Park City/Summit County
Short Range Transit Development Plan Update

Technical Memorandum Two: Alternatives Analysis

Prepared for the

Park City Municipal Corporation and
Summit County

Prepared by

LSC Transportation Consultants, Inc.

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June 27, 2011

LSC Ref. 107520

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Chapter 1
Introduction

A key step in the development of a transit plan is the analysis and evaluation of alternatives for the operation of public transit in the study area. Such an analysis requires consideration of a number of factors, including service, capital (vehicles, facilities, and other equipment), institutional and management, and financial alternatives. This document presents a discussion of each of these factors, based upon the analysis of demographic conditions and trends and existing transit services presented in *Technical Memorandum Number One*.

The discussion presented in Chapters 2 through 6 is not intended to identify a recommended course of action. This *Technical Memorandum* will outline clearly the options available to Park City and Summit County, and explain the advantages and disadvantages of each option. This discussion will provide the basis for recommending a course of action, to be presented in the *Draft Plan* to follow.

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Chapter 2

Summit County and Inter-County Service Alternatives

This chapter focuses on transit service alternatives outside of Park City, including service in the Snyderville Basin, The Canyons, to other communities in Summit County (Kamas, Coalville) and between Park City and Salt Lake City. Also discussed is potential service to Heber and Hideout, in Wasatch County.

SNYDERVILLE BASIN SERVICE

The evaluation of potential service to new areas in the Snyderville Basin area is presented in two steps. First, the ridership potential of individual new service areas is evaluated. Secondly, two feasible service plans that would serve various combinations of existing and expanded service areas are presented.

Evaluation of Ridership Potential in Individual Service Areas

The major areas considered as potential candidates for expanded service are discussed below. A summary of these areas is presented in Table 1.

Bear Hollow Village

This residential area consists of a total of 249 dwelling units, located west of SR 224 and south of Olympic Boulevard. While two transit routes pass the area on SR 224, it is not well served by the existing routes. Ridership potential was evaluated by calculating a transit ridership rate for the nearby Silver Springs area, based on observed boarding/alighting data and the number of dwelling units. Applied to the number of Bear Hollow Village units, daily ridership if this area is served at a level similar to existing service along SR 224 would equal 32 one-way passenger trips in the winter and 11 in the summer. Factored by the number of days per year, this equates to approximately 6,500 passenger-trips per year, as shown in Table 1.

Kimball Research Park

The area west of SR 224 and south of West Ute Boulevard is approved for development of the Kimball Research Park, which ultimately could encompass 1,300,000 square feet of office and light industrial floor area. Ridership potential was assessed on the basis of potential employment. Applying an average rate of 2.3 employees per thousand square feet, this development could ultimately be home of approximately 2,990 jobs. A transit trip rate per employee was calculated based upon existing Park City Transit ridership, the proportion of trips taken by non-ski-area commuters, and the total non-ski-area employment in the service area. The resulting rate of 0.07 transit trips per employee was applied (in both summer and winter, and jobs in the research park are likely to be year-round), yielding 229 transit trips per day. At 255 workdays per year, this equates to 58,500 transit trips per year. It should be noted that it is expected to take many years for the full development to build out.

TABLE 1: Analysis of Annual Ridership Potential by Development/Potential Service Area

Area	Existing or Future Planned Development				Daily Rate (1-Way Psgr-Trips per Unit)		Ridership (1-way Psgr-Trips) Daily		
	Dwelling Units	Commercial Floor Area (KSF)	Jobs	Other Generators	Winter	Summer	Winter	Summer	Annual
Bear Hollow Village	249	0	0	--	0.13	0.04	32	11	6,500
Kimball Research Park	--	1300	2990	--	0.07	0.07	229	229	58,500
Old Ranch Road Area	78	0	0	--	0.13	0.04	10	3	2,100
Powderwood Expansion (Liberty Peak)	150	0	0	--	0.13	0.04	19	7	3,900
Silver Creek Business Park Area -- Existing	--	NA	611	Justice Center	0.07	0.07	63	63	17,300
Silver Creek Business Park Area -- Future	--	41	94	--	0.07	0.07	7	7	1,800
Silver Creek Village Center -- Residential	1,070	--	--	--	0.13	0.04	139	47	28,100
Silver Creek Village Center -- Commercial	--	50	150	--	0.07	0.07	31	31	7,800
Silver Creek Village Center -- Total	--	--	--	--	--	--	169	77	35,900
Silver Creek Estates	340	0	0	--	0.04	0.02	13	6	3,100
Summit Park Corridor	554	--	--	Weilenmann School of Discovery, Gorgoza Park	0.04	0.02	67	16	12,000
Park City Heights	239	--	--	--	0.07	0.07	17	17	6,100
Todd Hollow Village	185	--	--	--	0.13	0.04	24	8	4,900
Deer Mountain	146	--	--	--	0.07	0.07	10	10	3,700

Old Ranch Road Area

While the existing transit routes serve SR 224 and the High Estates area, there is an intervening area along Old Ranch Road that is not currently served. This area encompasses approximately 78 homes. Applying the residential trip rate from the Silver Springs area, service to this corridor would generate 10 daily transit trips on a winter day, and 3 on a summer day. Over the course of a year, this would total approximately 2,100 transit trips. Service to this corridor would require either an additional route (which would be very costly), or diversion of the existing Silver Summit/Highland Estates Route off of Bitner Road in one direction or the other (which would reduce ridership in this high productivity area). Due to these factors, service to this area will not be considered further.

Powderwood Expansion

Plans are currently under way for 150 additional multifamily housing along Powderwood Drive (southwest of the Factory Outlet Stores). At the residential trip rate discussed above, this area would generate an estimate 19 transit trips per winter day and 7 per winter day, or an annual total of 3,900 passenger-trips.

Silver Creek Commerce Center / Silver Creek Business Park

This area along Silvercreek Drive and the North Pace Frontage Road already encompasses substantial development, including the Triumph plant, Home Depot, and the Summit County Justice Center. There is also existing commercial development potential in the area. Transit ridership was estimated based upon employment in area, and including an estimate 20 one-way passenger-trips per day associated with the Justice Center. No ridership was assumed associated with customers of Home Depot. A total of 63 passenger-trips per weekday is estimated. Over the course of a year (and assuming that weekend daily ridership is 20 percent of weekday ridership), service to this area would generate 17,300 one-way passenger-trips per year. Development of approved-but-not-yet-built commercial floor area would add an additional 1,800 trips, for a total of 19,100 one-way passenger-trips.

Silver Creek Village Center

Planning and entitlement is currently underway for the mixed-use Silver Creek Village Center in the southeast quadrant of the I-80/US 40 interchange (north of the Silver Creek Business Park). This is currently envisioned to consist of 1,070 dwelling units along with 50,000 square feet of commercial development. At the residential and commercial transit trip rates discussed above, this development would generate an estimated 169 transit trips per winter day and 77 transit trips per summer day. Over the course of a year, this would total an estimated 35,900 passenger trips. It is worth noting that efficient provision of transit service to this overall area would be significantly enhanced if Silvercreek Drive were to be extended to form a loop through the Village Center back to the Frontage Road.

Silver Creek Estates

Silver Creek Estates consists of an extensive large-lot residential development consisting of 340 homes north of I-80. Due to the low density land use pattern and dispersed roadway system, service to this area would be similar to that currently provided to the Jeremy Ranch area: a stop at a park-and-ride near the entrance to the subdivision. Considering the existing ridership

generated by the Jeremy Ranch park-and-ride and the number of dwelling units in Jeremy Ranch, a rate of 0.04 daily transit passenger-trips per dwelling unit in winter and 0.02 in summer was calculated. Applying these rates to the number of homes in Silver Creek Estates, service to this area would serve 13 passenger-trips on a winter day and 6 passenger-trips on a summer day. Given this low ridership potential and the operating time and costs that would be associated with serving Silver Creek Estates, service to this area would not be cost effective.

Summit Park

As the Park City Transit routes currently only extend as far west as Pinebrook Boulevard, the Timberline and Summit Park subdivisions to the west are not currently served. Due to the dispersed nature of Summit Park and its narrow, steep and windy roadways, it is not possible to effectively serve the interior of this area. It would be possible, however, to provide service along Kilby Road as far as a park-and-ride at the Parleys Summit interchange (Parleys Lane). This would also serve the Gorgoza Park tubing hill, as well as the Weilenmann School of Discovery (a private K-8 school). Ridership demand for this area would be generated from three sources:

- Residential park-and-ride would be generated. Applying the observed ridership rate at the Jeremy Ranch park-and-ride to the number of units in the Summit Park and Timberline areas, this would generate approximately 21 one-way passenger-trips over a winter day, and 10 over a summer day.

- The tubing hill is estimated to generate 40 passenger-trips over an average winter day.

- With the possible exceptions of class trips, transit ridership generated by the Weilenmann School of Discovery is expected to be minimal, consisting of an estimated six staff commute trips per day.

Overall, this service would generate 67 passenger-trips per winter day, 16 over a summer day, and 12,000 over the course of a year.

County Overall Service Plan Alternatives

These alternatives focus on the key interlined routes, and do not consider the Snyderville Circulator or Canyons services, discussed separately below.

Status Quo

The existing County service plan consists of three buses providing service every 30 minutes between Jeremy Ranch and Park City (a 90-minute total route cycle time), along with one bus providing hourly express service between Park City and Kimball Junction as and the Silver Summit/Highland Estates route (a 60-minute total route cycle time). This service plan has been effective in serving ridership and overall has provided reliable service. However, there are some existing deficiencies with this status quo:

- Some route segments consume resources without generating significant ridership, particularly the portion of the Silver Summit/Highland Estates route east of the Canyon Creek Club as well as the Silver Springs portion of the Pinebrook Route.

- With the exception of the once-per hour express run, travel time between Kimball Junction and Park City is long (roughly 30 minutes), due to service to local areas along the route.

- As discussed above, some potential ridership generating areas are not currently served. The existing County service plan does not have excess running time to serve new areas, without reducing service frequency to existing areas.

- The Express route does not serve the Canyons Transit Center. While this is addressed in part by provision of the separate Canyons Route service to Park City, it does reduce opportunities for more convenient trips between The Canyons and points to the north.

- The current Express / Silver Summit / Highlands Estates combined route does not have sufficient time to make up for any traffic delays during peak periods, particularly between 3:00 PM and 6:00 PM.

To address these deficiencies and provide for future growth, two overall service plan alternatives were developed and evaluated, as discussed below.

Alternative A

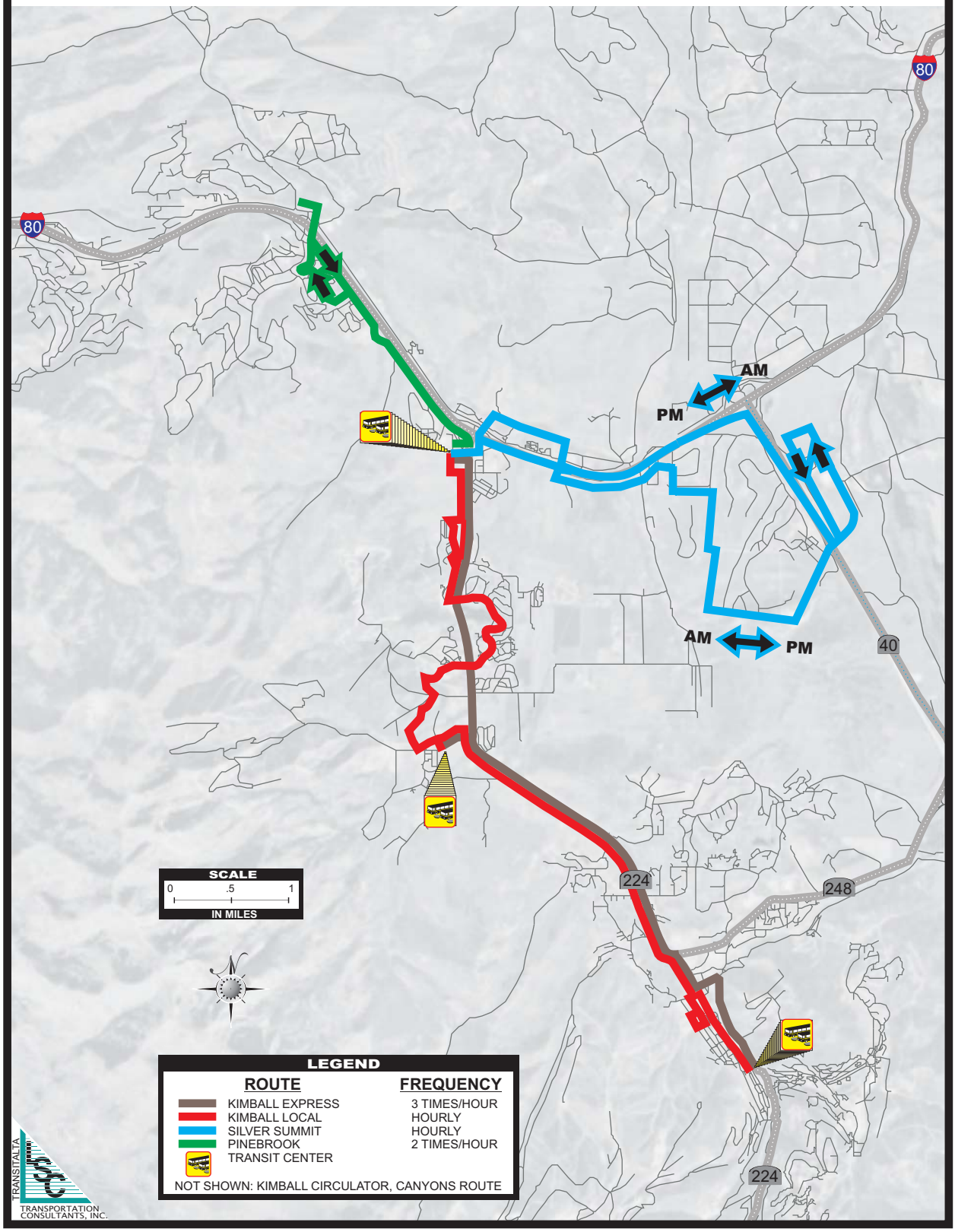
This alternative, as depicted in Figure 1, would consist of the following services:

- Two buses would be used to operate Kimball Junction Express service paired with Pinebrook service, providing an hour-long cycle length. Service provided twice an hour on the Pinebrook route would operate with alternating 20 minute and 40 minute headways. A stop at the Canyons Transit Center would be added in each direction to the Express route.

- A third bus would operate a Kimball Junction Express run, paired with a revised Silver Summit/Highland Estates route. Instead of the current route (operating a clockwise loop along Highland Drive, Silver Summit Parkway and Trailside Drive), the route would use I-80 and US 40 in the AM period to make a quick trip to Silver Creek Business Park and the Summit County Justice Center, and then return via the existing route along Silver Summit Parkway, Trailside Drive, Highland Drive and Bitner Road. This route can be operated in approximately 28 minutes, including time to serve future development in Silver Creek Village Center. This one-way route has the benefit of quickly serving commuters from the remainder of the transit service area traveling to the Business Park and providing shorter in-vehicle travel time for local residents traveling into the remainder of the system. In the PM, the route would reverse to serve the local streets on the outbound leg and returning via I-80. (While this route option would eliminate service along Highland Drive between Old Ranch Road and Silver Summit Parkway, available traffic counts indicate that these stops serve only approximately five passenger-trips per day over the course of the year.)

- A fourth bus would provide hourly “local” service along the SR 224 corridor, including the existing Silver Springs stops as well as new service to the Bear Hollow and Sun Peak/Frostwood areas. Ingress to Bear Hollow would be via Bear Cub Lane and egress via Bobsled Boulevard in both directions, in order to enter SR 224 at a traffic signal. One sub-option would be to serve the Grand Summit Hotel instead of the Sundial/Frostwood area, particularly if another route serves the Frostwood area.

FIGURE 1
Summit County Transit Routes
Alternative A



The first three buses would in combination provide express service along the SR 224 corridor between Old Town and Kimball Junction every 20 minutes. To provide adequate running time (and layover time) for this plan, the Kimball transit center would need to shift from Newpark to the planned location west of the Richins Building.

An operating cost model (as shown in Table 3) is applied to the service quantities, which is based on FY 2010-11 budget estimates and expected impacts of inflation (particularly to fuel costs). Total marginal operating costs would increase by approximately $106,000 per year, or 7 percent over the status quo.

The ridership impact of this alternative was evaluated based on a detailed assessment of the on-board passenger surveys with regards to trip origin and destination. The individual survey responses were grouped by origin and destination, and factored by the average daily total ridership, as shown in Table 4 and Figure 2. This analysis reflects the strong concentration of trips on the County services along the SR 224 corridor. It is worth noting the relative balance of overall ridership generated in the Pinebrook area versus the Silver Summit area. Also of note is the low ridership generated along SR 224 north of The Canyons but south of Kimball Junction, as well as the lack of any existing reported ridership between the Pinebrook and Silver Summit areas.

The ridership generated by each area was factored by the impact of the service alternative on three key transit service factors, as shown in Table 5: service frequency, travel time, and the need for passenger to transfer between routes. Standard “elasticity” factors were first identified reflecting the change in ridership associated with the change in these three key factors that would result from the service alternative. This standard factor was then adjusted by the proportion of overall ridership generated in each service area that would be impacted by the specific factor. The resulting factors were then applied to a “status quo” ridership in order to identify ridership that would result from the alternative. In addition, the existing ridership generated on the portion of the Silver Summit/Highland Estates Route that would lose service under Alternative A was subtracted.

As shown in Table 5, this alternative would increase ridership by approximately 133,000 passenger-trips per year or 27 percent over the status quo alternative. As also indicated in Figure 3, the bulk of this ridership increase would be generated within existing service areas, along with approximately 24,000 passenger-trips per year generated in the Bear Hollow and Silver Creek areas. While ridership would be reduced somewhat in the Silver Springs and Silver Summit areas, the increase in service frequency along the SR 224 corridor in particular would generate a very significant overall increase in ridership.

Table 5 also presents ridership estimates including the additional development presented in Table 1. With this additional ridership demand, ridership under this alternative would equal a total of 665,000 passenger-trips per year, adding another 48,000 annual passenger-trips.

The ridership estimate (at current level of development) is also used in Table 2 to assess the overall impact of this alternative on the performance measures for these elements of the County transit program. As shown, this alternative would increase the passenger-trips per vehicle-hour of service from 24.1 to 29.8 (a 23 percent increase), would slightly increase the passenger-trips per vehicle-mile of service (by 9 percent), and would reduce the operating cost per passenger-trip by $0.47 (a 16 percent decrease).

TABLE 2: Summit County Fixed-Route Transit Service Alternatives

Fiscal Year 2011-12 *Costs Exclude Allocated Fixed Costs*

Alternative/Route/Season	Vehicles (1)	Runs Per Day	Annual: Vehicle Service Miles	Annual: Vehicle Service Hours	Annual: Operating Days	Annual: Marginal Operating Cost	Ridership Impact (2) (One-Way Trips): Daily	Ridership Impact (2) (One-Way Trips): Annual	Performance Analysis: Passenger-Trips per VSH	Performance Analysis: Passenger-Trips per VSM	Performance Analysis: Op. Cost per Passenger-Trip
SUMMIT COUNTY STATUS QUO (1)	4	N/A	371,500	20,040	365	$1,443,980	1,325	483,680	24.1	1.3	$2.99
ALTERNATIVE A											
Modified Kimball Express Winter	1	45	81,300	2,900	129	$244,190					
Non-Winter	1	40	132,200	4,720	236	$395,390					
Subtotal	***1***	**--**	***213,500***	***7,620***	***365***	***$639,580***					
Kimball Local Winter	1	15	37,000	1,940	129	$140,710					
Non-Winter	1	14	63,200	3,300	236	$237,610					
Subtotal	***1***	**--**	***100,200***	***5,240***	***365***	***$378,320***					
Modified Silver Summit Winter	1	15	21,900	970	129	$76,480					
Non-Winter	1	14	37,500	1,650	236	$128,320					
Subtotal	***1***	**--**	***59,400***	***2,620***	***365***	***$204,800***					
Pinebrook Winter	1	30	23,200	1,940	129	$121,950					
Non-Winter	1	28	39,600	3,300	236	$205,520					
Subtotal	***1***	**--**	***62,800***	***5,240***	***365***	***$327,470***					
TOTAL	**4**	**--**	**435,900**	**20,720**	**365**	***$1,550,170***	1,689	**616,590**	**29.8**	**1.4**	**$2.51**
Net Change	*0*	**--**	*64,400*	*680*	--	$106,190	*364*	*132,910*	5.6	0.1	($0.47)
			17%	*3%*	--	*7%*	*27%*	*27%*	*23%*	*9%*	*-16%*
ALTERNATIVE B											
Modified Kimball Junction Express Winter	1	30	54,200	1,940	129	$164,090					
Non-Winter	1	25	82,600	2,950	236	$248,210					
Subtotal	***1***	**--**	***136,800***	***4,890***	***365***	***$412,300***					
Kimball Local Winter	1	15	37,000	1,940	129	$140,710					
Non-Winter	1	14	63,200	3,300	236	$237,610					
Subtotal	***1***	**--**	***100,200***	***5,240***	***365***	***$378,320***					
Modified Silver Summit Winter	0.75	15	20,900	1,450	129	$96,000					
Non-Winter	0.75	14	35,800	2,480	236	$162,660					
Subtotal	***0.75***	**--**	***56,700***	***3,930***	***365***	***$258,660***					
Pinebrook/ Summit Park Winter	0.75	15	21,300	1,450	129	$96,540					
Non-Winter	0.75	14	36,300	2,480	236	$163,340					
Subtotal	***0.75***	**--**	***57,600***	***3,930***	***365***	***$259,880***					
Pinebrook Winter	0.5	15	11,600	970	129	$60,980					
Non-Winter	0.5	14	19,800	1,650	236	$102,760					
Subtotal	***0.5***	**--**	***31,400***	***2,620***	***365***	***$163,740***					
TOTAL	**4**	**--**	**382,700**	**20,610**	**365**	***$1,472,900***	1,592	**581,210**	**28.2**	**1.5**	**$2.53**
Net Change	0	--	11,200	570	N/A	$28,920	267	*97,530*	4.1	0.2	($0.45)
			3%	*3%*	--	*2%*	*20%*	*20%*	*17%*	*17%*	*-15%*

Note 1: Excludes "The Canyons" service to Park City, early morning/late evening service, as well as all City routes.

Note 2: Excluding ridership generated by future development.

TABLE 3: Park City Transit Cost Allocation Model

Fiscal Year 2011-2012

Line Item	Total	Cost Allocation Parameter: Vehicle Service Hours	Vehicle Service Miles	Per Vehicle	Fixed
Driver's Salaries & Benefits	$ 2,794,423	$ 2,794,423			
Supervisor's Salaries & Benefits	$ 355,510	$ 355,510			
Managers Salaries	$ 127,743				$ 127,743
Membership	$ 3,060				$ 3,060
Public Notices	$ 3,098				$ 3,098
Meetings/Conference	$ 18,009				$ 18,009
Recruitment and Training	$ 16,528				$ 16,528
Department Supplies	$ 60,689				$ 60,689
Office Supplies	$ 5,748				$ 5,748
Postage	$ 2,319				$ 2,319
Uniforms	$ 16,842	$ 16,842			
Radio Maintenance	$ 14,023				$ 14,023
Building Maintenance	$ 16,320				$ 16,320
Printing	$ 27,523				$ 27,523
Photocopy	$ 346				$ 346
Utilities	$ 16,059				$ 16,059
Cellular & Pager	$ 6,837				$ 6,837
Misc. Contract Services	$ 74,946				$ 74,946
Street Signs	$ 9,098				$ 9,098
Administrative Charge (General Fund)	$ 494,425				$ 494,425
Vehicle Maintenance	$ 683,400		$ 683,400		
Vehicle Insurance	$ 102,000			$ 102,000	
Fuel	$ 778,550		$ 778,550		
Total Expenditures	$ 5,627,497	$ 3,166,776	$ 1,461,950	$ 102,000	$ 896,772
Unit Quantities		70,282	1,075,422	34	
Cost Per Unit (Fiscal Year)		$ 45.06	$ 1.36	$ 3,000	

Based on FY 2010-11 budget. Inflation rate of 15% for fuel and 2% for all other items applied to estimate FY 2011-12 values.

Advantages

- Provides 20 minute express service between Park City and Kimball Junction. All passengers on the Pinebrook and Silver Summit legs are provided with express service to The Canyons and Park City.
- Provides additional connections to a Canyons Circulator
- Expands service to the Bear Hollow, Frostwood/Sun Peak and Silver Creek Business Park areas.
- Significantly increases ridership and productivity.

