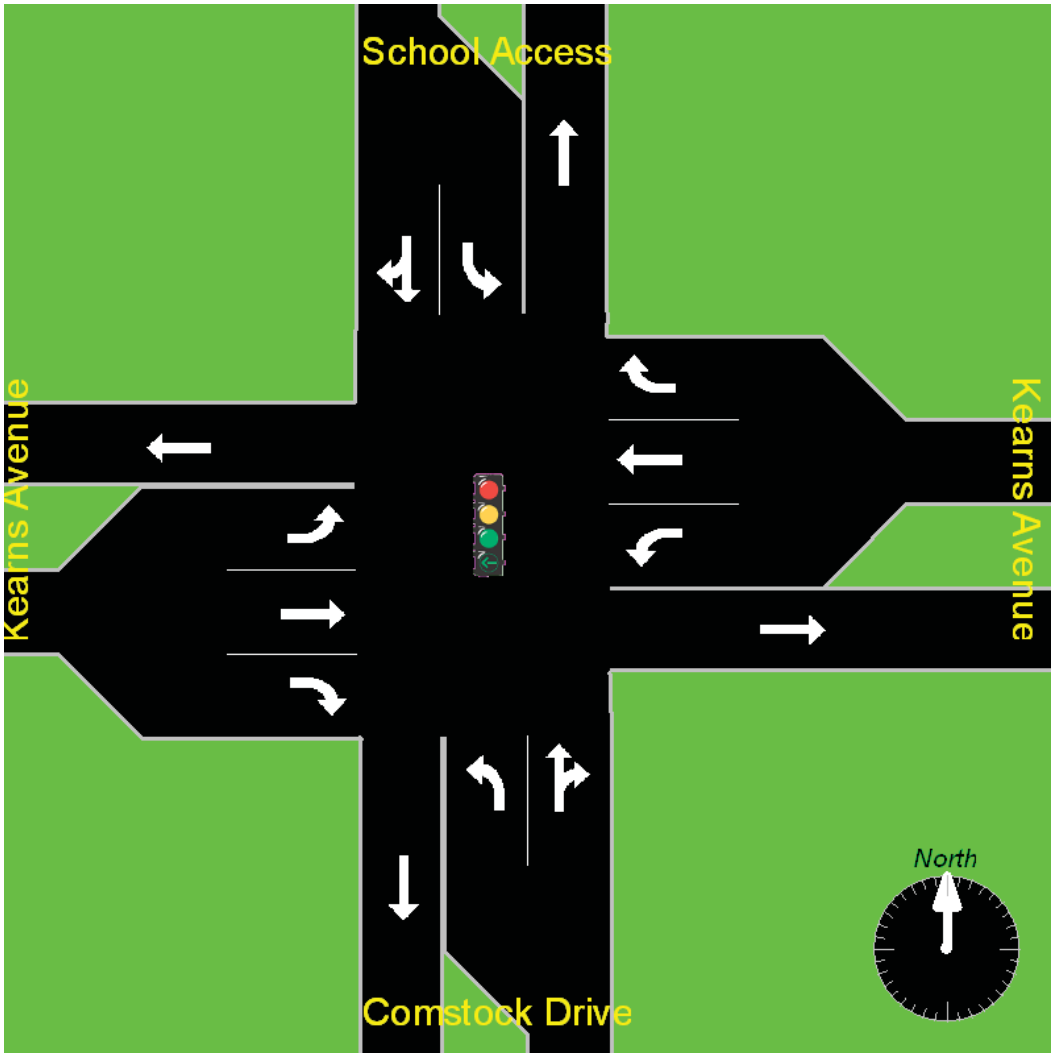
Project: PC0002
Intersection: Kearns Ave / Comstock Dr.
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Comstock PM
Site Code : 5
Start Date : 12/27/2010
Page No : 3

Image 1

Project: PC0002
Intersection: Kearns Ave / Comstock Dr.
City, State: Park City, Utah
Control: Signalized

File Name : Kearns Comstock PM
Site Code : 5
Start Date : 12/27/2010
Page No : 4



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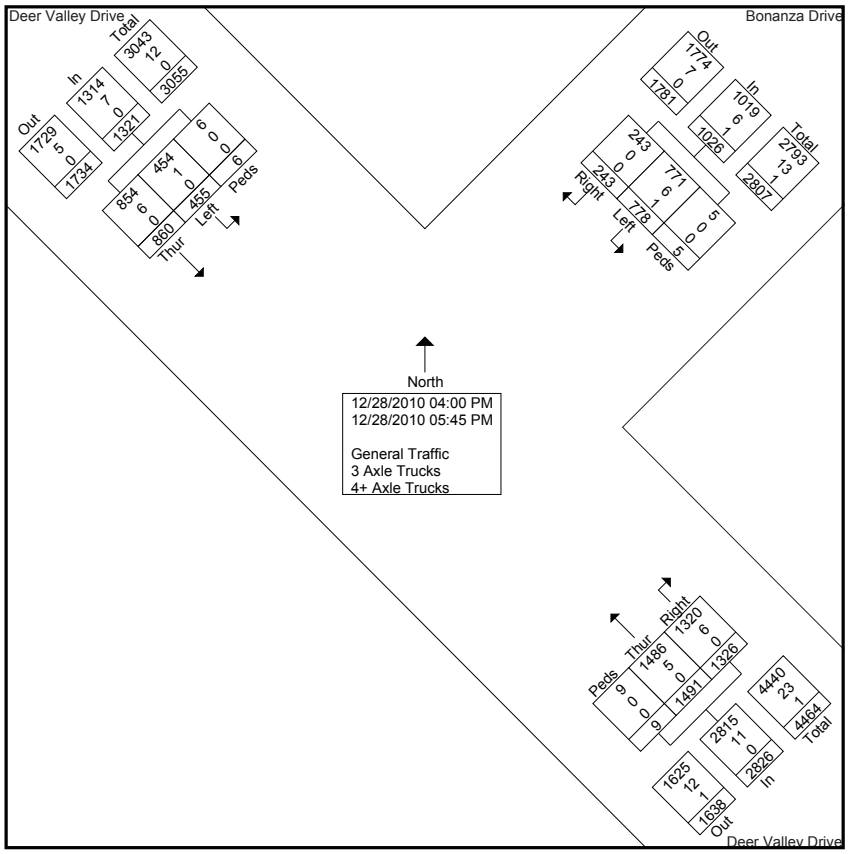
Project: PC0002
Intersection: Deer Valley Dr / Bonanza
City, State: Park City, Utah
Control: Signalized

