

SHUTTLE SYSTEM ANALYSIS AND RECOMMENDATIONS



Section Overview

This section of the report presents the analysis of the existing Zion Canyon shuttle (shuttle) system and recommendations. As Zion National Park's highly successful shuttle program nears its tenth year of operation, the system continues to operate very effectively. This analysis has helped to identify needs for potential adjustments to service and operations in order to "fine tune" the system, to help the park as it prepares to release the next service contract in 2010.

Objective of Analysis

In order to conduct an assessment of the shuttle operations, the team needed to first understand if there were any significant on-going issues with:

1. On-time performance
2. Peak period load and maximum loads
3. Stop-by-stop boarding activity and time of day loading.



Visitors boarding the park shuttle on a busy summer day

To gain an understanding of these aspects of the shuttle operation, the team conducted a full system ridecheck and timecheck during the first week of August, 2008.

The ridecheck and timecheck, and in-the-field analysis of the shuttle system operations enabled the team to:

- Gain an understanding of the operation of the shuttle and associated transportation system both inside the park and within Springdale;
- Clearly understand activity levels at each shuttle stop, as well as loading patterns and maximum load points during peak periods; and
- Confirm as much as possible, the differing needs and usage patterns related to the transportation system of those who live in the immediate area versus those who visit the area.

Analysis Approach

Prior to the data collection efforts in the field, the team verified available and outstanding data and compiled documents from the National Park Service. The team then performed field work (including the ridecheck/timecheck activities) on both the park and town loops to collect the data needed to determine stop activity by route, time of day and stop, plus load factors by route and trip and on-time performance. The team conducted a manual 100 percent boarding and alighting count and timecheck assessment on each bus during a two-day period in the peak season (August 7 and 8, 2008). The data collection was split over the two-day period, covering the morning trips on both shuttle routes (5:00 am to 2:00 pm) surveyed on Friday, August 7 and the afternoon

trips (2:00 pm to 10:30 pm) surveyed on Saturday, August 8. The two days were combined to create a sample full day.

Temporary staff was assigned to ride each trip of both routes. Surveyors noted passenger boardings and alightings at every stop and compared scheduled departure times with actual times. There were no anomalies reported by operating staff on either day, nor did field supervisors observe anything that would call into question the validity of the data.

All of the boarding/alighting data and timecheck data was entered into MS excel spreadsheets. Time of day and max load graphs, as well as stop-by-stop boarding charts and boardings maps, were created for both routes.¹

Tables 6-1 and 6-2 present the stop-by-stop

¹ The electronic files for all boarding/ridecheck/timecheck data have been provided to the contract operator.

shuttle boardings for the Canyon and Springdale. Figures 6-1 and 6-2 illustrate the Canyon and Springdale shuttle routes.

Observations and Findings

As a result of the ridecheck and field analysis the team offers the following observations and findings.

Canyon Route – The Canyon Route carried over 19,000 people and had a productivity rate of 114 passengers per hour. This rate surpasses most light rail lines in the US and is comparable to some of the nation’s highest ridership bus lines like San Francisco Muni’s 38-Geary. Productivity on a passengers per hour basis ranged from 8 (7:15 am trip) to 230 (1:42 pm trip). The most significant boarding activity for the day begins around 7:30 am (39 passengers/hour) and carries through until 8:45 pm (27 passengers/trip). The

Table 6-1. Canyon Shuttle Stop-by-Stop Boardings and Max Loads

Stop ID	Stop Name	Total Ons	% Riders Boarding	Average Max Load
Inbound (up-canyon)				
1	Visitor Center (Ons only)	5,468	28.2%	75
2	History Museum	629	3.2%	85
3	Canyon Junction	342	1.8%	86
4	Court of the Patriarchs	411	2.1%	85
5	Zion Lodge	1,183	6.1%	82
6	The Grotto	370	1.9%	81
7	Weeping Rock	784	4.1%	79
8	Big Bend	259	1.3%	76
9 and 10	Temple of Sinawava	4,692	24.2%	88
Outbound (down-canyon)				
11	Big Bend	376	1.9%	93
12	Weeping Rock	1,151	5.9%	100
13	The Grotto	773	4.0%	103
14	Zion Lodge	2,343	12.1%	109
15	Court of the Patriarchs	184	1.0%	107
16	Canyon Junction	56	0.3%	106
17	History Museum	336	1.7%	101
18	Visitor Center (Offs only)	0	0.0%	37
Total		19,357		



peak of daily activity actually occurs between 12:30 pm and 6:30 pm.

On a stop-by-stop basis the busiest stops were the Visitor Center and the Temple of Sinawava (between 4,500 and 5,500 boardings per stop). The two stops with the least activity were Canyon Junction and the Court of the Patriarchs, although both of those stops still had 300 to 400 boardings each.

Running time wasn't much of an issue. Even with the crush loads that typically hit the system in the peak of the afternoon, the drivers and supervisors were able to do a good job of maintaining round trip cycle times.

Springdale Route – This route carried almost 3,500 people and had a productivity rate of 72 passengers per hour. While this route had only two thirds of the productivity of the Canyon route, its 72 passengers per hour rate is still almost 50 percent better than the typical transit

route in dense urban areas like New York, Chicago and San Francisco.

Productivity on a passengers-per-hour basis ranged from a low of “0” (7:15 am trip) to 178 (5:10 pm trip). The busiest part of the day was between 2:15 pm and 7:30 pm.

On a stop-by-stop basis the busiest stops were the visitor center (1600+ boardings) and Zion Canyon Clothing (500+ boardings). The stop with the least amount of activity (less than 10 boardings) was the Silver Bear.

As with the Canyon route, running time problems weren't much of an issue on the Springdale route. Drivers and supervisors did an excellent job of maintaining headways even during the crush load period towards the end of the afternoon.

For the specific data spreadsheet from the Ridechecks, refer to Appendix B.

Table 6-2. Springdale Shuttle Stop-by-Stop Boardings and Max Loads

Stop ID	Stop Name	Total Ons	% Riders Boarding	Average Max Load
Outbound (out of park)				
1	Visitor Center	1,651	47.3%	46.5
2	Cliffrose/Café Soileil	28	0.8%	48.0
3	Flanigans	77	2.2%	33.5
4	Desert Pearl	19	0.5%	30.5
5	Pizza & Noodle	100	2.9%	25.0
6	Bit & Spur	11	0.3%	23.5
7	Driftwood	10	0.3%	19.5
8	Silver Bear	0	0.0%	19.5
9 and 10	Majestic View	145	4.2%	22.5
Inbound (to the park)				
11	Silver Bear	1	0.0%	22.5
12	Driftwood	144	4.1%	26.0
13	Zion Park Inn	202	5.8%	28.0
14	Zions Bank	261	7.5%	29.5
15	Desert Pearl/Post Office	270	7.7%	37.0
16	Zion Canyon Clothing	542	15.5%	48.0
17	Cliffrose/Café Soieil	31	0.9%	50.5
18	Visitor Center	0	0.0%	4.5
Total		3,492		



Figure 6-1. Canyon Shuttle Boardings Map



Figure 6-2. Springdale Shuttle Boarding Map

Recommendations

Day-to-Day Operations – This is one of the best run shuttle systems that the consultant team has ever observed. There is excellent coordination occurring between drivers, dispatchers and supervisors. The buses are well maintained (especially considering the age of the vehicles and the heavy loads). Everyone seems to have the attitude of “just get the job done... whatever it takes” and that’s a very rare attribute in the public transit business. There are no recommendations at this time regarding the day-to-day management or oversight of the system.

Service Adjustments – Both routes appear to be well utilized (in terms of passengers/hour) throughout the entire day. If some service reduction was needed to free up resources for other uses then the NPS could consider eliminating the first four morning trips on the Canyon Route (6:30 am to 7:15 am) plus the last four trips (9:00 pm to 10:30 pm). The impact on ridership would be minimal and perhaps, given the lack of alternative modes, there might even be no drop in ridership. This reduction in service on the Canyon Route would save about 10 service hours per day. Reductions, if desired, could also be made by eliminating the last three trips on the Springdale Route. These cuts would also have little to no impact on ridership, but would save only 1.5 service hours.



Shuttle stop signs should display the stop name and number.

However, ridership throughout the year on early morning and late day trips can vary greatly so this service reduction recommendation would need to be more fully evaluated.

Eliminating/Adding Bus Stops – Elimination of stops within the Canyon is not recommended. In fact, the NPS might want to consider adding a stop near the South Campground. Many people staying at the campground must walk about 1/3 mile to reach the visitor center to board a shuttle bus. Adding a stop will probably have little to no impact on the round trip cycle times. However, this may at times add more passengers to already gull vehicles departing the visitor center, so should be further evaluated. The NPS and Town of Springdale should consider eliminating the Silver Bear stop on the Springdale Route unless there’s a plan in the near term to add park and ride capacity near this location. Otherwise there’s nothing in the immediate vicinity that justifies the presence of a bus stop.

Reconfigure the Stop at the Zion Lodge – The current bus stop layout (and signage) at the lodge creates confusion for riders and contributes to longer than expected dwell times during the peak periods. The current layout forces bus drivers to swing the coaches a bit wider than expected in order to get the front door on the cab close to the curb. This leads to the trailer sitting at an angle that blocks the view of the cab unit as passengers approach the bus from the rear. When there’s a crowd waiting for the bus the passengers tend to move towards the visible unit (the trailer) as opposed to spreading themselves out between the two units and this leads to slower boarding times. It should be possible to reconfigure the bus bay layout and the adjacent signage in a manner that improves sightlines and makes it easier for people to see they can board two units instead of just one.

Better Signage at Stops – Given the nature of this system (very linear with a limited number of stops) it would be beneficial to everyone if it were signed and marketed more like a rail line. Each opposing pair of stops should have a distinctive name and number (e.g., Downtown Stop 5 on the stops near Zions Bank). The name and number should be clearly marked on the sign, and it should be a very visible

sign. In addition, each stop should have a map that clearly displays both shuttle routes AND the path that someone would take to transfer between the two routes.

Convert Flag Stops – The NPS should eliminate the idea of flag stops. All of the current flag stops had enough boarding activity to justify conversion to a regular stop (with the exception of Silver Bear). Each of these conversions should receive the signage noted above.

Relocate Downtown Stops - Ideally, bus stops in opposing directions of travel should be across the street from each other. Sometimes this isn't possible but as a practice this idea should be followed as often as possible. The NPS should consider moving the current Zions Bank stop a little closer to the Park, perhaps across the street from Zion Pizza & Noodle next to the Zion Park Motel. Refer to Section 4 for more discussion on this.

Shuttle Vehicle Rehabilitation/Replacement Recommendations – The Zion Canyon shuttle fleet is in its ninth year of operation. The vehicles have been well maintained and are in excellent condition. However, with ongoing operation and pressures on the system for increased service, the fleet will need to be replaced. Some of the considerations and questions that need to be addressed with vehicle options include the following:

- Should the system continue to use propane

engines even though propane is being phased out? Have there been any complaints about the propane exhaust levels? What about alternatives like electric or hybrid powered vehicles?

- How likely is it that medium duty buses can be rebuilt cost effectively, and provide another 7-10 years of service?
- What are the funding/financial possibilities related to fleet replacement?
- What about low-floor buses and trailers? Only the lead bus has a lift. Trailers are not ADA accessible. This impacts not just wheelchairs but the people with mobility impairments, older people, people with gear (hikers and climbers), and parents with strollers and little kids. Would going to low-floor buses require the park to install raised islands/loading platforms at some/all bus stops? (It appears so, but needs to be evaluated more closely.)
- If existing vehicles are rehabilitated, could the ceilings of the vehicles be retrofitted with linear windows for views upward in the canyon?
- Should the vehicles be equipped with a better air conditioning system?



The Zion Canyon shuttle fleet has been well maintained and is in excellent condition.

- Analysis of fleet replacement options should consider the scale of the vehicles in the park and context sensitive design, fuel/propulsion options, capacities, amenities for visitors, and other features (as discussed above).

Zion Vehicle Replacement Assumptions – The Zion NP shuttle fleet consists of:

- 30 – Model Year 2000 to 2002, 31-pax medium duty El Dorado Transmark Buses (propane)
- 20 – Model Year 2000 to 2002, 37-pax medium duty El Dorado Transmark Trailers

Medium duty buses and trailer have a life expectancy of 10 years. The average age of the fleet is eight years, and even though everything has been well maintained, it is unreasonable to expect that the buses will last more than another two to three years before they start experiencing some type of group wide critical failure. This is important because the buses are all the same age and the NPS runs the risk of losing a large number of vehicles at once should a critical system failure occur (e.g., wiring harnesses, transmissions, etc).

So This Raises an Important Question: Should the NPS try to immediately replace buses with an all new fleet or should it begin a fleet-wide rebuilding program which could extend the life



People boarding the shuttle in Springdale

expectancy by another six to seven years?

