Introduction and Background

Technical Analysis Background

The Zion Canyon Shuttle System (shuttle system/shuttle/system) has been very successful since its implementation in 2000. Representatives from national parks throughout the country have acknowledged the system as an excellent example of how to expand visitor access and enhance visitor experience. Visitors and Springdale community members who ride the shuttle are very supportive of the system and frequently comment on the experience as positive and enjoyable. Based on visitor surveys, 95 to 98 percent of visitors like the system. The shuttle has expanded access opportunities for all, including visitors with disabilities. Zion Canyon visitation has increased approximately nine percent since the start of the shuttle system. Implementation of the system has reduced resource impacts in the canyon and enabled improved management and protection of Zion National Park (park) resources.

Although the shuttle has been a great success, the park decided it was time to reevaluate the system to determine the need for adjustments to improve operational and financial efficiency.

In 2007, the park was successful in competing for an Alternative Transportation in the Parks and Public Lands Program (ATPPL) Planning Project Grant to "Conduct a Planning Study to Evaluate the Existing Transportation Service at Zion National Park." In addition, the park received funding from the National Park Service

According to visitor surveys, 95 to 98 percent of visitors like the shuttle system.

(NPS) Alternative Transportation Program for the US Department of Transportation's Volpe National Transportation Systems Center (Volpe) to provide technical assistance to the park as part of the study efforts.

The NPS retained Otak, Inc. to conduct this technical analysis. Otak was supported by Nelson|Nygaard Consulting in the analysis of the shuttle service, vehicle procurement options, and entrance area congestion problems. Volpe provided assistance with the financial analysis. A follow on study completed by Powell Consulting further assessed vehicle procurement options and resulted in a final process for replacing shuttle vehicles.

Overarching Purpose and Objectives of the Technical Analysis

The overarching purpose and intended outcome of this analysis and implementation of recommendations is:

To improve the long term viability of the Zion Canyon Transportation System.

In order to achieve this overarching purpose, the technical analysis presented in this report was scoped to achieve the following objectives:

- To review and analyze available background data and information related to the system;
- To gain an understanding of the operation of the shuttle and associated transportation system both inside the park and within Springdale;
- To clearly understand activity levels at each shuttle stop, as well as loading patterns and maximum load points during peak periods;
- To confirm as much as possible, the differing needs and use patterns related to the transportation system of those who live in the immediate area versus those who visit the area;
- To clearly understand and analyze parking capacity and use patterns in Springdale during peak periods;
- To gain a better understanding of park entrance area congestion and contributing factors;
- To identify the full range of parking and traffic congestion problems and issues within Springdale;
- To inventory the existing pedestrian network in Springdale and identify missing gaps and needs for pedestrian and streetscape improvements;
- To discern the general availability of signing, wayfinding, and visitor information to park visitors and shuttle riders;
- To examine the sense of entry and level of information and communications provided to park visitors (pre-trip, en route, and on-site) to determine needs for additional visitor communication improvements and strategies;
- To explore opportunities to provide for other forms of access (e.g. bicycle and pedestrian improvements, additional trails, multi-modal connections, etc.) in the Zion Canyon portion of the park, which could potentially relieve congestion on the shuttle during peak periods; and
- To coordinate with regional transportation interests to explore long range opportunities for transit connectivity between Springdale and regional portals to better serve the needs of visitors and employees.

Visitors boarding the shuttle in Springdale

Overall Approach to the Project

The 2007 ATPPL grant proposal served as a guide to determine the focus of the technical analysis and the components of the system to be analyzed. The technical analysis has followed a planning framework approach.

Steps in the process included: scoping and stakeholder input; determination of issues; analysis of existing data and conditions; determination of data needs; data collection; data analysis; development of draft recommendations; park and stakeholder feedback on draft recommendations; and determination of final recommendations. The technical analysis process and schedule is illustrated in Figure 1-1.

The recommendations are comprised of a series of operational and planning refinements that can be implemented within existing NPS management decisions, contracts, and operations. This technical analysis also recommends future planning activities that may require additional analysis, compliance documentation, and public involvement.

