PARK CITY

October 2011

TRAFFIC & TRANSPORTATION MASTER PLAN

PARK CITY
1884

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APPENDICES

Chapter 1: Introduction

As Park City and its surrounding area becomes an increasingly popular place to live, work, and recreate, the demands on its transportation system begin to take on a higher priority among city leaders. This transportation plan is intended to address multi-modal transportation needs of Park City to the year 2040. To that end, there are three "themes" that emerged about the nature of transportation, traffic congestion and Park City's future transportation vision during this process.

- Traffic congestion on "Gateway Corridors" (S.R. 224 and S.R. 248 or Kearns Boulevard) should not reach levels that inhibit economic development opportunities in Park City.
- Multi-modal approaches to traffic management beginning on Gateway Corridors and continuing in Park City will be necessary to avoid traffic problems that put quality of life in conflict with economic and tourism priorities.
- This approach requires Park City to accept some level of traffic congestion and this level must continually be evaluated and balanced with overall community support.

These themes form the foundation for this transportation plan. This plan outlines a series of steps that embrace a multi-modal approach which establish a path for mid-term and long-term evolution towards a transportation environment that is less reliant on the single-occupant vehicle.

Background

Originally established as a silver mining community in the 1800's, Park City has since evolved into a thriving center of tourism and recreation. With the popularity of the city and its proximity to the urbanized Wasatch Front, traffic issues have become an increasing concern.

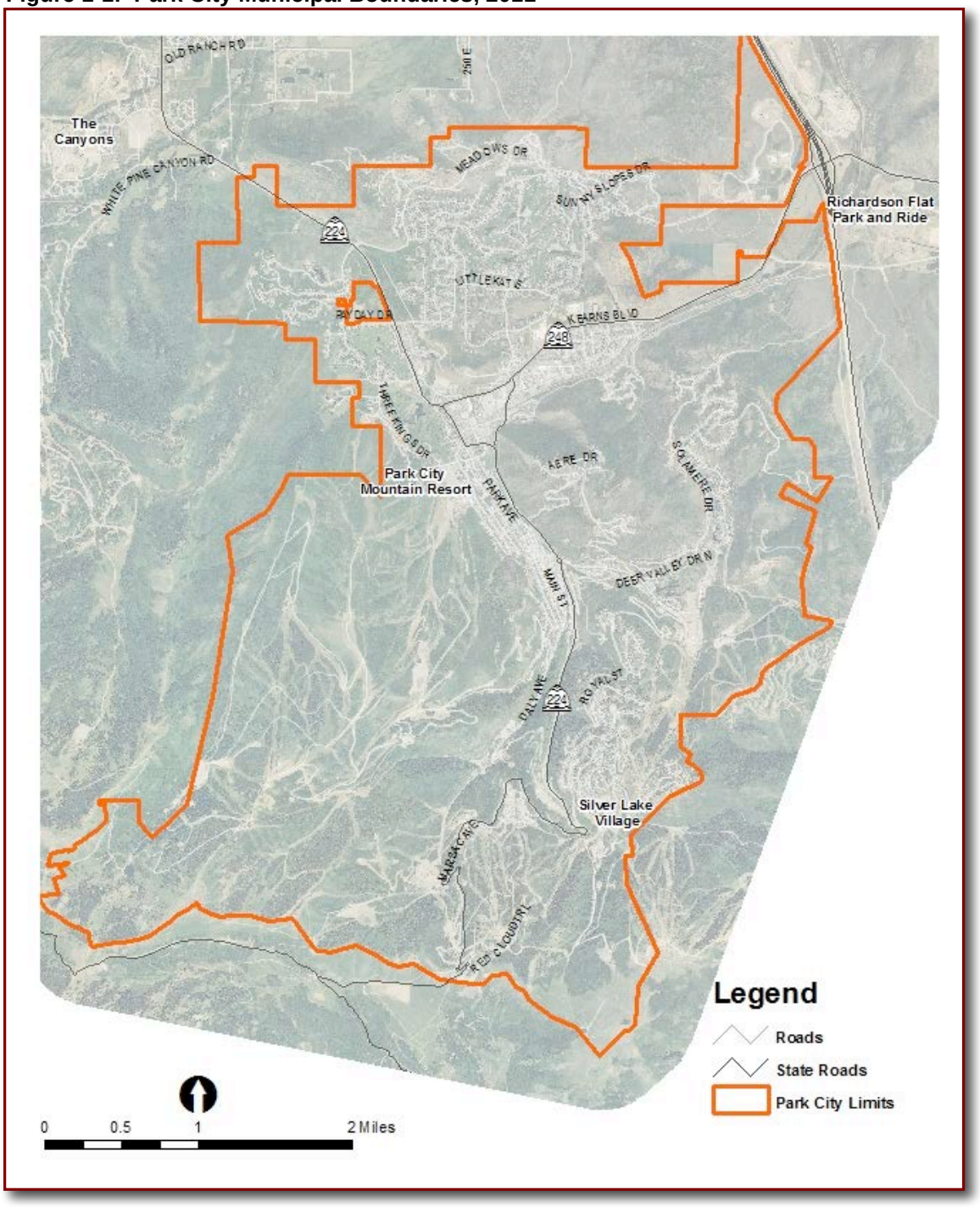
This plan covers the area within the Park City municipal boundaries. While it does incorporate traffic generators and destinations outside the city limits, transportation improvements outside of the city boundaries are out of Park City's full control and so are not included here and are under the jurisdiction of Summit County, Wasatch County, or other local government entity.

Objectives

This plan analyzes a broad range of multi-modal approaches to determine which are most viable and effective given existing conditions and the overall values of the city. It is intended to inform decision-makers on the implications of various approaches, decisions, policies, and actions. This plan is also intended to help Park City staff better understand the policies that connect transportation decisions to sustainable development and other goals of Park City.

It is hoped that this plan will help both Park City staff and elected officials be resilient in responding to unknown or uncontrollable future conditions. Much of the development of this plan focused on offering decision-makers an alternative course of action when circumstances change or are not under their jurisdiction. Park City officials do not have control over how people choose to travel or over the actions of Summit County or the Utah Department of Transportation (UDOT) but can influence individual choices with city policies that promote and support travel that is less impacting. By offering consistent policies beginning with Gateway Corridors and extending into "Neighborhood Connections," the impact of the ski resorts and internal and external transit, the objective is to offer mode split goals (in the "Report Card") that will support other policies and can be implemented citywide.

Figure 1-1: Park City Municipal Boundaries, 2011



Development of Goals and Objectives

The goals and objectives presented in this plan were developed through a process of examining the public input of the Park City Vision effort and turning sentiments expressed there into specific directives related to transportation. Both the Technical Committee and the Stakeholder Committee provided detailed input to these goals and objectives. Performance measures that are quantifiable are attached to each goal so that Park City can continue to work towards goals through continuous measurement and assessment. Goals and objectives defined in this transportation plan are intended to provide City leaders a common ground from which consistent decisions can be made.

Community Involvement

Involving the Park City community was important throughout the process. The community and Park City staff involvement was organized into various committees and different layers of public involvement.

Technical Committee
This committee was made up of consulting team members and Park City Municipal Corporation (PCMC) staff representing the engineering, public works, planning, and sustainability departments. This group met approximately 15 times over a 12-month period and provided technical oversight and day-to-day direction in the planning process.

Stakeholder Committee
The Stakeholder Committee consisted of representatives from groups in and around Park City. It was created to act as a sounding board for transportation goals and policies, to provide guidance on transportation alternatives, and to help provide outreach for public meetings. Groups and organizations represented on the Stakeholder Committee included:

- Park City Mountain Resort (PCMR)
- Deer Valley Resort
- Summit County
- Wasatch County
- Park City School District
- Chamber of Commerce
- Historic Main St. Business Assoc.
- Lodging Association
- Mountain Trails
- Park City Planning Commission
- Sundance Film Festival
- Fire District
- UDOT Region Two
- Park City Area Home Builders
- Snyderville Basin Water Rec. Dist.
- Prospector Square HOA
- Historic Preservation Board
- Recreation Advisory Board
- Envision Utah
- Ski Utah
- Americans with Disabilities

Summaries of Stakeholder Committee meetings and comments are included in Appendix G.

Planning Commission
PCMC staff and consulting team members presented information to the Planning Commission on August 11, 2010 and again on February 23, 2011. These presentations were intended to keep planning commissioners up-to-date on progress, upcoming events, and other major milestones. Two planning commission members were also members of the Stakeholder Committee in order to keep the Planning Commission apprised of important developments and events.

City Council
The City Council was briefed by staff and consultants on September 30, 2010 and on February 24, 2011. The primary purpose of these briefings was to give them a preview of information that would subsequently be presented at public open houses in addition to providing information related to progress, process, and key milestones.

Public Open Houses
Public open houses for the Traffic and Transportation Master Plan were held on October 5, 2010 and February 28, 2011. The main purpose of these two events was to gather information, comments, and ideas from Park City residents and workers. Information presented at the first event included:

- Draft goals and objectives
- Draft cross-section standards
- Draft functional classification
- VISSIM traffic simulation software

The second open house was a chance for Park City residents to provide comments on elements of the plan as they had been developed over the previous months.

- Transportation network alternatives
    - Gateway corridors
    - Neighborhood connections
- Road standard cross-sections
- Functional classification
- Trails
- Transit

Summaries of the comments received at these open houses are included in Appendix G.

Chapter 2: Existing Conditions

Demographics

Population and employment both in Park City and the surrounding area have great impact on the transportation and traffic conditions within the city. As Park City becomes a more popular place to live due to its proximity to the Wasatch Front urbanized area and as it becomes a larger component of the employment picture for the Wasatch Back, traffic to, from, and through the area becomes a citywide priority. As a world-class resort community with a historic, small town atmosphere, Park City also experiences high traffic demand during special events and peak tourist times.

Population

Population in Park City is often a "moving target" since distinguishing between full-time and part-time residents is often a subjective task. Census information related to full-time residents of Park City and the surrounding area is shown in Table 2-1.

Table 2-1: 2010 Population

Area	2010 Full-time Residents
Park City	7,558
Summit County	36,324
Wasatch County	23,530

Source: 2010 Census Redistricting Data (Public Law 94-171) Summary File. Summit County data includes Park City.

Employment

Park City is becoming an employment base for the region. With an economy that includes a strong tourism component, many jobs in the area are focused in the service industry which are typically lower paying and often seasonal in nature. Employment in Park City and Summit and Wasatch Counties is shown in Table 2-2 below.

Table 2-2: 2009 Employment

Area	2009 Employment
Park City	9,635
Summit County	20,232
Wasatch County	5,437

Sources: County-level data from the Department of Workforce Services, annual average non-farm employment excluding mining and construction. City-level data estimated from DWFS or October 2009. Data for Summit County includes Park City.

Housing Units

Like population, estimating the number of housing units in Park City can be difficult given the number of second homes in the area and the number of houses or condos that are primarily rental units. The number of housing units estimated to be in Park City is included in Table 2-3 below. Second homes and condos for 2009 are shown in Table 2-4. Second homes and condominiums are also included in the existing house unit numbers.

Table 2-3: Existing Housing Units

Area	2010 Housing Units
Park City	9,471
Summit County	26,545
Wasatch County	10,577

Source: 2010 Census Redistricting Data (Public Law 94-171) Summary File

Table 2-4: Second Homes and Condominiums

Area	2009 Estimate of Second Homes & Condos
Park City	5,672
Summit County	7,146
Wasatch County	1,022

Source: Estimated from Park City GIS address data and Wasatch County GIS/assessor data for non-owner-occupied units and adjusted for non-owner-occupied full-time households and the total single-family and multi-family units provided by Park City.

Land Use

Generally, land use in Park City is a healthy mix of uses and densities. The Historic Main Street area and Old Town are higher density areas with commercial, residential, and recreational uses. Areas that developed more recently are on larger lots and tend to be more single-family residential or larger commercial developments. Land within the current municipal boundaries is largely built-out although there are some areas with pending developments and a few planned redevelopment areas within the city.

Areas within unincorporated Summit and Wasatch Counties adjacent to Park City are a mix of developed and undeveloped lands, large recreational areas, and large-scale commercial development. While these areas are not within the incorporated boundaries of Park City and so are mostly beyond its control, they nevertheless have great impacts on traffic and transportation conditions in the city.

Alternative Travel Modes

Park City has consistently shown its commitment to alternative travel modes through achievements such as passing a $15 million walkability bond, providing free service on the local bus system, building a park-and-ride lot near U.S. 40 in order to reduce traffic impacts in the city, and considering innovative solutions to traffic congestion on Kearns Boulevard such as reversible lanes and high-occupancy vehicle lanes.

Transit

Park City Transit provides transit service for Park City and parts of western Summit County. Existing transit service consists of five bus routes in the summer and ten bus routes in winter with year-round trolley service on Main Street. These bus routes serve Historic Park City, residential neighborhoods in Park City and Kimball Junction, as well as, Park City Mountain Resort, Deer Valley Resort and The Canyons. Figures 2-1 and 2-2 show the summer and winter 2010 transit service within Park City. The city is currently in the process of updating its short range Transit Development Plan (TDP).

Figure 2-1: Summer 2010 Bus Routes

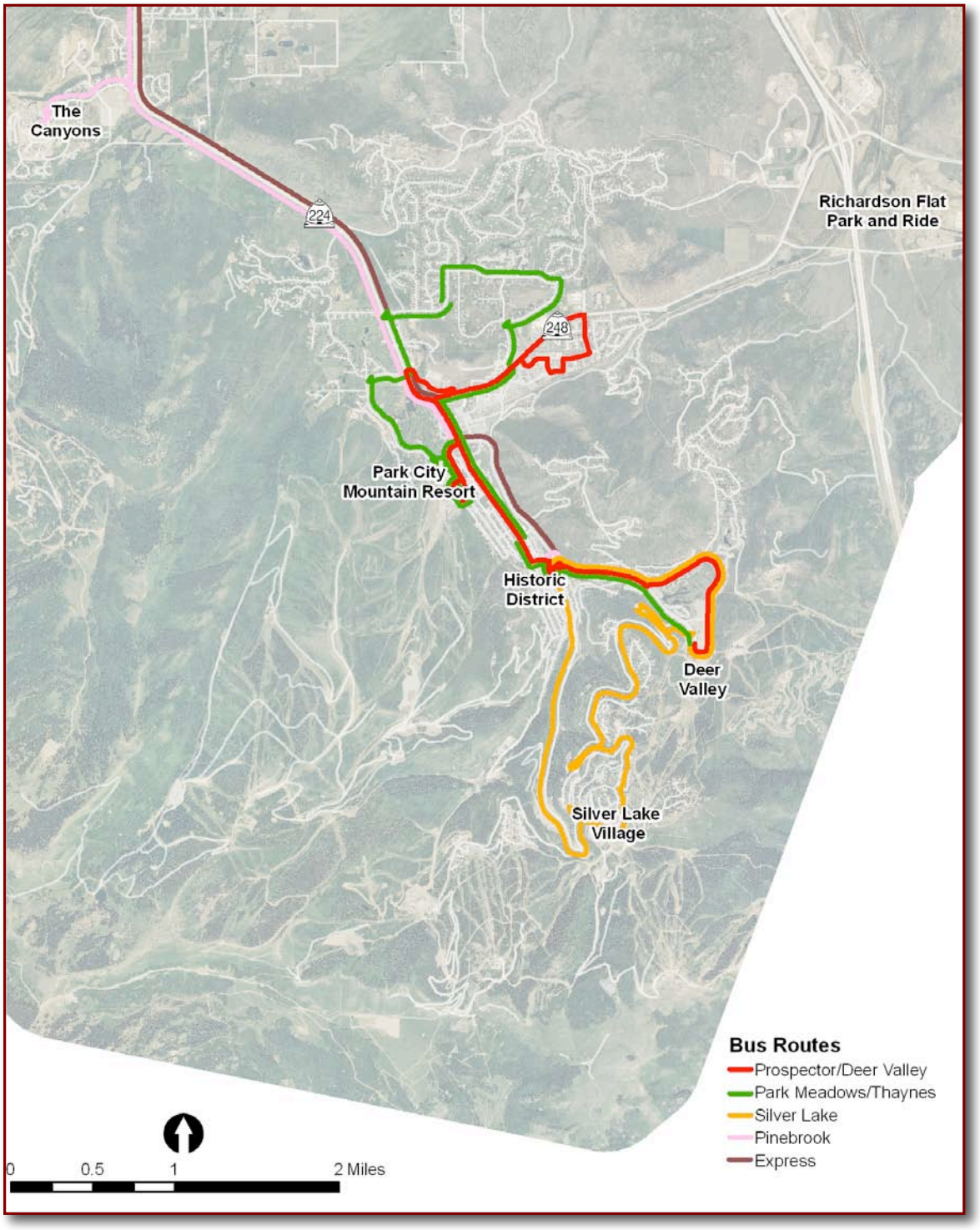
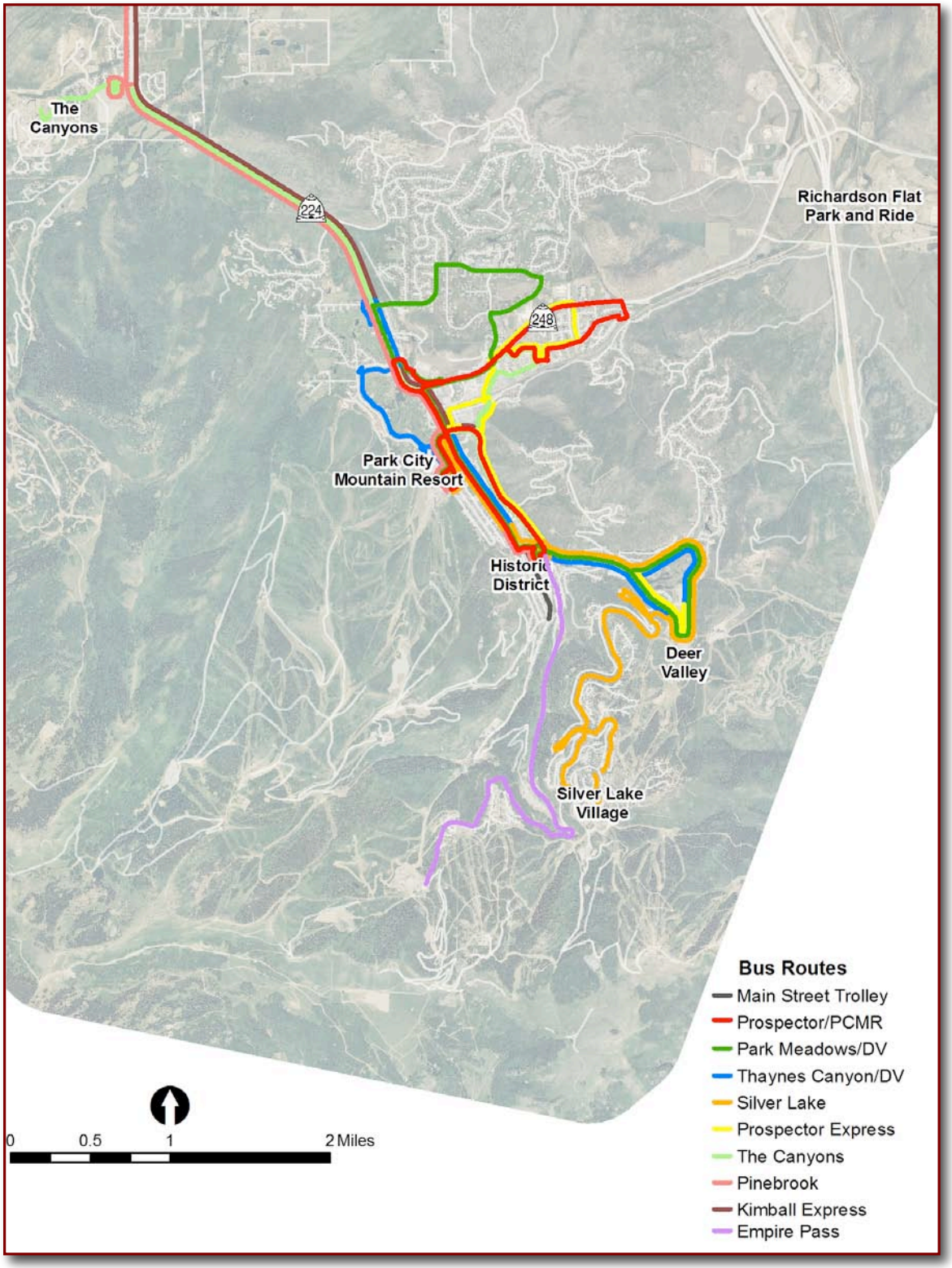


Figure 2-2: Winter 2010 Bus Routes



Trails Master Plan
Park City has an adopted plan for trails, the Park City Trails Master Plan Update 2008, which facilitates the development of an alternative transportation system for non-motorized transportation that helps support the road and transit system. The trails plan is intended to give decision-makers direction when making decisions regarding such things as trail acquisition, development and maintenance, priorities and options for funding, and trail implementation priorities.

The vision for trails identified in the plan, "*Non-motorized travel is a viable transportation option to the automobile. It improves the quality of life, community aesthetic, environment and thus our quality of life*," is consistent with the overall priorities and tone of this Traffic and Transportation Master Plan. Trail and bicycle facilities are an integral part of the overall strategy of Park City to rely less on the single-occupant vehicle. Trails are discussed in more detail in Chapter 6 of this plan, but nothing contained in this Traffic and Transportation Master Plan should be construed to alter or change the priorities, strategies, or concepts identified in the Trails Master Plan.

Street Inventory

As part of the development of a roadway functional classification system (see Chapter 4), a street inventory was completed within Park City. The street inventory used existing GIS data and aerial imagery to map the roadway characteristic of major routes; this inventory does not include information related to local streets. These characteristics include:

- Right-of-way width
- Pavement width
- Number of travel lanes
- Speed limits and traffic signals
- Edge treatment (curb/gutter, sidewalks, park strips)

Figure 2-3 classifies major roads within Park City by right-of-way width. These right-of-way widths were estimated from parcel data provided by Park City. Due to the uncertainties of the accuracy of parcel data, the right-of-way width is shown as a range. As would be expected, the states routes of S.R. 224 and S.R. 248 have the largest right-of-ways with narrower right-of-ways in Old Town and Park Meadows. Information on historic rights-of-way is included In Appendix G.

The existing pavement width was determined using 2009 aerial imagery and was also verified with actual pavement measurements in several locations. Figure 2-4 shows the pavement width for the major roadways. Again the state routes have the widest pavement with the narrowest streets in Old Town, specifically on Marsac Avenue from Deer Valley Drive to Hillside Avenue.

The major roads were also classified by the number of travel lanes. With the exceptions of S.R. 224 and S.R. 248, most roads within Park City have two travel lanes. Only Empire Avenue from Park Avenue to Silver King Avenue has more than two travel lanes with two southbound and one northbound travel lanes. Figure 2-5 shows the existing number of travel lanes within Park City.

Figure 2-6 shows existing speed limits and traffic signals. S.R. 224 and S.R. 248 are the high-speed routes into and out of Park City with city streets having lower speed limits of typically 25 mph.

Figure 2-7 shows the existing edge treatments on the major roads within Park City. While most roads have curb and gutter, many roads don't have sidewalks or only have sidewalk on one side. Additionally, there are few park strips within the city due to the narrow right-of-ways.

Figure 2-3: Right-of-way Width

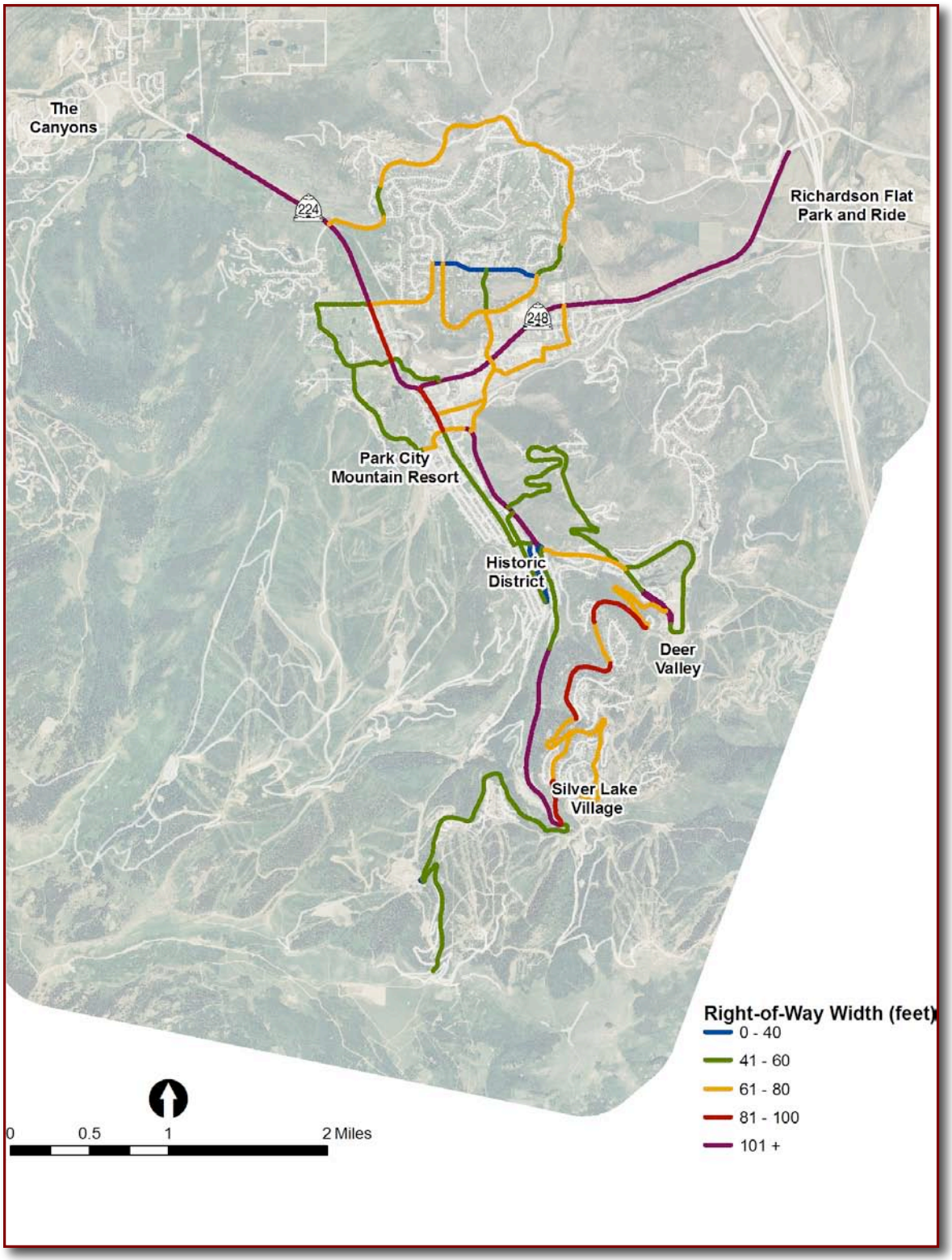


Figure 2-4: Pavement Width

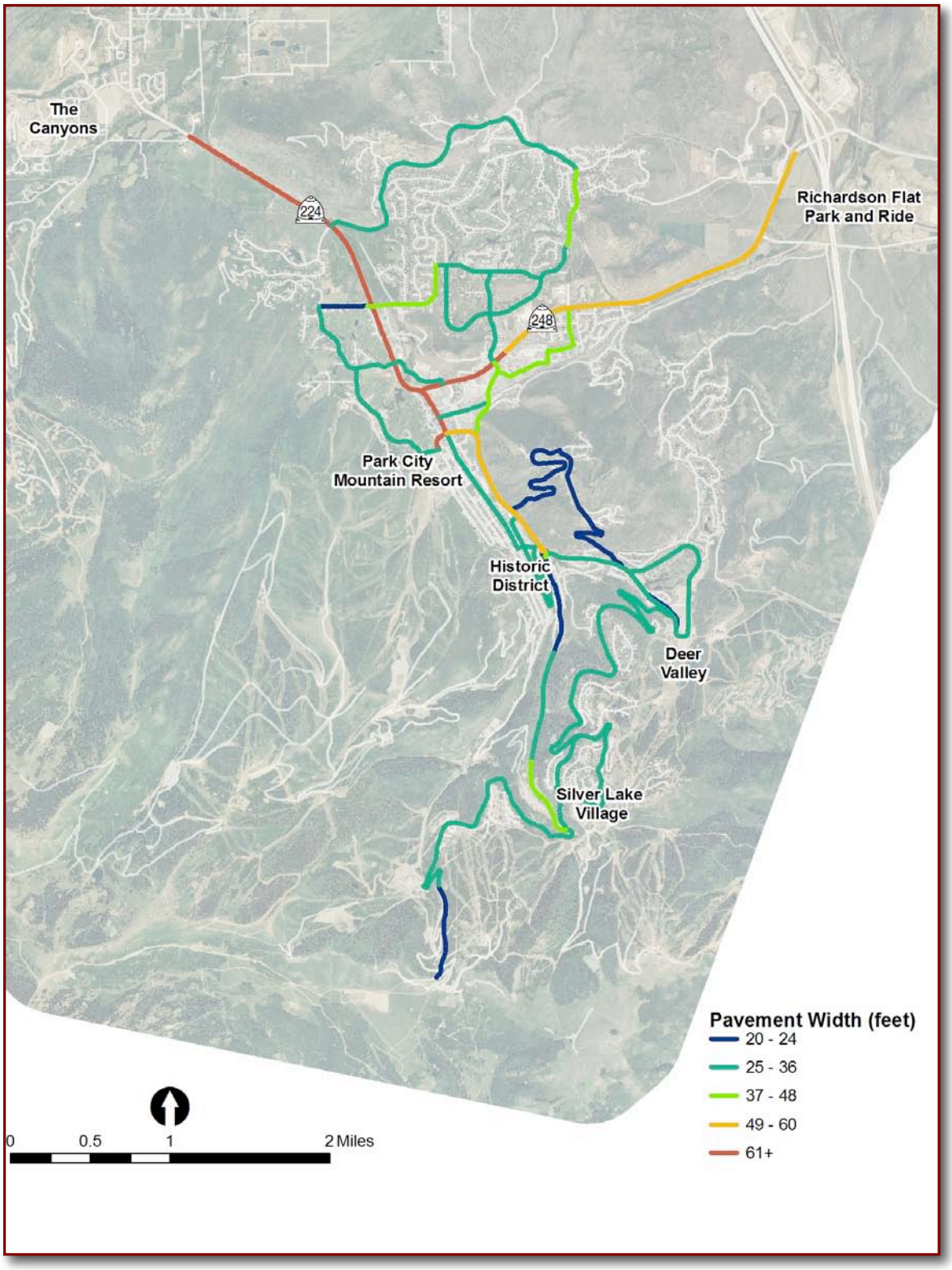


Figure 2-5: Travel Lanes

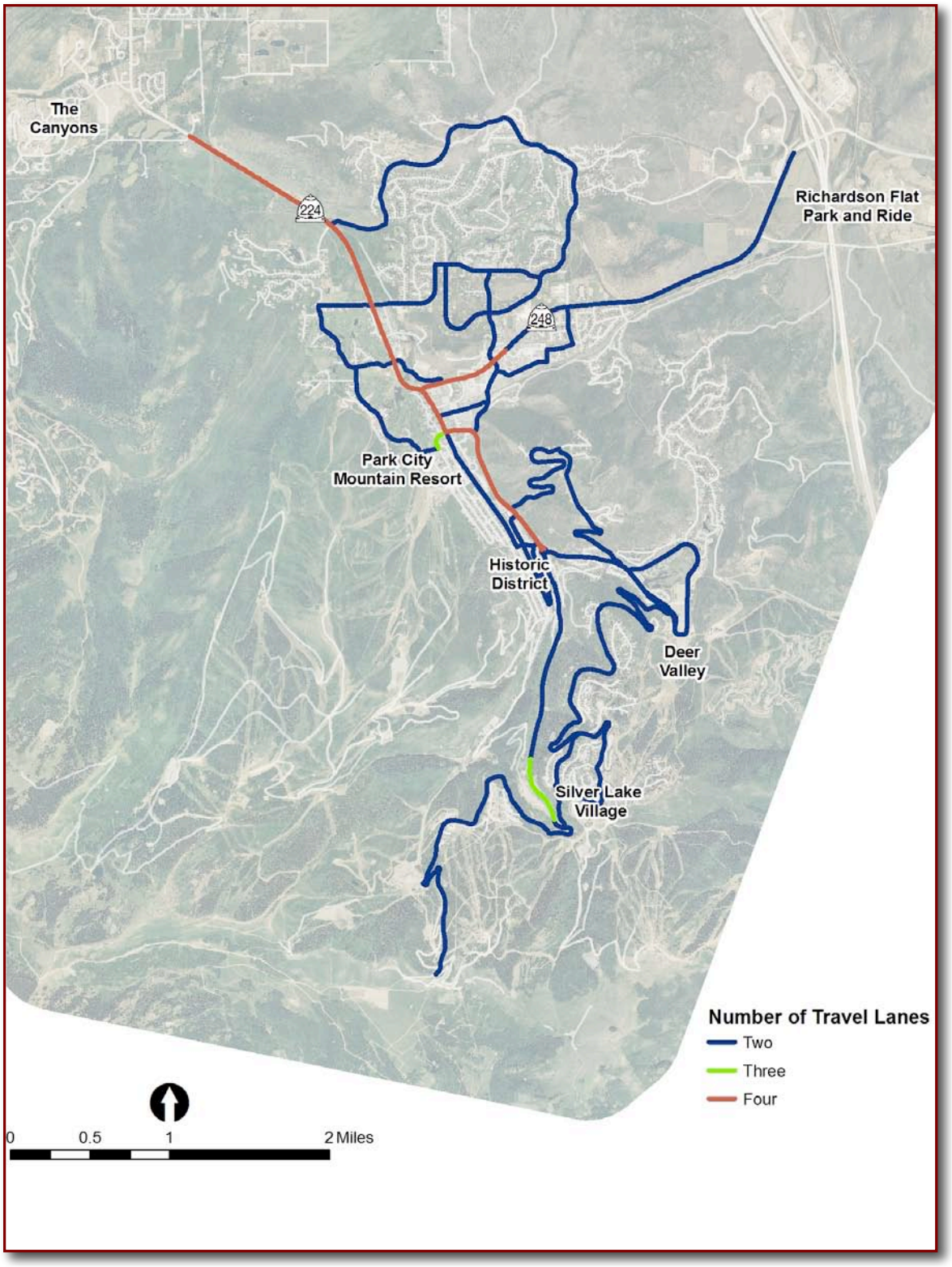


Figure 2-6: Speed Limits and Traffic Signals

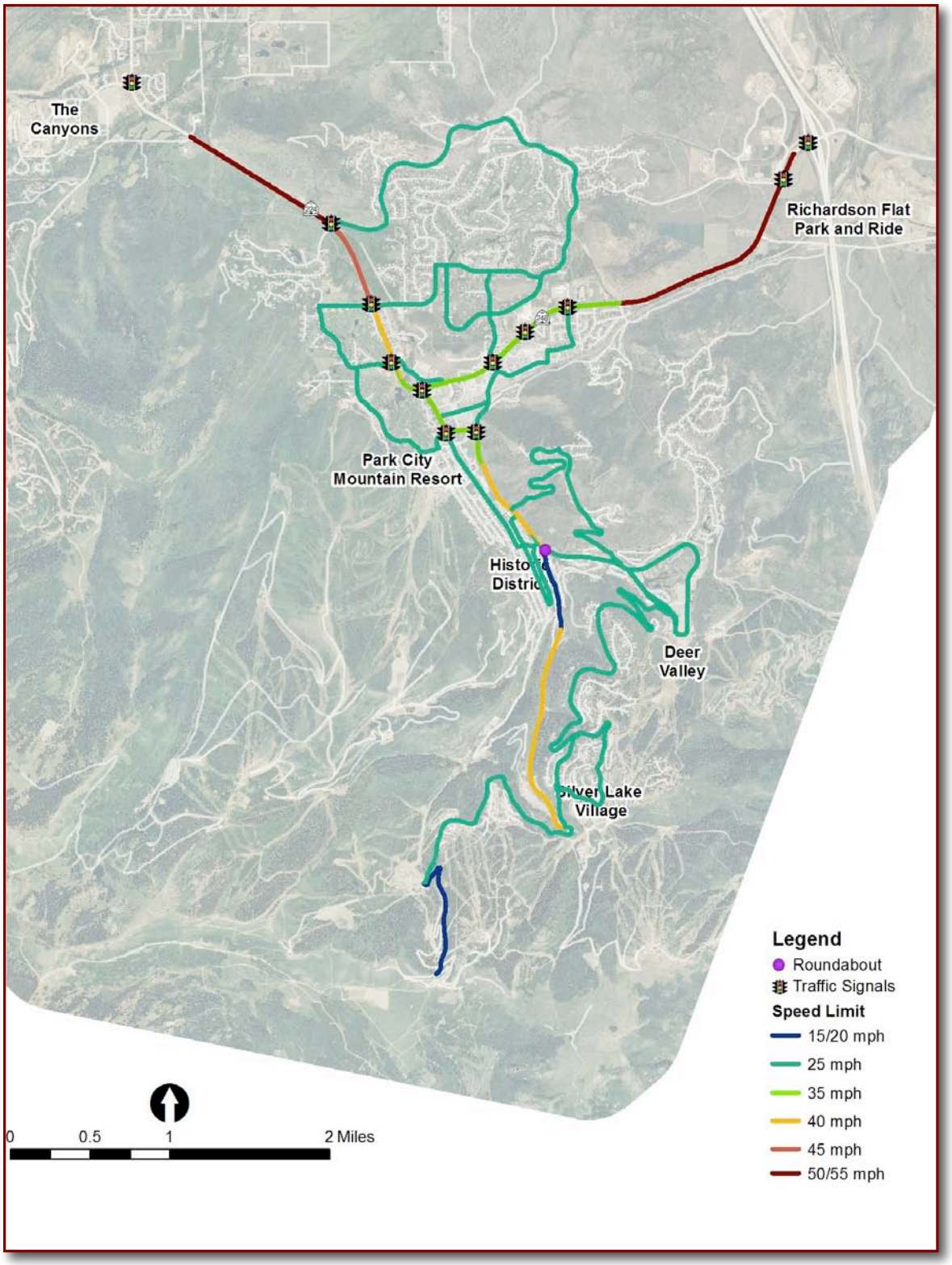
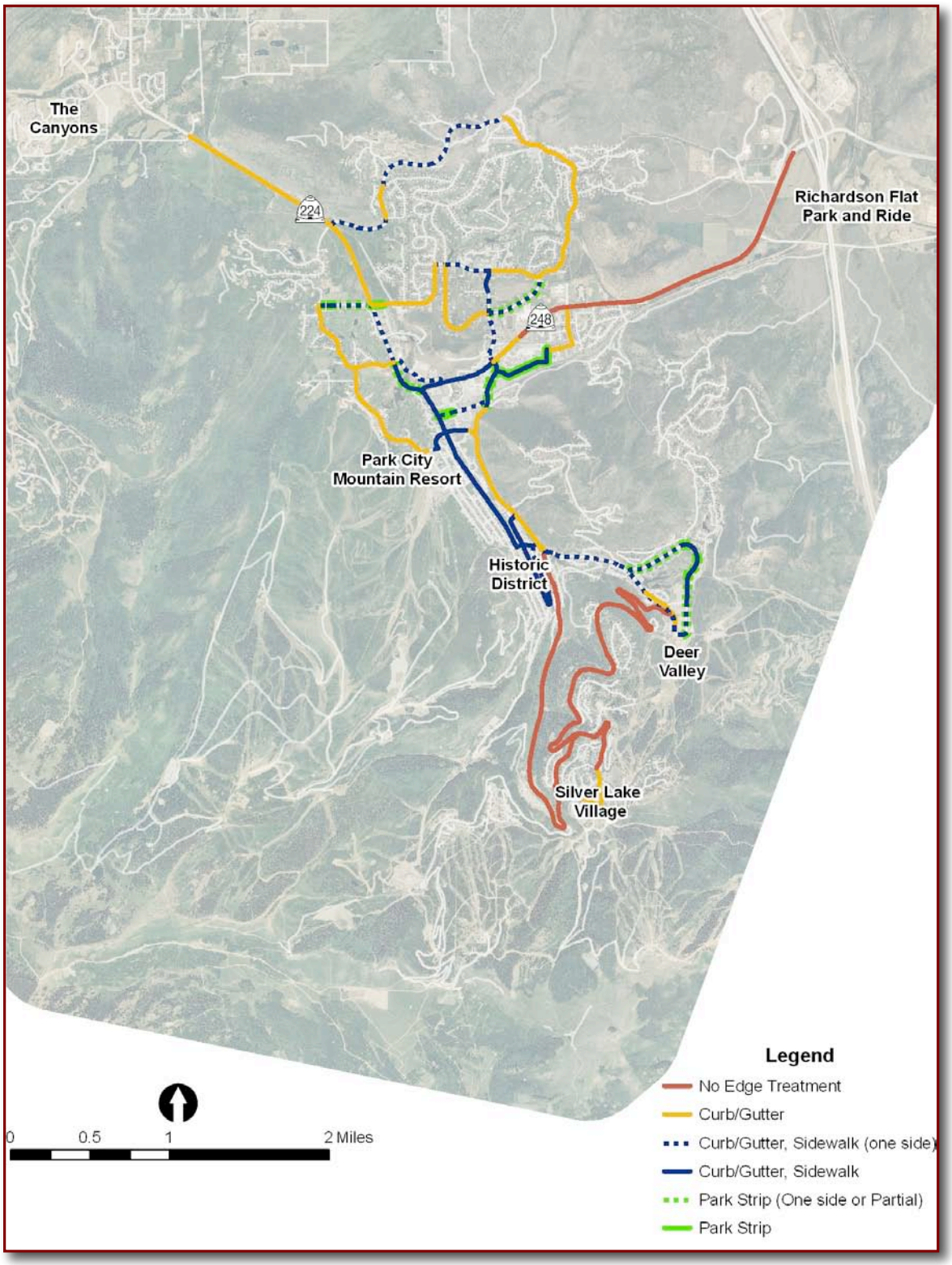


Figure 2-7: Edge Treatments



Previous Studies

1984 Master Plan
In July 1984, the Park City Council adopted a Streets Master Plan, an extension of the Transportation Master Plan. The Streets Master Plan inventoried existing roadways, identified deficiencies and suggested improvement implementation strategies including a capital improvements budget that ranked reconstruction, resurfacing and widening on 24 roadway sections of road. Emphasis was also placed on including in city ordinances provisions for:

- Dedication of rights-of-way
- Installation of public improvements and re-vegetation
- Connections to adjoining properties
- Double access requirement to all subdivisions
- Structures located within rights-of-way
- Frontage protection areas
- Street closures and vacations
- Trails
- Roadway design standards

Roadway design standards were assigned by functional classification:

Arterials (S.R. 224, S.R. 248, and Deer Valley Drive Belt Route)

- 100' right-of-way
- Two lanes in each direction
- Center median
- Two 7.5' plant strips
- 8' sidewalks

Collectors (Deer Valley Dr, Bonanza, Meadows, Lucky John, Royal, Marsac, and Holiday Ranch Loop)

- 60' right-of-way
- One lane in each direction
- Center median
- One 7' one 5' plant strip
- One 6' sidewalk

Standard Residential

- 50' right-of-way
- 25' pavement
- Two 5' plant strips
- Two 4' sidewalks

Low Volume Residential (suggested for minor streets which run vertically up the hillsides in Old Town)

- 30' right-of-way
- 20'pavement
- One 3' sidewalk

Old Town Improvement Study
The 2002 study analyzed and provided detail on a broad list of suggested improvements specific to the Old Town neighborhood. Categories and cumulative costs include:

- Street reconstruction projects ($28.1 million)
  Includes storm drains, sidewalks, public art, sewer, gutters, paving, landscaping, guardrails, utility conduits, relocation of fire hydrants, water line replacements, and relocating overhead utilities.
- Parking supply considerations ($16,000 to $5.9 million)

Includes capital improvement projects, parking re-configuration and improvements to access

- Pedestrian-friendly enhancements ($2 million)
  Includes widening sidewalks, additional pedestrian way-finding signage, decorative concrete pavers and street lighting and new stairways.
- "Mixed bag" ($4.9 million)
  Includes enhancements to the parking lot and landscaping at the senior citizen center, open space acquisitions adjacent to the ski bridge, sprucing up the white house at the top of Main Street and hiding areas for garbage cans.

These projects were to be prioritized for further research and fund appropriation considerations.

S.R. 248 Corridor Study
In 2008, Park City undertook a comprehensive corridor study for the S.R. 248 (Kearns Boulevard) corridor. The study was intended to look at existing and future traffic congestion in the corridor as well as a range of alternatives to address these issues such as high-occupancy vehicle (HOV) lanes and reversible lanes. Also of concern in the area is accommodating pedestrians and bicyclists in the corridor.

After analyzing a range of alternatives including looking at traffic flow, right-of-way impacts, and environmental factors such as carbon emissions, the final recommended alternative was determined. The recommendation is for a four-lane and five-lane cross-section in various areas with one lane in each direction being a high-occupancy vehicle lane. This recommendation offers many advantages to Park City:

- This cross-section could be accommodated in the existing pavement
- It can be easily converted to four general-purpose lanes in the future if the need arises
- It serves Park City's desire to maximize the use of the Richardson Flat park-and-ride lot by providing efficient bus/HOV service to/from it
- It includes bicycle lanes on the shoulders

The City Council adopted the corridor plan in February 2009.

Three Intersection Study
The Three Intersection Study was done in 1996 and examined existing and future conditions at three intersections in light of planned short-term and long-term growth in the area. Developments that were assumed include 49 background projects as well as Bonanza Flats, PCMR, and Flagstaff Mountain developments. The intersections of key concern in the study were:

- Deer Valley Drive and Park Avenue
- Deer Valley Drive and Bonanza Drive
- Deer Valley Drive and Marsac Avenue

The study looked at peak day conditions during President's Day weekend as well as a weekday afternoon peak hour. Improvements to achieve a level of service "C" (level of service "C" is the equivalent of higher levels of traffic, but not enough to slow individual vehicle movement) in the weekday afternoon peak included:

- Adding a second southbound left turn lane at the Deer Valley Drive/Park Avenue intersection
- Installing the planned signal at Deer Valley Drive and Bonanza Drive intersection
- Installing a signal at Deer Valley Drive and Marsac Avenue

Other Studies
Park City has undertaken several other smaller studies of specific transportation issues. These include studies of circulation at Park City High School, Bonanza Drive, truck restrictions on Bonanza Drive, and various other studies addressing isolated issues.

Peer Cities

This section provides brief descriptions of the recent transportation planning processes and outcomes in four peer communities. These places are all located in the Intermountain West and are ski towns and outdoor recreation-oriented communities. Each of these communities has prepared at least one recent transportation master plan or transportation element of a comprehensive plan. The peer places are:

- Town of Jackson and Teton County, Wyoming
- Crested Butte and Mt. Crested Butte, City of Gunnison, and Gunnison County, Colorado
- Flagstaff and Coconino County, Arizona
- Breckenridge, Colorado

A chronology and review of key transportation issues is provided for each place, with a summary of common elements and outcomes at the end of the section.

Town of Jackson and Teton County, Wyoming
The Town of Jackson is located at the south end of the mountain valley known as Jackson Hole. Teton County, Wyoming encompasses not only Jackson Hole but also the village of Alta on the west side of the Teton Range along with most of Grand Teton National Park and part of Yellowstone National Park.

Only four highways access Jackson Hole: WY 22 over Teton Pass to the west, US 89/191 over Hoback Pass to the south, US 26 over Togwotee Pass to the east, and US 89/287 through Yellowstone National Park to the north. Teton County's population is about 21,000 with about 9,000 residents in the Town of Jackson.

The first Town/County comprehensive plan was initiated in 1989, completed in 1993 and adopted in 1994. The first transportation master plan (TMP) was completed in 1999 and incorporated into the comprehensive plan as Chapter 8. An update of the Jackson-Teton County Comprehensive Plan, including a transportation element, is underway and may be completed in 2011.

The key transportation issues include transit, a bicycle network, walkability, traffic, development patterns, and parking.

> ***Transit.*** Before the first TMP was completed, the START (Southern Teton Area Rapid Transit) bus system operated only in winter as a skier shuttle. The TMP committed the Town and County to growing the transit system into a full-service local transit provider. The first regional transit plan recommended year-round service, a park-and-ride facility should be developed at the intersection of WY22 and WY390 (south of Teton Village) to intercept ski resort traffic, initiating commuter bus services working with local employers, an in-town circulator, competing for federal funds to buy new buses, and establishing dedicated funding for START operations and maintenance. A study of the potential for fixed route scheduled service between Town and the airport was completed in 2010 and recommended against this, in part because of existing active private sector providers. Finally, the draft update indicates the Town and County will study the potential establishment of a regional transit authority and is more explicit about the need to establish dedicated funding for START operations.

Bicycle Network. A "Friends of Pathways" advocacy group was effective in promoting development of specific trail projects in and around the Town. In the mid-1990's the Town and County created a "Jackson Hole Community Pathways" program through their joint powers authority. This agency has since built over 27 miles of off-road pathways (most of it paved) and is currently working on several major projects, including a link from Jackson to Grand Teton National Park and a corridor over Teton Pass into Idaho. The 1999 TMP adopted the existing pathways system plan, placing it in context with the land use plan and other transportation programs and projects. The current comprehensive plan update does not explicitly address the bicycling system. This continues a legacy of treating the bicycle program as a recreational function, rather than as basic transportation. For the same reason, there are few miles of on-street lanes in Jackson Hole.

Walkability in Town. The historic square in downtown Jackson has been the traditional center of shopping and pedestrian activity. The Town's ordinances mandate that buildings within the core district address the street with canopied boardwalks intended to evoke the historic western character. As part of the 1999 TMP, the Town began addressing pedestrian needs on streets outside the boardwalk district, most notably by making pedestrian improvements along much of the length of Pearl Avenue – the "local's main street" – including wide concrete sidewalks, modern crosswalks and curb ramps.

Traffic. Peak travel season in Jackson Hole is during summer, beginning in mid-June and running a little past Labor Day. The 100-day ski season is important economically, but winter visitorship is a fraction of what occurs in the summer. During "mud season" (April/May and October/November), traffic drops to less than 25% of peak season levels. With traffic volumes exceeding 50,000 vehicles per day past the Town Square during July, this single corridor through town presents a difficult dilemma. The first transportation element and the current update have both addressed potential bypasses of the town. To date the choice has been made not to pursue any of the bypasses.

Parking. Like many mountain resort communities, Jackson has wrestled with parking supply and policy issues for decades. A perceived parking "shortage" in the downtown shopping district has led to various attempts to develop parking garages and related financial schemes. One outgrowth of the first TMP was a downtown parking study, completed in 2003, that addressed a range of parking management, enforcement and supply issues, resulting in recommendations for modernization of the Town parking ordinance.

Crested Butte and Mt. Crested Butte, City of Gunnison, and Gunnison County, Colorado

Gunnison County is located in southwestern Colorado. The three largest incorporated places in the county are all located in the Upper Gunnison River Valley – Gunnison with a population of 5,500 and Crested Butte and Mt. Crested Butte, each with a population of about 1,700 people. Mt. Crested Butte, at the upper end of the valley, is the home of Crested Butte Mountain Resort (CBMR).

While Crested Butte is busiest in the summer, Mt. Crested Butte is busiest during ski season. Forty miles to the south, the City of Gunnison is one of

several cities its size in Colorado that anchor a rural region and serve as the principal commercial and educational center, with a small college (Western State) and an economy that relies on ranching, extraction and other sectors as much as it does on tourism.

The first transportation plan for the Upper Gunnison Valley was completed in 1999. The TMP was undertaken as an intergovernmental partnership between the County, the City of Gunnison and the Towns of Crested Butte and Mt. Crested Butte. It was the first transportation plan for each of the four local governments and represented a significant milestone in terms of the intergovernmental partnership required.

The TMP was updated in 2008, again through a partnership of the four local governments, but managed by the Gunnison Valley Rural Transportation Authority, a new regional entity created as an outgrowth of the first TMP. By this time the economy in the region was beginning to rebound from a series of issues following the 1999 plan, residential home sales were resuming, sales tax receipts were increasing and a proposed but delayed CBMR expansion had come back on the table.

The 1999 TMP reflected pressures between those in support of continued development – including the CBMR expansion project – and those who were concerned about changes to local character and quality of life. Traffic through Crested Butte on State Highway 135 was a major issue as was the need for improvement of transit service between the City of Gunnison and the upper valley and between Crested Butte and Mt. Crested Butte.

The 1999 document established five broad policies:

1. Maximum Carrying Capacity (MCC) of Valley Roadways should be tracked at five "control points" in the county relative to 2020 targets. Various strategies and policies would be triggered as traffic approached these levels.
2. Safe and Scenic Rural Highway 135, passing lanes and scenic pull-outs would be developed, but the highway would not have to be widened. The idea of limiting growth in intercity commuting had to do with the development of sufficient workforce housing in Crested Butte and Mt. Crested Butte to make it possible for workers to live and work in the upper valley.
3. Limited Growth in Intercity Commuting
4. Cost of Serving Urban Development in Rural Areas
5. Reduced Auto Dependency

A key feature of the 1999 plan was the focus on transit. The plan recommended formation of a rural transportation authority (RTA) and set the stage for a study of the feasibility of construction of a gondola from Crested Butte to Mt. Crested Butte (completed in 2001, the study recommended measures leading to development of a gondola although more recent events make it unlikely to be built). The new RTA now funds the regional, intercity transit up and down State Highway 135. Local transit in Crested Butte and Mt. Crested Butte continues to be funded by the Towns. Both Towns levy a one cent sales tax for transit and Mt. Crested Butte also assesses a one percent admissions tax on ski passes that goes to transit operations.

The 2008 edition of the Upper Gunnison Valley TMP was somewhat more narrowly focused on the transit program – both local operations by the Crested Butte "Mountain Express" transit agency and regional operations by the RTA services. In the nine years between the two county transportation plans, the City of Gunnison developed its own transportation master plan, and consequently the 2008 county update largely focused on the upper valley. Parking management was a topic of the plan – both in Crested Butte and in Mt. Crested Butte, as was continued progress on the local pedestrian environment and bicycling network. Most of the specific action items coming out of the update concerned expansion of local and regional transit services. Again, a bypass of Crested Butte was considered and rejected.

Flagstaff and Coconino County, Arizona

The City of Flagstaff, located at the base of the San Francisco mountains and at the intersection of Interstate Highways 17 and 40, is the principal city for a large area of north central Arizona. Surrounded entirely by public lands, the City's population is just over 60,000. Coconino County, with a population of about 130,000 is the second largest county in the United States in land area.

Originally settled as a railroad town in the late 1800s, Flagstaff has been a center for various natural resource extraction industries, including both mining and timber. The city continues to be a national transportation hub with a rail line through town, daily Amtrak passenger rail service, and a legacy as one of the principal stops along the storied Route 66. Today, the city is known as a gateway to Grand Canyon National Park, the home of Northern Arizona University (NAU), and the location of Northern Arizona's only ski resort – Snow Bowl.

The first transportation plan, completed in 2001, established policy direction that has been actively pursued by the City and County over the past decade and continues to be reflected in the update, Flagstaff Pathways 2030.

Public Transit. The transportation plan set public transit as a high priority. With passage of dedicated transit funding that year, Mountain Line embarked on a multi-year program of growth and expansion. In 2006, area governments came together and formed the Northern Arizona Intergovernmental Transportation Authority (NAIPTA), which includes Flagstaff, Sedona and Cottonwood, Coconino County, Yavapai County, and Northern Arizona University. NAIPTA operates Mountain Line fixed route transit, which has grown to six routes carrying over 5,000 riders per day. In 2008, Flagstaff voters approved extending the dedicated funding for NAIPTA operations as well as four related tax items for specific public transit service expansions, including a new bus rapid transit corridor connecting the NAU campus with downtown Flagstaff.

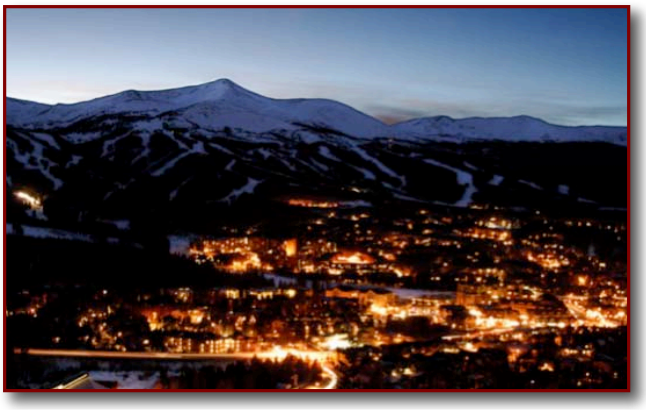
Street Network. The 2000 transportation plan established a new network-oriented direction for the county roads and city streets programs, identifying "connections" as the highest priority for capital investment. The connections concept applied to missing links in the local street network, which were given a higher priority than street widening. Voter approval of the "traffic flow" ballot item in May 2000 represented public endorsement of that new policy direction.

Urban Trails. The plan confirmed the Flagstaff Urban Trails System (FUTS) as a major component of the region's transportation program. Originally a recreational concept, FUTS is a network of off-street multi-use pathways connecting city neighborhoods directly with urban parks and with surrounding forest service lands. The transportation plan expanded the FUTS concept by placing it in a larger network of on- and off-street facilities to serve bicycle circulation and access needs. The plan created a planning basis for on-street bike lanes and for grade separations under arterials to complete the network and provide better access into the university campus and into commercial districts.

The new Flagstaff Pathways 2030 plan continues these policies and approaches, but establishes new direction for the transportation program by aligning capital investment planning and design with "place type and context," using a classification system for area types and activity centers. The context-based system sets different priorities and multimodal performance objectives for the different area and activity center types. This context-based capital planning approach fits into a broader regional policy direction in the plan that envisions transportation not as an end but as a means to achievement of community character, economic and environmental objectives in the regional comprehensive plan.

Breckenridge, Colorado

Breckenridge is a small ski town located at 9,600 feet in the upper valley of the Blue River in Summit County. Originally a mining settlement, Breckenridge had a population of 1,700 people by 1880. The population dwindled to 300 by 1950 but has now grown to about 2,700.



Although summer season is busier than winter, Breckenridge is best known as a ski town. Breckenridge attracts over 1.6 million annual skier days making it the busiest ski resort in the country. The town also programs events year-round, including an annual film festival, a huge Fourth of July parade, and the Breckenridge Music Festival.

The Town embarked on its first multimodal transportation planning process in 2000. At the time, Main Street through downtown was State Highway 9, under jurisdiction of Colorado DOT. The Town wanted to explore ways to make Main Street more pedestrian friendly and was also wrestling with Front Range day skier traffic that would reach peak levels on holiday weekends that far exceeded area roadway capacity.