The purchase price for each power unit in 2000/2001 was \$200,000. The cost for each trailer was \$132,000. Assuming an annual inflation cost for each unit of three percent, the cost to replace the fleet in 2009 with similar Transmark units would be \$290,000 per power unit and \$175,000 per trailer. The actual cost is likely to be five percent higher if propane engines are used to power the new buses simply because it is almost impossible to find an engine manufacturer that is willing to build propane engines for medium size buses. Detroit Diesel, Caterpillar and Cummins have all indicated that they will most likely exit this market sometime next year. There might still be a few manufacturers building propane engines but it's unclear at this time whether they will be suitable for a medium duty bus. For example, Blue Bird Corporation unveiled a new full size school bus powered by a GM 8.1 Liter propane powered engine.²

Rebuild or Replace? There are advantages and disadvantages to both of these tracks. There are several scenarios under “Replace and Rebuild” that should be further analyzed and considered:

Option A - Rebuild/rehab the existing fleet using propane engines (either rebuilt engines or new engines)

Option B - Rebuild/rehab the existing fleet using some other type of engine

Option C - Replace existing/purchase new vehicles using propane engines

Option D - Replace existing/purchase new vehicles using some other type of engine

Option A - Rebuild/Rehab the Existing Fleet Using Propane Engines – this scenario is likely going to be the least expensive (at least in the near term) and easiest to implement. The existing fleet has been maintained in good condition and given the operating terrain and low average mileage/bus this fleet as a whole is an excellent candidate for a rebuild/rehab program.

At a minimum, each bus will likely need a **\$150,000 rebuild** that would include:

² http://www.cleanfuelusa.com/index.php?/cleanfuel/vehicle/blue_bird_propane_powered_vision

- New suspension
- New transmission
- Upgrade electrical
- New seats
- New floors
- New paint
- New engine (\$20,000 for new medium duty engine)

If the contractor decided to rebuild the existing propane engines (it has already rebuilt three of them) then the engine cost can probably be reduced to \$7,500, reducing the power unit total rebuild cost from \$150,000 to \$137,500.

At a minimum, each trailer will likely need a \$75,000 rebuild which would include:

- New suspension
- New seats
- New floors
- New paint
- Upgraded electrical

If we assume that the NPS buys new propane engines for each rebuilt bus, then the total estimated cost to rebuild all 30 power units (\$2008) would be $30 * \$150,000 = \4.5 million. If the contractor rebuilds the existing engines then the cost drops to $30 * \$137,500 = \4.1 million.

The cost to rebuild the trailers would be (\$2008) $20 * \$75,000 = \1.5 million.

The total fleet rebuild program using new engines would cost \$6 million.

Regardless of which way the NPS decides to go with the engines, it should assume that vehicle replacement would begin during Calendar Year 2009. Before a fleet-wide rebuild program is initiated, Nelson\Nygaard recommends that one power unit and trailer be sent to a rebuild facility like Complete Coachworks (www.completescoach.com) to determine if a fleet-wide rebuild program is really feasible. If it is, then the NPS should proceed with a program that rebuilds the entire fleet over a period of three years. Ten buses and seven trailers can be sent to



Zion National Park shuttle carrying kayaks

the rebuild facility each year during the offseason until the entire fleet is upgraded in three years.

Option B - Rebuild Existing Fleet With Some Other Type of Engine – If new propane engines are not available after next year, the NPS may have no option but to rebuild the existing engines. Or...it could elect to “repower” the buses using standard diesel powered medium duty engines in place of the propane engines. Diesel fuel, though not cheap, is certainly plentiful and unlike propane engines, there will be no shortage of medium duty diesel engines on the market for the next decade. The emissions from current generation diesel engines are almost as low as what we would expect from propane and CNG engines. In addition, the noise profile from a new diesel engine is about the same or in some cases quieter than current generation propane and CNG engines. New diesel engines will likely cost about 10 percent less than a comparable propane engine.

For programming purposes this analysis assumes \$150,000/bus and \$75,000/trailer for a full rehab including new propane engines. We are also assuming that the entire fleet would be rehabilitated within two to three years.

Option C - Replace Existing/Purchase New Vehicles with Propane Engines – or

Option D -Replace Existing/Purchase New Vehicles Using Some Other Type of Engine – If, for whatever reason, the NPS decides to replace the existing buses and trailers with new buses then it will need to work through a much more detailed and complicated decision process that answers the following questions:

- What type of fuel should be used to power the vehicles? Propane, diesel, natural gas or gasoline? Should foregoing internal combustion engines be considered and instead purchasing a fleet of battery powered buses? What about delaying the decision five to seven years until fuel cells become at least a remote possibility?
- Should the NPS/park buy more medium duty 30' buses with trailer or standard 60' articulated buses? What about using 40' double-decker buses? What about going to smaller 20-25' buses and simply increasing the service frequency to every two minutes all day?³
- What kinds of amenities should be included on the next generation of vehicles? Air conditioning? High-back seats? Video screens?

³ The existing system has a tremendous amount of capacity that has to be replaced. The Zion Canyon shuttle route uses buses with trailers. The capacity per combined "unit" is 68 seated and just over 100 if you include standees. The Springdale shuttle route uses only buses and thus the capacity per unit is 31 seated and 51 with standees.



The current shuttle fleet consists of El Dorado Transmark buses and trailers.

No matter what it decides, if the NPS chooses to follow a path of vehicle replacement instead of rebuilding then it can almost certainly expect to spend significantly more money than it would on a rebuild program. For example, if the NPS contracts with El Dorado to build a second generation of For Transmark buses and trailers equipped with propane engines (if they are available), the NPS/park can expect to spend at least \$8.7 million for buses (30 * \$290,000) and \$3.5 million for trailers (20 * \$175,000) for a total fleet replacement cost of (\$2008) \$12.2 million. This is slightly more than double the cost of the rebuild program. A 60' articulated bus would have less capacity than one of the current bus/trailer combined units and it would cost at least \$600,000/bus. That is about 30 percent more than the cost to replace the current bus/trailer combined units. A double decker bus would provide about the same capacity as one of the current bus/trailer combined units but the cost per bus is almost \$900,000.

Replacement Options

The current Zion National Park Shuttle fleet consists of propane-fueled El Dorado Transmark buses and trailers. A bus-trailer unit operating inside the park can carry over 120 passengers, which during some peak periods is just barely enough to keep up with the loads on three to six minute headways. Outside the park the single unit buses can carry 50 to 55 people.

Given that the buses are near the end of their useful life and will either need to be rehabilitated or replaced, and given that propane engines most likely will not be an option on new buses, the Zion National Park may wish to consider the following options for new vehicles.

The most important factors in selecting new vehicles will be:

- Vehicle size and passenger capacity
- Fuel type and availability
- Environmental sensitivity
- Unit costs

Medium Duty Buses Similar to Existing Fleet

The shuttle bus information gathered by NPS staff at the recent APTA Expo was primarily

for small shuttle buses. While these might be desirable in terms of their limited “visual impact” in Zion Park, they might not be viable choices in terms of passenger capacity unless they can be mated with trailers, just like the existing fleet. If trailers are not used, then service frequency will need to be increased in order to accommodate peak season crush loads. This in turn would significantly increase operating costs. For that reason, the following buses would not be recommended unless they were mated with trailers:

- El Dorado/National⁴ – TransElite (room for 55 seated/standing combined)
- El Dorado/National - EZ Rider (room for 40 seated/standing combined)

⁴ Source: www.enconline.com

- El Dorado//National - Passport (room for 35 seated/standing combined)

On the other hand, if it would be possible to purchase new buses with propane engines it will almost certainly be limited to light and medium duty buses. There are no viable options for propane engines in the heavy duty bus market.

Approximate cost for each vehicle ranges from \$190,000 to \$300,000. Trailers will cost up to \$175,000 per unit.

Larger Buses

- Eco-Saver IV Hybrid Electric – Design Line⁵

These diesel-electric hybrid vehicles utilize a

⁵ Source: www.designlineinternational.com



Design Line



North American Bus Industries



New Flyer

start-of-the-art micro-turbine system. They come in 35' and 42' lengths. The 42' bus can hold up to 60 passengers. However, these buses are not designed to pull trailers and thus service frequency would have to be increased to accommodate peak loads (i.e., Zion National Park would need a larger fleet). The cost for these buses is expected to run in the \$650,000 to \$750,000 range per unit.

- 60' Hybrid Articulated Bus – NABI & New Flyer⁶

Transit fleets throughout the country with high

6 Sources: www.nabiusa.com and www.newflyer.com



Transteq Ecomark

ridership routes are investing in 60' articulated hybrid buses, which produce 90% fewer emissions than current 60' diesel buses and which have the ability to carry more than 100 passengers. These low-floor buses are easily accessible for passengers with disabilities, have multiple doors for boarding and alighting, and are becoming increasingly popular as a way to address heavy passenger loads. The cost for a diesel-electric 60' hybrid electric ranges from \$850,000 to \$1,000,000.

- 45' CNG/Electric – Transteq Ecomark⁷

In, 1999 Transteq and Denver RTD developed a new type of bus to operate on the high frequency and high ridership downtown Denver Pedestrian Corridor. This bus is 45' long, with multiple doors and no seats. Each bus is capable of accommodating up to 120 passengers. The buses are powered by CNG generators which provide power electric motors at each wheel. The buses cost \$500,000 each when they went into service in 2000. Nelson\Nygaard has been unable to obtain a current cost estimate.

- Wide Buses – COBUS 3000⁸

The COBUS 3000 is a 45' bus that can carry over 100 people as a result of the wide body and limited seating. The buses can be powered with diesel or CNG engines. The bus is 118" wide, roughly 24" more than a standard 40' heavy-duty transit bus. It is marketed primarily towards airport and ski resorts where fitting within the geometry of an existing roadway is not so much of an issue. The bus can safely operate within a 12' lane, but it's unclear at this time if the width can be accommodated during turning movements at the Lodge, The Temple and the Visitor Center. Nelson\Nygaard was unable to obtain current cost information but believes the current unit cost is in the range of \$650,000 to \$750,000.

Summary/Recommendation: Clearly there are some alternative buses that could work in the Zion National Park operating environment and that might lend themselves to maintaining and supporting a positive image to passengers and non-riders. However, given the respective unit

⁷ Source: www.transteq.com

⁸ Source: www.cobus.com

cost for each type of vehicle, and the park's desire to retain propane fuel engines for the foreseeable future, Nelson\Nygaard believes that the best course of action will be to rehabilitate the existing buses and trailers and rebuild the existing propane engines. A new, larger bus, with the capacity to replace a bus/trailer unit in the park, will cost at least \$650,000 per unit. Replacing the fleet with new medium duty buses mated to trailers will cost \$475,000. The cost to rehabilitate each of the existing bus/trailer units should not exceed \$225,000 per mated pair. The entire fleet can likely be rebuilt within two to three years during the off-season periods.

It should be noted that many of the newer buses and shuttle vehicles available on the market are larger sized vehicles with modern designs that do not necessarily fit the park context. The bus and shuttle vehicle market is more geared toward the demand in urban areas/settings, and the vehicle sizes and designs available are more suited to that context. The current shuttle vehicles and trailer buses were custom built and are of a size, scale, and character that fit well to the park's setting. It would be challenging to find new vehicles that fit the park context as well as the custom built vehicles currently operating at Zion National Park.

The park should also consider purchasing any new propane engines it can find that match the make and model of the existing engines so that it can have a stockpile in case of short term emergencies following the completion of the engine rebuild program.

Expanding Bicycle Capacity on Shuttles

If shuttle vehicles could carry more bicycles, this might encourage more bicycle transportation between stops in the canyon and in Springdale. This in turn may help to alleviate some congestion on the shuttle during peak periods. It may also help to reduce general traffic congestion on the road, as well as congestion in parking areas and at the park entrance gate. There are a variety of equipment options for expanding bicycle capacity, which can either be retrofitted to existing vehicles, or ordered as part of the package with new vehicles. Nelson\Nygaard has prepared a detailed

technical memorandum of bicycle carrying options for the Zion Canyon shuttle system, which is included as an appendix to this report.

During the peak season there is often not enough bicycle capacity on the Zion Canyon shuttle buses. This may discourage some people from using their bicycles. The following options for expanding bicycle carry capacity should be further reviewed and considered.

- Option 1 - Switch the two slot front mounted bike racks on all buses to three slot racks. This increases capacity by 50% at a cost of \$1,500 per bus (not an option for trailers). Total cost is \$45,000.
- Option 2 - Instead of, or in addition to Option 1, implement a Bus/Bike Shuttle Program. Three buses, pulling 20 slot bicycle trailers instead of passenger trailers, could be used to provide "bike service" every 30 minutes. The total cost for three trailers would be between \$10,000 and \$20,000. The net change in operating costs might be negligible if the bus/bike shuttles can be incorporated in the existing schedule and thus replace three bus/passenger trailer combinations. Additional capacity analysis is needed.



Bicycles parked near park interpretive display

It should be noted that the park could take an incremental approach to adding bike capacity – starting with Option 1 above, and then shifting to Option 2 in the future, which could coincide with any development of multi-use paths (Parus Trail extension) that may occur in the

canyon. With implementation of Option 2, a bike trailer would replace the passenger trailer on three vehicles as suggested. This would require some shifting of scheduling and service planning to ensure that adequate service would still be available for passengers in the canyon.



PARK ENTRANCE AREA CONGESTION ANALYSIS AND RECOMMENDATIONS



Section Overview

Analysis related to existing traffic congestion at the south park entrance area is presented in this section. Recommendations for reducing congestion and visitor confusion in this area are presented in this section as well.

Objective of Analysis

On busy days at the park, visitors are being turned back from entering the park via vehicle and directed to nearby parking areas in Springdale. This is causing congestion and back up at the gate and in the upper area of Springdale (to Lion Boulevard on some peak days), as well as a multitude of issues and problems as described below. The technical analysis has evaluated these issues and problems in detail. Potential solutions and strategies to address these issues were identified.