The project approach included the following components:

- **Scoping and Stakeholder Input** – To confirm the study requirements, scoping sessions were conducted with park staff, community representatives, and agency stakeholders. In January 2008 (along with project start-up discussions) an initial internal scoping session was conducted with park staff. Additional scoping discussions with Town Council and community members of the Town of Springdale, as well as representatives from the Utah Department of Transportation, Washington County, and others occurred in May 2008 to determine study parameters.
- **Data Collection** – After the data and information needs were identified and confirmed, data collection and analysis was completed in May through August, 2008. Data collected included parking supply and demand verification, detailed ridership analysis identifying shuttle use patterns, and future capital and operating fund sources, as well as other information.
- **Technical Analysis** – Technical analysis occurred in September through November, 2008 consisting of review of existing data, field observations, research, and other activities in order to identify efficiencies and enhancements to improve the shuttle system. Analysis topics included: visitor, community, and shuttle system operating characteristics; infrastructure needs; regional and local informational needs; parking strategies in the park and Springdale; and expanded pedestrian and bicycle opportunities in upper Zion Canyon.
- **Recommendations** – Draft recommendations for improvements to shuttle system operational and financial efficiency were prepared in November and December, 2008. Recommendations were prepared for all the elements addressed in the technical analysis (listed on page 1-4). In addition to the recommendations of each

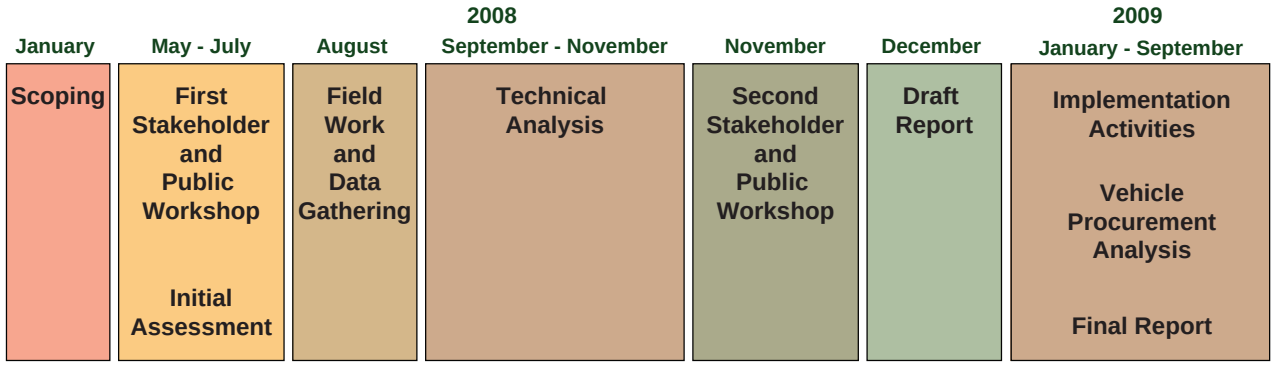


Figure 1-1. Technical Analysis Process and Schedule

section, Section 9 provides a summary of the shuttle system financial analysis, a description of potential funding opportunities, and an action plan for implementation.

The information in the previous draft of this report helped set the course for implementation activities in the 2009 season, as well as near term actions to be completed over the next three years. The action plan in Section 9 defines near term and far term actions to be implemented, as well as ongoing activities to be completed on a regular basis to support the Zion Canyon transportation system. The action plan should be reevaluated and updated on an annual basis.

Elements Addressed in this Report

This report provides technical analysis and recommendations related to the following elements:

- Section 2: Wayfinding and Visitor Information
- Section 3: Springdale Parking Utilization
- Section 4: Springdale Streetscape and Multi-Modal Connectivity
- Section 5: Zion Canyon Multi-Modal Connectivity
- Section 6: Shuttle System Service and Operations

Existing on-street parking in Springdale

- Section 7: Park Gate/Entrance Area Congestion
- Section 8: Regional Transportation System Connectivity
- Section 9: Financial Analysis, Funding Opportunities, and Action Plan

Technical Advisors

This technical analysis is the result of collaborative efforts of National Park Service staff from the Denver Service Center and Zion National Park working closely with the Otak, Nelson|Nygaard, and Volpe team. Parks Transportation Inc. (PTI), the park's shuttle service contractor, provided significant assistance and support to the consultant team for the system ridecheck and financial planning elements of the study.