File Name : Deer Valley Bonanza PM
Site Code : 3
Start Date : 12/28/2010
Page No : 1

Groups Printed- General Traffic - 3 Axle Trucks - 4+ Axle Trucks

	Bonanza Drive From Northeast				Deer Valley Drive From Southeast				Deer Valley Drive From Northwest				
Start Time	Right	Left	Peds	App. Total	Right	Thur	Peds	App. Total	Thur	Left	Peds	App. Total	Int. Total
04:00 PM	29	97	0	126	188	190	1	379	97	52	0	149	654
04:15 PM	38	97	2	137	205	204	0	409	114	74	2	190	736
04:30 PM	34	98	0	132	183	199	2	384	117	58	1	176	692
04:45 PM	32	117	0	149	186	205	0	391	98	75	0	173	713
Total	133	409	2	544	762	798	3	1563	426	259	3	688	2795
05:00 PM	35	80	1	116	150	222	0	372	98	51	0	149	637
05:15 PM	24	101	0	125	143	205	1	349	104	53	0	157	631
05:30 PM	23	79	2	104	137	139	4	280	111	47	3	161	545
05:45 PM	28	109	0	137	134	127	1	262	121	45	0	166	565
Total	110	369	3	482	564	693	6	1263	434	196	3	633	2378
Grand Total	243	778	5	1026	1326	1491	9	2826	860	455	6	1321	5173
Apprch %	23.7	75.8	0.5		46.9	52.8	0.3		65.1	34.4	0.5		
Total %	4.7	15	0.1	19.8	25.6	28.8	0.2	54.6	16.6	8.8	0.1	25.5	
General Traffic	243	771	5	1019	1320	1486	9	2815	854	454	6	1314	5148
% General Traffic	100	99.1	100	99.3	99.5	99.7	100	99.6	99.3	99.8	100	99.5	99.5
3 Axle Trucks	0	6	0	6	6	5	0	11	6	1	0	7	24
% 3 Axle Trucks	0	0.8	0	0.6	0.5	0.3	0	0.4	0.7	0.2	0	0.5	0.5
4+ Axle Trucks	0	1	0	1	0	0	0	0	0	0	0	0	1
% 4+ Axle Trucks	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0



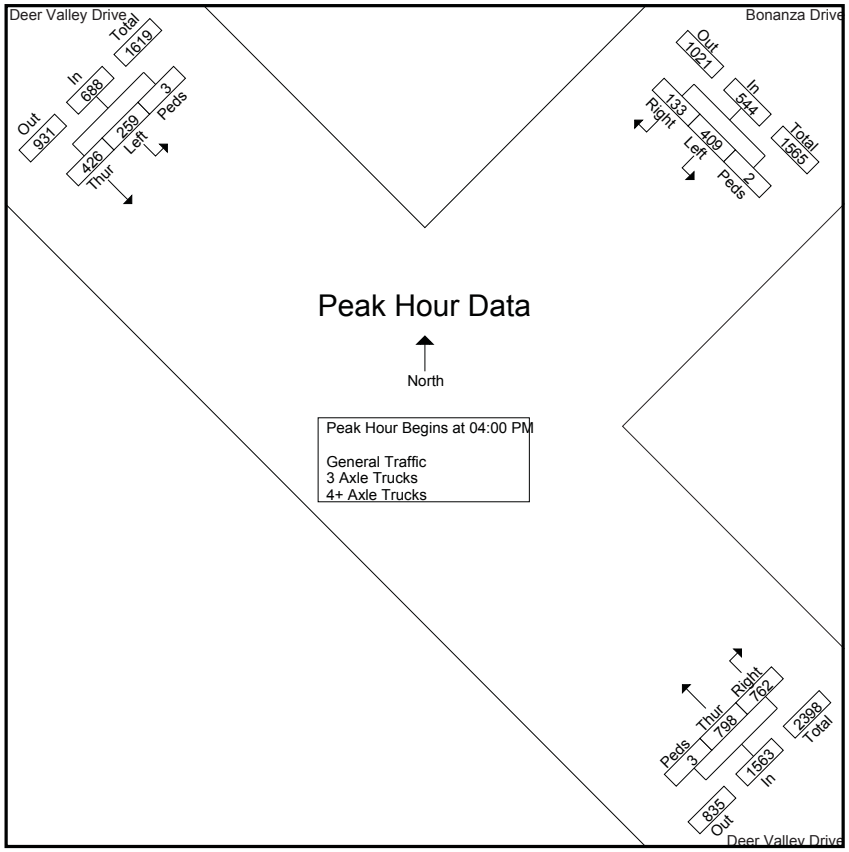
L2 Data Collection

www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Deer Valley Dr / Bonanza
City, State: Park City, Utah
Control: Signalized