At certain times of the day on peak visitation days, visitors who are trying to drive through the park or trying to reach the visitor center can get caught in a traffic queue at the South Gate. Sometimes this queue can stretch for as much as one half mile to Lion Boulevard in Springdale. This queue of idling vehicles:

- Causes driver frustration;
- Contributes to unnecessary emissions of Green House Gases (GHG); and
- Impacts the operation of the Springdale Shuttle (buses must navigate the queue to reach the transfer station at the visitor center).

The objective of this analysis was to collect information from automobile drivers caught in the queue to see if there were any options



Visitors being directed to park on Lion Boulevard by a park ranger



Traffic waiting to enter the South Gate; pedestrians can get there faster

for shortening or eliminating the queue. This enabled the team to gain a better understanding of the specific activities contributing to congestion and the possible range of solutions.

Analysis Approach

Originally, a more formal field survey process had been envisioned to evaluate conditions at the gate, with surveyors located near the gate to record license plate numbers (thus assessing queuing time) and to ask drivers a few questions about whether they were staying in the area or simply passing through on a day trip.¹ However, while in the field for the data collection activities, principal consultant team members had another chance to observe vehicle queuing activities at the South Gate.

Based on this new observation it was

¹ Technical Memorandum – OTAK/NN to Park Service dated, June 26, 2008

determined that the proposed turnback analysis scope of work would not work as planned because the vehicle queuing activities were significantly different than previously expected. Instead, a less formal approach to the technical analysis was conducted. One of the consultant team principals (Paul Jewel) spent one hour on Thursday, August 7 and one hour on Friday, August 8 standing with NPS fee collection personnel at the queue observing vehicle delays and NPS staff interactions with auto drivers. This revised approach was more than sufficient for gathering relevant information about queuing activities and issues.

Observations and Findings

As stated above, the congestion at the park entrance area is causing considerable confusion, which affects visitor experience. Although some visitors are allowed to pass through the South Gate because they will be visiting other areas of the park and not the Upper Canyon, many visitors are seeking entry to the Upper Canyon, which is closed to motor vehicle traffic during the peak season. Visitors are confused about where to park in town and how to use the shuttle system.

Management of congestion at the gate requires a significant amount of park staff time. Park rangers have to stand in the road to redirect queuing motorists. Motorists then have to leave the line and park in nearby areas. This causes a lot of confusion and congestion in the vicinity of the park gate and upper Springdale. It also increases the amount of vehicles clustered in the



Pedestrians who've parked at Lion Boulevard need safe crossing facilities (striped crosswalk) to access shuttle stop



Sandwich board sign - RV trying to turn around

vicinity of the South Gate. Visitors entering the park are surrounded by a sea of parked vehicles on all sides near the entrance area, which may negatively affect the sense of arrival to Zion National Park for some.

Several conditions became obvious during the observations in the field:

Language Barriers - Not surprisingly, language barriers frequently impacted the exchange of information between NPS staff and drivers. For example, NPS staff would often ask drivers if they were going “through the park?” Most drivers who were not fluent in English often answered yes to this question. The NPS rangers would then wave them through to the gate. When they reached the gate the next ranger was often able to gain a better understanding of the trip purpose (e.g., going to the park/canyon rather than *through* the park). Because cars are not allowed to stop in the park without a lodge or campground reservation, the drivers are turned back at the gate. Many of these drivers then came back towards the theater parking lot to try and find parking to catch the shuttle, but often couldn’t find spaces there so became confused about where they should park. The communication problems resulted in unnecessary vehicle and turning movements and additional traffic at the gate.

Requests for Other Information - Interaction time between NPS rangers and drivers varied from as little as a few seconds to as much as a few minutes. Obviously, part of the job description for rangers involves giving

information and interacting with visitors, but the primary job of the ranger in this instance is traffic control in the queue and directing people to the parking areas/shuttle stops. Time spent answering other questions results in a longer queue. In addition, it was not unusual for vehicles traveling in the opposite direction to stop in the middle of the road to ask the ranger a question and this resulted in traffic being stopped in both directions.

Also, it should be noted that these activities require significant park staff/ranger time that would be reallocated to other duties, such as visitor interpretation, if the problem were solved.

Insufficient Signage for On-Street Parking – When the queue first starts, rangers tell people to “park along the curb.” Many drivers were completely unclear about what “park along the curb” meant. There was/is insufficient signage along the curb and without other parked cars along the curb to use as a guide; drivers would slowly inch forward until the ranger was able to convey the idea to park along the curb. Again, the inability to communicate because of language barriers and, in this case, the lack of adequate signage, resulted in confusion for drivers and additional queuing. Once there were enough cars were parked along the curb it became easier for the ranger to convey the message to “park behind that car.”

Insufficient Signage for the Shuttle – Another case of inadequate signage that leads to driver



Parking along the curb near the South Gate

confusion and impacts traffic operations is linked to the shuttle. People driving through the queuing area, regardless of whether or not there is an actual queue, can't see the visitor center or the shuttle stop. They have no point of reference related to where to go. Many can't even see where to go once they get out of the car and are standing along the curb on Zion Park Boulevard. Additionally, the means of pedestrian access is not clean, and the steep grade between the road and the lower area is not accessible or navigable for some visitors. Visitors are often confused about where to go to catch the park shuttle. Some see the town shuttle stop (which is more clearly visible) and think this is where they should wait. It is a fairly long walk from the road in this vicinity to the visitor center plaza where visitors must go to board the park shuttle. Drivers and pedestrians need to be able to quickly understand how to get to the visitor center or the shuttle stop.

Many Springdale Hotel Guests are Driving to the Visitor Center – The team did not conduct an actual survey of drivers but, based on direct observations and discussions with NPS staff, it quickly became clear that a significant number of the cars (perhaps as many as one third) passing through the queue area were filled with people who were spending the night in Springdale and were simply driving “someplace” to try and reach Zion Canyon. Some of these people were trying to reach the shuttle station at the visitor center and some were actually trying to drive through the canyon. An argument can be made that all of these people should have been on the Springdale shuttle bus, and it's unclear at this time why this isn't happening.

Bus Operations at the Queue – NPS staff commented that most of the time, if a Springdale bus gets caught in the queue, then the ranger will simply start waving all of the cars through until the bus reaches the theater driveway. This helps the buses, but it also defeats the purpose of putting a ranger in the queue in the first place. On one occasion, as many as 12 cars were waved through by NPS staff. Many of these drivers moved forward 100 to 200 feet and stopped in the road to try and figure out where to go and what to do. “Flushing out the queue” helped the shuttle bus but aggravated traffic conditions in

the queue. On other occasions, Springdale buses were getting caught in the queue for as long as two minutes while waiting for vehicles to clear the area.

Recommendations

Team members found NPS staff assigned to the queue to be very helpful and patient with visitors to the park, even when it was clear there was a significant language barrier. Having said that, it's clear that there must be a better way to handle this queuing situation, because:

- It's dangerous to have rangers standing in the middle of the road,
- This isn't the highest and best use of ranger time and effort,
- Conditions are negatively affecting visitors experience, and
- The current approach to addressing the queuing issue is only partially effective.

For those reasons, it is recommended that the NPS consider the following potential strategies and solutions. (These recommendations can each be implemented separately or combined into packages of improvements.)

Develop a Multi-Language Flash Card – A basic front/back multi-language flash card for interacting with drivers who aren't fluent in English, with large print, and perhaps with graphics or pictures, could be used to determine exactly where drivers are planning to go – thus eliminating much of the guess work. Drivers who are actually going *through* the park can be sent to the gate. Those going *to the canyon* can be given a multi-language flyer showing where to park and where to find the park shuttle.

Use a Flagger – During the first 30 minutes of queuing activity it's often difficult for drivers to understand exactly where to park along the curb. NPS could consider adding a second ranger to the queuing area during this period. This second ranger would be equipped with a flag. The ranger in the queue would tell the driver to go the flagger and the flagger would show the person exactly where to park.

Improve Signage – NPS should consider adding/



improving signage along Zion Park Boulevard near the theater to give people a better sense of where to park and how to easily find the VC/shuttle. In fact, NPS should consider redesigning the entire pedestrian experience in this area to improve wayfinding and accessibility.

Create a “Bus Only” Lane – NPS and the city should consider removing approximately 13 parking spaces² along Zion Park Boulevard immediately south of the southern entrance to the Giant Screen Theater Parking Lot and replacing them with a curbside bus only lane. This lane would allow buses to simply bypass the automobile queue at least 75 percent, if not 100 percent, of the time. Losing 13 spaces is probably not a big issue given that many of the cars using these spaces are most likely people staying in Springdale who are trying to reach the shuttle or the visitor center. It’s possible that the center bi-directional turn lane along this stretch of road might have to be moved over two feet to ensure that there’s enough room curbside for buses, especially as they make their turns into the theater driveway. It does appear that there is significant roadway width to accommodate this lane shift.

Another concern in this general vicinity that should be noted just south of the South Gate, is the appearance of the area and the experience visitors are having as they enter Zion National Park. The area is severely congested with cars during peak visitation, as a result of cars filling the parking areas there and being parked along both sides of the street. As visitors approach the park gate, they are surrounded by cars. When visitors try to access the park’s entry monument for group and family photos they are surrounded by cars. They have to watch closely for cars going in and out of driveways. This entry area has become a very “urban” experience for visitors seeking the tranquility and natural splendor of Zion National Park. As strategies are considered for reducing congestion in this area and resolving parking issues, the park should consider reducing the amount of cars and vehicular pressure in this vicinity. Eliminating roadside parking here would help.

² The southern part of the lane would end just before the first commercial driveway along the same side of the street.

Improve Shuttle Visibility Within Springdale

– The Springdale shuttle system is an excellent operation and already transports nearly 3,500 passengers on busy weekend days.³ However, people are still driving from their hotels to the visitor center or the gate in an effort to reach Zion Canyon. The correct answer to address these problems may reveal itself over time through a series of outreach measures and signage demonstration projects. More outreach to business owners may help to ensure that fewer overnight guests get in their cars to see the canyon.

Evaluate the Potential for Alternate Ticketing

– Alternate ticketing (entrance fee collection) methods as a longer term strategy for reducing congestion at the gate should be considered. This would involve transferring NPS staff time spent collecting entrance fees to more important assignments, such as visitor orientation, education, and management, resource protection, and interpretation. Examples could include selling park passes at hotels and restaurants in Springdale that visitors carry with them as they board the shuttle in town. This may also help to reinforce the option of taking the shuttle to the park rather than driving.

Address Gate Congestion - Strategies related to maximizing the use of parking and shuttle service in Springdale discussed above also factor into addressing the problem with congestion at the gate (e.g., clarifying parking locations and availability and encouraging more parking down canyon).

Is Additional Parking Capacity Needed? As the parking utilization analysis shows (Section 3 of this report), there is more than sufficient existing parking capacity in Springdale to serve Park visitors. Although increasing frustrations with traffic congestion in Springdale seem to point toward the need to create additional parking capacity (through capital improvements), this could be a reactive and expensive solution.

Several suggested locations for new parking areas were offered during this process – including areas in the park (such as adjacent to the bus operations center and visitor center) and areas in Springdale (such as an area off of Lion

³ Nelson\Nygaard ridecheck

Boulevard and vacant pasture lands). A capital parking improvement project of this magnitude would be costly and would require analysis of potential environmental impacts that might be challenging to mitigate.

As the analysis in Section 3 shows, there is more than sufficient untapped parking capacity within the town of Springdale. Adding capacity near the Bus Operations Center would mean that more vehicles would actually be entering the gate and more passengers would be loading at the visitor center shuttle during the peak periods. This seems counter-productive to the goals and objectives of the park that have been confirmed in this study process. One of the indirect goals of this project is to reduce vehicle trips and encourage shuttle ridership to maximize efficiency of the system. Adding parking capacity, especially if it isn't really needed,

would increase vehicle trips and only encourage more trips through the gate.

Zion National Park has identified an opportunity to develop more parking inside the park, near the Visitor Center. A new parking area that could accommodate approximately 200 cars could be constructed there. The park sees this as a good opportunity to reduce traffic congestion and parking pressures in the north end of Springdale and also to resolve some of the issues occurring at the south entrance gate. Assembling funding, going through environmental approvals, design, and construction for this parking area will take time. In the interim the park and town will need to move forward with a variety of measures to help address the congestion and parking issues. Refer to Sections 2 and 3 for specific recommendations.



PARTNERSHIPS AND STEWARDSHIP; REGIONAL TRANSPORTATION SYSTEM CONNECTIVITY



Section Overview

This section of the report reinforces the importance of and need for ongoing partnerships for the long term stewardship and sustainability of the Zion Canyon transportation system. Potential opportunities to strengthen regional transportation coordination and to work towards a connected regional transportation network are also addressed.

Objective of Analysis

The objective of this element of the technical analysis was to identify the partners and stakeholders involved in the Zion Canyon transportation system and each of their roles and responsibilities as the shuttle and related facilities move into the second decade of operation. It is anticipated that the key partners will continue to work closely together in long range transportation planning efforts for the region in order to build consistency and cohesiveness between efforts and identify joint funding opportunities.