The *Breckenridge Transportation, Circulation, and Main Street Reconstruction Plan* was completed and adopted by Council in 2001. The Plan set major new policy directions for the Town and resulted in profound changes to the local transportation system.

> ***Gondola.*** One issue was a proposal to extend the ski resort's mountain transport system down into town. At the time, access to the ski base areas was via Ski Hill Road, a steep, two-lane street that climbs directly out of downtown. Day skiers would park at one of two parking lots (Watson and Sawmill) on the west side of downtown and ride buses up to the base area. After some public debate, the Plan recommended the ski resort be allowed to develop a gondola connecting skier parking lots in downtown to the Peak 7 and Peak 8 base areas. Envisioned as an element of the local transportation system, the BreckConnect Gondola was funded by the ski resort, opening to traffic in 2007. The 8-passenger gondola makes the trip from bottom to top in 7 ½ minutes and carries a peak load of 3,000 rides per hour.
>
> ***Transit Integration.*** Another priority of the 2000 planning process was integration of the Town and ski resort bus transit systems. Three transit systems were operating in Breckenridge in the winter – the Town's bus system, the resort's skier shuttles, and Summit Stage, an intercity commuter bus system operated by Summit County. Since all three transit systems served some bus stops while other bus stops were served by only one of the systems, the transit experience was confusing for both visitors and residents. The Plan identified an integrated route structure for a town/ski resort transit system that interconnects with Summit Stage and the gondola at the Watson and Sawmill Lots in

downtown. This integrated system has been partially implemented, with the town funding coming from local parking revenues. During 2010 the Town considered a tax on ski lift tickets as an additional source of funding. The town is also studying whether to take over ski season skier shuttle services, completing transit integration.

Main Street. Main Street in downtown Breckenridge is a vibrant commercial district and is the heart of the town's economy. Town leaders recognized that having a high-quality pedestrian environment would be essential to successfully competing with other destinations in ski country. Because of traffic issues and the layout of the local street grid, day skiers often would not patronize the downtown area. As day skiers represented most of the growth in skier days for the resort, this represented a key lost opportunity for the Town. The Plan recommended the Town negotiate with Colorado DOT to "swap" jurisdiction of Park Avenue (a local street around the west side of downtown) for Main Street. The Plan also recommended extension of the Blue River pedestrian system to the Watson and Sawmill Lots parking as well as a new pedestrian bridge connecting the skier parking into the commercial core. Finally, the Plan recommended installation of roundabouts at each end of the town. This would help with peak period traffic congestion and also make Park Avenue more feasible as a route for trucks and through traffic.

All of these recommendations of the 2001 *Town of Breckenridge Transportation, Circulation, and Main Street Reconstruction Plan* have been implemented. The Town also completed a Vision Plan in 2002 and its first Comprehensive Plan in 2008, both of which addressed and confirmed the transportation directions established in the 2001 Plan.

Common Elements and Outcomes

The development and evolution of transportation master plans in these four mountain communities share common elements and outcomes.

Transit System Development. All of these communities have come to regard public transit as essential to their economic future. Mountain resort towns often get into the transit business initially to serve winter skier needs or to meet local needs for special services transit, but eventually they venture into fixed route, scheduled service. While a rule of thumb is that towns and cities establish fixed route, scheduled transit service beginning at about 25,000 population, mountain resort communities much smaller than this have significant transit systems. In part this is due to a need to address parking in commercial districts and at ski base areas and in part it reflects a need to meet expectations of tourists who shop for destinations based on criteria that include the availability of local transportation services. In all of the peer communities, a key local issue has been how to establish dedicated local funding for transit operations.

Walkable Places. Resort towns compete with each other as destinations in a national and international marketplace. Increasingly, a minimum expectation – for destination visitors if not for day skiers and other pass-through visitors – is that the destination environment will be highly walkable, featuring a high-quality, interesting pedestrian environment. Surveys show that resort guests do not want to go on vacation only to commute around in cars like they do at home; rather, they want to be outdoors walking between activities and strolling in storefront settings. Not all of the peer communities have risen to this challenge. Jackson has a walkable core area around its town square and some other walkable streets, but important parts of the town are not pedestrian friendly. Crested Butte has given pedestrians priority use of its streets, but Mt. Crested Butte has not met pedestrian needs other than at the ski base. Breckenridge has placed a high priority on walking in its downtown shopping district and also has invested in key walk corridors along and across the Blue River.

State Highways. All of the peer communities have state highways as an important part of their local street networks. In each case there are tensions between the traffic-moving objectives of the state DOT and the economic and quality of life objectives of the local communities. In many

states, DOTs will consider transfers of jurisdiction to resolve these conflicts, but this can present significant cost exposure to the local government. The good news is that many state DOTs are becoming more progressive and are beginning to understand the importance of safe, low-speed pedestrian environments, good transit and bicycle networks in mountain communities.

Partnerships. Successful mountain communities have made their most significant progress through intergovernmental and public/private partnerships. Flagstaff has grown a transit agency that is supported by a regional group of local governments and a major university. The Gunnison County local governments have established a durable partnership on transportation issues that includes the ski resort. Breckenridge has done the same. In all cases, close city/county cooperation and integrated planning processes have been essential elements of transportation system development.

Integrating Land Use and Transportation. In all of these communities, progress on transportation has been made only once local community character and land use objectives have been established. Many mountain towns make transportation decisions based on traffic forecasts in a "predict and provide" paradigm that leads inevitably to sprawl subdivisions and commercial strips. Communities with clear visions of what they want to be like in the future tend to make strategic transportation choices that support those visions.

Chapter 3: Future Conditions

Demographics

Park City has long been a popular place to live, work, and recreate for people from around the state and the country. While the land area in Park City is largely built-out and population is expected to increase to a relatively small degree, areas adjacent to Park City have significant development plans which will impact transportation conditions within Park City.

Population

Population in Park City is expected to increase, although projected growth is relatively small compared to other nearby entities. Table 3-1 shows population growth between 2010 and 2040 for the City and surrounding area. Population projections shown here (and employment projections shown below) are intended to inform the analysis of future traffic conditions and should not be interpreted as planned or predicted land use or city policy.

Table 3-1: Regional Population Growth, 2010-2040

Area	2010	2020	2040	% Change 2010-2040
Park City	7,558	10,080	11,288	49
Summit County	36,324	61,738	104,620	188
Wasatch County	23,530	36,181	64,631	175

Sources: 2010 Census Redistricting Data (Public Law 94-171) Summary File. Future county-level data from GOPB, 2008 Baseline Projections. Future Park City estimated from household numbers and TAZ-level household size.

Employment

As commercial and residential development and redevelopment continue within the City and in the region as a whole, employment becomes an increasingly important component in planning the transportation network. With relatively high-cost housing and a large portion of jobs in the service industry, workers travel to and from jobs in and around Park City from other areas within and outside the region. Table 3-2 shows growth in employment in the region between 2009 and 2040.

Table 3-2: Regional Employment Growth, 2009-2040

Area	2009	2020	2040	% Change 2009-2040
Park City	9,635	10,842	12,917	34
Summit County	20,232	41,250	57,400	184
Wasatch County	5,437	57,400	33,248	512

Sources: Future county-level data from GOPB 2008 Baseline projections for sector employment. Totals exclude mining and construction. See Appendix D for detailed employment growth assumptions within Park City. Future Park City employment was assumed to grow at the same rate as housing units with exception of unit equivalent developments at Treasure Hill, PCMR redevelopment, and Deer Valley redevelopment. Retail space of these was assumed to be the same as Treasure Hill and employment was estimated using square footage.

Housing Units

The number of housing units is expected to increase throughout the region as well, although like population and employment, to a lesser degree in Park City than Summit and Wasatch Counties. Table 3-3 shows housing unit growth over the next several decades and Table 3-4 gives an

indication of the growth in second homes and condominiums over that time. It should be noted that "Second Homes and Condominiums" are included in the Housing Units shown in Table 3-3.

Table 3-3: Housing Units Growth, 2010-2040

Area	2010	2020	2040	% Change 2010-2040
Park City	9,471	10,014	11,496	21
Summit County	26,545	33,975	59,980	126
Wasatch County	10,577	13,769	25,755	144

Source: 2010 Census Redistricting Data (Public Law 94-171) Summary File. Future county housing units assumed to increase at the same rate as households. Future Park City housing units are assumed at same proportion by zone as existing.

Table 3-4: Second Homes and Condominiums, 2009-2040

Area	2009	2020	2040	% Change 2009-2040
Park City	5,672	6,052	6,804	22
Summit County	7,146	11,014	19,432	172
Wasatch County	1,022	1,613	3,017	195

Source: Future county housing units assumed to increase at the same rate as households. Future Park City housing units are assumed at same proportion by zone as existing.

Land Use

In order to evaluate future transportation demand within Park City and Summit County, future growth was estimated from build-out information provided by Park City and countywide demographic projections from the Governor's Office of Planning and Budget.

As of June 2010, Park City estimated that the city was at approximately 81 percent of build-out based upon approved sub-divisions and vested parcels with approximately 2,200 equivalent residential units remaining. Table 3-5 lists the vested developments that are projected to develop based upon Park City input and master planned developments (Treasure Hill) or pre-master planned developments (Park City Heights). These sub-divisions and developments were assumed to be completed by 2020 with the remaining vested developments built-out by 2040.

Table 3-5: Assumed Vested Developments by 2020

Location	Remaining Unit Equivalents
The Oaks	23
Rail Central	24
American Flag	25
Aerie	30
Snow Park Deer Crest	35
North Silver Lake – Lot 2B	54
Sweeny Properties – Old Town	63
Flagstaff/Empire Pass	71
Park City Mountain Resort – Munchkin	80
Sweeny Properties – Treasure	197
Park City Heights	239

Other Planning Efforts

Snyderville Basin Master Transportation Plan (MTP)
The Snyderville Basin MTP was completed in 2009 and includes many projects on S.R. 224, the primary link between Park City and the Kimball Junction/Interstate-80 interchange. The recommendations contained in this plan address five broad categories:

- Transit and multimodal accessibility reflecting a desire to improve the non-automobile trip rates as well as infrastructure improvements
- Traffic accident reduction attempting to reduce traffic accidents along primarily S.R. 224
- Transportation enhancement policies aimed at maximizing the functionality of the transportation network as well as incorporating stakeholders in transportation related decision-making
- Level of service seeking to maximize road network capacity prior to initiating expansion projects in addition to promoting master plan conformity
- Interagency cooperation

In Phase I the Preferred Alternative (2012 completion) transit improvements are emphasized. This phase includes transit hub construction in the Kimball Junction area and The Canyons as well as constructing a series of park-and-ride lots along the S.R. 224 corridor. Another project is emphasizing the intersection of New Park Boulevard and adding a travel lane on S.R. 224 to ease traffic through the commercial centers in Kimball Junction. Phase II involves widening the Olympic Park to I-80 section of S.R. 224 to six lanes as well as including an HOV lane. Phase III includes a possible new interchange with I-80 to access a future Kimball Junction bypass road to connect to S.R. 224. In addition, the Landmark Drive intersection will be eliminated through some form of grade separation.

UDOT Long Range Plan
The Utah Department of Transportation updates a statewide long-range plan for transportation every four years. This plan has a 30-year scope and pertains to every state road and highway. Phase 1 (2011-2020) of the plan involves interchange upgrades at Kimball Junction and adding travel lanes (possibly HOV lanes) on S.R. 248 from Wyatt Earp Way to US-40. The primary link between Park City and Kimball Junction is S.R. 224 and future upgrades in this corridor are also identified in the plan. S.R. 224 is scheduled to be improved In Phase 2 of the plan (2021-2030), although the details of this improvement have not been determined. Phase 3 of the plan (2031-2040) lists the construction of a new Interstate-80 interchange at the current High Ute View Area. This interchange would provide access to the future Kimball Junction bypass to S.R. 224.

Wasatch Back Emerging Area Plan
The Planning Division of UDOT completed an Emerging Area Plan (EAP) for all of Wasatch and the western portion of Summit County in July 2010. This plan identifies a shared vision and begins to outline region-wide priorities for the next several decades and gives each jurisdiction within the area a high-level perspective on the precedence of various transportation improvements across the region. Among the priorities identified in this EAP are transit connections between Heber City, Wasatch County, Salt Lake County, and Park City. Also, trail connections within and between cities are an important part of the plan. The EAP also identifies “hot spots” or areas of particular concern where there are issues yet to be addressed or resolved by the affected jurisdictions.

Holiday and Festival Travel Demand

Park City is a popular destination for statewide, national, and international travelers and hosts a range of events throughout the year. Each of these events is an important part of Park City’s economic development picture and traffic circulation in the city is highly impacted by the added visitors.

As a popular winter vacation destination, one of Park City's peak travel times is the holiday week between Christmas and New Year's when many people take extended ski vacations. In addition, the Sundance Film Festival is held every year in January and Park City is the center of activity for this event. During summer months, the Park City Arts Festival and the city's Fourth of July celebration are popular events for visitors from around the state.

These events are important to Park City's tourism, culture, and economic development efforts. Not surprisingly, they increase vehicle traffic in and around Park City and traffic congestion often frustrates residents and visitors alike. However, as these highest demand days occur for a total of about three weeks out of the year, building or expanding existing infrastructure such as new or widened roads to accommodate higher traffic volumes is not cost-effective. In addition, other transportation resources such as Park City's transit service could be used to greater efficiency and coupled with other strategies such as Variable Message Signage (VMS) on I-80 and U.S. 40 to warn drivers of limited parking in Park City.

This Traffic and Transportation Master Plan addresses ongoing traffic circulation and congestion issues, but does not attempt to relieve all congestion during these peak demand days. Instead, an overall strategy to reduce traffic impacts by reducing travel demand and shifting person trips to other modes are the focus of the plan.

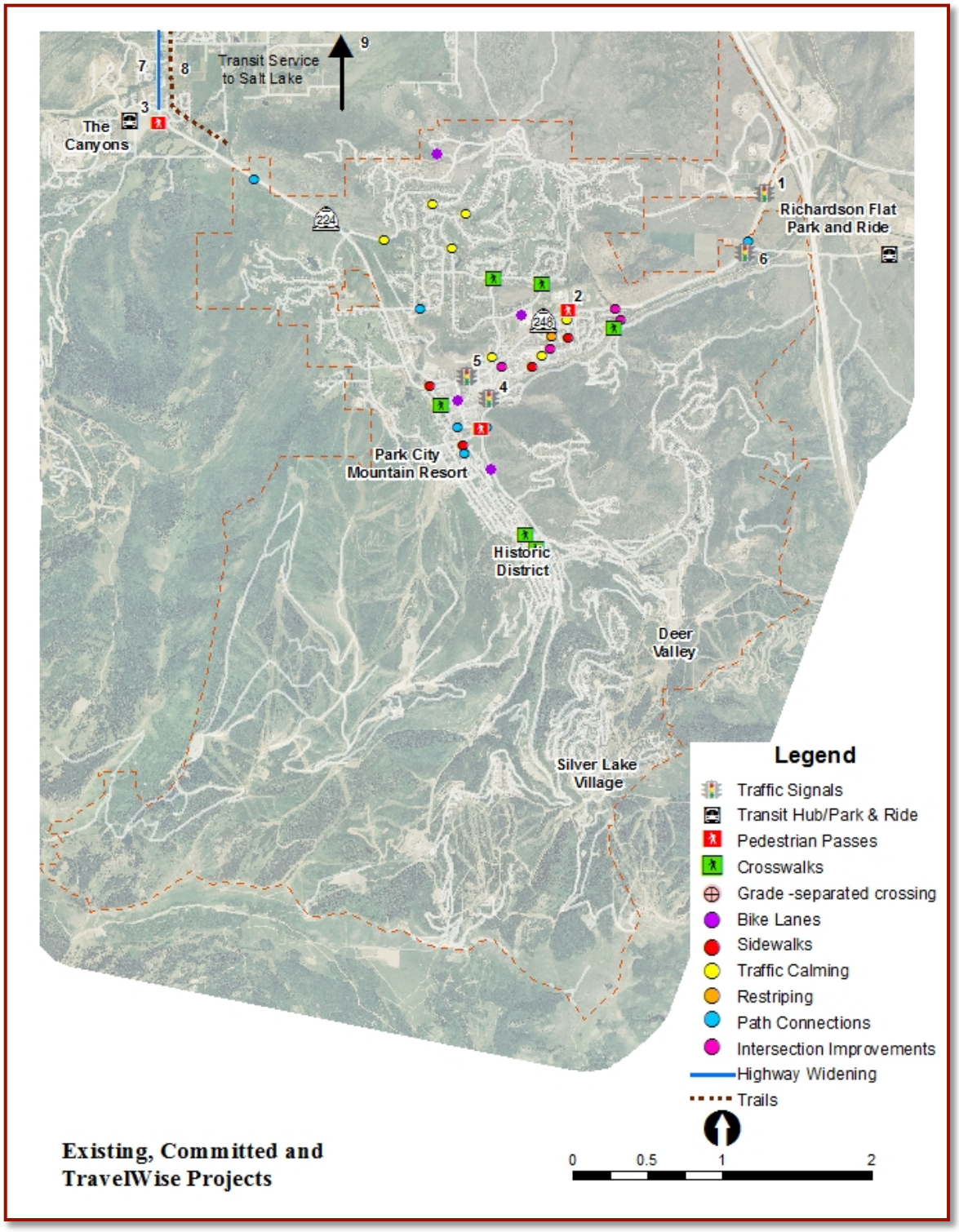
Committed Projects

Transportation projects included in the future model years reflect the priorities outlined by Park City and Summit County in their 2009 Transportation Master Plan. The model network assumed only existing projects (in development) and committed projects in Park City, and western Summit County. Table 3-6 lists these projects, as well as Walking and Biking Liaison Committee (WALC) and TravelWise projects. While most WALC and TravelWise projects were not modeled directly, they are included in the modeling with minor adjustments to mode choice to account for a more walkable community. Figure 3-1 shows the location of committed projects. Numbers correspond to numbered projects in Table 3-6.

Table 3-6: Committed Projects Assumed in Travel Modeling

	Project	Type	Source
	Existing		
1	S.R. 248 & Round Valley Drive	Traffic Signal	Park City
2	Kearns Crossing	Pedestrian Crossing	Constructed
3	Canyons Transit Hub	Transit Hub	Constructed
	Committed		
4	Bonanza Drive & Iron Horse Drive	Traffic Signal	Park City
5	S.R. 248 & Homestake Road	Traffic Signal	Park City
6	S.R. 248 & Richardson Flat Road	Traffic Signal	Park City
7	S.R. 224 Widen to Canyons	Widen to Six Lanes	Summit Co. Plan
8	S.R. 224 Trail - Silver Springs to White Pine Corridor Enhancement	Bike/Pedestrian Path	Summit Co. Plan
9	Transit Service to Salt Lake	New Bus Service	STIP
10	Update S.R. 248 to 5 lanes, 2 travel lanes, 2 HOV, 1 center lane	Capacity	S.R. 248 Plan
	TravelWise		
	Increase transit headways to 10 minutes	Transit	
	Designated bicycle lanes on "bicycle spine" on city streets	Bike	
	Bike-sharing program throughout Park City	Bike	
	Safe Routes to Schools	Pedestrian	
	Increase carpool rates	Carpools	
	Full park-and-ride at Richardson Flat	Park-and-ride	
	Mandated parking for Old Town area employees	Park-and-ride	
	Walkable neighborhoods	Walkability	
	Intelligent Transportation Systems (ITS)	ITS	
	WALC Projects		
	Grade-separated crossings (Bonanza and Comstock)		Park City
	Bike lanes (Bonanza, widen existing: S.R. 248, Meadows Drive, Park Avenue, Deer Valley Drive)		Park City
	Sidewalks (south side of Sidewinder, east side of Park Avenue, Olympic Plaza, Comstock)		Park City
	Crosswalks (Little Kate/Monitor, Little Kate/Lucky John, Comstock, Wyatt Earp/Sidewinder, S.R. 224 at Fresh Market, Main/Heber, Old Town)		Park City
	Traffic calming (Monitor, Comstock, Park Meadows 1-3)		Park City
	Intersection Improvements (Wyatt Earp/Sidewinder, Gold Dust/Sidewinder, Monitor/S.R. 248, Monitor/Little Kate, Wyatt Earp/S.R. 248)		Park City
	Restriping (Sidewinder)		Park City
	Paths (east side S.R. 224, bridge rail trail/Iron Horse, Holiday Ranch Loop, Gun Club connection, Park Avenue, Deer Valley Drive/Jan's)		Park City

Figure 3-1: Existing and Committed Projects Assumed in Travel Modeling



Travel Model Development and Application

As part of this plan development process, a travel demand and traffic simulation model was developed for the Park City area in order to assess existing and future travel demand within the study area.

The purpose of the model is to offer a tool to city staff and to use this tool both during the plan development and after the plan is completed in order to anticipate transportation problems and issues. While not a perfect tool, the model can help Park City officials anticipate the future and prepare for possible unintended consequences of various actions.

The travel demand model follows the basic "four step process" originally developed in the 1950s to help urban areas estimate travel demand while building the interstate system. This process is an econometric method of estimating individual choice decisions such that the aggregate estimate is reasonably accurate even if the individual estimates do not represent actual travel demand choices of individuals. The four steps of the travel demand model are:

- Trip generation
- Trip distribution
- Mode choice
- Trip assignment

The Park City travel demand model is a two-part model. The first part inputs growth assumptions in spreadsheet form that calculates trip generation, distribution and mode choice. The second part of the model is a Vissim multi-modal traffic simulation that uses dynamic assignment to route vehicles on the model roadway network. In the future, after completion of this transportation plan process, each part of the model can be used to fine tune local area growth options and to visually evaluate and display traffic problems and solutions and to help determine the impacts of parking infrastructure and transit assumptions.

The travel demand model component borrows person trip generation rates from other areas. A modal split uses a simplified logit model to estimate transit, drive alone, carpool, and walk/bike modal options. Trip distribution is simplified with fixed origin-destination pairs which were estimated. Trips by mode and by origin-destination pair are fed into the traffic simulation model. The traffic simulation is only run for the afternoon peak hour and uses a "dynamic assignment" process of allowing all trip pairs to establish the least delay route for all users of the network. Because of this dynamic assignment process, actual traffic counts are not hard-coded into the model but are the result of an iterative least delay estimate.

Model Calibration

The model was calibrated to the year 2009 and compared to Park City and UDOT pm peak hour traffic count data from that year. Traffic counts used for calibration came from Park City and UDOT's automatic traffic recorders on S.R. 224 and S.R. 248. After running the base year travel model, results were compared to the counts data to determine the accuracy of the model. The models were calibrated for two distinct periods in Park City, Christmas week when traffic volume is typically highest, and the shoulder season when there are generally lower traffic volumes. All calibration data is in Appendix A.

Analysis Years

In addition to the 2009 model, three future land use scenarios were evaluated for the years 2020 and 2040. The base scenarios assumed land use and population as discussed above. However, an additional scenario was also evaluated that assumed no new growth within Park City but regional growth to 2020. This model alternative was used to assess the impact of Park City growth policies on the transportation system.

Baseline Model Results

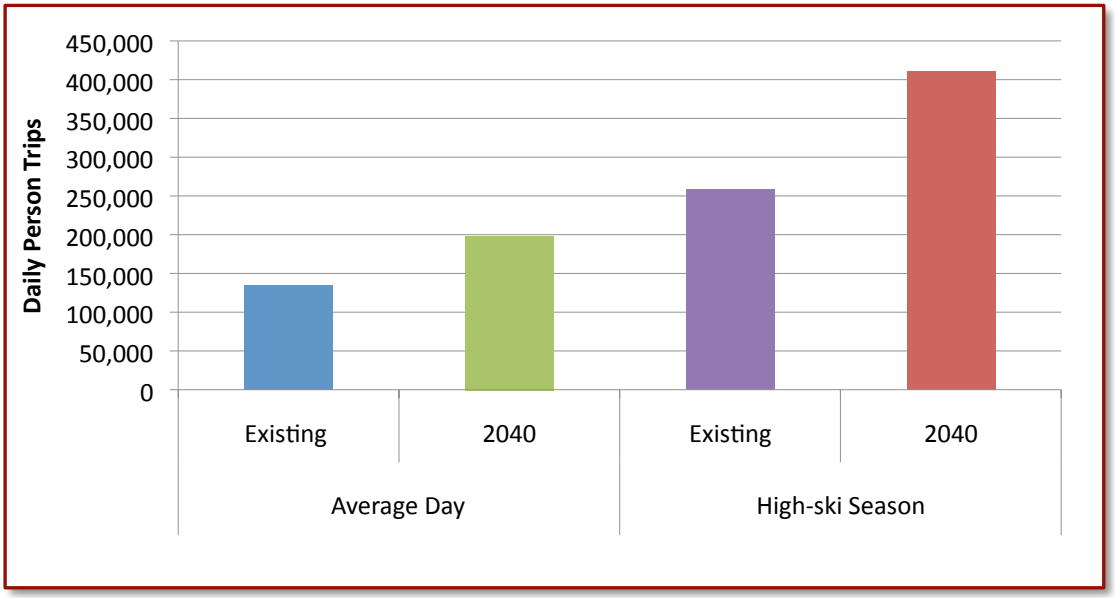
The baseline model results were generated to understand the scope of future transportation issues and the need for transportation policies or projects to address existing and future transportation concerns. These baseline models assumed the future development discussed previously along with the committed transportation projects within Park City and planned projects outside of the city boundary.

Based upon the baseline modeling:

- Park City will remain a major destination with the number of daily person trips increasing during both the shoulder and high-ski seasons.
- As a result, vehicle miles of travel (VMT) and delay will increase in the future.
- However, even with the expected growth in VMT and delay, the average day in 2040 will not approach the congestion levels that occur on high-ski days and during events.
- Congestion will continue to be an issue during the ski outload and large events.

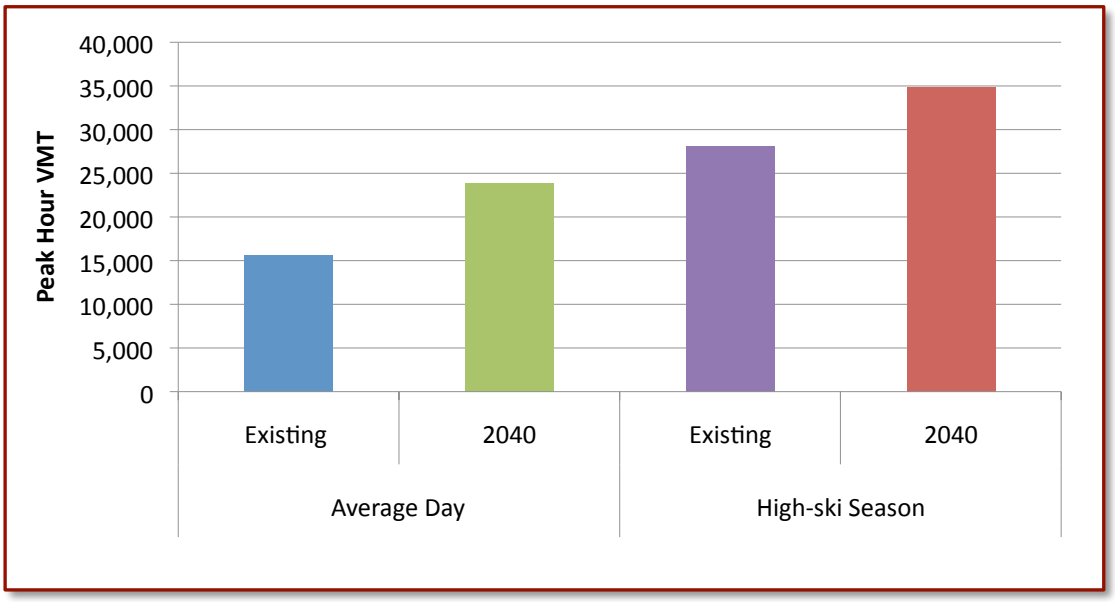
Figure 3-2 shows the daily number of person trips within Park City for the average day and during the high-ski season such as Christmas week. Daily *person* trips are expected to increase by 47 percent on an average day and by over 200 percent during the high-ski season.

Figure 3-2: Daily Person Trips, Existing and 2040



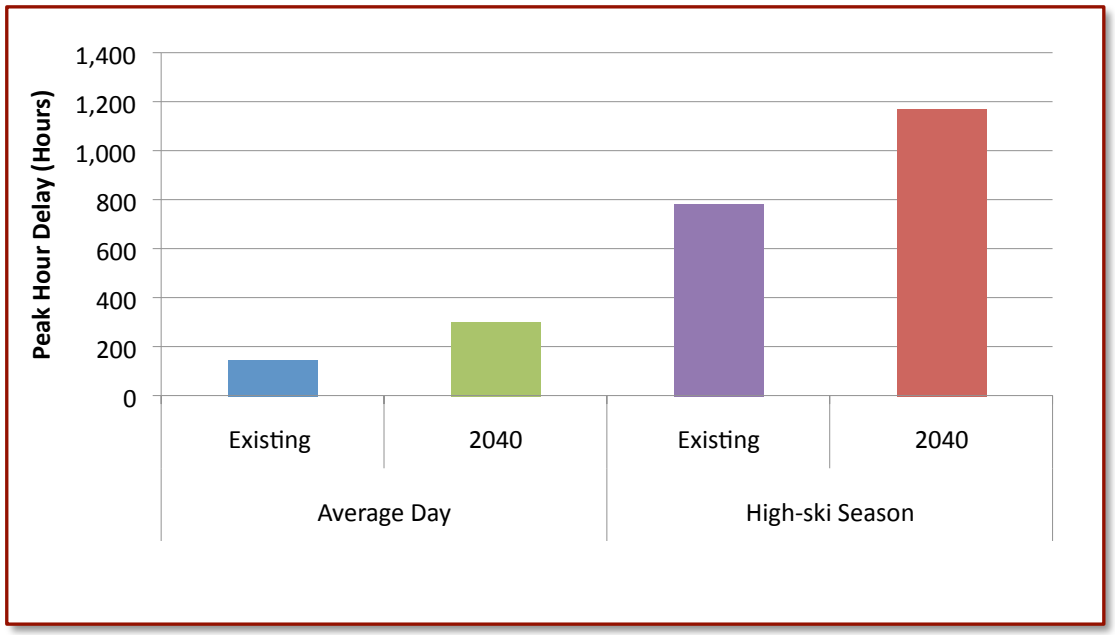
While person trips indicate how many people are traveling to/from Park City, vehicle miles traveled (VMT) is a measure of how much travel occurs in vehicles. Figure 3-3 shows the peak-hour model VMT for Park City. On an average day, the VMT increase is similar to the increase in person trips at 53 percent. However, during the high-ski season, peak-hour VMT is expected to increase by 118 percent as opposed to a 200+ percent increase in person trips.

Figure 3-3: Vehicle Miles Traveled, Existing and 2040



Vehicle hours of delay is a common measure of congestion since during congested conditions vehicle speeds are reduced and drive times increase. As illustrated in Figure 3-4, delay increases more than person trips and VMT. Peak hour vehicle delay on an average day is forecast to increase by 106 percent and on high-ski days by almost 693 percent.

Figure 3-4: Vehicle Hours of Delay, Existing and 2040



Chapter 4: Transportation Plan

This chapter summarizes the basic elements of Park City's Traffic and Transportation Master Plan. The themes identified at the outset of this plan do not lend themselves to a traditional transportation plan based on a map of planned road improvements. Instead, this chapter provides the foundation from which future transportation decisions can be made, along with detailed information on various concepts provided in Chapter 6.

Goals and Objectives

Defining the overall goals and objectives for transportation for Park City provides guidance to the work done during the planning process and a consistent way to evaluate various alternatives. Much work was done by city staff, the Stakeholder Committee, and the public in drafting, refining, and finalizing transportation goals for the Park City Traffic and Transportation Master Plan.

GOAL 1: Park City will have a multimodal transportation system with complete streets and balanced availability of pedestrian, bicycle, transit and auto travel.

GOAL 2: Park City's residents, workers, visitors and guests will have access to convenient transit for circulation throughout the City.

GOAL 3: Park City's residents, workers, day visitors and overnight guests will have efficient, direct and convenient regional transit connections from and to area resorts, Salt Lake and Utah Counties, and other communities of the Wasatch Back.

GOAL 4: Park City will have a complete and well-connected network of trails, bicycle lanes and sidewalks that supports safe, convenient and pleasant walking and bicycling to accommodate the needs of residents, visitors, and guests for short trips within the City and surrounding neighborhoods.

GOAL 5: Mobility and accessibility in Park City will be as good or better than today while achieving a net reduction in the amount that each person drives a car.

GOAL 6: Park City's street network will be well maintained, with streets that are not significantly wider than today and without a significant increase in lane mileage.

GOAL 7: Park City's transportation system will contribute positively to public health and quality of life by achieving a high level of travel safety and by creating an environment that supports active living.

GOAL 8: Park City's transportation system will contribute positively to improved environmental, social and economic sustainability of the community.

GOAL 9: Park City's transportation system will support development of clustered and diverse land use centers by providing convenient multimodal access to each center concurrent with its development.

GOAL 10: Park City will use system management and demand management techniques to minimize the financial burden and environmental impact of local transportation facilities.

Performance Measures

Identifying performance measures that correlate with each of the defined goals offers Park City the ability to measure and track performance on a number of variables and how well the City is

doing in achieving their goals. Specific details on how to measure each of these variables, sources of data, and existing conditions are available in the "Report Card" section of Chapter 5.

GOAL 1. Park City will have a multimodal transportation system with complete streets and balanced availability of pedestrian, bicycle, transit and auto travel.
Strategic Objectives by 2040:

a. Drive-alone mode share for trips on gateway corridors into Park City jobs will decrease to 50 percent (from over 70 percent today).
b. The percentage of housing units within ¼ mile from transit routes (while maintaining transit service standard of minimum four units/acre) and paved multi-use trails will increase to 100 percent (from approximately 80 percent and 60 percent, respectively, today).
c. 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" infrastructure that supports walking, biking, transit, and carpools over single occupant vehicles.

GOAL 2. Park City's residents, workers, visitors and guests will have access to convenient transit for circulation throughout the City.
Strategic Objectives by 2040:

a. Daily bus hours of local transit service in Park City will increase to 450 hours (from approximately 200 hours today).
b. Peak hour frequency on Park City's spine transit network will reach 10 minutes and support timed transfers to regional transit service.
c. Transit travel times will remain within 10 minutes of drive times on major origin-destination pairs within Park City.

GOAL 3. Park City's residents, workers, day visitors and overnight guests will have efficient, direct and convenient regional transit connections from and to area resorts, Salt Lake and Utah Counties, and other communities of the Wasatch Back.
Strategic Objectives by 2040:

a. Average daily bus hours of regional transit service connecting Park City to points within Salt Lake, Utah, Wasatch Counties, and other parts of Summit County will reach 350 hours (from approximately 85 hours today).
b. Weekday commuter transit service will efficiently connect Park City with at least five other cities/communities in the Wasatch Front and Back as demand dictates.
c. Annual ridership to will grow to exceed 5 million passengers (from under 2 million today).
d. Park City will build and/or support, through transit service and rideshare programs, continued expansion of intercept park-and-ride facilities at all gateway corridors.

GOAL 4. Park City will have a complete and well-connected network of trails, bicycle lanes and sidewalks that supports safe, convenient and pleasant walking and bicycling to accommodate the needs of residents, visitors, and guests for short trips within the City and surrounding neighborhoods.
Strategic Objectives by 2040:

a. All of the primary bicycle corridors identified in the Park City Transportation Master Plan will be completed and open to use and redundant systems for multiple users will be planned and initiated.
b. At least 75 percent of the linear mileage of secondary bicycle corridors identified in the Park City Transportation Master Plan will be completed and open to use.
c. 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.

GOAL 5. Mobility and accessibility in Park City will be as good or better than today while achieving a net reduction in the amount that each person drives a car.
Strategic Objectives by 2040:

a. Park City VMT will be tracked based on automobile counts at the major gateway corridors and will not increase faster than Park City housing or job growth.
b. Park City will track the automobile drive time between three major internal origin-destination pairs on an annual basis and will mitigate traffic congestion when travel times increase above 10 percent on any given year.
c. Park City will track the ratio of drive time to bicycle travel time and transit travel time between three major internal origin destination pairs and will take proactive steps to maintain increasing ratios.

GOAL 6. Park City's street network will be well-maintained, with streets that are not significantly wider than today and without a significant increase in lane mileage.
Strategic Objectives by 2040:

a. Lane miles of Park City streets will not exceed 250 (from 200 today, not including Park City Heights). This objective does not reflect new roads in potential annexation areas.
b. Park City will track pavement condition on a continuous basis using a Remaining Service Life (RSL) scale with 20 years being the best possible condition. Park City collector and higher functioning streets will have an RSL of no less than 8.0.
c. All elements of the transportation system including street furniture, transit equipment, signs, striping, etc. will be kept in good condition.

GOAL 7. Park City's transportation system will contribute positively to public health and quality of life by achieving a high level of travel safety and by creating an environment that supports active living.
Strategic Objectives by 2040:

a. The crash rate for reported traffic crashes within Park City will be no more than 3.5 crashes per million vehicle miles.
b. Park City will take positive steps to react to all fatalities resulting from traffic crashes with a goal of achieving zero fatalities within Park City.
c. Park City will establish a bicycle and pedestrian count program on at least five major trail corridors on the primary network and will achieve incremental increases of over 25 percent with the completion of major corridors and steady increases of over 10 percent per year.
d. Park City Engineering will coordinate with police and public safety services to provide annual crash statistics on the street system.

GOAL 8. Park City's transportation system will contribute positively to improved environmental, social and economic sustainability of the community.
Strategic Objectives by 2040:

a. Annual petroleum consumption by surface transportation within Park City will be no more than 470,000,000 kBTU equivalent (from approximately 570,000,000 kBTU equivalent today).
b. Annual greenhouse gas emissions from surface transportation with Park City will be no more than 50,000 short tons (approximately equal to today).
c. Parking pricing, transit fares, and other cost incentives will be used to minimize or decrease the growth in overall vehicle miles traveled (VMT) while supporting a strong and growing Park City visitor base while.

GOAL 9. Park City's transportation system will support development of clustered and diverse land use centers by providing convenient multimodal access to each center concurrent with its development.

Strategic Objectives by 2040:

a. Major new land developments (of greater than 200 additional Equivalent Residential Units) will be required to provide clustered and diverse land uses in order to minimize their impact on transportation infrastructure.
b. Major new land developments (of greater than 200 additional Equivalent Residential Units) will not be approved unless or until concurrent transportation facilities, services, and infrastructure can be in place to offer balanced modal use (transit, trails, high occupant vehicles).

GOAL 10. Park City will use system management and demand management techniques to minimize the financial burden and environmental impact of local transportation facilities.

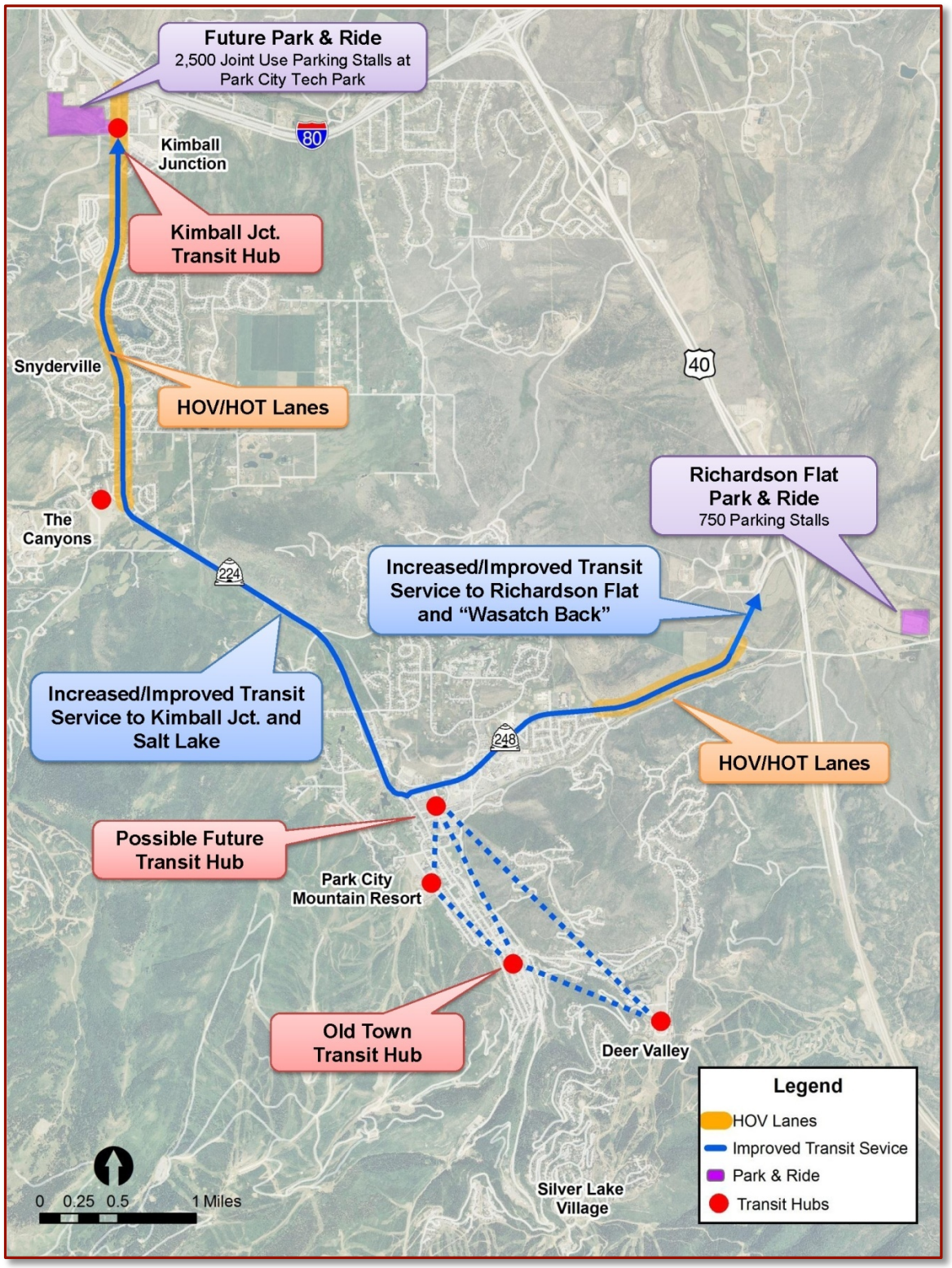
Strategic Objectives by 2040:

a. Traffic flows on Park City roads and streets (including state highways) will be managed for efficient multimodal operations through comprehensive signal synchronization and use of intelligent transportation systems (ITS) technologies such as variable and demand-based pricing, real time parking and transit information, etc.
b. Park City's festivals and special events will feature coordinated transportation strategies that minimize impacts of vehicular traffic while fostering growth in economic benefits.
c. Park City will be viewed as an innovator in offering effective travel demand management incentives through both public and private programs.

Transportation Plan Summary

Figure 4-1 offers a summary of the capital projects and plans that are important in this multi-modal strategy. They include projects and plans from entities outside of Park City such as Summit County and the Utah Department of Transportation. As discussed earlier, this plan is based on a foundation of optimizing multi-modal strategies on the gateway corridors and robust transit and high-occupancy vehicles lanes serving these corridors. These strategies will mitigate the impacts of increasing numbers of visitors to the city by minimizing the growth in vehicles coming to the city.

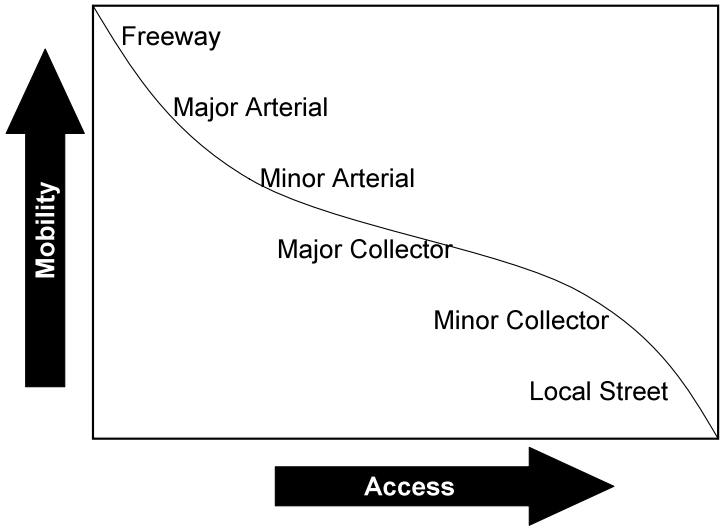
Figure 4-1: Transportation Plan Summary



Functional Classification

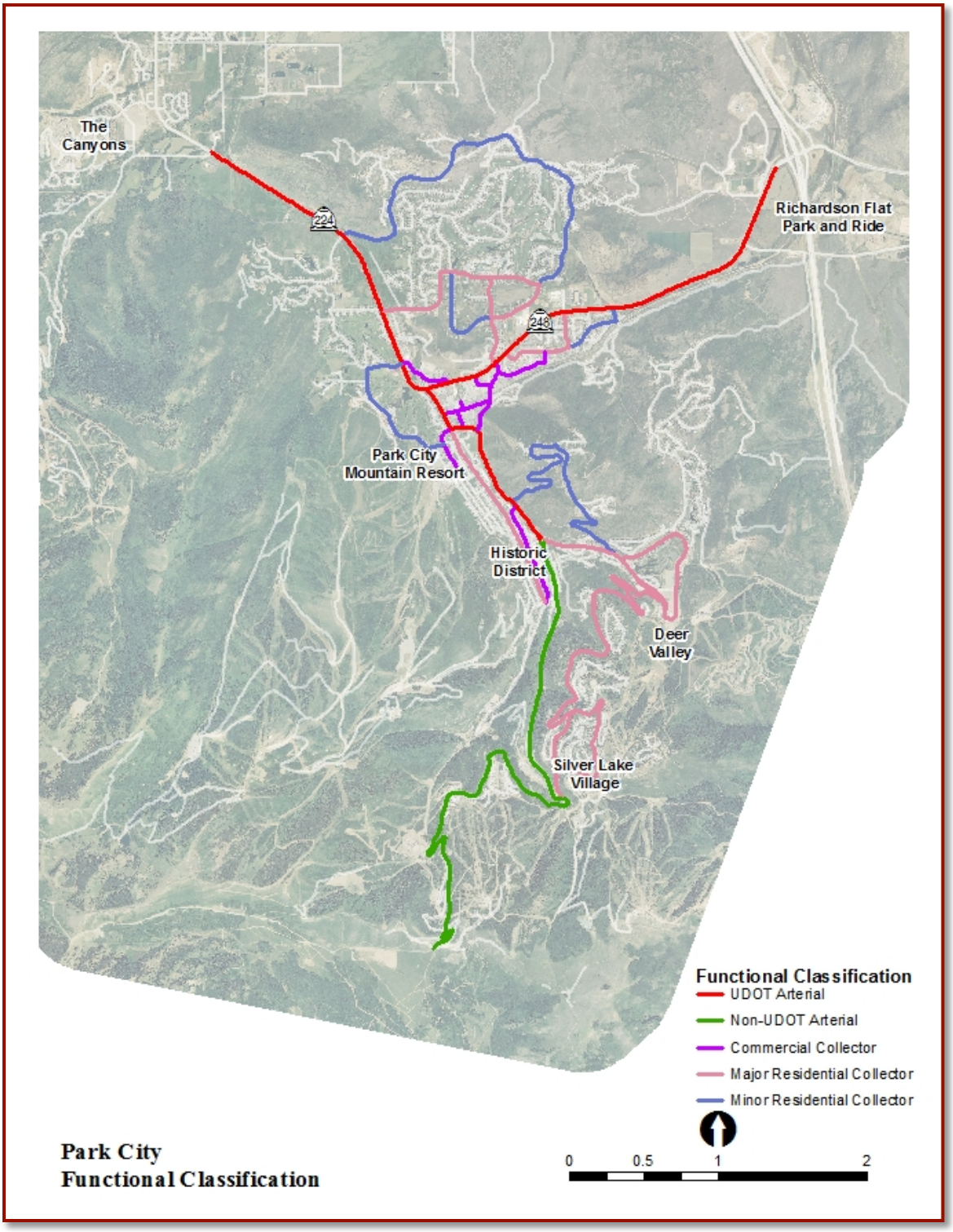
The functional classification of roads is a way to categorize different streets based on their primary function. Generally, a road's functional classification is determined by whether its purpose is to provide access or mobility. Those roads at the smaller end of the functional class system move traffic more slowly but provide greater access, such as to local roads or to residential or small commercial properties. On the other end of the scale, expressways provide greater mobility as they move more traffic at greater speeds, but with more limited accesses such as driveways and intersections. This concept is illustrated in Figure 4-2.

Figure 4-2: Access and Mobility by Functional Classification



In many areas, those streets serving higher mobility and those streets serving a variety of user modes (bicycles, pedestrians, transit, etc.) are seen as mutually exclusive. Park City embraces a "complete streets" system where every functional classification must serve all user modes. As mobility increases, various safety elements become increasingly important and must be offered in an aesthetically attractive way. Street cross-sections also offer a priority of users that may be evaluated in the event that localized problems are raised for any user group. Figure 4-3 shows the functional classification of Park City streets.

Figure 4-3: Park City Functional Classification



Standard Street Cross-Sections

This section describes the standard cross-sections for each of the functional classifications previously displayed. These standards will apply primarily to new roads, but should also be used to evaluate the elements of the roadway that are of most importance during major reconstruction, widenings, etc. For each cross-section, an order of priority is shown for elements outside of the travel lanes. This priority will be important in cases where the full right-of-way (ROW) width is not available to accommodate all of the cross-section elements.

Local Road – non-Old Town

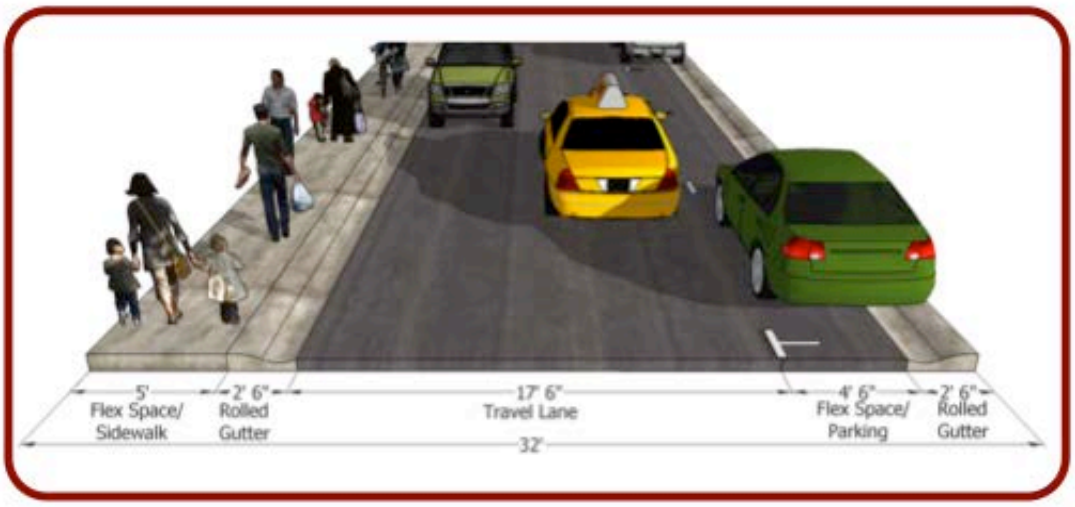
Daily Traffic Volumes: <2,000

Description: Primarily designed to provide access to houses. Usually provide access (driveways) over speed.

Threshold: 2,500 daily traffic

When the full ROW width is not available, the order of priority on flex space will be:

Parking
Sidewalks



Local Road – Old Town

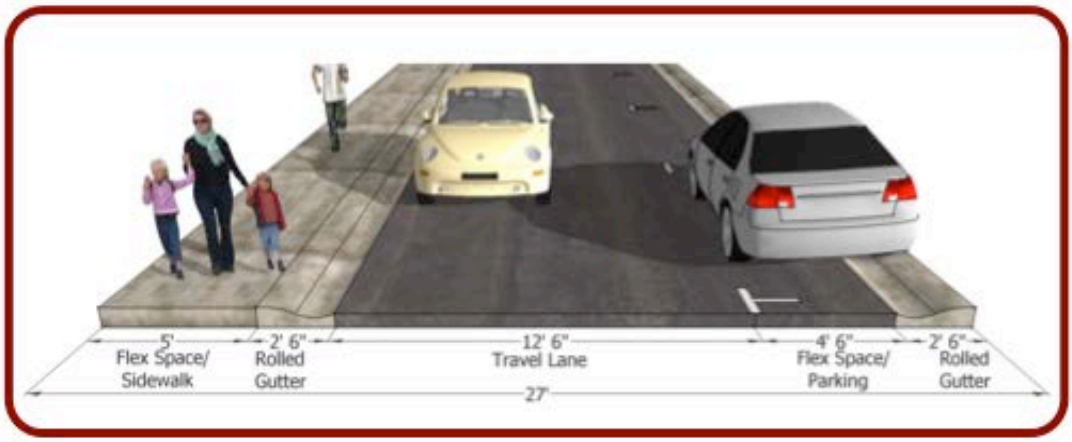
Daily Traffic Volumes: <2,000

Threshold: 2,500 daily traffic

Description: Primarily designed to provide access to houses. Usually provide access (driveways) over speed.

When the full ROW width is not available, the order of priority on flex space will be:

Parking
Sidewalks



Minor Residential Collector

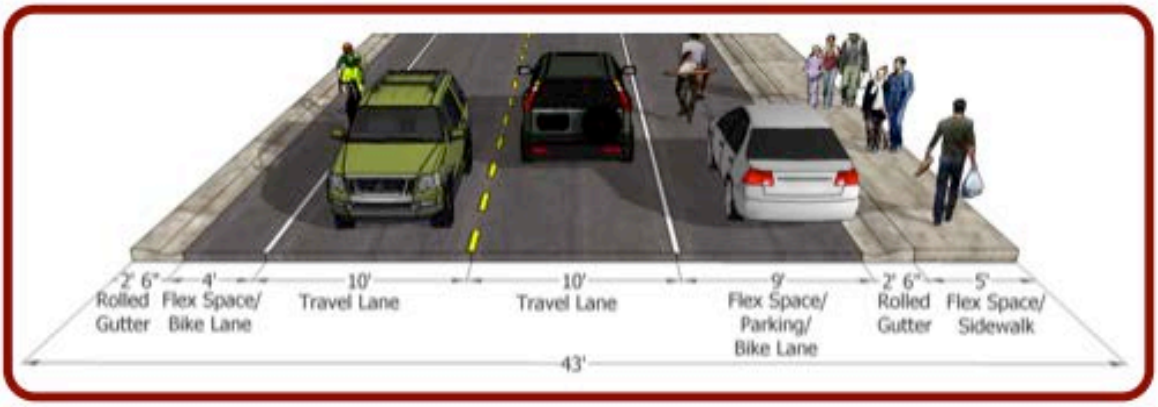
Daily Traffic Volumes: 2,000 - 5,000

Description: Typically connect local roads to higher functioning roads. Access is still a priority but road design begins to accommodate somewhat higher traffic volumes.

Threshold: 8,000 daily traffic

When the full ROW width is not available, the order of priority on flex space will be:

Sidewalks
Parking
Bike lanes



Major Residential Collector

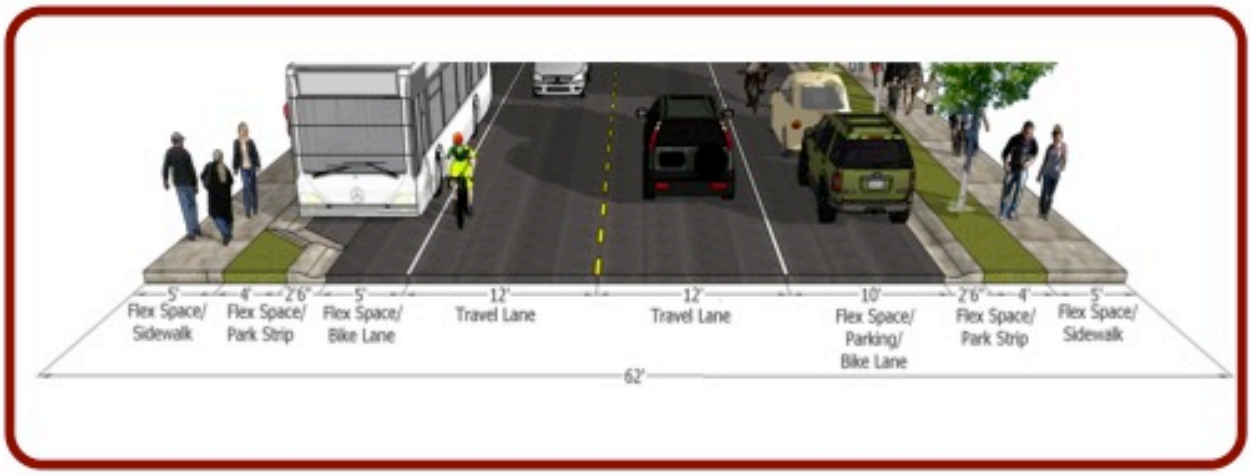
Daily Traffic Volumes: 3,000-8,000

Description: Provide access to some residential land uses but tend to serve higher traffic volumes and more direct access to arterial facilities.

Threshold: 10,000 daily traffic

When the full ROW width is not available, the order of priority will be:

Bus pull-outs
Parking
Sidewalks
Bike lanes
Park strips



Commercial Collector

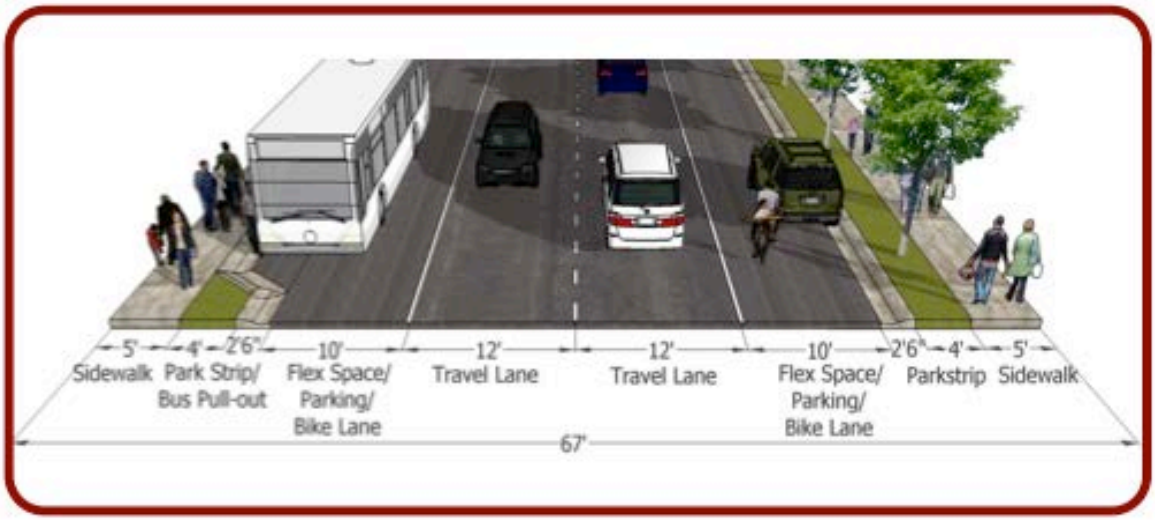
Daily Traffic Volumes: 7,000 - 15,000

Description: Provide access to local and smaller scale businesses. They serve higher volumes than residential collectors and often provide direct connections to arterial streets.

