

**The Potential for Alternative Transportation at Chimney Rock,  
San Juan National Forest**



**Prepared by the U.S. Department of Transportation  
John A. Volpe National Transportation Systems Center<sup>i</sup>**

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## **Report Notes and Acknowledgements**

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## **Introduction**

This report discusses the benefits of and ways that a shuttle system could operate at Chimney Rock in the San Juan National Forest in southwest Colorado. In recent years, Chimney Rock has experienced an increase in visitation and, along with this increase, challenges to safety, resource preservation, and parking capacity within its boundaries. Visitation, along with these pressures, are likely to increase if Chimney Rock is designated a National Monument, which is possible within the next couple of years.

In sum, this report finds that piloting a shuttle system at Chimney Rock is a relatively low-cost option that the USFS could pursue along with its partners to test how an alternative transportation system may help to accommodate the increase in visitation and its impacts to safety and resource concerns. Since the need for a shuttle –again, due to safety and resource degradation concerns –is significant, potential solutions are reasonable and the cost is not prohibitive, piloting a shuttle for two full seasons of “regular” visitation and pertinent special events would be a prudent approach to gaining valid information that can be used to determine what type of permanent alternative transportation system could be implemented. Ideally, the shuttle system should run daily and at selected special events.

## ***Background***

Chimney Rock is a San Juan National Forest Archaeological Area located in Colorado 47 miles east of Durango and 20 miles west of Pagosa Springs. It is managed for archaeological protection, public interpretation, and education. Management of Chimney Rock’s care, protection, and preservation are shared by the United States Forest Service (USFS), San Juan National Forest, Pagosa Ranger District; the Chimney Rock Interpretive Association (CRIA); and the public, (who contributes through tour fees, donations, and purchase of items from the Chimney Rock Visitor’s Center). The Chimney Rock Interpretive Program, managed and staffed by the USFS and volunteers of CRIA, conducts daily guided walking tours and operates the Visitor Center during in-season, May 15 to September 30. Self-guided tours are available for visitors as well.

Chimney Rock, which was designated an Archaeological Area and National Register Site in 1970, lies on San Juan National Forest land surrounded by the Southern Ute Indian Reservation. The site was home to the ancestors of the modern Pueblo Indians 1,000 years ago and is of great spiritual significance to these tribes. Their ancestors built nearly 200 sites that include more permanent structures, such as homes and ceremonial buildings, high above the valley floor, probably to be near the sacred twin rock pinnacles as well as to provide for secure work camps near farming areas.<sup>1</sup>

## **Existing Conditions**

### ***Facilities***

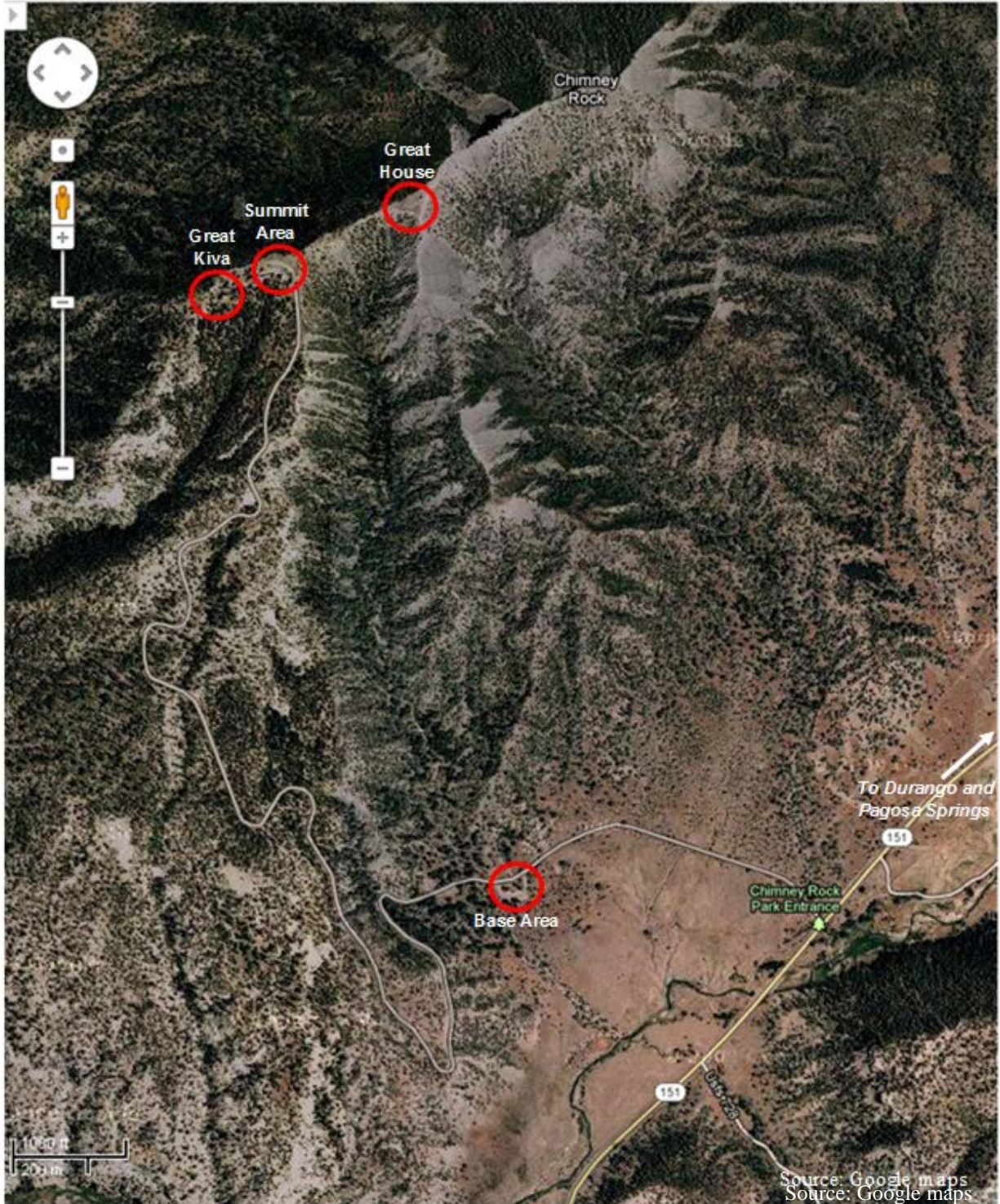
The facilities at Chimney Rock Archaeological Area are clustered into two areas: 1) an area at the base of the Chimney Rock formation, including and surrounding the Visitor’s Center and 2) an area at the top of the three-mile access road, including and surrounding the upper parking lot