TABLE 4: Existing County Transit Passenger-Trip Origin/Destination Pattern

FROM	TO: Along SR 224	Bear Hollow	Canyons	Kimball Junction Area	Park City (Deer Valley)	Park City (PCMR)	Park City (Other)	Pinebrook Leg	Silver Springs	Silver Summit Leg	Total
AVERAGE TOTAL DAILY PASSENGER-TRIPS IN PEAK WINTER MONTH (JANUARY)											
All County Routes											
Along SR 224	0	0	0	0	0	0	0	10	0	0	10
Bear Hollow	0	0	0	0	0	0	0	0	0	0	0
Canyons	0	0	30	110	10	0	320	20	20	10	520
Kimball Junction Area	0	0	60	60	30	40	270	30	20	80	590
Park City (Deer Valley)	0	10	20	20	0	10	30	0	0	0	90
Park City (PCMR)	0	0	40	50	10	0	60	20	0	0	180
Park City (Other)	20	0	370	270	50	30	340	30	0	20	1,130
Pinebrook Leg	0	0	50	110	0	10	80	10	0	0	260
Silver Springs	0	0	0	10	0	0	30	0	0	0	40
Silver Summit Leg	0	0	0	90	10	30	80	0	0	10	220
Total	20	10	570	720	110	120	1,210	120	40	120	3,040
Canyons Route Only											
Along SR 224	0	0	0	0	0	0	0	0	0	0	0
Bear Hollow	0	0	0	0	0	0	0	0	0	0	0
Canyons	0	0	10	10	10	0	240	0	0	0	270
Kimball Junction Area	0	0	0	0	0	0	0	0	0	0	0
Park City (Deer Valley)	0	0	0	0	0	0	0	0	0	0	0
Park City (PCMR)	0	0	30	0	0	0	50	0	0	0	80
Park City (Other)	0	0	130	0	40	0	150	0	0	0	320
Pinebrook Leg	0	0	0	0	0	0	0	0	0	0	0
Silver Springs	0	0	0	0	0	0	0	0	0	0	0
Silver Summit Leg	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	170	10	50	0	440	0	0	0	670
Kimball Junction and Silver Summit/Highland Estates Routes Only											
Along SR 224	0	0	0	0	0	0	0	10	0	0	10
Bear Hollow	0	0	0	0	0	0	0	0	0	0	0
Canyons	0	0	20	100	0	0	80	20	20	10	250
Kimball Junction Area	0	0	60	60	30	40	270	30	20	80	590
Park City (Deer Valley)	0	10	20	20	0	10	30	0	0	0	90
Park City (PCMR)	0	0	10	50	10	0	10	20	0	0	100
Park City (Other)	20	0	240	270	10	30	190	30	0	20	810
Pinebrook Leg	0	0	50	110	0	10	80	10	0	0	260
Silver Springs	0	0	0	10	0	0	30	0	0	0	40
Silver Summit Leg	0	0	0	90	10	30	80	0	0	10	220
Total	20	10	400	710	60	120	770	120	40	120	2,370
PERCENT OF TOTAL VALID RESPONSES											
All County Routes											
Along SR 224	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bear Hollow	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Canyons	0%	0%	1%	4%	0%	0%	11%	1%	1%	0%	17%
Kimball Junction Area	0%	0%	2%	2%	1%	1%	9%	1%	1%	3%	19%
Park City (Deer Valley)	0%	0%	1%	1%	0%	0%	1%	0%	0%	0%	3%
Park City (PCMR)	0%	0%	1%	2%	0%	0%	2%	1%	0%	0%	6%
Park City (Other)	1%	0%	12%	9%	2%	1%	11%	1%	0%	1%	37%
Pinebrook Leg	0%	0%	2%	4%	0%	0%	3%	0%	0%	0%	9%
Silver Springs	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Silver Summit Leg	0%	0%	0%	3%	0%	1%	3%	0%	0%	0%	7%
Total	1%	0%	19%	24%	4%	4%	40%	4%	1%	4%	100%
Canyons Route Only											
Along SR 224	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bear Hollow	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Canyons	0%	0%	1%	1%	1%	0%	36%	0%	0%	0%	40%
Kimball Junction Area	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park City (Deer Valley)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park City (PCMR)	0%	0%	4%	0%	0%	0%	7%	0%	0%	0%	12%
Park City (Other)	0%	0%	19%	0%	6%	0%	22%	0%	0%	0%	48%
Pinebrook Leg	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Silver Springs	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Silver Summit Leg	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%	0%	25%	1%	7%	0%	66%	0%	0%	0%	100%
Kimball Junction and Silver Summit/Highland Estates Routes Only											
Along SR 224	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bear Hollow	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Canyons	0%	0%	1%	4%	0%	0%	3%	1%	1%	0%	11%
Kimball Junction Area	0%	0%	3%	3%	1%	2%	11%	1%	1%	3%	25%
Park City (Deer Valley)	0%	0%	1%	1%	0%	0%	1%	0%	0%	0%	4%
Park City (PCMR)	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%	4%
Park City (Other)	1%	0%	10%	11%	0%	1%	8%	1%	0%	1%	34%
Pinebrook Leg	0%	0%	2%	5%	0%	0%	3%	0%	0%	0%	11%
Silver Springs	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%
Silver Summit Leg	0%	0%	0%	4%	0%	1%	3%	0%	0%	0%	9%
Total	1%	0%	17%	30%	3%	5%	32%	5%	2%	5%	100%

Source: Onboard Surveys Conducted March 2011, factored by peak winter monthly ridership totals.

FIGURE 2
Winter Daily Passenger Trips
By Origin/Destination Pairs on County Routes

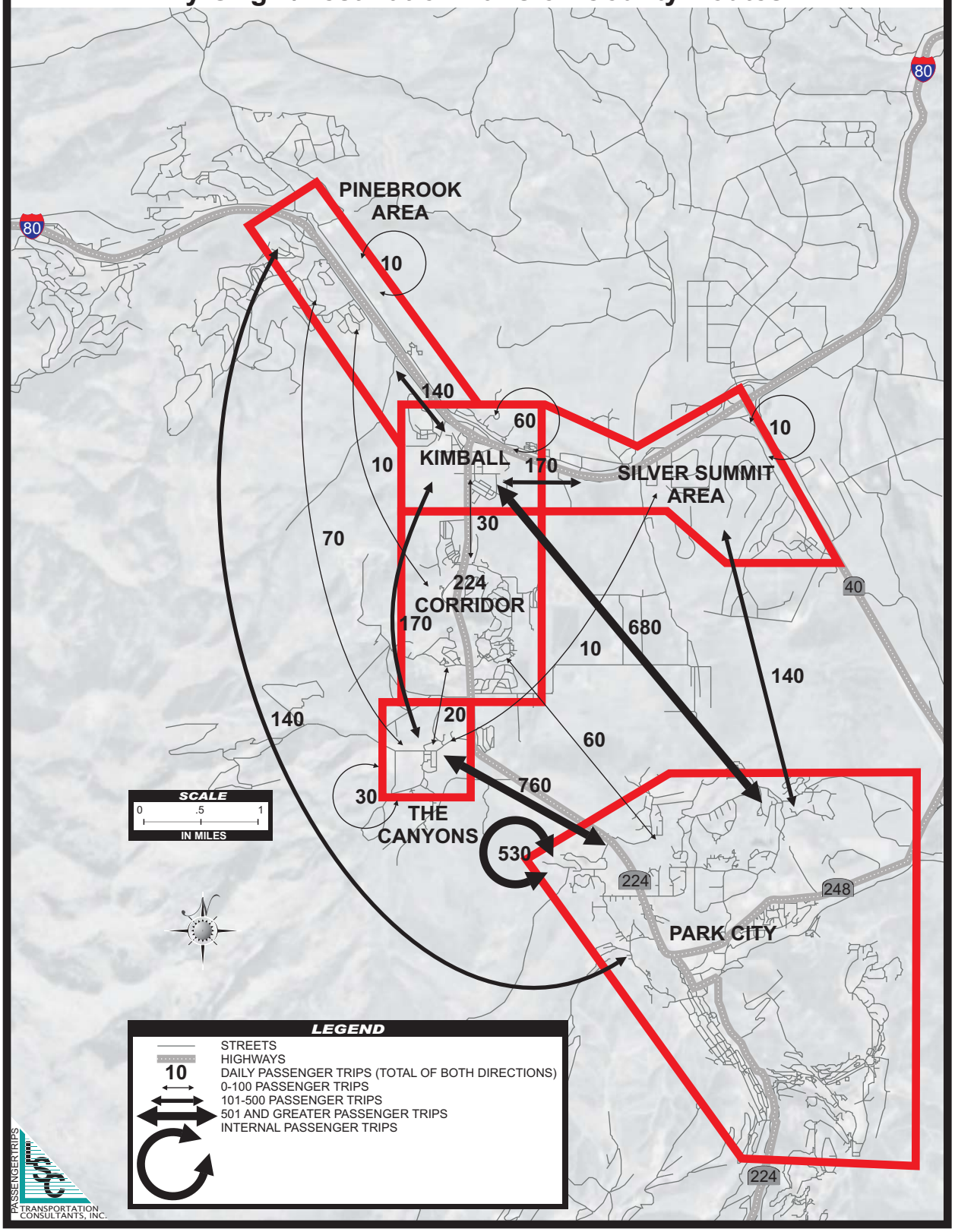


TABLE 5: Summit County Fixed Route Alternative A Ridership

Ridership Area	11-12 Status Quo Ridership	Existing Development: Service Quality Factors: Frequency	Travel Time	Transfers	Annual Ridership Under Scenario		With Future Development: Base Case Ridership	Annual Ridership Under Scenario	
Silver Summit Area	44,900	0%	-7%	0%	40,430		44,900	40,430	
Pinebrook Area	47,760	0%	20%	4%	59,270		47,760	57,810	
Kimball Junction	120,410	9%	19%	0%	154,260		139,891	177,750	
Jeremy Ranch	5,310	0%	20%	4%	6,590		5,310	5,130	
Silver Springs	8,160	-27%	0%	0%	5,970		8,160	4,510	
Bear Hollow	6,500	0%	0%	-3%	6,330		6,500	4,870	
Canyons	51,020	10%	31%	-13%	65,220		51,020	63,760	
224 Corridor	2,040	0%	0%	0%	2,040		2,040	580	
OTTC	183,680	9%	26%	-4%	240,280		183,680	238,820	
PCMR	20,410	0%	0%	-7%	18,900		20,410	17,440	
Silver Creek Area	17,300	0%	0%	0%	17,300		55,000	53,540	
Total	507,490				616,590			664,640	
Subtotal: Existing Svc Area	*483,690*				*592,960*			*606,230*	
Change From Base Case in Existing Service Area					*132,900*	27%		*180,950*	37%

Source: LSC Transportation Consultants, Inc.

Disadvantages

- Eliminates existing service along Highland Drive between Old Ranch Road and Silver Summit Parkway.
- One-way service plan of Silver Summit/Highland Estates may be confusing to passengers, and will result in longer travel times for some passengers traveling in the off-peak direction.
- Reduces service within Silver Springs from half-hourly to hourly.
- Requires $79,000 in additional annual operating funding.
- The 20 minute / 40 minute pattern of times between Pinebrook runs is slightly less convenient, and potentially confusing to passengers.
- New bus stops would need to be established in some areas.

Alternative B

As shown in Figure 4, this alternative consists of the following individual services:

- Two buses would be used to operate three routes, totaling a 2-hour cycle:

    1. An expanded Silver Summit/Highland Estates route, consisting of the existing route plus service to Silver Creek Business Park, the Summit County Justice Center and the future Silver Creek Village Center (40 minute route)

    2. An expanded Pinebrook route, extended along Kilby Road as far as a park-and-ride at Summit Park (35 minute route)

    3. The Kimball Junction Express route between Kimball Junction and Old Town Transit Center, with an added stop at The Canyons Transit Center. (35 minute route)

Figure 3: County Service Alternatives Annual Ridership

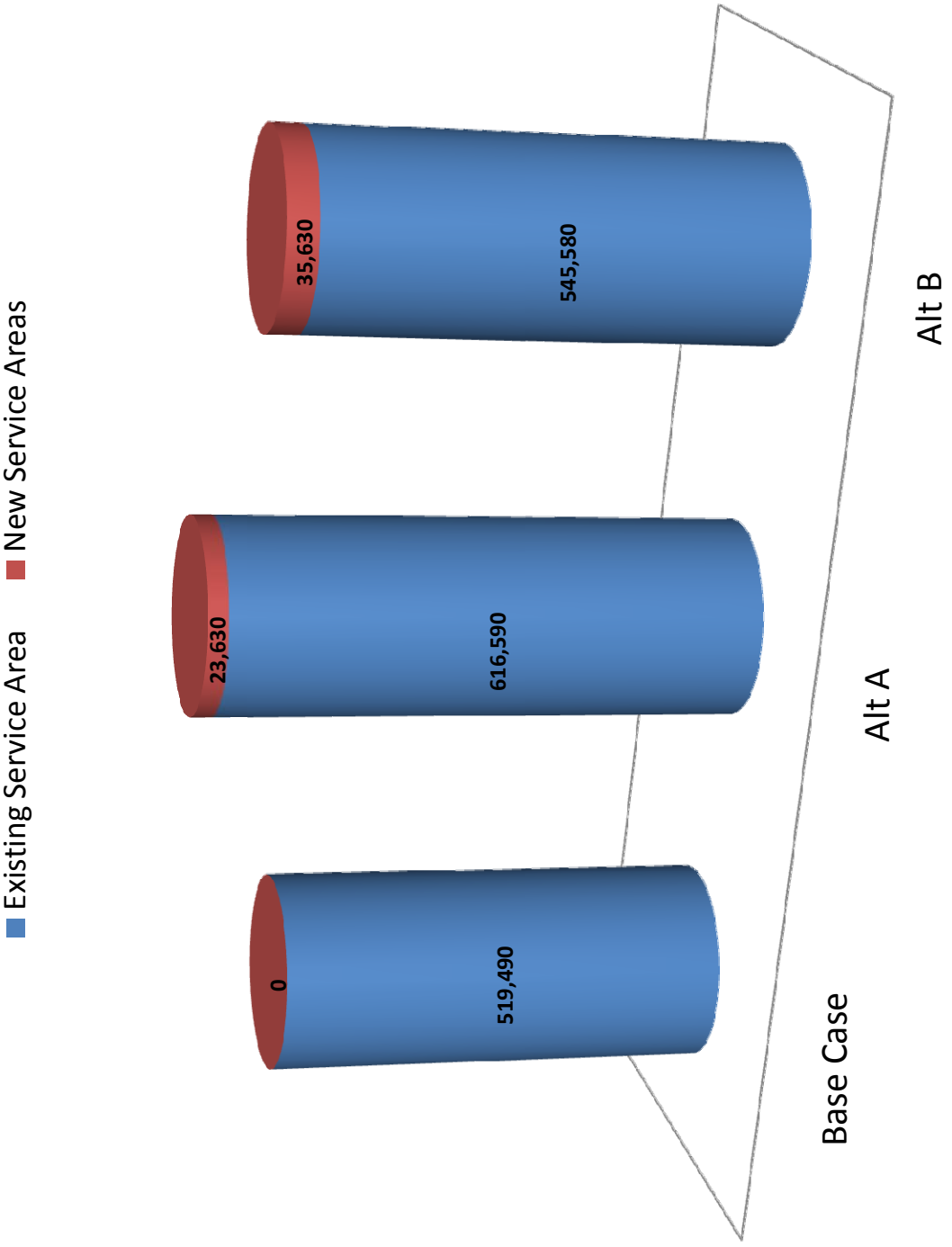
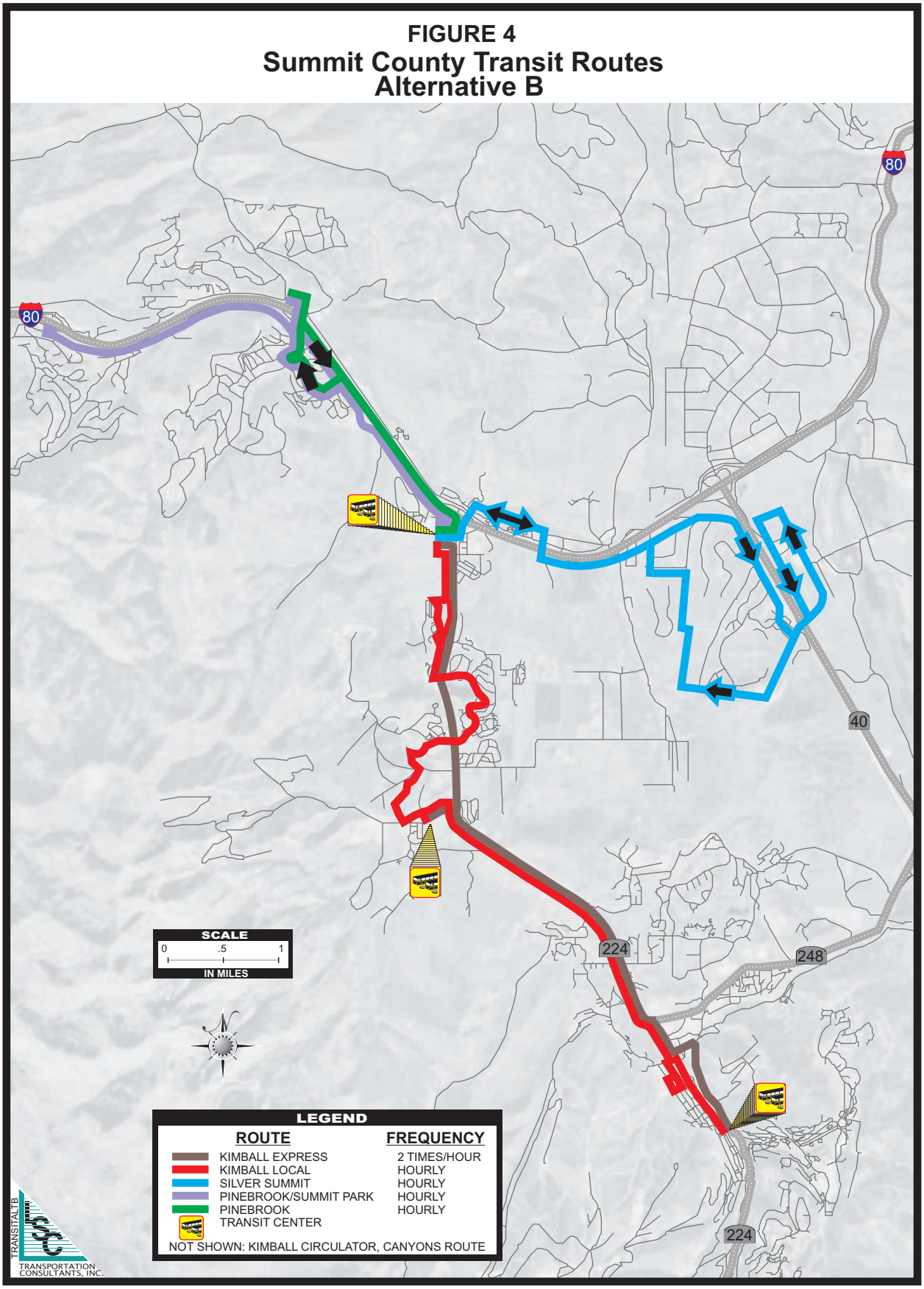


FIGURE 4
Summit County Transit Routes
Alternative B



- One bus would be used to operate an additional Kimball Junction Express run (also serving the Canyons Transit Center, and timed to provide half-hourly headways along SR 224) as well as the existing Pinebrook route (without extension to Summit Park).

- A fourth bus would be used to operate hourly "local" service along the SR 224 corridor between Park City and Kimball Junction, including service to Silver Springs, Bear Hollow, and Sun Peak/Frostwood.

In comparison with Alternative A, this alternative serves an additional area (Summit Park), but provides two Express runs each hour between Kimball Junction and Park City, rather than three.

Service quantities are shown in the bottom of Table 2. As indicated, the number of buses required to operate the service remains unchanged at four, and both vehicle-miles and vehicle-hours are within 3 percent of status quo levels. As a result, overall costs increase by only roughly $29,000 per year.

Ridership impacts were assessed using the same methodology discussed above for Alternative A, as shown in Table 6. The ridership benefits associated with travel time would be lower for Alternative B (reflecting one less Express run per hour), while the losses associated with the need to transfer would be high (due to the interlining of the three routes). Overall ridership would increase by roughly 98,000 passenger-trips per year or 20 percent, which is 7 percent less than for Alternative A. As shown in Figure 3, the ridership generated in new service areas is higher (reflecting service to Summit Park), but overall ridership would be roughly 35,000 trips per year lower than under Alternative A.

As shown in the bottom portion of Table 2, this alternative would substantially improve the passenger-trips served per vehicle-hour and vehicle-mile of service, increasing both by 17 percent. Overall marginal operating cost per passenger-trip would be reduced by 15 percent.

Advantages

- Increases Express service between Kimball Junction and Park City from every hour to every half hour.

- Provides service to Summit Park, as well as Silver Summit Business Park and Bear Hollow.

- Improves ridership and productivity over status quo.

- Lower cost impact.

- Preserves service to all existing stops in Silver Summit/Highlands Estates area.

- Avoids out-of-direction travel for passengers along Bitner Road traveling in the off-peak direction.

- Provides additional layover time.

TABLE 6: Summit County Alternative B Ridership

	Existing Development						With Future Development		
		Service Quality Factors							
Ridership Area	11-12 Status Quo Ridership	Frequency	Travel Time	Transfers	Annual Ridership Under Scenario		Base Case Ridership	Annual Ridership Under Scenario	
Silver Summit Area	44,900	0%	-7%	0%	41,890		44,900	40,430	
Pinebrook Area	47,760	0%	7%	0%	51,300		47,760	49,840	
Kimball Junction	120,410	0%	14%	0%	137,320		139,891	158,070	
Jeremy Ranch	5,310	0%	7%	0%	5,700		5,310	4,240	
Silver Springs	8,160	-27%	8%	-6%	6,140		8,160	4,680	
Bear Hollow	6,500	0%	0%	-3%	6,330		6,500	4,870	
Canyons	51,020	6%	21%	-8%	60,960		51,020	59,500	
224 Corridor	2,040	0%	4%	0%	2,120		2,040	660	
OTTC	183,680	0%	20%	0%	221,250		183,680	219,790	
PCMR	20,410	0%	0%	-7%	18,900		20,410	17,440	
Silver Creek Area	17,300	0%	0%	0%	17,300		55,000	53,540	
Summit Park	12,000	0%	0%	0%	12,000		12,000	10,540	
Total	519,490	-	-	-	581,210			623,600	
Subtotal: Existing Svc Area	*483,690*				*545,580*			*554,650*	
Change From Base Case in Existing Service Area					*97,520*	20%		*139,910*	29%

Source: LSC Transportation Consultants, Inc.

Disadvantages

- Less Express service, and more need for transfers.
- Lower ridership potential than Alternative A.
- Combination of longer and shorter routes would result in imbalanced schedules in Pinebrook area, and some need for additional in-vehicle travel times.
- New bus stops would need to be established in some areas.
- Reduces service within Silver Springs from half-hourly to hourly.
- Expansion to Summit Park would increase the area that would need to be provided with Paratransit/Mobility service. This area would be particularly challenging to serve given the long distance from the operations base in Park City.

OTHER SUMMIT COUNTY ALTERNATIVES

Kimball Circulator

At present, the Kimball Junction area is served by both the Pinebrook (Pink) route as well as the Silver Summit/Highland Estates (Brown) route, as each route travels off of the SR 224 corridor to the transit center at Newpark. Other major stops in the area include a stop along Newpark Boulevard new Redstone, as well as stops (on the Pinebrook Route only) serving Wal-Mart and the Tanger Outlet Center. This service strategy has several limitations:

- Some areas are far from the nearest existing stop. Accessing Redstone requires a 400 to 500 foot walk across parking lots from the nearest stop, for example. The southernmost multifamily housing areas in the Redstone area are roughly a 0.3 mile walk to the nearest stop.

- Service to most stops is only provided every half hour. This greatly limits the ability of current transit services to serve as an internal connector for trips within Kimball Junction.

- There is no capacity on existing routes to add to the transit routes to serve new areas. In addition, simply extending the existing routes would add travel time to the many existing passengers traveling through the Kimball Junction area.

Within the five-year SRTDP planning period, very substantial development is expected in the Kimball Junction area, particularly with regards to the Kimball Research Park and adjacent Liberty Peak multifamily housing area. As presented in Table 1, these areas have substantial potential to generate transit ridership, totaling roughly 62,000 passenger-trips per year at buildout. However, it is not possible to serve this area in the southwest portion of Kimball Junction with existing routes.

A logical next step in the evolution of both the Kimball Junction area and the transit program is the provision of a local circulator route serving the area. Figure 5 presents a conceptual route map that could serve the key activity centers as well as the Kimball Research Park and Liberty Peak areas, consisting of two one-way loops centered on the Kimball Transit Center. This route is 3.4 miles in length, and can be operated on a 20-minute schedule (even with traffic delays). The route would be timed to provide direct connections to/from the regional routes (which would be particularly effective with the 20-minute-headway Express service under Alternative A, above.) A smaller transit vehicle (such as 30-foot bus) would operate this service, preferably with a low floor to ease entry and exit.

A reasonable span of service for this route would be 7:00 AM to 11:00 PM, year-round, in order to serve commuters, shoppers and persons out for the evening. As shown in Table 7, this service would incur a marginal cost of $347,000. (A reduced span of service, such as evening service in the off-seasons on weekends only, could reasonably reduce this figure while still providing substantial benefits.) Ridership is estimated based on the observed existing ridership patterns as well as the effectiveness of similar service in other mixed commercial/residential centers to equal approximately 88,000 one-way passenger-trips per year.

It should be noted that some roadways along the conceptual route are relatively narrow, with parking along one or both sides. It may be necessary to reconfigure some intersections or parking areas to ensure that buses can make turns without encroaching onto oncoming travel lanes. In addition, timely snow removal will be important to ensure that bus travel routes are not impeded.

County Service Later in the Evening

The current schedule results in a last departure time during the winter starting a 9:00 PM on the Kimball Express and Silver Summit/Highland Estates (Brown) service, and starting at 10:10 PM on the Pinebrook Route (Pink). In the summer, the last departures start at 8:55 PM on the former and 8:40 PM on the latter. These end of service times are early compared with those of other transit services in mountain resort areas. As examples, the program serving Aspen ends at 12:00 Midnight year round, while the Vail Transit program operates many of its routes until 2:00 AM in winter and Midnight in the off-seasons.

Table 8 presents hourly ridership by route for an average winter day, along with the percent of total daily ridership in each hour. Figure 6 depicts the proportion of ridership in each hour for

FIGURE 5

Potential Kimball Junction Circulator Bus Route

County services and City services as a whole, which reflects the higher "commute" use of the County system in the 7:00 AM and 4:00 PM hours. This figure also depicts an equivalent graph line for the Aspen transit program, showing the relatively high proportion of daily ridership occurring in the later evening hours.

Four options regarding extension of the current service hours were evaluated, for the Kimball/Pinebrook (Pink) and the Express/Silver Summit/Highland Estates (Brown) routes:

- **Winter Service Till 11 PM** – This would add one additional Pink Route run and two Brown Route runs. (Buses on the routes at 11:00 PM would complete their runs). This would have the advantage of providing more consistent end of service times between the two routes, which is easier for passengers to understand. As shown in Table 7, costs would be increased by roughly $33,000 per year. Ridership is estimated based on the observed ratio of ridership in these additional hours to the total average daily ridership on comparable routes in the Aspen transit system, and reduced by 25 percent to reflect existing PCT passengers that currently use the last available runs and would make use of additional later runs. Overall, this additional service would carry an estimate 61 passenger-trips on an average winter day, or 7,800 over the course of the winter season. Overall, a respectable 17.3 passenger-trips would be served per additional vehicle-hour of service.