Threshold: 15,000 daily traffic

When the full ROW width is not available, the order of priority on flex space will be:

Parking
Sidewalks
Bike lanes
Park strips



Non-UDOT Arterial

Daily Traffic Volumes: 5,000 - 15,000

Description: Provide access to Park City from areas outside the city. Although Marsac is currently State Route 224, it does not function like a standard state route which typically provides high-volume and high-speed connections across regions.

Threshold: 19,000 daily traffic

When the full ROW width is not available, the order of priority on flex space will be:

Shoulders
Sidewalks/multi-use paths
Center turn lanes/medians

UDOT Arterial

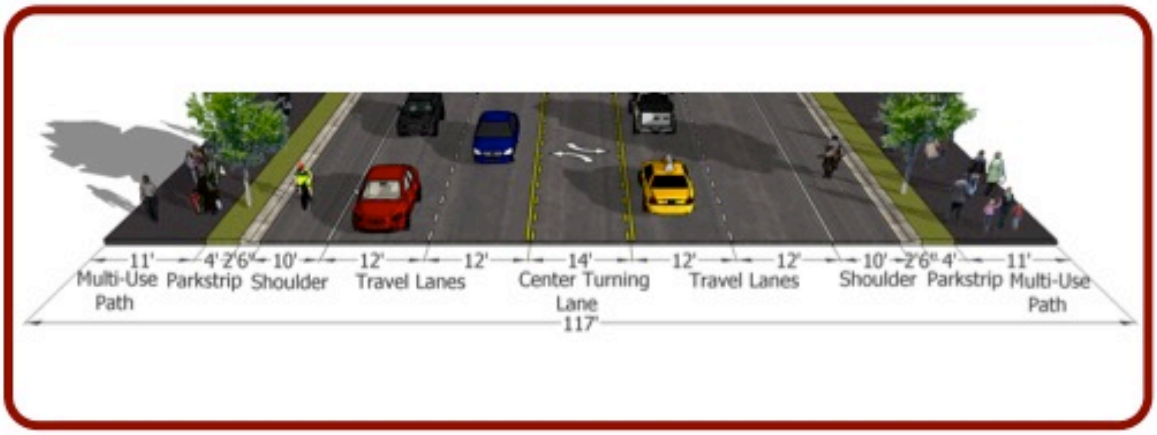
Daily Traffic Volumes: 15,000+

Description: Provide main access to Park City from other areas. They also serve large-scale land uses such as the schools on Kearns Blvd. and major commercial areas on Park Avenue.

Threshold: 38,000 daily traffic

When the full ROW width is not available, the order of priority will be:

Shoulders
Multi-use paths (can be narrower)
Travel lanes (can be narrower in slower speed sections)
Park strips



Chapter 5: Implementation

Chapter 4 presented long-term strategies through a series of goals and measureable objectives, offered details and priorities for implementing a complete streets network, and provided broad direction for meeting transit and non-motorized travel goals which are the cornerstone of the Park City transportation vision. This chapter focuses on short-term actions that need to be continued or initiated by Park City including existing level of service, a report card for specific transportation performance measures, and defining a 3 to 5 year Capital Improvement Plan.

Existing Level of Service

The Park City vision statement calls for economic development and redevelopment to continue while preserving the small town, historic feel of Park City. According to a 2009 Vision Statement developed by Park City, three themes emerged based on resident input and participation. These themes include the following:

- Park City as a Historic Small Town
- Park City is in an Incomparable Natural Setting
- Park City's Sense of Community

The Vision Statement uses these themes to offer an explanation of the balance that must exist in four key areas when evaluating and guiding change in Park City including:

- Environmental Impact
- Equity Impact
- Economic Impact
- Quality of Life

While void of specific guidance or statements about traffic congestion, the Park City Vision begins to define the types of transportation related tradeoffs that may exist between traffic congestion and accessibility. Traffic congestionmakes travel less efficient and less predictable and can worsen air quality and even contribute to declining traffic safety. Similarly, accessibility represents the ability to freely get around town in a variety of modes. The subtle difference in accessibility is that for Park City to continue to grow and meet the vision, traffic congestion must be managed, but not eliminated, so that carpool, transit, and non-motorized modal goals can be achieved, and ultimately measure gains in accessibility as compared with the more traditional measurements of traffic congestion.

Traffic congestion is typically measured by what traffic engineers call "levels of service." Like letter grades in school, measureable results of traffic delay are given A thru F grades where a level of service "A" reflects free flow travel and a level of service "F" reflects very congested travel. The American Association of State Highway and Transportation Officials (AASHTO) suggests that "highway agencies should strive to provide the highest level of service practical" but concede that in many areas "conditions may make the use of level of service "D" appropriate…".[1] Establishing an acceptable level of service in Park City is difficult because a balance of many factors cannot be expressed as a single number. Further, measures of accessibility are not commonly accepted in the transportation industry. Areas that have created accessibility measures have included multi-modal comparisons and many have included land use indicators which are sensitive to the changes in the distance between possible origins and destinations.

Short of developing a research project on measuring accessibility in Park City, the overall evaluation of "what is working" is somewhat subjective. An annual assessment in the form of a "report card" is offered in lieu of a service standard or service minimum. Park City leaders must review the annual assessment and make adjustments in transit service, trail provisions, travel

[1] *Geometric Design of Highways and Streets*, AASHTO, 2004, page 84.

demand management, intelligent transportation systems, parking policies, and related "soft" controls based on subjective assessments, personal preferences, and comparisons to the past.

The following section offers a report card and it is suggested that Park City staff (engineering division) update it on an annual basis. This report card offers a measurement of (average or typical) conditions over time based on comparisons as opposed to absolute values. Initially, these comparisons may offer little insight into overall conditions, but over time the data set will become more robust and the comparisons will be more useful. Key objectives under the report card Goal 5 (increase mobility and reduce car travel) offer effective accessibility measures. While short of an absolute standard, comparisons of the drive time measure has been offered in comparison to AASHTO level of service D and level of service F. Park City should strive to avoid getting worse than level of service D during the peak period on a typical or average day unless bicycle or transit measures can be improved. Goal 5 estimates from the 2010 report card are offered in Table 5-1.

Table 5-1:Accessibility Measures from Report Card

Origin – Destination Pair	2010 Drive Time (Minutes)	2010 Bicycle Time (Minutes)	2010 Transit Time (Minutes)	Worst LOS D Drive Time	Best LOS F Drive Time
PC Mountain Resort to PC High School	6	9	23	7.3	10.2
Old Town Transit Center to Racquet Club	7	9	27	9.0	12.6
Deer Valley Resort to Park City Market	7	15	33	12	16.8

Transit times include waiting at ½ of planned headway.

Report Card

The following report card represents simplified measures of various transportation indicators. For example, petroleum consumption and green house gas emissions can be estimated annually based on UDOT-provided traffic counts on the two gateway corridors (S.R. 224 and S.R. 248). Periodic adjustments to fleet mix and other variables can be ignored annually and provided every five or ten years, as needed. Similarly, vehicle occupancy and most other data collection efforts will require several person hours per year, but can generally be performed within a limited season.

The basic philosophy of the report card is to force Park City to become increasingly accountable to the defined Goals and Objectives of the Transportation Plan. Since the plan does not define a program of long-term capital improvements, the success of the plan requires an ongoing balance of many travel demand management, transit, non-motorized improvements and the continuing adjustment of parking prices, HOV policies, and related considerations. The report card, as shown in Table 5-2 is not intended to measure the worst traffic congestion in Park City and other measures may be useful for ensuring that the worst traffic days are confined to few and specific periods of time such as the Sundance Film Festival or the Fourth of July. Using the information from the report card as well as ongoing and individual observations, Park City must continually balance the use of various policy and pricing incentives and disincentives.

Table 5-2: Report Card

Goal		Measurement	Performance Goal	Past Year	2010
1	Complete Streets	SR-224 Single Occupancy Vehicle Share	50%	NA	70%
		SR-248 SOV Share	50%	76%	NA
		Percent households within 1/4 mile of transit	100%	80%	NA
		Percent households within 1/4 mile of a trail	100%	60%	NA
2	Convenient Transit	Daily Bus Hours (Local Service)	450 Hours	191	219
		Transit Spine Frequency	10 Minutes	10	10
		PCMR to PCHS (Bus Travel Time minus Drive Time)	10 Minutes	NA	17
		Transit Center to Racquet Club (Bus - Drive Time)	10 Minutes	NA	20
		DV to Dan's (Bus - Drive Time)	10 Minutes	NA	27
3	Regional Transit	Daily Bus Hours (Regional Service)	350 Hours	85	85
		Communities Served	5	1	1
4	Connected Out-Of-The-Car	Primary Bike Corridor Completion	100%	88%	89%
		Secondary Bike Corridor Completion	75%	85%	85%
5	Increase Mobility & Reduce Car Travel	Change in Gateway AADT/Housing Units	Less than 1	0.92	NA
		Change in Gateway AADT/Jobs	Less than 1	1.07	NA
		Drive time PCMR to PCHS	6 Minutes	NA	6
		Drive time Transit to Raquet	7 Minutes	NA	7
		Drive Time DV to Dan's	7 Minutes	NA	7
		Drive Time/Bike Time (PCMR to PCHS)	More than 1	NA	0.67
		Drive Time/Bike Time (Transit to Racquet)	More than 1	NA	0.78
		Drive Time/Bike Time (DV to Dan's)	More than 1	NA	0.47
		Drive Time/Transit Time (PCMR to PCHS)	More than 1	NA	0.26
		Drive Time/Transit Time (Transit to Racquet)	More than 1	NA	0.26
		Drive Time/Transit Time (DV to Dan's)	More than 1	NA	0.21
6	No New Mileage	Total Lane Miles	Less than 250	197	197
7	Promote Safety and Active Living	Crash Rate	Less than 3.5	7.9	NA
		Transportation Fatalities	0	NA	NA
		McLeod Creek Trail Usage per day	10% Increase	NA	NA
		Poison Creek Trail Usage per day	10% Increase	445	NA
		Rail Trail Usage per day	10% Increase	NA	NA
		Dan's to Jan's Sidewalk Usage per day	10% Increase	NA	NA
		Little Kate Sidewalk Usage per day	10% Increase	NA	NA
8	Transportation Adds to Community	Estimated Petroleum Consumption Equivalent kBTU	Decreasing	570,000,000	NA
		Estimated Annual Greenhouse Gas Emissions short tons	Decreasing	50,181	NA
9	Convenient Multi-Modal Access	Major New Land Developments	Subjective		
10	System & Demand Management	New ITS Implementation	Subjective		
		New TDM Implementation			

3-5 Year Capital Improvement Plan

The Capital Improvement Plan (CIP) list of projects includes projects or programs that were discussed throughout the transportation plan development process. These projects help move Park City towards its transportation goals and would be relatively easy to implement within a short timeframe. Many of the items included in this plan are well underway so only a summary is offered. Other elements have not been previously discussed but emerged as priorities through the transportation planning process and must be approved by the City Council before moving forward. The CIP elements include:

- Car Sharing
- Transportation Management Association Formation
- Buses on S.R. 224 Shoulders
- Intersection Improvement, Deer Valley Drive North and Deer Valley Drive South
- Intersection Improvement, Empire Avenue and Silver King Drive
- Ongoing Commitment to Transit, Trails, and Trail Maintenance
- Intelligent Transportation System (ITS) for Parking Availability
- ITS for Real-time Transit Information
- Transit to Salt Lake City

Car Sharing

Car sharing offers the opportunity to live and/or work in Park City without owning a car. Typically, for a monthly fee or initial sign-up, users have access to vehicles parked in the region by paying an hourly rate. Insurance, maintenance, parking and gas are included in the hourly rate and mileage is usually not charged. Nationally, companies such as ZipCar and UCarShare (currently operating in Salt Lake City) cover major metropolitan areas. ZipCar has a relationship with several ski areas in New Hampshire and Vermont who provide reduced rate lift tickets for ZipCar users. Waterville Valley is in its third year of this arrangement, offering $15 off a day ticket. SkiVermont also cooperates with ZipCar for deals on lift tickets, rentals and lodging. The City of Aspen Transportation Department has gone a step further and provides access to nine cars for $10 per month and $4 per hour. Cars may not be driven out of the program's boundaries.

Car sharing statistics:

- 27% of car sharers use transit more
- 35% of trips made by transit before joining, increases to 53% after
- 25% of members bike/blade more
- 15% of members give up a car when they join
- 25% of members do not buy a new car because they have joined
- Average reduction in driving of a former car owner – 72%
- Average reduction in driving of all car sharing members – 55%+

- Various sources

Car Sharing Next Steps

Park City should contact Aspen, Colorado as well as ZipCar and UCarShare to possibly identify a preferred provider for car sharing service in the city. Ski areas may want to be involved in targeted marketing and outreach efforts in exchange for offering lift ticket or other incentives to those using shared cars.

Transportation Management Association

A Transportation Management Association (TMA) coordinates public and private entities' needs for alternative transportation. A TMA would register business sponsors and facilitate cooperation in employee commuting, shift time coordination, parking, vanpooling, guaranteed ride home and other travel demand management (TDM) strategies. The Truckee/North Tahoe TMA has an annual budget of $160k, one part-time and one full-time employee and obtains 44 percent of its revenues from members. This TMA meets monthly and maintains a website which provides information about road conditions, transit schedules, a trip planner and other transportation information.

UDOT's TravelWise program has created partnerships with cities and major employers for assistance creating TDM programs. To date, this relationship has been between UDOT and the partner; because of its youth, opportunities between partners are relatively rare.

TMA Next Steps

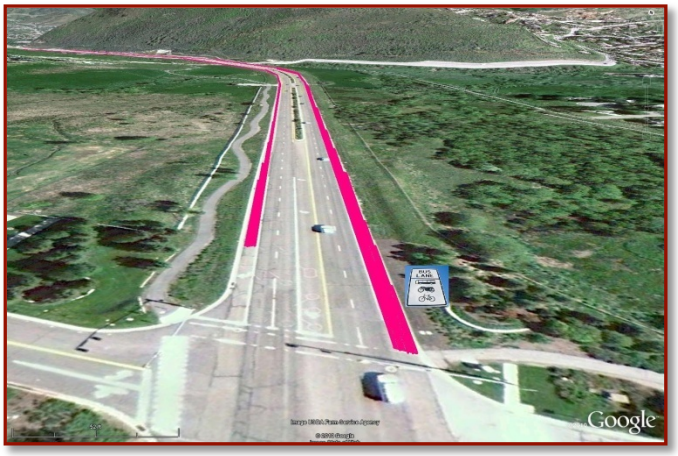
Park City already has relationships with area businesses that outline transit and parking requirements for workers. While the city could form and staff the TMA, typically a non-profit business performs this function. The Park City Chamber of Commerce/Convention & Visitors

Bureau should be approached to determine the interest of their members in creating a TMA. Park City can also connect with UDOT TravelWise staff to discuss the opportunities of partnering and possible subsidies to help fund a TMA in Park City.

Dedicated Bus Lane on S.R. 224

Dedicated bus lanes, or busways, provide incentive to riders and promote transit to drivers new to Park City. Lanes for exclusive bus, schoolbus and emergency vehicle use could be provided in the shoulders, in the median or alongside this gateway corridor. On S.R. 224, the probable busway configuration would be in the two shoulders, designated by signage, striping and pavement markings. At intersections, the right-turn lanes would need to be general purpose to allow non-bus vehicles to decelerate and turn right. Bus stops could be located outside of the bus lane to allow express bus service and different route buses to pass.

Figure 5-1: Busways on S.R. 224 Shoulders Concept



Busways can be introduced in stages. For example, lanes would be designated from Canyons Resort Drive to Meadows Drive one year and from Meadows Drive to Thayne's Canyon Road in a subsequent roll-out. The National Urban Institute's 1998 "At-Grade Busway Planning guide" lists several advantages of busways:

- Relieve congestion
- Alleviate bus service deficiencies
- Move transit faster
- Reserve capacity for future growth in bus trips
- Attract automobile drivers

Potential problems with busways in Park City include:

- Perceived "Empty Lane Syndrome" if buses are not frequently seen in the lane
- During snow and ice events, vehicles typically use the first cleared lanes which may be the busway
- Enforcement at the border as S.R. 224 changes from Summit County to Park City jurisdiction
- S.R. 224 busways would probably not be physically separated from the general-purpose lanes and thus enforcement can be difficult
- Pavement conditions of the shoulders and their ability to withstand regular bus traffic
- Possible safety concerns or widening needs at bus stops and turn lanes into driveways and roadway access points

Busway on S.R. 224 Next Steps
Park City needs to coordinate with UDOT officials on using the shoulders of S.R. 224 as busways. In addition, bus stop locations on the corridor need to be identified as well as the intervals between different bus routes and potential conflicts and stacking of buses. Right-turn lanes at intersections will also need to be considered and accommodated.

Intersection Improvement: Deer Valley Dr. North and Deer Valley Dr. South

Concerns have been raised about the "stewpot" intersection where Deer Valley Drive North meets Deer Valley Drive South – particularly during skier outload from Deer Valley Ski Resort. Westbound queues to the Marsac Avenue roundabout can block eastbound lefts and southwest-bound lefts. The proximity of the bridge structure over the stream restricts expansion and major change.

While a roundabout could possibly be accommodated at this intersection, it would not alleviate the left-turn movement difficulties. During skier outload, the long queue would fill the roundabout, and because vehicles in the roundabout have the right-of-way, opposing left turns would be further prevented.

There is sufficient land to adjust the turn radii slightly and re-stripe the roadway to delineate left turn pockets. This would allow eastbound through movements to pass waiting left turns and would support greater southwest-bound right turns by separating the left turns so they do not block the right turn lane. This concept is illustrated in Figure 5-2.

Figure 5-2: Intersection Improvement, Deer Valley Drive North and South

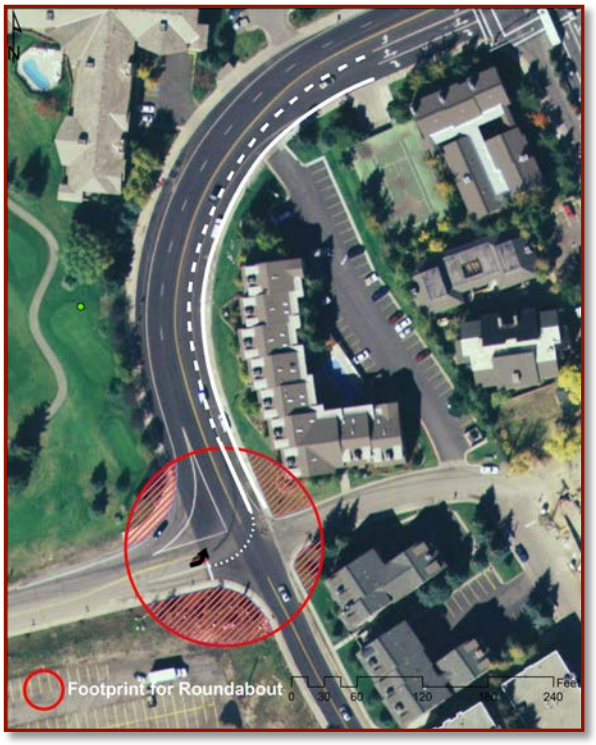
Intersection Improvement: Silver King Drive and Empire Avenue

Concerns have been raised about the intersection of Silver King Drive and Empire Avenue – particularly during skier outload from Park City Mountain Resort. Northbound queues on Empire can block east to northbound left turns onto Empire from Silver King. The proximity of the signal at Empire and Park Avenue creates long queues that prevent vehicles from turning left through the intersection.

A roundabout would be difficult to accommodate at this intersection due to the proximity of the structures and the slight vertical curve. There is sufficient pavement width to add a left-turn receiving lane and re-stripe the roadway to two lanes on Empire to the Park Avenue intersection.

This would allow east/northbound left turns into the newly created lane and would provide more queuing lane space for the signal. These improvements are illustrated in Figure 5-3.

Figure 5-3: Intersection Improvement, Silver King Drive and Empire Avenue



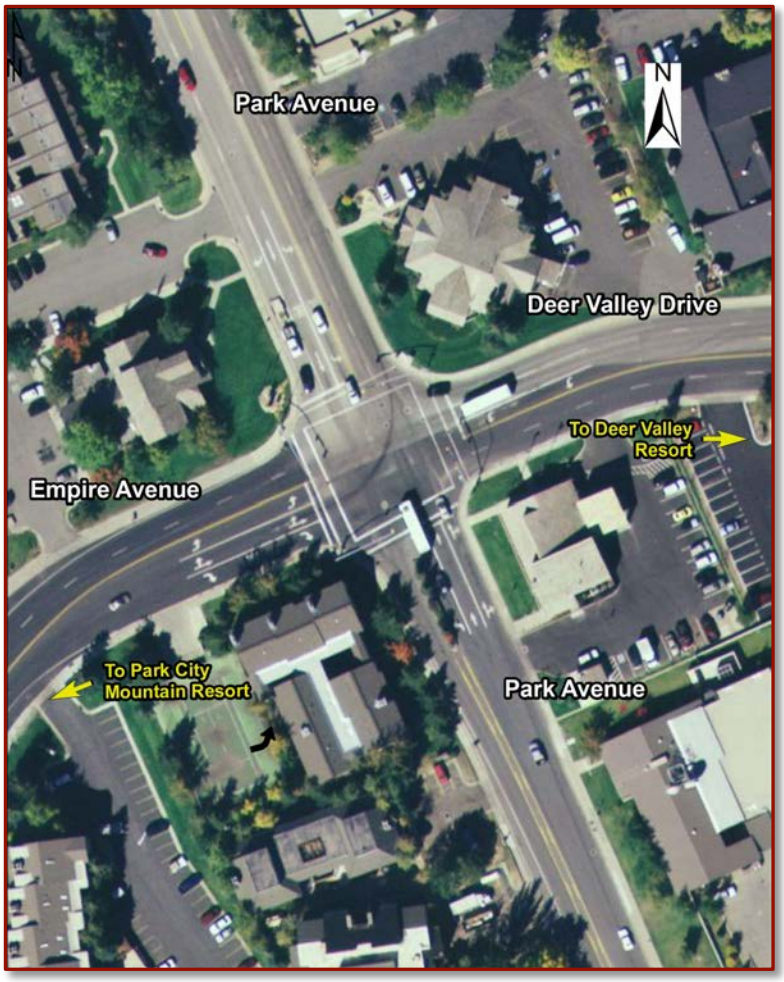
Intersection Improvement: Deer Valley Drive/Park Avenue/Empire Avenue

During peak ski days, ski traffic from both Park City Mountain Resort and Deer Valley Ski Resort converges at the Deer Valley Drive/Park Avenue/Empire Avenue intersection, frequently resulting in congested conditions. To evaluate the possibility of increasing intersection capacity without encroaching on private property or structures, a series of lane and timing changes was investigated. The following options were considered using existing traffic volumes for both peak-ski days and average days:

- Shared right-turn/through lane on Empire Avenue
- Shared left-turn/through lane on southbound Park Ave and split phasing for north/south movements
- Consolidate all pedestrian movements to a pedestrian scramble phase
- Shared right-turn/through lane on Deer Valley Drive

Overall, peak-ski day congestion is severe enough that most options have little effect on overall vehicle and pedestrian delay. Only the shared right-turn/through lane on Empire Avenue resulted in a decrease in delay, albeit slight. All other options actually increased delay during peak ski outload or else created a hazardous environment for pedestrians.

Figure 5-4: Intersection Improvement, Deer Valley/Park/Empire Avenue



Ongoing Commitment to Transit, Trails, and Trail Maintenance

Chapter 6 will provide a discussion of transit expansion and non-motorized trail expansion as components of the transportation plan. Park City staff has dedicated transit planning and operating divisions as well as non-motorized trail plans. Since both of these elements have dedicated staff and specific planning documents for each element, the goal of the transportation plan is not to duplicate such efforts but only emphasize the importance of these efforts in the overall transportation system of Park City. While it is widely recognized that ongoing roadway maintenance is necessary to maintain a valuable and expensive municipal asset, maintenance of both transit and trail systems is also important but often less valued. In this plan, Park City places great emphasis on the importance of a multi-modal system and a well-maintained trail system is critical to the success of that system. The report card offers a measure of the success of these assets and Park City may choose to increase trail snow plowing, for example, as a measure to improve overall accessibility. In many communities, trail maintenance is either an afterthought or a low priority budget item. It is very important that Park City emphasize ongoing funding for non-automobile modes if they are to achieve their long-term vision.

Intelligent Transportation System for Parking Availability

Drivers contribute to traffic congestion and expend considerable time, energy and fuel looking for a parking space. If someone destined for Park City knew *before* getting there that they were unlikely to be able to park there, they would be more likely to park outside of town and carpool or take transit to their Park City destination. An Intelligent Transportation System (ITS) for parking

seeks to communicate parking availability to drivers so that they may make that choice.

ITS for parking availability involves two stages, detecting the usage/availability of spaces and communicating the data to prospective parkers. There are two ways of determining space availability, a vehicle detection system at each space or an in/out counting mechanism. In areas where parking meters or some other fee parking is established, data collection may also occur. A space detection system can be an expensive investment but is highly accurate. Constructing counters at parking lot entrances/exits is neither as expensive nor as accurate. Problems may occur because some vehicles take up more than one space, park in un-designated areas or the sensor may need to be re-calibrated if it loses count. Counting is done using a break-beam inductive loop, magnetometer, infrared or ultrasonic sensor.

Once the availability of spaces is determined, variable message signs are the most efficient way to notify drivers. The information from the parking lots can be transmitted to the signs via a radio frequency or a cellular telephone interface. This data could also be relayed via cell phone text to those who sign up with the state's 511 system.

The United States Department of Transportation has created a national systems architecture for ITS which has a Parking Management subsystem.

Intelligent Transportation System for Real-Time Transit Information

This system is based on providing information to drivers traveling to Park City about the time it will take to get to common destinations such as PCMR and Deer Valley Ski Resort if they chose transit or private vehicle. In a very basic transit ITS system, variable message signs would report transit travel time to these drivers. The goal of a system like this is to help drivers understand the time benefits of parking remotely at Kimball Junction or Quinn's Junction and riding transit into Park City.

There are many additional, optional components for a real-time transit ITS. For the transit fleet, passenger counting, vehicle locators, scheduling/dispatch and traffic signal prioritization are all possible. For the traveler, variable message signs, time-to-destination information and schedule data would be useful. Some systems are available where buses automatically report their location and speed to provide real-time tools for riders.

In August 2006 the U.S. Department of Transportation published a Real-time Bus Arrival Information Systems Return-on-Investment Study which provides data about costs and benefits for this type of transit ITS. These systems reduce both perceived and actual wait times for users. Passengers benefit from pre-trip information and anxiety reduction once at the bus stop as well as making better use of their time if an alternate route is available. The transit operators also benefit because this data helps with scheduling and incident response.

The Federal Transit Administration notes these real-time transit information system perceived benefits: improved ridership, improved customer service, better customer satisfaction and transit visibility and improved communication technique during emergencies.

Costs in 2006 varied, however the vehicle location system cost ranged from $2,000 to $3,000 per vehicle with $145-$650 annual maintenance expense. Dynamic message signs are generally $10,000 per unit. Park City public works staff is pursuing this option.

Transit to Salt Lake City

In the Wasatch Front Regional Council Draft 2040 Regional Transportation Plan, a Bus Rapid Transit Type 1 route between Park City and Salt Lake City is funded. A Business Case prepared by Utah Transit Authority in November 2010 specifies the route as having a Salt Lake City leg from the Intermodal Hub, via the University, to Foothill Drive. There follows a connecting leg via I-80 with a stop at Jeremy Ranch/Pinebrook Fresh Market. In the morning, this stop would be a

pickup in the westbound direction only; in the afternoon peak, buses would only stop in the eastbound direction. The final portion of the route is termed a Park City Route, along S.R. 224 servicing ski areas and Old Town. Deer Valley is listed as a potential extension. UTA estimates a daily ridership between 1,030 and 1,130, including those on just the Salt Lake City leg. The bus is anticipated to be more of a commuter service from Park City to Salt Lake than a ski service from Salt Lake to Park City.

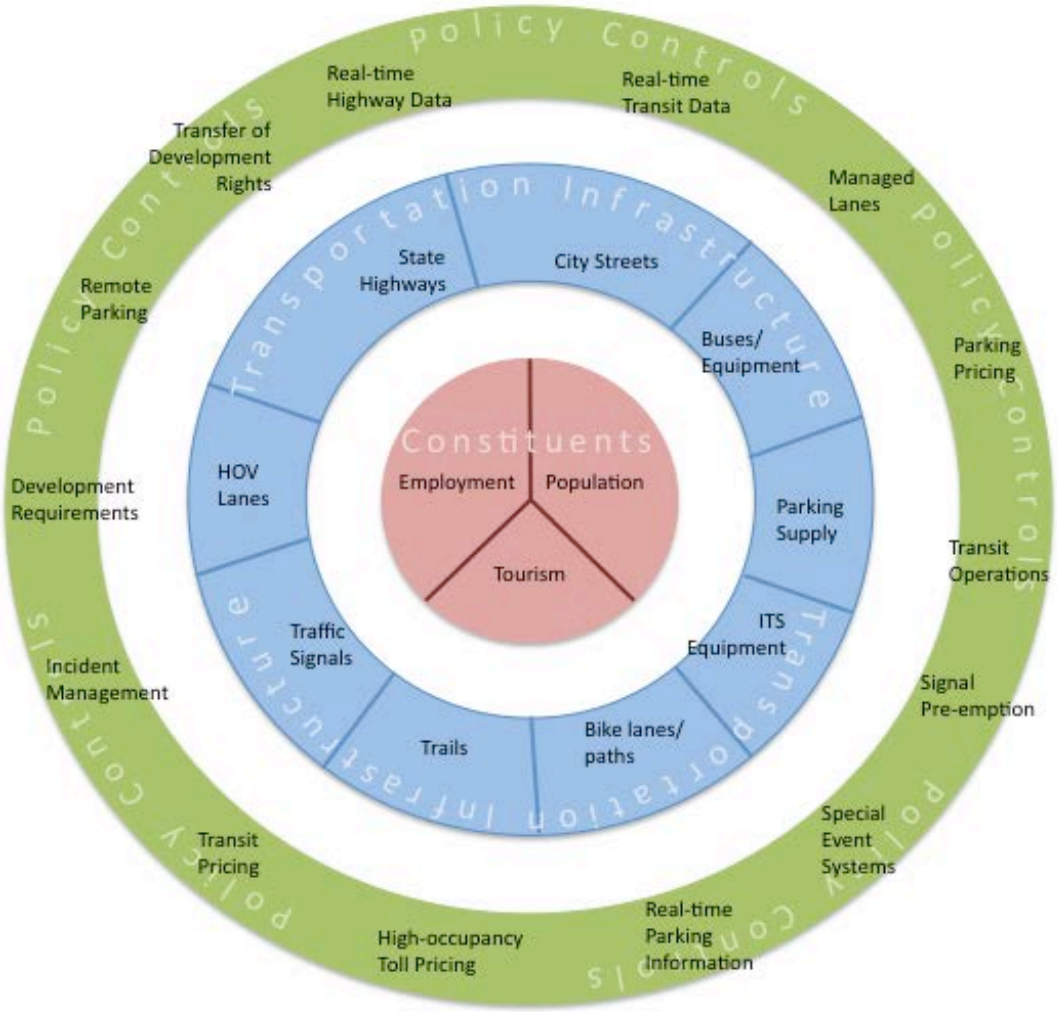
Frequency of coverage is planned to be seasonal and is planned to be five eastbound/three westbound trips on winter mornings and three eastbound/five westbound trips on winter evenings. In the April to August months, service is planned to be reduced to three eastbound/ two westbound trips in the am peak and the reverse in the pm peak. UTA plans to utilize six buses and estimates annual Operation and Maintenance costs to be $468,500 with an additional $120,700 budgeted to cover special events.

The fare is planned to be approximately $5.50 and could also incorporate a contract similar to the Eco-pass with the three ski resorts. Buses can hold 57 passengers and have storage space for skis and bikes underneath the coach. Success of a short-term route should be evaluated after implementation and improvements and changes be made based on experience.

Transportation Decision-making

Unlike a “traditional’ municipal transportation plan that identifies a series of roadway improvements over time, the Park City Traffic & Transportation Master Plan is a more process-oriented document. Outlining a process for decision-making for Park City elected leaders and staff allows them to employ a series of devices and strategies to consider and employ before taking on more controversial projects with a greater array of impacts such as road widening or construction to address specific congestion issues. For example, if traffic congestion issues on S.R. 224 are deemed intolerable through such means as increased travel time, public complaints, or perceived threats to economic development, the city council and staff have a series of strategies to consider such as parking pricing in Old Town or increased transit service to the Kimball Junction. In addition, some of these strategies could be considered for specific days and/or events such as the Sundance Film Festival or the Fourth of July celebration.

Figure 5-5: Transportation Decision-making Process



Chapter 6: Transportation Projects

This chapter begins to identify the various projects and approaches that support (or possibly conflict with) the themes stated at the outset of the plan:

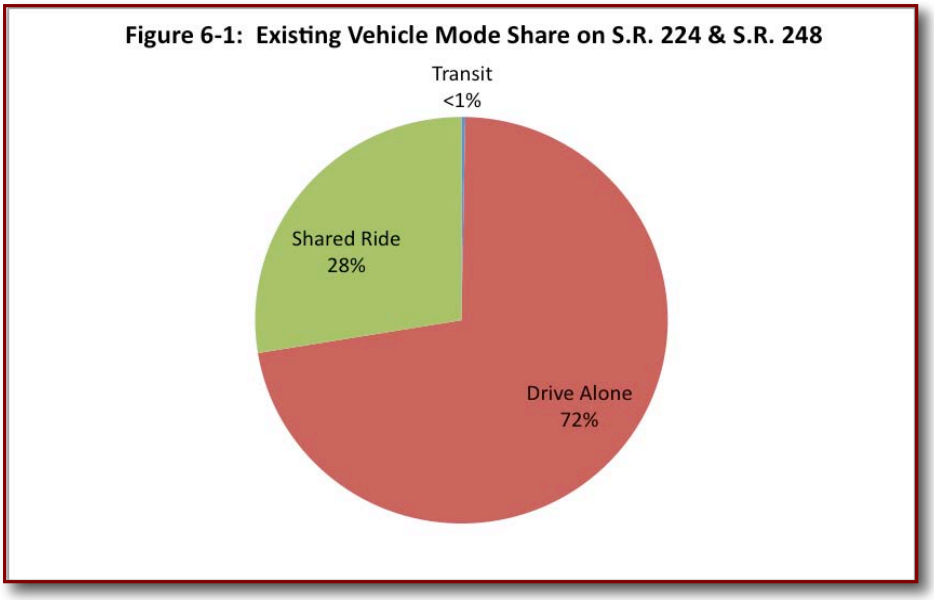
- Traffic congestion on "gateway corridors" (S.R. 224 and Kearns Boulevard) should not reach levels that inhibit economic development opportunities in Park City.
- Multi-modal approaches to traffic management beginning on gateway corridors and continuing in Park City will be necessary to avoid traffic problems that put quality of life in conflict with economic and tourism priorities.
- This approach requires Park City to accept some level of traffic congestion and that this level must continually be evaluated and balanced with overall community support.

Existing Gateway Corridors

The gateway corridors represent the main accesses to Park City from other areas. Existing gateway corridors include S.R. 224 from Kimball Junction at I-80 and S.R. 248, or Kearns Boulevard, from US-40 to the east. Analysis of the gateway corridors begins with a quantification of overall growth in existing corridors and their ability to accommodate this anticipated growth. Each of these corridors is a state highway under the jurisdiction of the Utah Department of Transportation.

The following information offers an in-depth look at existing and future conditions on S.R. 224 and S.R. 248. A corridor study of S.R. 224 is summarized in this plan and was completed concurrent with the plan. The corridor study is included in Appendix E. A corridor study of S.R. 248 was completed in 2009. Traffic conditions in Park City are highly affected by these corridors and current plans call for adding high-occupancy vehicle (HOV) lanes to both corridors along with park-and-ride lots and likely additional transit service. The Park City Traffic & Transportation Master Plan (TTMP) includes aggressive vehicle occupancy goals for these two gateway corridors (see "Goals" section in Chapter 4). The graphs below show existing and future mode share goals.

Figure 6-1: Existing Vehicle Mode Share on S.R. 224 & S.R. 248



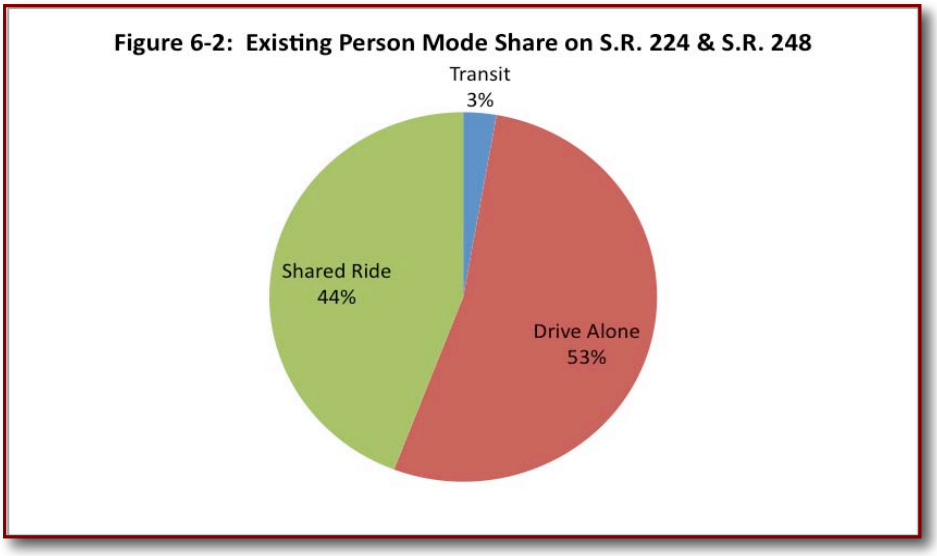
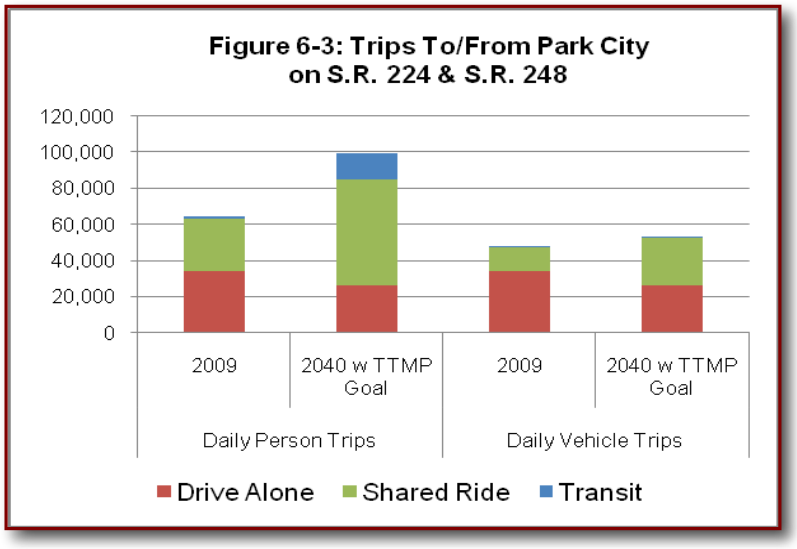


Figure 6-3 shows that by achieving the mode share and vehicle occupancy goals identified earlier in this plan, 50 percent more *people* may come to Park City while only increasing vehicle traffic by 11 percent. The travel model projects that person trips to and from Park City will increase less than 50 percent by 2040. Achieving mode split goals is important for many reasons, key among them is the role that tourism and recreation have in the overall economic development picture for Park City, and that access to the city is maintained while the impacts of single-occupant vehicles in the city are minimized.



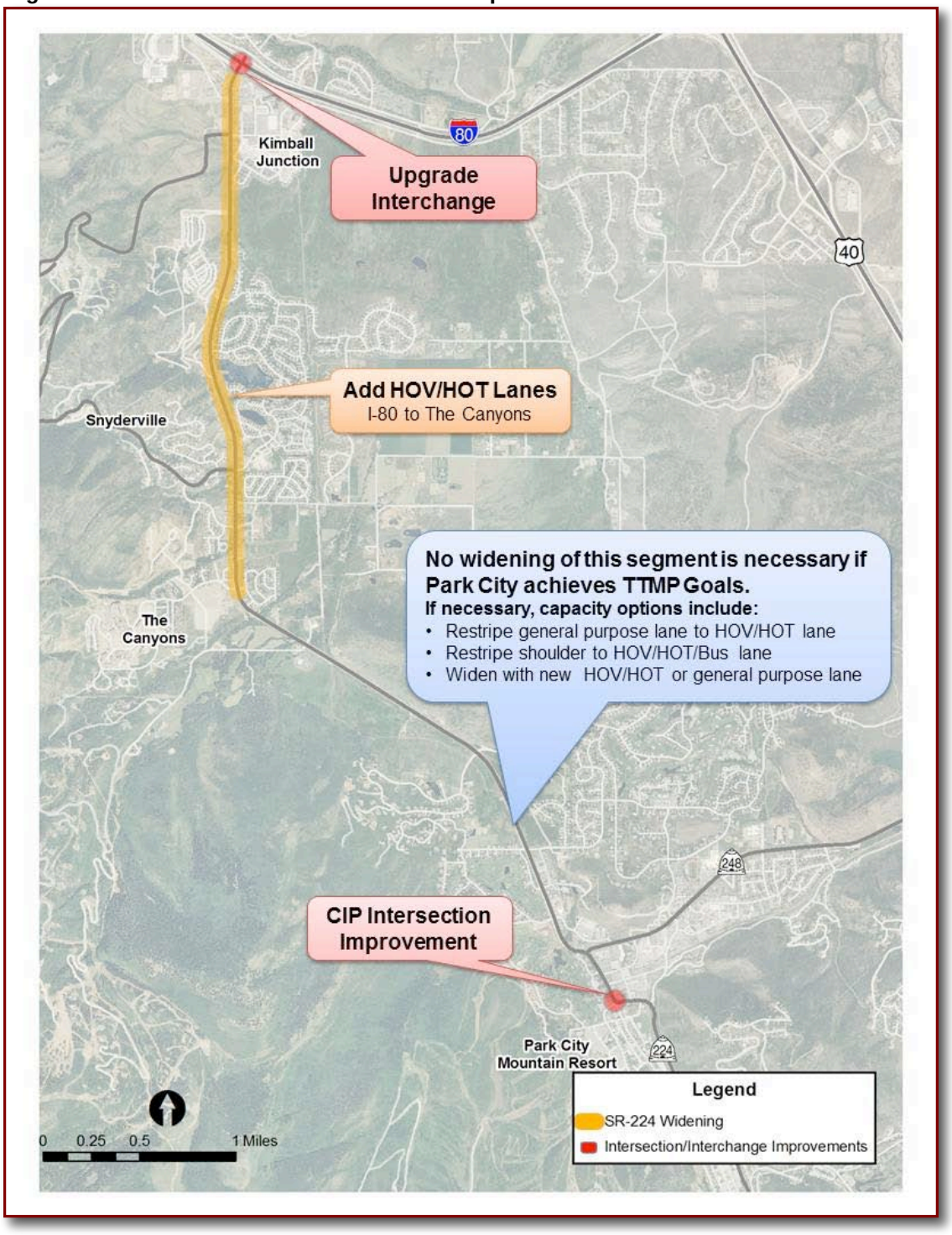
In order to achieve the aggressive mode split and vehicle occupancy goals of this Traffic & Transportation Master Plan, the plan optimizes multi-modal strategies on the gateway corridors including park-and-ride lots at Kimball Junction and Richardson Flat with additional transit and high-occupancy vehicle lanes serving these facilities. These strategies will help to increase the number of *people* visiting Park City but will limit growth in the number of *vehicles* in Park City, each an important component in the overall goals of the city. Additional Park City strategies might include:

- Parking incentives/disincentives
- Pricing incentives
- Mandatory remote event/festival parking
- Real time travel and parking information
- Future development requirements

S.R. 224

Existing and future conditions in the S.R. 224 corridor were evaluated in light of development anticipated in the area along with planned transportation improvements. These improvements are shown in Figure 6-4 and are based on existing plans of the Utah Department of Transportation and Summit County. Assuming that the mode split goals of the Traffic & Transportation Master Plan are met (see Chapter 4), no significant improvements to S.R. 224 south of Canyon Resort Drive are necessary.

Figure 6-4: S.R. 224 Planned and Possible Improvements



Existing and future traffic conditions on S.R. 224 are shown in Figure 6-5. Daily traffic volumes are indicated by the thickness of the band and "level of service" is given in colors from A-C (green) to F (red).

Again, assuming mode share and vehicle occupancy goals of this plan, future traffic conditions on S.R. 224 are not expected to be significantly different than today, with the exception of the segment between Kearns Boulevard and Deer Valley Drive in Park City. This section of road (often referred to as "Dan's to Jan's") is typically the first area to experience traffic issues as it is a major skier outload corridor from both Deer Valley and Park City ski resorts. Additionally, this section of S.R. 224, along with Bonanza Drive, is the only connection between Park City and S.R. 248. With the future development in eastern Summit and Wasatch Counties combined with the planned HOV lane capacity improvements, S.R. 248 is expected to accommodate much of the future traffic growth into and out of Park City. As a result, the Dan's to Jan's corridor will experience more traffic growth than the rest of the S.R. 224 corridor due to traffic growth on S.R. 248.

The use of a high-occupancy vehicle (HOV) or high-occupancy toll (HOT) lane allows Park City and the Utah Department of Transportation to offer premium service with reduced congestion to reward beneficial behavior. While it is often difficult to take away capacity from users, as Park City begins to achieve its modal goals, policies may be adjusted to limit only 3+ person carpools in the HOV lane, restripe an existing travel lane as HOV/HOT and allow users to pay for the benefits of reduced congestion.

Advantages and disadvantages of the improvements and strategies planned for on S.R. 224 are summarized in Table 6-1.

Figure 6-5: Existing and Future Traffic Volumes and Level of Service on S.R. 224

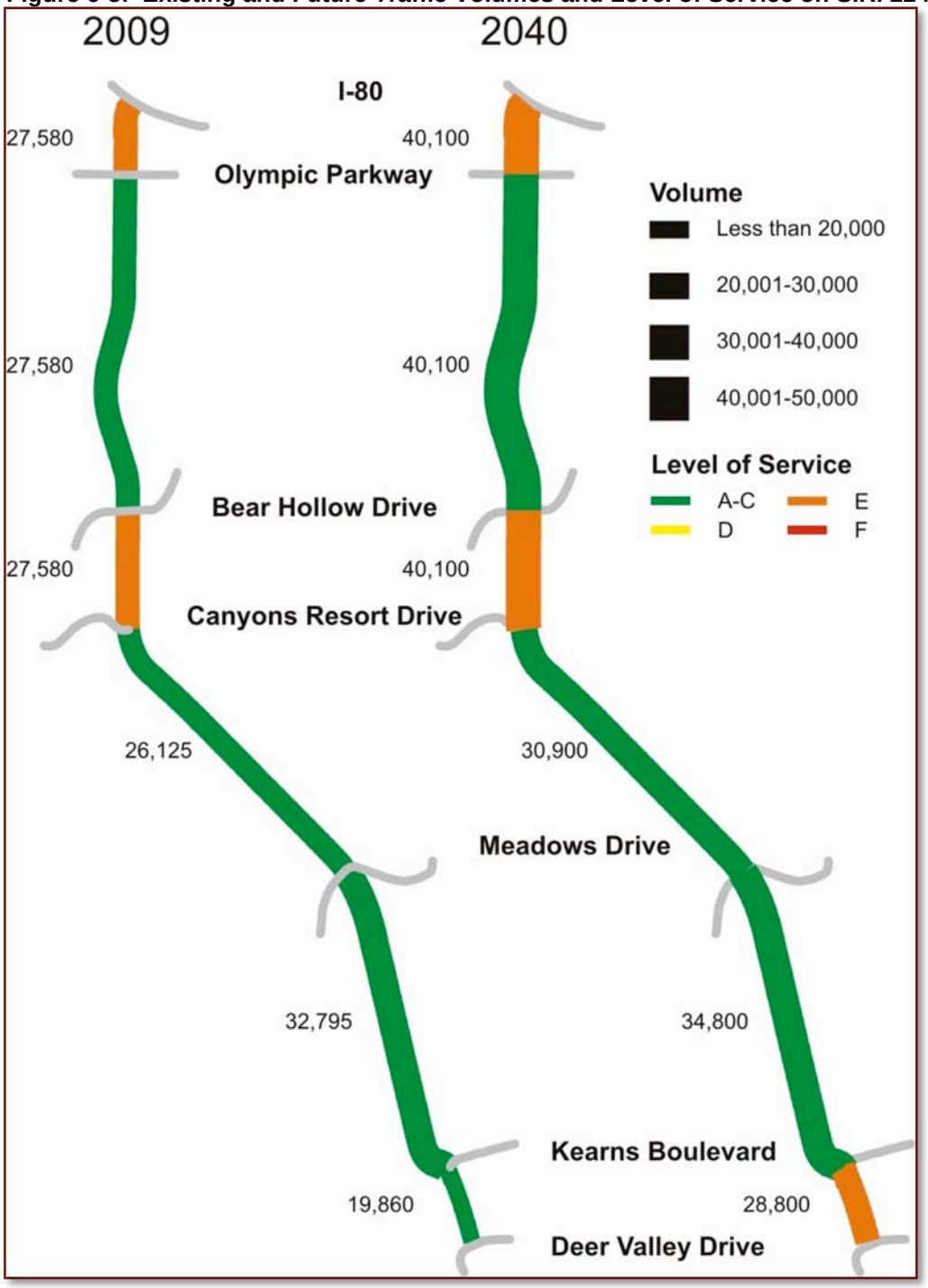


Table 6-1: S.R. 224 Summary

	Advantages	Disadvantages
HOV	Provides premier HOV service from I-80 to Canyons and possibly Park City	Potential to lose shoppers to "shopping where they park"
Transit	Short term, shoulders are used for transit. Long term, specific lanes are provided for transit (HOV) use	
Non-motorized Travel		• There are constraints in the Kearns to Empire segment that limit separated trail for bike/ped • Bicycles on shoulders would have to share with buses
Traffic Congestion	Capacity in general purpose lanes should increase by achieving mode split goals	General purpose lanes may remain congested or become more congested

Public sentiment related to existing and future conditions on S.R. 224 focused on:

- Improving traffic circulation in the Kimball Junction area.
- Exploring the possibility of letting vehicles use shoulders during peak periods such as skier outload, maybe only for traffic turning east into the Redstone development.
- Accommodating other modes of travel with bicycle lanes on the highway and pedestrian and wildlife underpasses
- Adding high-occupancy vehicle (HOV) lanes in the corridor by adding a lane, not converting an existing lane to an HOV lane. HOV lanes should also be extended all the way into Park City.

S.R. 248 (Kearns Boulevard)

Park City has implemented many improvements on S.R. 248 in recent years, including a school drop zone on Lucky John Drive (thereby moving some traffic off of S.R. 248), a pedestrian signal near the high school, a pedestrian tunnel at Comstock Drive, deceleration lanes in the corridor, and updating accesses to the schools. The city's current plan for the S.R. 248 corridor is to restripe the existing pavement to be two lanes in each direction the length of the corridor between S.R. 224 and US-40. Bicycle lanes would also be provided the length of the corridor. Between Wyatt Earp Way and Richardson Flat Road, the outside lane would be a high-occupancy vehicle lane. The existing center median in this section will be removed.

This plan was recommended as the result of a corridor study completed in 2009. While this plan calls for bike lanes the length of the corridor, it is important to not forget the adjacent Rail Trail as an off-road alternative for bicycles. During the S.R. 248 Corridor Study process, there was discussion of alternative use of the Rail Trail corridor for things such as Bus Rapid Transit or other transit facilities. These were not recommended and there is no specific plan for transit in the Rail Trail corridor.

The estimated cost for these corridor improvements is $5 - $9 million. The improvements recommended in the corridor study and adopted by the city council are summarized in Figure 6-6. A summary of the advantages and disadvantages of the plan for S.R. 248 are included in Table 6-2.

Figure 6-6: Planned Corridor Improvements, S.R. 248

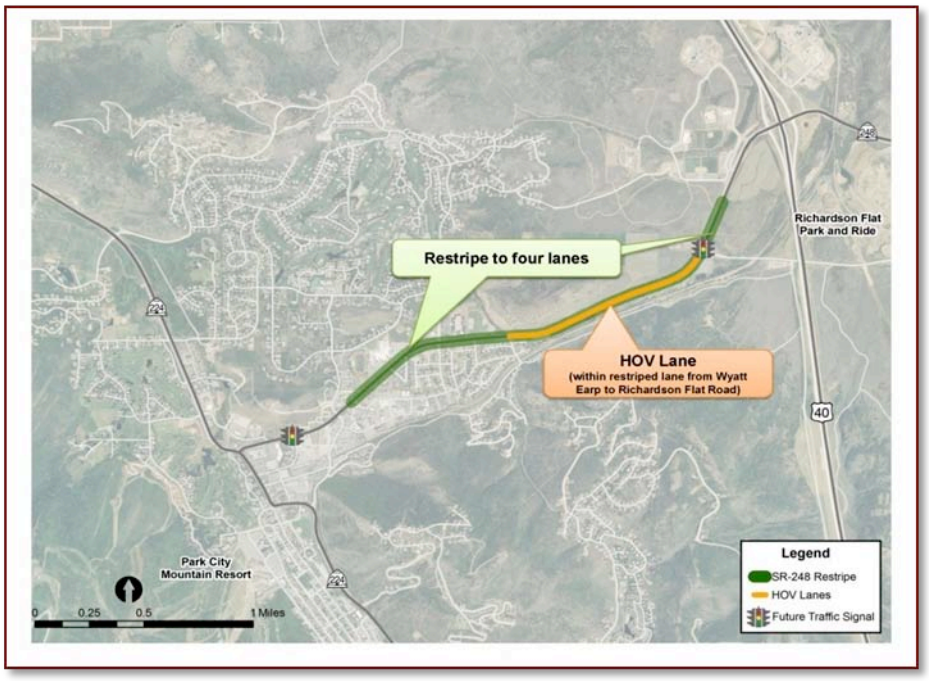


Table 6-2: S.R. 248 Summary

	Advantages	Disadvantages
HOV	Provides premier HOV service from US-40 to Park City, better utilizing the Richardson Flat Park-and-Ride lot	
Transit	Specific lanes provided for transit/BRT (HOV) use	
Non-motorized Travel	• Bicycle lanes are provided between S.R. 224 and US-40 (Rail Trail is also available) • Safety in school area needs to remain a priority	
Traffic Congestion	• Capacity in general purpose lanes should increase by achieving mode split goals • HOV lanes can be converted to HOT or general purpose lanes if need arises	General purpose lanes may remain congested or become more congested
Other	UDOT is looking for near-term funding for improvements on S.R. 248	The City Council's approval of the S.R. 248 plan was dependent on observance of traffic conditions after the Comstock tunnel was constructed.

Comments from public outreach efforts were primarily concerned with:

- The immediate need for additional travel lanes
- Maintaining bicycle lanes in the corridor
- Developing incentives/requirements to use the Richardson Flat park-and-ride lot

As gateway corridors, both S.R. 224 and S.R. 248 include remote parking as well as transit opportunities. On S.R. 224, PCMR serves as a secondary capture point for event-related parking and transit service. A more formal transit transfer facility should be considered in PCMR in the future. Bonanza Park has also been suggested as a more formal transit transfer location servicing S.R. 248 (and possibly S.R. 224). It is difficult to discuss the specifics of transit transfer and remote parking service in PCMR or Bonanza Park without knowing the details of development/redevelopment proposals of these areas as well as Deer Valley and other large development areas in the city such as Treasure Hill. The year-round nature of resort facilities may allow for a parking surplus in summer months and a parking deficit in winter months. Off-site facilities with available parking and convenient transit may allow for a public-private partnership which balances supply and demand in a manner that minimizes the burden on the transportation system. Each resort and each new development will be required to take some responsibility towards considering and improving this balance but the specifics will depend on the development proposals.

Transit

Although transit planning in Park City is documented in the Transit Development Plan (TDP) that is currently being updated, increased transit service was a priority expressed throughout the Traffic and Transportation Master Plan development process. As a result, transit service goals were incorporated in the strategic objectives that accompany the master plan goals.

Transit Service Goals

While Park City currently provides robust transit service within Park City and the Snyderville Basin area of Summit County, the strategic objectives identified in this plan (see Chapter 4) necessitate additional transit service by 2040. Specifically, this plan calls for significantly more transit service with the number of daily service hours increasing to 800 hours by 2040. In 2010, Park City Transit supplied a total of approximately 70,000 annual service hours including external transit service to The Canyons and Kimball Junction.

Within the 800 service hour goal, 450 hours are targeted for transit service internal to Park City and 350 hours are dedicated to external transit service to other areas in Summit, Wasatch and Salt Lake Counties. Existing internal transit service within Park City is approximately 200 daily service hours and external transit service is about 85 service hours. In order to meet these transit service goals by 2040, internal and external transit service needs to increase by approximately nine daily service hours per year on average. The increased transit service will be directed toward transit spines and external markets that were identified during the plan process. Transit spines are shown in Figure 6-7 and external markets are identified in Figure 6-8.

The internal transit goals broadly supply enough service to increase transit frequency to 10 transit spines, offer 10 minute service to Richardson Flat park-and-ride, and provide new 20 minute transit service to existing neighborhoods that do not have transit service. However, an important consideration is that Park City Transit has established a transit service standard to not serve residential areas of densities of less than four units per acre.

The external transit service goal should be able to provide regular service (30 minute service, 14 hours a day) to all external transit markets and 15 minute service to Kimball Junction and Salt Lake. Figure 6-9 shows growth in transit service hours based on service hour goals, and approximately when regular transit service to external markets would be feasible with these goals.