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<sup>1</sup> Source: <http://www.chimneyrockco.org>

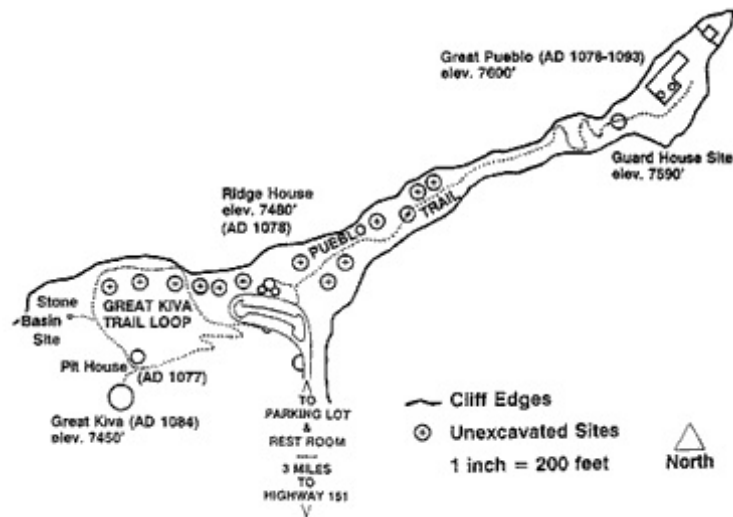
(Figure 1). The base area consists of the Visitor's Center, a 22-stall parking lot, primitive restrooms, picnic benches, interpretive signs, self-guided nature trail, and an informal amphitheater (see Figure A-10 in Appendix A). The summit area consists of a two-tier, 28-stall parking lot, primitive restrooms, trailheads and associated trails to archaeological sites, interpretive signs and a sitting area (see Figure A-11 in Appendix A). The access road covers 0.5 miles from the entrance off of Colorado Highway 151 to the base area, and three steep, winding miles from the base area to the summit (see Figure A-12 and Figure A-13 in Appendix A). The road is 24-feet wide edge-to-edge with 3:1 sloping shoulders. The access road and lower and upper parking lots were built between 1962 and 1967.

Figure 1: Chimney Rock Archaeological Area facilities



According to CRIA's website, the Chimney Rock Project in 1970-1972 was the definitive survey and excavation work at Chimney Rock.<sup>2</sup> The USFS contracted to have four structures excavated and partially-restored for public visitation. The four partially-restored structures are visited on the guided walking tour and include the Pit House, Great Kiva, Ridge House, and Great Pueblo (Figure 2).

**Figure 2: Chimney Rock Archaeological Area trails and features<sup>3</sup>**



The discovery of the endangered Peregrine Falcon within Chimney Rock prompted the area's closing in 1974 that extended for the next fourteen years, with only occasional group tours given by the USFS during this time period. Regular public tours provided by USFS summer intern guides began in the mid-1980s after restroom facilities were added at Chimney Rock. Beginning in the late-1980s, volunteer guides affiliated with the San Juan Mountains Association (SJMA)<sup>4</sup> conducted the regularly-scheduled tours in season. Facility improvements in the 1990s included construction of a barrier-free lower trail, paving of the lower and upper parking lots, and construction of the new visitor center cabin and two new restrooms. CRIA was derived from the Pagosa Chapter of the SJMA, operates under a special-use permit, and has conducted the public tours beginning with the 2004 season. The Forest Service manages the parking lots, access road, and restrooms; CRIA manages the Visitor's Center, the other facilities in the base area, and the trails at the summit area.

### **Admission**

Chimney Rock is open to the public for four and a half months, from May 15 to September 30. The cost for adult admission is \$10 and children cost \$5; children under 5 are free. Four guided

<sup>2</sup> Source: <http://www.chimneyrockco.org>

<sup>3</sup> Source: <http://www.chimneyrockco.org/mainnew.htm>

<sup>4</sup> SJMA is a non-profit 501 (c) (3) corporation located in Durango, Colorado. SJMA's staff and volunteers help answer questions on camping, backpacking, and mountain biking in the forest. According to their mission, SJMA promotes responsible care of natural and cultural resources through education and hands-on involvement that inspires respect and reverence for the San Juan Public Lands.



walking tours are conducted daily at 9:30 AM, 10:30 AM, 1:00 PM, and 2:00 PM and typically average 2.5 hours in length. Reservations are required for groups of ten or more. Tours are led by CRIA volunteers. Pets are not allowed on any of the trails but a shaded kennel at the base area is available on a first come, first served basis.