Documents Reviewed

Several reports, plans, and documents were reviewed by the consultant team to inform the technical analysis, including the following:

Transportation Scholar Reports - *Sharing the Road, Shuttle Operational Analysis*, and *Parking Analysis*

- End-of-year reports
- Comparative bus costs
- Monthly reports
- Optional service controls
- PTI cost projections
- Transportation revenue scenarios
- Vehicle data spreadsheets
- Springdale streetscape plans
- Visitor signage systems plans

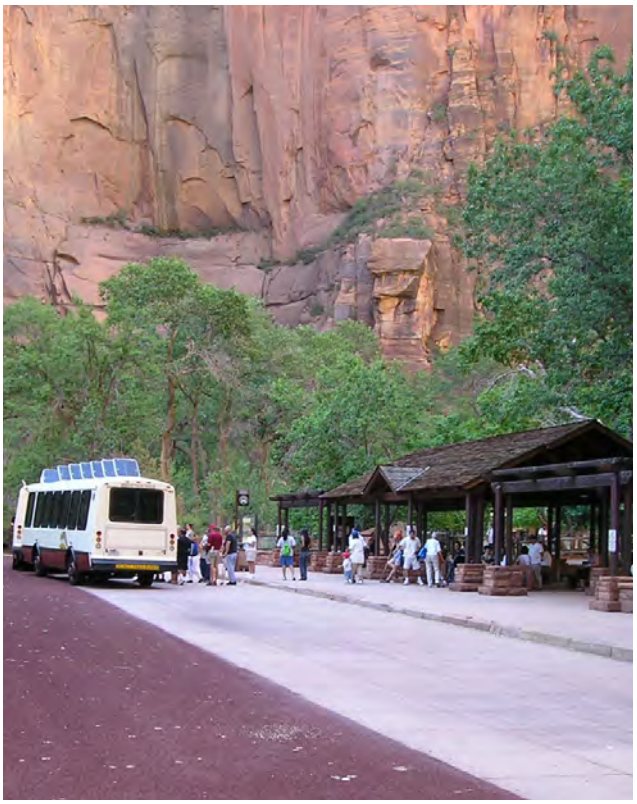
Overview of the Zion Canyon Shuttle System

The shuttle system operates from Springdale to the northernmost area accessible to vehicles in Zion Canyon (the Temple of Sinawava parking lot). The shuttle system consists of two loops operating as one system – the park loop and the

town loop through Springdale. The park loop operates from the visitor center plaza to the Temple of Sinawava. The town loop operates from the visitor center plaza to the southern limits of Springdale (Majestic View Lodge vicinity). In between the two loops, visitors walk through the park entrance and the visitor center plaza, where the two routes interface and provide transfer opportunities. Refer to Figure 1-2, next page, for the shuttle system route map.

The shuttle system includes 30 buses and 21 trailers, owned by the NPS and operated by PTI through a service contract with the NPS. The NPS also owns a shuttle/bus operations center located inside the park boundary (northeast of the visitor center complex). The center serves as the operating headquarters for PTI. The shuttle service contract will be renewed through a prospectus process in 2010.

The shuttle has carried an increasing number of passengers since it became operational in 2000. In 2007, ridership was just under three million. The shuttle also strengthened connections between the town and the park.



Visitors catching the shuttle inside the park

Context of the Technical Analysis

Zion National Park is located about 40 miles east of St. George, Utah and is part of southwestern Utah's Colorado Plateau area. The Town of Springdale is directly adjacent to the park's southern boundary. The park's dramatic scenery, rich mix of natural and cultural resources, and wide array of activities lure over 2.5 million visitors each year. Though the park is 229 square miles, most visitors never leave a small portion of the southern area of the park – Zion Canyon. See Figures 1-3, Vicinity Map, and 1-4, Regional Context Map.

Park Visitation

The charts on page 1-9, Figures 1-5 and 1-6, depict seasonal visitation patterns from 2004 to 2008 and annual visitation from 1994 through 2008, respectively. (Source: Zion National Park, 2009)

Visitation statistics indicate that the months of June through August typically experience the highest levels of visitation, with July receiving the most visitors each year (as shown in Figure 1-5). Annual park visitation levels have experienced ups and downs, but since the shuttle system was implemented in 2000, visitation to the park has increased overall as shown in Figure 1-6. Visitation increased approximately fifteen percent overall between 1994 and 2008, and approximately nine percent between 1999 and 2008.