Figure 6-7: Transit Spine

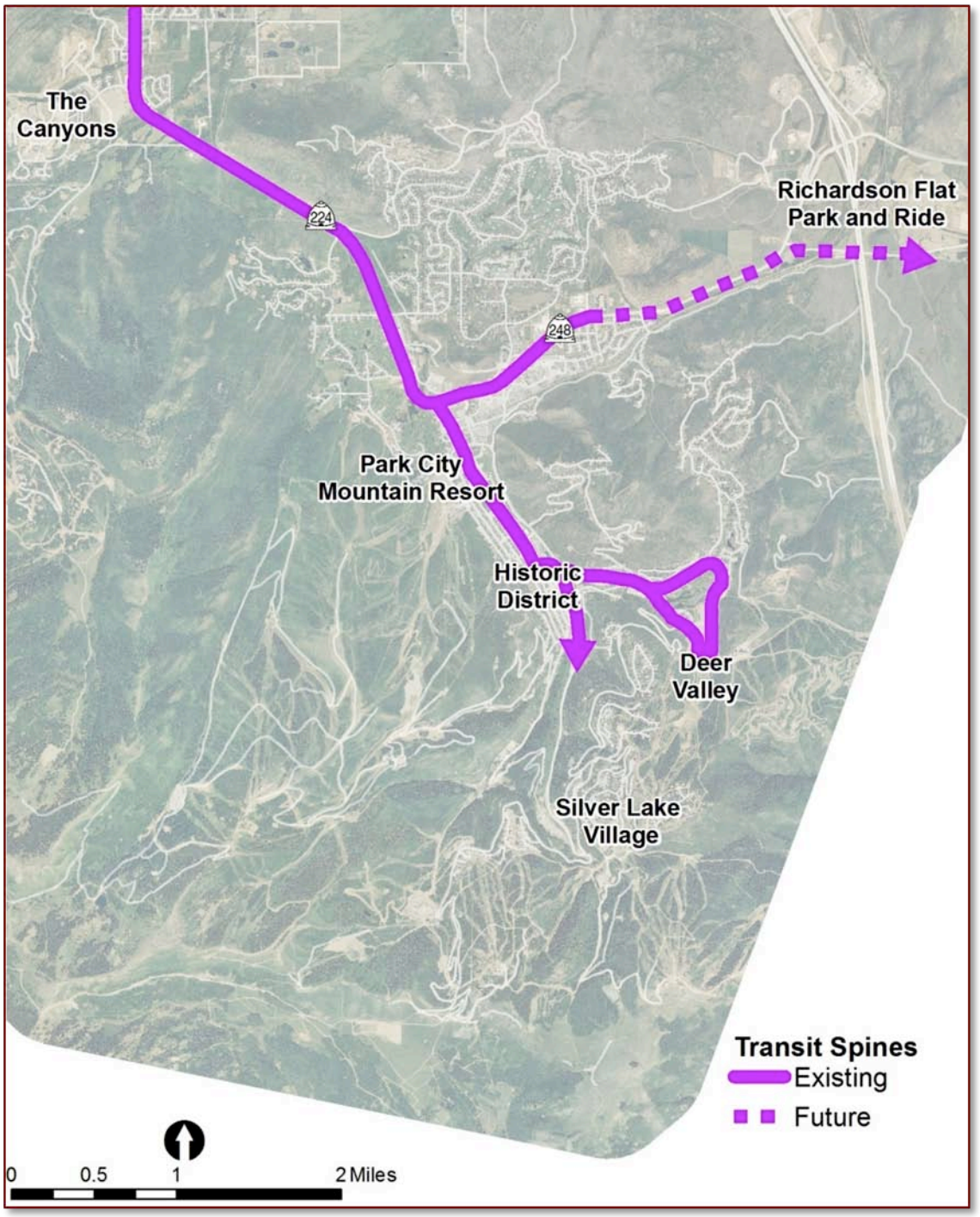


Figure 6-8: External Transit Markets

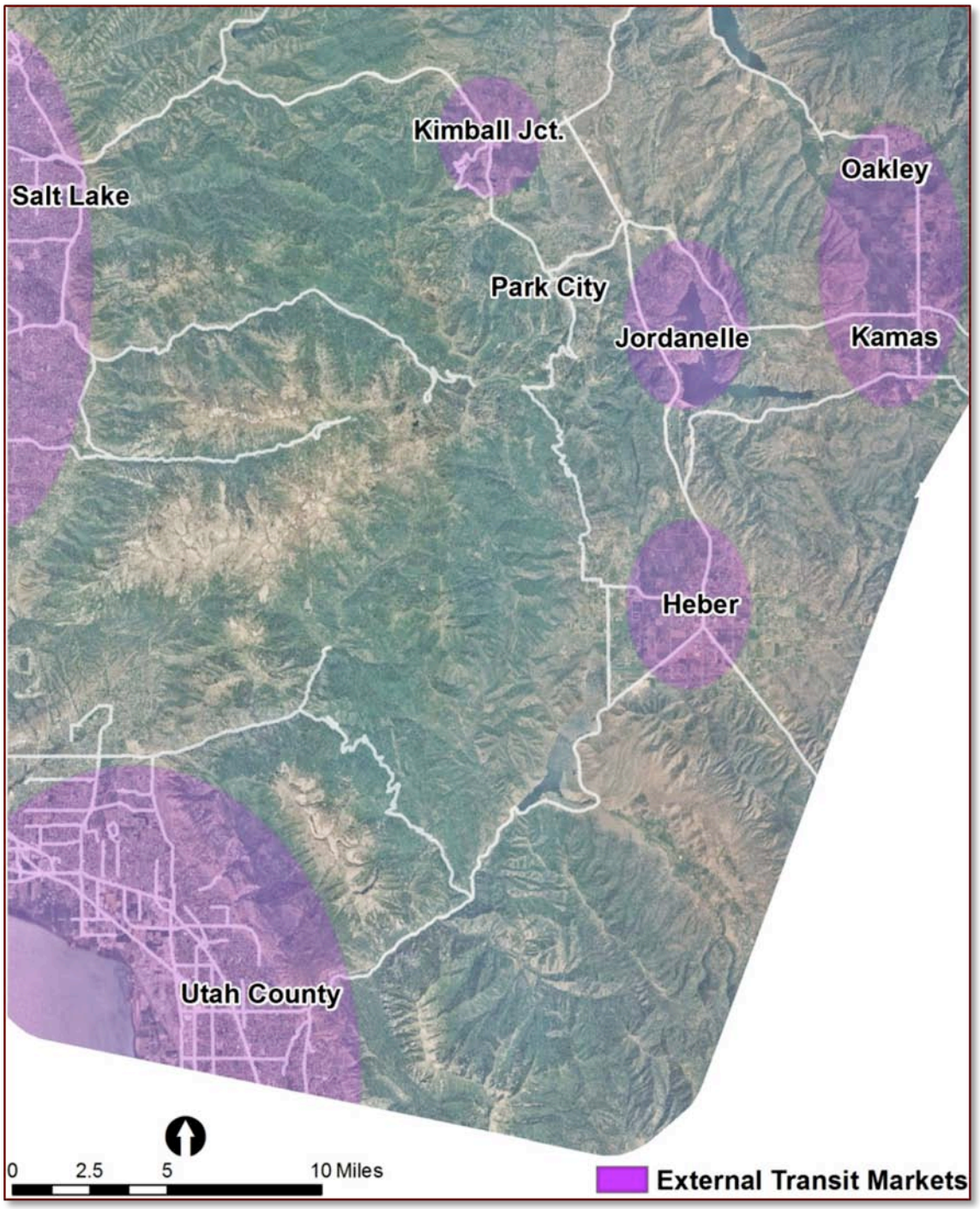
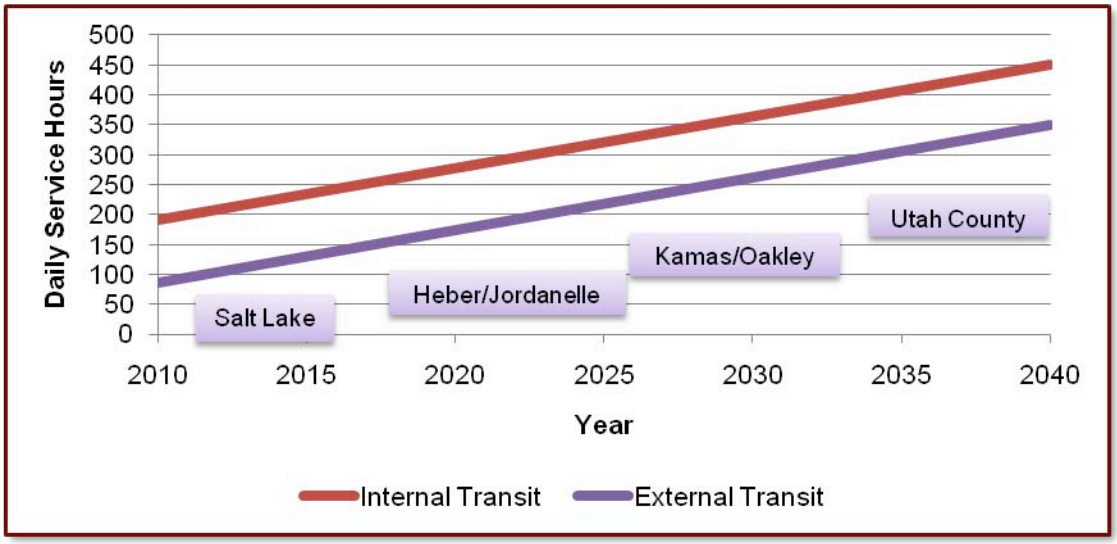


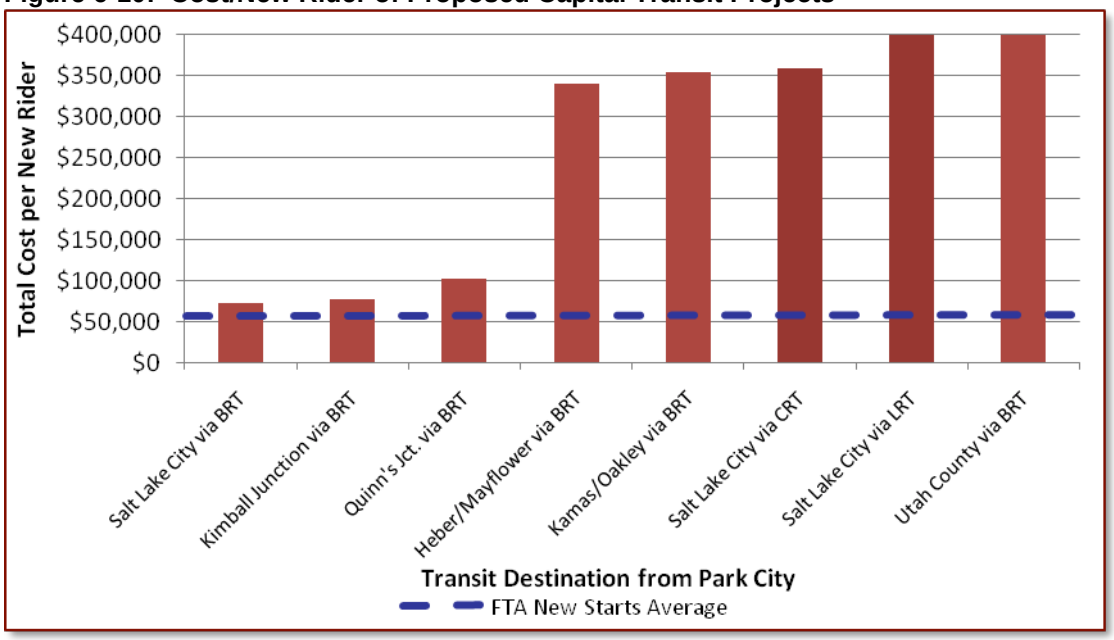
Figure 6-9: Transit Service Hour Goals



Capital Projects

In addition to increased/improved bus service, several capital projects were identified during this planning process. These concepts ranged from bus rapid transit (BRT) from the Richardson Flat park-and-ride lot to light rail transit (LRT) or commuter rail transit (CRT) between Park City and Salt Lake City. High-level cost and ridership estimates were developed to compare these capital projects to others that have received Full-Funding Grant Agreements (FFGA) from the Federal Transit Administration (FTA). Figure 6-10 provides the estimated cost per new rider of proposed capital transit projects. While the FTA no longer uses cost per new rider to determine cost effectiveness, this metric provides a quick comparison to transit projects that have received FFGA. Based upon the cost per new rider, BRT to Kimball Junction or Salt Lake City and possibly Quinn's Junction may be competitive but would require additional study. However, capital projects for other destinations and modes would likely not be competitive for federal funding.

Figure 6-10: Cost/New Rider of Proposed Capital Transit Projects



While improved transit service is a vital component of the transportation plan, the transportation plan is not intended to offer the details of either a short range or long-range transit system. However, key issues of the transit system have been identified and are offered to provide guidance on the level of transit improvements which will be needed in the future.

Given the relatively small user base in Park City, it is unlikely that federal funds will be available for rail transit serving Park City. Bus Rapid Transit (BRT) is often suggested and is growing in popularity as it offers a lower capital cost option with ridership benefits of improved transit stations and time sensitive service. BRT can use existing travel lanes with possible intersection improvements (queue jumper lanes, for example) or use a dedicated travel lane, depending on demand. Ski lifts have also been suggested as part of the planning process, particularly in context with improved connections to the two existing ski areas in Park City to redevelopment options in Bonanza Park. Analysis of the viability of ski lifts has not be evaluated in this plan, since they are unlikely justified solely from a transportation basis (but may offer transportation improvements compatible with economic development objectives).

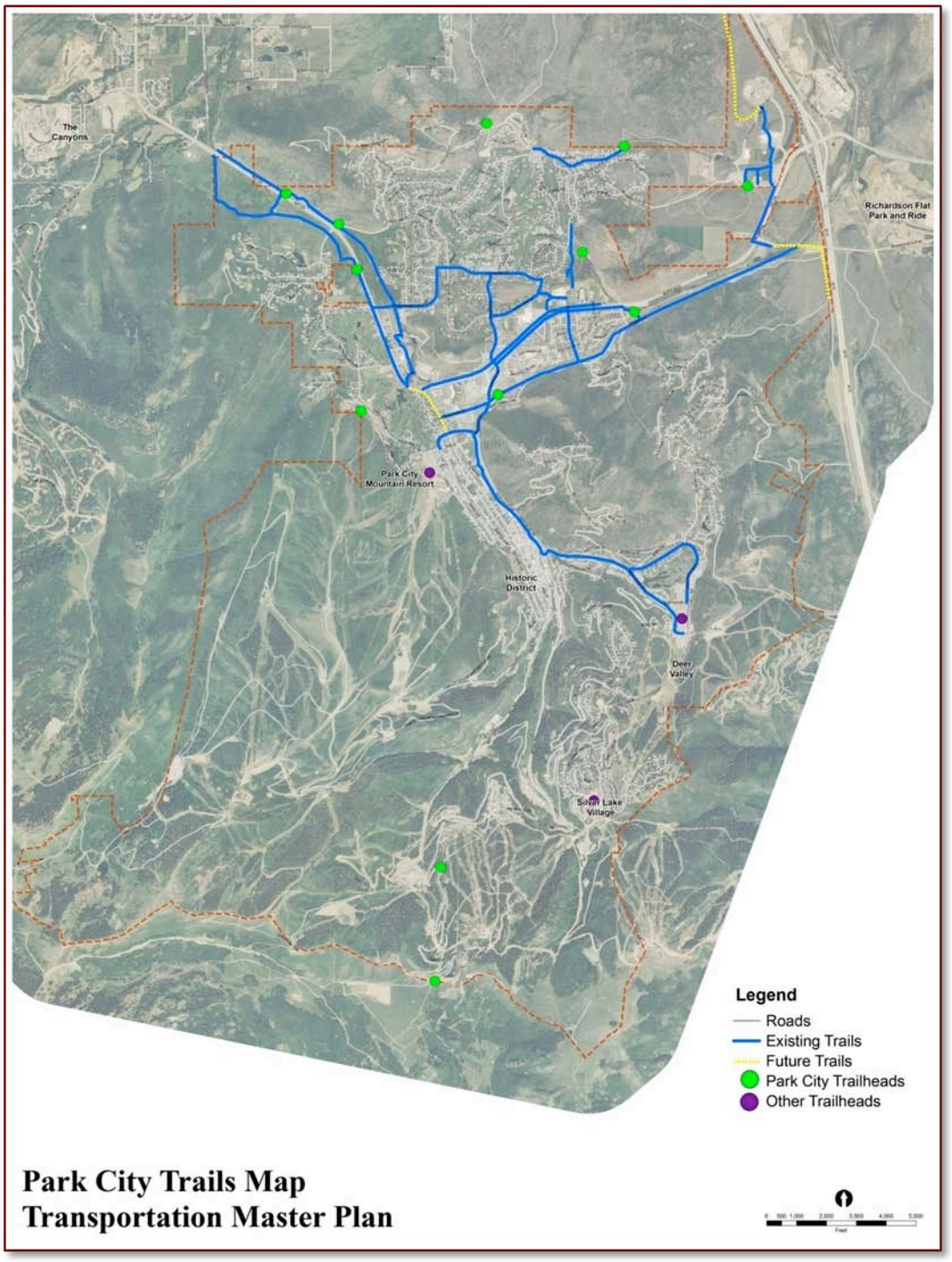
Cost issues are also a concern and additional revenue authority would most likely be needed. Regional transit service expansion would require a variety of inter-local agreements, similar to the agreement between Park City and Summit County for service in the Snyderville Basin, or the development of a regional transit district. The present structure of service outside of Park City municipal boundaries uses a Joint Transit Advisory Board which helps offer political representation of all service areas through a board of directors as opposed to as a division of Park City (public works), similar to the possible advantages of a regional transit district.

One of the short-term challenges of Park City as it relates to transit is the balance between regional transit service and local service. Regional service offers the ability to get visitors into town without cars. Local service offers residents and visitors the ability to get around town without cars, and fosters a “park once” attitude. Both elements are important to grow but given the desire to achieve mode split goals on the gateway corridors, external transit service should be a general priority.

Non-motorized Vehicles/Trails

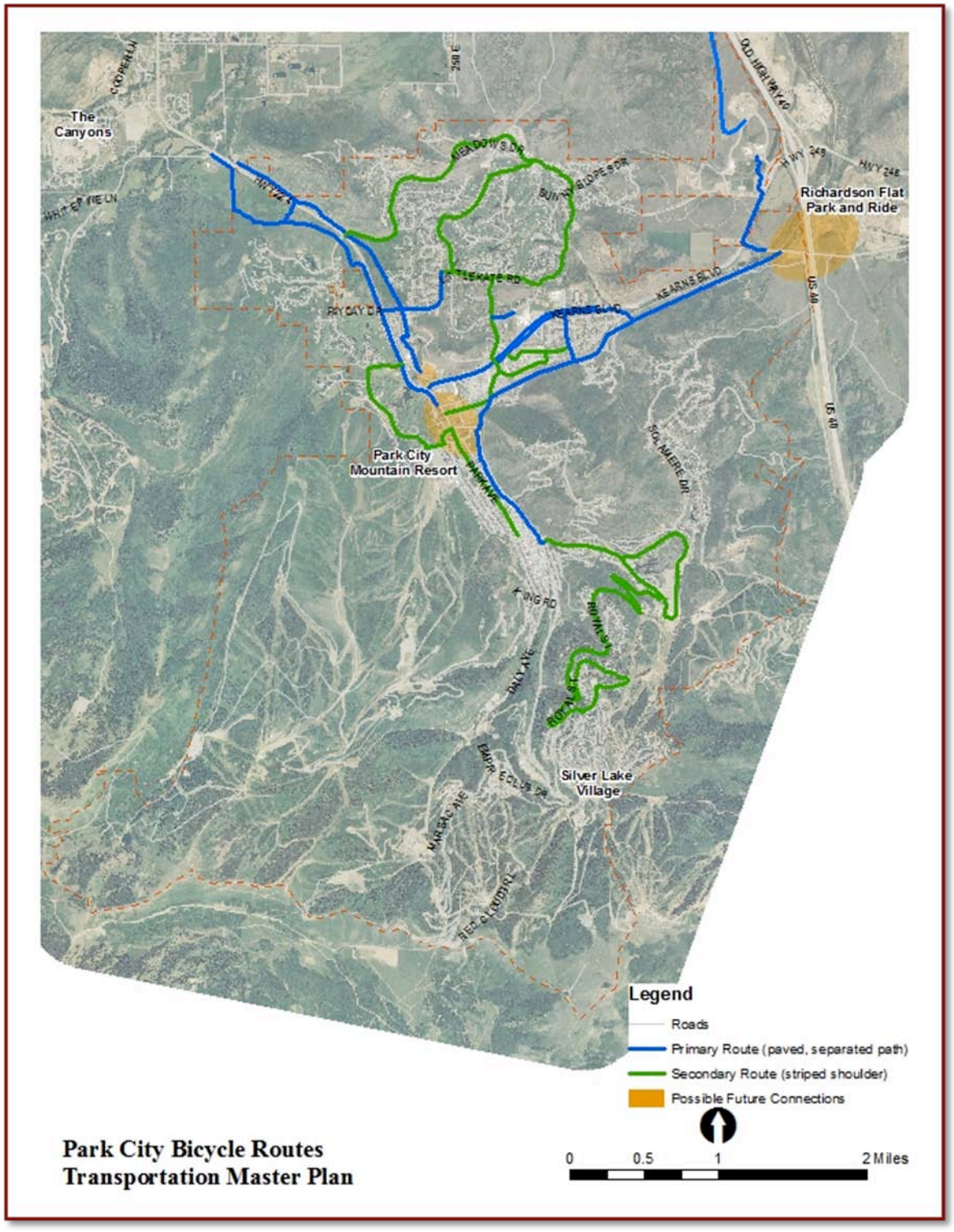
As discussed in Chapter 2, Park City has an adopted plan for trails, the Park City Trails Master Plan. Non-motorized facilities including multi-use trails and on-street facilities are an important part of Park City achieving the goals set out in both the Trails Master Plan and this Traffic and Transportation Master Plan. Existing and planned multi-use separated trails are shown in Figure 6-11. This map also shows trailheads that provide access to backcountry and recreational trails in the area.

Figure 6-11: Existing and Planned Trails and Trailheads



Park City has established a bicycle "spine" network; corridors that connect areas throughout the city that are completely separated from motor vehicle travel. These are referred to as primary bicycle routes and are shown in blue in Figure 6-12. Also shown are "secondary" bicycle routes which includes striped shoulders on city streets. These secondary routes are not necessarily bicycle lanes but instead a portion of the roadway that is intended for elements other than moving vehicles.

Figure 6-12: Primary and Secondary Bicycle Routes Network



Trail Maintenance
According to the Appendix of the Trails Master Plan, Park City has 44 miles of high-volume, non-back-country trails within city limits. Table 6-3 shows details and annual maintenance costs for trails and sidewalks.

Table 6-3: Trail Mileage and Maintenance Costs

	Miles	Annual Cost*
Asphalt, paved, plowed	11	$50,595
Asphalt, paved, not plowed	4	$13,712
Concrete sidewalk/trail, plowed	11	$23,641
Concrete sidewalk/trail, not plowed	12	$11,733
Unpaved trail	4	$2,360
Rail Trail	2	NC
Trailhead and signs		$2,940
Total Annual Miles/Maintenance Costs	44	$105,000

*In 2002 dollars, not adjusted for inflation
NC = No cost to Park City as it is officially a state park

Ongoing maintenance and year-round use of Park City trails is important in helping the city achieve the goals determined as part of this plan. Well-maintained and functional trails provide travelers alternatives to driving and because Park City is limited in its geographic size, alternative modes of transportation can be a viable option for many. Year-round access to the trail system and ongoing security and maintenance are important in making this system a reliable and heavily used option. Recreational benefits are also an important component that is not discussed in this transportation plan.

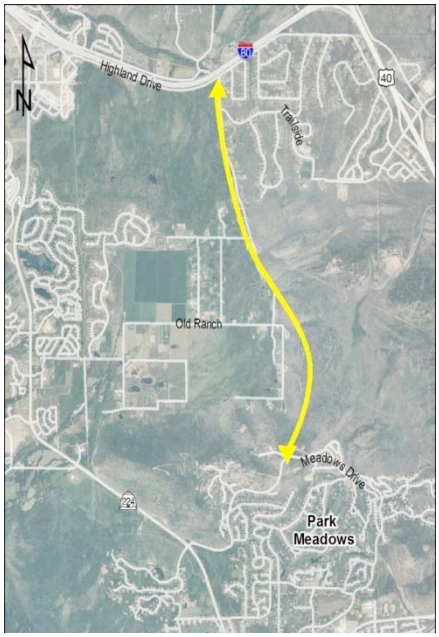
Possible Future Gateway Corridors

Throughout this transportation plan process, several ideas for additional access corridors to Park City were suggested. Each of these has its own set of impacts, benefits and implications and is examined in more detail here. This information is intended to provide a basis for understanding each of these potential alternative corridors, if congestion on existing corridors is deemed unacceptable. This plan does not recommend any of these corridors, but instead offers an initial examination of impacts, ability to relieve congestion, and potential general alignments.

Analysis of the existing gateway corridors (S.R. 224 and S.R. 248) suggests that achieving the high-occupancy vehicle and transit goals established in this plan (see Chapter 4) means that no new or additional gateway corridors are necessary to meet future demand. However, information provided here will form a basis of understanding and analysis should future conditions change, HOV and transit goals not be met, or other reasons occur to consider additional gateway corridors.

Meadows Drive to I-80

This concept provides an additional connection between the city and I-80 from Meadows Drive straight north to the Interstate. It is intended to provide an alternate route to S.R. 224, especially during peak traffic periods when that corridor is heavily congested. The estimated cost of this is between $6.5 - $40 million, depending primarily on whether an additional interchange on I-80 is constructed. This cost estimate assumes that it would be a major collector road.



Public input on this option was divided. Some expressed concern about compromising the rural nature of the area and the current road while others thought that there should be alternative routes to/from Park City and this may be a good alternative and deserves further exploration.

A summary of advantages and disadvantages related to this concept are shown in Table 6-4.

Table 6-4: Meadows Drive to I-80 Summary

	Advantages	Disadvantages
HOV		Planned HOV lanes on S.R. 224 may be under-utilized
Transit		Reduces efficiency of transit service with more corridors to serve
Non-motorized Travel	New/improved road would provide additional north/south bicycle facilities	
Traffic Congestion	• Provides additional capacity between I-80 and Park City • Serves between 5,000 and 10,000 vehicles daily, roughly 10 percent of Park City's gateway traffic	• Analysis suggests additional capacity is not necessary if mode share goals are achieved • Park Meadows neighborhood streets experience higher traffic volumes • Without an additional interchange, may exacerbate congestion at Kimball Junction • Does not connect to ski resorts so will not alleviate congestion during skier outload
Other	• Potential new emergency evacuation route • Additional alignments are possible including connecting to US-40 and Old Ranch Road instead of I-80	• May induce growth north of Park Meadows neighborhood • May require additional infrastructure for ramps and tunnel at I-80 • Potential impacts to wetlands • Not likely to be supported by neighborhood residents • Not consistent with Summit County plans

Guardsman Pass Road

Guardsman Pass Road provides access to an area in Wasatch County that has been approved for single-family residential development. It currently is open on a seasonal basis but pressure to provide year-round access is anticipated. Estimated costs to upgrade this facility range from $1.7 to $2.2 million which includes significant annual maintenance costs to keep the road open year-round.

Again, public sentiment was divided between wanting to see improvements made on this road and believing that it is impractical due to low traffic volumes and the cost of maintenance.

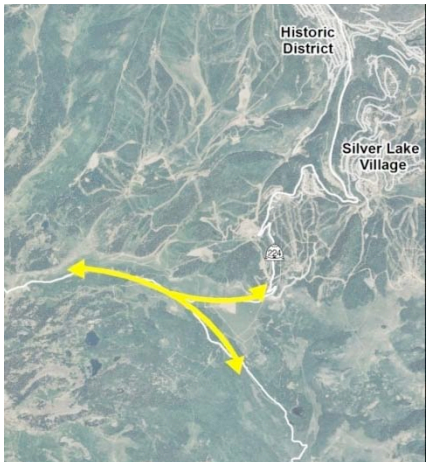


Table 6-5: Guardsman Pass Road Summary

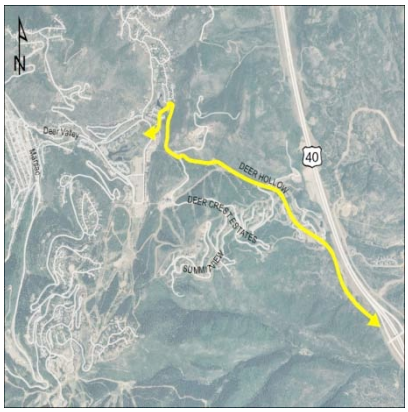
	Advantages	Disadvantages
HOV		Right-of-way not sufficient
Transit		Would not be a likely corridor for transit service to Wasatch or Salt Lake Counties
Non-motorized Travel	A paved road would provide additional north/south bicycle facilities	Safety concerns of bikers and cars on a winding, steep narrow road
Traffic Congestion	Provides direct access from Midway to three of Deer Valley Resort's base areas and PCMR without using S.R. 248	• Analysis suggests additional capacity is not necessary if mode share goals are achieved • Old Town neighborhood local /collector streets are likely to experience higher traffic volumes • Already speed concerns on Marsac Avenue in city • Traffic reduction on 224 is <5% • Other connections may provide benefit without impacts, such as to new US-40, River Road intersection
Other	• Provides an emergency evacuation route, although it already provides this function as an unpaved road during summer months • Other road alignments are possible • Economic benefits of more commercial activity in Park City	• Likely used by Wasatch County residents but impacts would fall to Park City and Summit County • Corridor is windy, narrow, and steep. Increased traffic volumes may invite safety issues • Significant impact to right-of-way to bring road up to standards • Significant winter maintenance issues • Potential to induce development in Bonanza Flats and Brighton Estates

Deer Valley Connection to US-40

This concept provides a connection between the base area of Deer Valley ski resort to US-40 via the existing Mayflower interchange. Both a tunnel option and a public road over the top were analyzed. Cost estimates are $5 million for road improvements to provide a major residential collector road that goes over the top through the Deer Crest development and $68 million to build a tunnel to a non-UDOT arterial standard (see cross-section standards in Chapter 4).

Public opinion generally was against the tunnel, due primarily to cost. However, the benefits of the connection were understood in terms of its impact on congestion on S.R. 248.

Road



Tunnel

Table 6-6: Deer Valley to US-40 Summary

	Advantages	Disadvantages
HOV	May potentially be used for HOV only	
Transit	If a tunnel, may potentially be used for transit only	If not a tunnel, buses are unlikely to be able to use road due to steep grades
Non-motorized Travel		Tunnel would not be suitable for bicycle or pedestrian traffic
Traffic Congestion	If the connection is a tunnel: • Reduces volumes on S.R. 248 by up to 20% • Decreased carbon emissions as overall Park City VMT reduced by up to 14% • Improves function of Deer Valley Drive/Bonanza intersection and round-about in peak season If the connection is not a tunnel it likely carries less traffic	• May cause delay at Mayflower interchange on US-40 • Skiers/travelers may bypass Main Street and other Park City commercial areas
Other	Potential emergency evacuation route	• There are many questions about this connection (tunnel versus road) • A tunnel would be expensive for relatively low traffic volume • A road exists but is gated for private development • Likely to be neighborhood concerns if road is open to public

Possible Neighborhood Connections

The goals and objectives identified as the foundation of this plan address mobility within the city by providing an efficient transportation network. Specifically, goal five reads, "Mobility and accessibility in Park City will be as good or better than today while achieving a net reduction in the amount that each person drives a car." To work towards this goal, residents highlighted several areas that currently experience traffic congestion and alternate ways to address these areas. The following eight concepts each address a single idea to improve traffic circulation or connections within Park City. These concepts were evaluated based on their impacts to things such as travel time, delay, environmental impacts, and neighborhood concerns, among others.

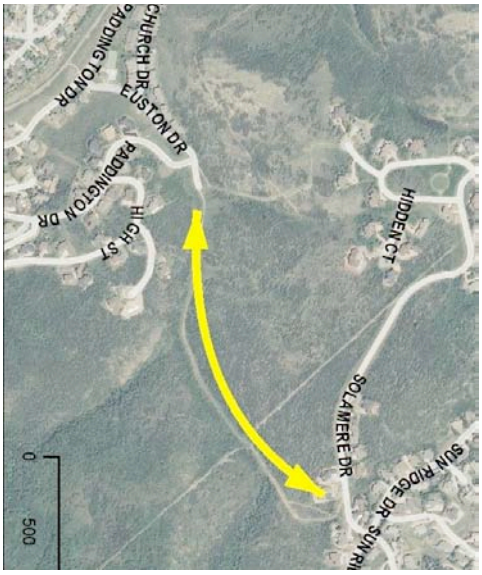
These connections provide greater connectivity and offer opportunities to move in and out of Park City without using the more heavily traveled arterials. In some cases, the connection would be circuitous but would provide an alternative or perhaps emergency exit route.

- Solamere
- Three Kings to Park City Mountain Resort
- Bonanza Park Redevelopment, Concept #1
- Bonanza Park Redevelopment, Concept #2
- Kearns Boulevard to Meadows Drive (North 40)
- New School-area Access Road
- 12th Street Connection to Deer Valley Drive
- Old Town One-way Streets

The final Traffic & Transportation Master Plan *will not* include a recommendation on any of these concepts. Instead, these summaries are intended to provide information and a foundation from which to begin a more in-depth analysis should the need for any of them become more of a priority. Although the analysis suggests that some connections may better serve transportation needs than others, no priority is offered in this plan. Individual priorities should only be considered after exhausting various policy options and will depend on the specific issues at hand.

Solamere Connection

The Solamere neighborhood connection would link the Solamere/Lower Deer Valley neighborhoods to the Prospector area and S.R. 248, providing a new alternative for drivers traveling between the Solamere neighborhood and S.R. 248. Due to the elevation, grade, circuitous road and multiple curves, slow speeds would be anticipated for this route. The estimated cost for this road, assuming a minor residential collector, is $2 - $3 million.



Public opinion related to this concept was divided between those concerned about the detrimental impacts to the neighborhood of cut-through traffic and those that believe it is an inevitable reality. Those opposing the idea suggest more emphasis on modes other than cars to move people to, from, and around Park City and improving traffic flow on Deer Valley Drive so this is unnecessary.

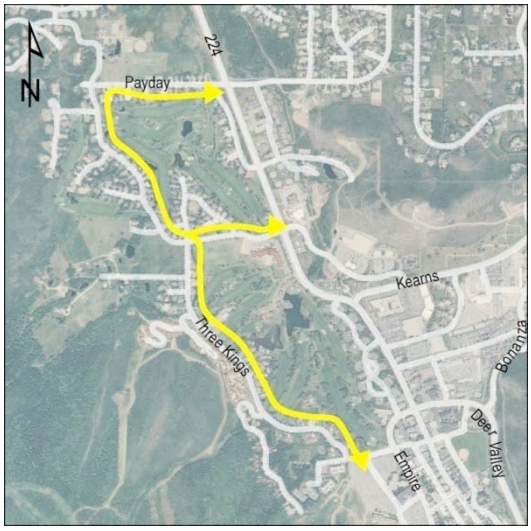
Several homeowners associations in this area have joined together to issue a formal comment on this concept. They are firmly opposed to it and ask that it be removed from any further consideration. Their letter is included in full in Appendix G.

Table 6-7: Solamere Connection Summary

	Advantages	Disadvantages
HOV		Not likely to be used as an HOV route
Transit		Not available to bus or truck traffic
Non-motorized Travel		• Not likely to be used as a bicycle route due to steep grade • Neighborhood recreational facilities and pedestrians would be impacted by this road
Traffic Congestion	• Reduces traffic on Deer Valley Drive by up to 45% • Improves connectivity to/from S.R. 248 to Solamere and Lower Deer Valley • Reduces peak-season day delay at roundabout and in Park City overall • During the off-season, could function adequately as a low-volume neighborhood collector • Allows neighborhood residents to avoid congestion on Deer Valley Dr, Bonanza and others.	• Used as a shortcut during peak ski days - upwards of 800 vehicles per hour during ski outload in 2040 • Adds significant delay to the S.R. 248 and Wyatt Earp intersection during peak ski days • Generally, moves delay from the Deer Valley Drive roundabout to S.R. 248
Other	There are other potential alignments for this connection	• Visual scarring of hillside • Steep grades of 15-20 percent • The neighborhood is likely to oppose the connection

Three Kings to Park City Mountain Resort

This option provides an alternative route for skier outload from Park City Mountain Resort to S.R. 224 via Three Kings. It would involve making this route more easily navigated by northbound out-of-town traffic by potentially changing the configuration of intersections, stop signs, etc. Traffic would connect to S.R. 224 at the existing Payday or Thayne's Canyon Drive signals. The approximate cost to implement this concept is estimated at less than $250,000.



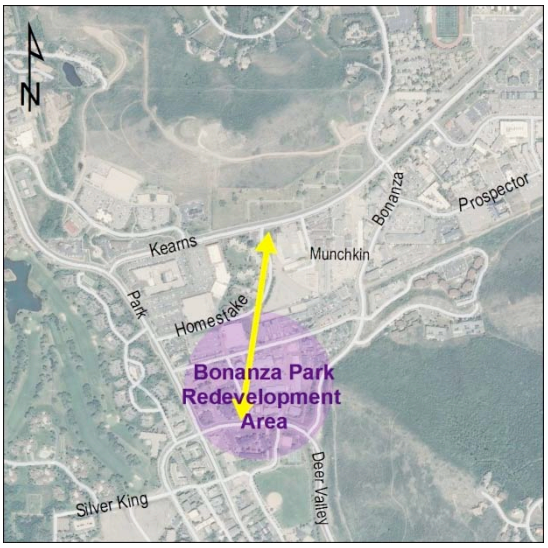
Public input on this concept focused on the need to provide alternative routes for ski traffic leaving PCMR. In addition, comments included that of all the concepts presented, this seems among the most "doable" and may be required in the future to ease traffic on Park Avenue.

Table 6-8: Three Kings to PCMR Connection Summary

	Advantages	Disadvantages
HOV	Potential HOV-only route	
Transit	Potential transit-only route	
Non-motorized Travel		Increased traffic on neighborhood streets may inhibit bikes and pedestrians in area
Traffic Congestion	• Improves connectivity between PCMR and S.R. 224 • Potential to connect to center HOV lanes on S.R. 224	• Does not service enough traffic to significantly reduce congestion from PCMR outload, yet attracts enough ski traffic to be detrimental to character of the residential neighborhood • Increased delay at Payday signal and at Thaynes Canyon signal
Other	• Could be implemented during peak periods and/or peak season only • Could be one-way in opposing directions during morning or afternoon peak travel times	• Does not address issue of parking shortage at PCMR. More parking may exacerbate problem • Not likely to be supported by neighborhood residents

Bonanza Park Redevelopment – Concept #1

The Bonanza Park area is currently considering redevelopment concepts. As part of this potential redevelopment, new road connections will be considered during the planning process. These new connections should be evaluated in the greater context of travel and traffic within the city and how they would potentially impact, positively or negatively, the larger area.



This concept provides a new north/south arterial from Kearns Boulevard to Deer Valley Drive in order to reduce congestion on Park Avenue in this area. Estimated costs for this concept range from $4 to $6 million.

Public comment was generally positive on this idea. Specific comments included ensuring that whatever is decided for this area should focus on helping skier outload from Park City Mountain Resort. Some comments viewed this road as part of an extensive road grid added to the general Bonanza Park area. An additional comment suggested that a better option would be to widen southbound S.R. 224 to allow two left turns at the Deer Valley Drive intersection.

Table 6-9: Bonanza Park Redevelopment #1 Connection Summary

	Advantages	Disadvantages
HOV		
Transit	A new transit hub located within the redeveloped area may offer better transit service within and from outside Park City	Would result in two transit hubs about one mile apart
Non-motorized Travel	Bicycle/pedestrian trail issues from Park Avenue may be able to be accommodated here with parallel right-of-way	Redevelopment concepts include a pedestrian friendly plaza
Traffic Congestion	Adds parallel north/south arterial to S.R. 224 in congested section	• An additional signal on Deer Valley Drive between Bonanza and Park Ave would likely contribute to congestion in area • Depending on the nature of the redevelopment, this could be a major traffic generator in an already congested area • Increases left turns from both Kearns Blvd and Deer Valley Dr which are typically detrimental to traffic flow
Other	Can be incorporated into redevelopment plans which are currently being developed	High functional class road seems to be inconsistent with development plans

Bonanza Park Redevelopment – Concept #2

This concept reroutes S.R. 224 around existing Park Avenue to Kearns Boulevard and Deer Valley Drive with a new arterial street around the Bonanza Park redevelopment area. This concept is similar to improvements on lower Main Street approximately 20 years ago where Deer Valley Drive was improved to serve as the main route into Old Town. This concept would move this connection further north on Kearns Boulevard. Cost estimates suggest a range between $15 - $20 million to implement.

Comments received during public outreach were divided, some believing it is a good idea while others were concerned that it does not help PCMR outload, it is too expensive with little benefit, and that it is not "bold enough."

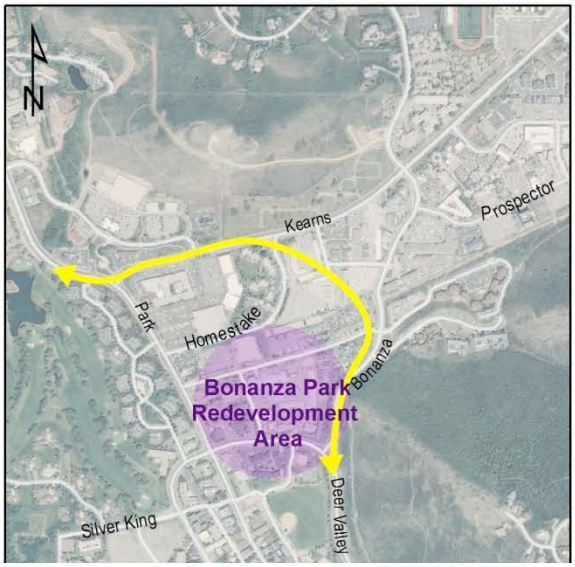


Table 6-10: Bonanza Park Redevelopment #2 Connection Summary

	Advantages	Disadvantages
HOV	There is an opportunity to take HOV lanes farther south into city	
Transit	• A new transit hub located within the redeveloped area may offer better transit service within and from outside Park City • May help reduce traffic congestion near Deer Valley, PCMR, Main Street	
Non-motorized Travel	Bicycle/pedestrian trail issues from Park Avenue may be able to be accommodated here with good connections to transit	
Traffic Congestion	Relieves existing bottleneck on Park Ave by moving main route to a new facility with potentially larger right-of-way	• Creates circuitous path and additional VMT to Old Town via S.R. 224 • Major changes to circulation system between Kearns Blvd and Deer Valley Drive • Unlikely to help PCMR outload
Other	Can be incorporated into redevelopment plans which are currently being developed	• High functional class road may create eastern barrier to development • Impacts recently reconstructed Bonanza Drive

Kearns Boulevard to Meadows Drive

The connection between Kearns Boulevard and Meadows Drive (the "North 40") east of the schools has been evaluated many times in recent years as a way to provide traffic congestion relief on Kearns Boulevard (S.R. 248). The road would link the Park Meadows neighborhood to Kearns Boulevard at Wyatt Earp Way. Cost estimates range from $0.5 - $1 million.

Public comment suggests that while many like this concept and believe it would offer real benefits to congestion on Kearns Boulevard, others are solidly against it due to cut through traffic of those traveling to S.R. 224.

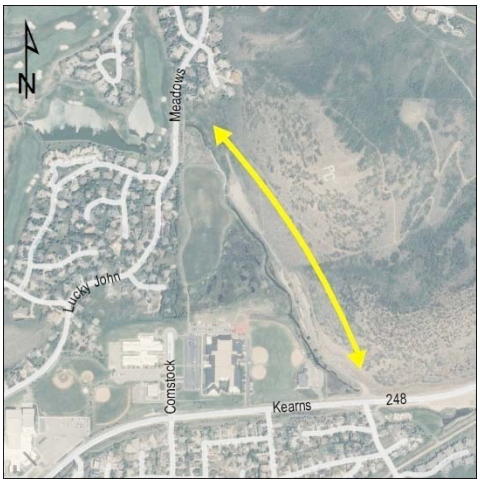


Table 6-11: Kearns Boulevard to Meadows Drive Connection Summary

	Advantages	Disadvantages
HOV		Less congestion on Kearns Blvd may reduce HOV incentive
Transit		
Non-motorized Travel		Impacts to trails and recreational fields
Traffic Congestion	• Serves between 3,000-10,000 vehicles daily • Allows Park Meadows residents to avoid traffic congestion between S.R. 224 and Buffalo Bill Drive.	• May warrant a signal at the intersection of S.R. 248 and Wyatt Earp Way • Increases Kearns (east end) traffic volume by 11 percent • Model shows that up to 25 percent of non-peak season and 50 percent of peak season traffic using this road is cut-through traffic to S.R. 224
Other	Provides opportunity for additional pick-up/drop-off options at schools	• Potential wetlands impacts • Not likely to be supported by neighborhood residents due to cut-through traffic • The "school area access road" is dependent on some portion of this connection being built

School-Area Access Road

This concept provides a new access to the school area specifically for school-related traffic. Potentially, this option would improve traffic congestion near the schools by removing school traffic from Kearns Boulevard. Bus movement and drop-off/pick-up by private vehicles would use this new road which would improve pedestrian safety for school children. Construction of the Kearns to Meadows connection (North 40) would impact how this road functions. Estimates of the cost for this option range from $700,000 - $1 million.

Public opinion was generally in favor of this idea but acknowledged that it will likely require signalized intersection(s).

Table 6-12: School-Area Access Road Connection Summary

	Advantages	Disadvantages
HOV	Could potentially be a bus-only road	Less congestion on Kearns Blvd may reduce HOV incentive
Transit		
Non-motorized Travel	Improved pedestrian safety at school area by reducing conflicts	
Traffic Congestion	May provide advantage to traffic during school drop-off in morning	• May warrant a signal at Wyatt Earp • May not be necessary with planned improvements to S.R. 248 • Possible connections to Lucky John Drive raises neighborhood concerns
Other	• Provides back entrance to schools without using S.R. 248 • Can be built in addition to or instead of the Kearns Blvd/Meadows Drive connection, but would require south segment of that option to be built • Need to consider if/how it connects with Lucky John Drive	• Impacts school ball fields • Possible wetlands impacts • May cause concern among neighborhood residents

12th Street Connection to Deer Valley Drive

This would provide a new connection between Park Ave and Deer Valley Drive at approximately 12th (Nelson) Street. It is intended to relieve traffic congestion, especially on peak travel days, created by vehicles having few alternate ways in and out of the Old Town area. Cost estimates are between $1 million and $1.5 million.

Public comments suggest support for the concept although some suggested that this needs to go along with a parking structure in the area and possibly restricted parking on Park Avenue. Those opposed to this idea believe that the benefits do not justify the investment and that a bigger benefit could be had by improving the Deer Valley Drive and Park Avenue intersection.

Table 6-13: 12th Street to Deer Valley Drive Connection Summary

	Advantages	Disadvantages
HOV		May reduce incentive to use HOV on peak days
Transit		May reduce incentive to use transit on peak days
Non-motorized Travel		• Requires a crossing of Poison Creek Trail • Would need to grade separate an existing sidewalk/access to trail from park
Traffic Congestion	• May provide some traffic congestion relief on Park Ave during peak/festival days • Offers another east/west connection which may help support one-way roads	• May warrant a signal at the intersection of Deer Valley Drive which would increase delay • Real benefits to traffic congestion are limited to a few days/year
Other	Should be considered with overall Old Town parking plan	

One-way Streets in Old Town

One-way streets in the Old Town neighborhood is a concept that has been discussed periodically as a way to relieve traffic congestion in the area, especially on peak ski and festival days. While analysis has been done on individual roads in Old Town, the success of this concept will be based on an overall strategy that addresses the area as a whole and not on a road-by-road basis.

Public sentiment on this concept included an unfavorable comment from an Old Town resident and another to consider this on an intermittent basis during peak periods or peak days. Local groups have periodically suggested one-way options but advantages to some groups often raise disadvantages to others so that past support has been mixed.

Any determination of one-way streets in Old Town should be down on a system-wide basis and not individually.

Table 6-14: One-way Streets in Old Town Summary

	Advantages	Disadvantages
HOV		
Transit		
Non-motorized Travel	Provides more opportunity for an integrated non-motorized and walkable network with bike facilities and sidewalks	
Traffic Congestion	Reduces conflicts and may improve safety	• Increases vehicle miles traveled • Increases vehicle speeds on downhill streets • May require changes at east/west access points
Other	• More easily able to accommodate on-street parking • Potentially helps snow removal efforts • Potentially incorporate traffic-calming measures to reduce speed concerns	• Increases carbon footprint • Not enough east/west streets to ensure connectivity • Decisions regarding the direction of individual streets may not be easily determined

Emergency Evacuation

Information included in this section is intended to inform an evacuation plan developed by Park City emergency service providers and other stakeholders. It is not an evacuation plan in itself, but instead provides data related to how long an evacuation of the city would take under various conditions including the winter season when fewer evacuation routes are available, and summer season when there are typically fewer tourists in the area. Emergency providers can use this information to evaluate evacuation versus "protect in place" procedures. Many other factors will need to be considered in development of an emergency evacuation plan including tourists that may be in the city without transportation, hospitals, multi-car families, pets, etc.

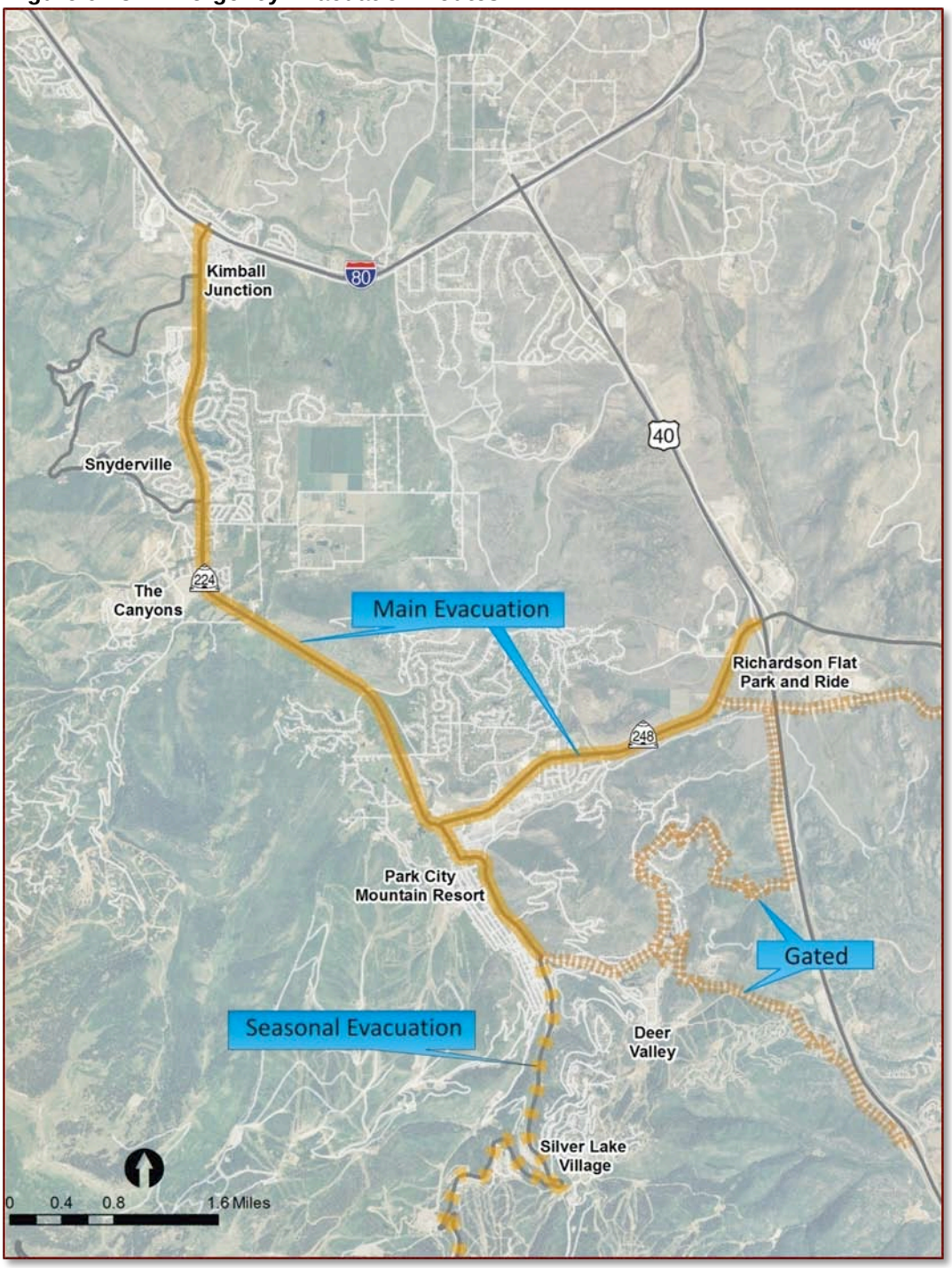
During an evacuation event, the main routes leading out of Park City are S.R. 224 and S.R. 248. For a non-winter evacuation, two other routes may be available including Guardsman Pass and a jeep track path in Hidden Hollow to Richardson Flat Road which spurs off the Morning Star Estates neighborhood. Neither of these routes is maintained in the winter, so snow condition is the determining factor in their use. Finally, the road through the Deer Crest neighborhood to the Mayflower interchange at US-40 is a potential evacuation route. Because the Deer Crest route proceeds through a gated, private development, its use would require coordination with the development to ensure the gates can be opened.

Evacuation analysis was conducted using VISSIM traffic modeling and simulation software for a non-ski day scenario (all five routes available, reduced visitor population) and a ski day scenario (S.R. 224, S.R. 248, Deer Crest route available only, full visitor population). Evacuation times for Park City are estimated at 3-4 hours and 7-8 hours for a non-ski day and a ski day respectively. A summary of these conditions is shown in Table 6-15 and the routes are shown in Figure 6-13.

Table 6-15: Emergency Evacuation Conditions Summary

	Peak Season (winter)	**Non-Peak Season** (non-winter)
Routes Available	S.R. 224 S.R. 248 Deer Crest gate	S.R. 224 S.R. 248 Deer Crest gate Guardsman Pass Hidden Hollow jeep track
Number of Vehicles to Evacuate	21,200	13,700
Evacuation Time	7-8 Hours	3-4 Hours

Figure 6-13: Emergency Evacuation Routes



APPENDICES

Appendix A: Travel Model Calibration and Results (Excel & VISSIM)

As part of the TTMP, a travel demand and traffic simulation model was developed for Park City area in order to assess existing and future travel demand within the study area. The travel demand model follows the basic "four step process" of:

- Trip Generation
- Trip Distribution
- Mode Choice
- Trip Assignment

The Park City travel demand model is a two part model. The first part is a simple growth model in Microsoft Excel that calculates trip generation, distribution and mode choice. The second part of the model is a Vissim multi-modal traffic simulation that uses dynamic assignment to route vehicles on the model roadway network. The purpose of this report is to document the development of model and calibration.

Trip Generation

Since detailed travel survey data is not available for Park City or Summit County, trip generation equations were borrowed from the Wasatch Front Regional Council (WFRC)/Mountainland Association of Governments (MAG) Version 6 Travel Demand model. For the Park City model, the trip attraction equations from the WFRC/MAG were used in trip generation. The number of trip ends attracted was estimated by WFRC/MAG from a regression analysis which used the 1993 trip diary survey responses as the estimation database. Trip generation equation were not borrowed since they use cross-classification approach to estimating trip productions based upon household size and auto ownership which required better socio-economic data than was readily available. Instead the trip production equations were calculated that match attractions using only the number of households as the independent variable.

The main trip purposes used in trip generation are:

- HBW-Home Based Work: Any trip that has home at one end and work at the other.
- HBO-Home Based Non Work: Any trip that has home at one end and does not have work at the other.
- NHB-Non Home Based: Any trip that does not end or start at home.

Equation 1 - Attractions Equations (Based upon WFRC/MAG equations)

HBW = 1.2167 * Total Employment

HBO

hbo = 0.8460 * Population + 2.8497 * Retail Employment
hbsc = 0.4197 * Population
hbsh = 1.6208 * Retail Employment + 0.7221 * Households
hbpb = 0.6886 * Households + 0.9799 * Retail Employment + 0.1913 * Other Employment

NHB = ½ * (nhbwe + nhbne)

nhbwe = 1.2130 * Total Employment + 0.7246 * Households
(non-home, work)

nhbne = 2.8188 * Households + 5.9869 * Retail Employment + 0.6750 * Other Employment
(non-home, non-work)

Equation 2 - Production Equations

HBW = 1.5660 * Households $_{(fulltime)}$

HBO = 6.4196 * Households $_{(total)}$

NHB = 3.3320 * Households $_{(total)}$

Ski Trips

In addition to the typical trip purposes, ski trips contribute significantly to trips to/from Park City during the winter. As a result, a ski trip purpose was added to the model to account for these trips. Since limited data was available regarding ski trips, ski trips attractions were simply estimated from the relative share of skier days from available resort data, and information from the Economic Profile Tourism Park City & Summit County by Chamber of Commerce. Ski trip productions were assumed equal to the ski attractions. Zonal productions were estimated based upon the relative share of visitor and local skiers and the lodging location for overnight skiers from the Wikstrom Ski-Snowboard Survey 2007/2008. Local skier productions were assumed to be relative to the share of population in Wasatch Front area.

External Stations

External trips are split into two types which are either internal-external, external-internal (IX-XI trips), or external-external trips (XX trips). IX-XI trips have one trip-end outside of the model region and the other trip-end inside the region. XX trips are pass-through trips that go directly from one external station to another without having an origin or destination within the region.

For the InterPlan calibration, total external trips in 2009 (IX-XI plus XX) were balanced to traffic counts from UDOT's Traffic on Utah Highways at the external stations. Year 2020 and 2040 external trips were estimated using a straight line traffic forecast at each station. The number of XX trips west estimated using NHCRP 365 procedures since no travel survey data was available. Tables 1-3 show the estimated number of XX and IX-XI trips by station.