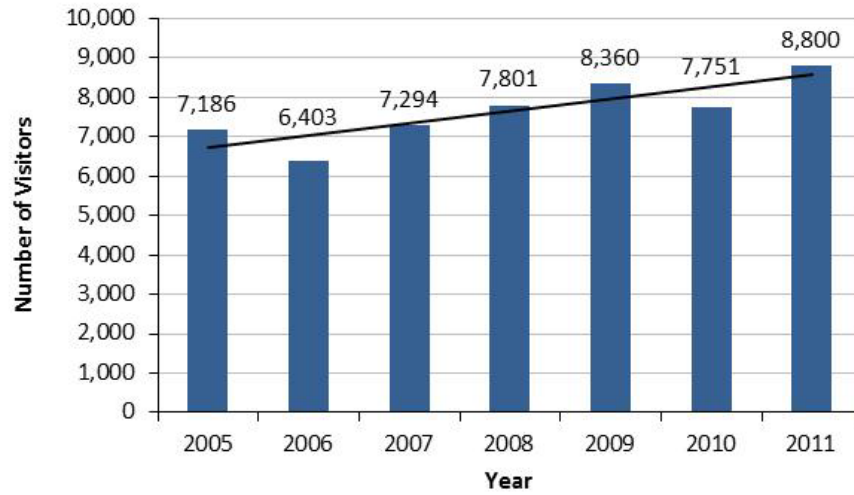
Guided tours are provided for both the Great Kiva (lower ridge) trail and the Great House (upper ridge) trail. These tours are capped at 25 people since larger group sizes have a hard time hearing the tour guide, and it is difficult for the tour guide to keep track of each tour participant. Keeping track of each visitor is important since visitors may inadvertently wander off the path and into sensitive areas, and visitors may be affected by the high altitude and heat exposure. The tour guides try to keep an eye on how everyone is doing throughout the 2.5-hour tour. Visitors must be part of a guided tour to access Upper Ridge Trail. This half-mile trail climbs 200 feet in elevation along a rocky ridge to access the Great House. At some points along the trail, visitors have to walk directly adjacent to and even over prehistoric ruins that have yet to be uncovered.

In addition to the guided tours, CRIA offers visitors the opportunity to take a self-guided tour on the Great Kiva trail only (visitors can only go on the Great House trail on a guided tour). This trail features the Great Kiva and a reconstructed pit house. Numbered sign posts along the path correspond to a printed brochure that describes each numbered stop along the way. The quarter-mile path is concrete and is wheelchair accessible. Self-guided tour pricing is the same as for a guided tour, and visitors can join a guided tour that comes along if there is space on that tour. This self-guided tour is only available from 10:30 AM to 2:30 PM, when Volunteer Monitors are on site.

### ***Visitation***

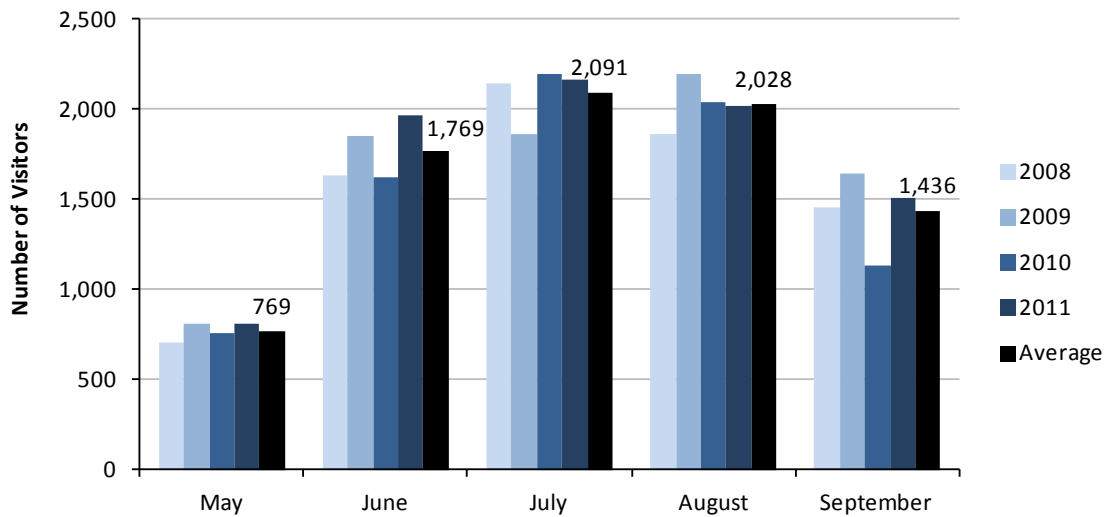
Approximately 12,000 people visited Chimney Rock in 2011, with 8,800 participating in CRIA tours, (Figure 3) – the highest tour participants on record (records began in 2005). The peak month for tour participants is July, followed closely by August (Figure 5), and based on 2005-2007 data, the peak day of the week for tour participants are Mondays, followed by Wednesdays, Tuesdays, and Thursdays (Figure 4). Based on more detailed CRIA tour participant records from the past two years, about 10 percent of participants are children, and 10 percent participate using a pass. While 15 - 20 percent take the self-guided tour, the remaining (80 - 85 percent) participate in a guided tour.

**Figure 3: CRIA tour participants, 2005 – 2011<sup>5</sup>**



Year	2005	2006	2007	2008	2009	2010	2011
Number of Visitors	7186	6403	7294	7801	8360	7751	8800