- **Winter Service Till Midnight** – Three additional Pink Route runs would be added, along with three Brown Route runs. Total costs would be increased by $69,300, while ridership would increase by 16,900 over a winter season. Productivity would be equivalent to the previous alternative.

- **Summer Service Till 11 PM** – This option would require operation of four additional Pink Route runs and two additional Brown Route runs per day. Reflecting the longer length of the season, operating these additional runs throughout the non-winter seasons would incur a cost increase of $132,500 per year. Approximately 82 passenger-trips per day would be served, or 19,000 over the course of the season. Productivity would be relatively low, at 10.1 passenger-trips per vehicle-hour.

- **Summer Service Till Midnight** – Adding the additional two Pink Route runs and one Brown Route run would increase the cost to $198,500 per year. Ridership would equal 9.3 passenger-trips per vehicle-hour of service.

There would be a benefit if the hours of service on the County routes were consistent with those of the City routes (as discussed below), as this is easier to communicate to passengers.

Canyons Service Alternatives

At present, a separate The Canyons Route is operated during the winter from 6:14 AM to 5:30 PM (every half hour), and during the summer from 6:14 AM to 4:55 PM (every 40 minutes). This route extends from the Grand Summit Hotel along Canyons Resort Drive and SR 224, and then operates along a loop in Park City encompassing Prospector Square, Old Town Transit Center and the Park City Mountain Resort. Service to other Canyons lodging properties, and in other periods of the day, is provided more informally by individual lodging vans.

In the northbound direction, The Canyons winter schedule fits well between Pink Route service times. However, in the southbound direction, The Canyons run (near the top of the hour)

TABLE 7: Other County Transit Service Alternatives In Existing Service Area

Fiscal Year 2011-12 *Costs Exclude Allocated Fixed Costs*

Alternative	Additional Vehicles		Runs Per Day	Annual Vehicle Service.. Miles	Annual Vehicle Service.. Hours	Annual Operating Days	Annual Marginal Operating Cost	Ridership Impact (One-Way Trips) Daily	Ridership Impact (One-Way Trips) Annual	Performance Analysis: Marginal Passenger-Trips per VSH	Performance Analysis: Marginal Passenger-Trips per VSM	Performance Analysis: Marginal Op. Cost per Passenger-Trip
Kimball Junction Circulator	1											
Winter	1	7:00AM-11:00PM	48	21,100	2,060	129	$123,000	384	*49,529*	24.0	2.3	$2.48
Non-Winter	1	7:00AM-11:00PM	48	38,500	3,780	236	$224,200	161	*38,071*	10.1	1.0	$5.89
Total	***1***		***N/A***	***59,600***	***5,840***	***365***	***$347,200***		***87,600***	15.0	1.5	$3.96
Extend Winter Service Till 11 PM												
Kimball/Pinebrook	0		1	3,300	190	129	$13,000	29	3,700	19.5	1.1	$3.51
Express/Silver Summit/Highland Estates	0		2	6,000	260	129	$19,900	32	4,100	15.8	0.7	$4.85
Total				***9,300***	***450***		***$32,900***		***7,800***	***17.3***	***0.8***	***$4.22***
Extend Winter Service till Midnight												
Kimball/Pinebrook	0		3	9,800	580	129	$39,500	86	11,000	19.0	1.1	$3.59
Express/Silver Summit/Highland Estates	0		3	9,000	390	129	$29,800	46	5,900	15.1	0.7	$5.05
Total				***18,800***	***970***		***$69,300***		***16,900***	***17.4***	***0.9***	***$4.10***
Extend Summer Service till 11 PM												
Kimball/Pinebrook	0		4	23,800	1,420	236	$96,300	62	14,500	10.2	0.6	$6.64
Express/Silver Summit/Highland Estates	0		2	11,000	470	236	$36,100	19	4,500	9.6	0.4	$8.02
Total				***34,800***	***1,890***		***$132,400***		***19,000***	***10.1***	***0.5***	***$6.97***
Extend Summer Service till Midnight												
Kimball/Pinebrook	0		6	35,700	2,120	236	$144,100	85	20,100	9.5	0.6	$7.17
Express/Silver Summit/Highland Estates	0		3	16,500	710	236	$54,400	26	6,200	8.7	0.4	$8.77
Total				***52,200***	***2,830***		***$198,500***		***26,300***	***9.3***	***0.5***	***$7.55***
Canyons Circulator												
Winter	1	7:00 AM-11:00 PM	64	24,000	1,940	121	$121,500	298	36,000	18.6	1.5	$3.38
Non-Winter	1	7:00 AM -9:30PM	56	21,000	1,750	121	$108,900	228	27,600	15.8	1.3	$3.95
Total				***45,000***	***3,690***		***$230,400***		***63,600***	***17.2***	***1.4***	***$3.62***
Replace Canyons Route with Canyons Circulator/Express												
Canyons Circulator/Express												
Winter	2		34	44,400	2,740	121	$186,800	423	51,200			
Summer	1		19	50,100	2,320	244	$174,100	91	22,200			
Subtotal				94,500	5,060		$360,900		73,400	14.5	0.8	$4.92
Existing Canyons Route												
Winter (1)	2		22	45,200	2,660	121	$184,300	400	48,400			
Summer	1		15	61,800	2,440	244	$195,500	54	13,100			
Subtotal				107,000	5,100		$379,800		61,500	12.1	0.6	$6.18
Net Total	***0***			***-12,500***	***-40***		***($18,900)***		***11,900***			

Note 1: Excludes passenger-trips wholly within Park City, which can be assumed to shift to other existing PCT routes.

Source: LSC Transportation Consultants, Inc.

TABLE 8: Hourly Variation in Ridership -- Average Winter Day

	6AM	7AM	8AM	9AM	10AM	11AM	Noon	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Mdnt	1AM	2AM
Average Winter Daily Ridership by Hour																					
Prospector Square (Red)		17	33	47	42	56	39	61	88	80	105	49	87	79	60	64	40	17			
Park Meadows (Green)		1	41	70	55	48	62	51	71	103	116	97	84	80	65	66	40	7			
Thaynes Canyon (Blue)		3	78	123	85	45	41	46	68	104	151	98	104	123	94	65	52	0			
Prospector Express (Yellow)		52	54	49	35	35	26	36	49	49	71	79	53	62	68	39	48	7			
Subtotal: City Core		*73*	*206*	*290*	*217*	*184*	*168*	*193*	*276*	*335*	*443*	*323*	*329*	*343*	*287*	*234*	*180*	*31*			
Trolley					4	9	21	10	11	11	32	18	16	12	17	7	6	1			
City Early Morning Service	39	60	7																		
City Late Night Service																	3	58	27	29	18
Silver Lake			0	72	34	53	30	41	41	56	48	49	28	26	28	10	10				
Subtotal City Service	*39*	*133*	*213*	*361*	*256*	*246*	*219*	*244*	*329*	*403*	*524*	*390*	*373*	*381*	*332*	*252*	*198*	*91*	*27*	*29*	*18*
Early Kimball Service	0	19	115																		
Kimball Core (Pink)	0	3	29	30	45	30	37	39	52	94	127	104	63	71	35	56	30	11			
Kimball West (Pink)	0	17	14	9	21	23	40	33	33	55	58	84	61	48	31	31	12				
Kimball Express (Brown)	0	28	18	10	13	17	12	9	11	21	22	16	32	8	19	22					
Kimball East (Brown)	0	1	3	2	8	6	6	3	4	12	13	13	19	12	7	5					
Canyons (Lime)	13	56	54	62	48	25	20	25	38	38	92	24									
Canyons Circulator		24	17	24	17	8	8	12	6	14	21	28	32	14	15	10	9	4			
Subtotal: County Services	*32*	*244*	*134*	*138*	*151*	*110*	*124*	*120*	*143*	*233*	*333*	*267*	*207*	*152*	*107*	*124*	*50*	*15*			
Total: All Services	*71*	*377*	*347*	*499*	*407*	*356*	*343*	*364*	*472*	*636*	*857*	*658*	*579*	*534*	*439*	*376*	*248*	*106*	*27*	*29*	*18*
Percent by Hour																					
Prospector Square (Red)		2%	3%	5%	4%	6%	4%	6%	9%	8%	11%	5%	9%	8%	6%	7%	4%	2%			
Park Meadows (Green)		0%	4%	7%	5%	5%	6%	5%	7%	10%	11%	9%	8%	8%	6%	6%	4%	1%			
Thaynes Canyon (Blue)		0%	6%	10%	7%	4%	3%	4%	5%	8%	12%	8%	8%	10%	7%	5%	4%	0%			
Prospector Express (Yellow)		6%	7%	6%	4%	4%	3%	4%	6%	6%	9%	10%	7%	8%	8%	5%	6%	1%			
Subtotal: City Core		2%	5%	7%	5%	4%	4%	5%	7%	8%	11%	8%	8%	8%	7%	6%	4%	1%			
Trolley					2%	5%	12%	6%	7%	7%	18%	10%	9%	7%	10%	4%	3%	1%			
City Early Morning Service	37%	57%	7%																		
City Late Night Service																	2%	43%	20%	21%	13%
Silver Lake			0%	14%	7%	10%	6%	8%	8%	11%	9%	9%	5%	5%	5%	2%	2%				
Subtotal City Service			4%	7%	5%	5%	4%	5%	7%	8%	10%	8%	7%	8%	7%	5%	4%				
Early Kimball Service																					
Kimball Core (Pink)	0%	0%	3%	3%	5%	4%	4%	5%	6%	11%	15%	12%	7%	8%	4%	7%	3%	1%			
Kimball West (Pink)	0%	3%	2%	2%	4%	4%	7%	6%	6%	10%	10%	15%	11%	8%	6%	5%	2%				
Kimball Express (Brown)	0%	11%	7%	4%	5%	7%	5%	3%	4%	8%	9%	6%	12%	3%	7%	8%					
Kimball East (Brown)	0%	1%	2%	2%	7%	5%	5%	3%	3%	11%	11%	12%	17%	11%	6%	5%					
Canyons (Lime)	3%	11%	11%	13%	10%	5%	4%	5%	8%	8%	19%	5%									
Canyons Circulator		9%	7%	9%	6%	3%	3%	5%	2%	5%	8%	11%	12%	5%	6%	4%	3%	1%			
Subtotal: County Services	0%	1%	9%	5%	5%	6%	4%	5%	4%	5%	9%	12%	10%	8%	6%	4%	5%	2%	1%		
Total: All Services	0%	1%	5%	4%	6%	5%	5%	4%	5%	6%	8%	11%	8%	7%	7%	6%	5%	3%	1%	0%	0%	0%

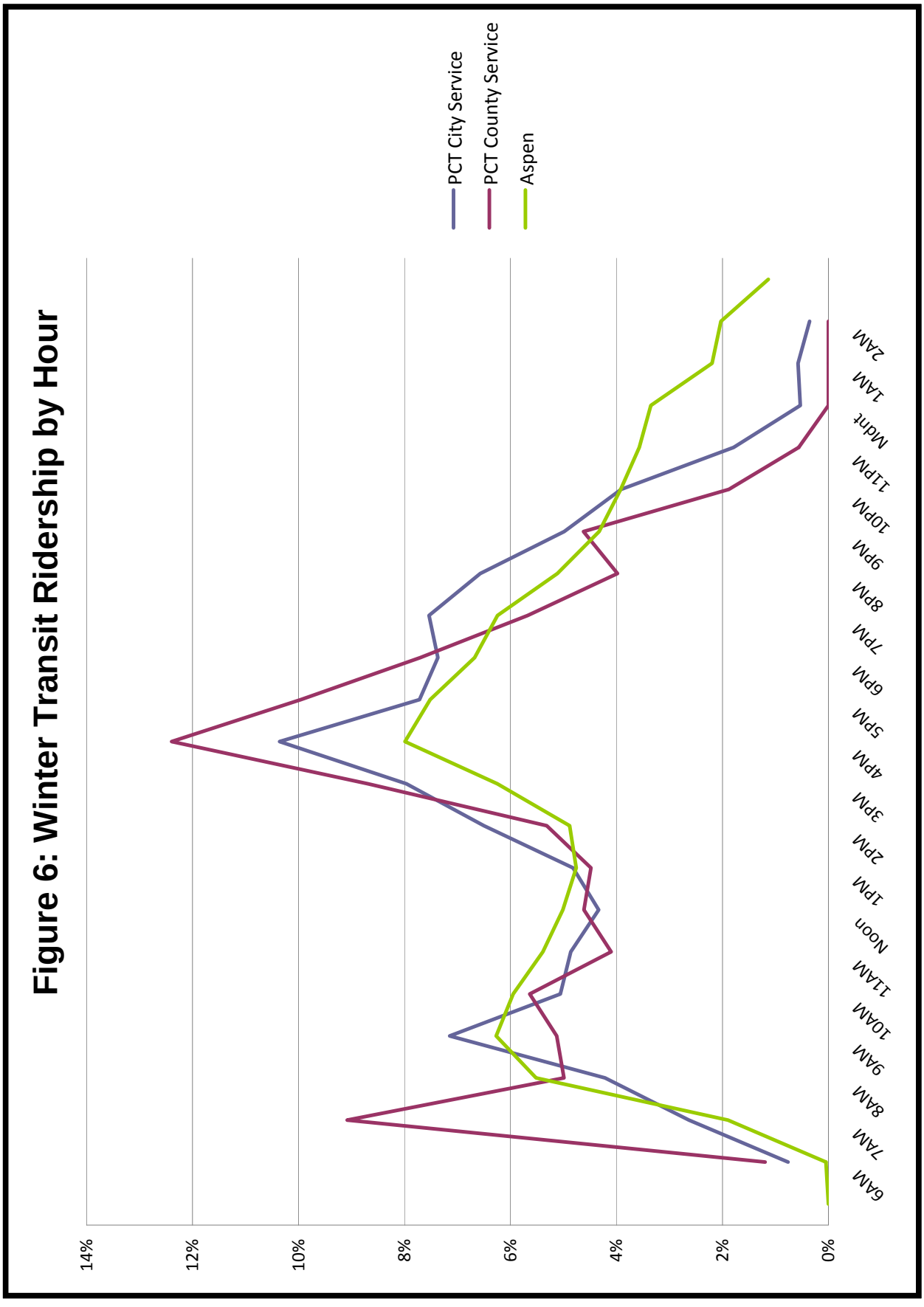


Figure 6: Winter Transit Ridership by Hour
PCT City Service
PCT County Service
Aspen
14%
12%
10%
8%
6%
4%
2%
0%
6AM
7AM
8AM
9AM
10AM
11AM
Noon
1PM
2PM
3PM
4PM
5PM
6PM
7PM
8PM
9PM
10PM
11PM
Midnt
1AM
2AM

essentially duplicates the Pink Route service. In the summer, the differing 40-minute and 30-minute schedule headways makes The Canyons route more difficult for passengers to use, and means that some runs are very close to existing Pink Route service times.

This service plan has the advantage of providing "one seat" transportation between the Grand Summit Hotel and Canyons lifts on one end and the key Park City lodging and visitor activity centers on the other end. As a result, visitors need not figure out the local transit system beyond the schedule for The Canyons bus. However, there are several disadvantages to this current operating plan:

- Service to other destinations within The Canyons is uncertain (as it depends upon individual lodging vans) or is nonexistent.

- Canyons guests that use The Canyons route during the day may find themselves in Park City after the end of service, and need to figure out the other transit routes (and connecting van services) to return. As a result, they are more likely to drive for trips such as evening dining in Park City.

- The service frequently duplicates other PCT routes and schedules in Park City. One result of this is that 36 percent of the ridership on the existing winter service is comprised of passengers travelling wholly within Park City (not to/from The Canyons).

A key consideration with regards to The Canyons is the extensive additional development that is allowed under The Canyons SPA Development Agreement. As of the end of 2010, total development within The Canyons reflects only 22 percent of the potential buildout, which totals 8.3 million square feet of total building floor area, of which just less than 1.3 million is commercial floor area.

A rough estimate of total transit trips generated at buildout can be made by dividing the current annual ridership generated in The Canyons (51,020 passenger-trips) by 22 percent. This indicates ridership on the order of 218,000 passenger-trips per year at buildout (equal to half of the existing total County transit ridership).

While much of the future development is in the core areas along Canyons Resort Drive, other substantial areas are in Frostwood, the Lower Village, and Willow Draw, which would require new route extensions to adequately serve with transit.

Extension of SR 224 Local Service to Grand Summit Hotel

One option to improve public transit in The Canyons would be to extend the Kimball/Pinebrook Route to the Grand Summit Hotel. While this would provide direct service to both Park City and Kimball Junction, it would add a total of 10 minutes of travel time to the existing route. As this running time is not available within the current 90 minute total route cycle length, it would require provision of an additional bus.

An additional strong disadvantage is the out-of-direction travel and associated travel time for through passengers on the Kimball/Pinebrook (Pink) Route not bound to or from The Canyons. As reflected in Figure 2, many of the riders on the Kimball/Pinebrook (Pink) Route along SR 224 at Canyon Drive are heading between Snyderville Basin and Park City. On an average winter day, approximately 800 people ride the Pink Route past Canyons Drive – rerouting the Kimball/Pinebrook (Pink) Route to the Grand Summit Hotel would add approximately 10 minutes

of additional travel time for these passengers. Extending the Kimball/Pinebrook (Pink) Route to Grand Summit Hotel would therefore be a detriment to the overall transit program. One possible exception to this would be if express bus service along SR 224 were to be expanded (as discussed above).

Provision of Canyons Circulator

Another means of expanding service availability in The Canyons would be to operate a separate Canyons Circulator connecting the Canyons Transit Center with lodging properties. A feasible circulator route is shown in Figure 7. This 3.1 mile-long route could be operated on a 15-minute loop. For purposes of this evaluation, it is assumed that service is provided over the following hours:

Winter – 7:00 AM – 11:00 PM
Summer – 7:00 AM – 9:30 PM

Other options can be considered with differing hours of operation, or by limiting the summer service calendar to peak summer season (such as the mid-June – Labor Day calendar used for the Silver Lake Village Route).

Ridership on a Canyons Circulator can be estimated by reviewing existing ridership generated in the area, and increasing by 25 percent to reflect the net improvement of additional service frequency and areas served minus the hassle of transferring at the Canyons Transit Center. At current development levels, a ridership of 63,600 one-way passenger trips is estimated, as shown in Table 7. Productivity would be moderate, at 17.3 passenger-trips per vehicle-hour of service.

The advantage of a circulator service is that it can provide direct service to properties not on Canyon Resort Drive. It can also provide more frequent service within The Canyons, which is particularly effective if service frequency along SR 224 is expanded. The biggest disadvantage is the need for passengers to transfer at the Canyons Transit Center (and for visitors to figure out an additional transit service). At peak times (particularly when demand in The Canyons can exceed the capacity of a transit vehicle), reliance wholly on a Circulator strategy could also result in vehicle overcrowding.

Canyons Hybrid Circulator/Express Route

Another option to better serve The Canyons would be to combine a Canyons circulator service with a direct service between The Canyons and Park City. As shown in Figure 8, this route would serve key stops within The Canyons (Grand Summit, Waldorf Astoria, Red Pines, Transit Center), and then operate an express run to the Old Town Transit Center via SR 224 and Deer Valley Drive. The Fresh Market stop could also be served to allow more convenient transfers to other locations in Park City, such as PCMR and Prospector. This service could be operated on a 30-minute headway using one vehicle in the non-winter seasons, and 20-minute headways (using two vehicles on a 40-minute route cycle) during the winter. It would serve the large majority of existing travel between The Canyons and Park City (though it would no longer effectively serve current passenger trips between stops within Park City).

This alternative would not change the number of buses used for Canyons service (two in winter and one in summer). As mileage would be lower, overall annual operating costs would drop by approximately $18,800. Ridership by season is estimated by considering current Canyons

FIGURE 7
Canyons Circulator Route

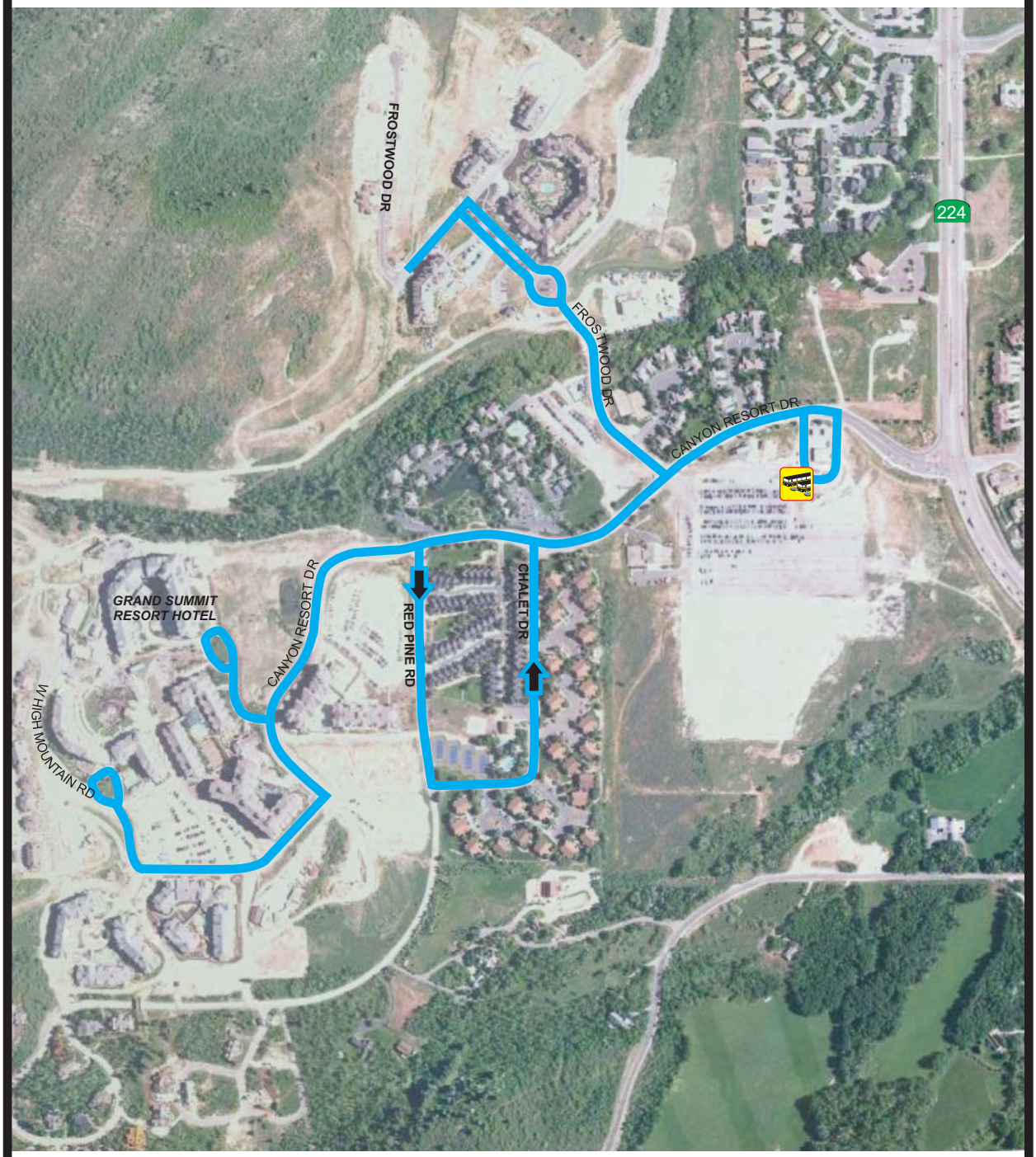
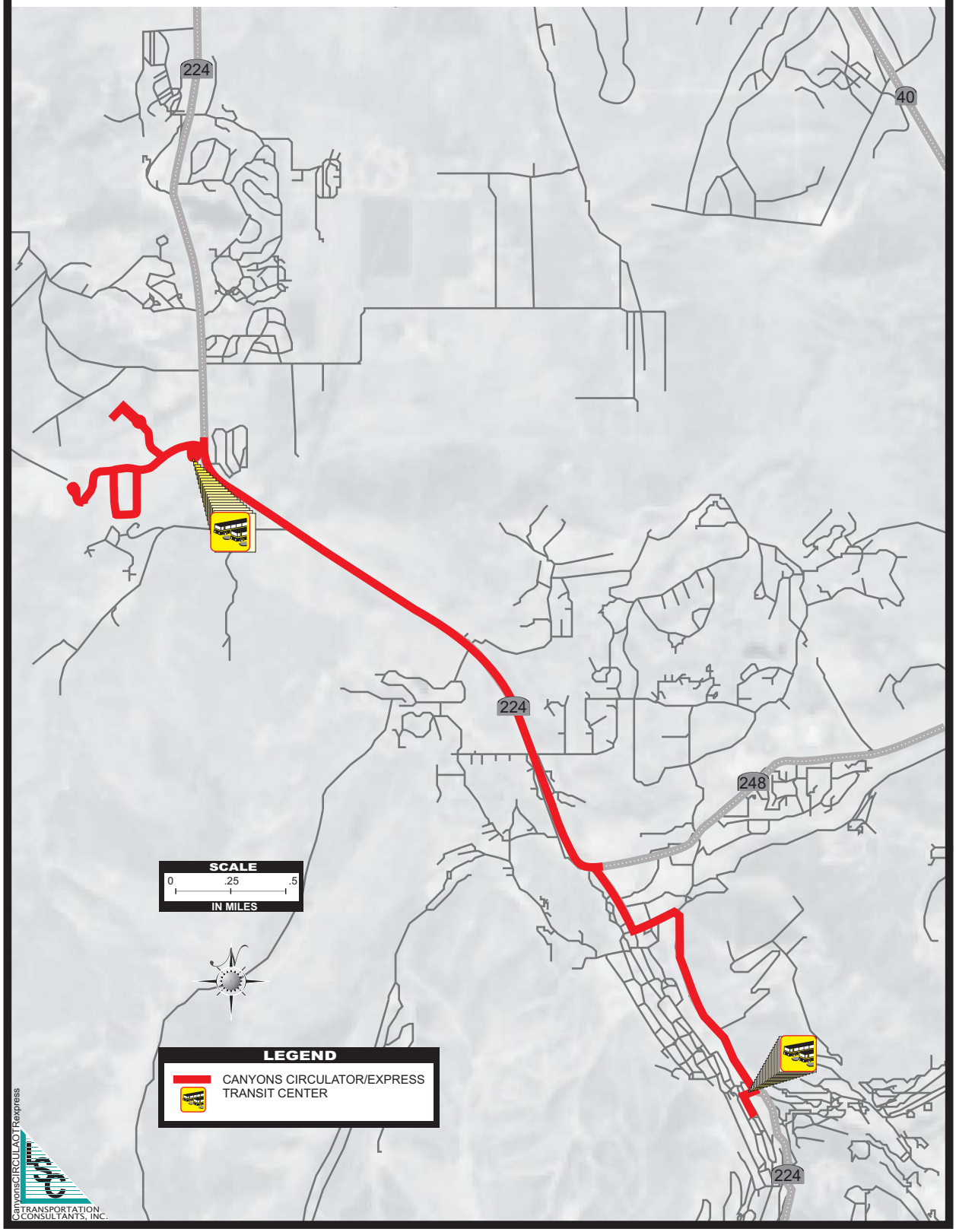


FIGURE 8
Canyons Circulator/Express Route



winter ridership, factoring for the change in service frequency and loss of direct service for a minority of existing trips, and adding a portion of the Canyons Circulator ridership discussed above (again, adjusted for the difference in service frequency and number of stops served). As 2011 is the first summer of Canyon service, this "existing" ridership is estimated by factoring the Canyons winter ridership by the ratio of summer to winter ridership on the Park City routes. Existing ridership on The Canyons route carried between stops within Park City is assumed to shift to other transit routes. Overall, this service alternative is estimated to carry 73,400 annual passenger-trips compared with 61,500 for the existing service plan, yielding a net increase of 11,900 passenger-trips. This alternative overall would improve the productivity of The Canyons service from 12.1 passenger-trips per vehicle-hour of service under the current plan to 14.5 under the hybrid alternative.