File Name : Deer Valley Bonanza PM
Site Code : 3
Start Date : 12/28/2010
Page No : 2

	Bonanza Drive From Northeast				Deer Valley Drive From Southeast				Deer Valley Drive From Northwest				
Start Time	Right	Left	Peds	App. Total	Right	Thur	Peds	App. Total	Thur	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	29	97	0	126	188	190	1	379	97	52	0	149	654
04:15 PM	**38**	97	**2**	137	**205**	204	0	**409**	114	74	**2**	**190**	**736**
04:30 PM	34	98	0	132	183	199	**2**	384	**117**	58	1	176	692
04:45 PM	32	**117**	0	**149**	186	**205**	0	391	98	**75**	0	173	713
Total Volume	133	409	2	544	762	798	3	1563	426	259	3	688	2795
% App. Total	24.4	75.2	0.4		48.8	51.1	0.2		61.9	37.6	0.4		
PHF	.875	.874	.250	.913	.929	.973	.375	.955	.910	.863	.375	.905	.949



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Project: PC0002
Intersection: Deer Valley Dr / Bonanza
City, State: Park City, Utah
Control: Signalized

File Name : Deer Valley Bonanza PM
Site Code : 3
Start Date : 12/28/2010
Page No : 3

Image 1

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Project: PC0002
Intersection: Deer Valley Dr / Bonanza
City, State: Park City, Utah
Control: Signalized

File Name : Deer Valley Bonanza PM
Site Code : 3
Start Date : 12/28/2010
Page No : 4

L2 Data Collection

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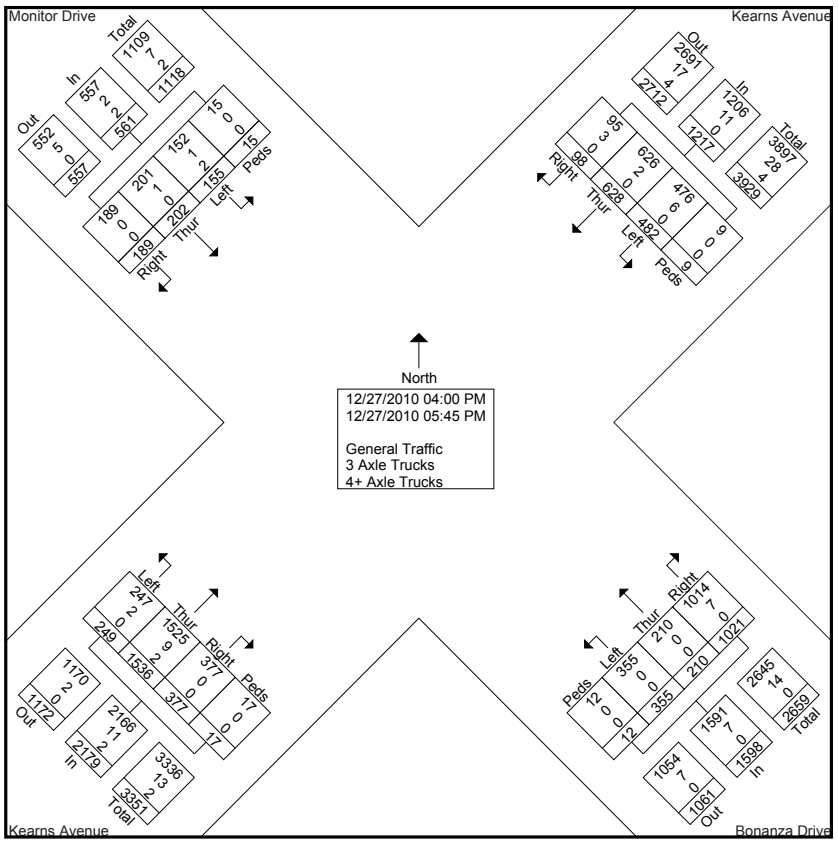
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Bonanza Dr / Kearns Ave
City, State: Park City, Utah
Control: Signalized