**Figure 4: Average CRIA tour participants by month, 2008 – 2011<sup>6</sup>**

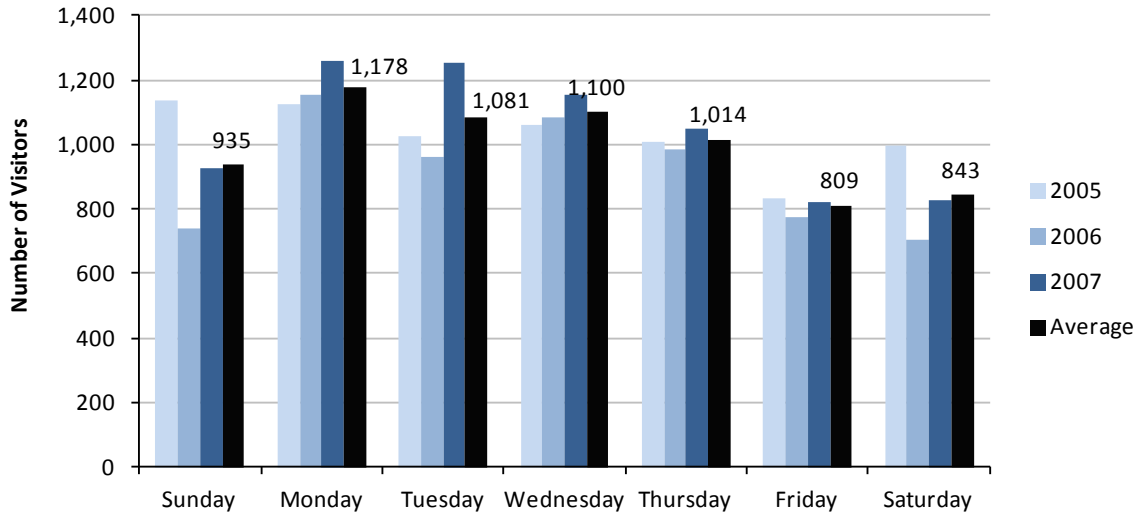


	May	June	July	August	September
2008	703	1636	2139	1863	1460
2009	808	1851	1866	2195	1640
2010	757	1623	2198	2036	1137
2011	806	1967	2162	2019	1507
Average	769	1769	2091	2028	1436

<sup>5</sup> These visitor counts only account for visitors who use the services of CRIA and are therefore counted by CRIA staff; other visitors visit the site at other times of the day or during the off season and do not interact with CRIA. For example, the Forest Service estimated visitation at 12,000 for 2011. FS visitation includes after-hours and off-season visits.

<sup>6</sup> Note that CRIA is only open for half a month in May

**Figure 5: Average CRIA tour participants by day of the week, 2005 – 2007**



	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2005	1138	1123	1026	1063	1006	834	996
2006	741	1152	963	1083	984	776	704
2007	927	1260	1255	1154	1051	818	829
Average	935	1178	1081	1100	1014	809	843

***Programs***

Special events bring hundreds of visitors to Chimney Rock, often all at the same time, thereby taxing the existing transportation facilities. Table 1 summarizes the most significant of these programs. The Full Moon Program is capped at 150 people, and 2011 marked the first year that this program was consistently full; CRIA even had to turn some people away. While there is no current cap for the Night-Sky Archaeoastronomy Programs, the program reached a high of 56 participants in 2011. The Chimney Rock Native American Cultural Gathering has brought the largest crowds to Chimney Rock. In 2011, Southwest Native Cultures provided shuttle service to ease congestion on the roads, enhance safety (by reducing the number of cars on the road), and to ease parking capacity issues during this event. This shuttle service is described in more detail in the following section of this report.

**Table 1: Description of special events and programs at Chimney Rock**

<b>Program Name</b>	<b>Description (and Duration)</b>	<b>Frequency and Cost</b>
Full Moon Program	Watch the full moon rise at the Great House Pueblo site, learn about the Ancestral Puebloans, archaeoastronomy theories, area geology, and enjoy Native American flute melodies by Charles Martinez (2 to 3 hours long)	Once per month (May – Sept.); cost: \$15
Night-Sky Archaeoastronomy Programs	Learn about visible celestial objects and naked-eye astronomy of Ancestral Puebloans; night-sky telescope viewing (3 to 4 hours long)	Once per month (June – Aug.); cost: \$10
Local Appreciation Days	Half-price tour fees for local residents (all day)	Memorial Day weekend
Sunrise Programs	These events begin at the Sun Tower, a place not visited on our regular tours, and concludes at the Stone Basin giving visitors two locations to view the rising sun (2 to 3 hours long)	Summer Solstice and Autumnal Equinox; cost: \$15
Life at Chimney Rock	Interactive demonstrations of crafts and skills of ancestral Puebloan culture and regional Native American cultures (10:00 AM – 4:00 PM)	One weekend in June; cost: free (regular tour fees of the summit are apply)
Chimney Rock Native American Cultural Gathering	Traditional singers, storytellers, and dancers from various Pueblos; traditional Puebloan Social Dances in the Great Kiva; Native American arts and crafts available (all day)	One weekend in July; cost: \$10 (no tours are available)

## **Issues**

The main transportation issues and challenges facing Chimney Rock are ensuring the safety of visitors, relieving parking pressures/congestion, preserving prehistoric sites/minimizing resource degradation, protecting investments in infrastructure, reducing maintenance costs, and protecting the environment. These issues are apparent in two main ways: visitor parking and accessing the summit areas.

### ***Parking***

Visitors must stop and park at the Visitor’s Center at the base area. While they can tour the base area facilities without paying, visitors pay for a guided or self-guided tour and then travel to the summit area. The base area lot has 22 parking spaces, including two accessible spaces, and the summit area lot has 28 parking spaces, including two accessible spaces. There are no designated RV parking spaces in either lot. Since RVs are prohibited from driving up the steep road to the summit area, it is not unusual for one to take up five parking spots in the lower lot, which makes parking for the other vehicles difficult. Two overflow parking areas can be used during special events: a small gravel area just up the road from the lower lot, which can accommodate eight cars, and a large grassy area that has been used as a helicopter landing area down the road from the lower lot. During special events, like the Chimney Rock Native American Cultural Gathering, cars also park along the road leading from the entrance gate to the lower lot and cabin.

### *Accessing the Summit Area*

For the guided tours, a tour guide leads visitors up the road in their vehicle. Visitors drive their own vehicles and they all back out of their parking spots in the lower lot at about the same time. This sight has been described as looking like “bumper cars”, but no damage to vehicles has yet to be recorded. Volunteers usually give visitors who arrive in RVs or on motorcycles a ride up to the summit area in their private vehicles.