Table 1 – 2009 XX and IXXI Trips

Station	Name	MP	TUH AADT 2009	XX assumed %	IXXI assumed %	2009 XX Assumed	2009 IXXI Assumed	XI = 50%	IX = 50%
60	US-40	36	4,975	6	94	300	4700	2,350	2,350
61	SR-35	8	545	0	100	0	500	250	250
62	SR-150	6	1,050	0	100	0	1100	550	550
63	I-80E/I-84	156	13,045	13	87	1700	11300	5,650	5,650
64	I-80 W	98	12,345	13	87	1600	10700	5,350	5,350

Table 2 – 2020 XX and IXXI Trips

Station	Name	MP	AADT 2020	XX assumed %	IXXI assumed %	2040 XX Assumed	2040 IXXI Assumed	XI = 50%	IX = 50%
60	US-40	36	5,700	6	94	300	5,400	2,700	2,700
61	SR-35	8	800	0	100	0	800	400	400
62	SR-150	6	1,200	0	100	0	1,200	600	600
63	I-80E/I-84	156	17,500	13	87	2,300	15,200	7,600	7,600
64	I-80 W	98	17,600	13	87	2,300	15,300	7,650	7,650

Table 3 – 2040 XX and IXXI Trips

Station	Name	MP	AADT 2040	XX assumed %	IXXI assumed %	2040 XX Assumed	2040 IXXI Assumed	XI = 50%	IX = 50%
60	US-40	36	7,300	6	94	400	6,900	3,450	3,450
61	SR-35	8	1,200	0	100	0	1,200	600	600
62	SR-150	6	1,400	0	100	0	1,400	700	700
63	I-80E/I-84	156	23,500	13	87	3,100	20,400	10,200	10,200
64	I-80 W	98	24,100	13	87	3,100	21,000	10,500	10,500

Distribution

Trip distribution is a simple growth or Frater model using a base origin-destination (OD) table. The base OD table was developed using Census 2000 Tract to Tract Work Flows and the relative number of households and employment for zones within each tract. The base OD table is included in the travel model Excel spreadsheet.

The trip generation and trip distribution steps estimate daily trips. However, the Vissim traffic simulation uses hourly trips. The pm peak hour trips were estimated using diurnal distribution by purpose and direction from NCHRP 365, Table 42 to create a peak hour (3pm to 4pm) OD table since local data was not available.

Mode Choice

Mode choice was incorporated into the Park City model using a basic multinomial logit function. The function was designed to incorporate:

- Drive Alone Trips,
- Share Ride Trips,
- Transit Trips,
- Walk Trips, and
- Bike Trips.

Since the Park City model is spreadsheet based, modal travel times are estimated using a zone to zone distance matrix and default modal travel speeds in the model control center. These zone to zone distances are the network distance that was estimated in GIS. Additionally, zonal transit access was also estimated in GIS. The portion of a TAZ that are within a ¼ mile of bus stops was used as a proxy for the number of people and jobs within walking access of transit.

The mode choice coefficients were estimated using National Household Transportation Survey (NHTS) 2009 data for trip length, transit ridership data from Park City Transit and vehicle occupancy count information from SR-224, and SR-248.

Figures 1-4 show the modal trip length for the model compared to NHTS data. These were used to confirm that the model coefficients did not result in any unusual trip lengths. The number of auto trips between 20-30 miles is a little higher than expected to Salt Lake County while the number of longer transit trips is less than expected due to limit transit service area.

Figure 1 - Auto Trip Length Frequency

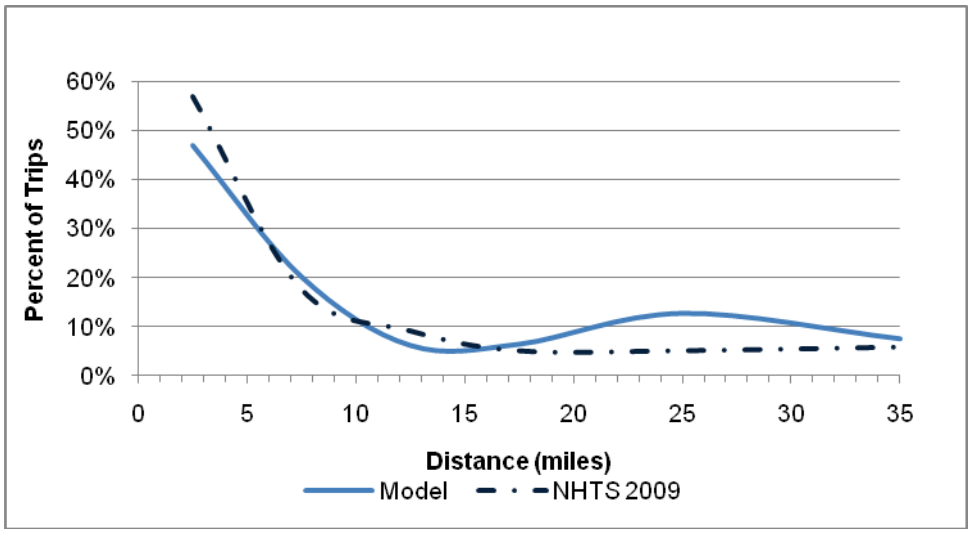


Figure 2 - Transit Trip Length Frequency

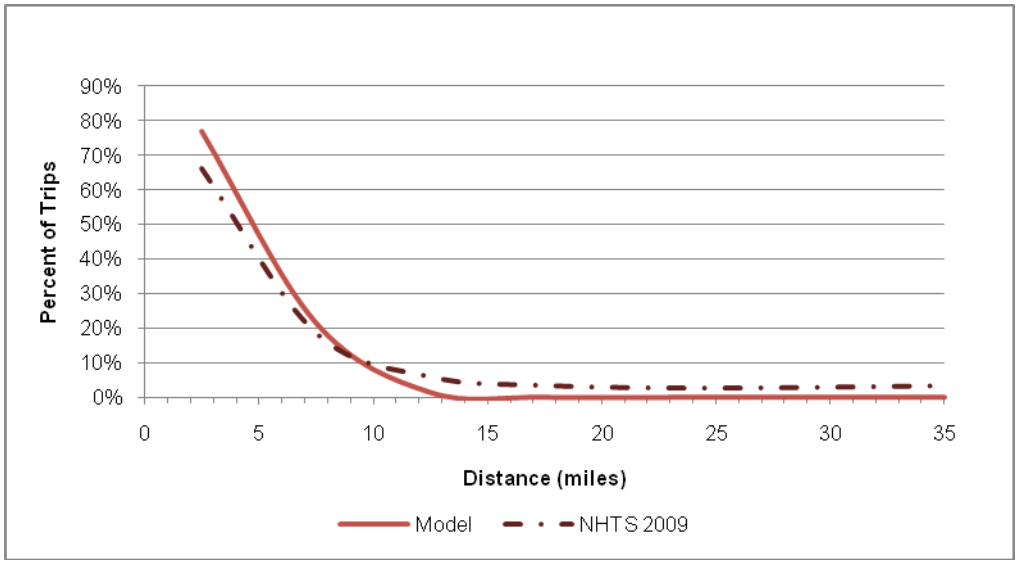


Figure 3 - Walk Trip Length Frequency

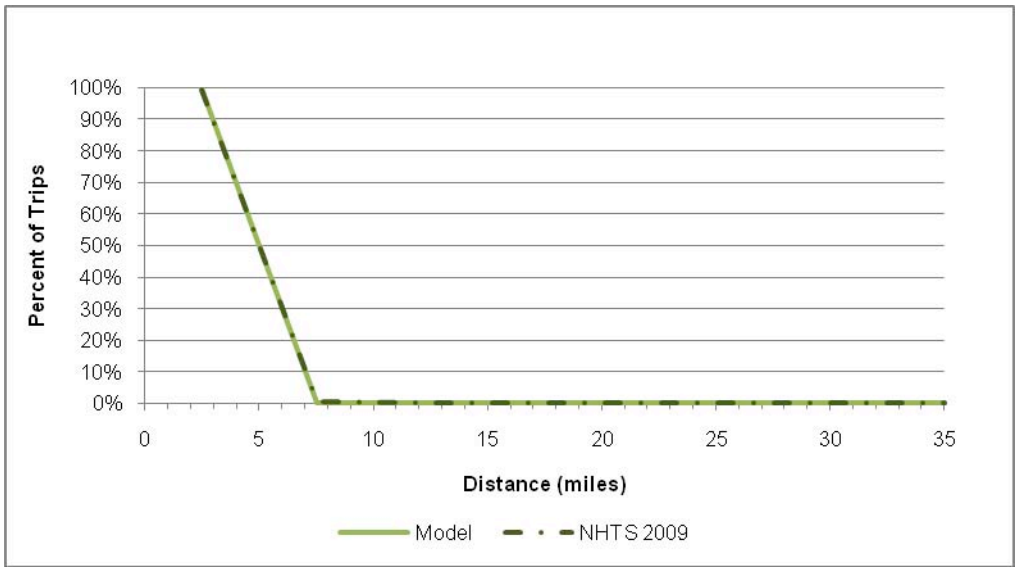


Figure 4 - Bike Trip Length Frequency

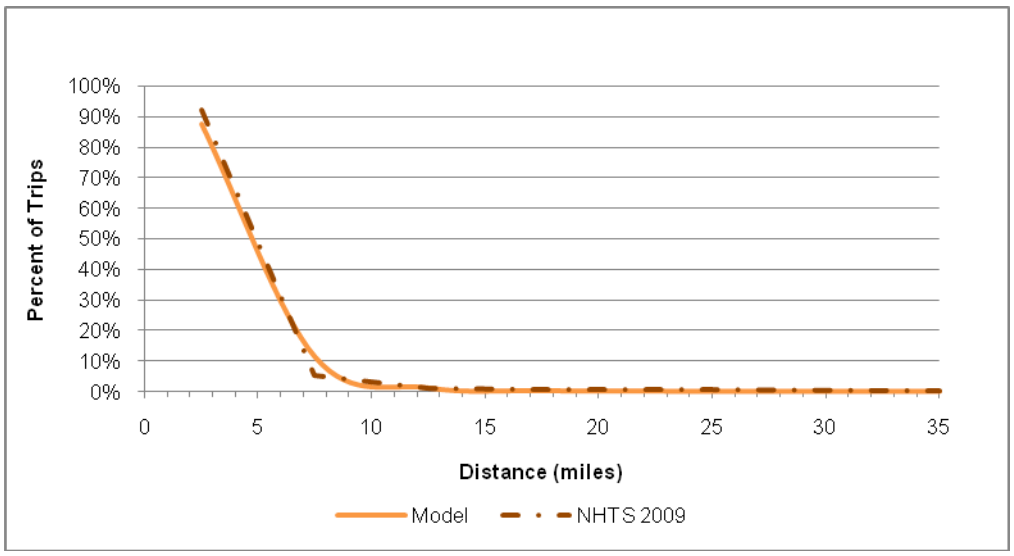


Table 4 shows the number and percent of trips by mode for the regional trips within Summit and Wasatch County. Again, NHTS data was used since local data was not available. At the regional level, the model coefficients generally match the NHTS data.

Table 4 – Summit and Wasatch County Model Trips and Person Trip Mode Share Compared to 2009 NHTS Data

Mode	Trips	Mode Share	NHTS 2009
Auto Trips	222,069	84%	84%
Transit Trips	11,670	4%	4%
Bike Trips	3,219	1%	1%
Walk Trips	30,538	11%	11%
Total	267,524	100%	100%

While the regional mode shares are close to NHTS data, Park City itself has many more transit and walking trips than the national data as would be expected. However, no local data was available to calibrate the model to Park City mode shares so only the model results are reported for Park City.

Table 5 – Park City Model Trips and Person Trip Mode Share

Mode	Shoulder Season Trips	Shoulder Season Mode Share	Ski Season Trips	Ski Season Mode Share
Auto Trips	14,047	67%	29,592	60%
Transit Trips	1,332	6%	9,324	19%
Bike Trips	367	2%	689	1%
Walk Trips	5,239	25%	9,878	20%
Total	20,985	100%	49,484	100%

The number of daily transit trips was calibrated to boardings data provided by Park City Transit. Since there is relatively little need to transfer within the Park City Transit system, the number of boardings is likely close to the number of transit trips. Table 6 shows the transit trips and boardings for high season and shoulder season.

Table 6 – Model Daily Transit Trips and Boardings

	Shoulder Season	High Ski Season (February)
Park City Transit Daily Boardings (2009)	2,014	11,676
Model Daily Transit Trips	2,013	11,670
Difference	-1	-6

Note: Shoulder season boardings are for April-June, and September-November 2009

Drive alone and shared ride trips were estimated from a vehicle occupancy count data conducted on SR-224 November 11, 2010.

Table 7 shows the percent of Drive Alone vehicle trips and average vehicle occupancy for share ride vehicle trips.

Table 7 – Drive Alone Percent and Shared Ride Vehicle Occupancy

	SR-224 Count	Model
Percent of Drive Alone Vehicle	71%	70%
Average Shared Ride Vehicle Occupancy	2.2	2.3

Auto operating costs are included in the model and other vehicle costs can be incorporated. The auto operating costs assumed are for 2009 from the American Automobile Association. The implied value of time from the estimated coefficients was $15 per hour for in-vehicle time and $30 per hour for out-of-vehicle time. The in-vehicle value is roughly in-line with the general estimates of the value of time, and the out-of-vehicle time is consistent with the weighting of out-of-vehicle time compared to in-vehicle time.

Assignment

Vehicle assignment was done using Vissim traffic simulation software using the dynamic assignment module. These model volumes were calibrated to the year 2009 Park City and UDOT pm peak hour traffic count data. Traffic counts used for calibration came from historic traffic counts conducted by Park City and UDOT's automatic traffic recorders on SR-224 and SR-248. After running the base year travel model, results were compared to the counts data to determine the accuracy of the model. The models were calibrated for two distinct periods in Park City, high-ski season (Christmas week) when traffic volume is typically highest, and the shoulder season when there are generally lower traffic volumes. The high-ski season had 13 peak hour count locations while the shoulder season had a total of 24 locations. It should be noted that not all of these counts were from 2009 or from the same time of year.

Root Mean Square Error (RMSE) is used to evaluate the effectiveness of link modifications, as well as changes in trip generation and distribution parameters. Generally, RMSE should be less than 40% and decrease as road volume increases. Figure 5 and 6 below shows the RMSE for the 2009 calibrated model. RMSE decreased for each volume classification, and meets or exceeds that of a typically calibrated model in every volume classification.

Figure 5 – Shoulder Season Root Mean Square Error

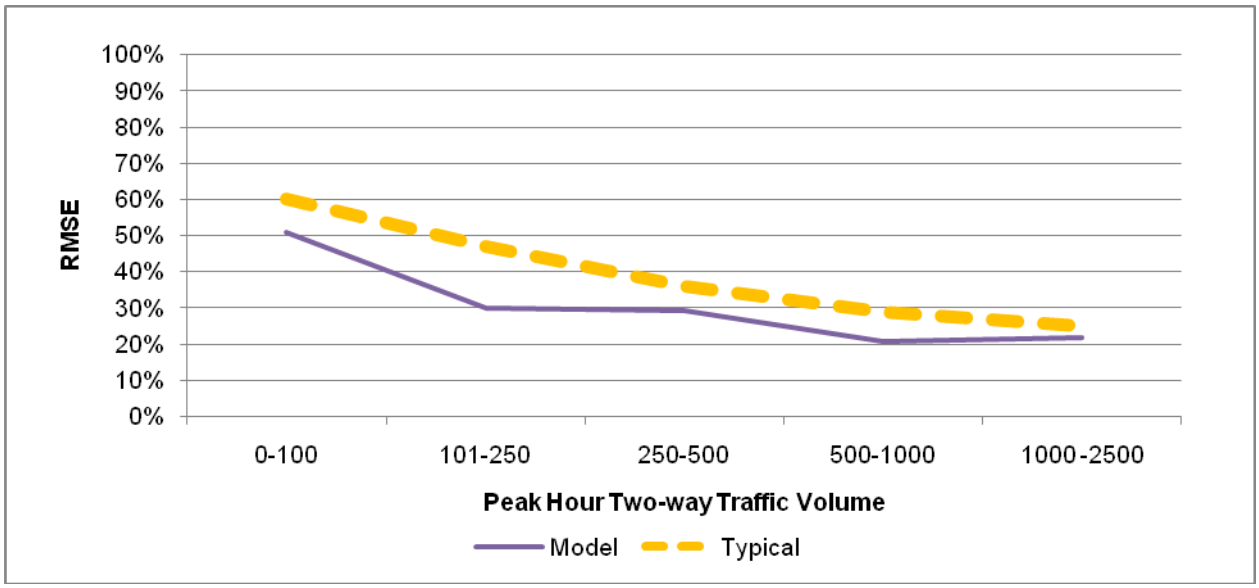
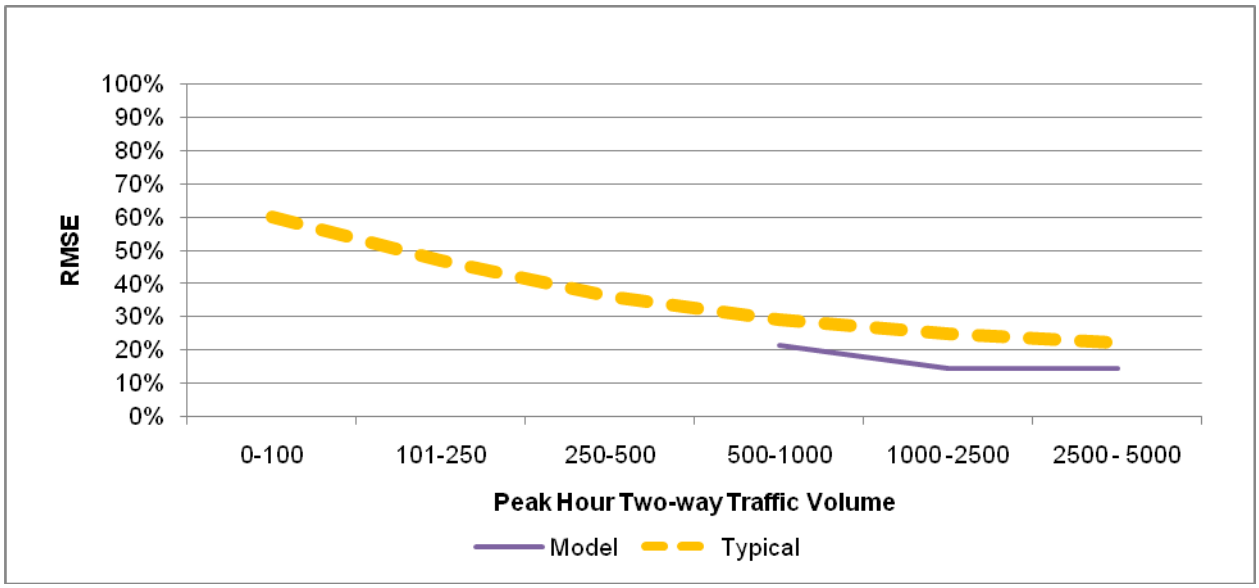


Figure 6 – High-Ski Season Root Mean Square Error



A comparison between the link level FHWA link level guidelines and the calibrated model are shown in Table 8 using estimated peak hour volumes from the ADT guidelines. The shoulder season model results show that 88% of links meet the guideline while 100% of high-ski season meet the guidelines. The correlation coefficient for the shoulder season falls within the national standard of 0.89.

Table 8 – FHWA Link Level Guidelines

Validation Measure	Link ADT	Est. Peak Hour Volume	Guideline	Shoulder Season Links	Shoulder Season Link within Guideline		High-Ski Season Links	High-Ski Season Link within Guideline	
Percent Error	<1,000	<100	±60%	1	0	0%	0	0	NA
Percent Error	1,000-2,500	100 – 250	±47%	3	3	100%	0	0	NA
Percent Error	2,500-5,000	250- 500	±36%	5	5	100%	0	0	NA
Percent Error	5,000-10,000	500 – 1,000	±29%	6	5	83%	1	1	100%
Percent Error	10,000-25,000	1,000 – 2,500	±25%	9	8	89%	8	8	100%
Percent Error	25,000-50,000	2,500-5,000	±22%	0	0	NA	4	4	100%
Percent Error	>50,000	>,5000	±21%	0	0	NA	0	0	NA
	TOTAL			24	21	88%	13	13	100%

Source: Calibration and Adjustment of System Planning Models, December 1990 and Model Validation and Reasonableness Checking Manual, February 1997

Figure 7 – Shoulder Season Modeled Volumes vs. Observed Counts (pm peak hour 2-way)

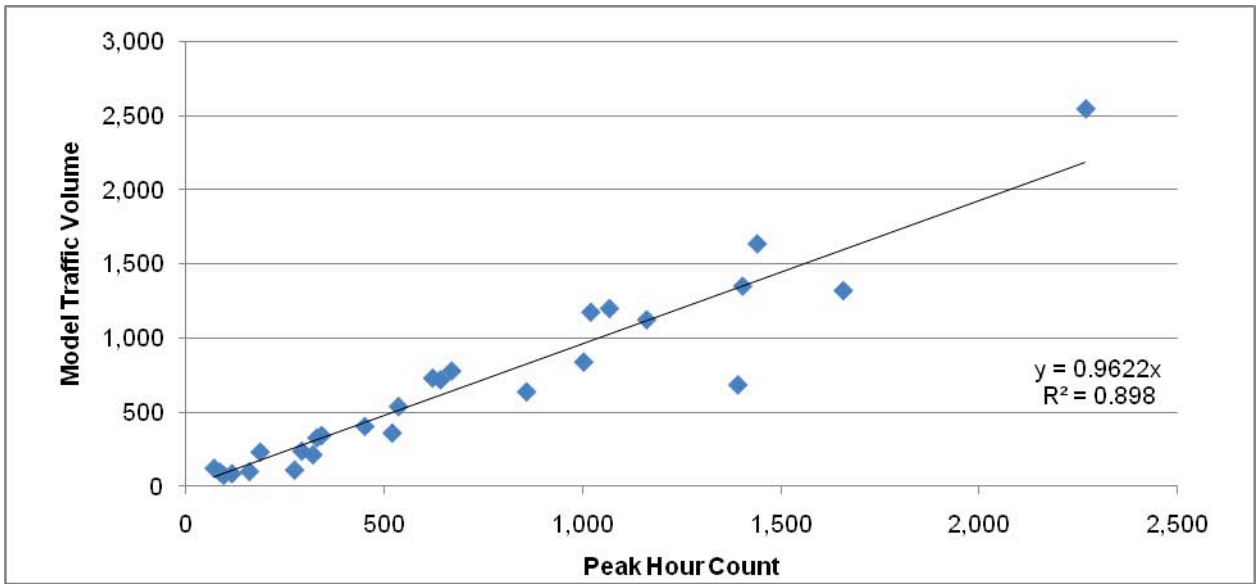


Figure 8 – High-Ski Season Modeled Volumes vs. Observed Counts (pm peak hour 2-way)

Appendix B: Travel Model "How To" Guide (Excel & VISSIM)

Excel Model "How To"

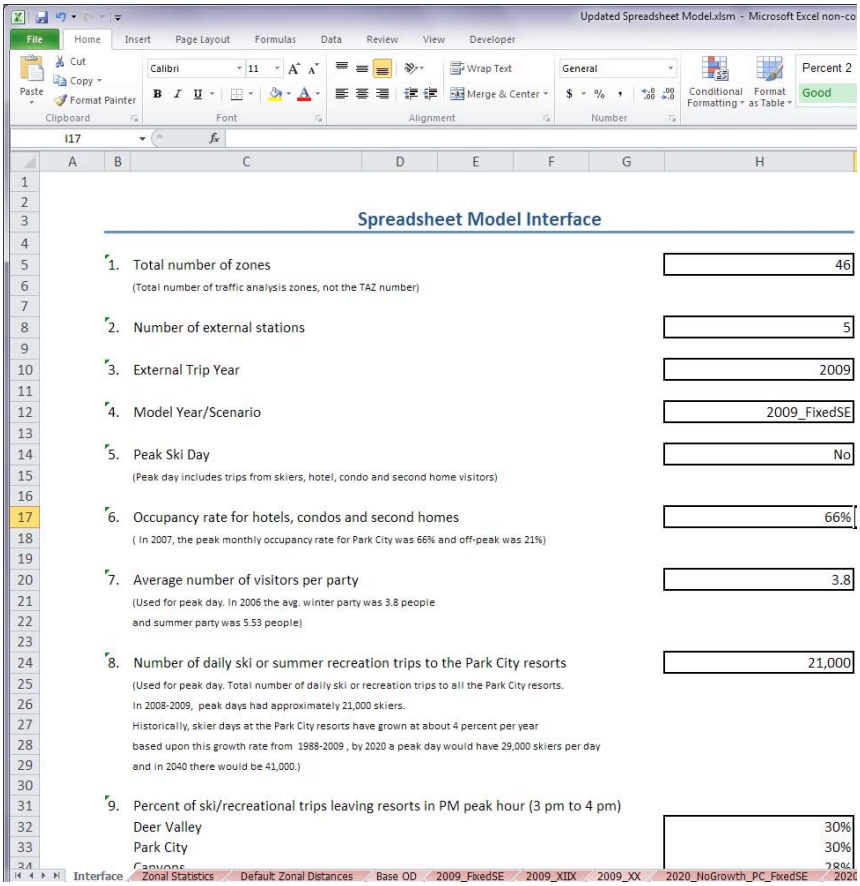
The Park City travel demand model is a two part model. The first part is a simple growth model in Microsoft Excel that calculates trip generation, distribution and mode choice. The second part of the model is a VISSIM multi-modal traffic simulation that uses dynamic assignment to route vehicles on the roadway network to be examined.

The spreadsheet model contains the data (socio-economic data/projections for various years) to create a variety of different modeling scenarios as well as the model code necessary to process the inputs and produce trip tables for a given scenario. The steps to using the spreadsheet model and creating outputs for the VISSIM traffic simulation are detailed below.

How to run a default model scenario?

InterPlan defined a baseline model scenarios and inputs as part of the Transportation and Traffic Master Plan. These baseline scenario and inputs are contained within the spreadsheet model for the years 2009, 2020 and 2040. These modeling scenarios are controlled using the "Interface" worksheet within the spreadsheet model. Figure 1 shows the model interface.

Figure 9 – Model Interface



To create a default model scenario:

1. Choose the model socio-economics that are to be used in the modeling (input # 4) on the "Interface" worksheet. The worksheets with the baseline models socio-economics are:
    - 2009_FixedSE (Base year)
    - 2020_NoGrowth_PC_FixedSE (Year 2020 with no growth within Park City)

- 2020_FixedSE (Year 2020 with vested growth within Park City)
- 2040_FixedSE (Year 2040 with Park City build out)

2. Select the year for trips that enter/leave the model area (input #3) at external stations. The default years are:
    - 2009
    - 2020
    - 2040
3. Determine if the model is for the shoulder season or a peak-ski day (input #5).
4. If modeling a peak-ski day, insert the total number of person ski trips (input #8) to the three Summit County resorts.
5. Select the model outputs to be generated using the provided check boxes. The trip generation, distribution and mode choice outputs yield person trip tables that are generated within Excel. To create files for VISSIM, select the checkbox "Vehicle Trip Tables." This will create the files need by VISSIM (.fma) in the same folder where the spreadsheet model is located and vehicle trip tables within Excel.
6. Click "Run."
7. To use the .fma files with VISSIM simply move the files to the same directory as the VISSIM network folder.

How to evaluate the transportation impacts of a proposed new development or evaluate the transfer of development rights (TDR) to a new location?

New model scenarios can be created by adjusting the number of households, population and employment for an individual traffic analysis zone (TAZ) or all TAZs. To do this:

1. Create a new worksheet based upon the fields that are in the "_FixedSE" worksheet.
2. Copy the default socio-economics that best match the desired scenario to the new worksheet.
3. Identify the TAZ or TAZs for the new development. Or, define the sending and receiving zones if transferring development rights.
4. Update the socio-economics for the identified TAZ or TAZs. For new developments simply add the planned development to the default socio-economics for the TAZ. For TDRs increase the socio-economics in the receiving TAZ and decrease them in the sending TAZ. The fields that could potentially need to be updated are:
    a. Full-time Households (HHs) is the number of full-time households within the TAZ.
    b. Population (Population) is the number of full-time residents within the TAZ.
    c. Second Homes & Condos (Snd_HM_Cnd) is the number of second homes and condos within the TAZ.
    d. Hotel Room (HTL_RM) is the number of hotel rooms within the TAZ.
    e. Total Employment (Total_Emp) is the total employment within the TAZ excluding mining and construction.
    f. Industrial Employment (Ind_Emp) is the industrial employment within the TAZ and includes NAICS codes 22, 31-33, 42, 48-49.
    g. Retail Employment (Ret_Emp) is the retail employment within the TAZ and includes NAICS codes 44-45.
    h. Other Employment (Oth_Emp) is the remaining employment within the TAZ and includes NAICS codes 51-56, 61-62, 71-72, 81, 92.
    i. Resort Market Share (Ski_Sh) is used to allocate the number of skiers to the Summit County resorts. Should be zero for all zones except zones: 1 (Park City), 7 (Deer Valley/Silver Lake), 8 (Deer Valley/Snow Park), and 44 (The Canyons).
5. Select the additional parameters for the scenario as described with "how to run a default model scenario.
6. Click "Run."

How to evaluate new transit or trail projects?

The spreadsheet model uses a multinomial logit function to estimate transit and non-motorized trips. Since the spreadsheet model doesn't include a transit or trail network, project specific information cannot be generated. However, aggregate totals from improved transit access or other transit service changes can be estimated.

To evaluate new transit access:

1. Identify the TAZ or TAZs that will have new service from the transit project.
2. Calculate the percent of each zone that is within walking distance from transit by buffering existing and new transit stops in GIS by ¼ mile.
3. Update the transit access in the worksheet "Zonal Statistics." Column F contains the transit access used in the model and needs to be changed for each model scenario. Existing and committed transit access is provided in column D and column E for comparison purposes. Committed access includes future bus service to Richardson Flat Park and Ride and to Salt Lake City.

To evaluate changes to transit frequency/cost:

1. System wide transit frequency can be set on the "Interface" worksheet under Average Transit Headway (input # 20). The model was calibrated to 15 minutes.
2. The per trip transit fare can be adjusted via the "Interface" worksheet under Transit Fare (input # 22).

New trail projects cannot be directly estimated by the model. However, if trail projects are thought to change the attractiveness of walking or biking the mode choice coefficients (input # 10 on Interface worksheet) could be changed to reflect the increased attractiveness of these modes. These changes should be done with caution however since changing these coefficients can have dramatic changes in the number of trips using other modes.

How to evaluate changes in parking or HOV policies?

Scenarios where parking costs or vehicle occupancy change can be evaluated using the model. Other parking and HOV policies, such as remote parking and HOV/Transit lanes, can be evaluated but require off-model processing. The steps to evaluate these changes are briefly described below.

To evaluate changes to parking costs:

1. Identify the TAZ or TAZs that will have a parking cost.
2. Update the parking cost in the worksheet "Zonal Statistics." Column H contains the zonal parking cost per vehicle trip to the zone and is in 2009 dollars.

To change vehicle occupancy:

1. The "Interface" worksheet has average vehicle occupancy by trip type and can be change by updating input #24.

Remote parking can by evaluated by adjusting the .fma files of a base scenario outside the spreadsheet model for input into VISSIM. To assess the effects of remote parking:

1. Run a default scenario and create .fma files.
2. Import the .fma files into Excel. The .fma files are simply space delimited text files.
3. Shift the vehicle trips, altered due to remote parking, from one zone to another. The vehicle trips to/from Old Town, for example, could be shifted to the Richardson Flat Park and Ride lot by moving vehicle trips to/from Old Town zones (zones 2 and 3) to the park and ride (zone 34). For this off-model change, the rows in the trip table contain the vehicle trips **from** each zone and the columns are the number of trips **to** each zone.
4. Save the file with the changes as a space delimited text file.
5. Change the file extension to .fma.

The evaluation of the benefits of HOV lanes and dedicated transit lanes is a more extensive and iterative process between the spreadsheet model and VISSIM. To evaluate changes in modal travel times:

1. Run a default scenario and create .fma files.
2. Import these .fma files into VISSIM and run until convergence.
3. Export the zone to zone travel times from VISSIM.
4. Reformat the travel time outputs in Excel to create a travel time matrix that is the same as the format of the worksheet "Default Zonal Distances"
5. Fill in missing values (not all zones will have travel times from the VISSIM output) using the "Default Zonal Distances" worksheet and estimated travel speeds.
6. Create a new worksheet in the spreadsheet model with these travel times.
7. On the interface worksheet, select to use VISSIM outputs for travel times (input # 12).
8. Fill in the name of the worksheet with the travel times into inputs #13, #14, and #15.

9. Run the model. These results will be the baseline outputs.
10. Create additional worksheets with the estimated zone to zone travel times for HOV and transit with the proposed improvements.
11. Fill in the name of these worksheets with the travel times into inputs #14, and #15.
12. Rerun the model. These outputs will have the effects of the improved HOV/transit travel times.
13. Use these .fma files with VISSIM if traffic results are desired.

Other Model Interface Inputs

The model has other inputs that can be used to evaluate other modeling scenarios. These input values can be changed on the "Interface" worksheet. The fields that can be adjusted on the "Interface" worksheet are listed below:

1. **Number of Zones/External Stations**
   These fields do not change unless adding new TAZs to model to improve the model resolution or add a new area. The base model has 46 TAZs and 5 external stations
2. **External Trip Year**
   The external trip year is used to identify the external/external and external/internal trip tables. The year should be the same as the year on trip table worksheets such as, 2009_XX and 2020_XX.
3. **Model Year/Scenario**
   The model/scenario is the name of the worksheet with the socio-economics that are to be used. If new socio-economics are generated for a scenario, the worksheet should have the same format as the default socio-economic worksheets, like "2009_FixedSE. "
4. **Peak Day**
   Peak Day defines if ski trips, and other trips from tourist/visitors are included in the model.
5. **Occupancy Rate**
   The occupancy rate is from Park City Chamber/Bureau and used to estimate the number of visitors in hotels, condos and second homes.
6. **Daily Ski Trips**
   Daily ski trips are the number of daily ski trips to be assumed in the scenario. In 2008-2009, peak days had approximately 21,000 skiers. Historically, skier days at the Summit County resorts have grown at about four percent per year based upon this growth rate from 1988-2009. By 2020 a peak day would have 29,000 skiers per day and in 2040 there would be 41,000.
7. **Percent of ski/recreational trips leaving resorts in PM peak hour (3 pm to 4 pm)**
   Use the estimated number of skiers that leave the resorts from 3 pm to 4 pm.
8. **Mode Choice Inputs**
   a. **Coefficients/Terminal Times**
      The static model coefficients are used to estimate mode choice and generally are not modified.
   b. **Default Travel Times or VISSIM Output**
      The drop down box allows you to use either default travel times or VISSIM model results. The default uses estimated zone to zone travel times calculated from the "Default Zonal Distances." The VISSIM options allows for model travel times to be read into the spreadsheet model to adjust the mode split based upon the congested travel times. If using VISSIM travel times, the names of the worksheets with the travel time matrices are required to be entered (inputs #13, #14, and #15).
   c. **Average Speeds**
      Used to calculate the default travel times based upon mode.
   d. **Auto Operating Cost**
      Variable operating costs, calibrated with $0.11 per mile for gasoline based upon 2009 American Automobile Association (AAA) data.
   e. **Transit Fare**
      Can be used to test ridership changes with a fare for Park City Transit
   f. **Distance for IXXI trips**
      Used to calculate mode split for IXXI trips and calibrated to 50 miles.
   g. **Average Vehicle Occupancy**

The average vehicle occupancy by trip purpose is from the WFRC/MAG V.6 model and is for calculating vehicle trips.

VISSIM Model "How To"

***Note**: Because creating a VISSIM network from scratch is time consuming, it is recommended that the analyst start with one of the previously created VISSIM roadway networks and make desired modifications. Then, the analyst can insert fresh Origin/Destination tables and run the a simulation on the modified network. Several previously created VISSIM networks are available for use. These networks cover a variety of time periods (existing, 2020, 2040) and roadway improvement scenarios (re-striped SR-248, Kimbal Jct Improvements, HOV lanes on SR-224, etc). The analyst can select the previously created network that best matches the conditions desired for analysis and copy the network to a new folder for editing.*

Initial Steps

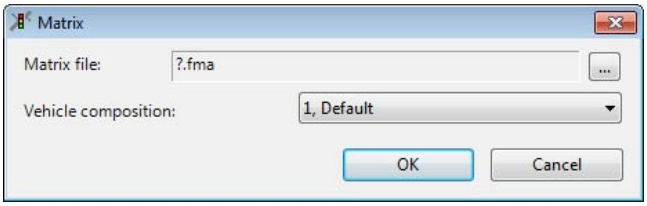
1. **Choose** desired roadway VISSIM network files and **copy** all associated files into a new folder
2. **Ensure** appropriate .fma files from the spreadsheet model are in same directory as the VISSIM network folder

   ***Note**: Four .fma files are needed to run the simulation:*
   1. *HOV seeding file*
   2. *HOV regular simulation file*
   3. *SOV+Heavy vehicle seeding file*
   4. *SOV+Heavy vehicle regular simulation file*

   ***Note**: If new .fma files are to be used , delete the accompanying .fma files and copy the new .fma files from the spreadsheet model into the VISSIM network folder. If the .fma files copied over with the VISSIM network are to be used, then no changes are required.*
3. **Open** base VISSIM network file
4. **Save As** a new VISSIM file so as to not rewrite original
   a. File -> Save As

Simulation Setup

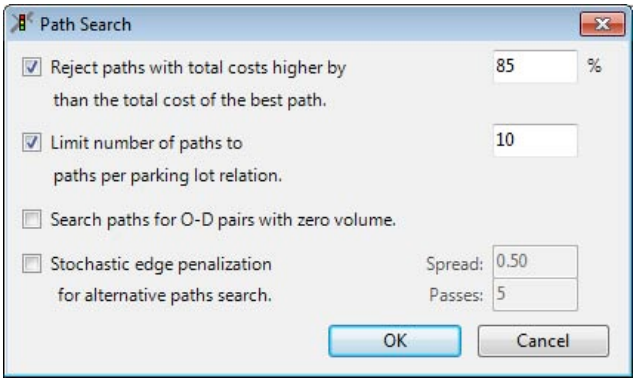
1. **Setup** Dynamic Assignment parameters
   a. **Open** Dynamic Assignment window
      i. Traffic -> Dynamic Assignment
   b. **Load** appropriate Matrices (.fma files) into VISSIM model [screenshots]
      i. In the Matrices subsection, **click** the "New..." button to bring up the Matrix window.
      ii. **Click** the "..." button to bring up the Windows Explorer window and **navigate** to the desired .fma file. **Highlight** the desired .fma file and **click** "Open" to return to the Matrix window.
      iii. **Select** the appropriate vehicle composition from the drop down box.
         1. SOV+Heavy Vehicle matrices use vehicle composition "1, Default"
         2. HOV matrices use vehicle composition "2, HOV"
      iv. **Click** "OK" to return to the Dynamic Assignment window.
      v. **Repeat** for each Matrix (.fma file)



   c. **Specify** new cost (.bew) and path (.weg) files
   Caution: If starting a new simulation, old cost and path files cannot be used. Either newly named cost and path files must be specified or else the old cost and path files must be deleted.

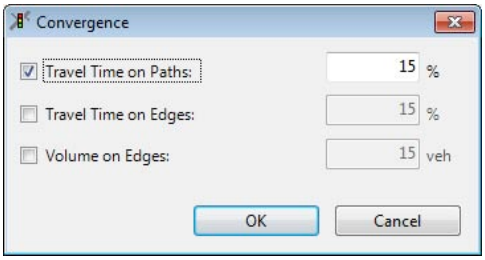
i. **Click** to "Cost file:" button to bring up the Windows Explorer window and **name** the new .bew file. **Click** "Save" to return to the Dynamic Assignment window.
ii. **Click** to "Path file:" button to bring up the Windows Explorer window and **name** the new .weg file. **Click** "Save" to return to the Dynamic Assignment window.

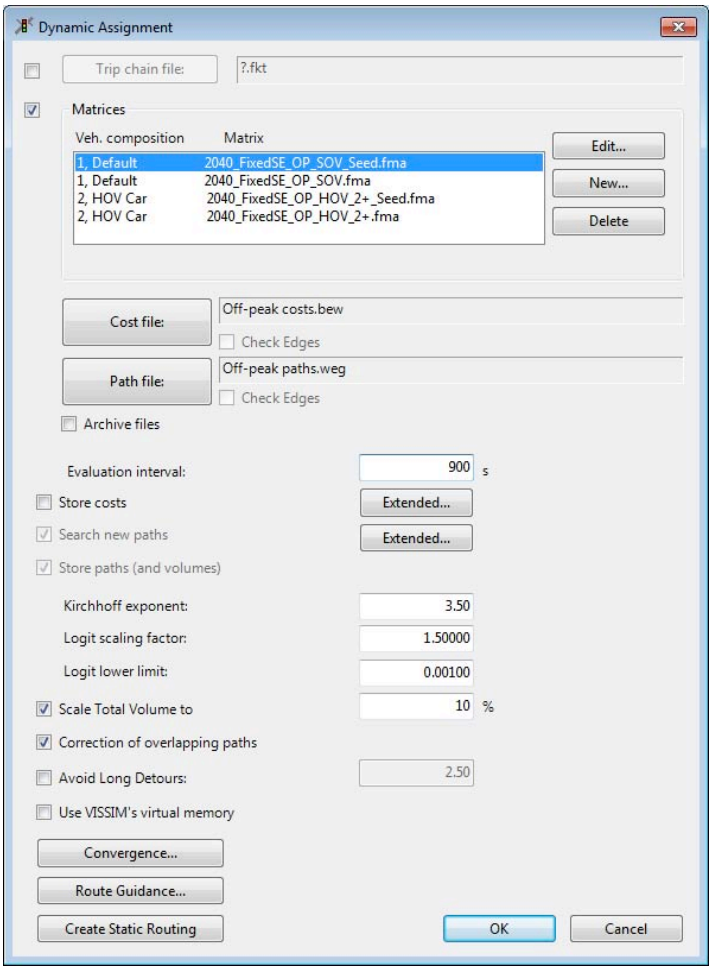
d. **Specify** other Dynamic Assignment settings
   i. **Set** the Evaluation Interval to 900 seconds.
   ii. **Check** the "Store costs" box.
   iii. **Verify** the "Search New Paths" and the "Store Paths (and volumes)" check boxes are checked.
   ***Note**: If new cost and path files were specified in the previous step, these check boxes will automatically be grayed out and checked.*
   iv. **Click** the "Extended..." button next to the "Search New Paths" check box to bring up the Path Search window
      1. **Check** the "Reject paths with total costs..." check box and **enter** "85%" in the corresponding field.
      2. **Check** the "Limit number of paths to..." check box and **enter** "10" in the corresponding field.
      3. **Click** "OK" to return to the Dynamic Assignment window



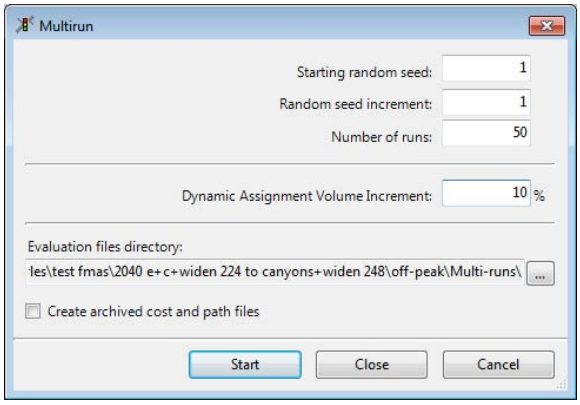
   v. **Check** the "Scale Total Volume to" check box and **enter** "10%" in the corresponding field
   ***Note**: for new simulations, the intitial run starts at 10% volumes and incrementally increases up to 100% volumes with each iteration.*
   vi. **Check** the "Correction of overlapping paths" check box
   vii. **Click** the "Convergence..." button to bring up the Convergence window
      1. **Check** the "Travel Time on Paths check box and **enter** appropriate percentage:
         a. 15% for an off-peak simulation
         b. 20% for a peak-peak simulation
      2. **Click** "OK" to return to the Dynamic Assignment window

e. **Click** "OK" to save changes and exit the Dynamic Assignment window





2. **Setup** multi-runs, iterative simulations
    a. **Open** the Multirun window
        i. Simulation -> Multiruns
    b. **Enter** a number greater than or equal to 50 in the "Number of runs:" field
    c. **Enter** "10%" in the "Dynamic Assignment Volume Increment:" field
    d. **Click** the "..." button in the "Evaluation files directory:" subsection and **specify** the folder to store the multirun evaluation files. This folder could be a new subfolder in the VISSIM file directory called "Multi-runs".
    e. If ready to begin multirun simulations, click the "Start" button. If further setup is needed, click the "Close" button to save changes and close the window.



Running Simulations and Attaining Convergence

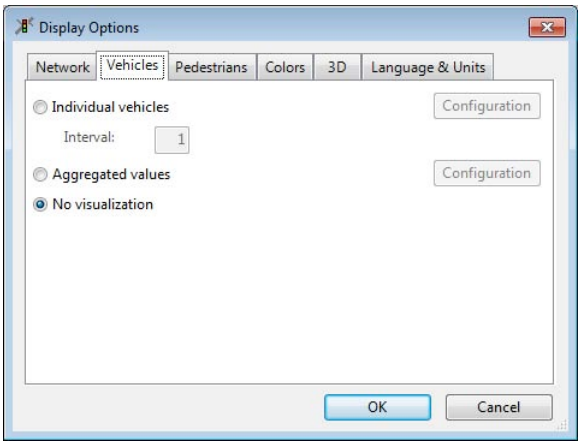
1. To begin multirun simulations, **open** the Multirun window and **click** "Start"
    a. To increase simulation speed, turn off vehicle visualization
        i. View -> Options -> select "Vehicles" tab -> choose "No Visualization

        ***Note**: Alternatively, pressing "Ctrl+q" cycles through the three vehicle visualization options*

        ***Note**: Simulations will proceed until either convergence is attained or the previously specified number of runs has been reached, whichever comes first.*

        ***Note:** When convergence is attained, the multirun simulations will stop and an alert window will appear announcing that convergence has been reached and asking whether to cancel all remaining simulation runs.*

        Warning: Depending on computer speed and amount of congestion in the network, it may take the simulation several hours to reach convergence.



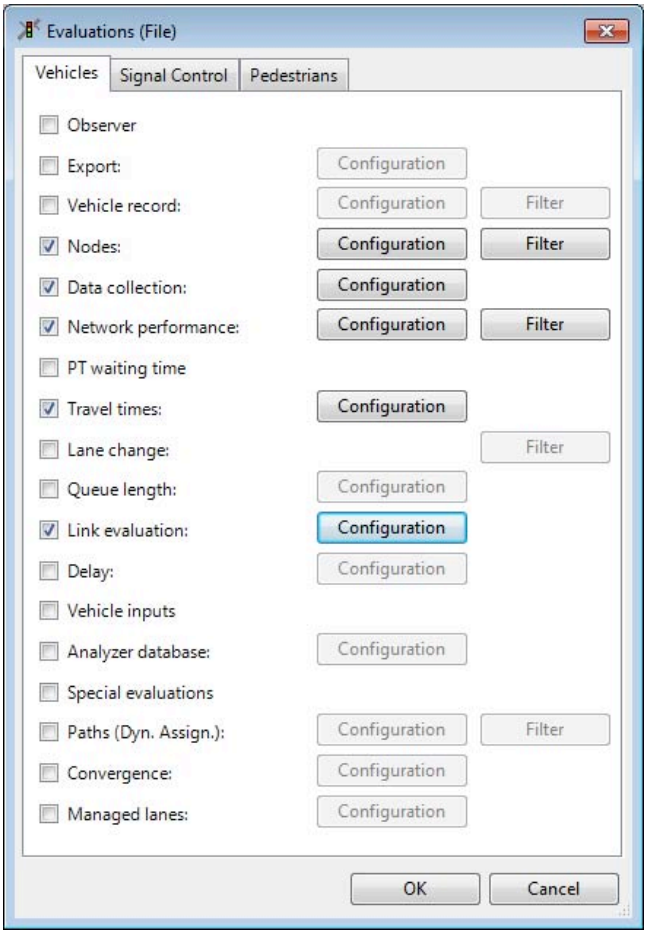
Recording Simulation Data after Convergence

1. After convergence has been attained, the simulation can be rerun to record traffic performance measures.
2. **Freeze** dynamic assignment
    a. **Open** the Dynamic Assignment window
    b. **Uncheck** the "Store costs", "Search new paths", and "Store paths (and volumes)" check boxes to effectively "freeze" the dynamic assignment process to the assignment schemes recorded during the last simulation
    c. **Click** "OK" to save changes and exit the Dynamic Assignment window
3. **Setup** to record simulation data
    a. **Open** the Evaluations (Files) window
        i. Evaluation -> Files
    b. **Check** the "Nodes:", "Data collection:", "Network performance:", "Travel times:", and "Link evaluation:" check boxes.
        i. Each type of evaluation file is associated with a unique configuration file and output file. Each type of configuration file and output file maintains a unique file extension. (See the table below)
        ii. If configuration files from a previously configured VISSIM network have been copied into the current VISSIM project folder network, configuration is automatically setup and evaluation parameters are ready to be recorded. Otherwise, each evaluation file type must be manually configured within the Evaluation (Files) window.

        Caution: It is strongly recommended that configuration files from a successful VISSIM network be used for all new networks. Configuring evaluation files requires advanced VISSIM knowledge and is not recommended for the inexperienced user.

***Note**: Output files are saved as semi-colon (;) delimited text files and are best viewed and analyzed by importing into Microsoft Excel.*

c. **Click** "OK" to save settings and exit the Evaluation (Files) window



Evaluation Type	Configuration File Extension	Output File Extension
Nodes	.knk	.kna
Data Collection	.qmk	.mes
Network Performance	.npc	.npe
Travel Times	(none)	.rsz
Link Evaluation	.sak	.str

4. **Run** the simulation once to record simulation data
   a. **Click** the "Simulation continuous" toolbar button (horizontal, blue triangle button on the Simulation toolbar) to start a single simulation run
   ***Note**: Alternatively, a simulation can be started by clicking Simulation -> Continuous*
   ***Note:** After the simulation is complete, output files will be created/updated in the VISSIM network file directory*

Appendix C: Report Card "How To"

Guide to Completing the Park City Traffic and Transportation Report Card
This guide provides instructions to complete the report card so that Park City can track its progress in meeting the TTMP Goals.

1) Complete Streets
- A) SR-224 SOV Share
  - i) Count Percentage of vehicles with 2+ occupants flowing south on SR-224 at a point between Meadows Drive and Kearns Boulevard between 9 AM and 10 AM on a weekday during ski season (excluding buses). Subtract from 100 to yield Single Occupancy Vehicle percent.
- B) SR-248 SOV Share
  - i) Count Percentage of vehicles with 2+ occupants flowing west on SR-248 at a point between Bonanza Drive and Wyatt Earp Way between 9 AM and 10 AM on a weekday ski day (excluding buses). Subtract from 100 to yield Single Occupancy Vehicle percent.
- C) Percent households within 1/4 mile of transit
  - i) Buffer bus stops by ¼ mile and count the number of residential dwelling units within the buffer. Residential dwelling units are identified using the Park City GIS address file joined to Summit County Assessor data. Residential dwelling units were assumed to have an assessor code "Residential" use with an improvement value greater than 0.
- D) Percent households within 1/4 mile of a trail
  - i) Buffer paved multi-use trails by ¼ mile and count the number of residential dwelling units within the buffer. Residential dwelling units are identified using the Park City GIS address file joined to Summit County Assessor data. Residential dwelling units were assumed to have an assessor code "Residential" use with an improvement value greater than 0.

2) Convenient Transit
- A) Daily Bus Hours (Local Service)
  - i) Total winter bus operating hours for routes operating within Park City limits (plus any service to Richardson Flat Park and Ride)
- B) Transit Spine Frequency
  - i) Headways for routes along the current defined transit spine. Yes/No value
- C) PCMR to PCHS (Bus - Drive time)
  - i) Difference in travel times from PCMR to PCHS. Drive times: average of three runs during the PM peak weekday hour. Bus Times: Fastest trip according to bus timetables including average wait times, transfer times, and walk times.
- D) Transit Center to Racquet Club (Bus - Drive time)
  - i) Difference in travel times from Old Town Transit Center to the Racquet Club. Drive times: average of three runs during the PM peak weekday hour. Bus Times: Fastest trip according to bus timetables including average wait times, transfer times, and walk times.
- E) DV to Dan's (Bus - Drive time)
  - i) Difference in travel times from Deer Valley Snow Park Lodge to the old Dan's Supermarket on Snow Creek Drive. Drive times: average of three runs during the PM peak weekday hour. Bus Times: Fastest trip according to bus timetables including average wait times, transfer times, and walk times.

3) Regional Transit
- A) Daily Bus Hours (Regional Service)
  - i) Total winter bus operating hours for routes providing service outside Park City limits (including the Canyons and Snyderville Basin)
- B) Communities Served
  - i) Number of outside communities connected by transit service (i.e. Snyderville Basin, SLC, Heber City, Kamas/Francis, etc) Community defined as American Community Service Place designation.

4) Connected Out of the Car
- A) Primary Bike Corridor Completion
  - i) Percent completion of Park City identified primary bike trail network. Use formula: (current miles of primary bike corridor + new miles) / planned miles

B) Secondary Bike Corridor Completion
   i) Percent completion of Park City identified secondary bike trail network. Use formula: (current miles of secondary bike corridor + new miles) / planned miles

5) Increase Mobility and Reduce Car Travel

A) Change in Gateway AADT/Housing Units
   i) Ratio of growth in SR-224 and SR-248 Average Annual Daily Traffic (AADT) to the number of new housing units within Park City. AADT as reported by UDOT Automatic Traffic Recorder stations #605 (SR-224 north of Canyons Drive) and #606 (SR-248 east of Richardson Flat Road). Compare Annual Average for Sunday/Saturday. New housing units data acquired from Bureau of Economic and Business Research, David Eccles School of business.

B) Change in Gateway AADT/Jobs
   i) Ratio of growth in SR-224 and SR-248 Average Annual Daily Traffic (AADT) to the number of new jobs within Park City. AADT as reported by UDOT Automatic Traffic Recorder stations #605 (SR-224 north of Canyons Drive) and #605 (SR-248 east of Richardson Flat Road). New jobs data acquired from Utah Department of Workforce Services.

C) Drive time PCMR to PCHS
   i) Drive times from PCMR to PCHS - average of three runs during the PM peak weekday hour.

D) Drive time Transit to Racquet
   i) Drive times from Old Town Transit Center to Racquet Club - average of three runs during the PM peak weekday hour.

E) Drive time DV to Dan's
   i) Drive times from Deer Valley Snow Park Lodge to the old Dan's Supermarket on Snow Creek Drive - average of three runs during the PM peak weekday hour.

F) Drive time/Bike time (PCMR to PCHS)
   i) Ratio of travel times from PCMR to PCHS. Drive times: average of three runs during the PM peak weekday hour. Bike times: Fastest trip according to Google Maps estimate.

G) Drive time/Bike time (Transit to Racquet)
   i) Ratio of travel times from Old Town Transit Center to Racquet Club. Drive times: average of three runs during the PM peak weekday hour. Bike times: Fastest trip according to Google Maps estimate.

H) Drive time/Bike time (DV to Dan's)
   i) Ratio of travel times from Deer Valley Snow Park Lodge to the old Dan's Supermarket on Snow Creek Drive. Drive times: average of three runs during the PM peak weekday hour. Bike times: Fastest trip according to Google Maps estimate.

I) Drive time/Transit time (PCMR to PCHS)
   i) Ratio of travel times from PCMR to PCHS. Drive times: average of three runs during the PM peak weekday hour. Transit Times: Fastest trip according to bus timetables including average wait times, transfer times, and walk times.

J) Drive time/Transit time (Transit to Racquet)
   i) Ratio of travel times from Old Town Transit Center to Racquet Club. Drive times: average of three runs during the PM peak weekday hour. Transit Times: Fastest trip according to bus timetables including average wait times, transfer times, and walk times.

K) Drive time/Transit time (DV to Dan's)
   i) Ratio of travel times from Deer Valley Snow Park Lodge to the old Dan's Supermarket on Snow Creek Drive. Drive times: average of three runs during the PM peak weekday hour. Transit Times: Fastest trip according to bus time tables including average wait times, transfer times, and walk times.

6) No New Mileage

A) Total Lane Miles. The lane mile goal does not include future annexations. Annexed area should be considered in this goal and the goal should be revised as necessary.
   i) Park City street data GIS file

7) Promote Safety and Active Living

A) Crash Rate
   i) Overall Park City crash rate (crashes per year per million vehicle miles traveled). Crashes per year as reported by Park City police. Vehicle miles traveled as estimated using carbon calculator.

B) Fatalities
   i) Number of roadway related fatalities in Park City as reported by police department

Trail/Sidewalk count method: Count all people, in either direction, 8am to 10am and 4pm to 6pm. Add two counts and multiply by 3 to obtain daily count.

C) McLeod Creek
   i) Daily trail volume measured August weekday. City Trailhead east side of S.R. 224.
D) Poison Creek
   i) Daily trail volume measured August weekday. At City Park Pavilion.
E) Rail Trail
   i) Daily trail volume measured August weekday. At Wyatt Earp Way.
F) Dan's to Jan's
   i) Daily sidewalk volume measured August weekday. At Ped Crossing crosswalk on east side of Park Avenue.
G) Little Kate Sidewalk
   i) Daily sidewalk volume measured August weekday. At corner of Racquet Club Drive.

8) Transportation Adds to Community

A) Estimated Petroleum Consumption use "Fuel Consumption and GHG Calculator.xlsx"
B) Estimated Annual Greenhouse Gas Emissions use "Fuel Consumption and GHG Calculator.xlsx"

Inputs

Gateway AADTs[1]	SR-224	27,580
	SR-248	14,655
Percent of Vehicle Miles of Travel[2]	Cars & light trucks, 2009	76%
	Heavy single-unit trucks, 2009	17%
	Heavy combo trucks, 2009	7%
Vehicle Registration[3]	Cars, 2009	25,868
	Light trucks, 2009	12,527
	Zero emission vehicles, 2009	0
Fuel Economy[4]	Cars, 2008	22.6
	Light trucks, 2008	18.1
	Heavy single-unit trucks, 2008	8.5
	Heavy combo trucks, 2008	5.4

Intermediated Outputs

Annual Vehicle Miles of Travel	All Vehicles, 2009	71,960,838
	Cars & light trucks, 2009	54,816,950
	Heavy single-unit trucks, 2009	12,464,860
	Heavy combo trucks, 2009	4,679,028
Percent of Light Vehicle Fleet	Cars	67%
	Light trucks	33%
	Zero emission vehicles	0%
Combined Fuel Economy	Light Vehicle Weighted Avg.	21.1

Final Outputs

Fuel Consumption	Gallons (gal)	**4,926,991**
	British thermal unit (kBTUs)[5]	**568,574,741**
Carbon Dioxide[6]	CO_2 Pounds (lbs.)	95,583,622
Other Green House Gases (N_2O, CH_4, and HFCs)[6]	CO_2e Pounds (lbs.)	4,779,181
Total Green House Gases	CO_2e Pounds (lbs.)	100,362,803
	Short Tons	**50,181**

1. Gateway AADTs are from Traffic on Utah Highways for the segments with Automatic Traffic Recorders (ATRs) on SR-224 at milepoint 8.920 and SR-224 at milepost MP 2.561
2. VMT by vehicle class is estimated using Truck Traffic on Utah Highways, for SR-224 and SR-248 within Park City
3. Summit County Vehicle Registration, *On-road Registrations by County and Vehicle Type* (2009). Utah State Tax Commission
4. Light Vehicles and Characteristics Table 4. (July 2010). *Transportation Energy Data Book:* Edition 29, 4-1
5. 115,400 Btu/gal (net), Heat Content for Various Fuels Table B.4, Transportation Energy Data Book: Edition 29, 4-1
5. Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle . (February 2005). *U.S. Environmental Protection Agency* , EPA420-F-05-004

9) Multi-modal Access

A) Major New Land Developments
   i) If development is greater than 200 ERUs, is in-place infrastructure balanced for transit, trails, high occupancy vehicles?