File Name : Bonanza Kearns PM
Site Code : 4
Start Date : 12/27/2010
Page No : 1

Groups Printed- General Traffic - 3 Axle Trucks - 4+ Axle Trucks

	Monitor Drive From Northwest					Kearns Avenue From Northeast					Bonanza Drive From Southeast					Kearns Avenue From Southwest					
Start Time	Right	Thur	Left	Peds	App. Total	Right	Thur	Left	Peds	App. Total	Right	Thur	Left	Peds	App. Total	Right	Thur	Left	Peds	App. Total	Int. Total
04:00 PM	20	22	24	0	66	19	88	69	1	177	118	21	34	1	174	44	127	14	1	186	603
04:15 PM	15	24	23	2	64	16	66	56	1	139	141	41	48	2	232	47	182	35	2	266	701
04:30 PM	32	22	18	0	72	8	81	76	0	165	135	34	50	4	223	44	180	30	4	258	718
04:45 PM	28	28	19	2	77	13	73	58	2	146	156	29	61	0	246	57	190	30	3	280	749
Total	95	96	84	4	279	56	308	259	4	627	550	125	193	7	875	192	679	109	10	990	2771
05:00 PM	27	33	20	1	81	12	84	50	0	146	122	29	43	2	196	39	223	48	1	311	734
05:15 PM	21	27	19	7	74	16	65	58	2	141	99	26	34	2	161	56	226	29	3	314	690
05:30 PM	22	25	21	0	68	6	94	53	3	156	124	17	35	1	177	52	216	38	0	306	707
05:45 PM	24	21	11	3	59	8	77	62	0	147	126	13	50	0	189	38	192	25	3	258	653
Total	94	106	71	11	282	42	320	223	5	590	471	85	162	5	723	185	857	140	7	1189	2784
Grand Total	189	202	155	15	561	98	628	482	9	1217	1021	210	355	12	1598	377	1536	249	17	2179	5555
Apprch %	33.7	36	27.6	2.7		8.1	51.6	39.6	0.7		63.9	13.1	22.2	0.8		17.3	70.5	11.4	0.8		
Total %	3.4	3.6	2.8	0.3	10.1	1.8	11.3	8.7	0.2	21.9	18.4	3.8	6.4	0.2	28.8	6.8	27.7	4.5	0.3	39.2	
General Traffic	189	201	152	15	557	95	626	476	9	1206	1014	210	355	12	1591	377	1525	247	17	2166	5520
% General Traffic	100	99.5	98.1	100	99.3	96.9	99.7	98.8	100	99.1	99.3	100	100	100	99.6	100	99.3	99.2	100	99.4	99.4
3 Axle Trucks	0	1	1	0	2	3	2	6	0	11	7	0	0	0	7	0	9	2	0	11	31
% 3 Axle Trucks	0	0.5	0.6	0	0.4	3.1	0.3	1.2	0	0.9	0.7	0	0	0	0.4	0	0.6	0.8	0	0.5	0.6
4+ Axle Trucks	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4
% 4+ Axle Trucks	0	0	1.3	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0.1



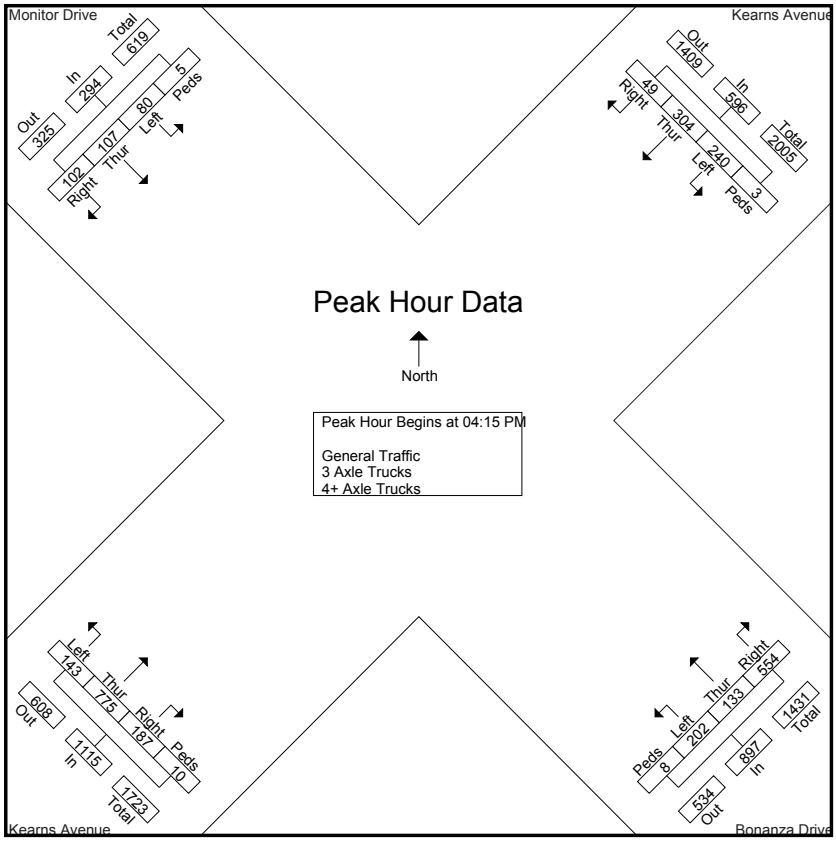
L2 Data Collection

www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Bonanza Dr / Kearns Ave
City, State: Park City, Utah
Control: Signalized

File Name : Bonanza Kearns PM
Site Code : 4
Start Date : 12/27/2010
Page No : 2

	Monitor Drive From Northwest					Kearns Avenue From Northeast					Bonanza Drive From Southeast					Kearns Avenue From Southwest					
Start Time	Right	Thur	Left	Peds	App. Total	Right	Thur	Left	Peds	App. Total	Right	Thur	Left	Peds	App. Total	Right	Thur	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	15	24	**23**	**2**	64	**16**	66	56	1	139	141	**41**	48	2	232	47	182	35	2	266	701
04:30 PM	**32**	22	18	0	72	8	81	**76**	0	**165**	135	34	50	**4**	223	44	180	30	**4**	258	718
04:45 PM	28	28	19	2	77	13	73	58	**2**	146	**156**	29	**61**	0	**246**	**57**	190	30	3	280	**749**
05:00 PM	27	**33**	20	1	**81**	12	**84**	50	0	146	122	29	43	2	196	39	**223**	**48**	1	**311**	734
Total Volume	102	107	80	5	294	49	304	240	3	596	554	133	202	8	897	187	775	143	10	1115	2902
% App. Total	34.7	36.4	27.2	1.7		8.2	51	40.3	0.5		61.8	14.8	22.5	0.9		16.8	69.5	12.8	0.9		
PHF	.797	.811	.870	.625	.907	.766	.905	.789	.375	.903	.888	.811	.828	.500	.912	.820	.869	.745	.625	.896	.969