Visitors then all park in the upper lot, which has 28 parking spaces. Since tour times and groups overlap at points in the upper lot, overflow parking sometimes occurs on the unofficial shoulders of the access road. This unofficial parking is very unsafe and undesirable for several reasons:

- There is not much space adjacent to both sides of the road near the summit area because the road travels along the top of a ridge (see Figure A-13); accordingly, the unofficial parking limits the width of the roadway so that vehicle traffic along the road is very confined, thereby making walking or opening car doors along the road hazardous
- Emergency vehicles have had a difficult time accessing the summit area when there is overflow parking on both sides of the access road near the summit area
- The unofficial parking erodes the sides of the road, which drop precipitously down the ridge of the mountain on both sides of the road; this is a hazard for a visitor who may lose their footing on the either side of the road
- Visitors parking on road shoulders often exit upon archaeological sites or vegetated areas, and may inadvertently cause irreparable resource impacts

Self-guided visitors can drive to the upper lot unescorted; a Volunteer Monitor is usually present for them to begin their self-guided tour on the Great Kiva trail.

Instead of driving to the summit area, visitors can walk up the three-mile access road. This hike is not ideal since motorists are usually not expecting to see people walking on the road, and the quality of the hike is not very attractive – the road is dusty, there is an elevation gain of 800 feet, and there is little shade. Visitors who walk up the road must walk back down. On busy days, CRIA has observed 10 to 20 people walking the access road. Walking the road is more common when visitors access the site after hours or when the site is closed.

Because their drivers are usually familiar with Chimney Rock and driving on dirt roads, school buses are allowed up the road but are not allowed into the upper lot. Instead, they must turn around by making a multi-point turn at the entrance of the upper lot. Buses used to be allowed in the upper lot, but due to tight turns, they usually could not successfully navigate between the upper and lower sections of the lot and had to back-up at a certain point over a low point in the wall surrounding the parking lot and onto the land. This maneuver damaged the wall and impacted the adjacent land. Charter buses do not currently stop at Chimney Rock; they would likely need to park like RVs if they were to arrive. Some clubs occasionally bring people in large vans.

A 24-passenger shuttle ran during the Chimney Rock Native American Cultural Gathering (Saturday, July 23, and Sunday, July 24, 2011) that was mandatory for visitors to take to access the summit area. The shuttle significantly alleviated parking issues at and downhill from the upper lot, but the wait time was long at some points throughout the day. This was difficult for some people due to the heat. Most visitors did not know there was going to be a shuttle in operation at the event. Southwest Native Cultures, which ran the event, did not receive

confirmation from Wilderness Journeys (a local outfitter) that they would have a shuttle available for use until a week before the event. Accordingly, there was not enough time to publicize the shuttle on printed promotional materials or the website. The shuttle was donated by Wilderness Journeys and the shuttle driver, who had to have a CDL, was a CRIA volunteer.

The shuttle made more than 20 roundtrips (approximately six miles total) each day, most of which were at capacity (24 people), and operated from 9:00 AM to 5:30 PM. In the future, at least two shuttles should be used since some visitors had to wait an hour for a shuttle ride down to the base area (a majority of visitors all left at once when the program ended at the summit area). Participants in the gathering could drive to the upper lot, as could handicap visitors. The shuttle was fueled in Pagosa Springs and the cost was covered by Southwest Native Cultures.

## **Opportunities**

To proactively address the issues cited above, Chimney Rock should consider its options and opportunities at this point looking forward. As with any analysis of options, one that should always be considered is to do nothing/status quo. Assuming continued visitation growth, this option would likely mean that the parking lots at Chimney Rock would become more congested and more parking would occur in undesignated spaces off the sides of the road, the safety of visitors – both motorists and pedestrians – would be increasingly jeopardized, and natural resources would be further degraded (through erosion, etc.). Another option would be to expand parking for visitors' vehicles, but while this might be a possibility for the base area, this is not an option for the summit area due to the volume of immediately-adjacent prehistoric sites. Accordingly, with this option, the issues listed above would still be of concern. Another option, to minimize these issues and provide a quality experience for the visitor, would be to pursue a shuttle/park and ride. The following section describes how this option could operate and be pursued by Chimney Rock and its partners.

### ***Shuttle/Park and Ride Options***

Stakeholders (Chimney Rock, CRIA, and Southwest Native Cultures) agree that it would be desirable if at least two shuttles could be used at the next Chimney Rock Native American Cultural Gathering. It is unclear whether the vehicles will come from Wilderness Journeys or from another partner (potential partners are explored in more detail below). Shuttles could also be used during high-visitation events, like the Full Moon Program and/or at peak times during the season (primarily July and August). To reduce visitor confusion (as to what dates the shuttle runs), and if the funding is available, a shuttle system could run during the entire season (May 15 – September 30), especially since visitation has steadily been increasing, and will likely show a sharp increase if Chimney Rock is designated a National Monument.

With a shuttle system in place, visitors could park their cars in the base area parking lot and take a shuttle to the summit area. Once parking in the base area parking lot reaches capacity, overflow parking (i.e., the gravel lot, the helicopter field, and/or along the road) could be utilized. If parking begins to occur in undesignated areas, Chimney Rock should consider expanding its parking capacity in the base area. Signage should be installed to help direct visitors where to park.

The rest of this section discusses the feasibility of implementing a shuttle service at Chimney Rock. The assumption for this section is that, due to the many benefits of a shuttle system described below, the shuttle system would be mandatory for all visitors without special needs.