Outlying County Service

While the transit program in western Summit County has grown into a successful service, no scheduled transit service is available to the smaller communities to the east, including Kamas, Oakley and Coalville. As discussed below, three potential levels of service were evaluated:

"Lifeline" Service

Lifeline service is defined as a very limited service designed for transit dependent residents of smaller communities, providing scheduled service into a larger urban center, typically for shopping, medical or social service purposes. While it may be offered more than one day per week, for purposes of this analysis service one day per week (such as every Tuesday) is assumed, with a morning run scheduled to arrive in Park City around 9:00 AM, with a departing run scheduled to depart around 3:00 PM. Once in Park City, of course, passengers could travel around the existing transit service area on other transit routes. A service from Coalville could also serve stops in Kimball Junction.

Service would be offered on a reservation basis, with passengers required to make reservations by 4:00 PM on the day prior to their ride. "Standing orders" could also be provided for passengers or groups consistently making use of the service. Several stops would be established in each community (such as at senior centers), though deviations would be available for those with mobility limitations (on both ends of the trip). Buses would "deadhead" out from Park City in the morning to start their run, and deadhead back in the afternoon. On the Kamas Route, service would start in Kamas and serve passengers in Oakley as requested.

Due to the length and cost of this service, a fare would be charged. A reasonable fare given the length of the trip and fares for similar longer-distance public transit trips in the region would be $4.00 per one-way trip for the general public, and $2.00 for seniors (age 65 and above), ADA eligible persons, and youth (typically age 5 to 16), with children under 5 years of age riding for no fare.

As shown in Table 9, this service would require an operating subsidy of approximately $29,000 per year for Kamas/Oakley service, and $35,000 for Coalville service. Ridership estimates are based on the non-program and program demand estimates presented in Tables 22 and 23 of Technical Memorandum One, reduced to reflect the limited service level. An average of 26 one-way trips (or 13 round-trips) per day is estimated for Kamas/Oakley, and 10 one-way trips (or 5 round-trips) for Coalville service.

TABLE 9: Transit Alternatives Serving Other Communities in Summit and Wasatch Counties

Fiscal Year 2011-12 — *Costs Exclude Allocated Fixed Costs*

Alternatives Options/Details	Additional Vehicles [1]	Runs Per Day	Annual Vehicle Service.. Miles	Annual Vehicle Service.. Hours	Annual Operating Days	Annual Total Operating Cost	Ridership Impact (One-Way Trips) Daily	Ridership Impact (One-Way Trips) Annual	Annual Farebox Revenue	Annual Subsidy Required	Performance Analysis Passenger-Trips per VSH	Performance Analysis Passenger-Trips per VSM	Performance Analysis Subsidy per Passenger-Trip
Lifeline Services													
Kamas/Oakley Service - 1 day/week	1	2	10,300	390	129	$33,100	26	1,372	$4,100	$29,000	3.5	0.1	$21.14
Coalville Service - 1 day/week	***1***	***2***	***12,900***	***390***	***129***	***$36,600***	***10***	***533***	***$1,600***	***$35,000***	***1.4***	***0.0***	***$65.67***
Coalville Commuter Service													
Winter Service	0	2	12,642	387	129	$34,600	12	1,530	$5,400	$29,200	4.0	0.1	$19.08
Non-Winter Service	0	2	23,128	708	236	$63,300	7	1,670	$5,800	$57,500	2.4	0.1	$34.43
Total	***0***	***2***	***35,770***	***1,095***	***365***	***$97,900***	***9***	***3,200***	***$11,200***	***$86,700***	***2.9***	***0.1***	***$27.09***
Kamas Commuter Service													
Winter Service	0	2	8,256	387	129	$28,700	41	5,250	$18,400	$10,300	13.6	0.6	$1.96
Non-Winter Service	0	2	15,104	708	236	$52,400	18	4,370	$15,300	$37,100	6.2	0.3	$8.49
Total	***0***	***2***	***23,360***	***1,095***	***365***	***$81,100***	***26***	***9,620***	***$33,700***	***$47,400***	***8.8***	***0.4***	***$4.93***
Heber City Commuter Service													
Winter Service	0	4	9,391	516	129	$36,000	103	13,260	$33,200	$2,800	25.7	1.4	$0.21
Non-Winter Service	0	4	17,181	944	236	$65,900	61	14,510	$36,300	$29,600	15.4	0.8	$2.04
Total	***0***	***2***	***26,572***	***1,460***	***365***	***$101,900***	***76***	***27,770***	***$69,400***	***$32,500***	***19.0***	***1.0***	***$1.17***

It should be noted that this cost estimate (and those for other new services beyond the existing service area discussed below) assume that Park City Transit operates the service. This does not necessarily have to be the case, as private transit service contractors could potentially operate service under direct contract to Summit County. On one hand, a private contractor could potentially provide service at a lower cost. On the other hand, any use of federal funding would require the private contractor to conform to the many personnel, reporting, and contracting provisions associated with federal funding. Unless the selected contractor also operated other services in the Summit County area, the sharing of existing resources would not be possible, which could increase costs. Determining a specific cost for contracted services would require a Request For Proposals process.

Commuter Service – Winter Only

Another option would be to provide commute transit service into the Park City area from the outlying communities, with one run per day in each commute period seven days a week throughout the winter season. These services would be most effectively provided under a "park out" operating plan, in which buses are stored overnight in the outlying community. This has the advantage of avoiding the long "dead head" travel needed if buses are stored overnight in Park City, which would effectively double the operating costs of these services. For a "park out" plan to be feasible, the following would need to be provided:

- A secured location to store the buses overnight, such as at a municipal or county corporation yard. This can also have the advantage of providing some "as needed" light mechanic help, if, for example, a battery goes dead overnight. Even in a rural area, parking a transit vehicle overnight in an unsecured location would likely lead to vandalism, and parking overnight at a driver's residence is often a problem with the community.

- Drivers need to be found that live in or near the outlying community. To operate seven-days-a-week service, a minimum of two drivers and preferably three in each outlying community are needed, in order to provide some relief if a driver calls in sick on short notice. Some amount of risk would be assumed that drivers on any particular day are not available and the costs of drivers traveling from Park City to start services are incurred.

- A mechanism needs to be established by which these drivers can officially start and end their shift, such as by calling in.

- Driver shifts need to be organized to allow these drivers to shift between commuter and local services, in accordance with local, state and federal work rules.

Ridership estimates for potential commuter service between Park City and the outlying communities of Coalville and Kamas were based on two sources of existing commute patterns. Figures from the Longitudinal Employer Household Dynamics program of the US Census Department, as presented in Table 9 of Technical Memorandum One, were used to represent year-round employee commuters. In addition, winter seasonal employee commute patterns were identified based upon a review of employee residence location for major employers in the Park City/Snyderville area, as presented in Table 10. In total, the number of persons commuting from the Kamas/Oakley area to the Park City/Snyderville area is estimated to equal 426, while 166 persons commute from the Coalville area in the winter. A five percent transit mode split was

TABLE 10: Employee Resident Locations for Major Park City / Western Summit County Employers

	Employer												Percent of Employees in Commute Area		
County	Back Country	Canyons	Deer Valley	IHC	Marriott	PC Schools	PCMC	PCMR	Rossignol	Total	Subtotal: Ski Areas	Subtotal: Other	Total	Subtotal: Ski Areas	Subtotal: Other
Box Elder County	0	2	0	0	0	0	0	0	0	2	2	0	--	--	--
Cache County	1	4	0	0	1	1	0	3	0	10	7	3	--	--	--
Carbon County	0	1	0	0	0	0	0	1	0	2	2	0	--	--	--
Davis County	4	9	0	0	0	2	3	13	0	31	22	9	1%	1%	1%
Duchesne County	2	19	25	2	2	10	10	7	0	77	51	26	2%	2%	2%
Grand County	0	4	0	0	0	0	0	0	0	4	4	0	--	--	--
Iron County	0	0	0	0	1	0	0	2	0	3	2	1	--	--	--
Juab County	0	0	0	0	0	1	0	0	0	1	0	1	--	--	--
Millard County	0	0	0	0	1	0	0	0	0	1	0	1	--	--	--
Morgan County	1	6	0	0	0	1	1	1	0	10	7	3	0%	0%	0%
Salt Lake County	113	332	0	50	42	83	29	172	13	834	504	330	20%	18%	22%
Salt Lake City	*67*	*171*	*0*	*0*	*26*	*39*	*7*	*97*	*7*	*414*	*268*	*146*	*10%*	*10%*	*10%*
Other	*46*	*161*	*0*	*50*	*16*	*44*	*22*	*75*	*6*	*420*	*236*	*184*	*10%*	*8%*	*12%*
San Juan County	0	1	0	0	0	0	0	0	0	1	1	0	--	--	--
Sanpete County	0	0	0	0	0	0	1	2	0	3	2	1	--	--	--
Summit County	81	642	100	115	45	472	107	648	24	2,234	1,390	844	53%	50%	57%
Coalville	*0*	*12*	*19*	*0*	*5*	*11*	*9*	*11*	*0*	*67*	*42*	*25*	*2%*	*2%*	*2%*
Francis, Kamas Area	*2*	*39*	*81*	*25*	*3*	*44*	*14*	*23*	*0*	*231*	*143*	*88*	*5%*	*5%*	*6%*
Park City, Snyderville, Summit Park	*78*	*589*	*0*	*90*	*37*	*415*	*82*	*610*	*24*	*1,925*	*1,199*	*726*	*45%*	*43%*	*49%*
Echo	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*2*	*0*	*0%*	*0%*	*0%*
Henefer	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*1*	*0*	*3*	*1*	*2*	*0%*	*0%*	*0%*
Peoa	*1*	*0*	*0*	*0*	*0*	*1*	*1*	*3*	*0*	*6*	*3*	*3*	*0%*	*0%*	*0%*
Uintah County	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--
Utah County	19	88	0	0	9	7	10	75	1	209	163	46	5%	6%	3%
Wasatch County	4	92	462	62	22	77	49	80	0	848	634	214	20%	23%	14%
Heber	*3*	*75*	*411*	*44*	*20*	*65*	*43*	*62*	*0*	*723*	*548*	*175*	*17%*	*20%*	*12%*
Midway	*1*	*16*	*51*	*18*	*2*	*10*	*4*	*18*	*0*	*120*	*85*	*35*	*3%*	*3%*	*2%*
Other	*0*	*1*	*0*	*0*	*0*	*2*	*2*	*0*	*0*	*5*	*1*	*4*	*0%*	*0%*	*0%*
Washington County	0	0	0	0	0	0	0	1	0	1	1	0	--	--	--
Weber County	3	4	0	0	0	0	1	2	0	10	6	4	0%	0%	0%
Out of State	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--
Total	231	1,365	587	229	123	656	211	1,007	38	4,447	2,959	1,488	--	--	--
Total Within Typical Commute Area	227	1,192	587	229	120	652	210	998	38	4,253	2,777	1,476	100%	100%	100%

Typical Commute Area includes Davis, Duchesne, Morgan, Price, Salt Lake, Summit, Utah and Weber Counties.

applied to these figures (adjusted for individuals commuting five days per week), resulting in an estimated ridership of 12 passenger-trips per day (1,430 over the course of the season) from Coalville and 30 passenger-trips (3,680 over the season) from the Kamas/Oakley area.

In addition, a Kamas – Park City commute service could serve the City of Hideout area along SR 248 in Wasatch County, including the Todd Hollow and Deer Mountain developments. As shown in Table 1, ridership demand for these areas would total approximately 8,600 passenger-trips per year, at current PCT service levels along the SR 224 corridor. Factoring for the lower level of service under this commute-only alternative, this equates to an estimated additional 10 passenger-trips per day in winter and 5 passenger-trips per day in non-winter.

Table 9 shows the details of implementing these services:

- *Coalville* – Winter service would incur a marginal operating cost of $34,600. Subtracting $5,400 in passenger revenues, (at an average fare of $3.50 per one-way passenger-trip), an annual subsidy of $29,200 would be required to operate the service. This option would serve 4.0 passenger-trips per vehicle-hour, and require $19.08 in subsidy per passenger-trip.

- *Kamas/Oakley* -- Commuter service to Kamas is estimated to result in a marginal cost of $28,700 over the course of the winter season. Subtracting an estimated $18,400 in passenger revenues, net operating subsidy of $10,300 would be required to operate the service. A total of 13.6 passenger-trips would be served per vehicle-hour, and $1.96 in subsidy would be required per passenger-trip.

As reflected in these forecasts, service to Kamas/Oakley would be substantially more effective than service to Coalville, due to the higher demand and lower operating costs.

Commuter Service – Year Round

Providing service throughout the year would serve year-round employees living in the outlying communities, as well as seasonal workers. As also shown in Table 9, operating a “park out” commuter service year-round would result in the following:

- *Coalville* – A marginal operating cost of $97,900 would be incurred. Ridership in the non-winter seasons would average seven one-way passenger-trips per day (an average of nine per day over the entire year). Subtracting $11,200 in passenger revenues, an annual subsidy of $86,700 would be required to operate the service. In total, 2.9 passenger-trips would be served per vehicle-hour, and $27.09 in subsidy would be needed per passenger trip.

- *Kamas/Oakley* – Year-round commuter service to Kamas is estimated to result in a marginal cost of $81,100. Average daily ridership outside of the winter season is estimated to be 18 passenger-trips. Subtracting an estimated $33,700 in passenger revenues, net operating subsidy of $47,400 would be required to operate the service. This option would serve 8.8 passenger-trips per vehicle-hour, and require $4.93 in subsidy per passenger-trip.

Overall, service limited to the winter season would be significantly more effective than year-round service, and service to Kamas/Oakley would more effective that service to Coalville.

HEBER CITY SERVICE

A commute service could also be provided from Heber City to Park City, and would serve a substantial market of commuters, as well as others making day trips to the Park City area for recreation, shopping, etc. The route would originate in the southern portion of Heber City (such as Wal-Mart or Days Market) and serve four to five stops along Main Street (with a possible park-and-ride opportunity at Smiths Market or Holiday Lanes). A stop could be provided at Utah Valley University Wasatch, as well as Stillwater Lodge. The route would serve existing stops along Kearns Boulevard and Bonanza Drive, and terminate at the Old Town Transit Center, (though a second stop at PCMR could be served if warranted by passenger demand). Given the demand, two AM and two PM runs would be needed (and would provide a better level of service). This route would require approximately 40 minutes to operate in one direction. Including time for traffic delays, departures at 5:50 AM and 6:50 AM would allow transfers to local PCT routes at 40 minutes past the hour, allowing commuter's time to walk or use the local routes to start work at 7:00 AM and 8:00 AM. In the opposite direction, departures from OTTC at 4:20 PM and 5:20 PM would serve commuters leaving work at 4:00 PM and 5:00 PM. As a commuter service, this option would not trigger the need for complementary door-to-door paratransit van service under the Americans with Disabilities Act.

As shown in Table 9, assuming one hour of driver time per run (including check-in/check-out time) and park-out operation, marginal costs over a winter season would be $36,000. In light of the relatively short travel distance, a mode split of 4% is estimated, and a fare of $3.00 for general public and $1.50 for elderly/disabled/youth (average fare would be approximately $2.50 per passenger trip). Ridership based solely on commuters (excluding trips for other purposes, such as skiing) is estimated to equal 13,260 trips over the course of the winter season. As fares would generate approximately $33,200 per year, subsidy over the course of the winter season would be only $2,800 (once full ridership potential is achieved). This service would be quite efficient, generating 25.7 passenger-trips per vehicle-hour of service.

It should be noted that full transit ridership potential is not typically reached until the third year of operation of a new service, as passengers become aware of the new service and make other decisions (such as replacement of a second car in the household for commuting) that affect their use of the service. In general, 65 percent of potential full ridership is achieved in the first year of a new service, and 90 percent in the second year. Applying these factors, winter service would generate 8,800 passenger-trips in the first year, and 11,900 in the second. In the first year, winter service would require a subsidy of $13,900, dropping to $6,200 in Year Two.

If operated year-round, this service plan would incur a marginal operating cost of $101,900, while the annual ridership of 27,770 would generate $69,400 in fare revenues. As a result, a marginal subsidy of $32,500 per year would be required. Even in the non-winter seasons, the efficiency of this service would be relatively good, with 15.4 passengers per vehicle-hour of service and a subsidy requirement of only roughly $2.04 per trip. In the first year of operation, a subsidy of $55,700 would be required, dropping to $39,400 in the second year.

SALT LAKE CITY TO PARK CITY SERVICE

With growth both in Summit County as well as along the Wasatch Front, there is an increasing demand for regional transit service between Salt Lake City and the Park City area. While the Park City/Salt Lake City corridor is currently served by a number of private limousine and charter bus providers, these services are primarily designed for visitors. The public has indicated a desire for a public transit connection between Park City/western Summit County and

the Wasatch Front, focusing on commuter transportation, shopping/recreation, and access to higher education.

The Utah Transit Authority is currently finalizing plans to initiate the "Park City Connect" public transit service between Salt Lake City and Park City, as presented in the Salt Lake City, Summit County, Park City Transit Business Case (UTA Strategic Planning, November 2010). This service is currently envisioned to consist of the following:

- The route would extend from the Salt Lake Central Intermodal Center, through the University of Utah campus via 200 South and Foothills Parkway, to the Old Town Transit Center. In Summit County, stops would be served at the Jeremy Ranch Park-and-Ride, Kimball Junction Transit Center/Newpark, The Canyons Transit Center, Park City Mountain Resort and Old Town Transit Center (with some runs with high ridership to/from Deer Valley potentially extended to the Deer Valley ski area). For persons commuting in the uphill direction, park-and-ride lots would be available along Foothills Parkway. Overall, the service would provide an end-to-end ride time of 1 hour 15 minutes.

- Service levels would vary by season. From December to April, AM service would consist of a total of five runs in the eastbound direction and 3 westbound, reversing in the PM commute period. Between April and August, this would be reduced to three eastbound and two westbound trips in the AM commute period (and reverse in the PM), while between August and December this would increase to three runs in both direction in both peak commute periods. Including a spare, six buses would be required to operate the service. In winter, service would operate 7 days a week, while in the remainder of the year service would be limited to weekdays only.

- Special services would also be provided for special events, such as Sundance, peak ski periods, the Arts Festival, and the Deer Valley Concert Series.

- Fares would be equivalent to the UTA's current standard premium fares, recently increased to $5.50 per one-way trip for the general public, with discounted fares available for persons age 65 and above and pass purchasers. An Eco-pass type program could be established with major employers, such as the ski areas.

- Buses would be provided by UTA.

The UTA study includes an analysis of potential ridership service, including ridership wholly within Salt Lake City (such as between the U of U and downtown). Based in large part by the opportunity to combine service to Park City with service in the existing UTA service area, the $4.50 base fare was found to cover operating costs. Specific funding levels required from Park City and Summit County have yet to be finalized.

An updated evaluation of potential ridership, focusing on ridership over Parley's Summit, is presented in Table 11. This evaluation is based on the UTA study, adjusted to reflect more recent information and the specific considerations of a resort economy:

- Year-round employees working in the Park City area commuting "up the hill" are based on the number of commuters (from the Longitudinal Employer-Household Dynamic US Census dataset, as shown in Table 8 of Technical Memorandum One), factored to reflect commuting five days per week and two one-way trips per person per day. As detailed in the UTA study,

a 5 percent transit mode split is applied, and factors are also applied that reflect the specific service levels and fare level of the proposed operating plan. Overall, uphill commuters are estimated to generate 114 one-way passenger-trips per day.

- Winter seasonal workers (not included in the LEHD data) commuting up the hill are presented in Table 10. Reflecting both a higher proportion of these workers without access to a car as well as expected efforts on the part of the ski areas to limit employee parking, a 25 percent mode split is applied. As service will be designed to fit employee shifts and fares supported by the major employers, no factors are applied to reflect these considerations.

TABLE 11: Salt Lake City -- Park City Transit Demand

	Daily Person-Trips	Mode Split	Base Daily Ridership: 30 minute service over 14 hour span, $2.00 Fare except $3.50 for Rec.	*Adjustment Factors*		Realized Ridership At Proposed Service Plan and Fare Level	
				Service Level	*Fare Level*	Daily	Annual
Uphill							
Commuters to Park City							
- Year Round	7,234	5%	362	*0.63*	*0.50*	114	
- Winter Seasonal	720	25%	180	*1.00*	*1.00*	180	
Skiers			329	*0.75*	*0.88*	218	
- Subtotal: Winter						512	76,800
- Total: Non-Winter						114	17,400
- Total Annual							94,200
Downhill (Year Round)							
Commuters to Salt Lake City	2,680	5%	134	*0.63*	*0.50*	42	
College/School			383	*0.586*	*1.00*	224	
Total						267	40,800
Total Both Directions							135,000

Notes

Excludes ridership within Salt Lake County. Negligable ridership within Summit County assumed.

Excludes trips for other purposes (shopping, other recreation, special events, etc.)

Impact of recent UTA fare increase assumed to be balanced by recent increases in price of gasoline.

- Skier transit demand is based upon observed ridership on the Little Cottonwood Canyons UTA service, factored by the relative levels of ski activity. As the service plan will focus service in the peak skier periods, only a 25 percent reduction is applied.

- In the “downhill” direction, year-round commuters were evaluated solely for those persons working in Salt Lake City (no persons that would need to transfer to jobs in other communities were included).

- Ridership would also be generated by students at the U of U and other institutions, as discussed in the UTA study.

In total, in winter 512 one-way transit trips would be generated by persons traveling up the hill for work or skiing, as shown in Table 11, along with 267 transit trips generated by persons traveling down the hill for work or school. In the remainder of the year (and assuming no summer seasonal employment commute demand), 114 one-way passenger-trips would be generated for those traveling up the hill.

Factoring by 150 winter days of service plus 153 in the other seasons, total annual ridership over Parley’s Summit on this service is estimated to be 135,000 per year. The substantial ridership generated by trips within Salt Lake County would be in addition to this figure.

This level of ridership potential indicates that this service would greatly benefit Park City, western Summit County, and the major activity centers. In addition to expanding access by employees and customers, this service would take approximately 350 vehicle-trips off of SR 224 over a winter day (assuming average vehicle occupancy of 2.0 for the avoided auto trips) and reduce parking demand by approximately 175 cars. Once established, it can also be expected that new trip patterns will emerge, such as persons traveling for recreational activities beyond skiing.

Role of Park City and Summit County

While UTA is planning to provide the vehicles and operate the service, there are still important roles with Park City and Summit County can play in implementing this service:

Park City

- Provide overnight storage of approximately two to three UTA buses, as well as mid-day storage for approximately four to five buses.

- Provide incidental mechanical assistance (such as minor repairs at pullout), a facility for UTA drivers to check-in/check-out, and incidental management assistance.

- Provide paratransit services within Summit County, necessitated by the provision of the new fixed route service.

- Enter into an Inter Local Agreement (ILA) to address responsibilities and roles.

Summit County and Park City

- Provide access to transit passenger facilities for the new UTA buses, and signage for the new service.

- Work with UTA to finalize stops and routing. As an example, Park City should encourage UTA to operate only on Deer Valley Drive between Deer Valley Drive/Park Avenue and the OTTC, rather than Park Avenue, in order to minimize the impacts on the adjacent neighborhood and reduce travel times.

- Encourage ski areas and other large businesses to support the new service through purchase of employee passes.

- Joint marketing of transit services, such as inclusion of contact information on PCT marketing materials.

The new service would be considered a “commuter” service under the Americans with Disabilities Act. As such, complementary paratransit service is not required.

COMPARISON OF SUMMIT COUNTY AND INTER-COUNTY SERVICE ALTERNATIVES

A summary of the various Summit County and inter-county service alternatives is presented in Table 12:

- The greatest potential to increase ridership is provided by the Salt Lake City – Park City service (135,000 passenger-trips per year), and the Summit County Kimball route alternatives (97,500 to 133,000 per year). Other options with relatively high ridership potential are a Kimball Junction Circulator (87,600 per year), Canyons Circulator (63,600 per year) and Heber City commuter service (27,800 per year).