Another objective of this analysis has been to coordinate with local and regional transportation interests to explore long range opportunities for better transit connectivity between Springdale and regional portals to serve needs of visitors and employees. The work has identified existing public and semi-private transportation systems (to the extent that these exist) to provide transportation between Springdale/Zion National Park and other cities, towns, and airports within Washington County and the surrounding region. Local and regional transportation interests were contacted to learn if any such plans were in place and to gauge interest in the potential of more regional transit connectivity.

Another related objective has been to discern

the long range potential for visitors to enjoy a completely car-free experience in their visit to Zion National Park. We've attempted to determine if there are existing or planned opportunities for visitors to be able to fly to Las Vegas or St. George and travel to Springdale via public transportation or modestly-priced private transportation.

Analysis Approach

To assess partnership and stewardship roles and responsibilities, a workshop session was held at the park in November 2008 to identify all existing and potential partners in the Zion Canyon transportation system and to begin to clarify their roles and responsibilities related to the system and its facilities.

In addition, during the course of the technical analysis for this project, the consultant team gathered regional transportation information, studies, and plans and conducted interviews and



*Partners Roles and Responsibilities Exercise,
November 19, 2008 Workshop*

research with regional transportation contacts (Washington County, MPO, Transit Agencies, St. George Airport, Dixie State College, Tour Companies, UDOT, etc.) to confirm current plans and projects underway and better understand their existing and potential relationship to the Zion Canyon transportation system. Team members also coordinated with the Dixie Metropolitan Planning Organization and the Five County Association of Governments in addition to speaking with transportation planning professionals in the region, who provided insight to future transportation plans within most of Washington County. We also reviewed planning documents for the new St. George airport, currently in the construction phase, along with reviewing the long and short term project lists identified by Utah Department of Transportation for Washington County.

Team members researched private and public options for transit/transportation for reaching Springdale/Zion National Park from McCarran International Airport in Las Vegas and the St. George airport without renting a car (no public transportation options currently exist).

Observations and Findings

The following observations and findings have been compiled for this section.

The Need for Strong Partnerships

Strong ongoing partnerships will be critical for continued successful operation of the Zion



*Partners and Stakeholders Workshop,
November 19, 2008*

Canyon transportation system. In the financial analysis summarized in Section 9, it is projected that the shuttle system will reach a point where annual operating and maintenance costs exceed revenues within the next few years. There will also be upcoming costs associated with vehicle replacement, signing and wayfinding needs, streetscape maintenance and pedestrian and bicycle improvements. Aside from funding needs, which partners can work together to resolve, there are ongoing responsibilities related to maintenance and operations, as well as planning for future programs and projects that will require a well-coordinated effort.

Partners – Existing and Potential

Representatives from the National Park Service, town of Springdale, UDOT, Visitors Bureau, and other agencies and organizations participated in a workshop session on November 19, 2008. One of the objectives of the session was to list all existing and potential partners related to the Zion Canyon transportation system. The following partners were listed by the meeting participants.

- National Park Service
- Town Government of Springdale
- UDOT
- Visitors Bureau
- Businesses in Springdale/Chamber of Commerce
- General Community of Springdale
- Washington County
- Five Counties Association of Government
- Zion Canyon Corridor Council (ZC3)
- Southern Utah University (SUU - Regional Services)
- Rural Planning Organization (RPO)
- Zion Natural History Association/Volunteer Program (ZNHA)
- Down Canyon and East Side of Park Communities (Regional Communities) – Governments and Chambers of Commerce
 - Rockville
 - Virgin

- La Verkin
- Hurricane
- St. George
- Toquerville
- Regional Transportation Interests:
 - Dixie Metropolitan Planning Organization
 - Transit Agencies (Sun Tran)
 - St. George Airport
 - Dixie State College
 - Tour Companies

routes serving the St. George vicinity. There currently are no plans for developing a public transportation system beyond St. George and Hurricane into Virgin, Rockville, and Springdale.



SunTran van rendering

Partner Roles and Responsibilities

After listing existing and potential partners, the workshop session participants were asked to share their perspectives on the primary roles and responsibilities of the key partners listed. The results of this exercise are summarized in Table 8-1.

Other Roles/Responsibilities Mentioned:

ZNHA – conduit to potential funding

RPO – conduit to potential funding

Dixie MPO – reviews transportation grant applications, regional transportation coordination, advocacy for bicycle and pedestrian needs, and down canyon messaging/communications

Regional Transportation System Planning and Connectivity Opportunities

The following information about regional transportation was gathered through phone calls to various transportation interests throughout the region and research over the Internet. Area transit programs, private shuttle services, and planned projects and initiatives are highlighted.

- **Regional Public Transportation** – Currently there is no regional public transportation system that serves Washington County and the surrounding areas. St. George has a bus system with limited service throughout St. George urban area operated by Sun Tran. Sun Tran’s transit network is a limited local public bus system that offers three different

- **Private Shuttle Transportation** – Private shuttle service is not currently offered from St. George Airport or McCarran International Airport to Springdale or Zion National Park. Semi-private and private van/shuttle operations do exist from the McCarran (Las Vegas) and Salt Lake City airports to St. George but they do not provide service further northeast on a scheduled basis. Below are the private shuttle services servicing the region:

- St. George Express
- St. George Shuttle
- Executive Shuttle
- Go Green Shuttle
- Desert Shuttle (no longer in business)

These shuttles have an average cost of approximately \$40 per leg from McCarran to St. George. The Go Green Shuttle based out of St. George services the corridor from Salt Lake City to St. George. Go Green just started its operation this fall (2008). They take pride in their environmentally friendly vehicles that run on natural gas. Currently their only service to Springdale would be through a charter, but this company has expressed interest in expanding service to Springdale if the opportunity arises.

The only other existing transportation options from St. George to Springdale, other than on a guided tour bus, are via driving a car, renting a car, or taking a cab.

- **St. George Airport** – A new airport will be

constructed in St. George that will expand the volume and size of planes that can arrive and depart from the runway. This new airport will help to alleviate flight congestion at McCarran and Salt Lake City thus bringing more tourism directly into the Dixie Region. Within the airports long term planning and construction efforts, future roadways have been discussed and are planned for connecting the new airport directly with adjacent smaller towns like Washington City and Hurricane. Highway

expansions and new interchanges are some projects identified in the St. George, including to the major concept of the Dixie Beltway, an expressway loop designed to connect St. George and the surrounding cities to each other and the new airport proposed near the southeast corner of St. George. New roadways like the Southern Parkway, currently under construction, will connect Washington City directly with the new airport.

- **Transportation Market for Airport to Regional Vacation Destinations Service** – The construction of the new airport may prompt the region into further discussion related to developing a unified transportation system that could serve communities and cities surrounding St. George and the Dixie Metropolitan Area. Transportation service expansions into the rest of Washington County would ultimately improve tourism travel throughout the region and bring travelers from the St. George to Springdale thus increasing the economic base for all communities along SR 9.



Go Green Shuttle Service Van

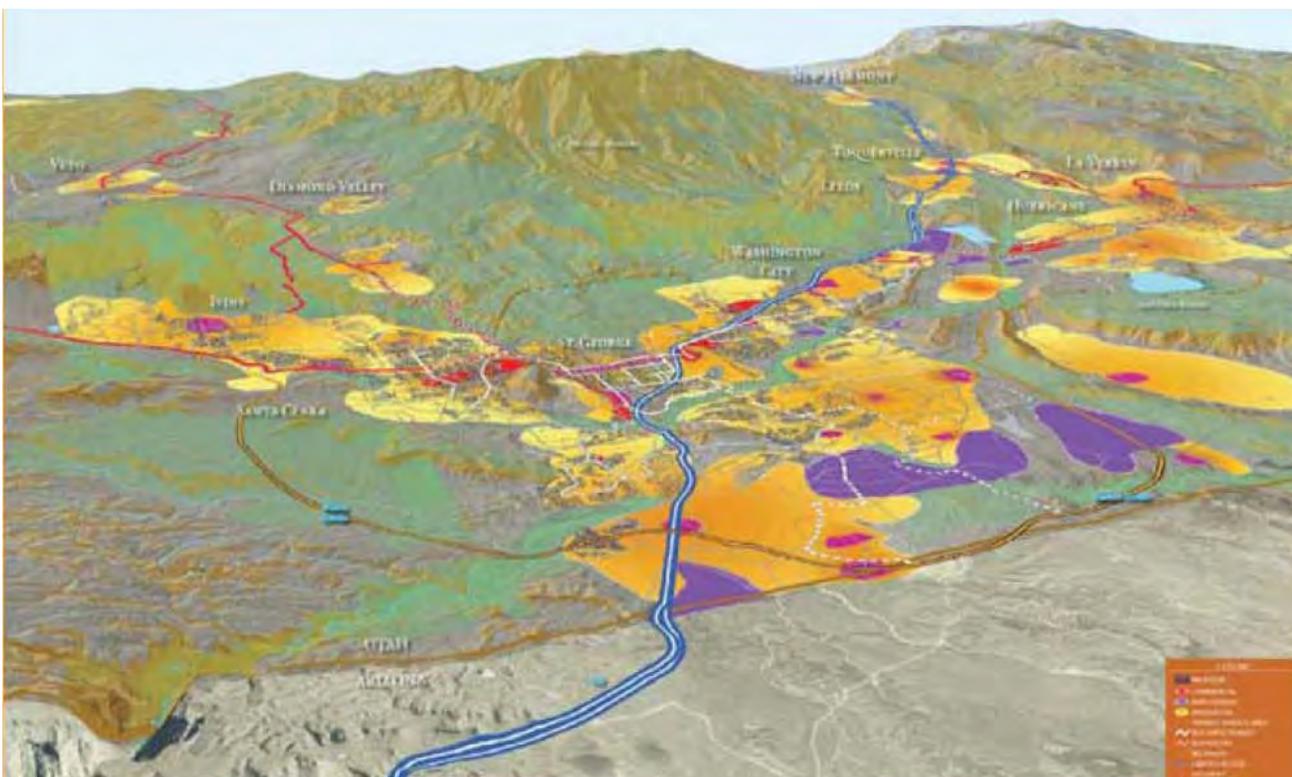


Figure 8-1. VISION DIXIE plan – Making a Better Washington County, 2007

Table 8-1 Perspectives on Partner Roles and Responsibilities

Zion National Park/National Park Service	Springdale – Town Government and Community	UDOT	Shuttle Service Contractor	Springdale Businesses	Visitors Bureau
<p>Resource protection</p> <p>Visitor experience, enjoyment, and satisfaction</p> <p>Shuttle service provider</p> <p>Facilitate planning for transportation system</p> <p>Financial obligations for shuttle service and vehicles; funding conduit for NPS related funding and other federal funding sources</p> <p>Park reps should walk the streets and talk to people and businesses</p>	<p>Parking and communication (wayfinding)</p> <p>Protect resources in town/resource stewardship in park</p> <p>Support the park</p> <p>Shuttle structures and streetscape maintenance (behind the curb) – includes sidewalks, shuttle stop facilities, and landscape</p> <p>Signage in Springdale (costs, uniformity)</p> <p>Visitor movement along and near the highway/traffic congestion in town</p> <p>Public parking in town (on-street included)</p> <p>Street lighting</p> <p>Historic ditch system</p>	<p>Traffic control and management on highway</p> <p>Turning capacity in right-of-way</p> <p>Highway/road maintenance, paving, striping, and clean up of debris (between the curbs)</p> <p>Pedestrian crosswalks and pedestrian safety</p> <p>Regulatory and traffic signage</p> <p>ITS and 511 program</p> <p>Traffic calming</p> <p>Speed limit adjustments</p> <p>On-street parking areas</p> <p>Stormwater control off highway/shared responsibility with historic ditch system</p> <p>Funding conduit for some state and federal transportation funding programs</p>	<p>Operate a sustainable system</p> <p>Effectively manage the system</p> <p>Interface between the users/visitors and the agency</p> <p>Balance customer satisfaction, productivity, and costs</p> <p>Knowledge of resources (provide information)</p>	<p>Welcome visitors/ visitor hospitality</p> <p>Shared parking for shuttle park and ride</p> <p>“Sales force” for the shuttle system</p> <p>Provide clear, consistent information about how and where to park and ride the shuttle</p>	<p>Visitor communications and development of outreach packet for area hotels and businesses</p> <p>One sheet “Shuttle and Parking How To” Guide</p> <p>Assistance with parking management</p> <p>Advocacy for system</p> <p>“Sales force” for the shuttle system</p>

- **VISION DIXIE** - Completed in 2007, the VISION DIXIE plan for Washington County resulted from an inclusive and innovative planning effort that involved a broad spectrum of public and private sector partners from across the county joining together to build a strong vision for tomorrow based on the ideas and values of county residents. Public preferences are summarized in a series principles, listed below. As shown in Figure 8.1, the VISION DIXIE planning area encompasses all of Washington County, including the Springdale/Zion National Park area. For more about the VISION DIXIE planning effort and to download the plan, visit: <http://visiondixie.org/>

1. Plan Regionally; Act Locally
2. Maintain Air and Water Quality; Conserve Water
3. Guard our “Signature” Scenic Landscapes
4. Provide Rich, Connected Natural Recreation and Open Spaces
5. Build Balanced Transportation that includes a System of Public Transportation, Connected Roads, and Meaningful Opportunities to Bike and Walk
6. Get “Centered” on Focusing Growth on Walkable, Mixed Use Centers
7. Direct Growth Inward
8. Provide a Broad Range of Housing Types to Meet Diverse Needs
9. Reserve Key Areas for Industry to Grow
10. Focused Public Land Conversion Should Sustain Community Goals and Preserve Critical Lands

Principle #5 objectives are particularly relevant to in considering future opportunities for regional connections to the Zion Canyon transportation system:

- Build a System of Public Transportation
 - A road system in a constrained geography like ours is difficult to add to and is susceptible to suffocating

congestion. This makes public transportation especially important to keep us from being overwhelmed by gridlock. We need to start putting in place today the transit backbone our downtowns and major centers will need tomorrow.