10) System & Demand Management

A) New ITS Implementation

i) Number of new ITS techniques employed. For example:
   - Emergency notification systems-alternate routing, wait time
   - Traffic enforcement devices – speed camera, red light camera, HOV detection
   - Variable speed limit application-speed limit change for weather or traffic
   - Traffic Light synchronization-timing coordination
   - Parking availability notification-real-time inventory information
   - Transit availability-next bus, schedule data

B) New TDM Implementation
   i) Number of new TDM techniques employed. For example:
      - Employer partnerships
      - Traveler Information System
      - Guaranteed Ride Program
      - Van Pool
      - Telecommuter Satellite locations
      - Flex Time work schedule
      - Congestion pricing
      - Bike, Car Sharing
      - Ski area incentives

Appendix D: Growth Projections Summary (Traffic Analysis Zones Map and demographics)

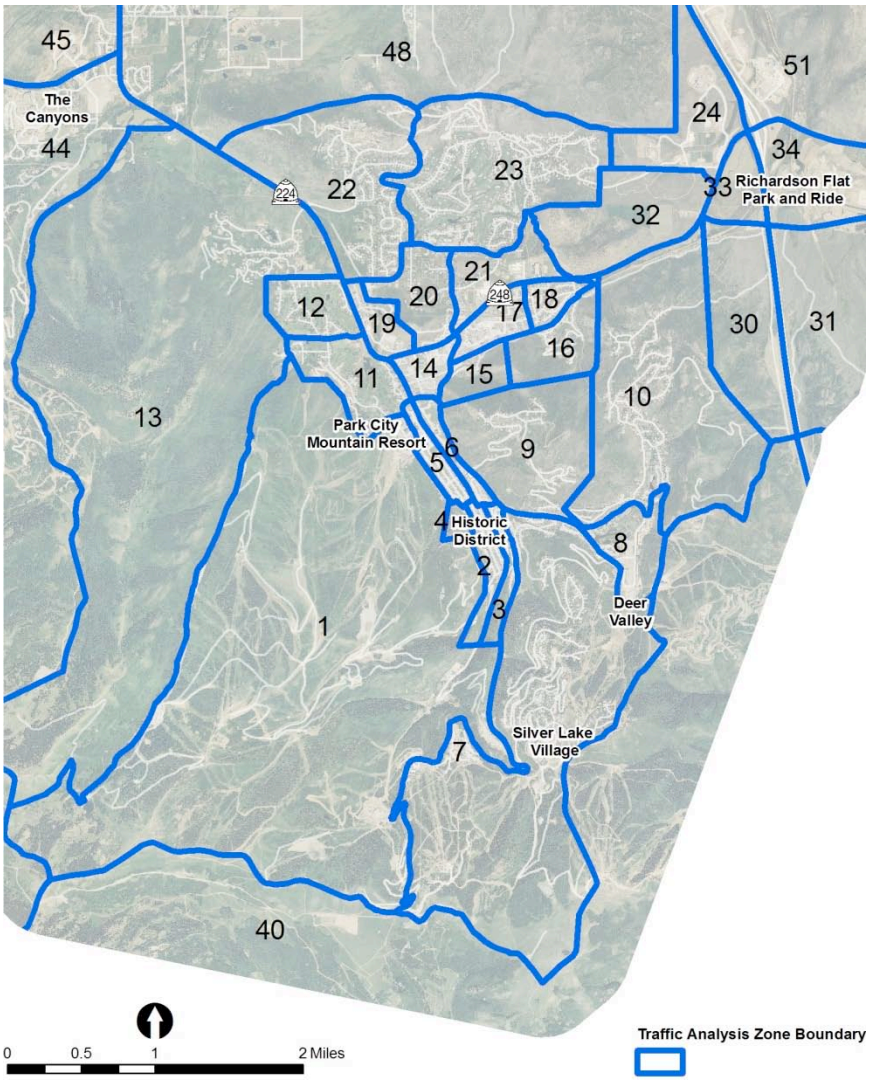
Existing and Future Socio-economics

For the TTMP, a travel demand and traffic simulation model was developed for Park City area to evaluate existing and future travel within the study area. In order to quantify the travel demand, existing and future households and employment were estimated. This appendix summarizes the socio-economics used for the travel modeling.

Traffic Analysis Zones

Traffic Analysis Zones TAZ boundaries were defined for Western Summit Count and Wasatch County based on existing Census geography, the highway network and land use. Generally, the TAZ boundaries were defined to not be divided by modeled roads, or major environmental features and have consistent land uses. The technical committee contributed to development of the TAZ structure and Figure 1 shows the TAZs developed for the TTMP.

Figure 10

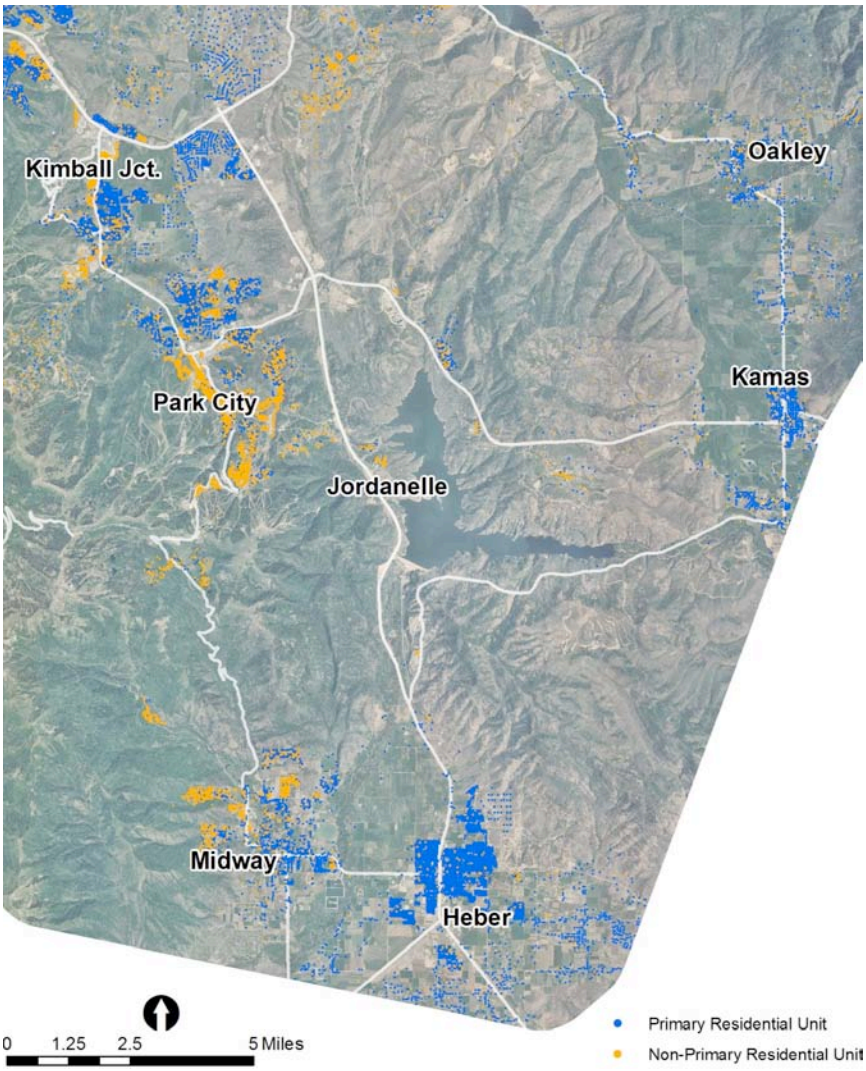


Existing Households and Employment

Households

The number of households by TAZ was estimated by using the address/parcel file data provided respectively by Park City GIS and Wasatch County GIS departments. Assessor data was joined to the GIS data to determine the property type and if a structure exists on the property by having an assessed improvement value. The number of identified dwelling units for Summit and Wasatch County were relatively close to the American Community Survey (2006-2008) estimate which was used as the control total. Figure 2 shows the locations of the identified residential dwelling units.

Figure 11 – Residential Dwelling Units

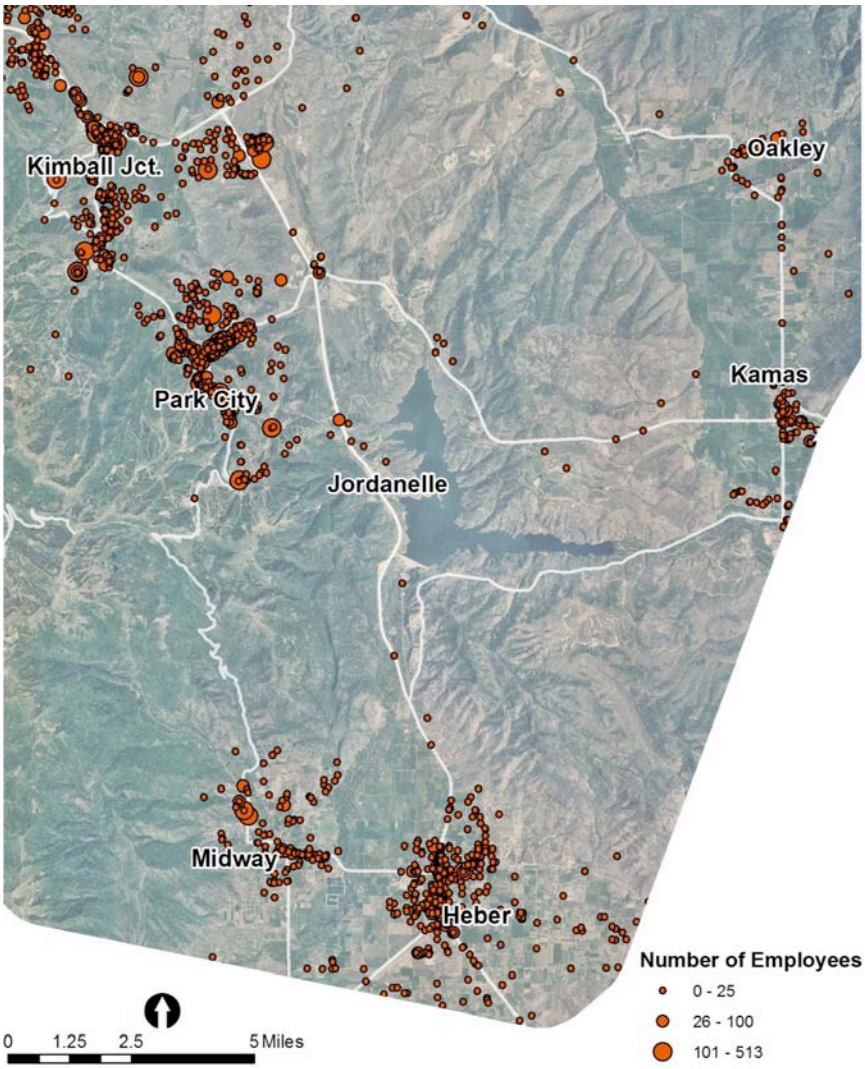


Households were then calculated using the dwelling unit estimates and household control totals from the Governor's Office of Planning and Budget (GOPB). The households outside the model area in towns, such as, Henefer and Coalville were removed from the county total which was then distributed to the primary and then non-primary dwelling units (renters). The remaining housing units were then considered secondary homes/condos.

Employment

Employment data is from the Firm Find data provided by the Department of Workforce Services (DWFS) for September 2009. While it is a comprehensive data set some employers are exempt from reporting employment and wage information to the Department of Workforce Services (DWFS) and are not included unless they voluntarily provide the information. The Firm Find data was geocoded using the Automated Geographic Reference Center (AGRC) geolocator. The geocoded employment totals by sector were controlled to the 2009 county level non-farm average employment sector totals from DWFS. These totals were then aggregated to TAZ level. Figure 3 shows the geocoded employment locations.

Figure 12 – Geocoded Employment Locations



Future Development

In order to evaluate future transportation demand within Park City and Summit County, future growth was estimated from build-out information provided by Park City and countywide demographic projections from the Governor's Office of Planning and Budget.

Park City Planned Development

As of June 2010, Park City estimated that the city was at approximately 81% of build-out based upon approved sub-divisions and vested parcels. Approximately 2,200 residential units remain to be developed within Park City not including Park City Heights that was recently annexed. Of these remaining units, 775

are equivalent residential unit (ERUs) which are equal to 2,000 square feet of residential development. Table 1 provides the general location of the remaining residential units.

Table 9 - Approved Sub-division and Vested Parcel Units Remaining

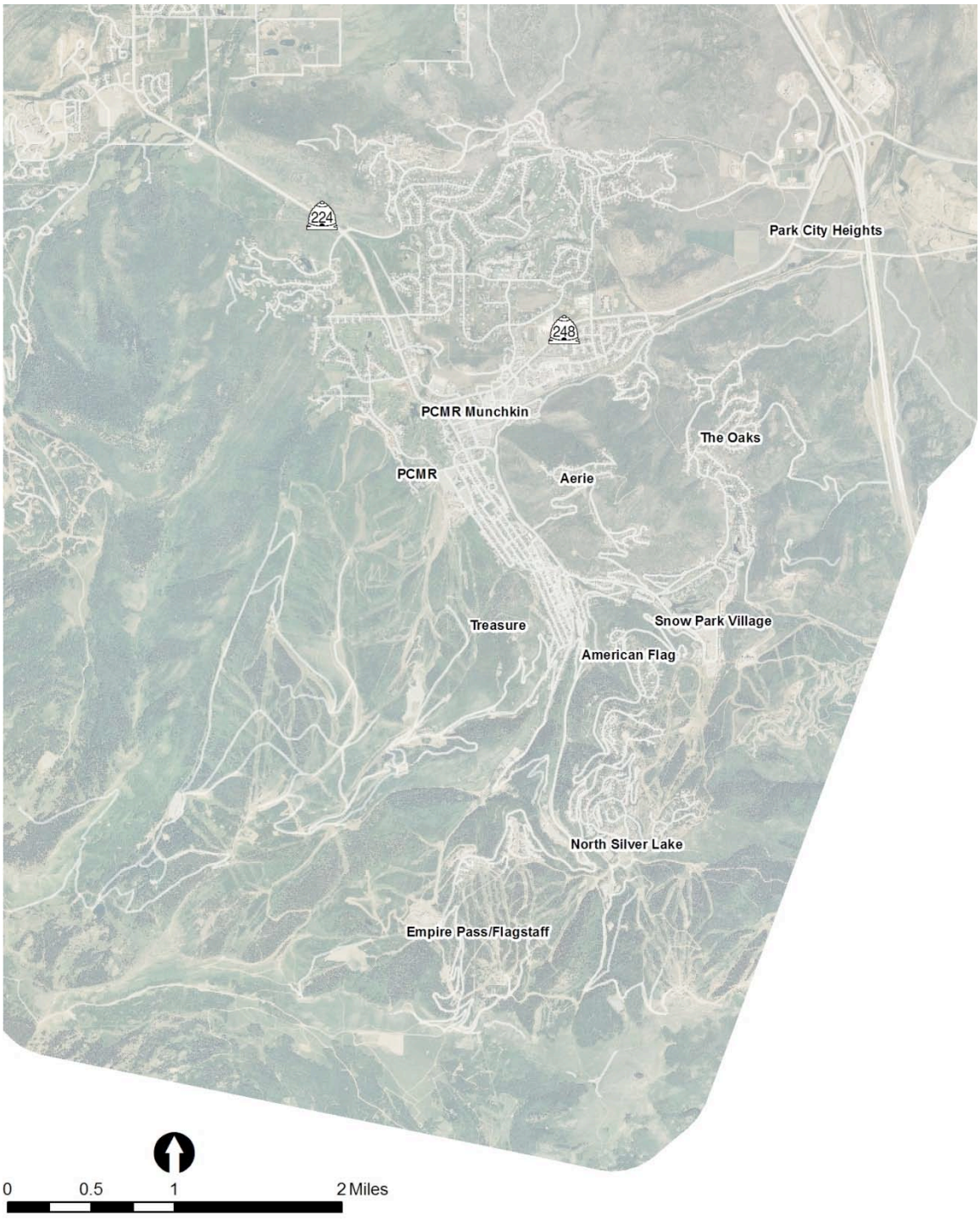
Location	Single and Multi-Family Units	Residential Unit Equivalents	Total Units
Resort Center (North of 12th Street)	0	284	284
Old Town (South of 12th Street)	67	197	264
Rest of Town	1,349	294	1,643
Recently Annexed (Park City Heights)	239	0	239

The vested developments that are most likely to develop based upon Park City input are summarized in Table 2 and shown in Figure 4. It was assumed that the smaller developments and master planned developments (Treasure Hill) or pre-master planned developments (Park City Heights) would be developed by 2020 with the remaining vested developments and parcels built-out by 2040.

Table 10: Assumed Vested Developments by 2020 and 2040

Location	Assumed 2020 Development (Units)	Assumed 2040 Development (Units)
The Oaks	23	
Rail Central	24	
American Flag	25	
Aerie	30	
Snow Park Deer Crest	35	
North Silver Lake – Lot 2B	54	
Sweeny Properties – Old Town	63	
Flagstaff/Empire Pass	71	
Park City Mountain Resort – Munchkin	80	
Sweeney Properties – Treasure	197	
Park City Heights	239	
Snow Park Village – DV Parking Lots		210
Park City Mountain Resort – Parking Lots		284
Unidentified Sub-divisions, and Parcels		1,095
Total	841	1,589

Figure 13 – Sub-divisions with Vested Parcels remaining



Future Households and Employment

Since ERUs specify square footage and not the number of units, the 197 ERUs at Treasure were assumed to be developed as proposed with a total 305 units. This ratio of units to ERUs was also applied to the remaining ERUs in the PCMR parking lots (284 ERUs) and Snow Park Village – DV parking lots (210 ERUs)since these areas would likely develop with focus on overnight visitors and not full-time residents and as a result have more but smaller units. The remaining 84 ERUswere assumed to be single unit developments since they were not identified in the build-out summary.

The housing unit totals were then used to calculate full-time households and population within Park City. It was assumed that future development in each TAZ would have a similar ratio of full-time households to second home and condos as existing development. The number of existing full-time households was estimated from the existing population estimate from GOPB and Park City using the average household size from the 2000 Census and 2005-2009 American Community Survey 5-Year Estimates. Table 3 shows the number of housing units, full-time household and population by year.

Table 11 – Park City Housing Units, Households, and Population

Year	Housing Units	Full-time Households	Population
2009	9,187	3,515	9,111
2020	10,014	3,962	10,080
2040	11,496	4,669	11,288

Table 4 provides the future population for Park City, Summit County and Wasatch County. While the Park City population is expected to grow by about 24 percent from 2009 to 2040 based upon the vested developments, the Summit County is expected to grow by more than 150 percent and Wasatch County by more than 170 percent. County total match the GOPB projections.

Table 12: Regional Population

Year	Park City	Summit County	Wasatch County	Region
2009	9,111	40,704	23,913	**64,617**
2020	10,080	61,738	36,181	**97,919**
2040	11,288	104,620	64,631	**169,251**

Employment for the ERU developments at Treasure Hill, PCMR parking lots and the Deer Valley parking lots was estimated based upon square feet of planned use assuming development plans similar to Treasure Hill. It was assumed that 10 percent of the ERUs would consist of support commercial and the remaining residential ERUs would still generate a small amount of additional support commercial employment based on estimates of the Fiscal Impact Analysis Model (FIAM) created for the Florida Department of Community Affairs (DCA). Additionally, it was assumed that while not explicitly included in the build-out summary, employment would grow at a similar rate to housing units due to employment densification and higher uses.

Table 5 provides the future employment for Park City, Summit County and Wasatch County. Again, Summit and Wasatch Counties are forecast to grow faster than Park City. This is a strong indication that most of the region's growth is taking place outside of Park City's boundaries, yet will likely impact the city's transportation network, as it remains a popular destination. It should also be noted that ski related trips, were estimated separately from the demographic forecasts and were assumed to grow at an average rate of 3 percent annually from 2009 to 2040 to each of the three major resorts in the Park City area.

Table 13: Regional Employment

Year	Park City	Summit County	Wasatch County	Region
2009	9,635	20,232	5,437	**25,668**
2020	10,842	41,250	17,941	**59,191**
2040	12,917	57,400	33,248	**90,648**

Build-out Summary from Park City

Build Out Summary

As of June 2010, the estimated build out of Park City is ±81%. This is based on currently approved subdivisions and vested parcels. Not included in this build out is the recently annexed Park City Height (239 residential units proposed – a mix of SF and MF). Currently, this area is being reviewed as a pre-MPD.

The Resort Center (Area north of 12th Street) is build out to 82%. Park City Mountain Resort has 284 unit equivalents remaining in the parking lots.

Old Town is built out to 86%. The Sweeney MPD had 197 unit equivalents of residential remaining. Within the Old Town lots, it is estimated that an additional 63 old town lots could be developed.

The remainder of Park City is built out to ±80%. There are many subdivisions with existing lots that are not built yet. The subdivisions most likely to develop (and with vested parcels) are Aerie (30), American Flag (25), Flagstaff/Empire Pass (71), PCMR housing on Munchkin (80), North Silver Lake Lot 2B (54), the Oaks (23), Rail Central (24), Snow Park Deer Crest (35), and Snow Park Village – DV parking lots (210).

	POTENTIAL LOTS			REMAINING LOTS			
RESORT CENTER(N OF 12TH STREET)(!)	SF	MF	UE	SF	MF	UE	
TOTAL	67	1152	333	0	0	284	
% REMAINING				0%	0%	85%	
% BUILT				1	1	0.1471	
UNIT POTENTIAL TOTAL	1552						
UNIT REMAINING				284			
UNIT BUILT				1268			
TOTAL BUILDOUT %							82%

	POTENTIAL LOTS			REMAINING LOTS			
REST OF TOWN	SF	MF	UE	SF	MF	UE	
TOTAL	2994	4733	581	555	794	294	
% REMAINING				19%	17%	51%	
% BUILT				0.8146	0.8322	0.494	
UNIT POTENTIAL TOTAL	8308						
UNIT REMAINING				1643			
UNIT BUILT				6665			
TOTAL BUILDOUT %							80%

	POTENTIAL LOTS			REMAINING LOTS			
OLD TOWN (S OF 12TH STREET) (&)	SF	MF	UE	SF	MF	UE	
TOTAL	710	943	197	63	4	197	
% REMAINING				9%	0%	100%	
% BUILT				0.9113	0.9958	0	
UNIT POTENTIAL TOTAL	1850						
UNIT REMAINING				264			
UNIT BUILT				1586			
TOTAL BUILDOUT %							86%

TOTAL BUILDOUT	
POTENTIAL	11710
BUILT	9519
REMAIN	2191
TOTAL BUILDOUT %	81%

Appendix E: SR-224 Corridor Study

Introduction and Summary of Results

As part the Park City Master Transportation Plan, an alternatives analysis of SR-224 corridor was completed in order to explore the potential need for capacity enhancements to the corridor. While SR-248, and to lesser extent Guardsman Pass, also provide access to Park City, SR-224 has been and will continue to be the major gateway corridor to Park City. As a result, efficient movement along the corridor is important in preserving Park City's economic development priorities and potential while allowing for continued sustainable development within Park City.

The SR-224 Corridor Study looks to support the goals of the Park City Traffic and Transportation Master Plan (TTMP). Specifically, this study evaluates capacity needs of SR-224 within the context of Park City's goals of reducing the drive alone mode share and increasing regional transit service. The emphasis on these goals helps ensure that options other than adding additional single-occupant vehicle capacity are given priority.

Study Area

While SR-224 extends south from I-80 to the Summit/Wasatch County Line at Guardsman's Pass, this study evaluates the section of the corridor that functions as the major gateway into Park City. Roughly, this gateway extends from Canyons Resort Drive (just north of the Park City boundary) to the intersection of Deer Valley Drive and Empire Avenue where traffic is dispersed from the gateway into the city. Figure 1 shows the SR-224 gateway corridor evaluated as part of this study.

Currently, there are thirteen traffic signals on SR-224 from Park City to Interstate 80, six of which are within the 3.1 mile gateway corridor. Although the traffic signals outside the gateway corridor contribute to delay to and from Interstate 80, these signals were not evaluated as part of the corridor study since both UDOT and Summit County have planned projects to address these capacity concerns. These projects are discussed in future conditions.

Figure 14: SR-224 Gateway Corridor Study Area

Summary of Results

Through analysis of the existing and future traffic on SR-224, it has determined that:

- Future traffic volume on SR-224 between Kearns Boulevard and Canyons Resort Drive should not exceed the corridor capacity but proactive steps must be taken to achieve the TTMP mode share and transit service goals in order to maintain good LOS.
- Reducing the drive-alone mode share and increasing regional transit service can accommodate future travel demand growth with only moderate increases in vehicle traffic.
- Although most of the SR-224 gateway corridor is expected to function at an acceptable level of service with TTMP Goals, some level of traffic congestion will continue to exist on the approach to and at the intersection of Deer Valley Drive/Empire Avenue/SR-224.
- Only significant capacity enhancement, such as widening SR-224, can improve the level of service at the intersection of Deer Valley Drive/Empire Avenue/SR-224 and the

corridor segment from Empire Avenue to Kearns Boulevard since there are three major roads out-loading into the corridor.

- Capacity on SR-224 from I-80 to Canyons Resort Drive will continue to be a concern even with widening of SR-224 and the TTMP mode share goals. Park City should coordinate with Summit County to ensure sufficient capacity on this segment of SR-224 since this segment is expected to have future capacity issues regardless of Park City initiatives.

TTMP Drive Alone Mode Share Goal

One of the strategic of the TTMP is to improve the efficiency of the gateway corridor by increasing the average vehicle occupancy for vehicles entering and exiting Park City. The TTMP proposes that no more than 50% of vehicles are drive alone. By decreasing the number of drive alone vehicle on the gateway corridors, corridor performance would be improved without requiring additional vehicle capacity.

In order to estimate the benefit of the drive alone goal, and provide a baseline condition for traffic on SR-224 an average vehicle occupancy (AVO) count was conducted for traffic traveling into Park City on SR-224. The count was done on Thursday, November 18, 2010 from 8:30 a.m. to 9:30 a.m. and due to the high traffic volumes on SR-224, a sample of vehicles and light trucks was used to estimate vehicle occupancy. Trucks and buses were excluded from the count. Figure 2 shows the percent of drive alone vehicles on SR-224 from this vehicle occupancy count in comparison to the TTMP goal in Figure 3. On SR-224, 71 percent of vehicles were single occupant vehicles which is significantly above the TTMP goal of a 50 percent drive alone mode share.

Figure 15: Existing Vehicle Mode Share on SR-224

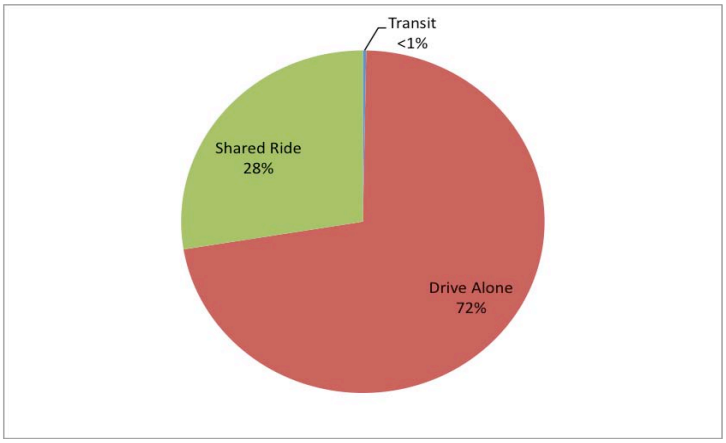


Figure 16: TTMP Vehicle Mode Share Goal on SR-224

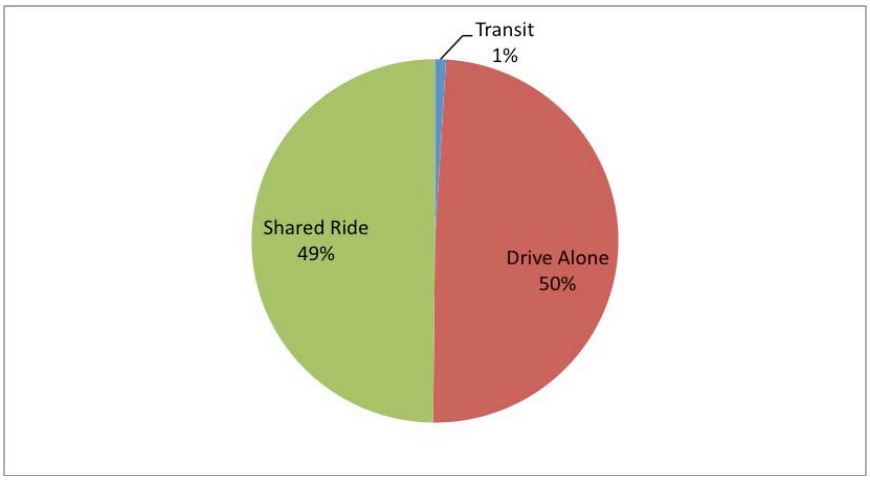
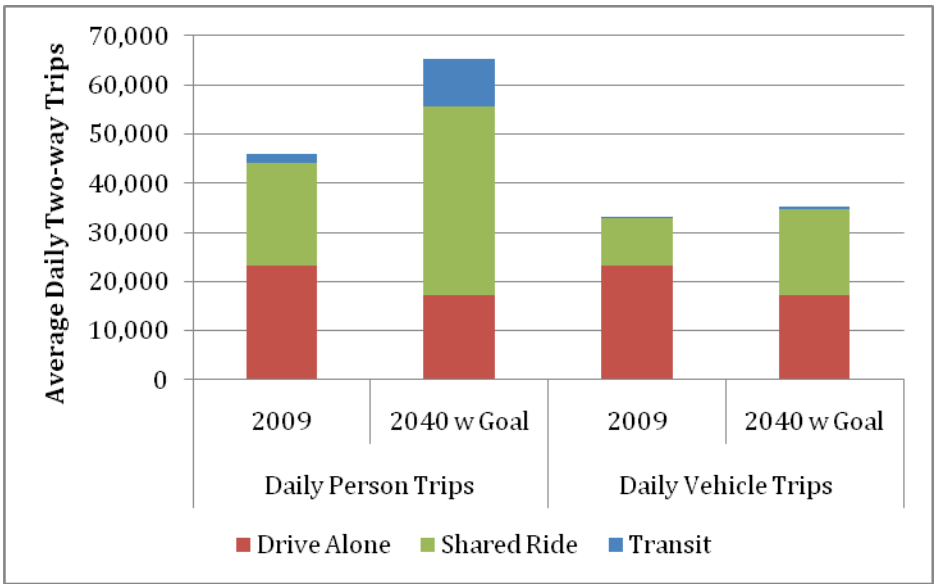


Figure 4 illustrates that with the TTMP vehicle mode share by 2040, about 42 percent more people travel on SR-224 each day, but traffic volumes increase by just 7 percent. Achieving the TTMP mode split goals is important for many reasons, key among them is the role that tourism and recreation have in the overall economic development picture for Park City, and that access to the city is maintained while the impacts of single-occupant vehicles in the city are minimized.

Figure 17: Daily Trips To/From Park City on SR-224



Future Conditions

Planned Development

In order to evaluate future transportation demand within Park City and Summit County, future growth was estimated from build-out information provided by Park City and countywide demographic projections from the Governor's Office of Planning and Budget.

As of June 2010, Park City estimated that the city was at approximately 81% of build-out based upon approved sub-divisions and vested parcels. Approximately 2,200 residential units remain to be developed within Park City not including Park City Heights that was recently annexed. Of these remaining units, 775 are equivalent residential unit (ERUs) which are equal to 2,000 square feet of residential development. Table 1 provides the general location of the remaining residential units.

Table 14 - Approved Sub-division and Vested Parcel Units Remaining

Location	Single and Multi-Family Units	Residential Unit Equivalents	Total Units
Resort Center (North of 12th Street)	0	284	284
Old Town (South of 12th Street)	67	197	264
Rest of Town	1,349	294	1,643
Recently Annexed (Park City Heights)	239	0	239

The vested developments that are most likely to develop based upon Park City input are summarized in Table 2. It was assumed that the smaller developments and master planned developments (Treasure Hill) or pre-master planned developments (Park City Heights) would be developed by 2020 with the remaining vested developments and parcels built-out by 2040.

Since ERUs specify square footage and not the number of units, the 197 ERUs at Treasure were assumed to be developed as proposed with a total 305 units. This ratio of units to ERUs was also applied to the remaining ERUs in the PCMR parking lots (284 ERUs) and Snow Park Village – DV parking lots (210 ERUs) since these areas would likely develop with focus on overnight visitors and not full-time residents and as a result have more but smaller units. The remaining 84 ERUs were assumed to be single unit developments since they were not identified in the build-out summary.

Table 15 – Assumed Vested Developments by 2020 and 2040

Location	Assumed 2020 Development (Units)	Assumed 2040 Development (Units)
The Oaks	23	
Rail Central	24	
American Flag	25	
Aerie	30	
Snow Park Deer Crest	35	
North Sliver Lake – Lot 2B	54	
Sweeny Properties – Old Town	63	
Flagstaff/Empire Pass	71	
Park City Mountain Resort – Munchkin	80	
Sweeney Properties – Treasure	197	
Park City Heights	239	
Snow Park Village – DV Parking Lots		210
Park City Mountain Resort – Parking Lots		284
Unidentified Sub-divisions, and Parcels		1,095
Total	841	1,589

The housing unit totals were then used to calculate full-time households and population within Park City. It was assumed that future development in each TAZ would have a similar ratio of full-time households to second home and condos as existing development. The number of existing full-time households was estimated from the existing population estimate from GOPB and Park City using the average household size from the 2000 Census and 2005-2009 American Community Survey 5-Year Estimates. Table 3 shows the number of housing units, full-time household and population by year.

Table 16 – Park City Housing Units, Households, and Population

Year	Housing Units	Full-time Households	Population
2009	9,187	3,515	9,111
2020	10,014	3,962	10,080
2040	11,496	4,669	11,288

Tables 4 provides the future population for Park City, Summit County and Wasatch County. While the Park City population is expected to grow by about 24 percent from 2009 to 2040 based upon the vested developments, the Summit County is expected to grow by more than 150 percent and Wasatch County by more than 170 percent.

Table 17 – Regional Population

Year	Park City	Summit County	Wasatch County	Region
2009	9,111	40,704	23,913	**64,617**
2020	10,080	61,738	36,181	**97,919**
2040	11,288	104,620	64,631	**169,251**

Employment for the ERU developments at Treasure Hill, PCMR parking lots and the Deer Valley parking lots was estimated based upon square feet of planned use assuming development plans

similar to Treasure Hill. The number of square feet of each development was then converted to employment using the Fiscal Impact Analysis Model (FIAM) created for the Florida Department of Community Affairs (DCA). Additionally, it was assumed that while not explicitly included in the build-out summary, employment would grow at a similar rate to housing units due to employment densification and higher uses.

Tables 5 lists the future employment for Park City, Summit County and Wasatch County. Again, Summit and Wasatch Counties are forecast to grow faster than Park City. This is a strong indication that most of the region's growth is taking place outside of Park City's boundaries, yet will likely impact the city's transportation network as it remains a popular destination.

Table 5 – Regional Employment

Year	Park City	Summit County	Wasatch County	Region
2009	9,635	20,232	5,437	**25,668**
2020	10,842	41,250	17,941	**59,191**
2040	12,917	57,400	33,248	**90,648**

Planned Projects on SR-224 Outside of Park City

The Snyderville Basin Master Transportation Plan (MTP) and the draft UDOT 2011 Long Range Transportation Plan (LRTP) include projects to increase capacity on this section of SR-224. Generally, the plans are similar although project phasing does vary slightly. The planned improvements on this section of SR-224 are listed below.

The Snyderville Basin MTP SR-224 projects include:

- Widening SR-224 from I-80 to Bear Hollow by 2015
- Widening SR-224 from Bear Hollow to Canyons Resort Drive by 2020
- A new interchange at the current view area by 2030

The UDOT LRTP improvements to SR-224 include:

- Kimball Junction interchange improvements by 2020
- SR-224 widening from I-80 to SR-248 by 2030
- A new interchange at the current view area by 2040

SR-224 HOV Lane in Summit County

The Snyderville Basin MTP discusses making the outside lane of a widened SR-224 a limited use lane for transit and/or HOV. However, with the TTMP goal of 50% of vehicles on SR-224 being HOV more than one HOV or HOT lane may be required in order to maintain LOS C or better to incentivize their use.

Table 7 lists the estimated the number of HOV lanes required and screening LOS for the GP lanes. The LOS for HOV lanes is not provided since the estimated daily capacity is for LOS C or better. Based upon the existing HOV vehicle mode share on SR-224, only one HOV lane in each direction would be required for HOVs with 2 + occupants. However, with future person trip growth and more HOV vehicles with TTMP goals, additional HOV restrictions or more HOV lanes will be required.

Assuming the TTMP drive alone vehicle mode share goal and 90% eligible vehicles will use the HOV lane by 2020 additional HOV restriction will be required to maintain LOS C within the HOV lane. The HOV lane could be restricted to HOVs with 3+ occupants or an additional general purpose lane could be converted to an HOV lane.

However, conversion of a general purpose lane to HOV may be politically difficult. An additional option would be to use High Occupancy Toll (HOT) lanes with the HOV 3+ restriction to make the

HOV more efficient. Converting the HOV to an HOV 3+/HOT improves the LOS of the general purpose lanes without requiring additional HOV lanes.

Table 18 – Number of HOV Lanes Required on SR-224 from I-80 to Canyons Resort Drive

Year	HOV Restrictions	Number of HOV Lanes Required	Level of Service General Purpose Lanes
2009	2+ Occupants	1	C
2020	2+ Occupants	2	E
2020	3+ Occupants	1	E
2020	3+ Occupants/HOT Lane	1	C
2040	2+ Occupants	2	F
2040	3+ Occupants	1	F
2040	3+ Occupants/HOT Lane	1	D

Daily capacity of HOV estimated from *Operational Design Guidelines for High Occupancy Vehicle Lanes on Arterial Roadways* (1994).

One concern with HOV lanes north Canyons Resort Drive is the transition to the five-lane cross-section within Park City. If Park City decides to increase capacity on SR-224 by using the existing shoulder or widening SR-224, the HOV lane could be continued through the intersection of Canyons Resort Drive into Park City eliminating the concern. However, if the current SR-224 cross-section is maintained traffic merging from the HOV lane could be an issue. Based upon the traffic simulation, terminating the HOV lane north of Sun Peak Drive should allow sufficient time for drivers to merge without issue assuming that the HOV lanes are not continued into Park City. If a general purpose lane is converted to an HOV/HOT lane within Park City, additional study will be required to evaluate and minimize any potential traffic concerns.

Screening Capacity Analysis/Corridor Level of Service

A road's capacity can be estimated based on general roadway characteristics such as functional classification, posted speed limits, number of signals per mile and other data that varies by specific location. Often called "screening capacities," these help illustrate which roadway segments currently have or are likely to experience congestion issues in the future.

The general capacity of SR-224 was estimated using the *Arterial Level of Service Standards* created for the UDOT Environmental Division. UDOT, following AASHTO recommendations, suggests that a level of service (LOS) D is acceptable for urban areas. Table 6 provides the approximate LOS D capacity thresholds based on signal spacing and speed limit. Generally, the existing (five lane) LOS D capacity on SR-224 ranges from 26,100 vehicles per day to 38,900 vehicles per day depending on signal spacing. However, these daily capacity thresholds are only general estimates of LOS D capacity and can vary depending upon more specific traffic characteristics. For example, these daily capacities may be lower during the high-ski season when more of the daily traffic occurs during the peak hour when the resorts are out-loading.

Table 19: Screening LOS "D" Capacities

	High Speed Arterial (45+ mph)	Lower Speed Arterial (45< mph)	
Lanes	**0 to 2 signals per mile**	**1 to 3 signals per mile**	**3 to 5 signals per mile**
Five Lanes	38,900	38,300	26,100
Seven Lane	53,500	52,800	36,900

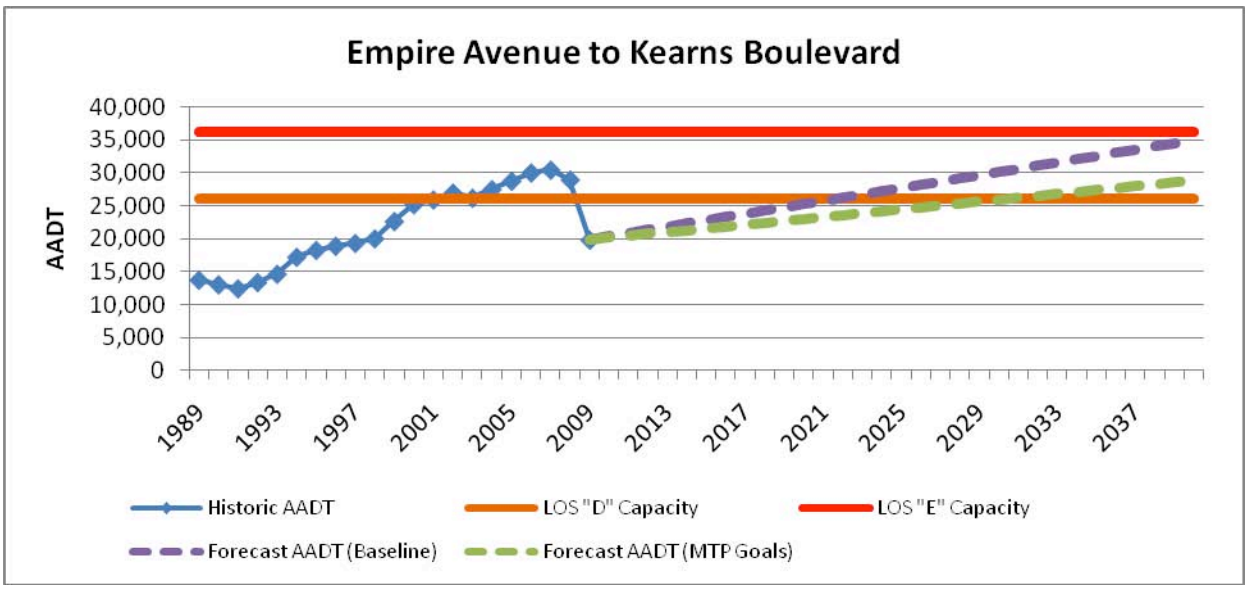
Although Park City is nearing build-out and is focused on sustainable development, it will remain a regional center and a trip generator. With the high growth rates expected in surrounding communities, there will be more transportation demand on the gateway corridors.

Historically, the highest traffic volumes on the SR-224 corridor are from Kearns Boulevard to Meadows Drive. However, future traffic growth is expected to be faster from Canyons Resort Drive to I-80 due to growth in Synderville Basin and a planned 8 million square feet of new commercial space at the Canyons Resort. As a result, this segment is expected to have the highest traffic volumes on the corridor by 2040.

Figures 6-8 show screening LOS D and F capacity as well as historic and future traffic volumes for various segments of SR-224 within Park City. Future traffic volumes are shown for two conditions: one uses a straight-line projection of baseline AADT (purple line) based upon model traffic growth and the other assumes achieving the mode split goals included in Park City's TTMP of 50 percent drive-alone rate and an baseline transit ridership of 1,150 two-way trips to and from Salt Lake City (green line).

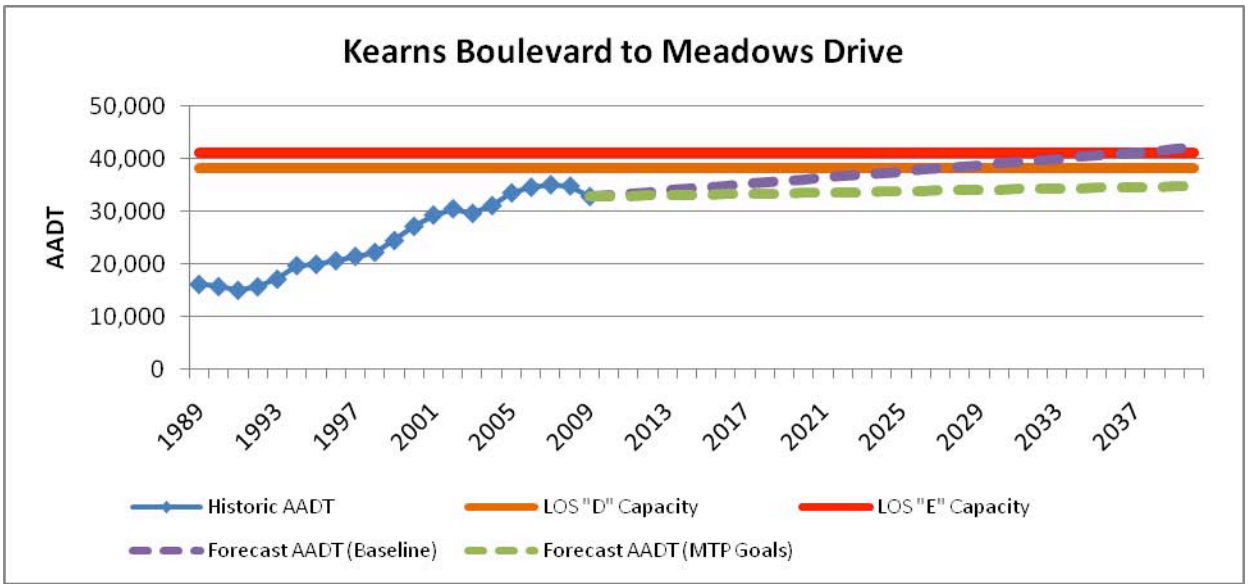
Traffic volume on SR-224 between Empire Avenue and Kearns Boulevard exceeded LOS D capacity from 2002 through 2008. However, there was a significant drop in traffic volume in 2009, lowering the traffic on this segment below the LOS D threshold. With the existing mode share and forecast traffic growth (purple), this segment is expected to exceed LOS D capacity again around the year 2022. If Park City achieves its mode split goals, this segment doesn't exceed the LOS D screening capacity until about 2030 (green).

Figure 18: Historic and Forecast AADT (Empire Avenue to Kearns Boulevard)



The segment of SR-224 from Kearns Boulevard to Meadows Drive has a higher capacity due to better signal spacing. As result, the existing traffic volumes are below the LOS D capacity. Assuming no changes in the drive-alone mode share and regional transit ridership, this section of SR-224 would reach the LOS D capacity by about 2028 and reach LOS F around 2037. However, assuming the Park City TTMP goals, traffic volumes on this section are still below the LOS D threshold by 2040.

Figure 19: Historic and Forecast AADT (Kearns Boulevard to Meadows Drive)



The SR-224 gateway to Park City between Meadows Drive and Canyons Resort Drive is well below the screening capacity based upon existing traffic volumes. Even if Park City does not achieve the TTMP goals this section of SR-224 is expected to be below the LOS D capacity in 2040.

Figure 20: Historic and Forecast AADT (Meadows Drive to Canyons Resort Drive)

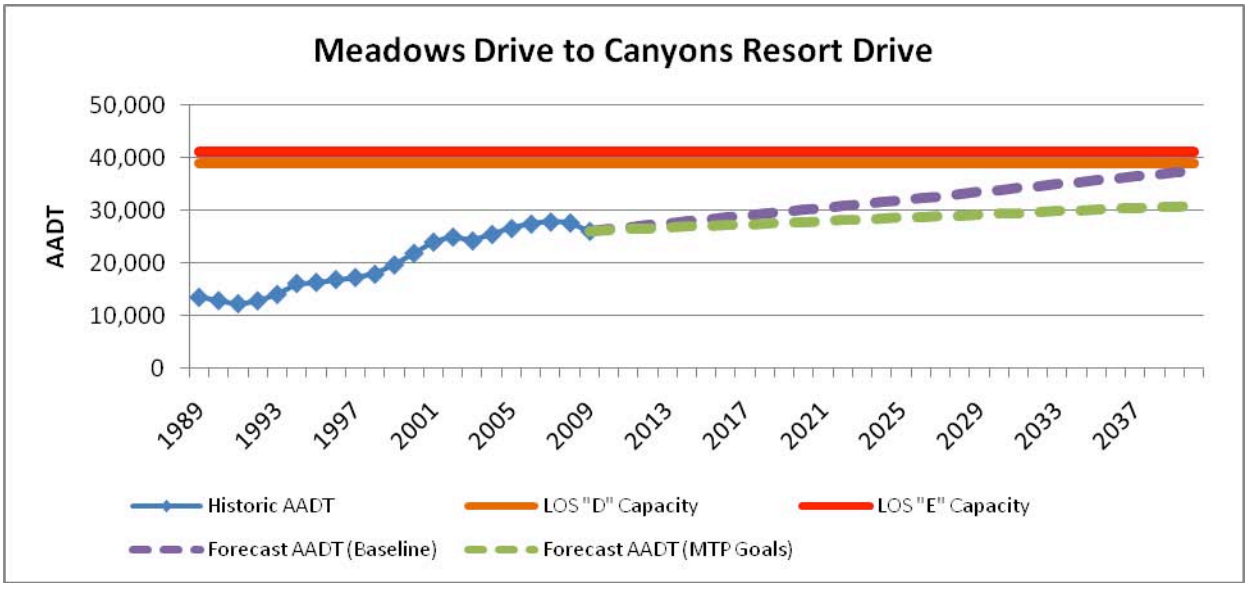


Figure 5 shows traffic volume and screening level of service for the entire corridor SR-224 for existing and future conditions. For the corridor analysis, it was assumed SR-224 would be widened from I-80 to the Canyons as planned in phase II (2021-2030) of the UDOT LRTP.

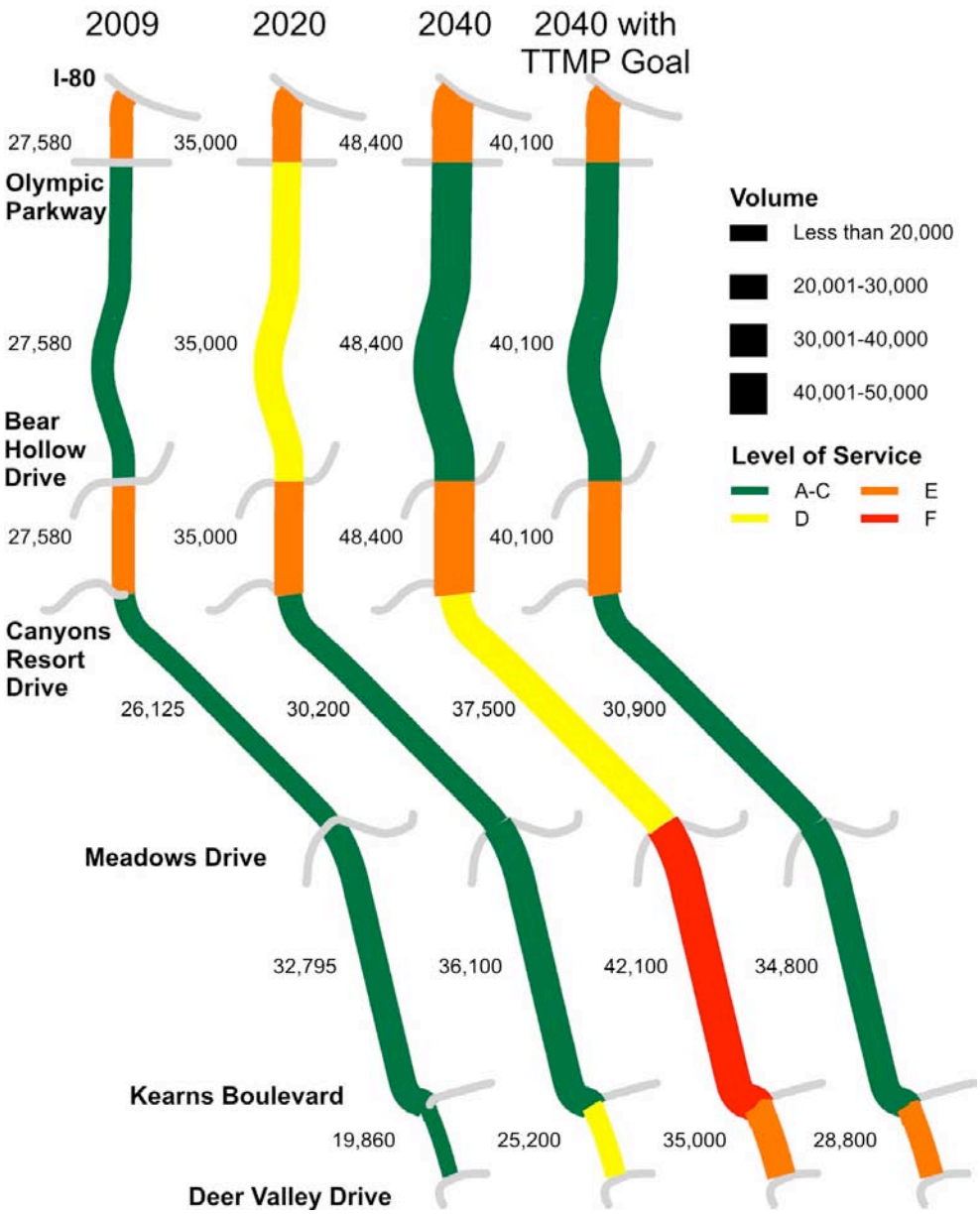
Although the segments of SR-224 from I-80 to Olympic Park, Bear Hollow Drive to Canyons Resort Drive and Kearns Boulevard to Empire Avenue have similar existing traffic volumes to the rest of the corridor, these segments have closely spaced signals which results in lower capacities

and considerably worse level of service. In 2009, the segments between I-80 and The Canyons have a screening LOS E, while the remainder of the corridor is at LOS C.

If Park City achieves its drive-alone mode share goal and regional transit goals, the SR-224 corridor should function at an acceptable LOS within Park City. However, even with the TTMP goals, there will continue to be capacity concerns from Empire Avenue to Kearns Boulevard and on some Summit County segments.

If Park City does not achieve the TTMP goals, based upon screening analysis there is expected to be severe congestion on SR-224. To address these concerns more detailed intersection and travel time analysis were conducted for the segments of SR-224 within Park City.

Figure 21



Intersection Level of Service

Intersection LOS is defined as how well an intersection or road segment operates based on levels A through F. Level A represents the best operating conditions and level F the worst. Typically LOS C or D service flow rates during the "peak hour" are used as minimally acceptable standards in order to ensure acceptable traffic operations. Table 8 illustrates the Level of Service (LOS) definitions for signalized intersections.

Table 20: LOS Criteria for Signalized Intersections

Level of Service	***Criteria for Signalized Intersections*** Average Control delay (seconds/vehicle)
A	0 – 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

Source: ***Highway Capacity Manual (HCM) 2000,*** Transportation Research Board National Research Council, Washington D.C., 2000.

The intersections LOS for signalized intersections were evaluated using Vissim, a traffic engineering software program published by PTV. One item to note is that the Vissim simulation incorporated dynamic assignment so vehicles could be rerouted if there is significant congestion at an intersection or intersections to less congested alternative routes. As a consequence, the level of service and travel times may understate the delay compared to static turn movement forecasts.

Based upon the results, there are no significant intersection LOS problems in the shoulder season. Even with future growth, the intersections should function at an acceptable LOS during the shoulder season as illustrated in Figure 9.

During the ski season, many of the intersections currently function at an acceptable level of service of LOS D or better during the afternoon peak hours. The important exception is the intersection of Deer Valley Drive/Empire Ave/Park Ave which has a simulated level of service "E" on high ski days. The actual level of service may be worse than this due to factors that can't be included in the model such as weather, unfamiliar drivers, atypical pedestrian behavior, etc.

Future LOS remains a concern at the intersection of Deer Valley Drive/Empire Ave/Park Ave and worsens at all but the intersection of SR-224/Snow Park. The most degradation in LOS is at the intersection of SR-224/Canyons Resort Drive which worsen to D by 2020 and F by 2040. Even though the LOS is the same with the TTMP goal, actual seconds of delay decrease at the intersection. Figure 10 provides the intersection LOS for high ski days.