TABLE 12: Summary of Summit County and Inter-County Service Alternatives

Fiscal Year 2011-12 *Costs Exclude Allocated Fixed Costs*

	Net Change in Annual					Performance Analysis (Marginal)		
Alternative	Passenger-Trips	Vehicle-Hours	Vehicle-Miles	Operating Cost	Subsidy	Passenger-Trips per VSH	Passenger-Trips per VSM	Operating Subsidy per Passenger-Trip
County Routes Alternative A	132,910	680	64,400	$106,190	$106,190	195.5	2.06	$0.80
County Routes Alternative B	97,530	570	11,200	$28,920	$28,920	171.1	8.71	$0.30
Kimball Junction Circulator	87,600	5,840	59,600	$347,200	$347,200	15.0	1.47	$3.96
Extend Winter Service Till 11 PM	7,800	450	9,300	$32,900	$32,900	17.3	0.84	$4.22
Extend Winter Service till Midnight	16,900	970	18,800	$69,300	$69,300	17.4	0.90	$4.10
Extend Summer Service till 11 PM	19,000	1,890	34,800	$132,400	$132,400	10.1	0.55	$6.97
Extend Summer Service till Midnight	26,300	2,830	52,200	$198,500	$198,500	9.3	0.50	$7.55
Canyons Circulator	63,600	3,690	45,000	$230,400	$230,400	17.2	1.41	$3.62
Replace Canyons Route with Canyons Circulator/Express	11,900	-40	-12,500	($18,900)	($18,900)	-297.5	-0.95	-$1.59
Lifeline Services								
Kamas/Oakley Service - 1 day/week	1,372	390	10,300	$33,100	$29,000	3.5	0.13	$21.14
Coalville Service - 1 day/week	533	390	12,900	$36,600	$35,000	1.4	0.04	$65.67
Coalville Commuter Service								
Winter Service	1,530	387	12,642	$34,600	$29,200	4.0	0.12	$19.08
Non-Winter Service	1,670	708	23,128	$63,300	$57,500	2.4	0.07	$34.43
Total	3,200	1,095	35,770	$97,900	$86,700	2.9	0.09	$27.09
Kamas Commuter Service								
Winter Service	5,250	387	8,256	$28,700	$10,300	13.6	0.64	$1.96
Non-Winter Service	4,370	708	15,104	$52,400	$37,100	6.2	0.29	$8.49
Total	9,620	1,095	23,360	$81,100	$47,400	8.8	0.41	$4.93
Heber City Commuter Service								
Winter Service	13,260	516	9,391	$36,000	$2,800	25.7	1.41	$0.21
Non-Winter Service	14,510	944	17,181	$65,900	$29,600	15.4	0.84	$2.04
Total	27,770	1,460	26,572	$101,900	$32,500	19.0	1.05	$1.17
Salt Lake City -- Park City Connect Bus	135,000	TBD	TBD	TBD	TBD	TBD	TBD	TBD

- One key measure of service effectiveness is the change in passenger-trips served per net change in vehicle-hours operated. One option – the replacement of existing Canyons service with a combined Canyons Circulator/Express route – results in a negative number of -298, which is a beneficial result in that it reflects an increase in ridership and a decrease in vehicle-hours. The Summit County route realignments also perform well based on this measure, adding at least 171 passenger-trips per net additional vehicle-hour of service. Heber City commuter service has a high effectiveness, with 26 passenger-trips per vehicle-hour of service in winter and 15 in the other seasons. The Canyons Circulator (at 17 passenger-trips per hour), the Kimball Junction Circulator (at 15 passenger-trips per hour) and the winter Kamas commuter service (at 14 passenger-trips per hour) attain the current service effectiveness standard for County routes of 10 passenger-trips per vehicle-hours of service. The evening extension of service hours to 11PM or Midnight in winter and to 11 PM in summer also achieve this standard. Other alternatives fall below this goal.

- The key measure of service efficiency is the change in subsidy required per marginal passenger-trip. Again, a negative value in Table 12 reflects a positive result – a

reduction in subsidy divided by an increase in ridership. The replacement of the existing Canyons route with a Circulator/Express route results in this condition (-$1.59). For positive values, a lower figure is better, in that it reflects less public funding required per additional passenger-trip served. The winter Heber City Commuter service fares well by this measure, requiring only $0.21 per net new passenger-trip, followed by the County Route Alternative B, at $0.30. While PCT does not have established standards for this measure, a good comparison is the existing total County fixed route service value of $3.32 (a shown in Technical Memorandum One). Using this as a yardstick, other alternatives that have relatively good service efficiency are the County Routes Alternative A ($0.80), Heber City year-round commuter service ($1.17), Kamas winter commuter service ($1.96), while the Canyons Circulator at $3.62 and Kimball Junction Circulator at $3.96 are only slightly higher.

Overall, the following initial conclusions can be drawn regarding the service alternatives:

- Park City – Salt Lake City service would generate very substantial ridership increases.

- Either of the County Route alternatives would provide substantial improvements in ridership and service efficiency/effectiveness over the current plan serving the Snyderville Basin. Alternative A provides greater ridership by providing higher frequency along the SR 224, while Alternative B provides service to additional areas (the segment of Highland Drive east of Old Ranch Road as well as to Summit Park).

- Circulator services in both Kimball and in The Canyons would be moderately effective at current development levels (though additional development would improve the effectiveness of these services).

- Extension of winter service until Midnight would be effective.

- A Canyons Circulator/Express route would be an overall improvement over the existing Canyons route plan, particularly in periods with low demand between Canyons and the outlying portions of Park City.

- A Kamas Commuter route (also serving Oakley and Hideout) would be an effective service in winter.

- Heber City commuter service in winter would be very effective.

- Service between Coalville and Park City/Snyderville Basin would not be effective.

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Chapter 3
Park City Service Alternatives

The transit route structure in Park City is well established. The evaluation of service alternatives therefore focuses on the span of service (the hours of the day in which service is offered). Alternatives are also considered to better serve the growing Quinn's Junction area. In addition, options to address current operational problems are discussed.

LATE NIGHT SERVICE HOURS

Winter

At present in winter, the four buses operating the Prospector Square (Red), Prospector Express (Yellow), Park Meadows (Green) and Thaynes Canyon (Blue) routes end at 11:00 PM, and are replaced with the two buses operating the Late Night Service. This Late Night route covers the large majority of the stops served on the four standard routes. Service is provided every 30 minutes rather than every 20 minutes, however. In addition, some passengers are required to be on the bus for much longer than under the daytime route plan (such as those heading home to the Three Kings area from Main Street, which must ride the bus for 38 minutes).

One option would be to simply operate the daytime routes for an additional hour, until Midnight, then operating the Late Night service from Midnight to 2:00 AM. Subtracting the costs associated with the reduction in Late Night operations from the costs associated with expansion of the regular routes, the net impact of this alternative would be to increase annual operating costs by approximately $15,600, as shown in Table 13. Ridership for this expanded service was estimated by considering the hourly variation in service for the Aspen local routes against the existing PCT regular route ridership (adjusted to reflect existing riders choosing to travel later) and subtracting the existing ridership on the Late Night runs, yielding a net increase in ridership of 14,200 passenger-trips over the course of the winter. This service change would be very productive, yielding an increase of 55 passenger-trips for each additional vehicle-hour of service.

As with any alternative that changes the span of service, existing driver shifts would need to be modified. This could potentially result in a loss of efficiency, or a need for a higher proportional of "short shifts." Overall impact on driver shifts will be assessed as part of the final plan preparation, once preferred alternatives have been identified.

Another more expansive option would be to eliminate the Late Night Service and extend the existing four-bus core route operating plan until approximately 2:15 AM (the current end of Late Night service). This option would result in a net increase in operating costs of $40,800, and a net ridership increase of 30,100. While productivity would be lower than the previous option, at 44 passenger-trips per net new vehicle-hour of service, this would still be a very productive service modification. This would also have the benefit of reducing the complexity of the transit service, which is a particularly important consideration for visiting riders.

Summer

Summer service on the core Prospector Square (Red) and Park Meadows/Thaynes Canyon (Green) routes currently ends at 10:30 PM. This is a relatively early end of service for a transit

TABLE 13: Park City Service Alternatives

Fiscal Year 2011-2012

Alternative	Additional Vehicles [1]	Runs Per Day	Annual Vehicle Service.. Miles	Hours	Operating Days	Marginal Operating Cost	Ridership Impact (One-Way Trips) Daily	Annual	Performance Analysis: Marginal Passenger-Trips per VSH	Marginal Passenger-Trips per VSM	Marginal Op. Cost per Passenger-Trip
Operate Winter Daytime Routes till Midnight											
Prospector Square (Red)	0	3	1,700	129	129	$8,120	42	5,400			
Park Meadows (Green)	0	3	1,700	129	129	$8,120	46	6,000			
Thaynes Canyon (Blue)	0	3	1,600	129	129	$7,990	56	7,200			
Prospector Express (Yellow)	0	3	1,500	129	129	$7,850	36	4,600			
Late PM	0	-2	(3,600)	(258)	129	($16,520)	-69	-9,000			
Total			2,900	258		$15,560	110	14,200	55.0	4.9	$1.10
Operate Winter Daytime Routes till 2 AM											
Prospector Square (Red)	0	9.5	5,400	408	129	$25,720	94	12,200			
Park Meadows (Green)	0	9.5	5,300	408	129	$25,590	104	13,400			
Thaynes Canyon (Blue)	0	9.5	5,200	408	129	$25,450	125	16,100			
Prospector Express (Yellow)	0	9.5	4,800	408	129	$24,910	80	10,300			
Late PM	0	-6	(13,355)	(949)	129	($60,900)	-169	-21,800			
Total			7,345	683		$40,770	234	30,100	44.1	4.1	$1.35
Extend Core Summer Service till Midnight -- All Non-Winter											
Prospector (Red)	0	4	9,200	692	236	$43,690	50	11,800	17.1	1.3	$3.70
Park Meadows (Green	0	4	7,000	535	236	$33,620	18	4,200	7.9	0.6	$8.00
Total			16,200	1,227		$77,310		16,000	13.0	1.0	$4.83
Extend Summer Service till Midnight -- Mid-June to Sept 5											
Prospector (Red)	0	4	3,200	241	82	$15,210	62	5,100	21.2	1.6	$2.98
Park Meadows (Green	0	4	2,400	186	82	$11,640	22	1,800	9.7	0.8	$6.47
Total			5,600	427		$26,850		6,900	16.2	1.2	$3.89
Replace Dial-A-Ride with Quinns Junction Fixed Route											
Fixed Route Winter	0	30	41,800	1,935	129	$144,010	236	30,500			
Fixed Route Non-Winter	0	26	66,300	3,068	236	$228,370	303	71,400			
Expansion of Paratransit Service	1	--	27,000	2,920	365	$171,270	20	7,300			
Subtotal		*N/A*	135,100	7,923		$543,650		109,200	13.8	0.8	$4.98
Eliminate Existing Dial-A-Ride			(26,200)	(2,860)	365	($164,480)	*-17*	(6,100)	2.1	0.2	$26.96
Total			108,900	5,063		$379,170		103,100	20.4	0.9	$3.68

Note 1: Additional vehicles can only be evaluated as part of the whole fleet mix.

Note 2: Includes Routes 1-3 (Prospector, Park Meadows, Thaynes); Trolley, Silver Lake, and Bonanza Express. Does not include County Routes, Special Services, or Paratransit.

Source: LSC Transportation Consultants, Inc.

program serving a resort community. Unlike in winter, no modified Late Night service is operated in the non-winter seasons. Two options were considered to extend this service to Midnight, varying by the length of season for the additional service. As shown in Table 13, providing this additional service for all 236 non-winter days per year would increase annual operating costs by $77,300. Ridership (based on the variation in summer ridership for the Aspen transit system) is estimated to be 16,000 passenger trips per year.

Alternatively, the provision of Red/Green service between 10:30 PM and Midnight could be limited to the 82 days of the peak summer season between mid-June and Labor Day (consistent with the calendar for summer Silver Lake Village (Orange) and Empire Pass (Lavender) service). The operating cost increase would be $26,800. Ridership increase during this period is estimated to equal 6,900 passenger-trips per year, or 16.2 additional passenger-trips per additional vehicle-hour of service.

DIFFERING SERVICE PLAN IN SPRING/FALL OFFSEASONS

Many other transit programs serving mountain resort areas operate a lower service plan in the off-seasons (spring and fall) than in the peak summer season. While this is the case for PCT to a degree (in that the Silver Lake Village and Empire Pass routes only operate from mid-June to Labor Day), the other core routes operate the same schedule for all non-winter days.

A review was conducted of ridership by route by month for the non-winter seasons. Productivity does vary somewhat, particularly on the interlined Red and Green route, which varies from a low of 12 passenger-trips per hour in May to a high of 25 in July. However, the May figure remains at a reasonable level, while the July figure is within the capacity of the current route plan. Reducing service in the off-seasons (such as late April and May, and mid-September to mid-November) would also create confusion. One relatively simple option would be to reduce the number of buses operating the interlined routes from four to two This would result in 40-minute headways, which would result in differing service times from hour to hour (which is confusing to the passengers). The two additional changes in schedule per year would also add confusion to the system, while also adding to the management workload. Overall, providing an off-season service plan for the interlined routes different from peak-season is not recommended.

QUINN'S JUNCTION FIXED ROUTE SERVICE

The Dial-A-Ride service was initiated in 2007 to provide transit service to the Quinn's Junction area, including the National Ability Center, the Recreation Complex, and Park City Medical Center. The current service is offered seven days a week from 8:00 AM to 9:00 PM, except in winter when service is extended to 11:00 PM. Riders are required to reserve a trip at least 2 hours in advance, except that "standing orders" for consistent trips can be made for periods up to 30 days. After several years in which ridership was low (600 to 900 passengers per year), in 2010 ridership jumped to 6,103 total passenger-trips – probably due to additional development in Quinn's Junction, including the People's Health Clinic.

One option to serve the Quinn's Junction area would be to replace the DAR service with a fixed route service. This route would originate at the Old Town Transit Center, and travel north on Deer Valley Drive and Bonanza Drive and then east on Kearns Boulevard, serving existing stops along Bonanza Drive and new stops along Kearns at Sidewinder Drive, the High School and Comstock Drive. Heading east on SR 248, stops would be served at Park City Heights (planned for 239 total residential units at buildout, with the first phase of 75 to 90 units in place

by fall of 2012), the Recreation Complex, the Park City Medical Center, and People's Health Clinic, before returning along the same route. This route is 10.8 miles in length, and can be served on a half-hourly schedule. (Providing a half-hourly schedule is why the route would be via Kearns Boulevard rather than Sidewinder Drive.)

Ridership for this service would consist of two key "markets":

- Due to the need for reservations, the potential ridership in the Quinn's Junction area is not currently being fully realized. As presented in the Quinn's Junction Transit Evaluation (LSC, December 18, 2009), the full potential of existing uses is estimated to equal 11,770 one-way vehicle trips. In addition, the Park City Heights residential project will add an estimated 6,100 passenger-trips per year, once completed.

- One of the strong benefits of this option over the current DAR service is that it could also serve as a "Prospector Express" service during the non-winter months (when the existing Prospector Express (Yellow) route is not in operation). Ridership was estimated by applying the existing ratio of Prospector Express ridership to Prospector Square ridership in winter to the summer Prospector Square ridership, and factoring downward to reflect (1) the lower frequency of service and (2) the fact that stops along Sidewinder Drive would not be served. In addition, this service would add service options between the Kearns Boulevard corridor and downtown Park City in the winter, increasing ridership. Overall, a "Quinn's Express" would generate approximately 85,000 additional riders as it passes through the Prospector Square area.

Overall, the fixed route service would serve approximately 101,900 passenger-trips per year, or 95,800 more passenger-trips than the existing DAR service. At 20 passenger-trips per vehicle-hour of service, the productivity of the fixed route would be comparable to existing PCT routes, such as Park Meadows (Green).

Expanding the fixed route service to Quinn's Junction would also expand the service area for the Paratransit/Mobility program. This could lead to a substantial increase in the need for such service, considering the types of trip generators in the Quinn's area. As the current Paratransit service is at capacity, additional service would be required. On an incremental basis, a conservatively high estimate of 8 vehicle-hours of additional service per day is assumed, over the entire year. This additional capacity would also leave some capacity for expansion of paratransit service to other portions of the service area, as well. At current utilization rates, 7,300 passenger-trips per year would be served, for a total (with fixed route) of 101,900 additional passenger-trips per year.

Assuming the same span of service as the current DAR, this service would incur $379,000 in increased operating costs over the current DAR service (including the cost of additional Paratransit/Mobility service).

Another benefit of this alternative is that it would add transit capacity to serve the potential Bonanza Park development. At present, this area (bounded roughly by Kearns Boulevard, Park Avenue, Deer Valley Drive and the properties east of Bonanza Drive) contain a total of 788,000 square feet of commercial, institutional and lodging floor area. Development plans are still being developed, but encompass scenarios that could increase this total to over 6 million square feet. In addition to sitting at a key location for travel corridors serving the region, this level of development would greatly increase the need for public transit service to the area

Addressing Winter Operational Issues on the Prospector Square (Red) Route

During periods of peak winter passenger and traffic activity the Prospector Square Route can become both overcrowded and behind schedule. There are several ways that this can be addressed:

- Provision of a Quinn's Express Route, as discussed above, would somewhat reduce ridership on the Prospector Square Route, marginally reducing running time.

- At present, the Prospector Square (Red) Route operates outbound from OTTC via Park Avenue but inbound via Deer Valley Drive. The Prospector Express (Yellow) Route operates in the opposite direct. Operating both directions of each route on a specific street would simplify the route system (making it easier for passengers to understand). Moving the outbound (northbound) Prospector Square (Red) route to Deer Valley Drive would also reduce running time on this route by two to three minutes.

SPECIAL EVENT TRANSIT SERVICE

Much of Park City's tourism is dependent on annual multi-day annual events which draw large crowds, such as the Sundance Film Festival and the Kimball Arts Festival. New events are often being added, and each event creates a need for expanded transit service. Due to the constraints of local roadway and parking capacity and the desire to keep the community attractive, transit services play a key role in managing access for special events. Transit services are essential to the success of the larger events. It is important to note that "special event transportation" is actually a significant element of Park City's overall public transportation program. In winter, 8 percent of ridership is generated by special events, while in summer this proportion increases to 13 percent of ridership. The specific transit needs of special events vary depending on the number of attendees, residence/lodging location of attendees, location of available parking, and timing of the events. Under this "alternative", the Park City transit program would commit to continuing involvement in Special Events transportation strategies.

COMPARISON OF CITY SERVICE ALTERNATIVES

A review of the City service alternative discussed above indicates the following:

- The greatest potential for increased ridership is provided by a Quinn's Junction fixed route (particularly after Park City Heights is constructed), with 103,100 additional passenger-trips per year (including additional trips within the current fixed route service area, and additional Paratransit/Mobility trips). Operating the core routes till 2:00 AM in winter generates 30,100 additional riders, followed by extending the core routes till Midnight in the non-winter season (16,000 passenger-trips).

- The most effective option, as measured by the change in passenger-trips per change in vehicle-hour of service, is the extension of winter hours of core route service, with 55 passengers per vehicle-hour for extension to Midnight and 44 for extension to 2:00 AM.

- Extension of service hours in the non-winter seasons and provision of Quinn's Junction fixed route service would not achieve the current PCT standard of 28 passenger-trips per hour of service.

- Extension of winter core route service would be the most efficient use of subsidy funding, requiring $1.10 per passenger-trip for service to Midnight and $1.35 for service to 2:00 AM. The performance figure for conversion of Quinn's Junction service ($3.68 per net new passenger-trip) makes it less effective than the average of existing PCT city services ($2.60), but more effective than either the existing Park Meadows Route ($4.03) or the Trolley ($4.06).

Overall, the extension of winter evening core route service until 2:00 AM appears warranted. Conversion of Quinn's Junction service to fixed route will be warranted as development of the area occurs (and will also help to serve Bonanza redevelopment). Extension of evening service in the non-winter seasons does not appear to be warranted.

Chapter 4
Capital Alternatives

Before transit services can be provided, a myriad of capital items are required. These capital items required for public transit service consist of vehicles, vehicle maintenance facilities, passenger amenities such as shelters and benches, and transit facilities. Indeed, many capital elements will be required to maintain and potentially expand Park City/Summit County transit services over the coming years, as discussed below.

FACILITY ALTERNATIVES

Kimball Junction Transit Center

A transit passenger facility in the Kimball Junction area is an increasingly important "next step" in the evolution of the regional transit program. Increased development in the area within the last decade has resulted in a greater need for transportation services. Further, with the potential for new intercity services, including service between Salt Lake City and the Park City area, the Kimball Junction area is a prime location for a transit facility to due to its proximity to I-80. Aware of these needs, Summit County has begun the planning and design phases of a new transit center in Kimball Junction.

The County has identified a vacant parcel adjacent to the existing Summit County Government offices, which includes the Library, located on West Ute Boulevard at the intersection of State Route 224. The transit center site is located to the west of the Summit County building, bordered by West Ute Boulevard to the north and North Landmark Drive to the west. Vehicular circulation would be provided by both roadways. This site is centrally located within the Kimball Junction area, providing easy access to the major shopping destinations including Wal-Mart, the Tanger Outlet Center, and the Newpark/Redstone developments.

Site Program and Design

A site design has yet to be created, however based on existing service and potential expansions discussed in Chapter 2 (Service Plan) a reasonable program can be developed. It is recommended that space be allocated to accommodate local and intercity services, as follows:

- Route serving the Pinebrook/Jeremy Ranch/Summit Park area	1 bus
- Route serving the I-80 East/Silver Summit area	1 bus
- Local route serving the SR 224 corridor	1 bus
- Express route serving the SR 224 corridor	1 bus
- Kimball Area circulator	1 bus
- Salt Lake service	1 bus
- Paratransit service	1 van
- Special event shuttle	1 bus
- Intercity bus	1 bus
- Private airport shuttle bus	1 bus
- Lodging vans	2 vans
- Total	11 buses + 3 vans

In reality, it would probably be possible for the four vans to share two bays with little conflict, as well as the private airport shuttle bus and the special event shuttle bus. Overall, therefore, the Center should provide space for a minimum of 10 buses plus 2 vans at peak times. Service expansion beyond these routes will probably be in the form of additional frequency, rather than additional routes, which would not impact the number of buses at the transit center at any one time.

In addition to the transit bays, the program for the Kimball Junction Transit Center should provide amenities to make the facility efficient and attractive to potential riders. Given the expected level of utilization, these amenities should consist of the following:

- *Transit Building*. A structure is warranted, providing the following:

    - A climate-controlled indoor waiting area with seating
    - Two restrooms
    - A transit information booth
    - A small driver break room
    - Space for interactive kiosks or other information devices

- *Lighting*. The facility must be well lit, to ensure the safety and convenience of the passengers. The lighting requirements for a specific facility will depend on the layout of the facility.

- *Bicycle racks and/or bicycle lockers*. Bicycle parking and storage should be located near the bus shelter/passenger loading area.

- *Landscaping*. Landscaping will make the facility more attractive to both current and potential users. Landscaping should be placed where it will not interfere with the safety and personal security of the passengers. Generally, landscaping should be focused on the entrances to the facility and the perimeter of the site. When placing landscaping in the passenger waiting area it is important that the landscaping not interfere with sight lines for both security reasons, and to ensure that waiting passengers can see approaching buses. Outdoor passenger seating is also important, allowing the opportunity for passengers to wait outside in good weather.

When designing a transit center, several operational factors should be evaluated, including the following:

- *Provision of Adequate Land Area*. In addition to providing space for passenger loading and bus bays, a transit center must also accommodate vehicle circulation, interior space, any setbacks required by local regulation, and landscaping.

- *Vehicle Access*. Given the relatively high number of transit vehicle movements through a passenger facility over the course of the day, safe and efficient transit access to and from adjacent arterial streets is a crucial consideration. Delays to transit vehicles (such as left turn movements onto busy streets or within busy parking lots) can cause substantial delay to the entire transit system. Vehicle travel paths must also be carefully designed to minimize conflict with pedestrians.

- *Environmental Impact*. Transit passenger facilities must also be designed to avoid or minimize any potential negative impact of their construction or operation. Any significant impacts associated with a facility will require mitigation, which can often become a large proportion of the total project cost. These potential impacts can include the noise, air quality, aesthetics, traffic, wetlands and ecologically sensitive areas, to name a few.

For proper systemwide bus circulation, buses should be able to enter the transit center from all major street directions. Circulation into the site should separate automobile and bus traffic to ease access for both, and two access points located on different streets should be provided to the facility whenever possible. Vehicle and pedestrian access should be designed to minimize conflict between buses and pedestrians.

In addition to the passenger loading bays, it is often beneficial to provide at least one parking location for an out-of-service transit bus. This can allow one vehicle to be traded out for another without affecting traffic flow around the center. As discussed below, a minimum of 15 park-and-ride spaces should be provided either onsite or immediately adjacent, for Salt Lake commuters. Parking for transit staff, and for drivers stopping for transit information, should also be considered.

Park City Mountain Resort Transfer Center

The bus loading area at the PCMR has long been a problem to efficient operation of the PCT system, particularly in peak winter ridership periods. This stop has the second highest boarding activity after the Old Town Transit Center. All of the in-town routes serve this stop, which is highly popular as a winter destination due to the ski resort.

Currently, the site has four bus benches, one for each route that serves the stop, and a designated “bus only” area to facilitate easier movement of the vehicles. Approximately 200 feet of curb is available, adequate to accommodate up to four buses at a time. There are no shelters available curbside for waiting passengers. While there are covered waiting areas at the resort, they are not directly adjacent to the bus stops. This can result in visibility issues between passengers and the drivers, particularly during winter months when overhead shelter is in high demand.

Given the popularity of the stop with current service levels, increased development will lead to more passengers. Potential future redevelopment of the PCMR area may provide an opportunity to construct a new transit facility which would also serve as a transfer center. Enhancing public transit (through provision of a new facility) could also help offset traffic impacts associated with redevelopment. It is recommended that Park City Transit work with developers to create a more comprehensive passenger facility at the PCMR stop. In addition to indoor heated waiting areas, the transit center should be designed with the provision for six buses at a time to accommodate future increased service levels. Standards as noted in the discussion for the Kimball Junction Transit Center above should also be considered, such as circulation, lighting and other passenger amenities.