- Preserve Major Road and Transit Corridors - To keep us moving, and save money, it is also important that we preserve corridors for future transportation investments.

- **Dixie Metropolitan Planning Organization**

– Established in 2002 after several years of planning and actions to comply with local, federal, and state requirements, the Dixie Metropolitan Planning Organization (MPO) was established to support regional planning in the urbanized and urbanizing areas of Washington County, Utah. Although Springfield and Zion National Park are outside the MPO jurisdiction, they are an important entity to coordinate with regionally and to work with in promoting alternative and multi-modal transportation connectivity throughout the SR 9 highway corridor. The MPO takes the lead in reviewing applications for certain federal transportation grant programs and also advocates for and supports transit, pedestrian and bicycle planning throughout the region. The Springdale and Zion Canyon National Park area may not be eligible or competitive for some of the federal transportation programs geared toward urban areas that are administered through the MPO; however, the MPO can provide support and guidance related to other potential funding sources and will be an important partner in considering opportunities for better connecting the region and mitigating overall travel demand pressures on SR 9 through a variety of strategies. For more information about the Dixie MPO, visit:

- **Eastern Washington County Rural Planning Organization and Five County Association of Governments** – As the



rural counterpart to the Dixie MPO, the Eastern Washington County Rural Planning Organization (RPO), coordinated through the Five County Association of Governments and supports unified planning efforts in Eastern Washington County. It would be good to bring this organization more closely into the fold of future planning for the Zion Canyon transportation system. For more information about these entities, visit: <http://www.fcaog.state.ut.us/>

- **Zion Canyon Trail** – Planning and design activities are underway for a multi-use trail/path in Zion Canyon that will connect Springdale with Rockville (and may extend further down canyon in the long term future). The trail will be constructed through Springdale all the way to connect to the Pa’ rus Trail in Zion National Park. A feasibility study for the trail was completed

in 2007 as a joint project between UDOT and the town of Springdale. Currently, UDOT has \$125,000 set aside for phase one of the Zion Canyon Trail improvements in Springdale, which will extend from Rockville to River Park. The vision for phase one will be to build the trail/path along the SR 9 corridor. Figure 8.2 below shows the Alternative 1 alignment for all phases of the trail through Springdale. Once constructed, this trail/path will provide the opportunity for park visitors to bicycle or walk from their hotels and lodging accommodations all the way to the park, and it will expand general recreation and transportation opportunities for the community.

There is an important opportunity for joint partnership in this project that should be ceased in the coming year. With planning and design of the trail in Springdale, new

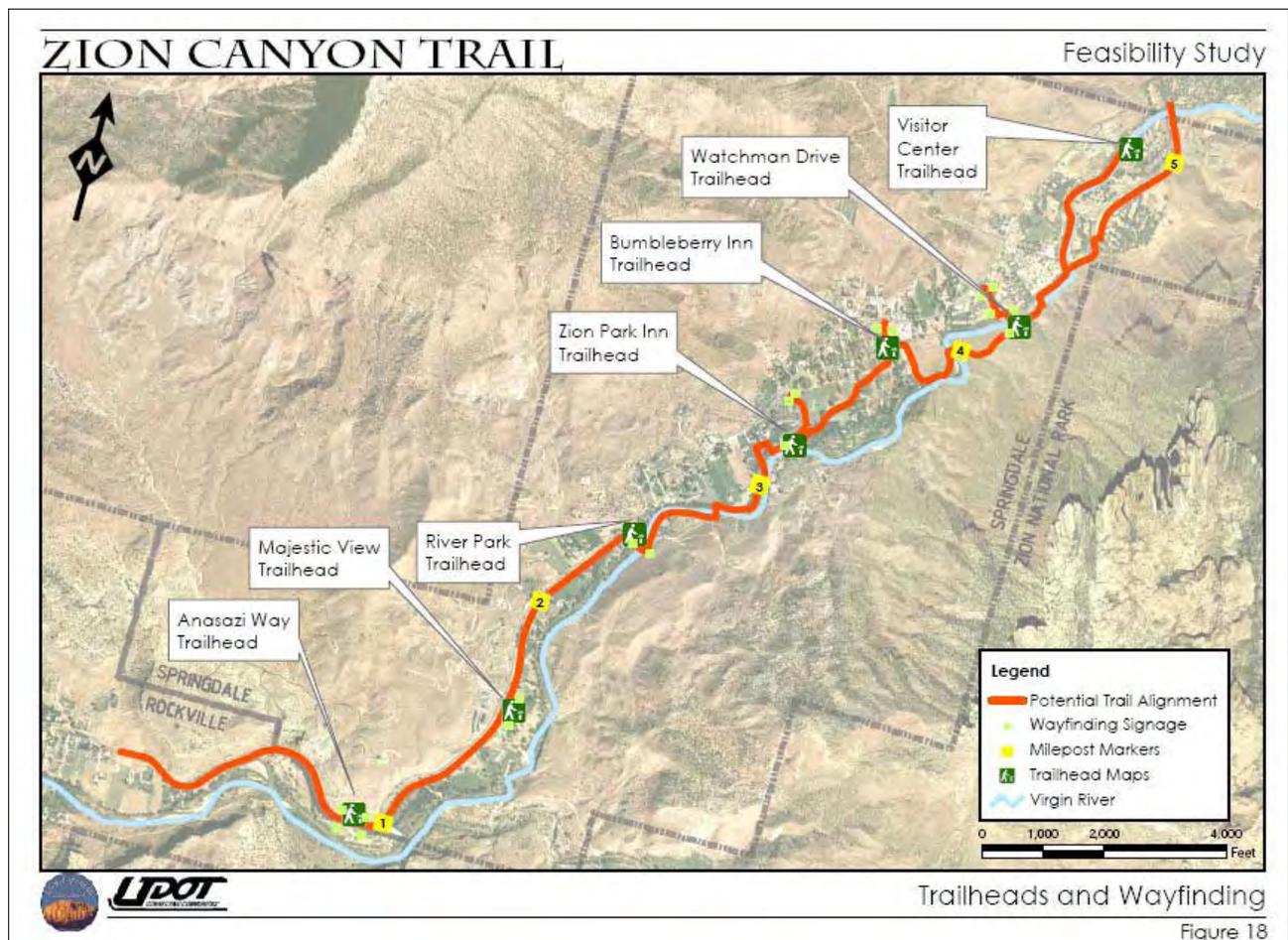


Figure 8-2 Proposed Zion Canyon Trail in Springdale

trailheads will be developed. Information kiosks and signs at these trailheads could serve multiple functions, such as orienting visitors to the trail, as well as to the Zion Canyon shuttle system and the locations of shuttle stops and parking areas in Springdale. Interpretive panels at the trailheads could promote and educate visitors about the region’s commitment to environmental stewardship and provide guidelines for use of public lands. Springdale, UDOT, and Zion National Park could partner on seeking funds for these kiosks and may be able to leverage the funding for the existing trail project as a matching fund for selected grant programs. *<Note: we will include a brief description of this project in Sections 2 and 4 too with a reference to this section, in the final draft of the report.>*

Summary of Regional Planning Efforts and Opportunities

As noted above, regional planning efforts are constantly evaluating the need for roadway improvements and public transportation systems and multi-modal transportation opportunities for both the near and long term. Discussions with transportation sources in the region indicate that the potential timeframe for a public transportation system likely is a long way out – for the area just within the Dixie Metropolitan Region (beyond St. George), such a system would not be expected for decades. However, a privately operated shuttle service between St. George and up canyon communities, with the ultimate destination being Springdale, may be a more plausible possibility within the next ten years, given the growing interest in taking “car free” vacations (due to the rising cost of fuel and environmental influences). The private market may recognize and serve this opportunity more rapidly than a public initiated transportation program.

The opportunities for regional transportation planning and coordination are immense with many concurrent initiatives and a lot of public will moving toward a well connected future. The VISION DIXIE principle, “Plan Regionally; Act Locally” is a good principle for guiding



Public Workshop, Springdale Community Center, November 19, 2008

ongoing transportation coordination and planning efforts related to the Zion Canyon transportation system.

Recommendations

A Call for Partnership and Stewardship for the Zion Canyon Transportation System

Ongoing operations of the Zion Canyon transportation system will require significant resources. While Zion National Park will continue to have primary responsibility for annual operations and maintenance for the shuttle system, the park will be faced with some tough decisions in the future. Service cutbacks may be needed in the coming years unless supplemental funding resources can be found. The park will seek federal funding to replace the shuttle fleet; however, funding sources are becoming increasingly limited and competitive. The Springdale streetscape and shuttle facilities will require ongoing maintenance and repairs. Wayfinding and enhanced visitor communication efforts will require near term



funding, while development of new parking areas, pathways, and other improvements will require additional funding over the long term.

How Will All These Needs be Met?

The Zion Canyon transportation system has been a huge success and a nationwide model for environmental sustainability and enhanced visitor access at national parks. Representatives from Zion National Park, Springdale, UDOT, and other agencies and organizations have been coordinating on a regular basis, but the time has come for these partners to jointly define opportunities for additional funding and resources to support the system. Ongoing partnership and stewardship responsibilities should be more clearly defined, and all parties should be working together to actively plan for the successful future of the transportation system.

Ongoing Partner Coordination and Communications

Ongoing, more frequent and focused coordination and communication regionally between the key partners and interests related to transportation, and specifically related to the Zion Canyon transportation system, will be important. A new “Zion Canyon Transportation Committee” (or other name) should be formed – either by expanding the focus of one of the existing committees or by creating a new committee. There are three organizations meeting regularly now that are good candidates for being involved in or leading a specific “Zion Canyon Transportation Committee.”

- **Springdale Parking Committee** – This committee includes representatives from Zion National Park and the town of Springdale, and its work has been focused on parking and visitor communications/signing related to parking. It is recommended that this committee be expanded to cover a broader focus related to transportation.
- **ZC3 – Zion Canyon Corridor Council** – A regional planning initiative/organization that is striving to apply Principle 1 of the recently completed Washington County VISION DIXIE planning process: “Plan Regionally,

Implement Locally.” This council includes representatives from the Southeast Utah University (SUU) Regional Services, UDOT, and other agencies and organizations <confirm Zion and Springdale involvement>. The council meets regularly to coordinate and plan with for the State Route 9 corridor as a gateway to Zion National Park. SUU provides technical assistance and funding for the planning efforts and also is working jointly with Utah State University’s Landscape Architecture & Environmental Planning Program on an extensive corridor study that will provide alternatives for future growth, development, and other critical elements identified by ZC3. This group would be a good foundation from which to build a broader “Zion Canyon Transportation Committee” around; however, it is unclear if the committee would want to take on the transportation planning and coordination efforts specific to the Zion Canyon transportation system. In any case, ZC3 will be a very important partner in planning for transportation in the corridor and in seeking funds for various projects.

- **Eastern Washington County RPO and the Five County Association of Governments** – See above for more information.

Zion National Park and Springdale officials should to participate on and coordinate with these organizations, as well as on a regular basis, as well as UDOT, the Dixie MPO, and other organizations to explore regional transportation opportunities and work towards implementation of programs and projects. Teaming with these organizations financially and with a common vision will benefit the tourism and economic base for the entire region. This “Plan Regionally; Act Locally” approach is consistent with the region’s vision for how to prepare for and address growth and change over the next three decades.

Regional Transportation System Connectivity

- As a long range option, it may be appropriate for the region to enter into very early planning discussions related to the vision

for either a private, semi-private, or public transportation system from St. George to up valley destinations, terminating at Springdale/Zion National Park. As a first phase, this system may be no more than a privately run shuttle system between the airport and Springdale, but over time, the service level and system characteristics could grow based on demand and changes in travel behavior. Over time, the service could grow and become a bus system with daily runs up and down the canyon.

As a very long term vision, the region could consider and study the potential for more innovative systems such as a Bus Rapid Transit (BRT), with more frequent service up and down the canyon. A BRT system would reduce overall traffic on SR 9, while also reducing congestion through the small towns along SR 9, SR 18, and I-15. Environmental benefits, such as reduced

fossil fuel emissions, cleaner air quality, and less energy consumption could also be realized, reducing the region's overall carbon footprint. A system of this type would also reliably and consistently support opportunities for a truly "car free" vacation experience to Zion National Park. Springdale and Zion National Park Service employees living in Virgin or Hurricane or other small towns along the SR 9 corridor could make use of a BRT system to commute from and to work. Another point to consider is that there are a high number of European travelers who come to Zion, and culturally, they are used to traveling via transit and some may actually prefer this type of travel to motor vehicle use. A BRT system could help to draw more tourists into the neighboring towns and cities with this opportunity to travel by bus to and from Springdale/Zion National Park.