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Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Bonanza Dr / Kearns Ave
City, State: Park City, Utah
Control: Signalized

File Name : Bonanza Kearns PM
Site Code : 4
Start Date : 12/27/2010
Page No : 3

Image 1

L2 Data Collection

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Project: PC0002
Intersection: Bonanza Dr / Kearns Ave
City, State: Park City, Utah
Control: Signalized

File Name : Bonanza Kearns PM
Site Code : 4
Start Date : 12/27/2010
Page No : 4

L2 Data Collection

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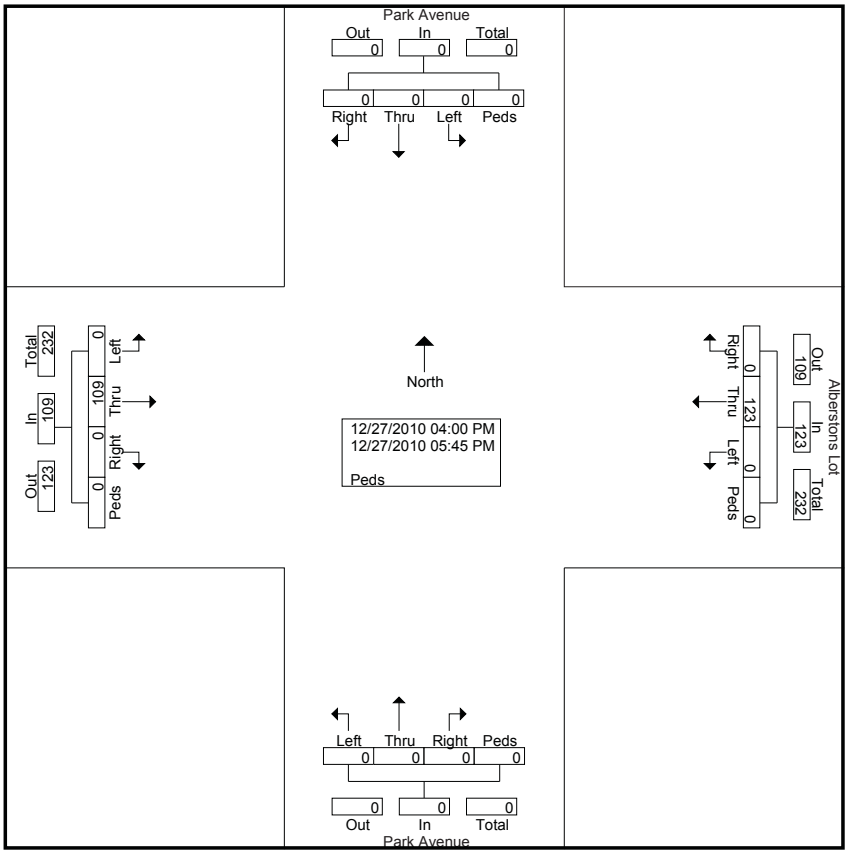
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Park Ave Ped Crossing
City, State: Park City, Utah
Control: Actuated

File Name : Albertsons Ped Crossing PM
Site Code : 1P
Start Date : 12/27/2010
Page No : 1

Groups Printed- Peds

	Park Avenue From North					Albertsons Lot From East					Park Avenue From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	0	28	0	0	28	43
04:15 PM	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	12	0	0	12	24
04:30 PM	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	5	0	0	5	15
04:45 PM	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	0	11	0	0	11	28
Total	0	0	0	0	0	0	54	0	0	54	0	0	0	0	0	0	56	0	0	56	110
05:00 PM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	12	0	0	12	23
05:15 PM	0	0	0	0	0	0	27	0	0	27	0	0	0	0	0	0	10	0	0	10	37
05:30 PM	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	11	0	0	11	32
05:45 PM	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	20	0	0	20	30
Total	0	0	0	0	0	0	69	0	0	69	0	0	0	0	0	0	53	0	0	53	122
Grand Total	0	0	0	0	0	0	123	0	0	123	0	0	0	0	0	0	109	0	0	109	232
Apprch %	0	0	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
Total %	0	0	0	0	0	0	53	0	0	53	0	0	0	0	0	0	47	0	0	47	