Bonanza Transit Transfer Center

With growth in outlying areas (such as The Canyons, Quinn’s Junction) as well as the potential for new services to other communities such as Kamas and Heber, there is a growing need for a facility to accommodate transfers between routes along the Kearns Boulevard area. While the Old Town Transit Center is a good location to serve transfers between some routes, this

location is not convenient for other growing trip patterns (such as The Canyons to Prospector Square, or Quinn's Junction to PCMR). The redevelopment of the Bonanza area provides a good opportunity to both facilitate this transfer pattern, and also to enhance service to the development itself. While it would not replace the Old Town Transit Center, a facility that can accommodate up to four buses at a time (with convenient ingress and egress to the east, west, and south) would be a long-term benefit to the growth in the local and regional transit program. An enclosed climate-controlled waiting area with capacity for approximately 50-80 persons at one time would be appropriate.

Summit Park Bus Turnaround/Park-N-Ride

If transit service is extended westward along Kilby Road to the Summit Park interchange (at Parley's Way), a turnaround loop will be needed (as there are no public streets that form a convenient route). In addition, the 554 residences in the area warrant at least a modest-sized park-and-ride, for both commuters to the Salt Lake Valley as well as to Park City. One feasible location is in the southeast corner of the Summit Park I-80 interchange. An example plan is shown in Figure 9. To accommodate grades, a retaining wall would probably be required between this facility and the adjacent I-80 eastbound onramp. While this layout provides 23 auto parking spaces, this figure could be increased by extending the facility to the east.

Expanded Transit Operations and Maintenance Facility

The Iron Horse Transit Operations Facility used by Park City Transit, along with the balance of the Public Works Department, is located on Iron Horse Drive in Park City. This facility, which is very well located with respect to the transit operations, is currently being expanded, including 8,708 additional square feet of maintenance shop/offices, 33,666 square feet of bus storage facility, and additional auto parking.

In order to meet the Vehicle Cleanliness Standard and meet Service Quality goals, the expanded facility should have a dedicated bay with accompanying maintenance systems for deep vehicle interior cleaning. By improving cleanliness and reducing corrosion, this would also serve to improve interior vehicle maintenance and reduce down time needed for repairs.

Park and Ride Facilities

The provision of park-and-ride lots in the Park City / western Summit County area is complicated by the fact that there are a variety of potential "markets" for park-and-ride facilities. The following discusses these various park-and-ride use groups:

- **Special Events** – The larger special events in the Park City area (Sundance, ski/snowboard events, golf events) generate the need for offsite parking, to varying degrees. The public is generally willing to use intercept parking for such events, so long as convenient shuttle service is provided. Information prior to the event (such as on event websites) and good directional signage is also important in ensuring good utilization while minimizing traffic congestion. Special event employees can also be required to use off-site parking as a requirement of the event permit. Identifying an appropriate number of parking spaces in the region for special events would require a detailed evaluation of access patterns for events, the amount of parking available at the event site, and the availability of other parking areas on a short term basis (such as school parking on weekends and holidays). Richardson Flats is a good location to serve this need, though events generating parking need in the evening

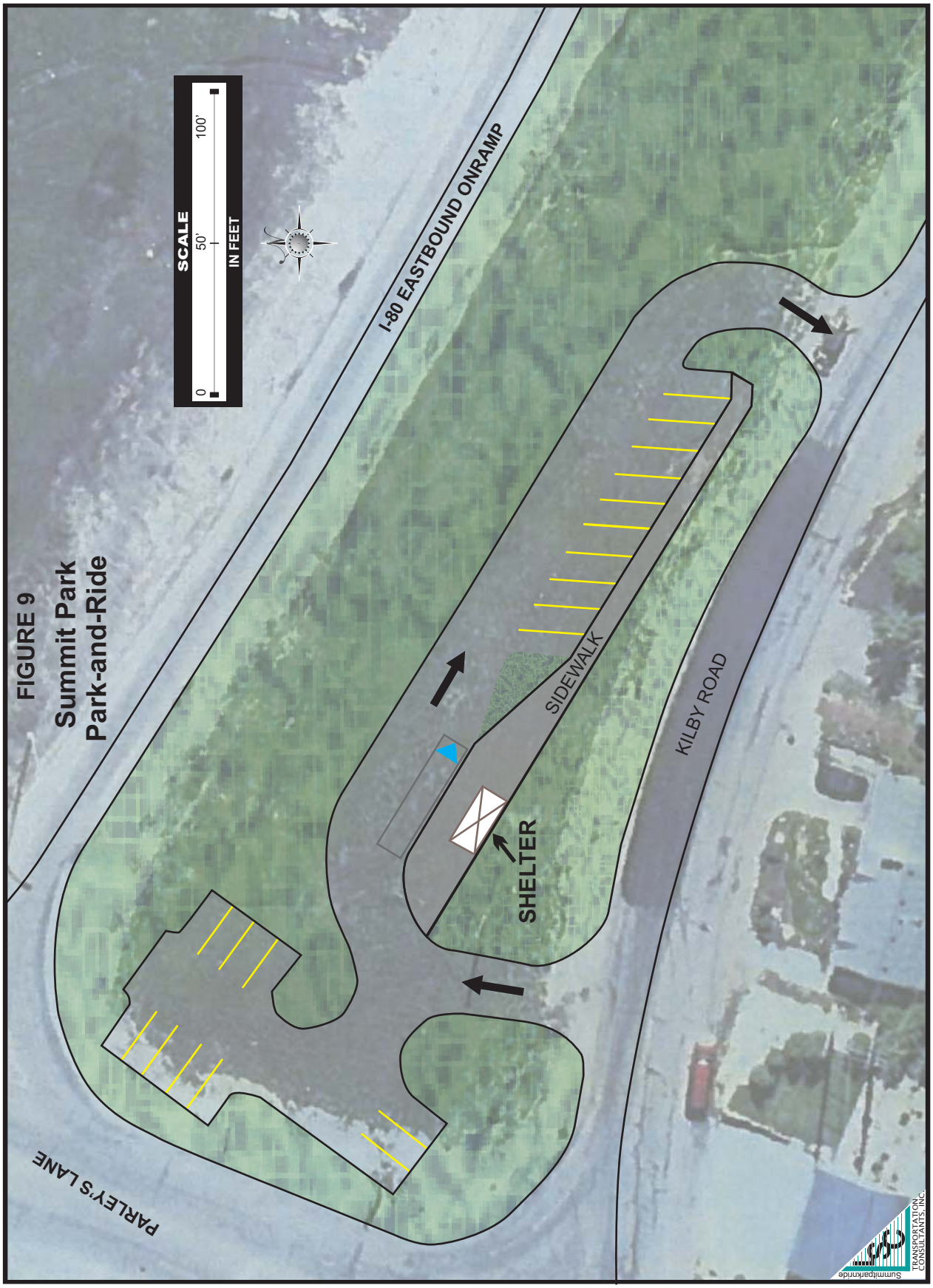
FIGURE 9
Summit Park
Park-and-Ride
SCALE
0
50'
100'
IN FEET
I-80 EASTBOUND ONRAMP
SIDEWALK
KILBY ROAD
SHELTER
PARLEY'S LANE
TRANSPORTATION CONSULTANTS, INC.

hours or on weekends/holidays could use the Research Park parking areas on a joint use basis, as that area develops.

- **Construction Workers** – Larger construction projects can generate employee parking requirements that can only be addressed through use of an offsite parking area. As evidenced by the parking provided at the Richardson Flats area during construction of the Montage project, intercept parking is an effective means of addressing this impact. Future parking needs will depend on the specifics of future major development projects and the ability to provide onsite parking during various construction phases.

- **Employee Parking** – One potential strategy to addressing parking needs in a successful commercial district (such as Old Town) is to park employees in an offsite location. Simply providing intercept parking and shuttle service, however, has proven to be ineffective so long as more convenient parking within walking distance of the employment site is available. With regards to Park City area employees, provision of a park-and-ride (with shuttle service) is only "half of the equation" in shifting travel patterns. Intercept parking strategies are only effective when providing the parking alternative is paired with a disincentive to use parking within walking distance of the employment site. This typically entails either an aggressive paid parking or parking enforcement program, or simply the unavailability of employee parking in a location more convenient than the intercept parking location. Short of disincentives, regular use of intercept parking by employees should not be expected. As an aside, provision of transit priority programs along SR 224 and SR 248 would also provide greater incentive for employees to use intercept parking.

- **Salt Lake Bus Service Parking** – Residents of the Park City/Summit County area using the planned "Park City Connect" service to Salt Lake City will generate the need for park-and-ride spaces. Applying an estimated 75 percent auto access mode share and an average of 1.2 persons per auto to the 267 daily passenger-trips shown in Table 11, and adjusting for round-trips, a total of approximately 85 parking spaces will be needed to accommodate residents driving to the new transit service. Of these, 20 are generated by residents of the Park City area, 50 are generated by residents of the Jeremy Ranch and Summit Park areas, while the remaining 15 are generated by residents of the Snyderville Basin area. In identifying appropriate locations for these spaces, the following should be considered:

  - Commuters prefer parking in a location that is in their general direction of travel, rather than driving away from their destination to access parking.

  - The transit route travel time needed to serve the parking should be minimized, by limiting the number of stops and any additions to the overall route.

  Both of these factors argue against Richardson Flat as a park-and-ride location for the Salt Lake service. Rather, parking should be provided in the following three general areas:

  - The existing Jeremy Ranch Park-and-Ride provides 40 spaces, though some are currently in use for existing carpools. It may be possible to expand the parking lot to the east, adding approximately 25 spaces. The Summit Park Park-and-Ride could also be constructed and served by the new route (though this would add running time). Other options for additional park-and-ride capacity in the vicinity include the LDS church (approximately a 1,000 foot walk from the existing Park-and-Ride), the Quarry Village shopping center, and/or a new park-and-ride adjacent to the eastbound off-ramp. If new parking areas are developed, it will be important for the Salt Lake service to only serve a

single lot, in order to provide an efficient running time. As a result, the existing lot could be limited to carpooling only.

- The relatively small number of parking spaces needed in the Kimball Junction area could be provided as part of the Kimball Junction Transit Center, or potentially along the adjacent street.

- To serve Park City residents, 20 spaces should be provided at a location along the SR 224 corridor near the north end of town. As this demand is largely during the week, these could potentially be provided at a church or other place of worship. Another potential option would be parking adjacent to The Canyons transit center, which would only be problematic on the very limited number of weekdays per year that are not business holidays but still have high levels of skier activity.

- **Skiers** – At present, parking for skiers is typically accommodated on-site at each of the ski areas. An exception is PCMR skier parking on peak holidays and Saturdays, which is accommodated in school parking lots as part of the City's Peak Skier Day Program. Regular use of other park-and-ride lots (such as Richardson Flats, or the Research Park on weekends and holidays) is not expected in the near-term, unless development of existing skier parking areas significantly reduces the amount of on-site parking.

In reviewing these lists, the Richardson Flats Park-and-Ride is most appropriately designated for the following uses:

- Special event parking
- Construction worker parking

Additional use for offsite skier parking will depend on future decisions regarding use of existing skier parking at the base areas. In addition, additional use for ongoing employee parking will depend on any future measures to reduce the supply or increase the cost of parking convenient to employment sites.

A regional park-and-ride management plan will be important in effectively accommodating the various uses:

- Quarterly, counts of commuter cars should be conducted at park-and-ride locations (both formal lots and observed informal locations) in the region. Prepaid mailback postcards left beneath windshield wipers should also be considered to survey driver's trip purpose, travel mode, and vehicle occupancy.

- On an ongoing basis, offsite parking usage for special events should be monitored. Event organizers should be required to provide the locations used for offsite parking, as well as a count of peak parking use at each location.

- Both the PCMC and County should designate an individual responsible for receiving and recording public comments/complaints regarding parking associated with the uses discussed above.

- On at least an annual basis, City and County staff should meet to (1) review the park-and-ride data, (2) discuss current park-and-ride issues, (3) coordinate the use of park-and-ride facilities for special events (including scheduling of major special events to ensure adequate

parking availability and (4) discuss the potential for new park-and-ride facilities, including joint use of parking associated with planned developments.

Bus Stop Design and Amenities

The “street furniture” provided by the transit system is a key determinant of the system’s attractiveness to both passengers and community residents. Bus benches and shelters can play a large role in improving the overall image of a transit system, and in improving the convenience of transit as a travel mode. In addition, they increase the physical presence of the transit system in the community. More importantly, shelter is vital to those waiting for buses in harsh weather conditions, both for comfort and safety. Passengers benefit from the installation of passenger amenities at major bus stops, particularly adjacent to regional shopping centers, medical facilities and social service agency facilities.

Shelters currently provided in the service area are attractive and complement the service. In addition to the 42 existing bus shelters (with benches), the system also has a total of 57 bus benches, of which 54 are located in the City and 3 in the Summit County service area. The majority of these benches are constructed of metal, which is appropriate given the winter weather conditions. Park City Transit staff has noted that several of the existing benches are in need of replacement, including one bench located at Canyons Resort Drive and SR 224, and the remaining four at the Old Town Transit Center.

The 2007 Park City / Summit County SRTP identified numerous bus stop improvements throughout the system. The vast majority of recommendations have subsequently been addressed, particularly the need for benches or shelters. In addition to these improvements, Transit Administration and Operations staff work as a team to evaluate and recommend improvements to amenities and the installation of bus shelters based on safety and usage.

Lighting and safety issues are equally important along major roadways. With late evening service and snowy conditions, adequate lighting can be an important additional amenity and safety consideration. This could range from overhead street lighting to a low power light to illuminate the passenger waiting area. Opportunities for the installation of solar-powered lighting at existing bus stops and transfer facilities should be explored as a low impact and environmentally friendly solution. Park City Transit should conduct an inventory of existing lighting facilities and provide lighting where needed. Generally, areas with poor visibility or lighting that may impact passenger security should be given higher priority. Additionally, neighborhood setting should also be considered, as lighting in residential areas may not be complementary to existing conditions and character.

Bus Stop Maintenance

At present, bus stops within Park City limits (128 stops, with 21 shelters) are maintained by Park City personnel, while Summit County is responsible for maintenance of the 98 stops and 21 shelters in the unincorporated county. This is due at least in part to liability concerns of one jurisdiction performing maintenance functions in the other jurisdiction. In turn, this has led to difference in maintenance and snow removal between stops in the two jurisdictions. Generally, stop maintenance and snow removal has been observed by the consultant to be better in Park City than in the county. As the system grows and the proportion of passengers not dressed for a day on the slopes increases, the importance of shelter maintenance and snow removal to the overall attractiveness of the transit program will only increase.

One option would be to retain a single private contractor for maintenance and snow removal throughout the system, contracted and paid separately by the two jurisdictions. This would ensure consistent maintenance throughout the transit system, and could well lead to an improvement in overall stop conditions. However, it would eliminate the opportunity to use work release labor at low cost, and would incur the administrative costs of any contract.

The use of existing Park City Transit staff to maintain bus stops and shelters is a low cost alternative to contracting the provision of these services to private sector businesses. In order to properly and effectively use staff to perform these functions, Transit operations would need to acquire necessary equipment, such as snow removal equipment, a dedicated field maintenance cleaning support vehicle and equipment. The issue of liability of PCMC staff working at County bus stops would also need to be explored with risk managers in both jurisdictions.

Another option would be for the two jurisdictions to continue maintenance of stops/shelters in their respective jurisdiction, but to develop and adopt a set of consistent standards for maintenance efforts. These standards would include the following:

- A minimum schedule for regular cleaning of stops and shelters.

- A maximum time allowed before a snowfall exceeding a minimum depth is removed (such as “snowfall exceeding 3 inches must be removed by Noon of the following day”)

- A maximum time before major maintenance (such as replacement of broken lights or shelter panels) must be performed.

- A schedule for regular inspection of bus stops and shelters (at least quarterly), with a consistent report format used to present inspection results to both jurisdictions.

Bicycle/Pedestrian Facilities

At one end of their trip or the other, virtually all transit passengers also travel on foot or on bicycle as part of their transit trip. A key element of a successful transit system, therefore, is a convenient system of sidewalks and bikeways serving the transit stops. Park City and Summit County should continue to work with the branches of their respective public works and planning departments to review construction plans and scheduling priorities for pedestrian and bicycle improvements to best coordinate with transit passengers’ needs. The need for bicycle racks at bus stops with high bicycle activity is strong (particularly in residential areas, where passenger’s can leave their bike while using the bus system), and the cost of modern bus stop bicycle racks is on the order of $750 each (including installation). The cost of procuring and installing bicycle racks could be defrayed if local community groups would donate the racks and/or labor to install them.

Advanced Public Transportation System Technologies

Over the past five to ten years, the use of Advanced Public Transportation System (APTS) technologies has become “standard practice” among mid-sized and larger transit programs across the US. Key APTS technologies consist of the following:

- **Automatic Vehicle Location Systems** -- AVL systems are computer-based vehicle tracking systems that are used extensively in the transportation industry for both military and

civilian purposes. Driven by Global Positioning System (GPS) technologies, AVL systems can be linked to a variety of other technologies, including computer-aided dispatch systems (that can include tools such as schedule adherence monitoring and computer-aided service restoration), automatic passenger counters, and automated traveler information systems.

- AVL systems can record locations by time of day, making it much easier for transit planners to determine when timetables need adjustment.

- Dispatchers can use real-time information about passenger loadings to dispatch and reassign buses as needed.

- Recorded information can be used to analyze patterns of use for service planning and to assess the impact of marketing efforts.

- AVL systems can be linked to passenger information systems to automate (1) on-board announcements of approaching stops and (2) in-terminal messages showing the expected arrival time of approaching buses.

- **Automatic Passenger Counting System** -- APC systems automatically record the number of passengers utilizing the transit system by time and stop.

- **Traveler Information Systems** – From a passenger's perspective, the most exciting APTS technology is the provision of real-time information on transit services:

  - Automated annunciator technology can be used to automatically announce and display the names of approaching bus stops among other things; this would help Park City comply with the requirements of the Americans with Disabilities Act, which states that fixed-route transit systems must provide both visual and audible information about vehicle locations to assist riders with visual impairments or other disabilities. This technology removes the responsibility for announcing stops from drivers, leaving them free to concentrate on safe driving.

  - AVL systems can also be used to provide electronic messages about approaching vehicles at key bus stops and transfer locations. For example, an electronic sign at the Park City Mountain Resort could announce: "A Deer Valley/Old Town bus will arrive in 5 minutes; a Prospector Square bus will arrive in 11 minutes." This information can also be provided automatically over the Internet (including smartphones), which allows passengers to monitor the service from their residence or place of work. Studies have shown that these strategies can increase ridership by up to 5 percent.

Applications in Park City/Summit County

In 2010, Park City Transit issued an RFP for APTS technology, and is currently in the process of procuring this equipment. It is estimated that the system will cost approximately $1.4 million, and would be paid for using federal grant funding (secured) and local funds, based on an 80/20 match, that have been factored into the Fiscal Year 2010 capital improvement program budget. A summary of the technologies that Park City is considering is included in the discussion below.

- *Computer Aided Dispatching (CAD)* – provides GIS and tabular display capabilities that allow dispatchers to see where vehicles are located, monitor events and to obtain schedule adherence and passenger count information. This also includes voice calling and data

messaging capabilities between dispatchers and vehicles. This is particularly important to PCT in light of the transfers between routes, and the uncertain running times generated by peak seasonal traffic. Additionally, the system is equipped with a silent alarm switch on the vehicles for emergency response.

- *Reporting and Analysis Techniques* – allows for detailed performance reports to be extracted, including schedule adherence, ridership, and incident information. The technology also includes tools for National Transit Database (NTD) reporting, as well as the ability to provide operational summary and trend analysis reports. Reports generating passenger by stop data would also be possible, through the implementation of APC technology.

- *Automatic Passenger Counting (APC*) – would provide automated passenger counts at each door through an overhead counter system. The information would be linked to the general AVL technology system, allowing for detailed boarding and alighting information to be produced.

- *Passenger Information* – includes real time passenger information displays in the form of wayside signs at stops throughout the system. The electronic signage would include a clock and scrolling display with departure times and other public service announcements. Additionally, stop annunciation systems will be installed on the vehicles, which would automatically announce stops prior to reaching the destination. This system also has the ability to provide on-board announcements unrelated to stops, such as advertising other services or for other information. Other passenger travel tools that will be incorporated include web and phone based capabilities. Passengers will have the ability to visit a website that can provide them with real time information, a feature that can also be used for customer support activities. Alternatively, passengers can call in to an automated phone system that provides current travel information by stop; to obtain the information, the caller must indicate a specified stop ID.

Park City is also planning to implement Google Transit technology, which provides more comprehensive trip planning opportunities beyond driving directions. A user is asked to input their origin and destination information and has the ability to get directions by car, walking, or public transit. Directions by mode are generated, and include details for the overall suggested trip times, bus routes, and departure and arrival times for each mode and stop. The program has the ability to link different modes and transportation providers, simplifying travel for those who wish to use public transportation by displaying trip plan including schedule options and fares.

In order to take part in Google Transit, transit agencies must provide specific information to Google. There are 11 key components, also known as files, 6 of which are required. Once provided with this data, Google gathers it into a schedule design that is easy to use. The components include:

- **Transit Agency** – General information about the transit agency that provides data in this schedule. (Required component)
- **Transit Stops** – Information about locations where vehicles pick up or drop off passengers. (Required component)
- **Transit Routes** – Information about a transit organization's routes. (Required component)
- **Trips** – Information about scheduled service along a particular route, with a trip consisting of two or more stops that occurs at a specific time. (Required component)

- **Arrival and departure** – Lists of the schedule times a vehicle arrives at and departs from individual stops for each trip along a route. (Required component)
- **Calendar Information** – Information regarding the service availability, such as operating days and when the service begins and ends. (Required component).
- **Calendar Exceptions** – Provides a list of exceptions for service categories. (Optional component)
- **Fares** – Information regarding fares for a transit agency's routes. (Optional component)
- **Fare Rules** – Rules for applying fare information. (Optional component)
- **Route Shape** – Defines rules for drawing lines on a map to represent routes. (Optional component)
- **Frequency** – Provides headway data for routes. (Optional component)

Due to the ability to provide directions linking different modes, as well as a relatively simplistic program to use, participating in the program could be a valuable resource for Park City where many of the visitors may not have access to a private automobile.

Bus Rapid Transit Alternatives

Bus Rapid Transit (BRT) is a system of technologies and operating strategies that is rapidly gaining acceptance nationwide. As defined by Wikipedia:

> "*BRT is a term applied to a variety of public transportation systems using buses to provide faster, more efficient service than an ordinary bus line. Often this is achieved by making improvements to existing infrastructure, vehicles and scheduling. The goal of these systems is to approach the service quality of rail transit while still enjoying the cost savings and flexibility of bus transit. At present, 30 full BRT systems are operating in the US, with many other transit services employing elements of BRT."*

BRT is a flexible concept, and can range from "heavy" options with dedicated right-of-way to "light" options whereby technology and relatively minor roadway modification are used to give transit vehicles an advantage in mixed traffic.

"Heavy" BRT consists of rubber-tired transit vehicles operating on separate bus lanes. Beyond travel lanes limited to transit vehicles, characteristics of "full" BRT include:

- High capacity vehicles with a distinctive image. Important vehicle characteristics for BRT include high capacity (typically articulated) buses, low-floor design, multiple loading points, and advanced real-time service information.

- Limited stops, with high level boarding platforms.

- Fare payment upon entering the stations, rather than on the vehicles.

- High frequency of service. BRT typically provides service every 5-8 minutes in rush hours, 10 minutes midday, and 12-15 minutes evening and weekends. Connecting services should be provided at least every 30 minutes off peak and 15 minutes peak.

This type of BRT service most closely reflects the characteristics of Light Rail Transit (LRT). Like LRT, this type of BRT service is typically used to connect outlying residential areas with major employment centers. Examples include the 17-mile Orange Line in Los Angeles, the Silver Line in Boston, and the majority of the EmX BRT system in Eugene, Oregon. Due to the limited frequency of service along any one corridor in the PCT service area, as well as the sobering capital costs and construction impacts of a separate facility, this option is not considered further as part of this SRTP.

However, there may well be opportunities in the Park City/western Summit County area for effective application of "BRT light" strategies. Under this scenario, BRT vehicles operate in mixed travel lanes with auto traffic. Examples are found in Reno, Oakland, and Las Vegas, and the Roaring Fork Transit Authority serving Aspen, Colorado is currently developing plans for a 39-mile BRT corridor stretching to Glenwood Springs. To provide faster and more dependable service, these types of BRT systems typically employ transit signal priority and/or "jump queue" lanes (discussed in greater detail below).

Transit Signal Priority

Under transit signal priority, a detector is installed (typically a video detector) that is triggered when a transit vehicle approaches the signal. A signal is then sent to the computer controlling the signal, generating a request for priority. The computer then identifies if the request should be accommodated (given pre-determined parameters). A second detector also identifies when the transit vehicle has cleared the intersection.

There are a variety of types of signal priority:

- A transit vehicle could be provided with a **green extension** if detected at a point in the cycle timing when additional green time (up to a pre-determined maximum) would aid transit operations. This is typically the most effective form of signal priority, as it does not require additional clearance phases that waste intersection time.

- An **early green** could be provided to a transit vehicle arriving during a red phase, speeding green phases for other movements to allow faster movement of the priority vehicle.

- **Phase insertion** could be provided *only* when a transit vehicle is present, such as a left-turn movement that is allowed only for transit vehicles.

- **Phase rotation** could change the order of specific phases in order to speed transit movements, such as providing a transit vehicle with a left-turn indication prior to the parallel through movement (a "leading left-turn phase") where left turns are typically provided with a phase after the parallel through movement (a "lagging left-turn phase").

A key consideration is the difference between transit signal **preemption** and transit signal **priority**. Under preemption, a transit vehicle is automatically provided with a green signal indication, regardless of where the signal is in the typical cycle of phases. In comparison, priority reflects a system in which a transit vehicle is provided with a higher percentage of green indications, but is not always provided with a green indication. As signal preemption can substantially impact overall traffic operations, priority is a much more common strategy.