### Benefits of a shuttle system

There are multiple benefits associated with implementing a shuttle system at Chimney Rock. These benefits include:

- Improves safety for pedestrians and motorists – fewer cars (driven by visitors unfamiliar with the challenging conditions) on the steep, winding, unpaved, and primitive access road (where people hike) and in the summit area parking lot (where people are walking around) translates into fewer vehicle-pedestrian conflicts and potential collisions. Similarly, fewer cars on the access road and in the summit area parking lot means that there would be fewer vehicle conflicts and potential collisions in those areas as well.
- Controls access to prehistoric sites and reduces negative impacts to important cultural resources – implementing a shuttle system will help keep tour groups all together, as opposed to dispersed as they are getting out of their vehicles.
- Improves access for emergency vehicles – fewer cars parking along the access road near the summit area and fewer vehicles in the summit area parking lot will more easily allow emergency vehicles to access the summit area parking lot.
- Creates less dust – more people riding in one vehicle as opposed to several separate vehicles will reduce the amount of dust being kicked up along the access road. A reduction in dust improves the hiking experience for visitors along the access road as well as it reduces visual pollution in the area.
- Leads to less erosion – fewer people driving along the access road and fewer people parking along the access road near the summit area (in overflow situations) will, respectively, reduce the degree of washboarding on the access road and will reduce the degree of erosion along the shoulders of the access road near the summit area.
- Saves energy and pollutes less – fewer cars making the five-mile roundtrip will reduce the amount of gas used by visitors and will result in a related reduction in the emission of pollutants from private vehicles. Approximately 640 gallons of gasoline, equating to 5,380 pounds of carbon dioxide, would have been saved if the 8,800 visitors in 2011 used a 24-passenger shuttle instead of driving their own cars.<sup>7</sup> If the shuttles run on a greener fuel, such as biodiesel or compressed natural gas, or are hybrid electric vehicles, these savings would be even more pronounced.
- Reduces road operations and maintenance costs – fewer vehicles on the road will reduce wear-and-tear on the road, thereby necessitating less grading and other road work.
- Provides an opportunity for interpretation and setting ground rules – if the driver is comfortable talking while driving (or if not, a CD can be played), information about the

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<sup>7</sup> Assumes a vehicle occupancy of 2.5 people, private vehicles that average 22.6 MPG, and a bus that makes four roundtrips each day with an average of 11 MPG.

site and ground rules for staying together during the tour can be shared with shuttle passengers. This information may enhance the visitor's experience with their visit.

More benefits are realized a) the more often the shuttles are used; and b) the larger the capacity of the shuttle system is. In sum, the following options are listed in descending order of maximizing the benefits of a shuttle system:

1. Two shuttle busses (most beneficial)
2. Two vans/multi-passenger vehicles or one shuttle bus with a dedicated driver
3. One smaller shuttle bus or one van with a dedicated driver
4. One van (least beneficial)

### Vans vs. shuttle busses

Two vehicle options exist:

1. Chimney Rock procures passenger vans (with a capacity of up to 14 people)
2. Chimney Rock procures shuttle busses (with a capacity of up to 24 people)

The advantages of the first option are that vans are less expensive than the shuttle busses (to purchase/lease, operate, and maintain) and that drivers would not need a CDL, which can be a significant obstacle, especially if CRIA volunteers (which by definition are not paid and therefore would save the operation that cost) are to drive the shuttles. Vans are also more fuel-efficient. In addition to not having the capacity of shuttle busses, a notable disadvantage of vans is that they can be difficult for passengers to board and alight, particularly for older or mobility-impaired passengers.

The main advantages with the second option are that capacity is greater for busses and that an entire tour group could fit in a shuttle bus. Shuttle busses are also easier to board and alight. One disadvantage of using shuttle busses is that if the shuttle busses were to be operated by CRIA, their volunteers work an average of one day a week, so either seven volunteers would need CDLs or one or two would need to be persuaded to work more days per week. It should also be noted that most CRIA volunteers are retirees who may or may not return to Chimney Rock to volunteer year after year.

### Shuttle system schedule – special events

Two vehicles should be in operation during special events because one shuttle has been shown to be overwhelmed during special events (i.e., the Chimney Rock Native American Cultural Gathering and the Full Moon Program). The drivers of these vehicles would need to shuttle people from the base area to the summit area before, during and after the program on the summit concludes. Because the goal would be to get as many visitors to the summit (and then back to the base) area as quickly as possible, the shuttles should have no layovers or breaks before and after the program; instead, drivers should turn around and begin the next leg of their route as soon as they drop off their passengers. The shuttle busses would be much more effective for these special events since they could move more visitors than vans. If vans are used, the wait time for visitors to catch a ride may be significant at peak times.

### Shuttle system schedule – regular season

Two options exist for shuttle service during the regular season. Assuming that the drivers of the vehicles would also be the tour guides, two vehicles would be needed to accommodate the



current tour schedule (9:30 AM, 10:30 AM, 1:00 PM, and 2:00 PM). Given this assumption, people would ride in the vehicles on the way up, and would ride down in the same vehicle after the tour. Under this assumption, only half of the tours scheduled per day would use a shuttle if only one vehicle is procured.

Another option could be that the shuttle drives tour groups between the base area and the summit area all day long. This option assumes that there is a dedicated shuttle driver (with a CDL, if a bus is procured) and that the tour guide is not the shuttle driver. Under this assumption, only one vehicle would need to be procured, at least for service during the regular season (two vehicles would still be ideal for special events).

If vans are procured, then if the tour group size exceeds 13 people, the remaining visitors would need to drive in their own cars and follow the van up to the summit area. If shuttle busses are procured, then the entire tour group could ride up in the vehicle together.

Piloting shuttle service

Whatever option is decided upon, Chimney Rock should consider having the shuttle piloted before being implemented on a more permanent basis. Piloting the service is prudent since many options exist (Table 2); piloting one option will not only help fine-tune the operation of that option but might cause Chimney Rock to consider pursuing a different option at a later time. Because it would be difficult to extrapolate how the shuttle works during special events to how it could work during the regular season, Chimney Rock should consider piloting a system that at least offers partial service during the regular season (Options C – H). The pilot should cover at least one season, but ideally two since the system could be fine-tuned over the winter and re-tested during the second season.