Stakeholder and Community Involvement Summary

Stakeholder and community involvement has been an important and integral part of the technical analysis process. Workshop sessions were held in May 2008 to gain input and help shape the analysis efforts. Another workshop was held in November 2008 to present preliminary draft results and obtain comments and additional ideas to be incorporated into the study. In both May and November, the team met with park staff, stakeholders and partners, and conducted a separate meeting with the community that was advertised and open to the general public. In March 2009, a workshop that focused on near term implementation actions and responsibilities was conducted with community stakeholders and park staff. These

activities are described in more detail below.

Results of May 2008 Initial Assessment and Partner/Stakeholder Meeting

As part of the data collection stage of work, an initial assessment of the transportation system was conducted in May 2008. The project team met with park representatives, as well as regional partners and stakeholders in workshop sessions designed to identify issues and elements that needed further analysis. A general public meeting was held in the evening for the same purpose. A separate Initial Assessment Report was prepared summarizing the results of these meetings and the limited "on-the-ground" assessment of existing conditions and shuttle operations conducted during the same timeframe.

Table 1-1 summarizes and prioritizes the issues and elements that needed further analysis as identified by partners and stakeholders. The technical analysis and resulting recommendations of this report were scoped specifically to address these issues. Categories of comments and issues most often discussed and mentioned are listed first in the table. Least mentioned topics are listed last. Table 1-1 illustrates how some of the separate discussions in the meetings tended to align. For example, parking was the most often mentioned and discussed issue in all three meetings.

Results of November 2008 Stakeholder and Public Involvement Workshops

Representatives from the National Park Service, Town of Springdale, UDOT, Springdale Visitors Bureau, and other agencies and organizations participated in a workshop session in November 2008. One of the objectives of the session was to list all existing and potential partners related to the Zion Canyon transportation system. Once a list was established, the group then discussed the individual roles and responsibilities that partners should have in the ongoing stewardship of the Zion Canyon transportation system.

Other topics discussed during the meeting included:

- Vehicle rehabilitation and replacement
- Partnering and funding

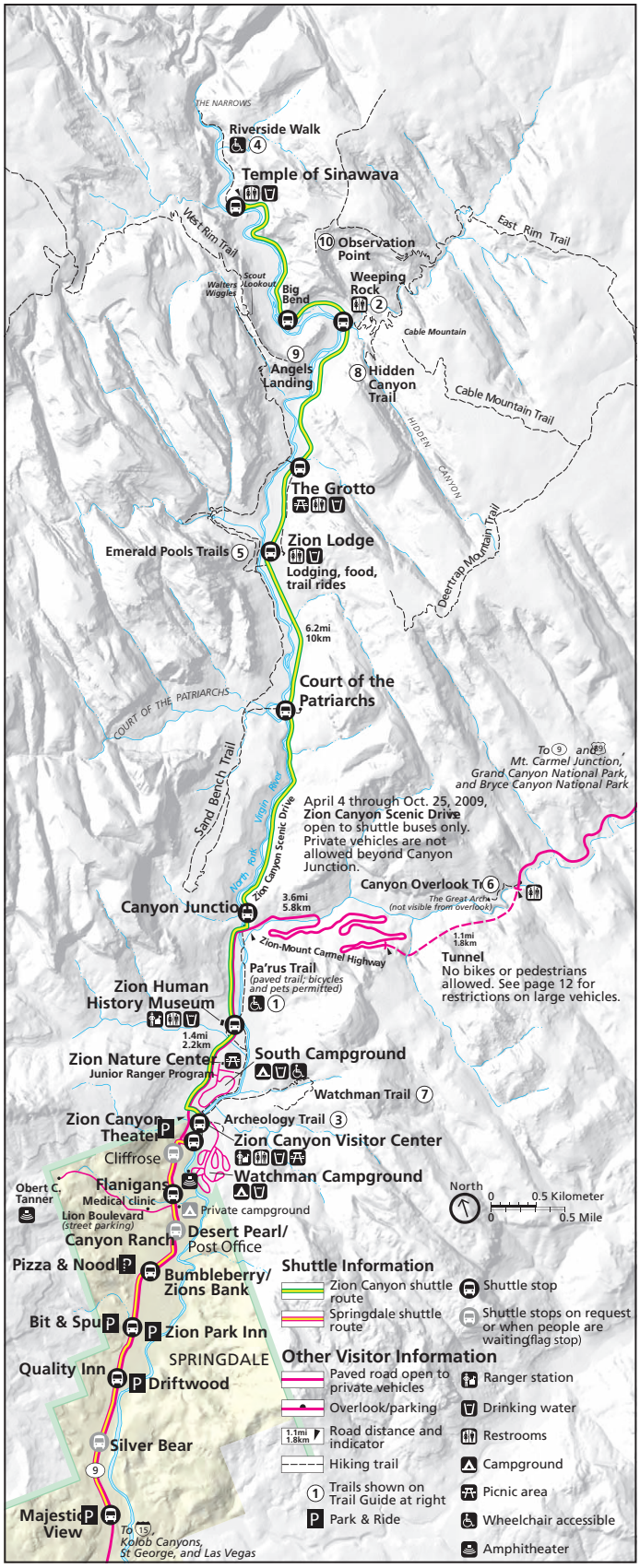


Figure 1-2. Zion Canyon Shuttle System Route Map

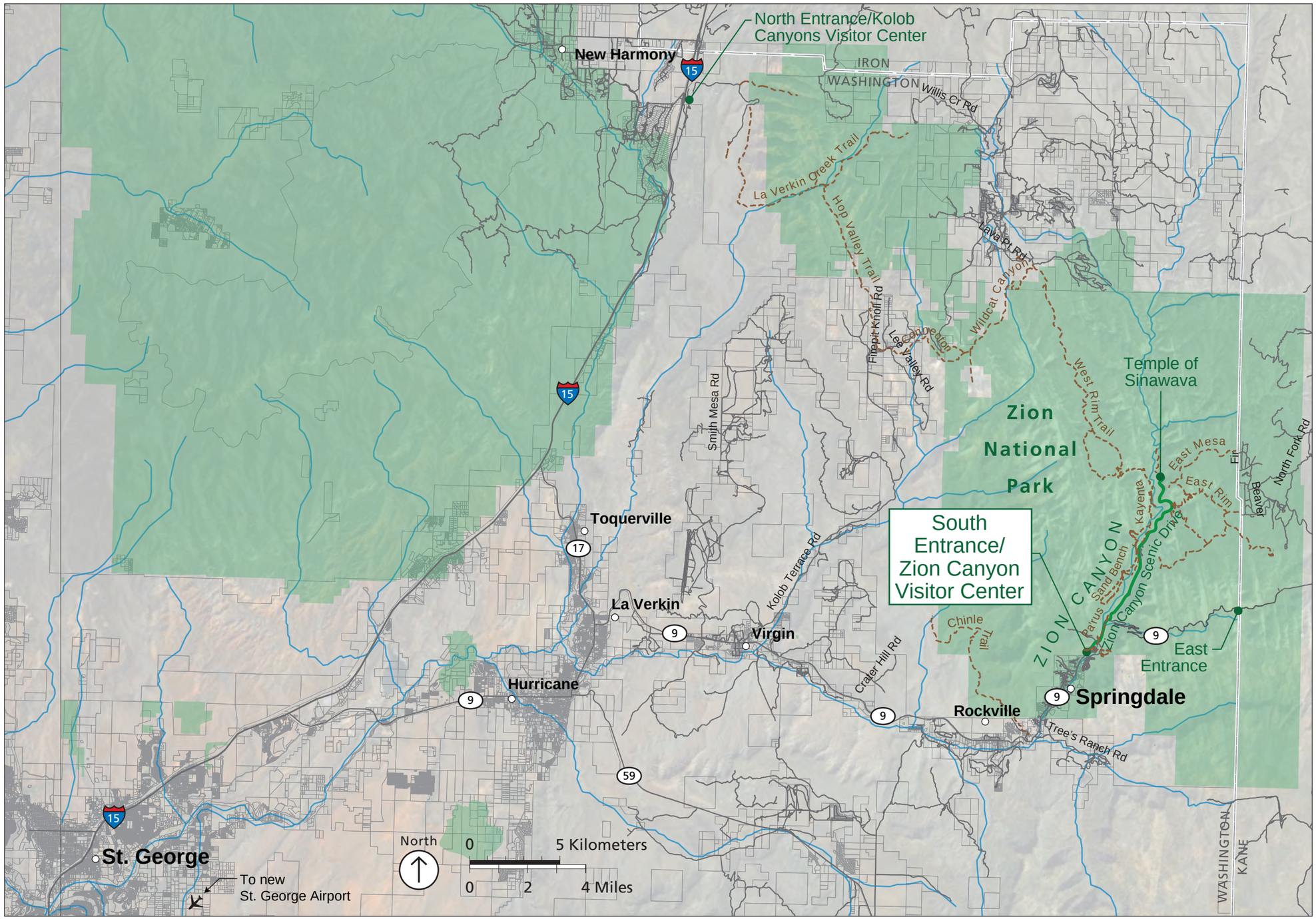