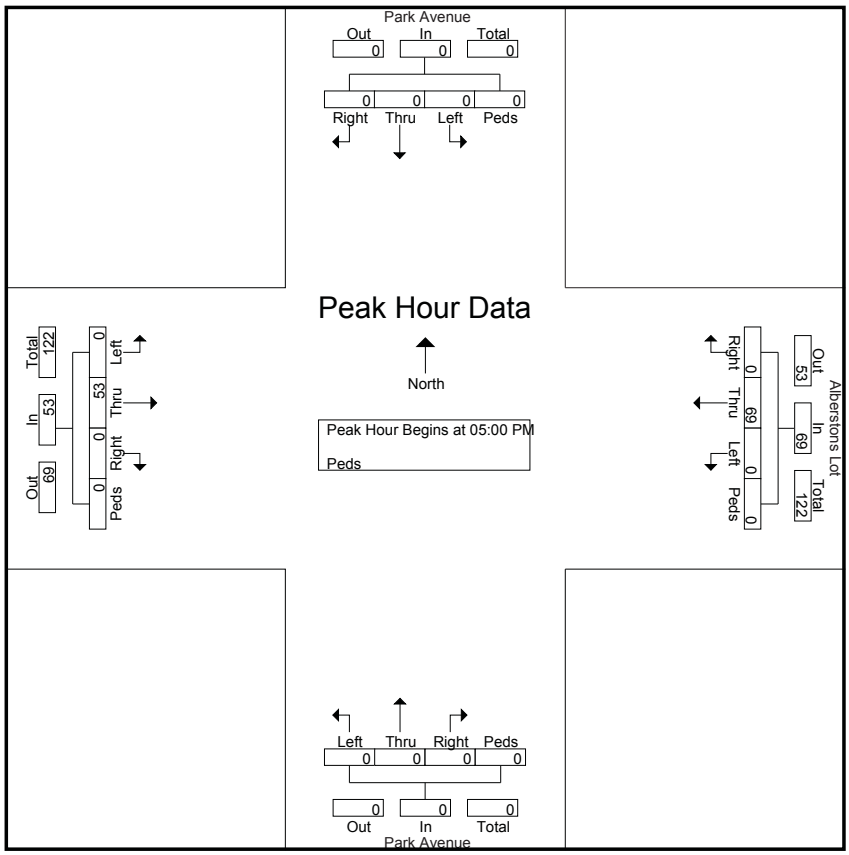
L2 Data Collection

www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Park Ave Ped Crossing
City, State: Park City, Utah
Control: Actuated

File Name : Albertsons Ped Crossing PM
Site Code : 1P
Start Date : 12/27/2010
Page No : 2

	Park Avenue From North					Alberstons Lot From East					Park Avenue From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	12	0	0	12	23
05:15 PM	0	0	0	0	0	0	**27**	0	0	**27**	0	0	0	0	0	0	10	0	0	10	**37**
05:30 PM	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	11	0	0	11	32
05:45 PM	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	**20**	0	0	**20**	30
Total Volume	0	0	0	0	0	0	69	0	0	69	0	0	0	0	0	0	53	0	0	53	122
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.639	.000	.000	.639	.000	.000	.000	.000	.000	.000	.663	.000	.000	.663	.824



L2 Data Collection

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Idaho (208) 860-7554 Utah (801) 413-2993

Project: PC0002
Intersection: Park Ave Ped Crossing
City, State: Park City, Utah
Control: Actuated

File Name : Albertsons Ped Crossing PM
Site Code : 1P
Start Date : 12/27/2010
Page No : 3

Image 1

L2 Data Collection

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Project: PC0002
Intersection: Park Ave Ped Crossing
City, State: Park City, Utah
Control: Actuated

File Name : Albertsons Ped Crossing PM
Site Code : 1P
Start Date : 12/27/2010
Page No : 4

MEMORANDUM

UTAH DEPARTMENT OF TRANSPORTATION

Date: November 20, 2011

TO: Lynn Jacobs, P.E.
Transportation Engineer, Fehr & Peers

FROM: John L. Leonard, P.E.
Traffic & Safety Operations Engineer

SUBJECT: Operational Safety Report #11-049; Project No. SR-224; Thayne's Canyon Dr. to Bonanza Dr.; MP 5.54 to MP 6.30; Corridor Study.

We have evaluated the crash history for the subject section of SR-224 for the three-year period of 2007 through 2009, with the following results:

Table I; CRASH SUMMARY

URBAN MINOR ARTERIAL OTHER PRINCIPAL ARTERIAL		ACTUAL				EXPECTED
		2007	2008	2009	TOTAL/AVG	
Number of Crashes		42	38	22	102/34.00	
Crash Rate		4.79	4.48	3.31	4.19	3.16
Severity		1.45	1.34	1.18	1.32	1.53
Rear End Crashes	28.4%				29	
Right Angle Crashes	24.5%				25	
Single Vehicle Crashes	15.7%				16	
Left Turn Crashes	14.7%				15	
Sideswipe Same Direction	11.8%				12	

Crash data indicates that the crash rate of this section of SR-224 is higher than the expected and the severity is lower than the expected. The predominant crash types are listed in table I above. The total number of crashes had decreases of 9.5% and 42.1% for the years 2008 and 2009, respectively; the crash rate also had decreases of 6.5 % and 26.1% for same years; the severity index showed a similar trend with decreases of 7.6 % and 11.9% for 2008 and 2009, respectively.

The time periods from 12:00 noon to 3:00 pm and from 3:00 pm to 6:00 pm were the ones where most crashes occurred with 24.5% and 29.4%, respectively; for the day of the week, Wednesdays and Thursdays had the highest percentage of crash occurrence with 18.6% and 19.6%, respectively; with regards to weather conditions, 63.7% of crashes took place in dry conditions, 14.7% in cloudy conditions and 15.7% in snowy conditions; for roadway surface conditions, 65.7% occurred in dry pavement conditions, 11.8% in rainy conditions, 18.8% in snowy/icy conditions. Percentages that are missing for the last two parameters were coded as unknown or invalid.

Most of the rear end crashes were concentrated at various intersections and their main contributing factor was "following too closely"; approximately 55.2% of these crashes occurred in dry weather conditions, 31.0% in snowy conditions and 13.8% in rainy conditions.