**Table 2: Options for piloting a shuttle at Chimney Rock**

<b>Option</b>	<b>Days in Operation</b>	<b>Number of Shuttles in Operation</b>	<b>Dedicated Driver or Tour Guide Driver</b>
A	Special events	1	Dedicated driver
B		2	Dedicated driver
C	Special events and July - Aug. of the regular season	1	Tour guide driver
D		1	Dedicated driver
E		2	Tour guide driver
F		1	Tour guide driver
G	Special events and all of the regular season	1	Dedicated driver
H		2	Tour guide driver

Cost estimate

For a pilot period, leasing a shuttle through the U.S. General Services Administration (GSA) or working out a lease with a partner (such as one of those listed below) would be a cost-effective and non-binding choice for Chimney Rock to pursue. According to the GSA’s 2012 vehicle lease rates:<sup>8</sup>

<sup>8</sup> <http://www.gsa.gov/portal/category/21852>

- A passenger van would cost \$201-407/month with \$0.195-0.32/mile for gas and maintenance. The price varies depending on size and what options are selected.
- A 24-passenger cutaway shuttle bus (Figure 6) would cost \$560/month with \$0.525/mile for gas and maintenance.
- A 24-passenger school bus would cost \$554-664/month with \$0.51-0.59/mile for gas and maintenance.

**Figure 6: An example of a cutaway shuttle bus available through GSA**



Lower floor and larger size buses and shuttles would cost more. Table 3 estimates the cost for each of the options listed in Table 2 for three different service periods. Assumptions include that a roundtrip is five miles in length and takes 30 minutes (including loading and unloading), that vehicle(s) would be in operation continuously for special events, peak months include July and August, and that a vehicle would have to be leased for the full season to cover special events. It would be ideal if Chimney Rock could test-drive its desired vehicle from the base area to the summit area before committing to a lease or sale. The vehicle must be able to safely navigate the parking lots and their tight turns, especially the summit area parking lot.

**Table 3: Cost estimates per month and per season for leasing a vehicle through GSA**

Option	Service Period	Vehicle Type	Cost of Lease	O&M Cost	Total Cost per Season <sup>9</sup>
A	<i>Only Special Events</i>	Van	\$904 - 1,831	\$68 - 111	\$972 - 1,943
		Bus	\$2,493 - 2,988	\$177 - 205	\$2,670 - 3,193
B		Van	\$1,809 - 3,663	\$136 - 223	\$1,945 - 3,886
		Bus	\$4,986 - 5,976	\$355 - 411	\$5,341 - 6,387
C	<i>Peak Months + Special Events</i>	Van	\$904 - 1,831	\$140 - 230	\$1,113 - 2,173
		Bus	\$2,493 - 2,988	\$367 - 425	\$3,038 - 3,618
D		Van	\$904 - 1,831	\$281 - 461	\$1,253 - 2,404
		Bus	\$2,493 - 2,988	\$734 - 850	\$3,405 - 4,043
E	<i>Full Season + Special Events</i>	Van	\$1,809 - 3,663	\$281 - 461	\$2,226 - 4,347
		Bus	\$4,986 - 5,976	\$734 - 850	\$6,075 - 7,236
F		Van	\$904 - 1,831	\$316 - 518	\$1,288 - 2,461
		Bus	\$2,493 - 2,988	\$826 - 956	\$3,497 - 4,149
G	<i>Full Season + Special Events</i>	Van	\$904 - 1,831	\$632 - 1,037	\$1,604 - 2,980
		Bus	\$2,493 - 2,988	\$1,652 - 1,912	\$4,323 - 5,105
H		Van	\$1,809 - 3,663	\$632 - 1,037	\$2,577 - 4,923
		Bus	\$4,986 - 5,976	\$1,652 - 1,912	\$6,993 - 8,298

Two additional items must be considered. First, the nearest gas station is outside of Pagosa Springs, 17 miles away. Accordingly, there will be a periodic need (and additional cost) to drive the vehicle to Pagosa Springs and back. Second, and more importantly, is the other major cost associated with shuttle systems: salaries. The lowest cost salary option for Chimney Rock is to have CRIA volunteers drive the shuttles. As mentioned earlier, this may not be a problem if Chimney Rock leases one or two vans and tour guides/volunteers are competent to drive a shuttle on the steep, winding, and primitive road. However, if Chimney Rock leases one or two shuttle buses, then the driver must have a CDL. Since currently only one CRIA volunteer has a CDL, additional volunteers would need to train and receive CDLs, or Chimney Rock would need to hire a driver. It would likely be difficult for CRIA to train all of its tour guides to receive CDLs since many of the tour guides would not be interested in the training (nor in driving a shuttle bus) or would be unable to pass the test. Instead, it would be more likely for CRIA to opt to train one or two volunteers to be dedicated shuttle bus drivers for all or a portion of the season (or hire out this critical position) CDLs in Colorado cost \$35 and are good for four years.

Chimney Rock would have two options to hire a driver: CRIA or another partner could hire a driver or the USFS could hire a seasonal employee to drive the shuttle. According to the Bureau of Labor Statistics' Occupational Employment Statistics, the median wage for a bus driver in a western Colorado non-metropolitan area is \$15.40/hour.<sup>10</sup> According to the Office of Personnel Management (OPM),<sup>11</sup> a federal employee driving would likely be Grade 6. Also according to the OPM,<sup>12</sup> the wage of a Grade 6 – Step 1 employee is \$16.73/hour in FY12.

<sup>9</sup> The total cost for the B and C options includes the O&M costs for special events

<sup>10</sup> [http://www.bls.gov/oes/current/oes\\_0800002.htm](http://www.bls.gov/oes/current/oes_0800002.htm)

<sup>11</sup> <http://www.opm.gov/fedclass/fws5703.pdf>

<sup>12</sup> <http://www.opm.gov/oca/12tables/indexGS.asp>

Table 4 shows what the cost for salaries would be for the types of operation discussed above. Only the dedicated driver (DD) options are estimated since if Chimney Rock hires a driver, it only makes sense for the driver to continuously shuttle people to and from the summit. It is assumed that a work day is eight hours long. Note that these estimates do not include the cost of benefits, which usually equate to 30 percent of the employee’s salary. Also note that one driver would not likely be able to work seven days a week; Chimney Rock would therefore need to hire two part-time or one full-time and one part-time seasonal employees.