Figure 1-3. Project Vicinity Map

Figure 1-4 Regional Context Map

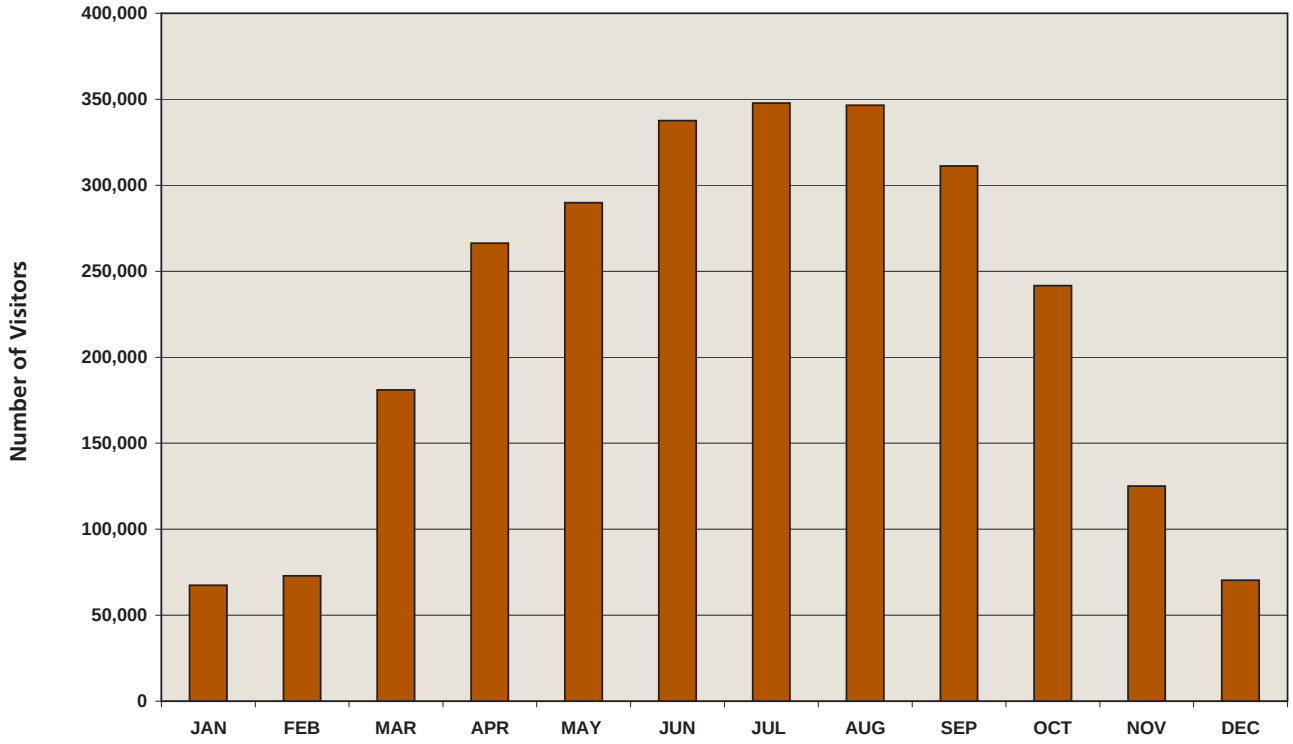


Figure 1-5 Zion National Park Average Monthly Visitation, 2004-2008.