Figure 22 – Shoulder Season Intersection Level of Service

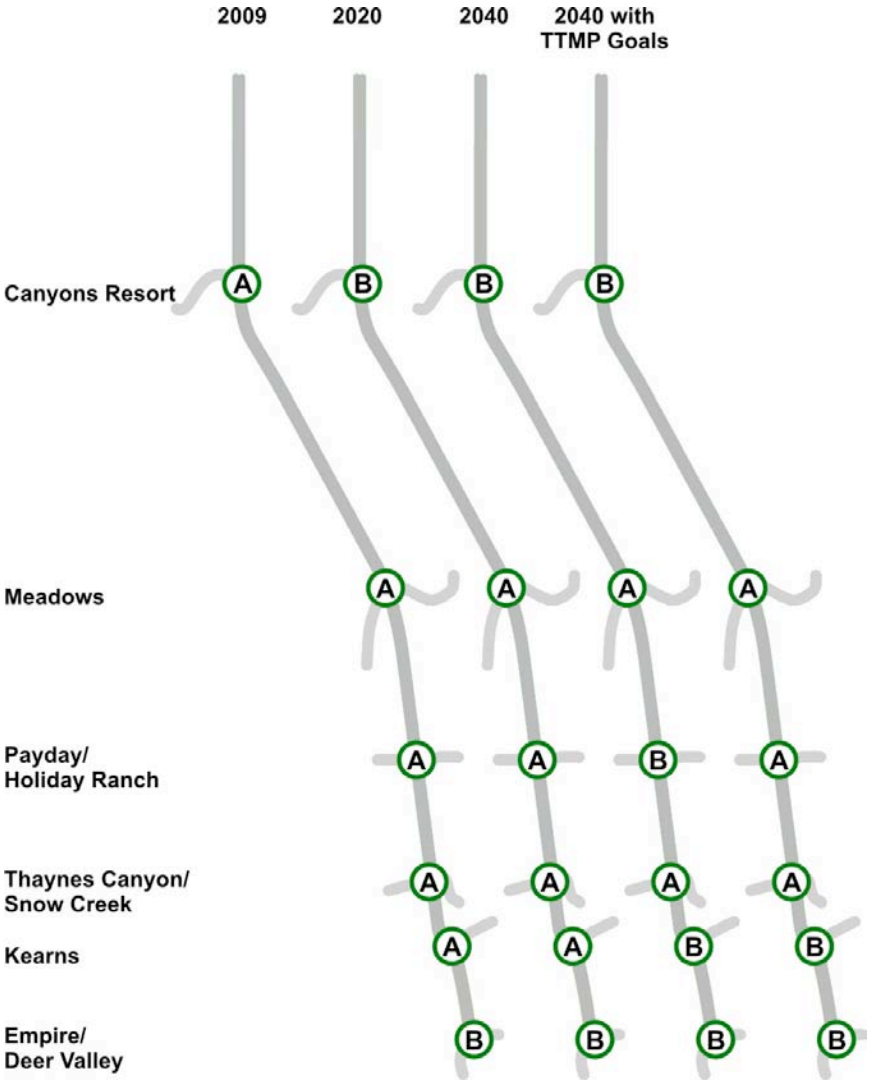
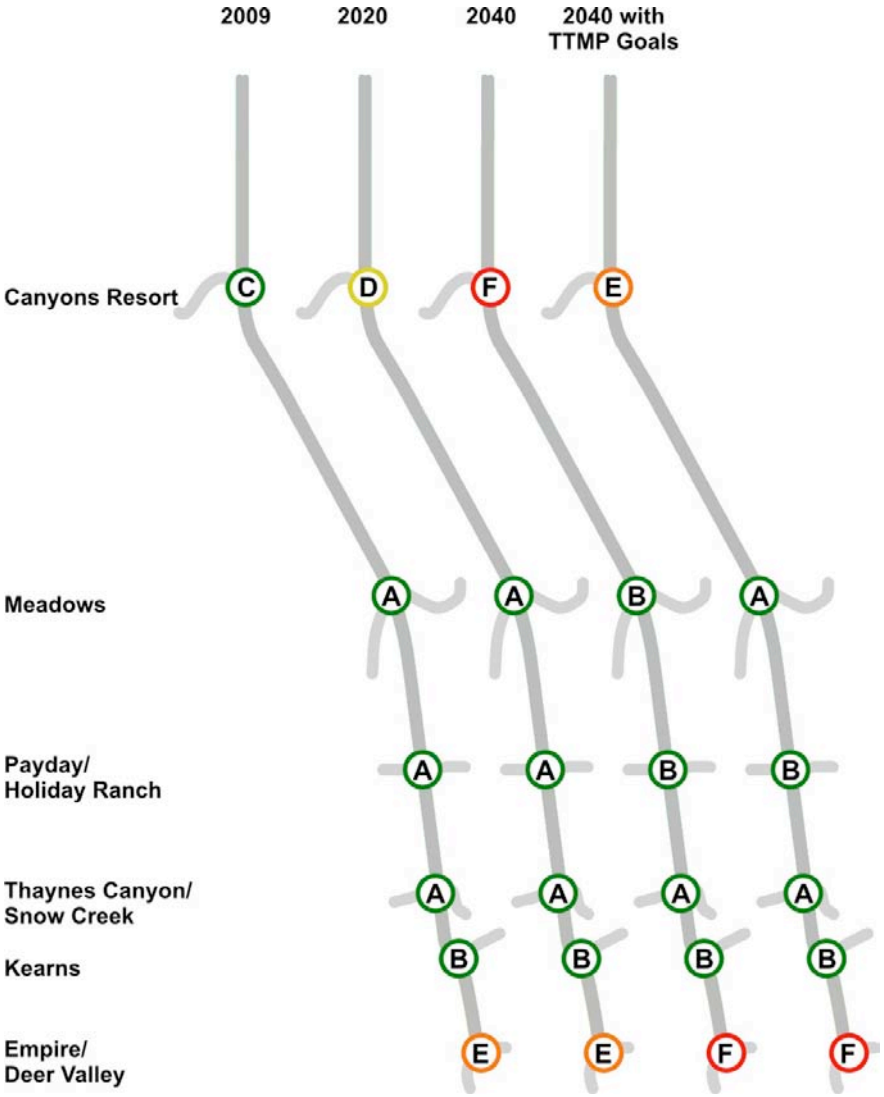


Figure 23 – High Ski Season Intersection Level of Service

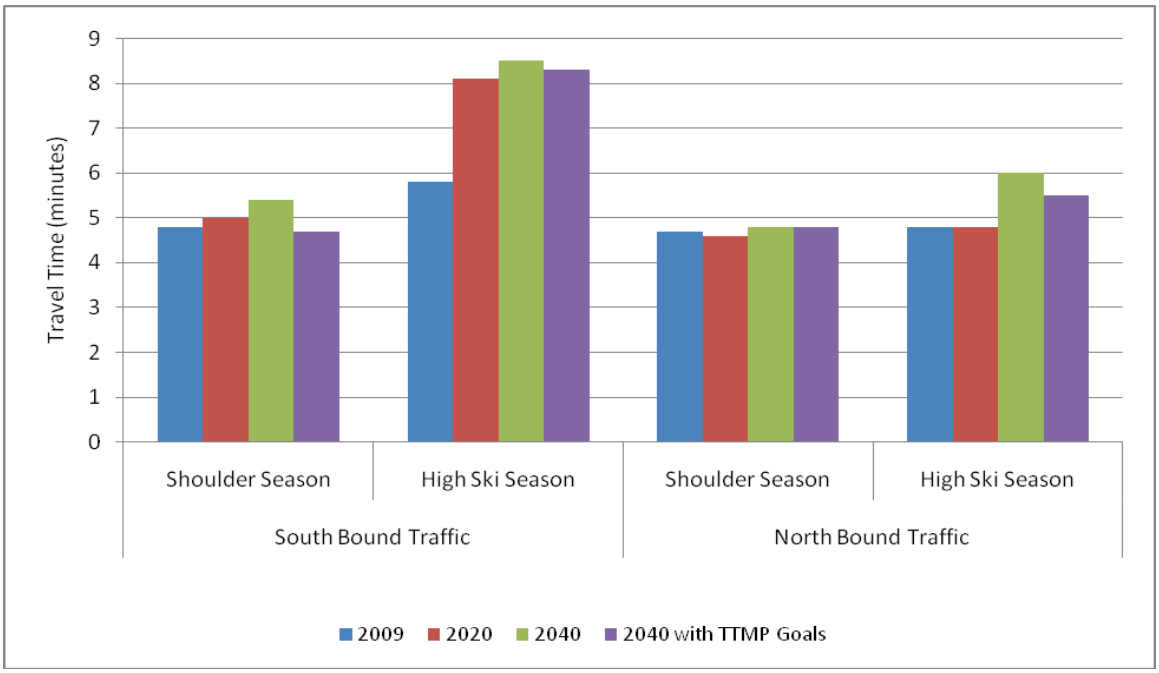


Corridor Travel Time

Travel time is an easy method to evaluate and relate the level of congestion on a particular corridor and the corridor travel times were simulated for the SR-224 corridor using Vissim. The corridor travel time covers an average thru trip from Canyon's Resort Drive to Empire Avenue and does not include delay for the first signal on the corridor. For example, the northbound travel time does not include delay from the signal at Deer Valley Drive/Empire Avenue/Park Avenue.

Based upon the simulation results, by 2040 the southbound travel times increase by about 13 percent in the shoulder season and by 47 percent during the ski season. For northbound traffic, the 2020 travel times are expected to be similar to today due to more traffic using SR-248 with the planned addition of HOV lanes. By 2040, northbound travel times increase by 25 percent without the TTMP goals, and 15 percent with the goals.

Figure 24- SR-224 PM Peak Hour Travel Times (Canyons Resort Drive to Empire Avenue)



Potential Capacity Alternatives

Since Park City cannot directly control how people choose to travel, there is some uncertainty as to how aggressive various strategies need to be in order to realize the TTMP drive alone and transit goals. To address potential capacity concerns on SR-224 if Park City does not reach the TTMP mode split goals, several general alternatives for the corridor were evaluated with respect to level of service on SR-224. These alternatives were assessed under a "worst case" scenario where the drive-alone rate and transit ridership is similar to today.

No Action

The no-action alternative assumes no improvements to either of the major gateway corridors of SR-224 or SR-248, or any new gateway corridors. Generally, this alternative assumes similar gateway capacity as today.

SR-248 HOV Lanes

This alternative assumes the SR-248 is reconfigured to add HOV lanes from Bonanza Drive to US-40. The SR-248 HOV lanes increase the total capacity of the gateway corridors but leaves SR-224 unchanged from today.

SR-224 HOV Lanes

The SR-224 HOV Lane alternative builds on the SR-248 HOV lanes alternative by increasing capacity on SR-224 by adding HOV lanes to the Deer Valley Drive/Empire Ave/Park Ave intersection. In addition to increasing capacity on SR-224, this alternative offers incentives to change the mode split with improved travel times for shared ride and transit trips. It also assumes HOV improvements on SR-248 described above.

SR-224 Widening

The SR-224 Widening alternative also assumes the SR-248 improvements and general widening of SR-224 to six general purpose travel lanes to the Deer Valley Drive/Empire Ave/Park Ave intersection.

Analysis of Alternatives

Figure 12 and 13 illustrates future intersection for the alternatives described above. The SR-224 corridor is expected to operate at an acceptable level of service during the shoulder season afternoon peak hour with no improvements to the gateway corridors. Adding an HOV or general purpose lane to SR-224 to Empire Avenue/Deer Valley Drive improves the intersection of Empire Avenue/Deer Valley to LOS D and LOS C respectively. However, widening the entire SR-224 corridor doesn't improve the intersection LOS at Canyons Resort Drive due to the ski out-loads. Future intersection improvements at Canyons Resort Drive are likely need to address the ski out-load and should be coordinated with Summit County to improve travel times for people leaving Park City.

Figure 25 - Year 2040 Shoulder Season Level of Service

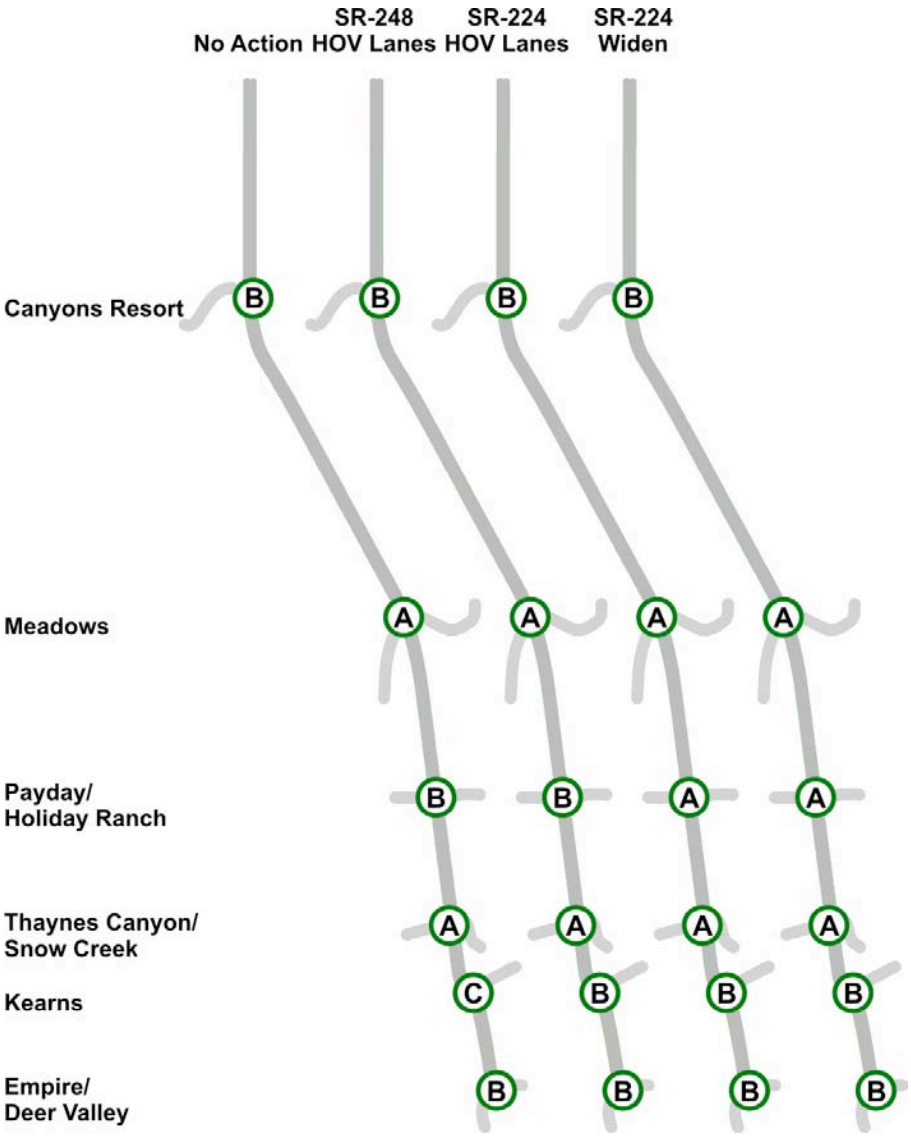
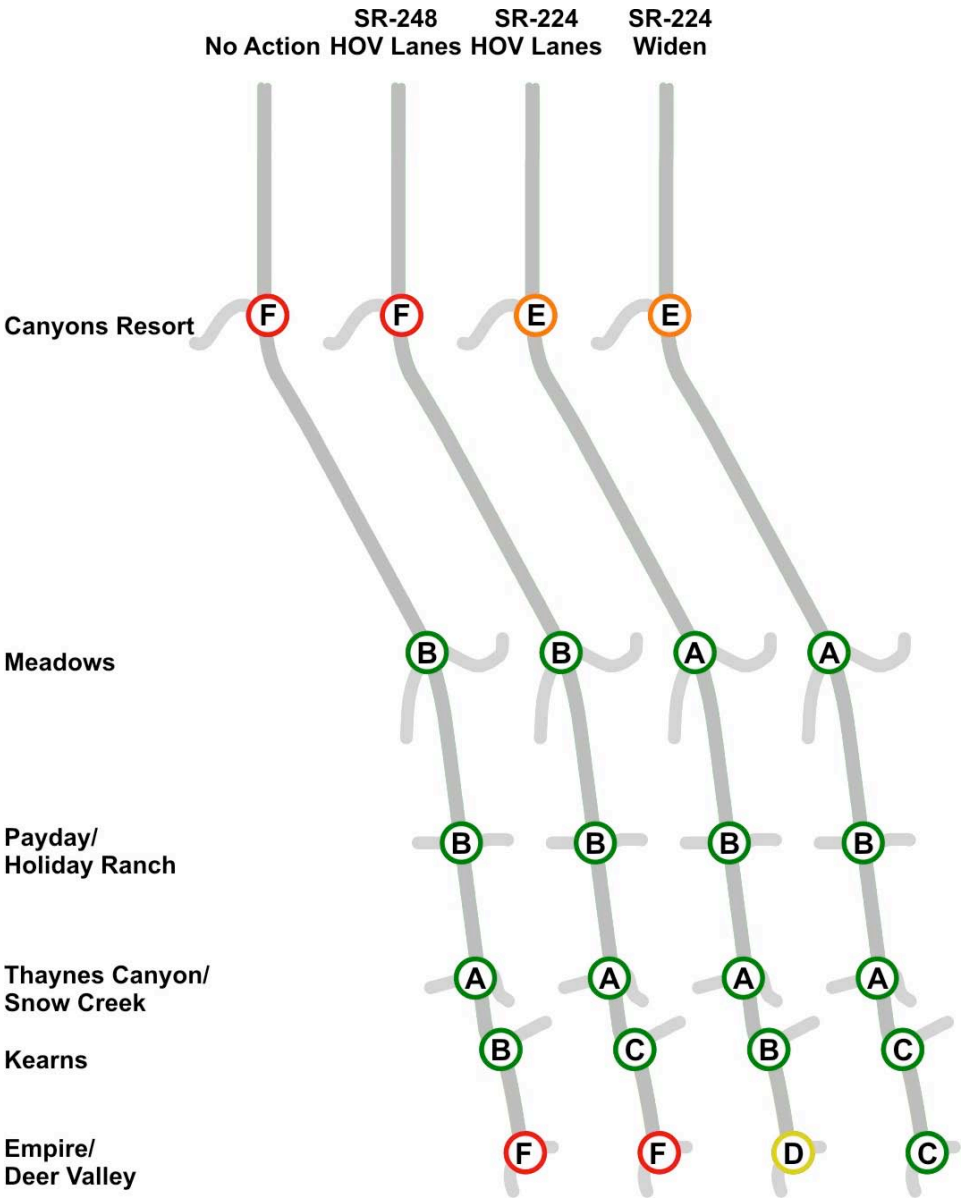


Figure 26 – Future High-Ski Season Level of Service



Deer Valley Drive/Empire Ave to Kearns Boulevard
Both the screening level of service analysis and Vissim modeling show that most of the corridor has sufficient capacity to meet existing and future vehicle demand. However, the corridor segment from Empire Avenue to Kearns Boulevard has existing and future capacity concerns. Based upon the alternatives analysis, only full corridor widening has been shown to improve LOS on this segment and specifically at Empire Avenue/Deer Valley Drive intersection.

Access Management
Traffic congestion in this section of the corridor is complicated by numerous driveways on the east side of the corridor. The Highway Capacity Manual suggests that free-flow travel speeds are reduced by 0.25 mph per access point. Consolidation of these access points through redevelopment of the area could marginally improve travel speeds and level of service on SR-224.

Pedestrian Management
In addition to numerous access points on this section of SR-224, pedestrian traffic at the intersection of Empire Avenue and the Fresh Mart pedestrian crosswalk contribute to reducing the vehicle capacity of the road. Removing the pedestrian conflicts at these locations could improve corridor and intersection performance by allowing more vehicles through the intersection during each cycle phase. Combining the existing crosswalk with a coordinated signal as part of access consolidation discussed above could potentially reduce pedestrian conflicts. A grade-separated crossing also could be used to minimize pedestrian conflicts.

Right-of-Way Constraints
In the event that Park City doesn't achieve its TTMP mode split goals and/or roadway capacity expansion is desired for the SR-224 corridor, a right-of-way analysis was completed to determine what, if any, right-of-way constraints exist. Currently, most of the SR-224 corridor has a pavement width of approximately 82 feet which is consistent with the typical right-of-way for a five-lane UDOT arterial as shown in Figure 12. For the right-of-way analysis, a 106 foot right-of-way was assumed as the lower bounds for future capacity enhancement. These bounds were chosen since a 106 foot right-of-way could accommodate an additional travel, bus, or HOV lane with narrower 11' travel lanes and a 12' center turn. Alternatively, the center turn lane could also be replaced by narrow shoulders or a bike lane.

Figure 27: Standard UDOT Five-Lane Cross-section, 106' Right-of-Way

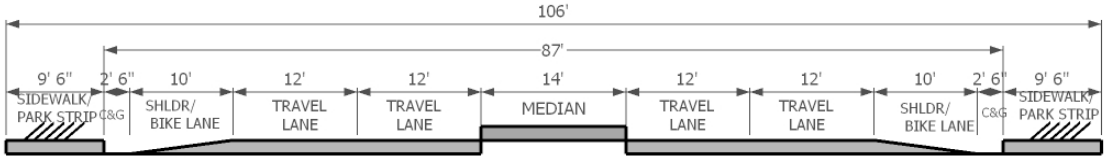
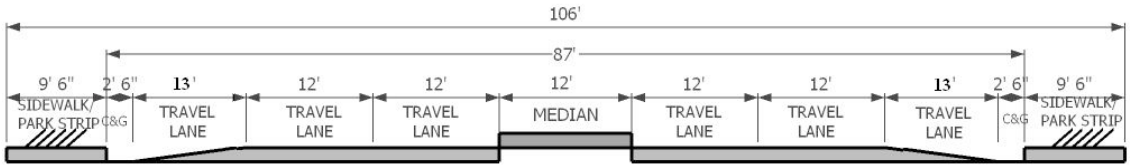


Figure 28: Modified Seven-Lane Cross-section, 106' Right-of-Way

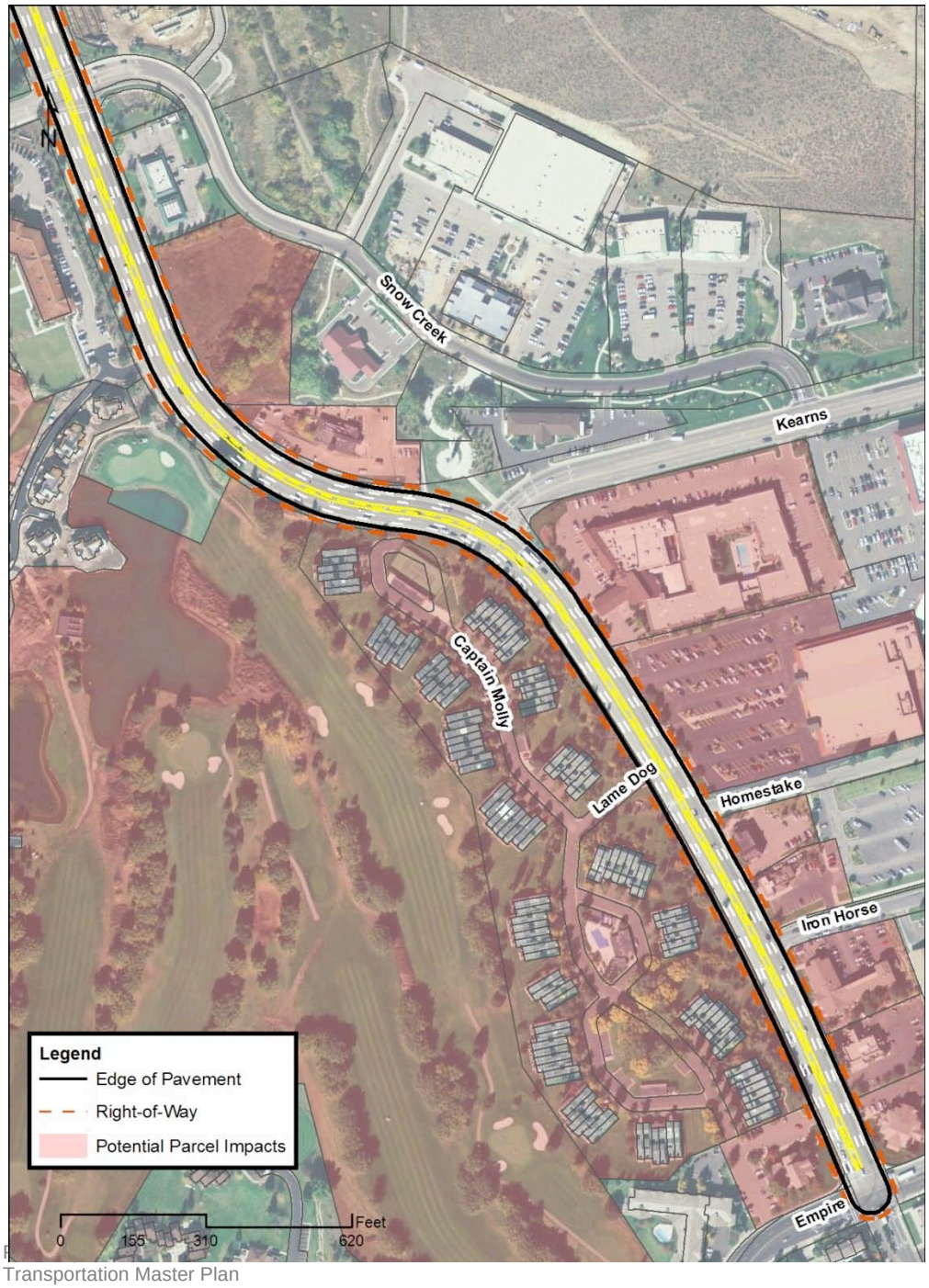


Assuming the 106 foot right-of-way and symmetrical widening of SR-224, Table 10 provides the number of parcels and structures that potentially would be impacted by widening SR-224. The impacts are concentrated between Kearns Boulevard and Deer Valley Drive/Empire Ave. Figure 14 illustrates which parcels might potentially be effected.

Table 21: Summary of Impacts from SR-224 Widening

Highway Segment	Parcels	Acres
Canyons Dr. to Kearns Blvd.	3	0.01
Kearns Blvd. to Deer Valley Dr.	9	0.94
Total	**12**	**0.95**

Figure 29: Impacted Parcels with Seven Lane Cross-section



Appendix F: Long Range Transit Assumptions

Transit

While Park City provides existing robust transit service within Park City and Summit County, the strategic objectives that accompany master plan goals necessitate additional transit service to meet these goals by the year 2040. Specifically, the objectives will require more service, larger service areas, and higher frequency transit service on key transit corridor or spines.

Internal Transit

Within Park City, the strategic objectives call for a significant increase in the amount of transit service provided with 450 daily bus service hours by the year 2040. In fiscal year 2010, Park City Transit supplied total of approximately 70,000 annual service hours including external transit service to The Canyons and Kimball Junction.

Based upon the 2010 summer and winter transit schedule, daily transit service within Park City alone was estimated at about 200 daily service hours during the winter and 110 daily service hours in the Summer. The 2011 winter schedule increased the estimated daily hours to 219. In order to meet the 450 daily service hour goal by 2040, on average an additional 9 daily service hours are required.

While this future transit service is planned by the Transit Development Plan, which is currently being updated, as part of TTMP several general goals emerged to guide transit planning. Objective 1.b aims to increase the transit service area so that 90 percent of housing units with densities equal to or greater than 4 units per acre will be within ¼ mile transit. Figure X shows the existing transit service area, and estimated densities. The neighborhoods without transit service and densities at or approaching 4 units per acre include: Solamere, Park Meadows, The Aerie, and Iron Canyon. New transit service would also be required to the Richardson Flat Park and Ride which was identified as a spine route.

Objective 2.b strives to increase transit frequency on major corridor or spines to 10 minutes. Much of the spine network, such as Main Street and the Deer Valley Drive, already meet this objective during the winter season but some segments of the spine network currently have less frequent or limited transit service. For example, spine network to Quinn's Junction currently is only served by dial-a-ride service. Figure 2 illustrates the transit spines that were identified as part of the plan.

Figure 30 – Transit Service Area and Residential Densities

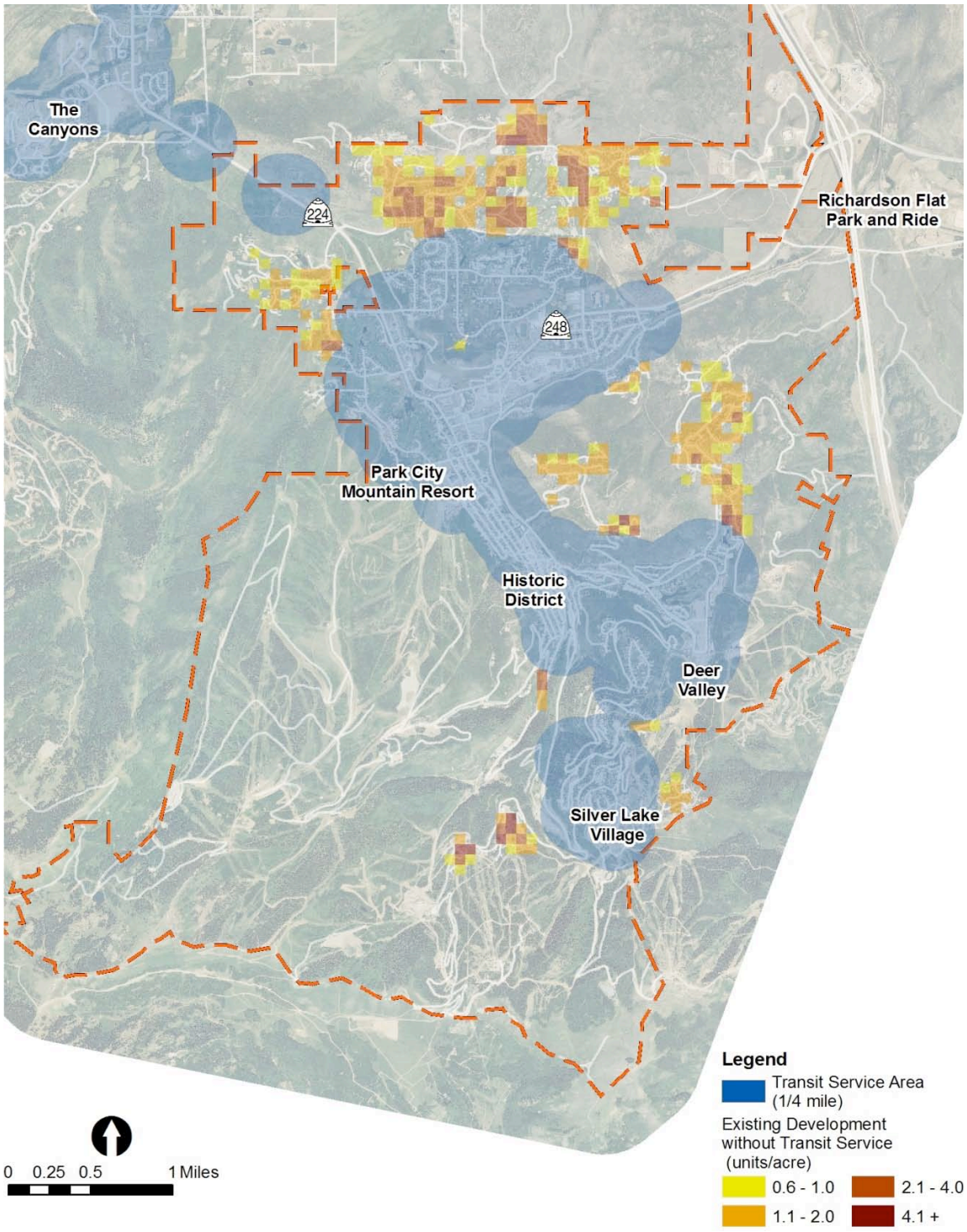
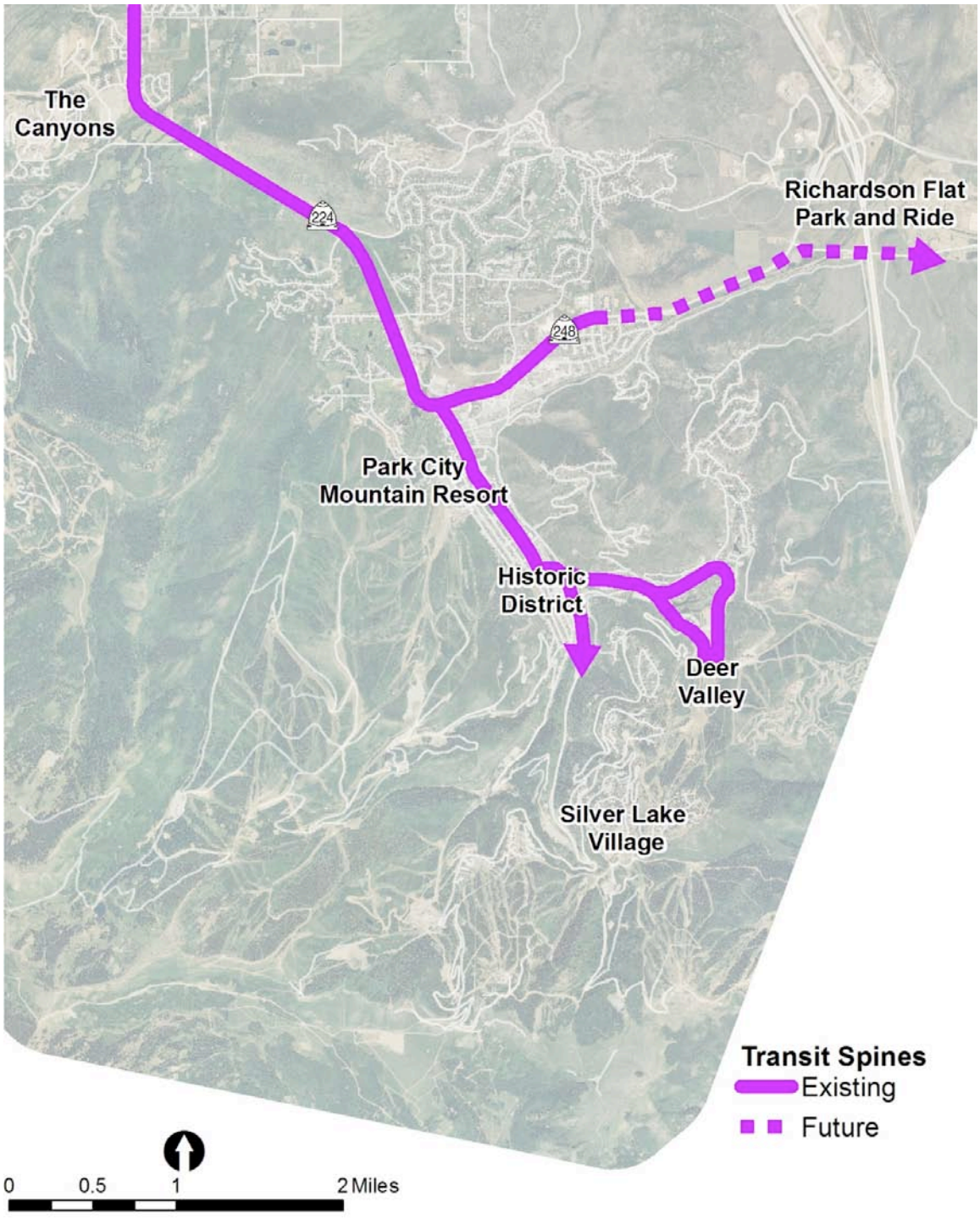


Figure 31 – Park City Transit Spine



The internal transit goals broadly supply enough service to increase transit frequency to 10 minutes on all transit spines, offer 10 minute service to Quinn's Jct. Park & Ride, and provide new 20 minute transit service to existing neighborhoods that do not have transit service. While Park City Transit has established a transit service standard to not serve residential areas of densities

of less than four units per acre, four neighborhoods have densities at or approaching this density threshold. For simplicity, this analysis assumed that future service would extend to these areas although these neighborhoods have marginal densities.

Based upon the winter 2010 transit schedule, much of the transit spine has 10 minutes service frequency or sufficient transit service to meet the service goal if arrival times were more evenly distributed. The only exceptions are Kearns Boulevard, and SR-224 south from Main Street to Empire Pass. New transit service to Quinn's Junction should address transit service frequency on most of Kearns Boulevard. However, depending on routing of the Quinn's Junction service part of the transit spine from Park Ave to Bonanza Drive would not meet the goal if the new service was routed to the transit center via Bonanza Drive. Again, for simplicity, it was assumed the service frequency for the routes that currently operate on these sections of Kearns Boulevard and SR-224 would be 10 minutes in order to meet the goal.

Tables 1 and 2 provide the estimated daily service hours for extending transit service to new areas and increasing transit frequency on the spine network. The estimated service hours required to meet the transit service goal are likely higher than would be estimated with a more detailed analysis since this simple analysis doesn't consider route redesign or efficiencies. However, this estimate should provide sufficient transit service to meet the goal but allow flexibility to deliver transit service that exceeds the goal with future transit plans.

Table 22 – New Transit Service Hours

Route	Future Frequency (minutes)	Route Transit Time	Daily Route Trips	Estimated Service hours
Richardson Flat Park and Ride	10	40	96	64
Solamere	20	29	48	23
Park Meadows	20	34	48	27
Aerie	20	16	48	13
Iron Canyon	20	27	48	22
Total				149

Travel times based upon Google estimates and assume transit speeds are 0.7 of drive speeds to account for boardings and alightings. Daily service hours assume 16 hours of service.

Table 23 – Increased Transit Service Hours

	Route	Existing Frequency (minutes)	Future Frequency (minutes)	Existing Daily Service Hours	Future Daily Service Hours
1	Red	20	10	31	62
2	Green	20	20	43	43
3	Blue	20	20	31	31
4	Orange	30	20	28	28
5	Yellow	20	20	30	30
9	Lavender	30	10	31	93
	Trolley	15	20	13	13
	Early Morning/Late Night			12	12
	Total			219	312

External Transit

The transportation plan goals also propose for expanding regional transit services. The objectives aim for 350 daily service hours by 2040 up from approximately 85 daily hours in the winter and 58 daily hours during the summer in 2010. On average, this translates to an annual increase of 9 daily service hours. To meet the plan objectives, the increased transit service will need to connect Park City with at least commuter transit service to five other cities/communities along the Wasatch Front and Back.

Based upon previous transit study and input received as part of the MTP, five regional markets were identified. Figure 3 shows these markets and include:

- Salt Lake City,
- Heber City,
- Kamas and Oakley,
- Jordanelle, and
- Utah County.

The external transit service goal should be able to provide regular service (30 minute service, 14 hours a day) to all the external transit markets and 15 minute service to Kimball Jct. and Salt Lake. Based upon an additional 9 hours per year Table 3 summarizes when new service can be provided for each market. The assumptions for the transit route times and Park City share of service provision are in Table 4.

Table 24 – Estimated Year New Service Could be Provided by Market

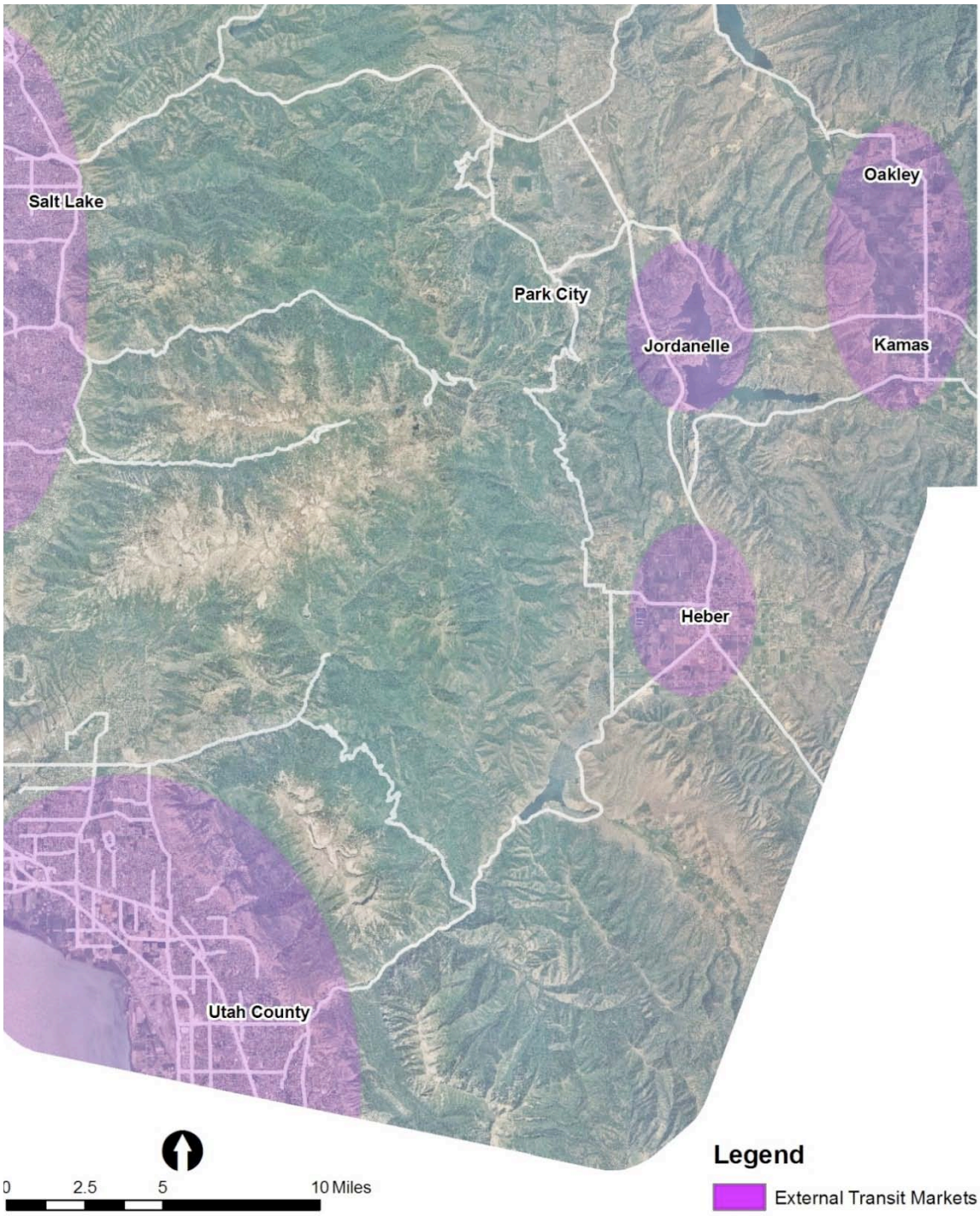
Market	Peak Service	Hourly Service	½ Hour Service	15 minute Service
Kimball Junction	Existing	Existing	Existing (Pink)	2032 Corridor, 2038 Routes
Salt Lake	2012	2018	2022	2033
Heber/ Jordanelle	2013	2019	2024	NA
Kamas/Oakley	2015	2020	2027	NA
Utah County	2017	2021	2030	NA

Table 25 – New External Transit Assumptions

Market	One-way Drive Time		One-way Transit Time		Park City Daily Service Hours with Hourly Service
	Total (min)	Park City Share (min)	Total (min)	Park City Share (min)	
Salt Lake	58	18	83	26	12
Heber/Mayflower	28	28	40	40	19
Kamas/Oakley	32	32	46	46	21
Utah County	61	44	87	63	29

Travel times based upon Google estimates and assume transit speeds are 0.7 of drive speeds to account for boardings and alightings. Daily service hours assume 14 hours of service.

Figure 32 – Regional Transit Markets



Annual Operating Cost Increase for New Internal/External Service

The annual cost increase associated with the increase in internal/external transit service to reach the Park City's objectives and goals was estimated using Park City Transit's 2010 cost model. The cost model is:

Operating Cost = $44.73 x annual vehicle service hours +
$1.14 x annual vehicle service miles +
$2,941.18 x Number of revenue vehicles +
$993,681 in annual fixed costs.

While service hours are known for internal/external transit, service miles were not calculated since they are route specific. For the cost estimate, service miles were estimated from the 2010 ratio of service hours to service miles. However, this may understate the number of future service miles, since external transit service will likely have a higher operating speeds on the lower volume/higher speed roads to the external markets.

Table 5 provides the annual operating cost increase to meet the TTMP goals. The annual increase of approximately 15 daily service hours for internal service, and 9 service hours for external service will increase operating costs by about $740,000 per year in 2010 dollars.

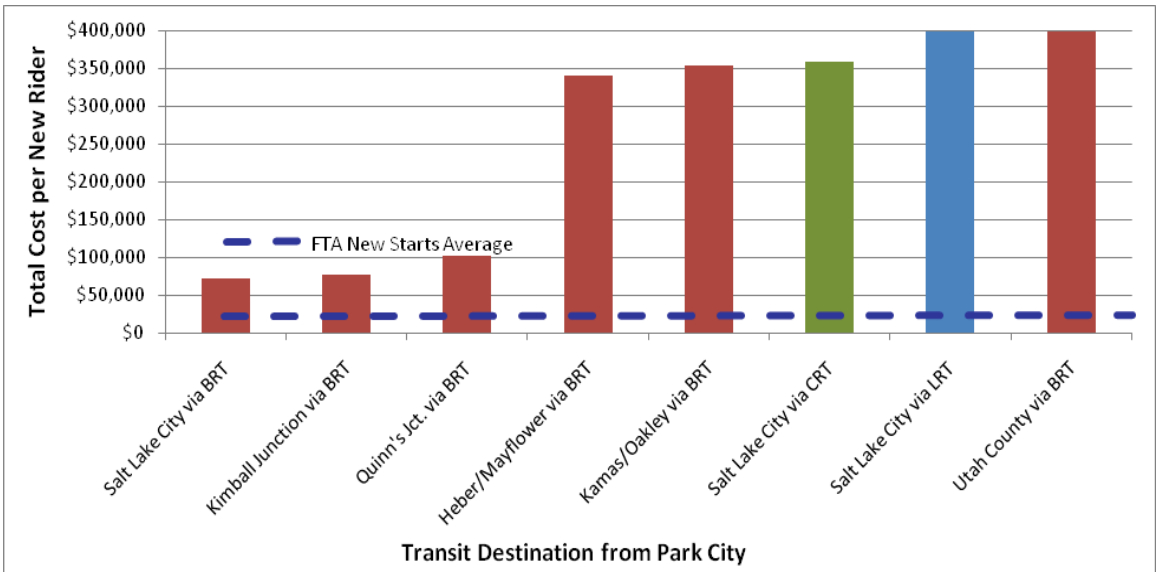
Table 26- Annual Cost Increase for New External Transit Service

	Internal	External
New Winter Daily Service Hours	15	9
New Summer Daily Service Hours	18	10
New Annual Service Hours	6,260	3,444
New Annual Service Miles	94,469	51,973
Annual Operating Cost (2010 $s)	$480,000	$260,000

Capital Projects

In addition to increased/improved bus service, several capital projects were identified during the Transportation Plan. These concepts ranged from bus rapid transit (BRT) from the Richardson Flat Park & Ride to light rail (LRT) or commuter rail (CRT) between Park City and Salt Lake. High level ridership and cost estimates were compared to others capital that have received Full-Funding Grant Agreements (FFGA) from the Federal Transit Administration (FTA). Figure X provides the estimated cost per new rider of proposed capital transit projects. While the FTA no longer use cost per new rider for cost effectiveness, this metric provides a quick comparison to transit projects that have received FFGAs. Based upon the cost per new rider, BRT to Kimball Jct. or Salt Lake City may be competitive but would require additional study. However, capital projects other destination and mode would likely not be competitive for federal funding.

Figure 33 – How Potential Capital Projects Would Compete for Federal Funding



Ridership

Table 6 shows the potential commuter ridership and total ridership demand for the remaining regional transit markets assuming high level of transit service. The commuter ridership was estimated based upon journey to work data from Bureau of Transportation Statistics, Census Transportation Planning Package. Total ridership was calculated from the estimated commuter ridership and trip purpose/mode data from the 2009 National Household Transportation Survey (NHTS).

Of the regional markets, Kamas/Oakley has the highest estimated ridership followed by Heber City. Although the ridership is fairly low, peak period service with on am trip to Park City and one pm trip from Park City may be viable. These markets appear to be the next reasonable targets for regional transit service expansion once Salt Lake commuter service is established.

Although Jordanelle has the lowest ridership of the regional markets, transit service could be supplied by routes to Heber and Kamas/Oakley. This would not only provide service to Jordanelle but would also improve ridership on these routes. As a result, providing transit service to Hideout, Deer Mountain and Mayflower should be considered with any transit service expansion to Heber City or Kamas/Oakley.

Table 27 – Ridership Demand Estimates

Area	Commuter Trips (Work Trips) To Park City	From Park City	Total	Mode Share	Daily Round Trip Ridership	Annual Ridership	All Trips Daily Round Trip Ridership	Annual Ridership
Heber	287	53	340	5%	32	11,800	149	54,400
Kamas/Oakley	396	54	450	5%	43	15,600	197	71,900
Jordanelle (Hideout/Deer Mountain/Mayflower)	36	5	41	5%	4	1,400	18	6,500
Utah County	70	95	165	5%	16	5,700	72	26,400

Table 7 shows the elasticities used to estimate ridership with BRT, LRT, CRT.

Table 28 – Ridership Estimates by Mode

	ALTERNATIVE			Kimball BRT		Salt Lake BRT		Heber BRT		Kamas BRT		Utah Co. BRT		Rail Trail BRT			Salt Lake LRT		Salt Lake CRT
1	Ridership Demand			1420		2318		167		197		72		2212			2318		2318
	Source: Park City Transit Year over Year Ridership Count Comparison for Kimball Junction. Salt Lake Ridership from Salt Lake City, Summit County, Park City Transit Business Case 2010. Ridership demand assumes 30 minute headways. Rail Trail BRT Ridership is based upon ITE trip generation rates for Park and Ride with Bus Service and 750 Park Stalls and Assumes SR-248 Vehicle Occ. of 1.31																		
		% change	Value																
2	**Travel Time Elasticity**	***per 1% change in travel time***		TT		TT		TT		TT		TT		TT			TT		TT
	Old travel time (min)	**16.857143**		83		40		46		87		20					83		83
	Miles Bus Lane	**6.8**		32.4		18.1		22.1		44.1		5					32.4		32.4
	Travel time saving (min)	**3.4**		**16.2**		**9.05**		**11.05**		**22.05**		**2.5**							
	New travel time	**13.457143**		**66.8**		**30.95**		**34.95**		**64.95**		**17.5**					**58.5**		**41.58**
	% change	**-0.20**		**-0.20**		**-0.23**		**-0.24**		**-0.25**		**-0.13**					**-0.30**		**-0.50**
	High value (-0.35)	**-0.35**	0.07	100	0.07	158	0.08	13	0.08	17	0.09	6	0.04	97			0.10	239	0.17	405
	Source: "*Patronage Impacts of Changes in Transit Fares and Services*" by Ecosometrics, Inc. 1980. Travel time savings from TCRP Report 185 Table S2. Bus lanes assumes a travel time saving of 0.5 minutes per mile due to higher operating speeds. Light Rail Assumes Average Speed of 40 mph and dwell Time 45 seconds for 22 stations and commuter rail 50 mph with 6 stations																		
3	**Service Elasticity**	***per 1% change in service frequ***		SE		SE		SE		SE		SE		SE			SE		SE
	Base headway	20		30		30		30		30		10					30		30
	New headway	15		15		15		15		15		10					15		30
	% change	-0.25		-0.5		-0.5		-0.5		-0.5							-0.5		0
	Off Peak	**-0.46**	0.12	163	0.23	533	0.23	38	0.23	45	0.23	17	0.00	0			0.23	533	0.00	0
						533		38		45		17						533		0
	Source: Mayworm, Lago, McEnroe (1980)																		
4	**Other Variables (amenities, image, and branding)**																		
	Low value (10 %)	0.10		142		232		17		20		7		221	Low value (1		0.15	348	0.15	348
	Source: Information from various BRT lines (Silver Line, Boston; MetroRapid, LA; B-Line, Vancouver)																		
5	**Grand Total**			1830		3240		240		280		100		2530			3440		3070

Capital Costs

High level planning cost estimate were used to estimate the cost per rider. These planning costs assumed $4.5 million per mile for BRT, $15 million a mile for CRT, and $40 million a mile.

Salt Lake City Ridership and Costs

Utah Transit Authority (UTA) completed a business case in November 2010 for transit service between Salt Lake City, Summit County and Park City. This service would link Salt Lake Central Intermodal Center, The University Utah, Foothill, Jeremy Ranch, Kimball Junction, The Canyons, Park City and Deer Valley. The preferred service scenario would provide am and pm peak period service with:

- 5 trips to Park City/ 3 to Salt Lake in the am peak, reverse in pm from December to April
- 3 trips to Park City/ 2 to Salt Lake in the am peak, reverse in pm from April to August
- 3 trips to Park City/ 3 to Salt Lake in the am peak, reverse in pm from August to December

The ridership demand was estimated at 2,318 daily riders. However, with the proposed service scenario and fare structure daily ridership is estimated at 1,030 to 1,133 daily riders. The proposed service would require six vehicles and is estimated to cost about $589,000 per year assuming UTA's cost structure.

Appendix G: Public Involvement

A Stakeholder Committee has been acting as a sounding board for transportation goals and objectives and to provide guidance on transportation alternatives. The following organizations were asked to participate on this committee:

- Park City Mountain Resort
- Deer Valley Resort
- Summit County
- Wasatch County
- Park City School District
- Chamber of Commerce
- Historic Main Street Business Association
- Lodging Association
- Mountain Trails
- Planning Commission
- Park City
- Sundance
- Fire District
- Utah Department of Transportation
- Park City Area Home Builders
- Snyderville Basin Water Reclamation District
- Prospector Square Homeowners Association
- Historic Preservation Board
- Recreation Advisory Board
- Envision Utah
- Ski UTah
- ADA Advocate

Park City Traffic and Transportation Master Plan
Stakeholder Committee
June 16, 2010
4:00 – 5:30pm
Agenda

1. Welcome & Introductions
2. Process & Schedule
3. Public Involvement
   - Role of the Stakeholder Committee
4. Goals and Policies
5. Land Use Scenarios & Transportation Alternatives
6. Next Steps

Park City Traffic and Transportation Plan
Stakeholder Committee Meeting Summary
June 16, 2010

Below is a summary of the first Stakeholder Committee meeting held on Wednesday, June 16, 2010. Following

1. Welcome & Introductions

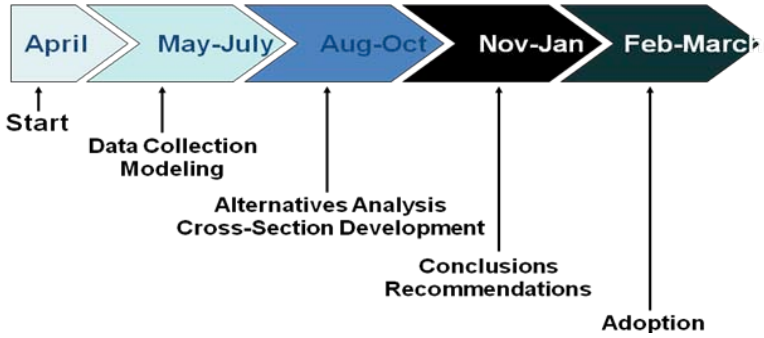
Attendees

Lisa	Baird	UDOT - Region 2	Michael	Boyle	SBWRD/PCSD
Robert	Miles	UDOT - Region 2	Kevin	Callahan	Summit County
Matt	Cassel	PCMC	Geri	Strand	PC HBA
Brooks	Robinson	PCMC	Colleen	Burke	PC Chamber Bureau
Sayre	Brennan	PCMC	Alison	Butz	HMBA
Thomas	Eddington	PCMC	Kenzie	Coulson	Sundance Institute

Roger	Burns	Deer Valley	Jenni	Smith	PCMR
Bob	Wheaton	Deer Valley	Matt	Riffkin	InterPlan Co.
Scott	Adams	PC Fire District	Suellen	Heath	InterPlan Co.
Adam	Strachan	PC Planning Comm	Rob	Eldredge	InterPlan Co.
			Andrea	Olson	InterPlan Co.

2. Process & Schedule

- Stakeholders will *guide* transportation plan but will not *approve*
- Year-long process (3-4 meetings)
- Ask questions
- No polarizing decisions



3. Public Involvement

- Planning Commission and City Council
- Approximately quarterly updates
- Other updates as needed
- Public Workshops/Open Houses
- Twice during planning process
- Stakeholder Committee
    - Meet three times throughout process
    - Act as a sounding board for transportation goals and policies
    - Provide guidance on transportation alternatives
    - Help provide outreach for public meetings

4. Goals and Policies

- Based on information from Park City Vision process
- Need to provide a foundation for transportation decision-making and policies
- Will ultimately be adopted in the General Plan and Transportation Plan

5. Land Use Scenarios & Transportation Alternatives

- Build a travel model to predict and display travel conditions
- Look at future land use changes and alternative transportation networks
- Input will guide the transportation alternatives considered
- Assist in interpreting travel model results

The Transportation Plan will consider several land use options including:

- Development outside of Park City
- Entitled or zoned development within Park City
- Cumulative effects of potential new development within Park City

Various transportation options will be evaluated including:

- Strong promotion of single-occupant vehicle travel reductions
- Widening SR-224 and/or SR-248 to include priority bus or carpool lanes
- New and expanded transit both within Park City and to outside communities
- Intersection improvements including new round-abouts and/or added turn lanes

6. Next Steps

- Bike ride, June 25th
- Stakeholder committee, September 14th
    - Review public open house information
    - Review alternatives analysis
    - Review draft cross-sections
    - Review performance measure standards
- Meeting reminder will be e-mailed to you

Key-Pad Polling Results Summary

- We do a good job of serving visitors/guest and residents.
- Don't do a good job of serving commuters to PC and commercial traffic
- Highest priority should be residents and commuters to PC
- Goal of the transportation network should be top notch transit, followed equally by minimizing vehicle delay and creating a bike/ped route that is safe and easy
- PC is closest to achieving safe/easy to bike/walk followed by minimizing neighborhood traffic
- City is furthest from reducing carbon emissions and minimizing vehicle delay
- The amount of roads/capacity the city has today is about right, maybe too little
- Today's level of transit is somewhat too little, but about right
- People generally want more sidewalk/trails
- People would widen asphalt to include bike lanes and transit
- People would be willing to give up parking/turn/travel lanes for bicycle lanes although many would widen roadway in order to not reduce amenities
- With limited financial resources, most would choose to maintain existing street network and invest in transit improvements
- The highest priority for transportation investments should be designed to improve quality of life and public health followed by travel safety and sustainability
- Most believe that in ten years, Park City should have about the same amount of roads as today or fewer.
- Almost everyone polled believes that Park City should have more transit in ten years than today.
- Most believe that PC should have more urban trails and sidewalks in ten years.
- In looking at "out of the box" ideas to be evaluated (including a tunnel from Deer Valley to US-40, a transit line on the Rail Trail, year-round access to Guardsman Pass, and a paved road connecting Solamere to Kearns Blvd) about 1/3 thought we should look at transit on the Rail Trail, and a ¼ believe we should look at all of these ideas.
- 1/3 of respondents believe we should NOT consider a tunnel from DV to US-40 and another 1/3 believe we should NOT consider year-round access to the Guardsman Pass area.
- Everyone polled believes that transportation is a high, if not the highest, priority of the city.
- Everyone felt that "balancing transportation modes" should be a goal of the transportation plan
- A slight majority of respondents believe that "no new or widened roads" should NOT be a goal of the plan

Summary of Comments from Meeting Participants

- Helping workers getting in and out of the city will relieve congested areas to help residents.
- Congestion is bad in Park City to those that have lived here for awhile, but not compared to east coast or LA.
- Bikes and cars SHARING the road is the trouble.
- Modification to the network will be very disruptive. It's an established city and transportation network.
- Rumor on the street is it's hard to get to Old Town. Poor transportation does impact economic vitality.
- Widening SR-224 or SR-248 will receive push-back from the City Council.
- Intersection improvements also include signal timing, special event planning, reversible lanes, etc.
- The Guard Road will happen soonest and it's the least controllable by PC.
- One person said "other" on the "which do you most want to see out-of-the-box" question because they wanted NONE.
- One person said "other" on the "which do you least want to see out-of-the-box" question because they wanted ALL to be considered.
- Is the Guardsman connection the ski inter-connect? A gondola? A people mover? We should consider improving the connection to users other than cars.
- How many lots are available in the Guardsman area?
- The Flagstaff process was trying to prevent sprawl.
- The Guardsman concern is where it comes out. Seems like it would be into Old Town. There isn't room for those new cars.
- How to buffer PC when the Guard road opens?
- The concern about the Deer Valley tunnel isn't really cost, it's where do the vehicles go in PC. It could be a monorail (or other transit) rather than a road for cars.
- The poll question about keeping cars out of Old Town was interpreted to be beyond just Main Street.
- How do we reduce the number of cars and have better transportation? We could pay a premium to drive.
- Taxes and business licenses pay for transit. Our visitors pay for it but locals use it.
- The June 25th bike ride will end at Wasatch Brewery. All are invited to meet us there to further discuss transportation issues.
- Colleen will tag team with Bill Malone on this committee.