Existing transit signal priority programs are in place in many locations, including two corridors in Los Angeles, California; Davis, California; Eugene, Oregon; and Sacramento; California. Priority

is also planned as part of the UTA Provo-Orem BRT and 5600 West BRT projects, as well as the RFTA BRT project in Aspen, Colorado. A survey of existing transit priority systems presented in the *Transit Signal Priority Handbook* (ITS America, 2005) yielded the following key findings:

- Annual cost of maintenance was relatively small. Some agencies did not notice any change in overall signal maintenance costs over and above activities without priority systems. Of those that did, an average is on the order of $1,000 per intersection per year.

- Travel time savings through individual intersections ranging from 9 percent to 70 percent, with a typical value in the range of 20 to 30 percent.

- Very little impact on non-priority street traffic, typically described as "minimal," 1 second per vehicle, or "infinitesimal."

"Jump Queue" Lanes

Jump queue lanes allow buses to bypass traffic queues at traffic signals. This is most beneficial in congested conditions where vehicles cannot pass through a signal in a single cycle. This can take the form of designating existing right-turn lanes as "Right Turn Only – Buses Excepted" in order to allow buses to jump the through traffic queue. Merging back into the through traffic stream can potentially be accomplished by either (1) providing an acceleration lane on the far side of the intersection to allow buses to get up to speed and merge to the left, or (2) providing a special signal indication (and timing phase) to give buses a short head start before the through general traffic movement phase.

Evaluation of BRT Applicability to the PCT Area

The effectiveness of signal priority or jump queue strategies depends upon a combination of existing traffic delays as well as the level of transit activity. Table 14 presents an evaluation of existing traffic delays at key intersections (as observed in a series of travel time runs in September 2007 as part of a study conducted by the University of Utah), as well as the hourly total PCT bus movements through each intersection (per the current winter schedule). Based on this information, the relative potential for benefits to the transit service (and transit passengers) of signal priority and/or jump queue lanes at each intersection was identified. As shown, the greatest potential (under current service plans) is at the SR 248/Bonanza Drive intersection, due to the combination of medium to high traffic delays in many time periods, as well as a moderate level of transit activity. Other locations with a relatively high potential include SR 224/Ute Blvd, SR 224/Canyons Drive, SR 224/SR 248, Park Avenue/Deer Valley Drive, and SR 248/Comstock Drive. It is important to note that (1) additional bus routes in the future would increase the viability at specific locations and that (2) higher traffic delays during the peak winter season would also increase viability.

A more detailed study is recommended in the near term to identify the specific locations and technologies that would be cost-effective and implementable along PCT's key service corridors. This study, undertaken by a partnership between PCMC and Summit County and including strong participation by UDOT, should consider the following:

- The existing delays at key intersections, during peak and off peak periods, by day of week and by season.
- Forecasts of future delays.

TABLE 14: Assessment of Transit Priority Feasibility

Intersection		Traffic Delays (1) Northbound AM Pk	Northbound Midday	Northbound PM Pk	Southbound AM Pk	Southbound Midday	Southbound PM Pk	Transit Bus Movements per Hour (2) City	County	Total	Overall Potential for Transit Priority
SR 224	Kimball Jct	Medium	Medium	Medium	Low	Low	Low	0	2	2	Low
SR 224	Ute Blvd	Low	Medium	Medium	Low	High	High	0	5	5	Medium
SR 224	Olympic Park/Newpark Blvd	Low	Low	Medium	Medium	Low	Low	0	5	5	Low
SR 224	Canyons Drive	Low	Low	Low	Medium	Low	Low	0	10	10	Medium
SR 224	SR 248	Low	Low	Medium	Low	Low	Low	12	10	22	Medium
Park Avenue	Deer Valley Dr	Low	Low	Low	Low	Low	Low	30	14	44	Medium
Deer Valley Dr	Bonanza Dr	Low	Low	Low	Low	Low	Low	6	6	12	Low
SR 248	Bonanza Dr	High	Medium	Medium	Low	Low	Medium	12	2	14	High
SR 248	Comstock Dr	High	Low	Low	Medium	Low	High	6	2	8	Medium

Note 1: Source -- Adaptive Signal Control V SCATS Evaluation in Park City, UT (University of Utah, July 2008). Delays observed in September 2007.
Low delays = less than 20 seconds average delay. Medium delays = 20 to 60 seconds average delay. High delays = greater than 60 second average delay.
Note 2: Source: Existing PCT winter schedules.

- Transit activity levels through key intersections, including both transit vehicle movements and passenger loads.
- Existing transit route on-time performance, and the ability of transit running time reductions to improve schedule adherence/reliability as well as transit operating costs.
- Current transit signal technologies and capabilities.
- Impact of various levels of signal pre-emption to provide travel time reductions for transit vehicles, and associated impact on general traffic level of service and average delays.
- Right-of-way, construction and environmental considerations of intersection and roadway improvements.
- The impacts of potential transit-only advanced green intersection phases at the end of jump-queue lanes.
- Traffic safety impacts of intersection modifications and jump-queue lanes.

A reasonable estimate for total cost of this study is $50,000 to $60,000, depending on the scope of the corridors and intersections to be included.

VEHICLE ALTERNATIVES

The size and types of Park City/Summit County's fleet was presented in the Technical Memorandum Number One. In summary, the two agencies currently have 37 revenue vehicles, ranging in seating capacity from 15 passengers to 32 passengers. In addition, it uses a fleet of five non-revenue vehicles. The average age of the revenue fleet is 4.9 years and the average mileage is 158,523 per unit.

Per the standards outlined in FTA Circular 5010, the design life for the fixed-route buses is 12-year/500,000 miles, and 7-year/250,000 miles for the Dial-A-Ride minibuses and the Trolley. Bus replacement and expansion projects are typically eligible for FTA funding at an 80 percent Federal/20 percent local split.

Utilizing the FTA standards noted above, approximately 29 revenue vehicles would require replacement within the Plan period, the majority of which would have reached their economically useful lives in 2017. This information is shown in Table 21 of Technical Memorandum Number One. Of these vehicles, 10 are recommended for replacement prior to the maximum age is reached; based on the current mileage per year information, these vehicles would reach the maximum 500,000 miles prior to the 12-year mark. In addition to the replacement of existing

vehicles, additional vehicles may be needed in order to meet the growing service, depending on the final Service Plan.

Alternative Fuels

Global climate change or "global warming" is a major environmental issue which needs to be acknowledged in planning documents. Climate change has been linked to the release of greenhouse gases (GHG's) such as carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride into the atmosphere, which traps heat and increases temperatures near the earth's surface. Vehicles, including buses, release various emissions that may not only play a role in climate change, but result in reduced air quality. As noted by the Utah Division of Air Quality, over 50 percent of the air pollution in Utah is from mobile sources.

The United Stated Department of Energy's Vehicle Technology Program created a government industry partnership, called the Clean Cities Initiative. As one of the 100 participating coalitions, the Utah Clean Cities Coalition provides support and information regarding alternative fuels to further the programs goals to reduce dependence on foreign oil, develop regional economic opportunities, and to improve air quality.

To reduce pollution from mobile sources, the United States Environmental Protection Agency (EPA) has adopted a variety of regulations, as required by the Clean Air Act Amendments (CAAA) of 1990. Standards for transit vehicles state that Particulate Matter emissions (PM, or "dust") must be cut by more than 90 percent or no more than 0.05 grams per brake-horsepower per hour (g/bhp-hr). Other standards include: nitrous oxide (NOx), no more than 4.0 g/bhp-hr; hydrocarbons (HC), no more than 1.3 g/bhp-hr; and carbon monoxide (CO), no more than 15.5 g/bhp-hr.

With the need to replace aging vehicle and expand the fleet to meet increased service demand, it is important to discuss the options regarding fuel. Alternative fuels can not only provide cost effective options, but they also work towards clean air and other environmental goals set forth by local, state and federal programs. The following discussion presents the different alternative fuels, their advantages and disadvantages, and their potential application for the Park City Transit fleet. While this review should serve as a step in the development of a more detailed long-term alternative fuel strategy plan, a more detailed study is recommended, that would focus on the following:

- Availability, cost, and quality of fuel in Park City.
- Need for new storage and fueling facilities, and availability of space for these facilities.
- Air quality goals, and the trade-off between emission categories inherent in fuel choices.
- Life-cycle emissions, including emissions associated with the generation of electricity in the local market.
- Impact of off-site fueling on transit staff time and other operational costs.
- Impact on vehicle range and power performance, particularly in cold weather.
- Impact on transit vehicle noise.
- Life-cycle transit vehicle capital costs.
- Availability of additional funding sources for capital and operational needs.
- Requirements for maintenance facility modifications.
- Mechanic training requirements, and availability of unique maintenance personnel skills in the Park City area.
- Requirements for emergency response.

- Ability to share resources and costs with other fleets in the region, including other City and County vehicle fleets.

A reasonable cost estimate for this study would be $40,000 to $50,000.

Compressed Natural Gas (CNG)

Natural gas is a domestically produced alternative fuel and is readily available to end users through the utility infrastructure. The strength of CNG as an alternative fuel for transit buses is that it is generally less expensive per unit of energy than gasoline or diesel fuels. Per the Clean Cities Alternative Fuel Price Report in April 2011, the average price of CNG in the Rocky Mountain Region was $1.55 per diesel gasoline equivalents compared to $4.05 per gallon of diesel gasoline (the fuel price can vary for bulk purchasers). The fuel also has the potential to reduce NOx emissions and PM when compared to diesel, although low sulfur diesel fuel used in conjunction with particulate matter traps can reduce PM emissions by a similar amount. Greenhouse gas emissions from CNG vehicles are approximately 15 percent to 20 percent lower than from gasoline vehicles, since natural gas has a lower carbon content per unit of energy than gasoline. However, CNG generally vehicles have about the same greenhouse gas emissions as diesel fuel vehicles, with lower CO_2 emissions offset by higher hydrocarbon emissions.

Many people – both inside and outside the transit industry – perceive CNG as the future fuel of choice. Others see CNG as a stop-gap measure that can be used to reduce vehicle emissions until other technologies (hydrogen fuel-cell or combustion-electric hybrid) are developed further. Indeed, the decision to pursue CNG comes down to the underlying goals of the agency considering alternative fuels, the local politics, the financial resources of the agency, and the commitment of decision-makers.

Historically, the weakness of CNG is its difficult storage requirements. CNG is stored in high pressure cylinders at pressures up to 3,000 pounds per square inch. The high weight, volume, and cost of the storage tanks for CNG have been a barrier to its commercialization as an alternative fuel. Tanks also have a useful life that can be less than that of the bus as a whole, resulting in expensive replacement of on-vehicle tanks. The recent development of lighter aluminum tanks, however, has reduced this disadvantage to some degree.

The advantages of a CNG bus are the lack of visible pollution and quieter operation. The problems encountered with CNG include the inconsistent quality of local CNG supplies, limited range of CNG vehicles, and continued industry concerns regarding reliability. Specialized maintenance training and equipment, along with modifications to facilities to safely accommodate CNG, also add to costs.

According to the Utah Transportation Authority (UTA), a 40-foot CNG bus in 2010 cost on the order of $480,000, substantially less than a hybrid bus ($630,000) and slightly more than a diesel engine bus ($430,000). The higher cost relative to diesel engine vehicles is due to the higher cost of the engine itself and the higher cost of the fuel tanks. The useful life of a CNG engine is roughly equivalent to that of a traditional diesel engine, depending on the level of maintenance as well as level of contaminates in the fuel. The CNG tanks, however, are typically certified for 15 years; if careful maintenance on the remainder of the bus allows its life to exceed this period, a transit agency can be faced with expensive replacement of the tanks.

In general, a CNG refueling station for an urban transit fleet can cost between $320,000 and $7,400,000. The lower end of this range is for “slow fill” facilities with a very limited capacity in the number of vehicles that can be fueled per day, while the high end is for “fast fill” facilities with large (and expensive) compressors. Additional costs would be incurred to upgrade the new maintenance facility with required safety features and to provide emergency response equipment and training.

In a 1996 Department of Energy report, Pierce Transit (Tacoma, Washington) estimated that CNG engines are about 20 percent less efficient than diesel engines on a per gallon equivalency, which reduces the range of CNG buses. CNG buses are described as having a driving range of about 300 miles (depending upon the capacity of the gas cylinders) compared to a little more than 400 miles for diesel buses. Typically, buses smaller than 35 feet in length are unable to accommodate enough fuel tanks to operate a full urban cycle service day without refueling.

One of the major drawbacks for CNG use in Park City is the lack of an adequate fueling station. While there is a fueling station in Park City, it only has two pumping stations and is also open for public use. As such, refueling at the end of the day would be a long and laborious process. In order to better serve the needs of the transit fleet, Park City Transit could alternately provide a separate fueling station. Such a task would increase start-up costs dramatically and would present additional problems should the CNG option prove to be a poor long term solution.

CNG also would require modifications to the transit maintenance facility. In particular, enhanced venting systems are required, along with modifications to heating, lighting and switching systems to avoid any source of spark (such as is generated by a typical light switch). Specialized emergency response training and equipment is also necessary.

Another important consideration is that the power provided by CNG engines, while it has improved over recent years, is still 25 to 30 percent lower than the power provided by a similar diesel engine. This can result in substantial operational problems on steeper grades present on several of the Park City Transit routes. In addition to delaying routes, this increases the traffic congestion caused by bus operations.

Hybrid Electric

A vehicle technology gaining popularity among transit systems nationwide is hybrid electric propulsion. Under this arrangement, battery-powered electric motors drive the wheels; the batteries are charged using a small internal combustion engine (diesel-, gasoline- or alternative-fueled) to power an electric generator. This arrangement provides dramatically lower emissions, as the engine operates within a very narrow and efficient operating range. Hybrid buses which use ultra-low sulfur diesel and particulate matter filters have 90 percent lower emissions than a conventional diesel bus, and tend to have less greenhouse gas emissions than both conventional diesel and CNG buses.

Operating costs for a hybrid electric system are typically lower in comparison to conventional diesel- or CNG powered arrangements due to greater fuel economy and reduced brake wear (the batteries are also charged through regenerative breaking, which tends to slow the vehicle while it recoups energy). In addition, hybrid electric buses provide better acceleration and quieter operation than conventional internal combustion engine propulsion systems. Another benefit of hybrid electric technologies is that it does not require the large infrastructure investment that is required for CNG technologies. However, the average price of a hybrid bus is

quite dramatic, costing on the order of $630,000 (per UTA in 2010) when compared to $430,000 for a conventional diesel bus. In addition, conventional sealed-gel lead acid battery systems typically last only two to three years, and replacement units cost on the order of $25,000. Better battery technology currently exists that could extend battery life (i.e., nickel metal hydride), but this technology currently costs $35,000 to $45,000 per bus.

Hybrid electric propulsion systems have been tested at several large transit programs, most notably at New York City Transit. The National Renewable Energy Laboratory prepared an evaluation of the benefits of 10 new CNG Orion VII buses and 10 new Orion VII hybrids used for New York City Transit. According to the report, hybrid maintenance costs were lower than the CNG buses, battery replacement rate for the hybrid vehicles was about 4.5 percent per year, brake repair costs were 79 percent lower on the hybrid buses than the CNG buses and the hybrids had fewer roadcalls. New York City Transit has since placed an order for an additional 500 hybrid buses. Other agencies which have tested hybrid technologies include Sunline Transit in Thousand Palms (California), the Roaring Fork Transit Authority (Colorado), the Los Angeles County Metropolitan Transportation Authority, the Orange County Transportation Authority, Omnitrans in San Bernardino, TriMet in Portland (Oregon), King County Metro Transit in Seattle, the Southeastern Pennsylvania Transportation Authority in Philadelphia, and New Jersey Transit.

The National Renewable Energy Laboratory (NREL) has conducted several studies comparing fuel economy and maintenance cost per mile between hybrid electric and diesel transit vehicles for urban fleets. According to a NREL study for Long Beach Transit, fuel economy (miles per gallon) on a gasoline powered hybrid electric vehicles was 4.3 percent lower than on a diesel fueled vehicle but maintenance per mile costs were 42 percent less on the hybrid. Similar comparisons made for King County Metro Transit in Seattle show that fuel economy in miles per gallon was 27 percent greater on a diesel hybrid vehicle in comparison to an Ultra Low Sulfur Diesel (ULSD) vehicle. In this case study, total maintenance cost per mile was only 4 percent lower for the hybrid vehicles.

Little research has been performed regarding the cost effectiveness of hybrid vehicles for rural transit fleets. The frequent stops and starts of typical urban and suburban routes get the most out of the hybrid system. Routes with extended distances between stops would not have as much improvement in fuel economy but would still realize benefits in reduced maintenance from the regenerative braking. If Park City were to replace all revenue vehicles with hybrid electric vehicles, the transit agency could potentially save up to $290,000 in maintenance costs per year and $150,000 in annual fuel costs (assuming the best case scenario figures from the NREL studies). Although this represents up to an eight percent reduction in total annual operating costs, the savings would not pay for the roughly $490,000 increase in average annual capital costs to purchase hybrid vehicles as the existing 37-bus fleet requires replacement. Switching to a hybrid vehicle fleet would be largely dependent upon the level of grant funding available. The life expectancy of a hybrid electric vehicle is similar to a diesel vehicle.

Ultra Low Sulfur Diesel

Diesel-fueled engines have traditionally dominated the transit vehicle marketplace with their fuel efficiency and durability. From an air quality perspective, diesel engines have very low tailpipe emissions of CO and other organic gases. The concern from an air quality perspective, however, has been the emission rates of NOx and PM.

Due to increasing environmental pressure to reduce the above emissions, the Environmental Protection Agency has developed stringent NOx and PM regulations as referenced above. The final Clean Air Amendments permit the use of clean diesel in urban buses, provided that the clean diesel engines meet the PM standards. In partial response to the 1990 CAAA amendments for cleaner burning fuels and the continued development of the previously mentioned alternative fuels, the traditional diesel fuel engine has made great strides toward evolving with a cleaner burning particulate trap and catalytic converter technology.

Ultra-low sulfur diesel (ULSD) is diesel fuel with 15 parts per million (ppm) or lower sulfur content. In 2010, the U.S. Environmental Protection Agency required 100% of the highway diesel fuel refined in or imported into the United States to be ULSD. This ultra-low sulfur content enables use of advanced emission control technologies such as particulate traps and catalytic converters on light-duty and heavy-duty diesel vehicles. When combined with advanced emission control technologies, reductions from use of clean diesel can be equivalent to removing the pollution from more than 90 percent of today's trucks and buses[1].

While ULSD typically does not impact vehicle performance, fuel economy can be compromised since the process that produces ULSD can also reduce the fuel's energy content. Additionally, lubricity is reduced as a result of removing the sulfur. This can be resolved by adding various additives to the fuel before retail sale or by addition biodiesel.

Biodiesel Fuel

Biodiesel can be legally blended with petroleum diesel in any percentage. The percentages are designated as B20 for a blend containing 20% biodiesel and 80% petroleum diesel, B100 for 100% biodiesel, and so forth. Per the Energy Policy Act of 1992, alternative fuel credits are available for B100 and blends of B20 and higher. PCT currently uses B5 blends in winter, and B20 blends in the remainder of the year, obtained from a station on Ironhorse Loop Drive (shifting to onsite fueling at the expanded Ironhorse maintenance facility, once complete).

Biodiesel, in general, contains roughly 8 percent less energy per gallon than standard petroleum-based diesel. Benefits related to greenhouse gases and air quality correspond with the blend used, whereby B20 generates roughly 20 percent of the benefit of B100.

B20 is the most common biodiesel blend in the United States and provides the benefits of biodiesel but avoids many of the cold-weather performance and material compatibility concerns associated with B100. B20 can be used in nearly all diesel equipment, is compatible with most storage and distribution equipment, and generally does not require engine modifications. According to the United States Department of Energy, B20 can reduce PM (particulate matter) emissions by 10 percent, CO (carbon monoxide) by 11 percent, and unburned HC (hydrocarbons) by 21 percent. Further, carbon dioxide emissions can be reduced by 15 percent.

B100 and other higher level blends cannot be used in all engines, though they are typically compatible with diesel engines built after 1994 with biodiesel-compatible material for parts such as hoses and gaskets. Since biodiesel blend levels increase quite substantially beyond B20, there are concerns that should be considered. These concerns include lower energy content per gallon, potential engine warranty issues and microbial contamination. Of particular concern to Park City would be the potential for gelling in low temperatures during the cold winter months. Emission reductions are greater with the use of B100 biodiesel – reducing PM and CO by nearly

[1] United Stated Department of Energy Alternative Fuels and Advanced Vehicle Data Center, 2011

50 percent and unburned HC by nearly 70 percent. Likewise, carbon dioxide emissions can be reduced by more than 75 percent. It is important to note that despite these potential reductions, use of B100 biodiesel can actually increase NOx emissions.

Low-level biodiesel blends are also available, and are the result of blending biodiesel with petroleum diesel. Such fuel is compatible with diesel engines and aids in reducing harmful emissions. Blends include B2 (2 percent biodiesel, 98 percent diesel) and B5 (5 percent biodiesel, 95 percent diesel), both of which are suitable for light-duty and heavy-duty vehicles such as transit buses. As mentioned in the low-sulfur diesel discussion, low-level biodiesel, such as B2 or B5, is a common additive to increase lubricity. In addition to the lubricity benefit, these biofuels also provide air quality benefits. The United States Department of Energy states that "using 100 gallons of B5 brings roughly the same air quality and alternative fuel use benefits as using 25 gallons of B20 or 5 gallons of B100".

In terms of pricing, biodiesel tends to cost slightly more than traditional diesel fuel. As of April 2011, the Clean Cities Initiative cited the cost of B20 biodiesel at $4.15 and of B99 to B100 at $5.10 per gallon, compared to $4.05 per gallon for standard diesel.

Summary

Barring conversion to alternative fuels beyond biodiesel, a number of steps can be taken to substantially reduce the air quality impacts of diesel-fueled transit buses. Various transit systems have been successful in reducing PM emissions through the application of "clean-diesel" technology. The utilization of a low sulfur fuel has proven to reduce the average annual PM emissions of a transit coach from 935 pounds to 260-300 pounds – roughly a 70 percent reduction. In addition, installation of an electronically-controlled fuel injection system and specially-designed transmission has dropped emission levels by 120 pounds of PM annually, for a total reduction in emissions of 87 percent.

The Transit Bus Life Cycle Cost and Year 2007 Emission Estimation report concluded that ULSD buses are still the most economical technology, followed by buses fueled by B20 biodiesel. Fuel economy rated best among the hybrid buses but overall costs were offset by battery replacement costs. As for GHG emissions, the hybrid buses also outperformed the other alternative fuels followed by B20 diesel, ULSD and then CNG. Considering the majority of the Park City Transit fleet is equipped with diesel engines, the most cost effective route would be to pursue ULSD or biodiesel options. However, Park City Transit should remain open to the ideas of alternative fuels as technology progresses and alternative fuel infrastructure is built.

In order to utilize the most appropriate technology for their services and to meet community goals, Park City Transit should undertake a more detailed and thorough study regarding alternative fuel options. This study should be regarded as more of a long-term plan to include implementation strategies for the fleet as the service evolves.

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Chapter 5

Institutional and Management Alternatives

This chapter focuses on the institutional framework for public transit services, administrative staffing, and marketing alternatives.

ESTABLISHMENT OF A TRANSIT DISTRICT

Transit services provided to Summit County by Park City are currently governed by an "Inter-local Transportation Agreement" executed on February 1st, 2006, and amended on December 15th, 2009. Under this agreement, the City provides transportation management and operations services to the County based upon a specific scope of work. The document also established the Joint Transit Advisory Board, with two representatives of each of the two governmental entities, and technical support provided by City staff.

Cost responsibilities are assigned to the County using a "Cost Allocation Model" (similar to the cost model shown in Table 3 of this document) based upon actual costs for the previous fiscal year. This cost model apportions to the County the following costs, based upon the proportion of total system-wide vehicle-miles, vehicle-hours and number of vehicles used in the County service:

- Driver salaries and benefits
- Supervisor's salaries and benefits
- Uniforms
- Drug testing
- Fuel
- Vehicle Maintenance
- Vehicle Insurance

Costs are also allocated for marketing, as well as for ongoing revenues into a fund for the 20 percent "local match" for vehicle replacement. In addition, under this agreement the County pays 24.88 percent of the overhead (fixed) costs associated with PCT. Also included are monthly payments reflecting the County's share of the improvements currently underway at the Ironhorse Transit Operations Center.

This agreement has served well in providing the financial and institutional framework for expansion of public transit into the Snyderville and Canyons portion of Summit County. In particular, it has avoided the need for duplicative administrative/management staff between both the City and the County. It also provides for more cost-efficient maintenance of transit vehicles, as specialized training and equipment can be used for both City and County vehicles.

An option to the current institutional framework would be the establishment of an independent transit district. Section 17B-2-203 of the Utah Code allows the formation of special districts for purposes of providing public transit service, and also sets forth requirements for such a district.

Among these requirements is that the number of board members must be an odd number, between 3 and 9. Board representation must be proportional to the amount of transit service provided in each jurisdiction. Under the current service plan, roughly two-thirds of annual vehicle-miles of service are operated within Park City limits, and the remaining one third in unincorporated Summit County. To be proportionate, it would be necessary to have a board of 3 members (2 from Park City, and 1 from the County) or 9 (6 from the City and 3 from the County). Growth in services in one jurisdiction or another would change the relative board

proportion. For instance, expansion in the County services could result in a 7 member board (4 City and 3 County).

At least for the foreseeable future, the County representatives would be a minority on a transit district board. City representatives could in theory make changes to services in the County areas over the wishes of the County. This could be seen as a loss of control from the current situation, whereby the County specifies routes and schedules in the County through contract. However, in practice transit board members tend to consider the best interests of the service as a whole, and to defer to the wishes of individuals representing areas most affected by specific service decisions.

An important factor in the issue of district formation is whether the institutional change would result in cost savings. Assuming no change in driver, maintenance or fuel costs, this typically focuses on whether administrative costs could be reduced. As the County does not have significant staff time assigned to transit issues (and County staff time would still be required to coordinate with the transit district), it is doubtful that any substantial reduction in County costs would accrue. Another potential for cost savings is associated with administrative charges (interdepartmental charges) imposed on the transit service by the Park City Municipal Corporation (PCMC). As shown in Table 3, this is currently $494,000 per year. This costs addresses some functions that otherwise would need to be either provided by additional transit district staff or through service contracts, such as accounting staff and legal services.