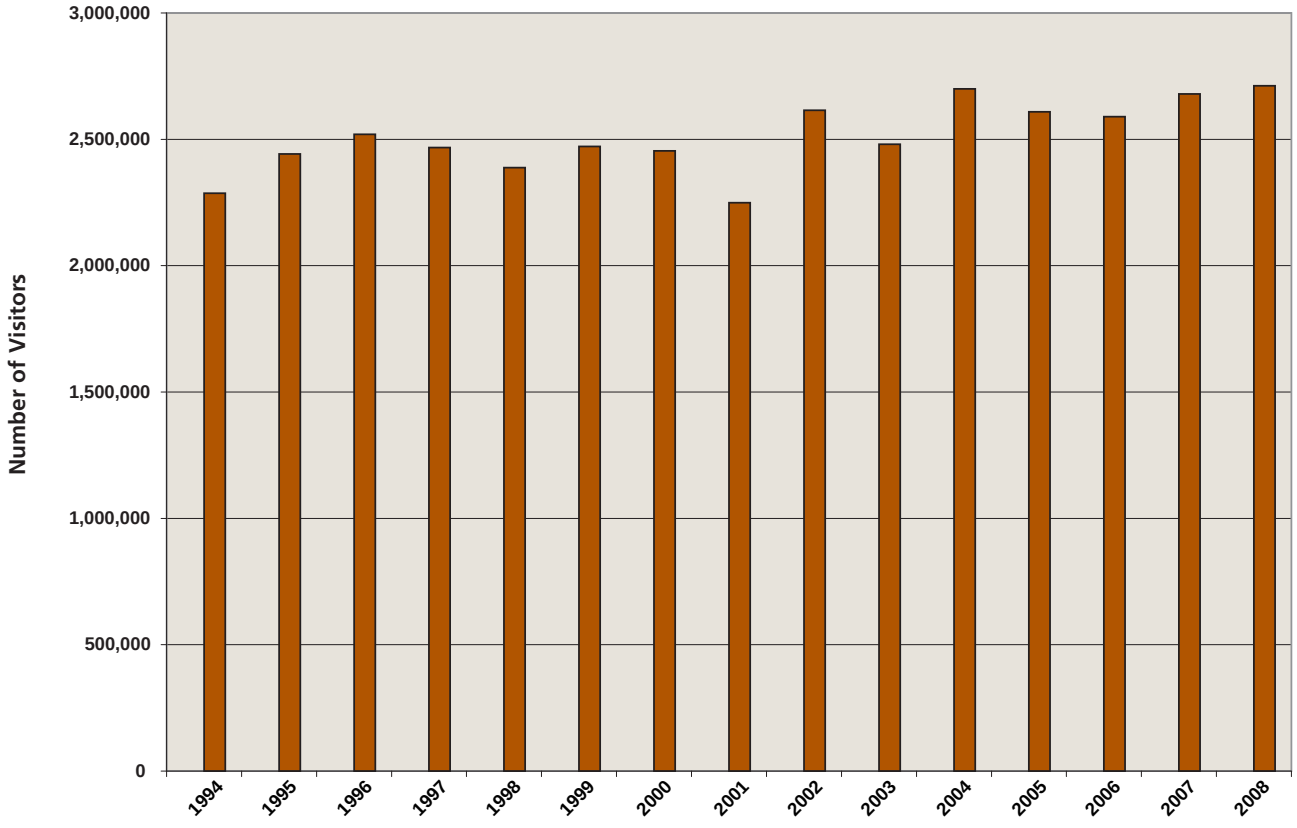


Figure 1-6 Zion National Park Annual Visitation, 1994-2008 (last 15 years).

- Multi-modal transportation options
- Sense of arrival to Springdale/ Springdale streetscape
- Shuttle service
- Visitor information and communications/ wayfinding
- Parking
- Visitor management/congestion management (including at the gate)

Results of March 2009 Pilot Projects Action Plan Meeting

The purpose of the March 2009 workshop was to convene stakeholders and the community to prioritize immediate action items resulting from the Draft Zion Canyon Transportation System Technical Analysis. The objective of the meeting was to prioritize and assign responsibilities to stakeholders for each item. Immediate actions included only those that could be completed within 2009. Stakeholders in attendance included members from the Springdale Visitors Bureau, Town of Springdale, Parking Committee, NPS, business owners, and UDOT. The meeting facilitated an opportunity for positive collaboration and sharing of ideas for how to begin implementing the plan and achieving on the ground results. It was considered especially effective because key people were designated for each task. A second meeting was scheduled for March 24 at Town Hall to follow up on action items and continue implementation planning efforts. The group hopes to continue meeting to work together to solve many of the transportation problems and issues currently being experienced in Springdale and Zion National Park.

Additional summaries and notes from the May and November 2008 and March 2009 meetings are provided in Appendix D.