Park City Traffic and Transportation Master Plan
Stakeholder Committee
September 14, 2010
4:00 – 5:30pm
Agenda

1. Welcome & Introductions
2. Update on Progress Since June
3. Goals and Objectives Discussion

4. Breakout Groups
   - Cross-sections Workshop
   - Transportation Network Alternatives Workshop
5. Wrap-up & Next Meeting

Park City Traffic and Transportation Plan
Stakeholder Committee Meeting Summary
September 14, 2010

Reminder: City Council will have a work session about this plan on September 30.
City wide Open House October 5 at the Eccles Theatre. Stakeholders should come at 4 and wear nametags.
NEW >>>>> Next meeting for Stakeholders: October 19. We will work further on transportation alternatives.

Below is a summary of the Stakeholder Committee meeting held on Tuesday, September 14, 2010.

1. Welcome & Introductions

Attendees

Lisa	Baird	UDOT - Region 2	John	Halsey	RAB
Alison	Butz	HMBA	Robert	Miles	UDOT - Region 2
Kevin	Callahan	Summit County	Tom	Pettigrew	PCMR
Kent	Cashel	PCMC	Adam	Strachan	PC Planning Comm
Matt	Cassel	PCMC	Charlie	Wintzer	PC Planning Commission
Kenzie	Coulson	Sundance Institute	Matt	Riffkin	InterPlan Co.
Thomas	Eddington	PCMC	Suellen	Heath	InterPlan Co.
Jim	Gonsalves		Rob	Eldredge	InterPlan Co.
Dave	Gustafson	PCMC	Andrea	Olson	InterPlan Co.
			Charles	Allen	InterPlan Co.

2. Update on Progress Since June

Matt Riffkin presented InterPlan's progress to date. Much has been done modeling current conditions and extrapolating future conditions. Several boards were shown with these results.

3. Goals and Objectives Discussion

Matt presented the current draft of Goals and Objectives for the Park City Transportation Plan. These were derived from:

- Key-pad polling results from last meeting
- City staff input
- Park City Vision process

These will ultimately include detailed performance measures for each goal.
Multi Modal – no comments
Transit –

- We should add a connection to the airport
- Try to get tourists on public transit – encourage them out of private cars

- Should we build more parking or public transportation?
- But should we focus on visitors or residents?
- Can locals be more conveniently moved via transit
- There's disagreement if it's tourists or locals that cause traffic
- Clarify the term visitor versus guest

Minimize vehicle traffic-

- there's not much room to add more mileage
- Some areas could benefit from more connections, i.e. Park and Bonanza

Quality of life-

- jargon "system management" versus "demand management"?

Other discussion, can we come up with a one sentence summary?

Get to where you want to go with the least impact on people around you.
A vibrant economic community with a transportation system that enhances the quality of life.
Decrease traffic by getting cars off the road and into public transit and a bike. Add options of how to get there.

"The best Sundance was when there was no parking on Main Street or the high school. It was also good for the Olympics. It was the best because we didn't try to get around."

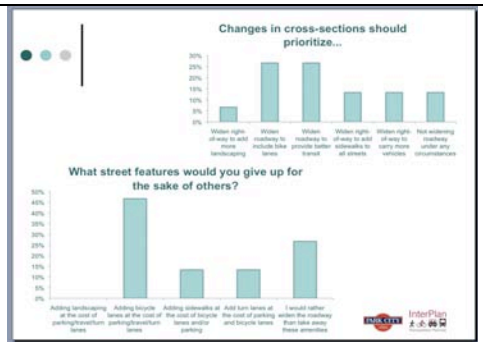
4. Breakout Groups

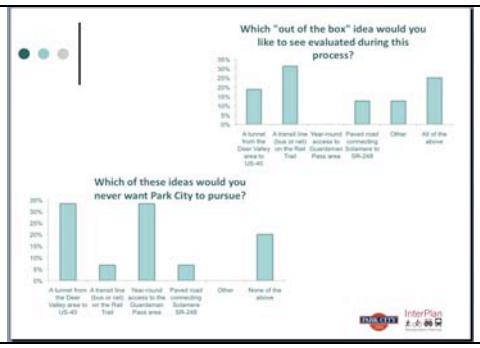
Cross-sections Workshop

Andrea led a workshop to rank needs and desires for various presented street cross section standards.

Lisa Baird, Kevin Callahan, Kenzie Coulson, Dave Gustafson, Kent Cashel, Charlie Wintzer, Thomas Eddington

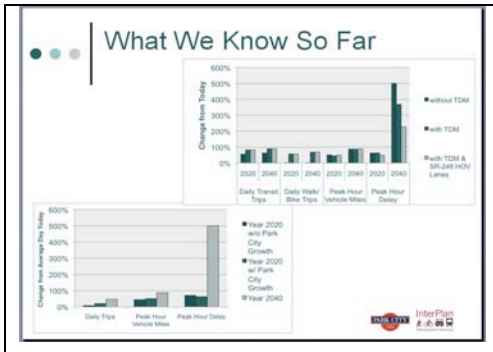
Old Town and park meadows should be in the save category?
Therefore are there two local type cross sections?
Can we expand roads with the ROW available?
Major streets need parking, bikes and walking – more modes.
Small streets should stay small with less amenities.
Many PC streets are very difficult. Hard to classify.

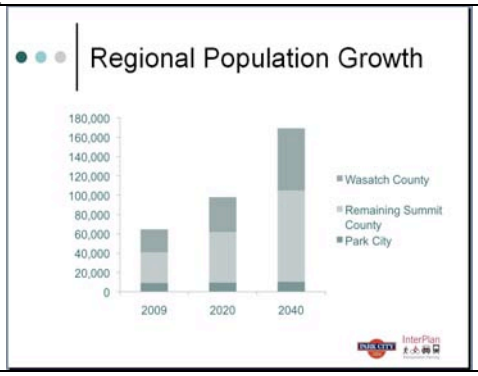


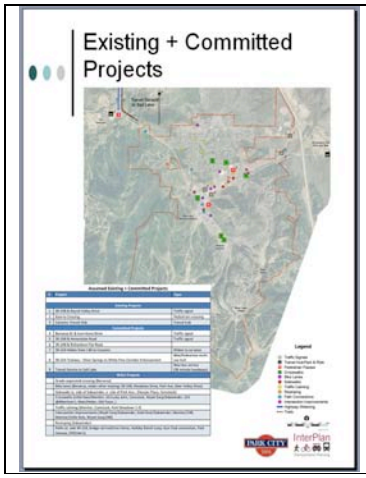


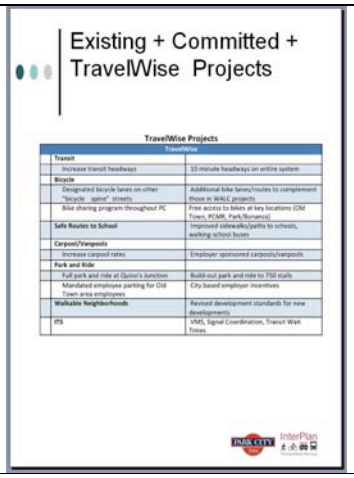
Transportation Network Alternatives Workshop

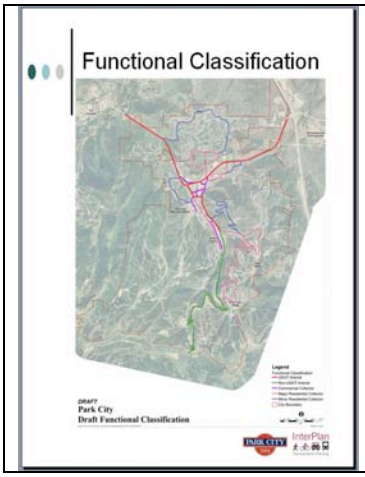
Matt led the discussion to solicit transportation alternatives for Park City.
Tom Pettigrew, John Halsey, Jim Gonsalves, Alison Butz, Robert Miles, Matt Cassel, Adam Strachan, Snow – should we address climate change in our future projections?
There's a typo in increased headway.
HOV lanes are a short term bandaid.
How about 1 way in 1 way out 224 and 248?
It's hard to get people to change modes in a single trip.
Fewer cars is more important than faster travel.
There should be incentives for public transit.









Park City Traffic and Transportation Master Plan
Stakeholder Committee
October 19, 2010
4:00 – 5:30pm
Agenda:

1. Brainstorm Universe of Options
   - New or Widened Roads Inside Park City
   - New Bus Routes
   - New Rail / BRT Routes
   - New Bicycle Routes
   - Intersection Improvements
   - New Connections outside Park City
   - New Managed (HOV, Express, other?) Lanes / Managed Roads
   - New Technology

2. Brief Discussion of Themes
   - No Transportation Improvements (beyond Committed)
   - Least Congestion/Highest Capacity Option
   - Fewest Cars (HOV, transit) Option
   - Emergency Evacuation

Park City Traffic and Transportation Plan
Stakeholder Committee Meeting Summary
October 19, 2010

Below is a summary of the Stakeholder Committee meeting held on Tuesday, October 19, 2010.

1. Welcome & Introductions

Attendees

Kevin	Callahan	Summit County	Brooks	Robinson	PCMC
Matt	Cassel	PCMC	Tom	Pettigrew	PCMR
Kenzie	Coulson	Sundance Institute	Charlie	Wintzer	PC Planning Commission
Jim	Gonsalves	Resident – ADA Advocate	Matt	Riffkin	InterPlan Co.
Dave	Gustafson	PCMC	Suellen	Heath	InterPlan Co.

John	Halsey	RAB	Andrea	Olson	InterPlan Co.
			Brooks	Robinson	PCMC

2. Matt Riffkin opened the meeting. The goal of this meeting is to develop Transportation Alternatives. Then, we can get these random ideas into THEMES. Matt recapped the Open House and Council Meetings. The next meeting of Stakeholders will be in late January, early February.

3. Brainstorming Alternatives by type of improvement and location

<u>New or widened roads</u>

- New "North 40" road connection SR-248 to Lucky John/Meadows Dr.
- Connect Deer Valley to US 40, tunnel?
- Deer Valley Dr to Bonanza will be widened. Should the intersection be straightened?
- A Homestake connection between Deer Valley Dr and SR-248 is desirable. But shop people want a Blvd, not a fast road. Maybe use Shortline?
- Lower Empire is undersized and should be widened.
- A new road between 9th Ave and Empire is needed.
- Should we build a Rail Trail expressway. Maybe just for transit access?
- SR-224 will be widened to three lanes in each direction from Kimball Junction to The Canyons. Should this be extended towards PC?

<u>Bus Routes</u>

- New route along the Rail Trail to connect the hospital and the Park and Ride to main Park City area
- New route near Solamere to connect Deer Valley to US 40
- More service is needed to Kimball Junction.

<u>New Rail/BRT</u>

- Need for a transit center to service routes to Salt Lake
- New intermodal hub near Park/Bonanza?
- Secondary transit center
- Provide parking in the High School during Saturday and Sunday and then bus to ski resorts.
- BRT could go to intermodal hub and then new bus routes to ski resorts.

<u>New Bike Routes</u>

- Riding on SR-224 feels unsafe. You could park at St. Mary's and then bike to Old Town. Or get to Bear Hollow and then go on the highway. The connections between trail systems aren't very good.
- It has to be a mountain bike, fat tire, to ride SR-224 because of the road debris.
- Deer Valley Dr has lots of bikes, partially because Poison Creek Trail is too slow for biking.
- You can go down Deer Valley Dr, because you're at the speed of traffic. But coming up (southbound) on DVD makes you a greater conflict with vehicles.

- There are rumble strips on the shoulders of SR-248 where it narrows. These are bad for bikers trying to ride there.
- Thayne's Canyon has snow on each side and walking or biking is impossible during the winter.

Technology

- Parking costs should change with demand
- Have a sign that says "XXX number of parking spaces available at China Bridge." (like Stratford on Avon)
- Have a sign at an entrance to town near a parking area that shows "7 minutes by bus to PCMR. 16 minutes by car to PCMR."
- We need more external parking areas.
- Travel time communication is needed.
- Intersection Improvements

Intersections

- Sidewinder to Kearns left turn is bad
- Bonanza/Deer Valley Drive is bad
- Roundabout can still be tricky, doesn't operate as efficiently as it could although recent channelization has helped
- Pedestrian crosswalk at Fresh Market slows cars on SR-224. Is this a good location for a ped tunnel? Put timing on push button?
- SR248/Homestake will get a signal.
- SCAT system use?

New connections

- If a way from Deer Valley to US-40 were available, 1/3 of the out-of-town traffic would go away from the interior of Park City
- The Guardman's Pass Road to Midway will be paved soon.
- The Richardson Flat road will be paved soon. There will be a signal at SR-248
- A frontage road on US-40 would be a back door way to Deer Valley
- HOV lanes to town are needed.

4. Themes

A brainstorm of potential alternative "themes" included:

- No transportation improvements except for those committed today.
- How good can it be? (least amount of traffic congestion)
- Fewest cars (may mean more congestion)
- Emergency evacuation. "An event in Empire runs away"
- Locals/Residents vs. others.

January 11, 2011 for the next meeting?

Park City Traffic and Transportation Master Plan
Stakeholder Committee
February 15, 2011

4:00 – 5:30pm
Agenda

1. Welcome & Introductions
2. Remaining Schedule
3. Previously Discussed Plan Elements
4. Stakeholder Committee's Role in Plan Adoption
5. Overview of Open House Information
6. Breakout Groups
   Advantages and Disadvantages
7. Wrap-up

Park City Traffic and Transportation Plan
Stakeholder Committee Meeting Summary
February 15, 2011

Below is a summary of the Stakeholder Committee meeting held on Tuesday, February 15, 2011.

1. Welcome & Introductions

Attendees

Kevin	Callahan	Summit County
Matt	Cassel	PCMC
Lisa	Baird	UDOT
Bob	Wells	DV
Tom	Eddington	PCMC
Dave	Gustafson	PCMC
John	Halsey	RAB
Brooks	Robinson	PCMC
Tom	Pettigrew	PCMR
Charlie	Wintzer	PC Planning Commission
Matt	Riffkin	InterPlan Co.
Suellen	Heath	InterPlan Co.
Andrea	Olson	InterPlan Co.

2. Matt Riffkin opened the meeting. The goal of this meeting is to develop advantages and disadvantages to a number of "trial balloons." Matt recapped the Council Study Session. The Stakeholders will probably not meet again but are encouraged to come to the Planning Commission and Council meetings and the Public Open House.
   a. Open House, 4:30 – 6:30, February 28, Eccles Center
   b. Planning Commission – March 23 Brief overview and recap, not an adoption meeting
   c. City Council – March 24 Brief overview and recap, not an adoption meeting

We are about one month behind of the schedule we laid out this time last year. But we hope for adoption in April. The delay is primarily because the Alternatives Analysis process has taken a different track.

The Goals and Objectives put forth in this plan will be an element of the General Plan.

In general, Matt said, "With achievement of these goals, we have found that the average future day's peak period will not be as bad as the worst days in 2010." Kevin asked if the plan will have an LOS standard defined? Varying feelings of congestion were discussed and the group agreed that the appetite to bear the problem may be greater than the appetite to

solve the problem.

3. The Content Summary chart, Goals Summary, Cross Sections and Functional Class map were distributed.

4. Boards outlining some advantages and disadvantages to "trial balloons" were introduced. Matt commented that if the objectives of the plan were achieved, future congestion in Park City will be similar to today. There may be areas, however, where future conditions in some locations become unacceptable. For those situations, InterPlan has investigated 6 or so Neighborhood Connection options and 3 Gateway Corridor options. Some study has been done today, when interests aren't concentrated and emotions are reduced. In the future, one or many of these ideas may be examined further to provide possible solutions.

5. Stakeholders reviewed the boards and added additional advantages/disadvantages and comments.

6. Summary discussion:
   - Matt Cassel indicated the boards are missing the rail trail BRT as part of the S.R. 248 information. The board shouldn't necessarily have it, but we should be ready because it will come up for transit discussions. The BRT on the Rail Trail cost per rider should be added to the transit board.
   - Bob Wells said that InterPlan should rank the 10 options. Which have more influence on success?
   - We need to show the park and ride on 224 as a big, obvious choice.
   - Kevin Callahan said the PC Tech Center will have 2500 spaces available for weekend use at the base of the UOP.
   - The easiest solution is transit. The fall back is widening. But, what's the plan to find when the fall back should be called forth – with enough lead time to enact it?
   - These trial balloons preserve corridor, in a way.
   - Tom Pettigrew commented that the chapter of the book is missing somewhat. The explanation of what's changing to prevent having to use the balloons needs greater emphasis and explanation.

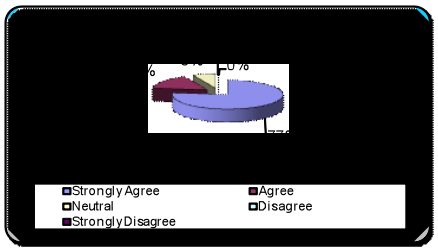
Key Pad polling Summary Open House October, 2010

Turning Graphical Results by Question

Session Name: PC open house 10-5-10.tpz
Created: 10/6/2010 12:42 PM

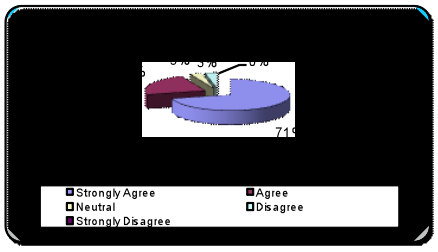
1.) #1: Park City will have a multi-modal transportation system with complete streets and balanced availability of pedestrian, bicycle, transit and auto travel.

	Responses	
Strongly Agree	23	76.67%
Agree	5	16.67%
Neutral	2	6.67%
Disagree	0	0%
Strongly Disagree	0	0%
Totals	**30**	**100%**



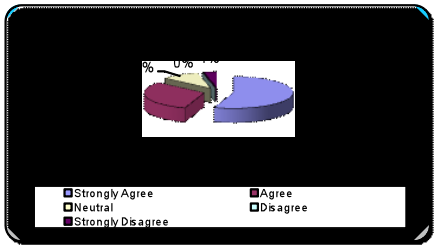
2.) #2: Park City's residents, workers, visitors and guests will have access to convenient transit for circulation within the City.

	Responses	
Strongly Agree	22	70.97%
Agree	7	22.58%
Neutral	1	3.23%
Disagree	1	3.23%
Strongly Disagree	0	0%
Totals	**31**	**100%**



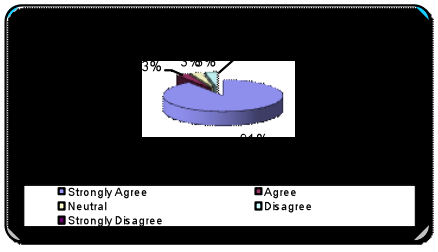
3.) #3: Park City's residents, workers and visitors will have efficient, direct and convenient regional transit connections from and to area resorts, Salt Lake and Utah Counties, and other communities of the Wasatch Back.

	Responses	
Strongly Agree	16	55.17%
Agree	9	31.03%
Neutral	3	10.34%
Disagree	0	0%
Strongly Disagree	1	3.45%
Totals	**29**	**100%**



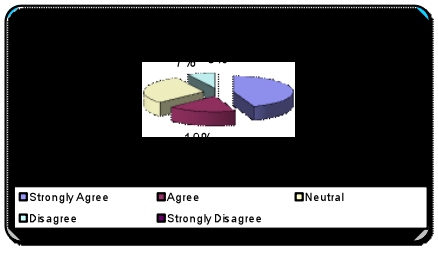
4.) #4: Park City will have a complete and well-connected network of trails, bicycle lanes and sidewalks that supports safe, convenient and pleasant walking and bicycling to accommodate the needs of residents and visitors for short trips within the City

	Responses	
Strongly Agree	28	90.32%
Agree	1	3.23%
Neutral	1	3.23%
Disagree	1	3.23%
Strongly Disagree	0	0%
Totals	**31**	**100%**



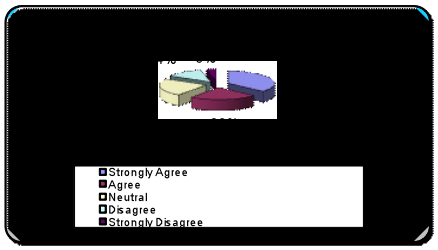
5.) #5: Mobility and accessibility in Park City will be as good or better than today without a per capita increase in average daily vehicle traffic.

	Responses	
Strongly Agree	12	44.44%
Agree	5	18.52%
Neutral	8	29.63%
Disagree	2	7.41%
Strongly Disagree	0	0%
Totals	**27**	**100%**



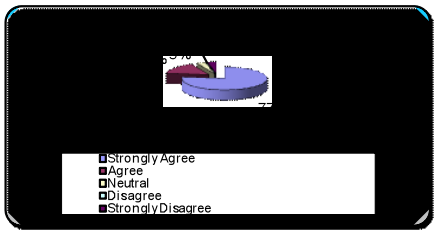
6.) #6: Park City's street network will be well-maintained, with streets that are not significantly wider than today and without a significant increase in local street mileage.

	Responses	
Strongly Agree	11	36.67%
Agree	7	23.33%
Neutral	7	23.33%
Disagree	4	13.33%
Strongly Disagree	1	3.33%
Totals	**30**	**100%**



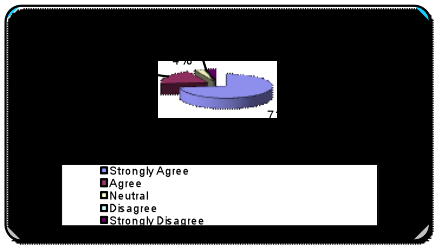
7.) #7: Park City's transportation system will contribute positively to public health and quality of life by achieving a high level of travel safety and by creating an environment that supports active living.

	Responses	
Strongly Agree	23	76.67%
Agree	5	16.67%
Neutral	1	3.33%
Disagree	0	0%
Strongly Disagree	1	3.33%
Totals	**30**	**100%**



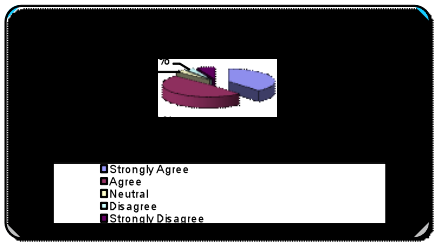
8.) #8: Park City's transportation system will contribute positively to improved environmental, social and economic sustainability of the community.

	Responses	
Strongly Agree	22	73.33%
Agree	6	20%
Neutral	1	3.33%
Disagree	0	0%
Strongly Disagree	1	3.33%
Totals	**30**	**100%**



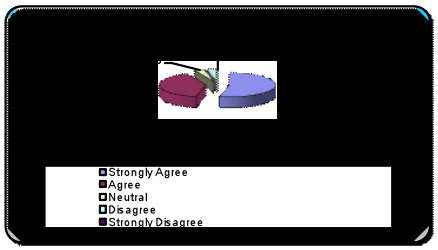
9.) #9: Park City's transportation system will support development of mixed-use nodes by providing convenient multimodal access to each node concurrent with its development.

	Responses	
Strongly Agree	12	38.71%
Agree	15	48.39%
Neutral	1	3.23%
Disagree	1	3.23%
Strongly Disagree	2	6.45%
Totals	**31**	**100%**



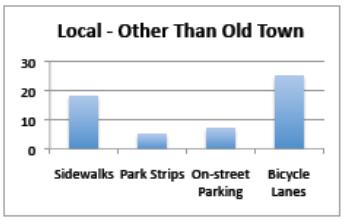
10.) #10: Park City will use system management and demand management techniques to minimize the financial burden and environmental impact of local transportation facilities.

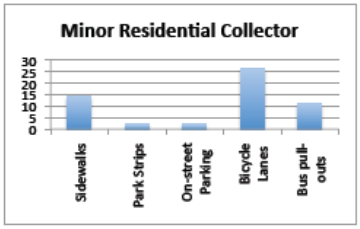
	Responses	
Strongly Agree	16	53.33%
Agree	12	40%
Neutral	1	3.33%
Disagree	1	3.33%
Strongly Disagree	0	0%
Totals	**30**	**100%**

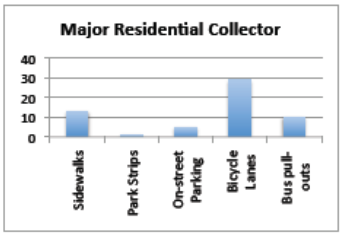


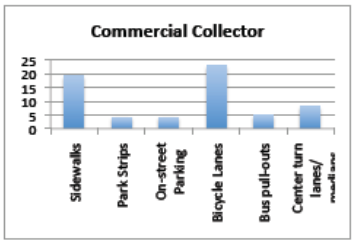
Cross-Section Priorities - October 5th Public Open House

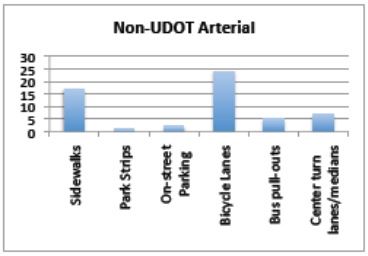
Local - Old Town	
Sidewalks	16
Park Strips	8
On-street Parking	16
Bicycle Lanes	7
Local - other than OT	
Sidewalks	18
Park Strips	5
On-street Parking	7
Bicycle Lanes	25
Minor Residential Collector	
Sidewalks	14
Park Strips	2
On-street Parking	2
Bicycle Lanes	26
Bus pull-outs	11
Major Residential Collector	
Sidewalks	13
Park Strips	1
On-street Parking	5
Bicycle Lanes	29
Bus pull-outs	10
Commercial Collector	
Sidewalks	19
Park Strips	4
On-street Parking	4
Bicycle Lanes	23
Bus pull-outs	5
Center turn lanes/medians	8
Non-UDOT Arterial	
Sidewalks	17
Park Strips	1
On-street Parking	2
Bicycle Lanes	24
Bus pull-outs	5
Center turn lanes/medians	7
UDOT Arterial	
Sidewalks	10
Park Strips	3
On-street Parking	0
Bicycle Lanes	25
Bus pull-outs	6
Center turn lanes/medians	11

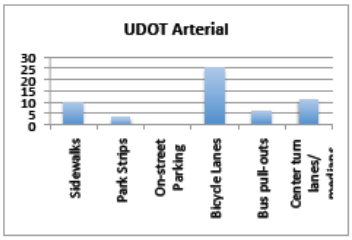












Station Four: Transportation Network Alternatives Comments from Boards

What other ideas do you have about bicycle & pedestrian programs and facilities?

- Bike Path from between Iron Horse & Snow Creek (so there's a safe way through parking lots)
- Better road/street markings to identify appropriate travel lanes for cyclists
- Cyclist – Motorist education. Regarding obeying rules of road / share the road
- Bike storage facilities at intermodal centers
- Sharrows
- More cleared sidewalks during winter to encourage walking by locals & tourists
- New bike path that connects existing path that ends by Snow Creek Plaza running behind Snow Creek Plaza and cemetery to Monitor Drive
- Bike-specific lanes on 224, 248 (Kearns), Park Ave, Deer Valley Drive
- More bike lanes, Clean bike lanes

- Clean bike lanes, More of them, Good surface, Enforce against aggressive driver behavior
- More bike racks and bike storage lockers throughout city
- Walking maps available to visitors
- Bike path on small segment behind Rite-Aid from Iron Horse to Home Stake
- In order to facilitate more bikes there will need to be more roads that are safe to bike
- Paved bike path from Parley's Summit to Mountain Dell so you can safely ride to Salt Lake or pave the road to top of Guardsman Pass.
- Bike lanes, residential areas, more in Park Meadows, in Jeremy Ranch bike lane ends randomly.
- Bike lanes on all major roadways for commuters
- Get rid of the hills
- Better connections from existing trails to key uses in Park City – more connectivity.

What other ideas do you have about road projects?

- Light colored roads – reduce warming
- Immediately make speed limit 45 from Kimball Junction to 224 to Park Ave, there is now accordioning and it is unsafe.
- Road from 248 behind No. 40 fields to connect into Meadows Drive
- Do not open connect thru Deer Crest (from US-40 to Queen Esther) residential area
- Rail trail stays as is
- Require complete streets assessments/audit for certain thresholds of CIPs, Master Plans, Annexations w/ goal of identifying best opportunities to maximize the mulit-modalness of the public realm
- Fewer traffic signals & more roundabouts
- Smooth surfaces for reduced wheel resistance. Synchronize traffic lights
- Complete streets
- Dedicated lanes for bus rapid transit/alternative transportation, before HOV lanes or standard travel
- Yes to roundabouts. No to stop lights.
- Need traffic lights to sync so fuel is not wasted waiting on lights
- Tie in planning with Questar, Rocky Mountain Power, SBWRD; to make all upgrades at one time.
- Under ground tunnel everywhere.

What other ideas do you have about transit programs and facilities?

- Bus to Salt Lake. DVDs on bus
- Intermodal transportation HUB in Bonanza/Park plan
- Extend late night bus service to Kimball Junction from Old Town
- Skier bus – parking at Kimball Junction
- Bus/Trail to SLC
- Circular around the greater Kimball area. Facilitating 1 express bus into

town.

- 248 – 2 lanes inbound am and 2 lanes outbound pm. 2248 – During high season have satellite parking at Research Center. 4 buses (express) for resorts. Dream wish – have mono rail thru EA resort
- Non-stop/ frequent bus transport from Kimball/Quinn's to resorts
- Late night to Kimball Junction, even just 1 bus
- Bus service to Jeremy after 9:30 pm
- Accommodate most visitors & pedestrians with public transit. Free shuttle
- Buses good, light rail, gondolas, better!
- More bus service through Park Meadows, i.e. Meadows Drive
- On the TVs on the new buses, it would be beneficial to have Park City sponsors play videos advertizing to tourists. It could make people extra money.
- Support the Hi-Tech magnetic induction system. Incentivize LEV w/ free parking/tax benefits.
- Add chair lifts, gondolas, monorails.
- Park and ride at Quinns Richardsons flats doesn't work
- You need 4 lanes on SR 248 by 2020 – Originally planned
- Expand transit service from Park City to U of U, O.T. Salt Lake City, & SLC Airport
- Reliable, frequent, economic transit PC to SLC airport
- Consider alternative vehicles for transit: smaller, would be easier to run more frequently and on smaller streets in Old Town, Lower Main, Park Ave, etc.
- Consider ability of private sector to capture higher percentage of transit or shuttle ridership w/: newer, higher quality vehicles, videos & entertain, level of service (frequency, bag assistance, etc.)
- Late night bus to Kimball Junction
- Transit system for Wasatch County

What other ideas do you have?

- Reward hybrid and green vehicles with free or priority parking
- Franchise taxi service and require all cabs to have fare meters
- Local bus routes directly to schools so parents do not need to drive their kids to school (specifically Park Meadows)
- Let people (kids) graffiti the street w/ license to tag.
- Open road thru Deer Valley to Highway 40 to get people out of Deer Valley easiest way and/or shuttle for workers going down thru 40
- Wind or solar powered light rail
- Local bus routes specifically to get locals around – Park Meadows town – not thru resort.
- Synchronize UDOT traffic Signals
- Account for seasonality. Bike = Summer, Winter = Traffic. Maybe we need sidewalks over bike paths?
- Provide "out of town" people garage service

- Mono Rail from Kimball and Quinn's to Resorts / Main Street
- What the point if we don't have total input of all the Wasatch Back? We need a comprehensive plan for all the communities.
- Golf cart type vehicle rental (zip?car) In PC provider
- Account for income & habits. Those with $ drive those w/o walk. Then need pedestrian access for safety
- Consider use of public funds for private trans facilities that improve public circulation such as lifts, people movers, hill trac elevated tram, etc. if utilized to connect private and public nodes and high generated uses.
    - Resorts and commercial areas: Require or encourage more paid parking
    - With private & public sector transit plans
    - Centralize reservations & trip management
    - Reduce employee housing requirement if proximate and increase it if not proximate plus require transit.

- Coordination and public subsidy of private transit contracts. Solutions for certain user groups (Destination visitor). Conditioned on:
    - Vehicle type (green)
    - Trip occupancy accountability
    - Reporting
    - Reservation management and coordination

INCOMPLETE BELOW HERE

Possible Gateway Corridors
Deer Valley to US-40

- Tunnel way too expensive. Gated community will not accept this
- Prefer roadway route option for lower cost, effect to reduce congestion on 248, shorter/quicker route to Deer Valley & Main St, from Wasatch county
- Would be better to add anew interchange between mayflower and SR-248 – serve new park area at Ross Creek on Jordanelle – direct connect to Deer Valley Drive not base area at DV.
- Don't like it but…It would decrease congestion on 248. It would reduce the miles driven by workforce.

Guardsman Pass Road

- Interconnect ski areas and this road is not important
- Year round access would improve "public safety" as population grows
- Impractical, low traffic flows, significant winter maintenance issues/hazards. Unimproved road keeps speeds low.
- There is not sufficient need to warrant an "over the mountain" access. Better idea would be to improve North River Road and tie-in to new intersection planned for US-40 and SR-32, N River Road..

- Like it!

Meadows Drive to I-80

- Too expensive, effects wetlands & rural nature of road. On and off ramps to highway prohibitive.
- Need to add a connector from Old Ranch Road – new connection road East-West to Silver Summit interchange on US-40
- Need some alternative ingress & egress this could help. Explore…
- Need a new tunnel under I-80 that serves traffic from new connector and wildlife going to-from Swaner.
- Need new ramps onto and off of I-80.

Existing Gateway Connections

- Bravo! Please do it Future generations will thank us
- Great ideas. Do it!

SR-248

- Think bike lanes too
- Critical need for 4 lanes now – suggest unrestricted use of all lanes in and out. Please maintain bicycle lanes in each direction.
- This would be great so long as school safety is addressed
- 4 lanes needed. widen if needed. Do park and ride and incentives/requirements used for employees
- UDOT short term and long term plans include widening 248 to 4 lanes from Bonanza to and beyond Summit/Wasatch county line
- Need a better tunnel under widened SR-248 – for walking, biking and wildlife migration under 248-not on it.

SR-224

- Allow cars to use shoulders on 224, especially those destined to Redstone and other east side commercial.
- Need an underpass-overpass combination at Ute Blvd. Traffic light is a road block. Maybe at Olympic Park too.
- Need a connector from planned interchange or ramps at High Ute interchange (in UDOT LRP) that connects to Olympic Park Blvd behind Research Center
- Need two pedestrian/wildlife underpasses under SR224 – one at Bear Hollow – one at Cutter Lane or North Silver Springs.
- We need it. Add bike lanes.
- Need to add HOV lanes – not take away a lane to be HOV. Should be HOV lanes all the way to PC if you move more traffic onto Meadows Drive.

Park City Traffic and Transportation Master Plan
Summary of Public Comments from Open House on February 28, 2011

6 Comment Forms received

Contact Information:

- Michael Sweeney 825 Main Street 801-244-9696 mesgold@yahoo.com
- Cindi Sharp PO Box 4530 Neighborhoods: Hidden Meadows and Aspen Springs 801-649-4049 saleprice@comcast.net
- Mark J. Fischer 2245 Monitor Drive, Park City, UT 84060, 435-640-6858 mark@fishernetwork.com

How did you learn of this open house?

2 Newspaper
City Staff
Radio
Hidden Meadows HOA
Radio/print material

Highest transportation-related priorities in the next 5 years?

- Taking school traffic Kearns Blvd, run busses in back of schools; add 4 lanes
- 248
- More traffic lanes on SR-248 all the way to US 40; synchronizing traffic lights on SR-224 for smoother flow in and out
- Get parking in Richardson Flat and provide buses for skiers and employees in and out of town – especially employees who come and go at routine times each day.
- Ingress and egress out of town on 224 and 248
- A transportation hub and master plan

Are there any "Neighborhood Connections" that were displayed tonight that you completely support? (check all that apply)

1 Solamere
0 Three Kings to PCMR
2 Bonanza Redevelopment #1
2 Bonanza Redevelopment #2
(one comment: Bonanza Redevelopment #1 or Bonanza Redevelopment #2 but need grid sys)
2 Kearns Blvd to Meadows Drive (North 40)
3 School-area Access Road
2 12th Street Connection to Deer Valley Drive
1 Old Town One-way Streets
0 None of the above

Are there any "Neighborhood Connections" to which you are completely opposed?

2 Solamere
2 Three Kings to PCMR
0 Bonanza Redevelopment #1

0 Bonanza Redevelopment #2
3 Kearns Blvd to Meadows Drive (North 40)
1 School-area Access Road
0 12th Street Connection to Deer Valley Drive
0 Old Town One-way Streets
0 None of the above

Additional comments:

- Keep up the good work – thinking 5 – 30 yrs in future is great.
- Yes to tunnel to DV drive from 40
- Moving traffic (heavy employee and skier traffic) presently on commercial streets and state highways onto low traffic residential streets makes no sense from a planning and traffic safety standpoint.
- Please do something bold and forward thinking. Future generations will benefit. Doing nothing should not be an option! Thank you!

March 10, 2011
Matt Cassel (matt.cassel@parkcity.org) Park City Municipal Corporation, Engineering Department
Andrea Olson (andrea@interplanco.com) InterPlan Co.

Re: JOINT OPPOSITION STATEMENT Park City Traffic & Transportation Master Plan – Solamere Neighborhood Connection

Dear Mr. Cassell and Ms. Olson:

The Oaks at Deer Valley Homeowners Association, the Solamere Homeowners Association, and Hidden Meadows Homeowners Association (collectively referred to as the "Solamere Neighborhood Associations") join together to oppose the Solamere Neighborhood Connection being considered as a part of the Park City Traffic & Transportation Master Plan ("Plan"). On its face, this proposal is inconsistent with many of the Transportation Goals that were intended to serve as the foundation for the development of the Plan, will afford negligible benefit but propound considerable harm to the environment and the neighboring properties, and is against public policy. For these reasons, which will be addressed in more detail below, the Solamere Neighborhood Associations, and the hundreds of citizens that they represent, oppose this proposal and call for the swift rejection of this or any substitute proposal that would create a neighborhood connection between the Solamere Neighborhoods and SR 248 or US 40.

- The Negligible Benefit That a Proposed Solamere Neighborhood Connection May Bring to Park City Is Outweighed by the Harm That Will Be Caused to the Environment and the Social and Economic Stability of the Solamere Neighborhoods.

The Plan facilitators and the Stakeholders generated ten Transportation Goals that were to be used by Plan participants and City decision-makers to evaluate and assess future transportation policies and projects. It is our position that, if the Solamere Neighborhood Connection is fully analyzed, City decision makers will determine that this proposal fails to meet many of the Plan's goals, and the minimal benefit that may be gained in traffic congestion would be outweighed by the harm that it would cause to the land and the most-affected citizens.

In its Plan meetings, the Stakeholders involved in this process realized that the proposed Solamere Neighborhood Connection would be met with great opposition from the neighborhoods

that would be affected. In fact, in its materials from both the June 16, 2010, and the September 14, 2010, Workshops, "a paved road connecting Solamere area to Kearns Blvd" was noted as one of five proposals that the Plan facilitators anticipated that the Stakeholders may never want Park City to pursue." Thus, it is conceivable that City Engineers, Interplan, and the Stakeholders realized that the minimum benefit that such a roadway may provide would be outweighed by the substantial risk to the impacted mountainside and the existing neighborhoods.

The advantages of this proposal recognized by the Plan Stakeholders are few. The Stakeholders saw this connection may relieve the peak season burden from Deer Valley Drive. It is our opinion that this oft-mentioned impediment is limited to peak season delays at the end of a day and during events like the World Cup and the Sundance Film Festival. Alternatively, we do appreciate that such a connection would provide a "direct and convenient" connection to SR 248 as noted by the Stakeholders. However, this direct shot will further compound the already existing problems at the intersection of SR-248 and Wyatt Earp Drive. Moreover, some of the advantages that could be gained from high-volume alternatives in other viable proposals—such as HOV and bus lanes or truck routes—aren't possible with the instant proposal because of the same problems that defeat the overall utility of this idea, *e.g.*, dangerously steep grade, safety issues, impact on an existing neighborhood, etc.

Transportation Goals 6 through 8 envision a Plan that would provide a positive impact on traffic without jeopardizing the health, safety, and stability of Park City's citizens1. The Solamere Neighborhood Connection does not meet any of these goals in their entirety. The Stakeholders have already acknowledged the steep grade of the hillside at 15-20% to be a disadvantage. In order to construct the proposed Solamere Neighborhood Connection in a manner that will meet local and state standards, if such a plan can be devised with very creative engineering, the hillside would be permanently scarred. Even if proper grading of this new roadway could be accomplished, this would not eliminate the safety concerns that already exist once drivers reach Sun Ridge Drive. Currently, at the point where Sun Ridge Drive meets Solamere Drive, where this proposed street would connect, the descent is historically treacherous when the roads are slick and snow-packed, even at slow speeds. Because the proposed road

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Transportation Goal 6. Park City's street network will be well maintained, with streets 1 that are not significantly wider than today and without a significant increase in street mileage.
Transportation Goal 7. Park City's transportation system will contribute positively to public health and quality of life by achieving a high level of travel safety and by creating an environment that supports active living.
Transportation Goal 8. Park City's transportation system will contribute positively to improved environmental, social and economic stability.
See **Transportation Goals** contained in the materials circulated at the Park City Traffic & Transportation Master Plan Public Open House, February 28, 2011.

Matt Cassell, Park City Municipal

would create a shortcut for more than 800 vehicles per hour traveling to Deer Valley Resort from SR 248 and US 40 in peak hours, the speeds that drivers will likely travel, regardless of posted limits, will exacerbate the inherent safety hazards that exist in poor weather. The safety of not only these travelers using this new connection will be threatened, but also of the citizens in the Solamere Neighborhoods who drive Solamere Drive on a daily basis.

Similarly, it is anticipated that sidewalks will need to be constructed along Solamere Drive if this new connection is built. This may require the widening of Solamere Drive, as well as the purchase of additional rights of way, further encroaching on the tight setbacks that already exist in Deer Valley neighborhoods.

The impact that the proposed Solamere Neighborhood Connection will have on public safety cannot be understated, either. This new connection obviously will increase the need for public services, such as fire and police. If an accident occurred on this proposed piece of roadway, emergency personnel would likely have difficulty performing their duties on such a steep incline. Moreover, it can be expected that the straight shot from SR 248 and US 40 to these Deer Valley properties will bring increased security issues to the Solamere Neighborhood citizens, many of whom are part-time residents, as well as to their properties.

For many residents in the Solamere Neighborhoods, it is difficult to reconcile the economic impact that such a proposed roadway would have upon their property values. A value decline will affect not only property owners, but also Summit County, which will need to find alternative revenue sources to fund increased services and maintenance that this road would require. It should come as no surprise that many of those owning homes in this neighborhood purchased because of the quiet and serene quality of life that Deer Valley provides. Many bought their homes in the Solamere Neighborhoods because Solamere Drive isn't a through road. This proposed street has the potential to destroy what makes Deer Valley unique. The social and economic stability of the Solamere Neighborhoods may be forever negatively impacted if this connection is built, in direct contravention of the Plan's goals.

In sum, we believe that the proposed Solamere Neighborhood Connection would resolve very few true traffic issues. Instead, we foresee such a thoroughfare having minimal effect upon traffic congestion or create new issues. The advantages of this proposal are miniscule in relation to the overwhelming negative fallout that will occur in the Solamere Neighborhoods.

- Notwithstanding All the Factual Arguments against the Proposed Solamere Neighborhood Connection, This Proposal Constitutes Bad Public Policy.

The Solamere Neighborhood Associations see the benefit of creating a Master Transportation Plan that envisions future growth and considers which elements in Park City are vulnerable to change and evolution. However, any Plan for the future worth adopting should not go against established rules of engineering and urban planning. This proposed thoroughfare will require very complex and creative engineering that may not totally eliminate certain inherent safety hazards. That alone should cause City officials and Plan Stakeholders to consider other,

more realistic alternatives. Similarly, this new proposed high-volume roadway would connect into an established neighborhood whose roads were never designed or intended to accommodate the projected traffic. Although this proposal may be an engineering solution, it violates countless urban planning principles and constitutes bad public policy that should be considered a nonviable solution and quickly removed from consideration.

- A Similar Proposal Was Recently Considered by the Park City Council and Rejected.

For the better part of 2008 and through 2010, the annexation application related to the Park City Heights development was debated before the Park City Council. Even though the primary development was located in the Quinn's Junction Area and nowhere near the Solamere Neighborhood boundaries, a similar roadway was considered that would link Park City Heights to the Hidden Estates Subdivision at Fox Tail Trail. After much public comment, the Park City Council gave this proposal very little consideration and quickly rejected the idea based upon many of the reasons we've addressed herein. The City Council very clearly articulated their position that no street connection would be constructed under any circumstances from the Solamere Area to SR 248/US 40 when they adopted Ordinance 10-24 which included the following language:

The Development Agreement shall not propose a road or street connection from Park City Heights to the Oaks at Deer Valley Subdivision, Hidden Meadows Subdivision, or to the Morning Star Estates Subdivision2.

The Solamere Neighborhood Associations realize the Solamere Neighborhood Connection is different from the road contemplated in the Park City Heights Development. However, the impact upon the Solamere Neighborhoods would be as or more detrimental if this proposal were adopted. Accordingly, the Associations strongly encourage Park City Officials, Interplan, and the Plan Stakeholders to remove this proposal from any further consideration and look to other alternatives to address the future needs of the Deer Valley Area.

- Any Proposal Involving Solamere Area Neighborhoods Should Include at Least One Citizen Group to Represent the Solamere Neighborhood Associations.

In reviewing the list of stakeholders that were involved in this process and allowed to give substantial feedback, it is apparent that no citizen group from the Solamere Area Neighborhoods was represented. Since the proposal at issue would have the most impact upon these neighborhoods, we believe having a voice in this dialogue is warranted and appropriate.

2 *See* Ordinance 10-24, *An Ordinance Annexing Approximately 286.64 Acres of Property Located at the Southwest Corner of SR248 and US40 Interchange in the Quinn's Junction Area, Known as the Park City Heights Annexation, into the Corporate Limits of Park City, Utah, and Approving an Annexation Agreement and a Water Agreement, and Amending the Official Zoning Map of Park City to Zone the Property Community Transition (CT.)*, Exhibit D, Page 3, Paragraph 6, Roads and Road Design.

Therefore, if the Solamere Neighborhood Connection survives the scrutiny we expect it to elicit, and additional discussion continues or alternate proposals are debated that would directly affect the Solamere Neighborhoods, the Associations request one of their representatives be granted a stakeholder seat.

Questions or concerns can be sent directly to any of the undersigned or sent to Debra Griffiths Handley at dhandley@dadlaw.net.

Respectfully Submitted,

Richard F. Reiner President, Oaks at Deer Valley Homeowners Assn. (shootingstar3@earthlink.net)

Wm. Barry Jenkins President, Hidden Meadows Homeowners Assn., Inc. (wbjenkins@jhs-architects.com)

William G. Watson President, Solamere Homeowners Assn., Inc. (Billpris@aol.com)

Enclosure

Cc: Board of Trustees, The Oaks at Deer Valley Homeowners Assn.
Board of Trustees, Solamere Homeowners Assn.
Hidden Meadows Homeowners Association.

Appendix H: Transportation Rights-of-Way

Park City is an historic mining town. Many road rights-of-way may have been platted or otherwise dedicated to transportation uses with no visible transportation facility. Similarly, other transportation facilities may be been built or developed, with or without continuous transportation users, without accompanying legal descriptions or having the land dedicated for a transportation corridor. The purpose of this section is to identify transportation corridors where the historic or present use does not coincide directly with legal descriptions of the right-of-way. This appendix is offers some continuity between past planning efforts and is not intended to provide an exhaustive research of all transportation rights-of-way, easements, or prescriptive uses in Park City.

According to the ***Streets Master Plan, Park City, Utah,*** prepared by the Park City Municipal Corporation Planning Department and Wayne Van Wagoner and Associates, adopted by the Park City Council July 19, 1984, Table 1 was developed to document existing but un-built rights-of-way. The following text was offered with this table:

The existing rights-of-way owned by the City were laid out in a grid system that frequently did not reflect the topography of the area. Where roads were built to conform to the topography, they are often outside of the dedicated rights-of-way.

Many of the platted rights-of-way are on ground too steep to allow the construction of safe roadways. Park City's long and sometime harsh winters require that streets be passable when snow-covered or icy. In many areas the cost of construction would be very expensive because of the need for extensive regrading and retaining walls. In these instances, the platted right-of-way should be deemed unbuildable and should be retained as pedestrian corridors, fire breaks, open spaces or pocket parks, or utility easements. In limited cases the rights-of-way should be sold or traded to provide formal rights-of-way on existing prescriptive easements.

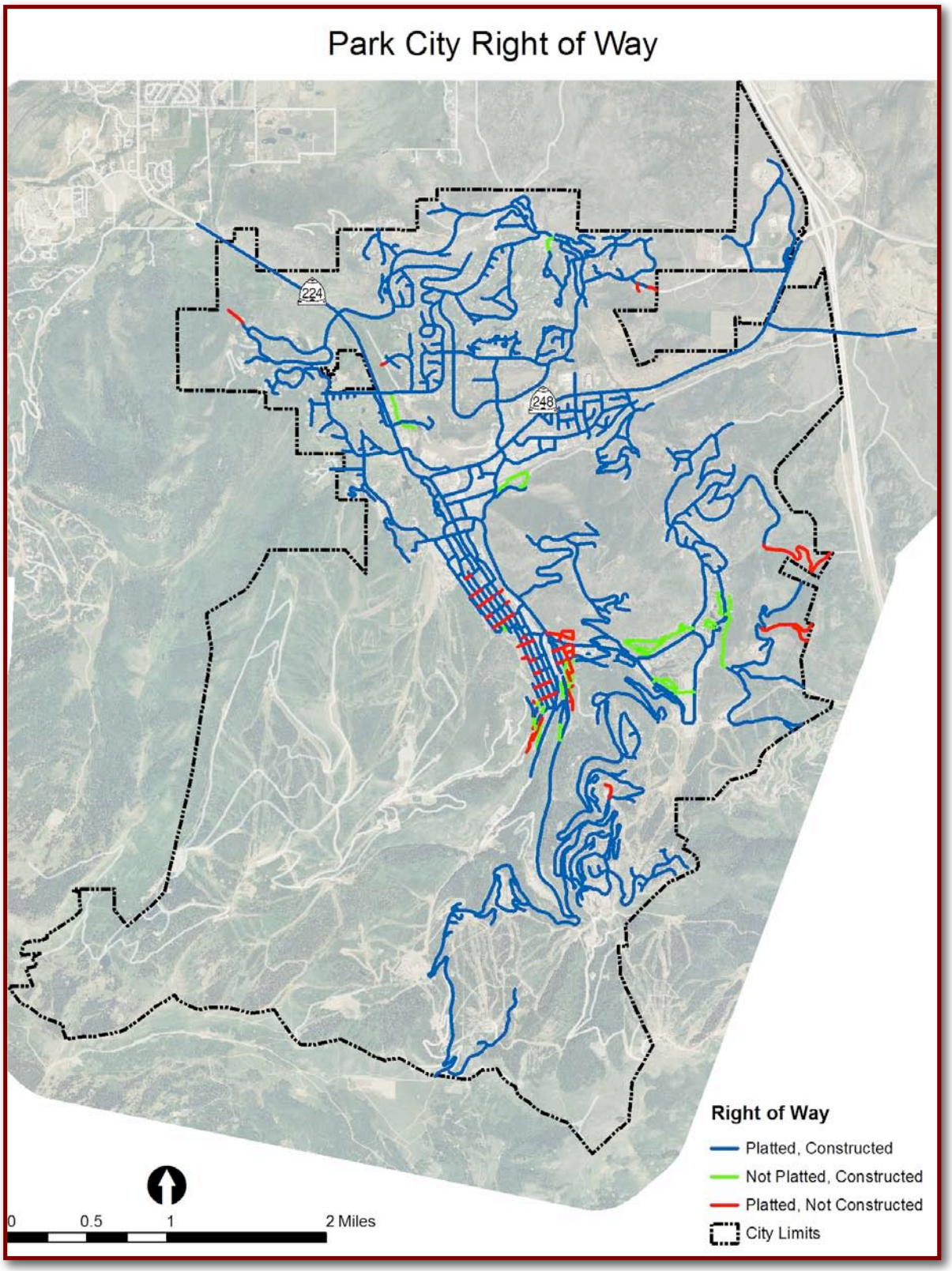
Similarly, the 1984 ***Streets Master Plan*** attempted to list streets located outside of existing platted right-of-way. This list is provide in Table 2 and was referenced with the following text:

Numerous sections of roadways are also located outside of existing, platted rights-of-way owned by the City. These sections are primarily within the older sections of the City and have been used by the public for a long time. Consequently, these streets exist on prescriptive easements. A defined right-of-way for these streets should be secured and the roadways upgraded to the recommended minimum standards. Alternatives for acquiring needed rights-of-way would include trading, requiring dedication prior to development, and the possible purchase of critical sections. The following table identifies those public roadways located outside of existing rights-of-way.

The accompanying map with this appendix was provided to graphically illustrate Tables 1 and 2. Since earlier maps were not provided in the 1984 plan, this map is only intended to assist with offering approximate locations and should be considered for information only.

Table 1. Existing Unbuilt Rights-of-way		
Street Name	Location	Comment
Allison R.O.W.	Kamas R.O.W. to South of Coalville R.O.W.	
Coalville R.O.W.	Marsac Ave. (SR 224) to Provo R.O.W.	
Eleventh R.O.W.	Lowell Avenue to Woodside Ave	
Eleventh R.O.W.	Park Avenue to the East	
Fifth R.O.W.	Marsac Avenue to Heber Avenue	
Fifth R.O.W.	Woodside Avenue to Park Avenue	
First R.O.W	Hillside Avenue to Marsac R.O.W.	
Fourth R.O.W.	Marsac Avenue to Rossi Hill	
Fourth R.O.W.	Woodside Avenue to Park Avenue	
Kamas R.O.W.	Allison R.O.W. to Provo R.O.W.	
Marsac R.O.W.	North of Second R.O.W. to South of First R.O.W.	
McHenry R.O.W.	Fifth R.O.W. to Rossi Hill	
McHenry R.O.W.	Rossi Hill to Third R.O.W.	
Ninth R.O.W.	Lowell Avenue to Woodside Ave	
Ninth R.O.W.	Park Avenue to the East	
Ninth Street	Woodside Avenue to Park Avenue	
Norfolk R.O.W.	**Empire Ave. (at Millsite) to Thirteenth**	
Ontario R.O.W.	Rossi Hill Dr. to Second R.O.W.	
Pacific Avenue	**North of Heber Avenue**	
Provo R.O.W.	Heber Avenue to Rossi Hill Dr.	
Provo R.O.W.	Kamas R.O.W. to South of Coalville R.O.W.	
Ridge Ave. R.O.W.	Norfolk Avenue to the South	
Sampson Avenue R.O.W.	South of King Road	
Sandridge R.O.W.	**Hillside Avenue to Second St.**	
Second R.O.W.	Marsac R.O.W. to Ontario R.O.W.	
Second R.O.W.	Norfolk Avenue to Main Street	
Seventh R.O.W.	**Norfolk Avenue to Woodside Ave.**	
Sixth R.O.W.	Norfolk Avenue to Main	
Swift R.O.W.	McHenry R.O.W. to Provo R.O.W.	
Tenth R.O.W.	Park Avenue to the East	
Tenth R.O.W.	Lowell Avenue to Empire Avenue	
Third R.O.W.	Ontario R.O.W. to McHenry R.O.W.	
Third R.O.W.	Norfolk Avenue to Main Street	
Thirteenth R.O.W.	Norfolk Avenue to Empire Avenue	
Tramway Drive (aka Crescen	Park Avenue to the West	
Twelfth R.O.W.	Empire Avenue to Norfolk Avenue	
Twelfth R.O.W.	Lowell Avenue to the East	
Unnamed R.O.W.	Norfolk Avenue to Woodside Ave. (Between 5th and 6th)	
Utah Avenue R.O.W.	Even with 2nd Street	
Utah Avenue R.O.W.	Sampson Avenue to King Road	
Woodside R.O.W.	**Even with Millsite Way**	
Aspen Springs R.O.W.	Ruminant Road to the North	Unbuilt, platted after 1984
McLeod Creek R.O.W.	Creek Road to the West	Unbuilt, platted after 1984
Fairway Hills Estates R.O.W.	Morning Sky Court to the East	Unbuilt, platted after 1984
Fairway Hills Estates R.O.W.	Morning Sky Court to the South	Unbuilt, platted after 1984
Morning Star Estates R.O.W.	Rising Star Lane to the East	Unbuilt, platted after 1984
Hidden Hollow R.O.W.	Snowtop Road to the East	Unbuilt, platted after 1984
Hidden Hollow R.O.W.	Hidden Hollow R.O.W. to the South	Unbuilt, platted after 1984
North Silver Lake R.O.W.	Silver Lake Drive to the North	Unbuilt, platted after 1984

Table 2. Streets Located Outside Existing Platted Right-of-way		
Street Name	ROW Required	Existing Pavement Width
Crescent Tram, Empire to Norfolk	27	22
Deer Valley Loop, South of Rossi Hill Drive	32	28
King Road, Norfolk to Woodside	27	24
Marsac, 50' plus North of 3rd Street	89	24
McHenry Avenue, 500' South of Coalition View Court	27	18
Norfolk Avenue between 1st and 2nd.	27	18
Ontario Avenue, Rossi Hill To Marsac Avenue	27	14
Ridge Avenue, King Road to Daly Avenue	27	14
Prospect Avenue South of Plat	27	14
Sampson Avenue, King Road to Norfolk at 2nd	32	12
Silver King Drive, Park Avenue to Empire	27	32
Woodside, 13th To 15th	27	26
Amber Road, Deer Valley Drive to Solamere	32	22
Pinnacle Drive, Amber Road to Amber Road	32	22
Lower Deer Crest Estates, Queen Esther Drive to Snowtop Road	32	20
Deer Lake Drive, Queen Esther Drive to Queen Esther Drive	32	20
Doe Pass Road, Deer Valle Drive to Deer Valley Drive	32	18
Gilt Edge Road, Queen Esther Drive to Queen Esther Drive	32	22
Jupiter View Drive, Holiday Ranch Loop to Saddle View	32	24
King Road, East of Ridge Avenue	32	16
Lakeside Circle, Deer Valley Drive to Deer Valley Drive	32	20
Lower Iron Horse Loop, Bonanza Drive to Iron Horse	32	22
Nansen Court, East of Queen Esther Drive	32	20
Sandridge Road, West of Marsac Drive	32	20
Sunny Slopes Drive, Sunny Slopes Drive to Meadows Drive	32	26
Windrift Lane, South of Saddle View Drive	32	24


Park City Right of Way
224
248
Right of Way
Platted, Constructed
Not Platted, Constructed
Platted, Not Constructed
City Limits
0
0.5
1
2 Miles