Right angle crashes were also concentrated mostly at intersections and a few others at business accesses. The main contributing factors for these crashes were 'failure to yield the right-of-way' at non-

signalized intersections or business accesses and 'disregard the traffic signal' at signalized intersections.

Left turn crashes were also concentrated at intersections and their main contributing factor was 'failure to yield the right-of-way'; the greatest percentage of these crashes occurred at the intersection of SR-224 and Bonanza Dr., with 40% total.

Sideswipe same direction crashes were scattered through the boundaries of this corridor and were all caused by an improper lane change maneuver on the part of the offending driver.

The occurrence of single vehicle crashes is depicted in Table II below, broken down by crash type, number of crashes, and percent of single vehicle crashes:

Table II; SINGLE VEHICLE CRASHES

CRASH TYPE	No.	% OF SINGLE VEH. CRASHES
Run Off The Road to the Right	7	43.8
Pedestrian Related	4	25.0
Bicycle Related	3	18.8
Wildlife Related	2	12.4
TOTAL	16	100.0%

All of the crashes where vehicles ran off the road were caused by excessive speed. The fixed objects most commonly struck were signal poles and mailboxes or fire hydrants.

The majority of the pedestrian and bicycle crashes (5 or 71.4%) occurred within a 400 feet stretch of road from MP 5.83 to MP 5.91 or mostly in the area between Iron Horse Drive and Home Steak Road; the 2 highest severities were a 4 and the 2 lowest were a 1, with the average being 2.71 (there were 3 crashes with severity 3).

We recommend that a comprehensive study be undertaken to develop various alternatives for improvements that can be implemented in this urban area, which is fully developed. Areas of concern should include any type of improvements that can be made to the existing signal systems, signal coordination, and pedestrian improvements; additionally, the study should consider alternatives to develop an Access Management Plan that would consider the combining of various business accesses, as this type of existing scenario (based on the analysis of crash data) contributes to a large number of crashes, both vehicular and pedestrian related.

Source documents are available at the Division of Traffic and Safety for additional analysis. If questions arise, please call me at 801-965-4045.

JL/eg

cc: Robert Hull, John Leonard, Roland Stanger, FHWA, Robert Miles, R-2, Zeke González, Oanh Le-Spradlin, R-2











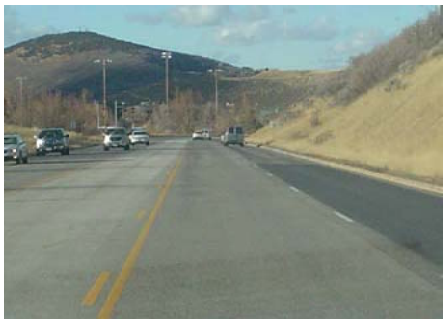











VISSIM Post-Processor
Average Results from 10 Runs
Intersection Volume and Delay

SR-224 Corridor Study
Existing - December 2010
PM Peak Hour

	Intersection	Control	Volume (vph) Demand	Volume (vph) Served	Percent Served	GEH	Delay (sec/veh) Average	Delay (sec/veh) Std. Dev.	Level of Service
1	Park Avenue/Kearns Blvd	Signal	3,705	3,760	101.5%	0.9	27.5	13.6	C
2	Park Avenue/Deer Valley Drive	Signal	3,007	3,067	102.0%	1.1	49.4	17.1	D
3	Deer Valley Drive/Bonanza	Signal	2,787	2,820	101.2%	0.6	23.9	8.9	C

Network Summary	
Total Demand Volume (veh/hr)	12,511
Total Volume Served (veh/hr)	12,673
Percent Served	101.3%
GEH Statistic	1.4

Notes: 1. Volume is measured for the entire peak hour.
2. Delay is measured for the peak 15 minutes in the peak hour.

Fehr & Peers

8/1/2012

VISSIM Post-Processor
Average Results from 10 Runs
Intersection Volume and Delay

SR-224 Corridor Study
Phase 1 - December 2010
PM Peak Hour

	Intersection	Control	Volume (vph) Demand	Volume (vph) Served	Percent Served	GEH	Delay (sec/veh) Average	Delay (sec/veh) Std. Dev.	Level of Service
1	Park Avenue/Kearns Blvd	Signal	3,705	3,734	100.8%	0.5	19.4	2.4	B
2	Park Avenue/Deer Valley Drive	Signal	3,007	3,033	100.9%	0.5	32.3	2.6	C
3	Deer Valley Drive/Bonanza	Signal	2,787	2,824	101.3%	0.7	20.2	2.3	C

Network Summary	
Total Demand Volume (veh/hr)	12,511
Total Volume Served (veh/hr)	12,590
Percent Served	100.6%
GEH Statistic	0.7

Notes: 1. Volume is measured for the entire peak hour.
2. Delay is measured for the peak 15 minutes in the peak hour.

Fehr & Peers

8/1/2012

VISSIM Post-Processor
Average Results from 10 Runs
Intersection Volume and Delay

SR-224 Corridor Study
Near Term Baseline
PM Peak Hour

	Intersection	Control	Volume (vph) Demand	Volume (vph) Served	Percent Served	GEH	Delay (sec/veh) Average	Delay (sec/veh) Std. Dev.	Level of Service
1	Park Avenue/Kearns Blvd	Signal	3,890	3,737	96.1%	2.5	54.2	33.8	D
2	Park Avenue/Deer Valley Drive	Signal	3,156	3,056	96.8%	1.8	87.5	12.2	F
3	Deer Valley Drive/Bonanza	Signal	2,926	2,823	96.5%	1.9	102.8	66.5	F

Network Summary	
Total Demand Volume (veh/hr)	13,134
Total Volume Served (veh/hr)	12,618
Percent Served	96.1%
GEH Statistic	4.6

Notes: 1. Volume is measured for the entire peak hour.
2. Delay is measured for the peak 15 minutes in the peak hour.