FINANCIAL ANALYSIS, ACTION PLAN, AND POTENTIAL FUNDING SOURCES AND OPPORTUNITIES



Section Overview

This section of the report provides a summary of financial analysis of projected annual maintenance and operations costs for the Zion Canyon shuttle system, as well as estimated costs related to shuttle vehicle replacement and transportation system capital improvements. Service planning scenarios related to potential adjustments in service to reduce long term costs also are presented. This report section also provides an action plan for immediate next steps (within the next year), as well as recommended strategies and projects to be implemented within the next 1 to 3 years and beyond 3 years. Potential funding sources and opportunities to support implementation of these actions are also presented.

This section of the report closely relates to discussion of partnerships and partner roles and responsibilities in Section 8 of the report.

Financial Analysis and Related Service Planning Scenarios

The project team analyzed a number of financial scenarios related to potential annual costs for ongoing operation and maintenance of the Zion Canyon shuttle system and potential annual revenue. This analysis will help the park and its partners proactively plan for the future of the shuttle system. This information will aide the decision-making process related to seeking additional funding for the system and areas of service adjustments that may be required to keep the costs of ongoing annual operation and maintenance in check with revenue to support the system.

Revenue to support ongoing operation and maintenance of the shuttle system (including the park route and the town route) is tied to park visitation levels. As park visitation levels increase, revenue for the shuttle increases proportionately. As park visitation levels decrease, revenue for the shuttle decreases. Any surplus that might occur in revenue annually can be placed back into investments in the system (new vehicles, upgraded facilities, etc.) However, surplus revenues are not expected in the future as the costs for operating and maintaining the shuttle system through a service contract will be increasing on an annual basis due to inflation.

Results of Scenarios Analysis – The results of three of the financial scenarios analyzed are highlighted in this report – Scenario A, Scenario B, and Scenario C. All three scenarios assume that current service levels and schedules are maintained. Service would continue to be provided from Easter through November



Visitors leaving the park to return to Springdale



Existing Pa' rus Trail

(weekends only in November) each year and would continue on the same routes with the same number of stops as under current conditions.

- Scenario A – assumes that the annual visitation/revenue would be capped at the current 2008 level (\$3,335,000), and costs of annual operations and maintenance would increase annually by three percent (compounded) due to inflation.
- Scenario B – assumes a one percent annual increase in annual visitation/revenue would occur each year, and costs of annual operations and maintenance would increase by three percent (compounded) due to inflation.
- Scenario C – assumes a one percent annual decrease in annual visitation/revenue, and costs of annual operations and maintenance would increase by three percent (compounded) due to inflation.

These three scenarios are illustrated the charts on page 9-3.

Operation and Maintenance Challenges Ahead –

The results of the financial analysis, which assess various potential revenue and cost scenarios, indicate that there will be potential challenges related to ongoing operation and maintenance of the Zion Canyon shuttle system in the coming years.

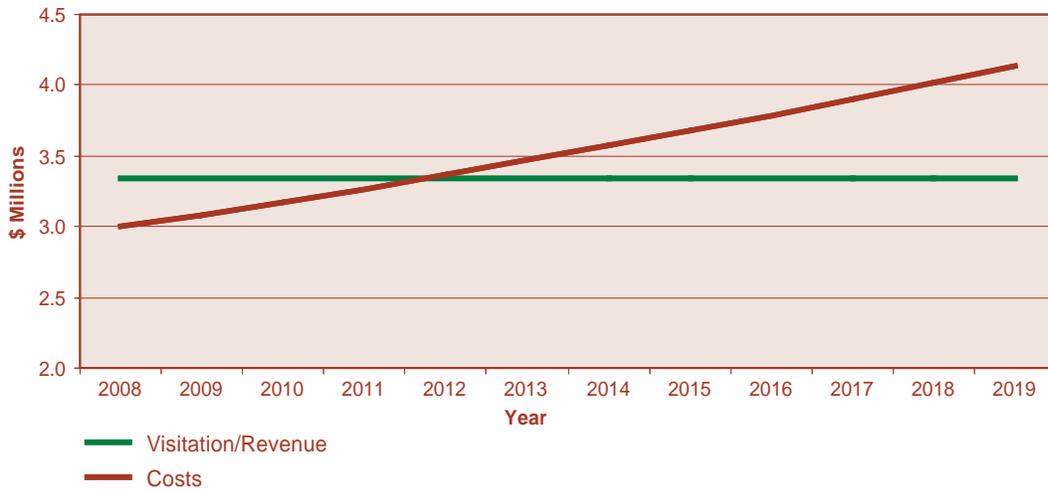
A lot of factors affect cost of operation and maintenance, and visitation/revenue levels fluctuate annually. It is difficult to predict the course of the future, but from review of these scenarios, the park may need to seek additional funding to support the shuttle system or cut back on service by the 2011 or 2012 season (three to four seasons from now) as shown under Scenarios A and C.

If visitation levels and thus revenue levels increase annually (as shown in Scenario B, the need for either additional funding or for implementing service reductions would occur later, by the 2014 season. It is important to note that these are planning scenarios. Actual conditions in the future could vary. For example, visitation/revenue may increase by more than one percent annually in some years, or it may decrease by more than one percent. If propane prices experienced a sharp escalation, the costs of service may increase more than the three percent inflation rate assumed.

Generally though, it is safe to assume that if conditions in the future continue to be similar as those of today and if costs continue to increase, a time will come within the next few years that the shuttle system will need additional financial

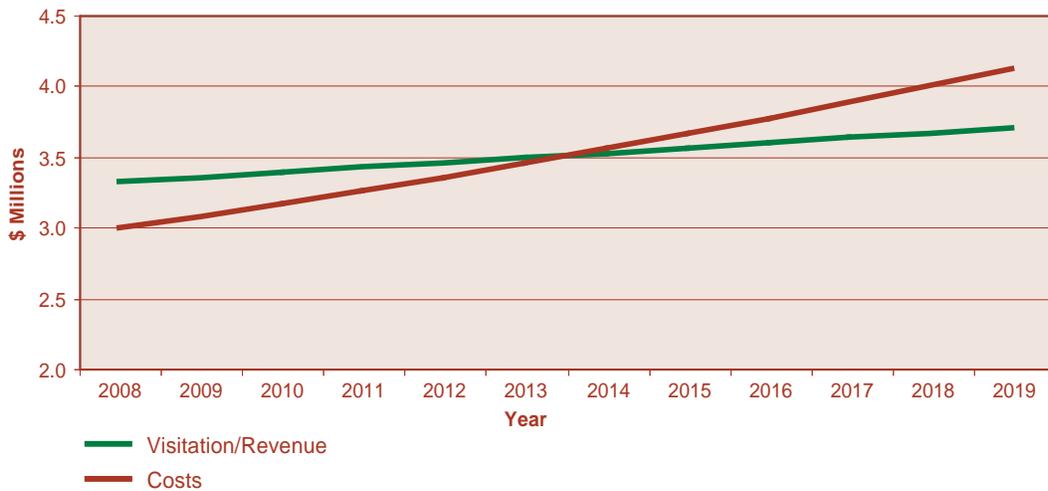


Temple of Sinawava Shuttle Stop



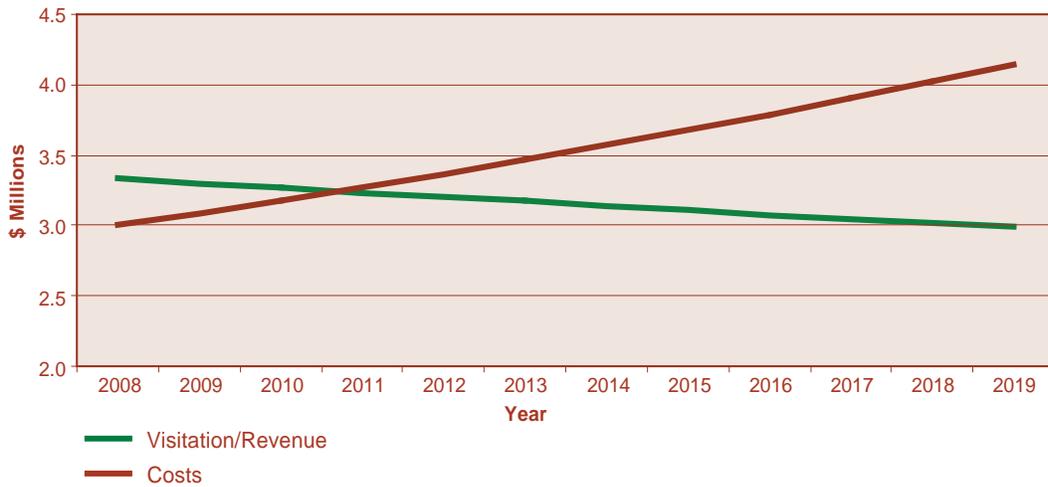
Assumes service Easter through November (weekends only in November), three percent annual inflation in costs; and annual revenue capped at \$3,335,000.

Figure 9-1. Scenario A



Assumes service Easter through November (weekends only in November), three percent annual inflation in costs; and one percent increase in visitation/revenue from 2008 level.

Figure 9-2. Scenario B



Assumes service Easter through November (weekends only in November), three percent annual inflation in costs; and one percent annual decrease in visitation/revenue from 2008 level.

Figure 9-3. Scenario C



Busy summer day at Zion National Park

support or service reductions will be needed to avoid a deficit. The time to start planning for this potential future condition is now.

Expanded Service Opportunities are Limited –

The public and stakeholders have suggested that shuttle service be expanded. Requests to extend the seasonal operation of the system, expand operating hours, and provide service further down canyon have come forward. Given the financial challenges that the park will be facing to operate and maintain the existing service (and to replace vehicles and make other improvements – see discussion later in this section), it is not anticipated that any service expansions would be possible.

However, if additional financial support could be obtained from partners or other sources, potential service expansions could be considered. As one example, if the community of Rockville wanted the shuttle service to extend south to pick up and drop off people there, funding would have to be found to either support expansion of the existing system that is confined to Springdale, or to support a new shuttle system that would connect to the park/ Springdale system.

Service Cutbacks – What are the Possibilities –

Potential service cutbacks if needed in the future to reduce operating and maintenance costs could include one or more options, such as:

- Reduced hours of service during peak season (such as reduced length of service each day or more limited morning and

evening service for example);

- Shortening the season of service (the current service from Easter through end of October and November weekends, could be reduced to May through September service, for example);
- Increasing “headways” – extending the time between shuttle service pick ups and drop offs (going from the current 6 to 10 minute periods between pick ups and drop offs at stops to 10 to 15 minute periods for example); and/or
- Reducing the length of the routes of service (such as eliminating a portion of the Springdale service route for example).

Costs and Benefits of the Springdale Portion of the System –

Eliminating shuttle service in Springdale in its entirety is not really considered to be a viable option because most of the shuttle riders are overnight visitors who are based in town and most of the parking for day use and overnight visitors also is based in town. The shuttle system was originally designed to include the town route for the specific purpose of picking up visitors in town on the town shuttle and bringing them to the park to transfer to the park shuttle. This important operational dynamic would need to continue or the system would not function properly. (Without the town connection, people would have to park inside the park, and even with parking expansion inside the park, there would not be enough space to accommodate all visitors. Without sufficient parking capacity, visitation would have to be limited and shuttle service would not operate at an efficient level.)

An interesting outcome of the park route/town route system is the use of the town route by visitors for other trips (not just to and from the park), such as for meals in Springdale and visiting shops, galleries, and other destinations. Citizens of Springdale also often use the system for transportation purposes not related to visiting the park – such as to go to the post office and run errands in town. These uses of the system are important because they help to reduce congestion on Zion Park Boulevard in Springdale. The more people ride the shuttle



instead of driving, the less traffic there is on the road – reducing congestion, noise, pollution, and creating a better environment for visitors as well as residents of the area.

However, there is a cost associated with the transportation and community benefits of the town route. The town route segment of the system requires 20.5 percent of the total hours of service and associated costs of the system (so roughly \$600,000 in annual operation and maintenance costs). The town route operates less efficiently than the park route with only 14 percent of the total boardings of the system and an average of 48.43 passengers per hour compared to the system-wide average of 70.94 passengers per hour.

As planning for the Zion Canyon transportation system moves forward in the future, additional funding sources to support the shuttle service should be investigated. Refer to the discussion related to potential funding sources and opportunities later in this section.

Shuttle Vehicle Replacement

The shuttle system fleet has an expected operating life of ten to twelve years, and the shuttle system is nearing its tenth year of operation. The park is looking at a range of options that include either rehabilitating the existing fleet or replacing the fleet with new vehicles. The estimated cost of these options ranges from \$6,000,000 (rehabilitation) to \$12,000,000 (total fleet replacement). This is in addition to the annual operation and maintenance cost of the shuttle system.