Another important factor is the impact on employee salaries and benefits of shifting from PCMC employment to employment with a separate special district. Some current benefit programs potentially might not be available to special district employees. Some employees may also see a detriment to losing the potential for future internal job changes within the PCMC. Current positions that are shared between transit functions and other municipal functions (such as parking) would need to be redefined to focus solely on transit. This could result in a net increase in the need for administrative personnel. While this additional cost could be a detriment, there may also be benefit associated with management that is devoted solely to transit matters.

Existing capital assets used for the transit program (facilities, vehicles, equipment) would need to be transferred to a new transit district, or other legal arrangements established. It is common upon the establishment of a transit district for these assets (and the existing federal share in the value) to be transferred. However, this is complicated in the case of PCT by the fact that the key facility asset (Ironhorse Transit Operations Facility) is used both for transit purposes as well as other PCMC functions, such as parking management. If the facility ownership is transferred to a new district, either the other PCMC functions would need to become a tenant, or other city office space would need to be found. This transfer may also change utility costs, as rates applied to a separate district may differ from those currently charged to PCMC.

Bifurcating transit functions from PCMC may complicate coordination between transit services and other municipal functions, such as snow removal, bicycle/pedestrian improvements, street and parking improvements, etc. Issues that are currently addressed within the municipal government, such as adjusting on-street parking to provide a bus pullout, would instead become a matter of discussion between two separate organizations. On the other hand, the fact that much of the future growth in the transit program will occur outside of City limits – and that coordination between PCT and the County on such matters appears to not be an issue – argues that this factor may not be a concern in Park City.

The impact on revenue sources is also a crucial consideration. While one factor is the potential for a larger organization to obtain a greater amount of Federal funding, PCT is already very effective in presenting the case to fund the region as a whole, and in gaining Federal funding. Existing funding provided to PCMC and to the County could also continue, as a direct "pass through" to the transit district.

In conclusion, the current institutional arrangement appears to be working well in supporting the current scope of the transit program. However, a "tipping point" may come in the future when the amount of transit service operated outside of the municipal boundaries exceeds that operated within Park City, at which point formation of a transit district should be given closer consideration.

ADDITIONAL ADMINISTRATIVE STAFF

To date, PCT has relied on a relatively "lean" administrative staff. Much of the lower-level administrative functions are provided on a part time basis by drivers. While this has the advantage of keeping costs down and allowing more full-time positions, growing demands on the system will necessitate an expanded staff more focused on administrative functions. In particular, the growth in technology will require additional staff resources to manage these systems and review data. Additional staff time is also warranted to expand marketing efforts, and to manage the growing transit fleet and APTS systems. Over the five-year SRTP period, the following new positions are warranted:

- **Data Analyst** – This position will be responsible for data collection and analysis including benchmarking, passenger counts, route and schedule efficiency, budget preparation and service billing. It would also be responsible for day-to-day management of the APTS system

- **Marketing Manager** – This position should be responsible for marketing functions, including interior advertising sales, schedule\route map production, brochures, and maintenance of Twitter/Facebook/web page. Much of the salary cost will be offset by eliminating third party contract for interior ad sales.

- **Equipment Coordinator** – This position will be responsible for coordinating equipment (bus and bus equipment) readiness. Works closely with fleet maintenance and bus operations staff to ensure transit equipment required to meet scheduling demands is available. Addresses the hardware aspects of the APTS/AVL technology.

TRANSIT GOALS AND OBJECTIVES

This section presents a number of potential goals, objectives, and performance standards for Summit County and Park City's public transit system. It is worth noting that many of these goals inherently conflict with each other, such as the goals of (1) providing a high level of service, and (2) minimize financial cost to the community. In such cases, local officials and residents need to make policy decisions to balance these conflicting goals.

Planning and Management Goal: To evaluate strategies that help management maximize productivity while meeting the transit needs of the community and to develop a transit program that takes into account land development in the service area. In addition, Summit County and Park City will strive to provide services to reduce the use of the private automobile and

maximize the use of alternative transportation modes (transit, bicycle, rideshare, etc.) within the respective service areas.

- Planning Standard – The Short-Range Transit Plan shall be updated at a minimum of every five years. This will be a joint effort between Summit County and Park City.

- Service Monitoring Standard – Monitoring reports on the effectiveness and efficiency of transit service will be collected and reviewed monthly.

- Land Use Planning Standard – Park City Transit staff will review development proposals within the service area with pertinent community development and public works departments to study the effects of development on transit service, and to ensure land development that is compatible with alternative transportation as identified in the Summit County and Park City General Plans.

Service Effectiveness Goal: To maximize the ridership potential of area transit services.

- Fixed-Route Effectiveness Standard – Maintain the following annual productivity levels by route:

  - Park City Local Regular Route Services – 24 one-way passenger-trips per vehicle service hour.

  - County Kimball Junction Routes – 20 one-way passenger-trips per vehicle service hour.

  - Other County Routes – 10 one-way passenger-trips per vehicle service hour.

  If route productivity figures fall below these standards, staff should conduct route segment analyses to determine what revisions (if any) could be implemented to boost ridership.

- Marketing Standard – Conduct marketing efforts to ensure that all service area residents are aware of area transit services. Conduct targeted marketing efforts for high-potential groups, including visitors, elderly, disabled, students, low-income, and transit-dependent residents.

Service Quality Goal: To provide safe, reliable, and convenient public transit services.

- On-Time Performance Standard – 95 percent of all fixed-route trips should be operated "on-time." On-time is defined as not early, and not more than five minutes late.

- Park City Mobility Denial Standard – No pattern of ADA-eligible trip denials (as defined in the Americans with Disabilities Act of 1990) due to capacity constraints. Passengers whose trip request resulted in a denial will be put on a "stand-by list" maintained by the scheduler; all attempts will be made to accommodate that trip should trip cancellations occur. Regardless of whether the trip can be accommodated, the scheduler will discuss the status of the standby request with the passenger at least two hours before the requested trip time. Call backs will occur only during normal office hours. If a denial can be accommodated within the two-hour window by adding capacity, operating staff should do so in the smallest increment possible (no more than a two hour block).

- Passenger Amenity Standard – Shelter should be considered at all bus stops serving 30 or more passenger boardings per day. Seating should be considered at all bus stops serving 15 or more passenger boardings per day. Benches and shelters will only be installed on existing UDOT, Park City or Summit County right-of-way, except where written confirmation from the property owner can be obtained to install a bench or shelter on private property. On

an annual basis, the Transit/Transportation Manager will identify potential sites and prepare an installation priority list.

After review of the priority list by other public works staff, the Transit/Transportation Manager will contact adjacent property owners by telephone (with follow-up correspondence) to notify them of intentions to install a passenger amenity. Adjacent property owners include all owners of parcels within a 50-foot radius of placement of the bus stop sign. If an adjacent property owner protests installation at the site, Park City Transit will not immediately install it until a protest proceeding is completed. However, if passenger boardings at that bus stop exceed 20 passengers per day for a bench or 60 passengers per day for a shelter, Park City Transit will begin proceedings to install the amenity while the protest is being processed.

The protest proceedings will begin with a written notice to adjacent property owners (return-receipt delivery) explaining Park City Transit's intent to install the passenger amenity, with a copy to either the City Manager or Summit County Manager (as appropriate). This notice will detail the action being taken, projected milestones, and protest procedures available to the complainant.

- Passenger Load Standard – For passenger safety and comfort, vehicles should be sized and the transit service operated to require standees on no more than 20 percent of the runs for any route, and to avoid any recurring loads of more than 150 percent of the seated capacity.

- Accident Standard – Maintain a minimum of 50,000 miles traveled between preventable collision accidents, and 25,000 miles between all types of non-collision preventable accidents (i.e., employee injuries).

- Maintenance Standard – Maintain a minimum of 20,000 miles between road calls. Road calls are defined as any time passenger service is interrupted more than five minutes due to a mechanical failure (except for flat tires).

- Vehicle Cleanliness Standard – The exterior of each vehicle used in service will be washed daily in winter, and as needed during the summer (consistent with the City Water Conservation Program). Vehicle interiors will be swept daily and detailed at least weekly. Vehicle detailing includes mopping the floor, washing the windows, and removing any minor stains that may have accumulated on the passenger seats. A vehicle that experiences a major stain will be removed from service as soon as possible and cleaned/repaired before re-entering service.

- Service Frequency Standard – Provide regularly-scheduled service with a maximum headway of 60 minutes. Specifically, Summit County and Park City will strive to attain the following service frequency standards (in minutes):

Service Corridor	***Winter***	***Non-Winter***
Prospector Square/Deer Valley	20	20
Park Meadows/Deer Valley	20	20
Thaynes Canyon/Deer Valley	20	20
Silver Lake/Empire Pass	30	30
Bonanza Express	20	N/A
Kimball Junction – Park City	20	30
Kimball Junction – Silver Summit	60	60
Kimball Junction – Pinebrook	30	30
The Canyons Route	20	20

- Service Area Standard – Maximize the area provided with transit service while maintaining minimum service efficiency standards. Summit County and Park City will strive to provide service within ¼ mile of all major employment, medical, shopping, and institutional centers, and of all residential areas with four or more dwellings per acre. Major employment centers are defined as an industrial or commercial zone that employs 200 or more non-agricultural, non-construction employees.

- Service Quality Standard – Increase service levels where warranted and financially feasible to maintain the existing service quality. Below is a summary of pertinent service quality objectives:

  Seasonal Visitor Services

  - Offer direct day-time bus service connecting major hotels and condominium centers with Park City, Deer Valley and Canyons ski areas without requiring a transfer between buses.

  - Offer direct evening bus service connecting major hotels and condominium centers with Old Town without requiring a transfer between buses.

  - Offer convenient bus links to restaurants and visitor attractions in Silver Lake and the Kimball area.

  - Increase the frequency of service to lodging establishments and ski areas on routes when extra "tripper" sections are called for on more than 65 percent of daily runs.

  - Offer direct "front door" service at major hotel complexes in the service area where feasible. Work with hotel owners and city/county transportation officials to develop convenient bus stops where "front door" service is not safe or practical.

  - Minimize delays during the winter season at the Old Town Transit Center for buses traveling between the Park City Mountain Resort, the Deer Valley Resort and The Canyons Resort.

  Tourism Promotion and Visitor Transportation

  - Increase the percentage of visitors who travel between the Salt Lake International Airport and Park City/Kimball Area without an automobile.

  - Develop a marketing program to enable travel agents to sell car-free visitor packages and to increase public awareness of car-free travel options to and within the study area.

  - Develop joint marketing agreements involving Park City Transit, private airport shuttle services and one or more Park City-based car rental agencies.

  - Add vehicle capacity to regular Park City and Kimball Area transit routes as needed to accommodate increased demand resulting from travel agency marketing and sales efforts.

Regional Employee Transportation

- Provide transportation services necessary to help provide an adequate supply of workers for area employers.

- Increase the supply of available parking for visitors by minimizing the use of local in-town parking spaces by employees.

- Insure that commuter services provide area workers with direct and convenient access to employment sites.

- Work with major employers to expand existing employee transportation programs.

- Develop subscription commuter bus programs for outlying communities if commitments are received from enough individuals to insure that revenues will cover at least 85 percent of direct operating expenses.

- Vehicle Accessibility Standard – Maintain a fully accessible transit fleet (as defined by the Americans with Disabilities Act of 1990).

- Vehicle Spare Ratio Standard – Maintain sufficient fleet spare ratios to ensure adequate capacity for regularly-scheduled and tripper services. At a minimum, a 20 percent spare ratio should be maintained for each type of vehicle in each respective service category.

- Cost and Revenue Standards – Limit operating cost increases for the visitor transit program to the rate of increase in transit-dedicated funding, including tax and license revenues, unless a significant shift occurs in the percentage of visitors who utilize the bus system.

- Fare Standard – Maintain free fixed-route service within the Park City and Snyderville Basin areas.

POTENTIAL ADDITIONAL INTER-REGIONAL AGREEMENTS

If the Park City transit program is expanded outside of the Park City/Snyderville Basin area, an agreement regarding funding and management of the expanded services would be required. In particular, service to Heber City in Wasatch County would require an intergovernmental agreement. Similar to the existing agreement regarding Snyderville Basin services, this agreement would need to define the scope of the services to be provided, a decision-making process, and a mechanism by which cost responsibilities would be allocated to the new jurisdiction(s).

A key issue with this option is the appropriate funding level. While it is relatively straightforward to calculate the marginal operating costs and subsidies associated with the expansion of service outside of the current limits, there are often long discussions held over the proportion of fixed costs (such as administrative salaries, maintenance facility costs, advertising costs and vehicle costs) that should be paid by the "contracting" jurisdiction. In the short-term, establishing the funding level based upon the marginal cost can ensure that the residents of Park City and the Snyderville Basin area do not subsidize outlying residents, while providing the benefits of an expanded regional transit system to all jurisdictions. However, in the long-term, the costs

associated with fixed transit items indicate that some proportion of fixed costs should be paid by the smaller jurisdictions.

An intergovernmental agreement has the following advantages:

- It is relatively easy to implement, as it does not require a public vote or establishment of a separate public entity.

- The "contracting" jurisdictions maintain strong control over the design of the service, through the contract.

- Service can be easily modified or terminated, which is particularly beneficial in the first few years of a new service.

Disadvantages of this alternative are as follows:

- The appropriate level of funding for capital and fixed costs is an ongoing issue.

- There is less certainty regarding the long-term permanence of the service. As a result, it is more difficult for Park City and Summit County to make long-term capital or staffing plans, and passengers are not as assured of the long-term availability of service.

ENCOURAGE DEVELOPMENT PATTERNS THAT INCREASE THE POTENTIAL FOR TRANSIT RIDERSHIP

Land use planning has a strong relationship to transportation demand and travel patterns. Land use decisions play an important role in determining the viability of public transportation and the feasibility of serving portions of the community. In recognition of this important relationship, local actions that may be further addressed to encourage transit use in the community are addressed below:

- PCT staff should review all proposed development projects and their subsequent effect on the existing public transportation system.

- Encourage in-fill and redevelopment by designating underdeveloped or declining neighborhoods for public investment.

- Promote mixed land-use in redevelopment areas.

- Adopt transit-oriented development design guidelines.

- Recognize transit-friendly planning and design by sponsoring an annual awards program.

- City ordinances should require that parking be provided at the rear or side of buildings, and that the front of the buildings should be oriented to the street to encourage walking and the use of public transportation.

- Provide comfortable transit facilities and make bus stops attractive through high-quality design and construction and by providing pedestrian amenities such as lighting, seating, and weather protection.

- Sidewalks and other paths to residential and commercial development should connect bus stops.

- Emphasize the provision of pedestrian facilities, as the majority of transit patrons are pedestrians before boarding and after alighting from the bus.

- Provide incentives such as density bonuses or reduced parking requirements for developers who design pedestrian-friendly projects.

- Incorporate pedestrian-friendly design guidelines in street design manuals for all new developments.

MARKETING ALTERNATIVES

Advanced Public Transportation Systems

A key focus of marketing over the coming few years should be in the integration of advanced public transit system technologies into the overall marketing program, including the following:

- Provision of real-time transit arrival/departure information on the web (including smartphones).

- Provision of arrival/departure information at transit centers and other key transit stops.

- Ongoing upkeep of the Google Transit program.

In particular, the provision of transit information by smartphone and other mobile internet devices is rapidly becoming the prevalent form of transit marketing among younger demographic groups.

Route and Schedule Information Changes

PCT currently distributes three schedule marketing pieces for the winter service, a “Transit System Guide” (which includes the color maps of the system), the “Park City Summit County Winter Transit Schedule” and the “Transit System Time Point Guide”. In summer, both a “Transit System Guide” and a “Summer Transit Timetable” is provided. To fully understand the transit system at present, a passenger (or potential passenger) must consult at least two of these pieces.

The Transit System Guide is a good marketing piece, and provides sufficient information to be solely relied on by passengers traveling within the higher frequency areas. (It also is useful to visitors in providing information on other community services.) For lower frequency areas where it is more important to know specific service times, however, the other pieces must also be referred to. While the Winter Transit Schedule and Summer Transit Timetable are reasonably understandable to the “layperson,” the winter Transit System Time Point Guide is confusing to most.

The need to consult a second piece could be reduced by including specific “minutes past the hour” scheduled times at one or two locations on each route as part of the Transit System Guide. For example, a box next to the Jeremy Ranch Park-n-Ride indicating “Service at 00 and 30 minutes past the hour” along with a box next to the Newpark transfer point indicating “Pinebrook Service at 15 and 45 minutes past the hour” would give passengers along the entire Pinebrook leg a good idea of when their specific stop is served. It is also recommended that the “Transit System Time Point Guide” be limited to in-house use only (it is useful in discussing service at specific stops, such as when meeting with lodging property representatives), but not be distributed to the public.

Promotion of Potential New Services

Provision of new services (such as commuter services) will trigger the need for focused marketing efforts, including the following:

- Presentations to major employers and to employee groups. New employee orientation meetings are particularly effective.

- Presentations to social services (such as at Senior Centers) and clubs (Lions, Kiwanis, American Legion, etc.), particularly in the outlying communities.

- Free ride coupons for the first few days of service, distributed through local papers.

- A ribbon-cutting event.

It is also useful to make presentations to Town Councils and other elected groups, as both a means of maintaining positive relations as well as leveraging free local media coverage.

Chapter 6

Potential Funding Sources

The crux of any issue regarding the provision of public service is the matter of funding. Provision of a sustainable, permanent funding source has proven to be the single greatest determinant in the success or failure of transit service. A wide number of potential transit funding sources are available. The following discussion provides an overview of these programs. This discussion will be developed in greater detail as analysis of operating and capital alternatives yield estimates of total future funding requirements.

FEDERAL TRANSIT FUNDING SOURCES

The federal government provides a number of grant programs that assist in transit operations. Key programs providing funding potentially available to the Park City/Summit County (either directly or through partnership with other areas) are presented below. It should be noted that the future of these funding programs and associated funding levels are very uncertain, given the present lack of progress on reauthorization of the federal surface transportation program (SAFETEA-LU).

FTA Section 5309 Bus and Bus Related Equipment and Facilities Program

This FTA program is available for a wide range of transit capital items in urbanized areas. Eligible expenses for which funding can be provided consists of the following:

- purchase of buses for replacement or fleet/service expansion
- bus maintenance and administrative facilities
- transfer facilities and park-and-ride stations
- bus malls, transportation centers and intermodal terminals
- bus rebuilds and bus preventive maintenance
- passenger amenities such as passenger shelters and bus stop signs
- other equipment such as mobile radio units, supervisory vehicles, fare boxes, computers and shop and garage equipment

A local match of 20 percent is typically required, though lower local match requirements pertain to certain projects required for ADA, bicycle, and air quality purposes. A total of $516.2M is allocated to this program for FY 2011 nationwide, including $11.4M in Utah.

A key factor in this funding program is that all funds in recent years have been allocated based on congressional “earmarks.” As such, the availability of funds for Park City and Summit County projects depends greatly on the willingness and ability of local legislators to “carry” the earmark request, and the overall political process of federal transportation funding decision making. While there are currently efforts underway to transform this program to a competitive grant process, it is uncertain how this issue will resolve. This picture is further complicated by the “continuing resolution” status of the federal surface transportation law as allocations in future years are uncertain.

FTA Section 5310 - Elderly and Persons with Disabilities Program

The FTA 5310 program, administered by UDOT, is largely used for purchase of vans for services benefiting the elderly or persons with disabilities. Until recently, recipients of Section 5310 funding were restricted to non-profit organizations; with passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) and subsequent Transportation Equity Act of the 21st Century (TEA-21), however, local governmental jurisdictions are also eligible for funding. This funding source requires a 20 percent local match for capital projects, and a 50 percent local match for operating assistance. In FTA Fiscal Year 2011, a total of $400,736 was apportioned to Utah.

FTA Section 5311 Non-Urbanized Area Formula Program

Federal transit funding for rural areas (areas with population less than 50,000) is currently provided through Section 5311. This program requires a 50 percent local match for operating expenses, and 20 percent for capital and administrative support. A total of $2.05M is available throughout Utah for FY 2010-11. While the number of recipients has been limited in the past (the Ute Nation, Cedar City, Cache County and Park City), this list can be expected to expand in the future, reducing funding available for PCT.

FTA Section 5316 Job Access and Reverse Commute Program (JARC)

The JARC program assists states and localities in developing new or expanded transportation services that connect welfare recipients and other low-income persons to jobs and other employment related services. The JARC grant program is intended to establish a coordinated regional approach to job access challenges. All projects funded under this program must be the result of a collaborative planning process that includes states and metropolitan planning organizations, transportation providers, agencies administering Temporary Assistance to Needy Families and Welfare to Work funds, human services agencies, public housing, child care organizations, employers, states, and affected communities and other stakeholders. The program is expected to leverage other funds that are eligible to be expended for transportation and encourage a coordinated approach to transportation services. Applicable projects are targeted at developing new or expanded mobility management transportation services such as shuttles, vanpools and new bus routes. A total of $68,530 is allocated in FY 2010-11 for Utah jurisdictions below 50,000 in population. This is a potential source of funding for new commute services to Kamas, Coalville or Heber City.

FTA Section 5317 New Freedom (NF)

The New Freedom (NF) or Section 5317 program was introduced in 2006 by SAFETEA-LU and was modeled after JARC (services that expand transit availability beyond that traditionally provided by public transit, at about half of the Section 5316 funding level). Both operating and capital programs are eligible as long as they support new or expanded travel options for persons with disabilities going beyond the Americans with Disabilities Act (ADA) mandate to complement fixed route bus coverage or provide new travel options beyond ADA. Only $31,448 in FY 2011-12 5317 funds are allocated for Utah jurisdictions below 50,000 population. Under the 5317 program, capital projects require a 20 percent local match and operating projects a 50 percent local match.

LOCAL TRANSIT FUNDING SOURCES

Sales Tax

The most common form of local dedicated revenues across the country is a sales and use tax. In Utah, the ability of local jurisdictions to impose a 0.30 cent sales tax to fund public transportation was granted in 1988 by Public Law 59-12-2213. A simple majority vote is required for passage. In addition, the law allows for the tax to be applied in a public transit district that bifurcates a county.

There are many benefits to a sales tax:

- It is a relatively stable source of funding, as it is imposed on a very broad tax base and is very responsive to inflation;
- It is simple to collect, as the mechanisms to collect the tax are already in place;
- It affects all portions of the local economy equally; and
- It provides a flexible source of funding that can be used for capital, maintenance or operating, and for highway, transit, or non-motorized transportation modes.

The local sales and use tax within Park City, specifically dedicated to transit, supplied approximately 40 percent of Park City Transit's operating funding in 2010, as well as local matching funds for FTA operating and capital grants.

The recently-enacted Utah Code 59-12-2214 allows local jurisdictions to levy an additional 0.25 cent sales tax for purposes of funding public transit. This is a potential funding opportunity to expand public transit services.

Main Street Marketing Funding

A recently-initiated program to enhance Main Street in Park City includes $40,000 for transit marketing, with a focus on services that benefit Old Town.

Transient Room Tax

Summit County currently collects a Transient Room Tax. While in the past approximately $40,000 was contributed annually to the Kimball Area Transportation Special Services District, at present no funds are allocated for transit services. Rather, they are being used for promotion and to boost tourism.

Transportation Impact Fees and Assessments

The ability of local governments to impose impact fees is set forth in the Impact Fee Act (Utah State Code Title 11, Chapter 26, Sections 1-5). Transit capital improvements can be funded through an impact fee, as transit programs can reduce the roadway improvements that would otherwise be needed to address the impacts of development. As with fees collected for other purposes, impact fees can only fund projects necessitated by future development (or the proportion of individual projects required by future development). Impact fees may be collected

for transit facility costs such as maintenance facilities, passenger facilities and bus stop improvements, but are not applicable to vehicle purchases.

Summit County's Ordinance 652 established a transportation impact fee program for the Western Snyderville Basin. This program includes impact fees for transit improvements, consisting of partial funding for the transit maintenance facility, a "Kimball Transit Hub" and bus shelters. In addition, ongoing assessments for operations are in place in the Kimball and Canyons areas. At present, Park City does not have a transportation impact fee program that provides funding for transit capital improvements. TIF revenues are a potential source for additional capital program funding, to the degree that the expenditures are eligible under the Impact Fee Act.

Instituting Fares

A discussion of potential transit funding sources must include a look at fares. As fares make transit funding more equitable (those who directly benefit from the service pay at least part of the costs), a fare system has the advantage of increasing the political acceptability of transit. At current ridership levels, it is estimated that a $1.00 base fare (with discounts for seniors, persons with disabilities, and youth, as well as for pass users) would generate on the order of $800,000 per year in additional revenues. However, there would be a number of disadvantages of imposing a fare:

- Ridership would be reduced by approximately 30 to 35 percent. The "hassle factor" of fishing out the fare or pass is particularly high for skiers or boarders. Other benefits to the community, such as reductions in traffic and parking demand, would in turn be negatively impacted.

- Loading time along the routes would be increased. While each passenger boarding would only add a few seconds of delay (particularly if electronic passes are implemented), when multiplied by the high number of boardings at peak times delays to individual runs would be substantial. As a result, the current 20-minute route running times of the Park City core routes could not be maintained, at least in winter. Extending running times (such as to 30 minutes) would either reduce ridership further, or incur additional operating costs to maintain current headways. This could offset any revenues collected by fares.

- Capital costs associated with fare collection and handling is very substantial. Fareboxes can cost several thousand dollars or more, depending on capabilities. Pass vending machines and coin/currency counters would also be required. Security equipment would be needed in the fare counting area, as well.

- Staff time would be required to count fares, make deposits, and maintain equipment.

Overall, implementing fares on the existing local services would be a detriment to the overall transit program, and to the region. It should be noted that numerous transit agencies combine services that require a fare with services that are free to the passenger.

Advertising

One modest but important source of funding for many transit services is on-vehicle advertising. The largest portion of this potential is for exterior advertising, rather than interior "bus card" advertising. The potential funds generated by advertising placed with the vehicles are comparatively low, currently totaling roughly $20,000 per year for PCT.