Table 1-1. Issues Prioritization (Listed in Order of Most-Often Discussed/Mentioned)

Meeting 1: May 7, 2008 Zion NP Staff*		Meeting 2: May 8, 2008 Stakeholders		Meeting 3: May 8, 2008 General Public Meeting Open House
Topic	Number of Comments Received	**Topic**	Number of Comments Received	Comments
Parking	13	**Parking**	8	Parking (can't find parking, need more parking, need better parking management; do not pave open spaces in town for more parking)
Financial Sustainability	11	**Gate Back Up**	6	Shuttle service/shuttle stops (includes mention of need for down canyon connections)
Service Planning	9	**Connection to Down Canyon**	5	Wayfinding/signing/visitor information (concerns about passive vs. electronic signs)
Fleet Replacement	7	**Buses/Financial Feasibility**	2	Shuttle vehicles
Ridership	1	**Maintenance Outside the Park**	2	Pedestrian considerations in Springdale/multi-modal pathways and trails in park
Other	--	**Sharing the Road**	1	Regional transportation

**Similar comments to those from scoping meeting with the park in January 2008*

Benefits of the Zion Canyon Shuttle System

An important outcome of the technical analysis has been solid confirmation that the Zion Canyon shuttle system is viewed positively by the community of Springdale and park visitors. Many visitors and Springdale representatives have commented on the benefits of the system. Not only does the system reduce traffic congestion and provide alternative transportation options, it also brings significant economic, environmental, and visitor experience benefits.

Regional and Local Economic Benefits

Since the shuttle system began operation in 2000, park visitation has increased. Visitation to the park greatly benefits the local and regional economy. The average visitor group at Zion typically consists of 2.7 people, and the group will spend about $246 within an hour's drive of the park. On a group trip basis, the average spending in 2006 for groups was:

- $67 for day trips
- $178 for campers staying inside the park
- $273 for campers staying outside the park

Park visitors spend approximately $113 million each year in the area

- $560 for visitors staying in motels and lodges outside the park
- $639 for visitors staying in park lodges or cabins

Total visitor spending in 2006 within an hour drive of the park was $113 million (not including revenues received by the park such as park admissions and donations). Of this amount,

- 35 percent was for lodging,
- 23 percent was for restaurants and cafes,
- 12 percent was for local transportation,
- 9 percent for gas and oil,
- 6 percent for groceries, and
- 13 percent for souvenirs and shopping.

Eighty percent of visitors indicated the park visit was the primary reason for the trip to the area. Counting only a portion of visitor expenses, if the park visit was not the primary trip purpose, yields $99 million in spending attributed directly to the park.

Including direct and secondary effects, the $113 million spent by park visitors in 2006 supported 2,432 jobs in the area and generated $143 million in sales, $57 million in labor income, and $83 million in value added (labor income as well as profits and rents to area businesses and sales and excise taxes). After adjusting for non-primary purpose trips, local economic impacts of $99 million in spending in 2006 as a result of specific visits to Zion National Park supported 2,084 jobs and generated $49 million in labor income and $72 million value added. (Source: *Impacts of Visitor Spending on the Local Economy: Zion National Park, 2006*, Daniel J. Stynes, Department of Community, Agriculture, Recreation and Resource Studies - Michigan State University, September 2008)

Environmental Benefits

Implementation of the Zion Canyon shuttle has reduced the level of resource impacts in the canyon/national park and has resulted in improved environmental conditions (better air quality, less noise, reduced social trails, etc.) In addition to these specific benefits, the shuttle system also has resulted in the following planet-friendly environmental benefits.

- LESS CARS: Each full shuttle replaces 28 cars, or approximately 8,100 vehicle trips per day in the summer season.
- LESS MILES DRIVEN: The shuttle reduced visitor miles driven in private cars by 50,385 each day or 10.6 million miles a year.
- REDUCED CARBON EMISSIONS: The shuttle reduced CO_2 emissions by 24,201 pounds (12 tons) each day or 2,264 tons a year for a 222-day season.

(Source: Zion National Park, 2008)

Visitor Experience Benefits

Surveys conducted at the park have confirmed that visitors believe the shuttle system has enhanced visitor experience, and 95 to 98 percent of visitors like the system. (Source: National Park Visitor Study, Summer and Fall 2006, University of Idaho Park Studies Unit)

Shuttle drivers provide interpretation to visitors, increasing their knowledge of park features and resources, and enhancing their experience.

Scenic Zion Canyon