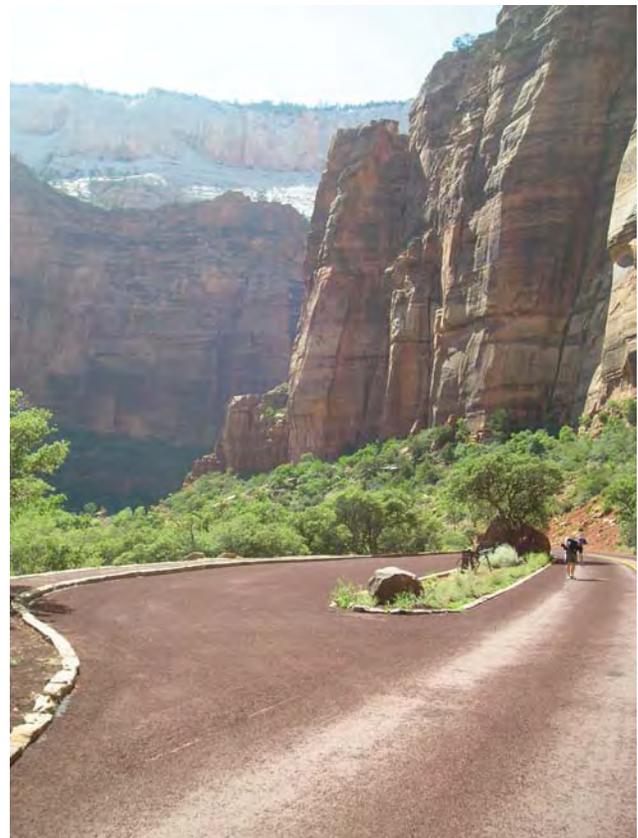
Shuttle vehicle replacement/rehabilitation options are discussed in more detail in Section 6 of this report. The recommended option is to proceed with a rehabilitation program that might extend the life of the shuttle fleet for another cycle of use. The park will be seeking funding through federal transportation grants and other sources to support the vehicle rehabilitation/replacement program.

Cost Estimates for Potential Capital Projects

Various project recommendations were described in the previous sections of this report. The table on page 9-6 provides planning level

cost estimates for many of the major capital improvement projects that have been discussed. The park, town, and other partners may or may not decide to move forward with these projects in the near term, but these estimates help provide perspective on the potential costs related to implementation. Acknowledgement of these additional potential projects and their related costs underscores the need to seek a range of funding options to support not only ongoing operation of the shuttle system and shuttle vehicle replacement, but also to repair and enhance the supporting infrastructure of the overall Zion Canyon transportation system.

These cost estimates are preliminary and provided for the intent of aiding future planning and decision-making efforts. Once projects move forward into design and engineering, design-level estimates of the probable costs of construction should be prepared. Estimated costs are in 2008 dollars and include design and preparation of construction drawings/documents, environmental permitting, and construction related services, but do not



Historic "Floor of the Valley Road" and Pull Off Area

Table 9.1 Estimated Capital Project Costs

Project/Action:	Preliminary Cost Estimate (Planning Level)	Notes:
Bus stop signs, parking, no parking, and pedestrian wayfinding signs package	\$150,000	Assumes signs at all stop locations in Springdale and the park; parking and wayfinding signs in town; signs on shelters and pedestrian signs/maps; includes graphic design, fabrication, and installation
Communications and marketing package	\$40,000 to 50,000	Could be more or less - depends on number of pieces developed and quantities printed
Contextually designed electronic variable message signs at three locations	\$35,000 to \$40,000	Assumes one large sign at entrance to town and two smaller signs – one in advance of the Desert Pearl vacant lot, and one in advance of Lion Blvd. (or other locations); assumes red rock sign base/housing
Information kiosks at five locations in Springdale	\$125,000	Assumes pre-fabricated kiosks from NPS approved vendor and graphic design and fabrication of displays, maps and information on kiosks
Springdale streetscape maintenance and missing gap sidewalk improvements, including sidewalk repair/expansion, historic ditch repairs, additional pedestrian lighting at selected locations, street trees, landscaping, rebuild driveways to meet ADA, and other elements	\$600,000 to \$750,000	Based on 2006 SAFETEA-LU Enhancement Grant application, the cost estimate has been updated to current year (2008) dollar value, and the estimate has been increased to include additional work
Zion Park Boulevard maintenance and striping (roadway maintenance, crosswalk striping at seven locations, rebuilding/installation of bus pads at fourteen locations, pedestrian signs, and various other needed maintenance work)	\$200,000	UDOT maintenance responsibility – may need to increase region’s maintenance budget assumptions to cover this as a special improvement effort and not as typical cyclical maintenance
Relocation of the Bumbleberry/Zions Bank shuttle stop further to the north	\$25,000 to \$30,000	This cost assumes that the current shelter and furnishings can be saved and relocated in the new location.
Installation of new shuttle stops (could occur at the Desert Pearl/Canyon Ranch and Cliffrose stops, which are currently flag stops, and/or in the vicinity of the South Campground)	\$175,000 to \$200,000 per Location (covers two stops/one on each side of the street)	Assumes construction of two shelters (northbound and southbound), furnishings, landscaping, pedestrian lighting, and sidewalk extensions
Extension of portions of the Pa’ rus multi-use path/trail	\$65 to 70 per linear foot for pervious concrete \$30 to \$35 per linear foot for bituminous/ asphalt \$10 to \$15 per linear foot for stabilized crusher fines	Apply to segment lengths to determine total estimated costs; assumes 8-foot wide path/trail surface; costs assume grading and sub-base installation
Parking areas/parking improvements – for parking areas, this assumes clearing, earthwork, paving, curbing, striping, landscaping or landscape restoration around the edges and within the parking area (landscape islands), pedestrian scale lighting, and signing.	\$8,000 to \$10,000 per stall for surface parking areas (Note: cost for structured parking is typically \$20,000 to \$25,000 per stall)	200 car parking area in the park – approximately \$2,000,000 Expanding 1000 linear feet of the shoulder of Lion Boulevard and restriping to angled parking to increase capacity – approximately \$200,000



include any land or right-of-way acquisition that may be needed to implement some of these projects. Estimated costs shown also include mobilization, contingencies, and management costs, and assume each element listed would be constructed as a separate project. Some savings in cost could occur if projects are combined and with detailed design.

Looking Ahead – An Action Plan for the Next Few Years – Ongoing operation of the Zion Canyon transportation system will require significant resources. While Zion National Park will continue to have the primary responsibility for annual operations and maintenance of the shuttle system and vehicle replacement, other partners may be able to help with some of the projects listed above. Partners also may be able to assist in pursuing and obtaining additional funding to support the shuttle system over the long term so that service cutbacks won't have to occur.

Implementation of the major projects listed above and other recommendations in this report can be staged over the next few years. The

action plan shown in Table 9.2 organizes the recommended actions in this report under three timeframe categories:

- Stage I – Immediate Actions – To be Completed within the Next Year (2009)
- Stage II – Near Term Actions – To be Completed within the Next 1 to 3 Years (2010 – 2012)
- Stage III – Actions Beyond 2012 – To be Completed beyond 2012; and Ongoing Actions – To continue on an ongoing basis

Various actions and projects are shown in the table, and when known, responsibilities for carrying out the action are listed. This action plan should be considered as a dynamic document that can be reviewed and updated on a regular basis, adding in responsible parties and new projects as they are identified and rearranging priorities if needed.



Pedestrians in Zion National Park

Table 9.2 Action Plan

Stage I - Immediate Actions– To be Completed within the Next Year - 2009	
Action/Project:	Responsibilities (if known):
<p>Springdale Parking Committee – continue to meet and coordinate; expand committee to become “Zion Canyon Transportation Committee”</p> <p>Parking Committee/Zion Canyon Transportation Committee actions to address gate congestion for the 2009 season (also see below for other actions):</p> <ul style="list-style-type: none"> - Use a flagger to orient visitors to parking - Develop a multi-lingual card to orient visitors to parking - Stripe area near entrance to Giant Screen Theater/Visitor Center Plaza as “No Parking” and “Shuttle Lane Only” so shuttles can get through. - Determine how to visually strengthen the connection between where people are parking above and the pedestrian travel way to the Visitor Center Plaza – add signs and provide a map hand-out to better guide visitors 	NPS, Springdale, UDOT, Visitors Bureau, and others
Expand NPS involvement in regional transportation discussions through ZC3, the RPO, and other entities	NPS
Update websites with more detailed information about where to park and ride the shuttle; bring the shuttle up more prominently on the home page	NPS, Springdale, Visitors Bureau, local hotels and businesses
Update the Highway Advisory Radio message (1610 am) to include more information about where to park and ride the shuttle	NPS working with UDOT
511 Traveler Advisory – determine if a message related to Zion National Park can be included on the system and provide park and ride information if so; install signs instructing visitors to call 511 for park information	NPS working with UDOT
Repackage transportation enhancement grant application for sidewalk and streetscape improvements (FY 2009?) and seek other funding sources	Springdale, working with NPS and UDOT
Develop printed materials, including a detailed “where to park” map, visitor information/outreach packets for hotels and businesses, detailed maps, placemats, and other tools to educate visitors about where to park and ride the shuttle and park stewardship	Visitors Bureau working closely with the NPS, Springdale, and others
Make a decision about vehicle replacement/rehabilitation program and seek funding for program	NPS
Initiate a volunteer “parking ambassadors” program for the 2009 season	Visitors Bureau, NPS, Springdale
Take steps to improve information/messaging about where to park and ride the shuttle for visitors coming in from the East Entrance	NPS
Install crosswalks at every shuttle stop and at the base of Lion Boulevard and other key locations in Springdale	UDOT, working closely with Springdale
Ongoing vehicle rehabilitation/replacement program	NPS
Make a decision about converting flag stops to permanent stops (at Cliffrose, Desert Pearl/Canyon Ranch); eliminating Silver Bear stop; and potentially adding a new stop at the South Campground and seek funds for stop improvements	NPS, working closely with Springdale and UDOT



Table 9.2 Action Plan, Continued

Stage I - Immediate Actions– To be Completed within the Next Year (2009)	
Action/Project:	Responsibilities (if known):
Bumbleberry/Zions Bank shuttle stop – reorient the wooden slats so they are horizontally lateral with sidewalk; determine if shuttle stop should be moved and find location/enter into agreement with property owners; seek funds for relocation costs	NPS/Springdale/UDOT
Draft and obtain formal agreements with property owners related to shared parking for park visitors who park and ride the shuttle	NPS with support from business owners in Springdale
Repair signs at Virgin pull off area; add new sign/information about where to park and ride the shuttle (this could be a Stage II action instead)	NPS, working closely with UDOT
Begin to consider funding options and pursue funding for long term operation and maintenance of the shuttle system (also see below)	NPS, Springdale, Visitors Bureau and others
Planning and conceptual design of the Pa’ rus Trail extension up canyon will continue through the student project	Sharlene Sherwood, working with NPS
Seek funding for ongoing Pa’ rus Trail design implementation	NPS
Seek funding for special projects (see Stage II, below)	NPS, Springdale, Others
Consider replacing two capacity bicycle racks with three capacity bicycle racks on shuttle vehicles if funding is available; this could be staged and may only include a few buses in this first phase	NPS
Confirm requirements/laws related to advertising on shuttle vehicles and at stops and related to donation boxes as potential additional sources of revenue to support the system; implement pilot advertising and donations programs as allowable	NPS
Update maps on display inside shuttle buses	NPS

Stage II -Near Term Actions– To be Completed within the Next 1 to 3 Years - 2010-2012	
Action/Project:	Responsibilities (if known):
Carry over actions from Stage I that still need to be completed	NPS and Partners
Springdale Parking Committee/Zion Canyon Transportation Committee continue to meet and coordinate on a regular basis	NPS, Springdale, UDOT, Visitors Bureau, and others
Continue to expand NPS involvement in regional transportation discussions through ZC3, the RPO, and other entities	NPS
Implement special projects as funding becomes available: - Visitor information kiosks - Electronic variable message signs - Design and install new sign package for shuttle stops, parking/no parking areas in Springdale, and pedestrian wayfinding; as part of this work, repair and/or replace existing signs and maps at shuttle stops - New shuttle stops/shuttle stop relocations (make flag stops permanent, relocate Bumbleberry/Zions Bank, add new stop at campground) - Improve/formalize Desert Pearl vacant lot for parking; reconfigure for better efficiency - Restripe Lion Blvd. parking for diagonal parking along south shoulder (and potentially north shoulder) to improve efficiency	NPS and Springdale; Visitors Bureau

Table 9.2 Action Plan, Continued

Stage II -Near Term Actions– To be Completed within the Next 1 to 3 Years - 2010-2012	
Action/Project:	Responsibilities (if known):
Work with UDOT on roadway improvements needed along Zion Park Boulevard (SR 9), such as bus pad replacements, pavement patching, shoulder repair, and striping of additional crosswalks and on-street parking/no parking areas, drainage/gutter repair, clean up of debris, utility box repairs, etc.	UDOT lead, NPS and Springdale support
Coordinate with UDOT to consider the need for additional accommodations for bicyclists on SR 9 in Springdale, such as bike lanes and symbols, or in areas where space is limited, “sharrow markings” and “share the road” signs could be installed notifying vehicles to share the road with cyclists	UDOT lead; NPS and Springdale support
Participate in regional discussions to advocate for regional transit and connections between communities, which will facilitate better commuting options for employees down canyon who travel to Springdale and the park to work, as well as options for visitors to leave their cars in down canyon communities and travel to the park, or to fly into St. George and travel to the park via private or public transit	NPS, Springdale, and Other Partners
Continue to consider and pursue funding options for long term operation and maintenance of the shuttle system	NPS, Springdale, Visitors Bureau and others
Design and environmental permitting of the Pa’ rus Trail extension up canyon if the park decides to pursue construction of certain segments (phased); contingent upon available funding	NPS
Continue to coordinate with Zion Canyon Trail project proponents on development of trail and support facilities and connection to the Pa’ rus Trail at the park. Coordinate on the development of the roadside pull off area just south of the Majestic View Lodge and park shuttle stop	NPS, Springdale, UDOT and others
Continue to move forward with parking improvement project(s); could move through design, environmental permitting, and construction during this timeframe if funding becomes available	NPS likely in lead
Implement shuttle stop improvements in the park	NPS
Continue to seek funding/allocate funding to support transportation director position at the park	NPS
Seek funding to make more substantial improvements to the Virgin pull off area, with more displays and information related to park and ride (where to park in town); a vault restroom, and other improvements to make this a more inviting place to stop and obtain information.	NPS, UDOT, Springdale, and others