Fehr & Peers

8/1/2012

VISSIM Post-Processor
Average Results from 10 Runs
Intersection Volume and Delay

SR-224 Corridor Study
Near Term Phase 1
PM Peak Hour

	Intersection	Control	Volume (vph) Demand	Volume (vph) Served	Percent Served	GEH	Delay (sec/veh) Average	Delay (sec/veh) Std. Dev.	Level of Service
1	Park Avenue/Kearns Blvd	Signal	3,890	3,914	100.6%	0.4	21.2	2.4	C
2	Park Avenue/Deer Valley Drive	Signal	3,156	3,184	100.9%	0.5	38.8	3.8	D
3	Deer Valley Drive/Bonanza	Signal	2,926	2,943	100.6%	0.3	23.8	3.9	C

Network Summary	
Total Demand Volume (veh/hr)	13,134
Total Volume Served (veh/hr)	13,179
Percent Served	100.3%
GEH Statistic	0.4

Notes: 1. Volume is measured for the entire peak hour.
2. Delay is measured for the peak 15 minutes in the peak hour.

Fehr & Peers

8/1/2012

VISSIM Post-Processor
Average Results from 10 Runs
Intersection Volume and Delay

SR-224 Corridor Study
Near Term Phase 2
PM Peak Hour

	Intersection	Control	Volume (vph) Demand	Volume (vph) Served	Percent Served	GEH	Delay (sec/veh) Average	Delay (sec/veh) Std. Dev.	LOS	Worst Movement
1	Park Avenue/Kearns Blvd	Signal	3,890	3,898	100.2%	0.1	13.9	4.8	B	
2	Park Avenue/Deer Valley Drive	Signal	3,156	3,176	100.6%	0.4	39.8	5.4	D	
3	Deer Valley Drive/Bonanza	Signal	2,926	2,956	101.0%	0.5	23.6	4.5	C	

Network Summary	
Total Demand Volume (veh/hr)	13,134
Total Volume Served (veh/hr)	13,181
Percent Served	100.4%
GEH Statistic	0.4

Fehr & Peers

8/1/2012

Near Term PM Peak Hour CO Emissions (g)			
	Baseline	Phase 1	Phase 2
Kearns/ Park	7030	4837.29	4672.09
Park/DVD	7459.5	4389.45	3941.67
Bonanza/DVD	4957.31	4897.22	4993.89
SUM	19446.81	14123.96	13607.65

Near Term PM Peak CO Reduction		
	Phase 1	Phase 2
Kearns/ Park	31%	34%
Park/DVD	41%	47%
Bonanza/DVD	1%	-1%
SUM	27%	30%

Near Term PM Peak Hour NOx Emissions (g)			
	Baseline	Phase 1	Phase 2
Kearns/ Park	1367.78	941.16	909.02
Park/DVD	1451.35	854.03	766.91
Bonanza/DVD	964.51	952.82	971.63
SUM	3783.64	2748.01	2647.56

Near Term PM Peak NOx Reduction		
	Phase 1	Phase 2
Kearns/ Park	31%	34%
Park/DVD	41%	47%
Bonanza/DVD	1%	-1%
SUM	27%	30%

Near Term PM Peak Hour VOC Emissions (g)			
	Baseline	Phase 1	Phase 2
Kearns/ Park	1629.27	1121.09	1082.8
Park/DVD	1728.81	1017.3	913.52
Bonanza/DVD	1148.9	1134.98	1157.38
SUM	4506.98	3273.37	3153.7

Near Term PM Peak VOC Reduction		
	Phase 1	Phase 2
Kearns/ Park	31%	34%
Park/DVD	41%	47%
Bonanza/DVD	1%	-1%
SUM	27%	30%

Near Term PM Peak Hour Fuel Consumption (gal)			
	Baseline	Phase 1	Phase 2
Kearns/ Park	100.57	69.2	66.84
Park/DVD	106.72	62.8	56.39
Bonanza/DVD	70.92	70.06	71.44
SUM	278.21	202.06	194.67

Near Term PM Peak Fuel Consumption Reductio		
	Phase 1	Phase 2
Kearns/ Park	31%	34%
Park/DVD	41%	47%
Bonanza/DVD	1%	-1%
SUM	27%	30%

Near Term Ped Delay			
	Baseline	Phase 1	Phase 2
Kearns/ Park	335.6	125.2	0
Park/DVD	5698	5000.5	5140.8
Bonanza/DVD	0	0	0
Total Peds	144	141	142
Delay/ped	41.9	36.35248	36.20282

Near Term Veh (- peds) delay			
	Baseline	Phase 1	Phase 2
Kearns/ Park	160763.6	72731	51506.4
Park/DVD	226851.8	120214.7	99187.2
Bonanza/DVD	64332.8	57559.8	66723
Total Vehicles	9749	10091	9901
Delay/veh	46.35842	24.82465	21.95905

Assumptions

Veh Occupancy 1.3

Near Term Person Delay (seconds)			
	Baseline	Phase 1	Phase 2
Total	593566.3	330782.9	287782.4

Near Term Person Delay Reduction		
	Phase 1	Phase 2
Total	44%	52%