Table 9.2 Action Plan, Continued

Stage III – Actions Beyond 2012 and Ongoing Actions	
Action/Project:	Responsibilities (if known):
Carry over actions from Stage I and II that still need to be completed	NPS and Partners
Springdale Parking Committee/Zion Canyon Transportation Committee continue to meet and coordinate on a regular basis (Ongoing partner coordination and communication will be critical in order to implement this action plan.)	NPS, Springdale, UDOT, Visitors Bureau, and others
Continue to expand NPS involvement in regional transportation discussions through ZC3, the RPO, and other entities	NPS
Continue to monitor effectiveness of ongoing shuttle service and make adjustments in service as necessary to match annual revenues	NPS
Continue to monitor gate area congestion and implement additional strategies/actions to improve entrance process, such as: - Alternate ticketing (fast passes; visitors buy passes at hotels, etc.) - Incentive strategies, such as discounted entrance fee at non-peak periods and discounted entrance fee for those who ride the shuttle into the park vs. drive in and park	NPS
Intensively manage visitor parking and direct visitors to north end areas in town with excess capacity (Lion Blvd., Desert Pearl vacant lot, Pizza and Noodle, etc.). Continue to monitor the effectiveness and efficiency of parking both in the town and in the park and move forward with other actions above, as well as parking improvements as necessary to manage parking;	NPS/Springdale



Waiting for the Shuttle



Custom-built shuttle vehicles

Funding Sources and Opportunities

A variety of public and private funding sources and opportunities can be pursued to help support the Zion Canyon transportation system and supporting visitor improvements, streetscape enhancements, signing and wayfinding elements, marketing, outreach, and other elements. The list below has been adapted from multiple reference sources. There may be sources and opportunities other than those listed that partners will identify as coordination efforts continue.

Federal – Alternative Transportation for Parks and Public Lands (ATPPL) – The ATPPL Program, administered through the Federal Transit Administration through authorization of the Safe, Accountable Flexible, Efficient Transportation Equity Act (SAFETEA-LU), provides grant funding on a year to year basis to the National Park Service and other federal land management agencies. The ATPPL Program is very competitive – in 2007 about 100 project proposals were submitted totaling more than \$65,000,000 in planning, capital, and vehicle procurement requests, competing for approximately \$20,000,000 available. The 2008 year was just as challenging and 2009 is

the final cycle authorized under SAFETEA-LU, which will be up for either an extension or re-authorization for funding beyond 2009. Zion National Park applied for funding for vehicle replacement in 2008; however, the application was not successful. The park should continue to follow this funding source and re-apply for funding at the next opportunity.

Federal – Federal Lands Highway Program for Park Roads and Parkways Program (PRP) – The PRP Program is the main source of funding for improvement of transportation infrastructure in national park system units, including the resurfacing, rehabilitation, and reconstruction of park roads, bridges, parking areas, and development and maintenance of NPS-owned alternative transportation systems. There are three PRP Program categories:

- Category I – Road Rehabilitation (3R) and Road Reconstruction/Realignment (4R)
- Category II – Congressionally Mandated Parkways (not really applicable to Zion NP)
- Category III – Transportation Management Program



Existing pull off area just south of Majestic View Lodge

Category III – Transportation Management Program (formerly the Alternative Transportation Program) integrates all modes of travel in national park system units and supports transportation planning studies. This funding is reserved for special needs not being met by the ATPPL.

Although the PRP Program is the primary source of transportation funding for the National Park Service, PRP projects can be supplemented with funds from other federal, NPS, or private sources.

Federal – National Park Service Repair/Rehabilitation Program – This program provides funding for minor repairs to roads and bridges. Repair/Rehabilitation funds are approved through the NPS operating budget that is appropriated each fiscal year. R/R funds are two-year funds that expire at the end of the second fiscal year, and there is a \$500,000 funding cap per project.

Federal – NPS Line Item Construction Program – Funds to develop new parks and areas within parks are budgeted through the Line-Item Construction program. Funds from this program are appropriated by line item in the yearly Department of Interior appropriation act, and these funds do not normally expire.

Federal – Federal Lands Recreation Enhancement Act (FLREA) Program – The FLREA Program (formerly the Fee-Demonstration Program) allows park units to charge fees for access to specific areas/attractions. The park units are allowed to use a portion of these funds for certain purposes within the park unit, including transportation projects. Zion National Park currently uses a portion of their FLREA funds to support the Zion Canyon transportation system.

Federal – Congressional “Earmark” Projects – Projects that are “earmarked” or selected by Congress as part of a reauthorization of the highway and transit laws or the annual appropriations process have become common. In the SAFETEA-LU authorization there were 46 projects valued at more than \$170,000,000, including many projects in national parks – transit, highway, and other high priority projects.

Federal – Public Lands Highway Program Discretionary Funds (PLHD) – NPS projects may be eligible for PLHD funds, which can be used

for a wide variety of facilities, including:

- Transportation planning for tourism and recreational travel
- Parking areas
- Interpretive signs
- Pedestrian and bicycle facilities
- Construction/reconstruction of roadside rest areas and related utilities
- Visitor centers that relate to road facilities as determined by the Secretary of the Department of Transportation

It should be noted that the National Park Service has no legal authority to transfer any NPS funds to a state or local government for road projects. There are special procedures for how multiple fund source projects are to be implemented.

Federal - Land and Water Conservation Fund – The Land and Water Conservation Fund (LWCF) provides money to acquire new federal recreation land or develop new recreation projects on property owned by the applicant. Eligible projects must be included on a statewide recreation plan, and ranked compared to other projects on that plan. Funds are distributed to states using a formula, which is based on factors like state population. LWCF grants require at least 50 percent local match. In 2007, Utah received \$357,000 for eligible projects. LWCF applications are due October 15 annually. Local and state agencies are the typical applicants for these funds.

Federal - FHWA National Recreational Trails Program (RTP) – The National Recreational Trails Program provides funds for developing trails, acquiring easements or property for trails, and building trail-related facilities such as trailheads, bridges, and restrooms. Both motorized and non-motorized trail facilities are eligible. Applicants are required to provide a 50 percent match for this program, administered by the Utah State Parks Board, which consist of cash, volunteer labor, donated equipment and materials, or donated real estate. Applications for National Recreational Trails funding are due

annually on May 1st, with proposals reviewed during the summer months and grantees notified in the fall.

Federal – FHWA National Scenic Byways Program – State Route 9 is a designated scenic byway in Utah and as such it is eligible for scenic byway funding, which must be applied for through local communities tied to byway representatives and the state byway division. Projects such as interpretive facilities, visitor facilities, and parking areas are eligible for funding. Another program under the umbrella SAFETEA-LU, the National Scenic Byways Program is currently only funded through 2009 and will be up for reauthorization.

Federal – Administered through State – Surface Transportation Program (STP) and Transportation Enhancements Program – STP funds are distributed to states based on a weighted formula. Ten percent of Utah's federal Surface Transportation Program funds (authorized through the federal SAFETEA-LU) are designated for transportation enhancements such as bicycle and pedestrian facilities. Funding is discretionary and provides 80 percent federal share, for projects with construction costs of \$50,000 to \$500,000. Projects are selected by the Enhancements Advisory Committee, which reviews applications and makes recommendations to the State Transportation Commission related to which projects to approve. Transportation Enhancement grants in Utah are already obligated until 2009, and the program will then be subject to reauthorization (note: it has been reauthorized for three six year cycles since 1993). The Transportation Enhancement program requires applicants to register their intent for funding in December annually, with the final application due in February. Springdale applied for an Enhancements grant in 2007 for streetscape improvements and was unsuccessful, but the town, supported by the NPS, UDOT, and other partners, should continue to follow the availability of Transportation Enhancement funding in the coming years and reapply at the next opportunity.

Federal – Administered through State - Safe Routes to School Program – The Safe Routes to School

program was initiated with the federal re-authorization of the

transportation spending bill, SAFETEA-LU, in 2005. The purpose of Safe Routes to School is to encourage walking and bicycling to school. Eligible projects include sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street bicycle and pedestrian facilities, secure bike

parking, and traffic diversion improvements in the vicinity of schools (within approximately 2

miles). Safe Routes to School projects must already be identified in a school's Student Neighborhood Access Program (SNAP). Funding is discretionary, and state guidelines cap funds at \$150,000 per infrastructure project and \$75,000 for non-infrastructure projects. No local match

is required for Safe Routes to School funds. This program also will be subject to reauthorization to fund projects beyond 2009.

State - UDOT Highway Safety Improvement Program – The Highway Safety Improvement Program funds are intended to significantly reduce traffic fatalities and serious injuries. They can be used on bicycle and pedestrian safety improvements, pavement or shoulder widening, signage improvements, and many other potential projects. The funds are distributed on a discretionary basis, and eligibility will depend on collision data and whether the project meets UDOT's Roadway Safety Improvements Criteria. Submittals of potential safety spot locations are due to UDOT by October 1st annually, for inclusion in the Statewide Transportation Improvement Program in January.

State - Utah Riverway Enhancement Program – The Utah Riverway Enhancement Program began in 1986, providing funds to develop recreation areas along rivers or streams that are prone to flooding. Eligible activities under the program include property acquisition, trail development, and flood control. The Utah Riverway Enhancement Program is also administered by the Utah State Parks Board, and



applications are due May 1st annually. Applicants are required to provide 50 percent matching funds. Projects submitted for Utah Riverway Enhancement funding should demonstrate innovative or unique design features; links to areas of statewide significance; minimal adverse effects on wildlife, adjacent property owners, and natural areas; and complement existing and planned land uses.

State - Utah Trails and Pathways Non-motorized Trails Program – The Utah Trails and Pathways Non-motorized Trail Program is also administered by the Utah State Parks Board. Trails and Pathways funds can be used for planning, acquisition, and development of recreational trails (including construction of trailhead facilities and bridges). Applications are due to the Utah State Parks Board on May 1st annually. As with the Recreational Trails Program, Springdale can include donations of cash, labor, equipment and materials as part of the 50 percent match required by the Trails and Pathways program. Projects submitted for Trails and Pathways funding should demonstrate innovative or unique design features; links to areas of statewide significance; minimal adverse effects on wildlife, adjacent property owners, and natural areas; and complement existing and planned land uses.

Local Funding – Springdale and Washington County have limited funds for capital projects, and typically look for funding through federal and state sources. Although municipal funding through the general budget may be limited, local jurisdictions could pursue bonding for projects, such as a local voter-approved initiative that might help fund needed streetscape and parking improvements.

Also there is a local hotel/motel tax (also called a “bed tax” or “pillow tax”), and this could be reviewed as an opportunity to direct more funding to the Zion Canyon transportation system. It may be possible to increase the tax to support the Zion Canyon transportation system and special projects.

The Springdale community is actively interested in supporting the Zion Canyon transportation system and assisting however possible.

Volunteers and donations from the community may be able to provide resources and address some of the streetscape needs (landscaping, sidewalk repairs, stop relocation, etc.).

Private Funding Opportunities, Grants, and Creative Funding Strategies – There are a number of private sector funding opportunities, non-profit/foundations, grant programs, and creative funding strategies that should be considered to address the financial needs of the Zion Canyon transportation system. The list below provides some initial information about some of these sources – websites are provided for additional research.

- National Park Foundation – The foundation’s mission is to connect all Americans to their 391 national parks by making strategic grants, creating innovative partnerships, and establishing special funds that enhance the national parks. <http://www.nationalparks.org/who-we-help/>
- Private Corporations – Private corporations provide grants and gifting for special projects and national, regional, and local businesses and corporations may be willing to donate materials and supplies in exchange for recognition of their involvement. Two possible examples: a recreational equipment company could be approached to donate the 3-capacity bicycle carriers for the shuttle in exchange for recognition on the carriers of their name “generously donated by ____” and perhaps a Utah company would be willing to donate funds for the visitor information kiosks in Springdale (such as Zions Bank or another corporation).
- Donations - Donation boxes could be placed on the shuttle buses; a local “dollar check off” program could be established at local businesses and hotels – “check here if you want a dollar to go to the Zion Canyon transportation system.” Local businesses could be approached for donations as well to support improvements to the streetscape, bus stops and shelters, and other elements. Special interest organizations and groups in Utah such as members of the park’s Friends group, Utah Bicycle Coalition, Southwestern Utah Bicycle Touring Association,

and others could be approached for donations and or to provide volunteer resources for special projects.

- Advertising – Zion National Park should confirm and clarify requirements related to advertising. It may be possible to allow a certain level of advertising inside the shuttle buses or in discrete locations (such as on visitor information kiosks or at the bottom of maps, etc.) in exchange for revenue that could go to support the transportation system. The Washington State

Ferries System has recently implemented an advertising program on the ferries to support the system. Advertisements from companies such as Recreational Equipment Inc. (REI), Eddie Bauer, and others are very tastefully presented inside the hull of the ferry.

- Other Grants/Resources – There are a number of private foundation and non-profit grant sources available for special projects. For more information on potential sources, visit: www.nps.gov/partnerships/funding_sources.htm