**Table 4: Salary estimates per season**

<b>Option</b>	<b>Type of Wage</b>	<b>Wage per Season</b>	<b>Wage + Benefits per Season<sup>13</sup></b>
<i>Special Events Only</i>	Federal	\$477	\$620
	Private	\$519	\$675
<i>Peak Months</i>	Federal	\$7,392	\$9,610
	Private	\$8,030	\$10,439
<i>Full Season</i>	Federal	\$16,632	\$21,622
	Private	\$18,068	\$23,488

**Partnerships**

Chimney Rock can explore a handful of partnerships when determining how a shuttle system could work and how much it might cost. These partners include:

- Pagosa Springs – Archuleta County runs [Mountain Express Public Transit](#) in Pagosa Springs. Service is provided from 6:45 AM to 11:00 AM and from 3:00 PM to 5:45 PM Monday to Friday. One mid-day run is also made on Saturdays (to the grocery store). It is possible that Chimney Rock could cost share the operation of a shuttle or shuttles in Chimney Rock with this service. Any shuttle service at Chimney Rock should be discussed with Archuleta County first in case any such opportunity might exist.
- Southern Ute – The Southern Ute operate the [Sky Ute Casino](#) in Ignacio, Colorado, which is 35 miles southwest of Chimney Rock. This 140-room hotel, casino, and events center is a major attraction in the Four Corners region. The Southern Ute might be interested in sharing one of its shuttles with Chimney Rock, particularly for just special events.
- Wolf Creek Ski Area – This ski area, operated in the Rio Grande National Forest, is located 47 miles northeast of Chimney Rock. The ski area has several shuttles that are minimally used in the summertime. Chimney Rock can engage Wolf Creek in a conversation regarding leasing or otherwise using their vehicles during the ski area’s off season.
- Durango Mountain Resort (DMR) – This ski area, operated in the San Juan National Forest, is located 77 miles northwest of Chimney Rock. The ski area also has several shuttles that are minimally used in the summertime. Chimney Rock can engage DMR in a

<sup>13</sup> Assumes that benefits equal 30 percent of salary

conversation regarding leasing or otherwise using their vehicles during the ski area's off season.

### ***Grants/Funding***

A handful of options for funding the shuttle system, especially as a pilot, exist for Chimney Rock:

- One USFS employee suggested that the Regional Recreation Director might be able to help fund a piloting of a shuttle system.
- Since tour attendance is approximately 8,000 people per year, CRIA could add a \$1 transportation/shuttle fee to every admission. \$8,000 would cover any of the costs for leasing a shuttle (or shuttles) as estimated in Table 3. An additional dollar or two would have to be added to every admission to also cover the salary of a driver for the peak months or full season, respectively. This added cost (of two or three dollars total) is relatively significant and may not be an attractive option to Chimney Rock.
- Funding could be requested through the recreation or engineering regional office (RO) or the Washington office (WO) for piloting the system for a season or two of service. Since the total cost of the pilot system would not exceed \$30,000 per season (assuming the most expensive lease option and the hiring of a driver for the full season), funding could possibly be found in the RO or WO. The likelihood of this funding being allocated by the RO or WO increases with the ability of Chimney Rock to keep the costs of a pilot down (i.e., by finding a volunteer driver or two).
- CRIA or another partner or group of partners could hold a fundraiser to specifically fund the piloting of a shuttle system.

If the pilot is successful and Chimney Rock would like to implement a more permanent shuttle system, while a few federal grant programs fund capital expenses (like the procurement of a vehicle or the construction of a park-and-ride lot or shuttle waiting area), no programs currently fund the operations and maintenance (O&M) of such a shuttle system. Accordingly, Chimney Rock would have to budget or increase admission (by only as much as \$0.20) to account for this cost. Table 3 estimates the O&M cost for the different options discussed above.

Funding programs to which Chimney Rock could apply for funding for a vehicle include:

- The [Paul S. Sarbanes Transit in the Parks Program](#) (only one more funding cycle)
- The [Public Lands Highway Discretionary Program](#) (to a limited degree)
- The [Transportation, Community, and System Preservation Program](#) (to a limited degree)
- The [Great Outdoors Colorado Grant Program](#) (for, at a minimum, parking lot amenities)
- Other programs sponsored by the new MAP-21 legislation

### ***Other Opportunities***

#### ***Trails***

A hiking trail could be constructed to connect the base area with the summit area. An old road alignment parallels the current access road; this old alignment could be cleared to become the new hiking trail. The benefits of a trail include reducing the pedestrian-vehicle conflict that currently exists between motorists and hikers along the access road (by requiring that hikers use

the trail and not the road) and providing a trail may cause people who would otherwise drive to leave their cars in the base area parking lot and hike to the summit area.

A concern with such a trail is that CRIA and the USFS would not be able to monitor access from the trail to ensure that visitors are not accessing the summit area's prehistoric sites without a volunteer monitor present. One option, in conjunction with a shuttle, could be that people are only allowed to go down the trail. This limitation would help ensure that people would not be accessing the summit area at unpredictable times. Another option could be to have the trail not follow the old road alignment but to instead terminate at a different point up the mountain. While this option would help ensure that people would not access the summit area at unpredictable times, it would not realize the benefits of a trail as described above. However, this kind of trail would provide a new amenity to visitors to Chimney Rock who would like to go on a hike in the area. Regardless of what trail alignment is preferred, there are many unmarked prehistoric sites throughout Chimney Rock that would need to be avoided or mitigated when planning the path of a new trail.

### *ITS/Visitor Information*

To acquaint visitors with a shuttle system, there are a handful of ITS/visitor information measures could be pursued. These measures include:

- Information about a mandatory shuttle should be highlighted clearly on CRIA's website ([www.chimneyrockco.org](http://www.chimneyrockco.org)). It should be clear to visitors viewing the website that they must take a shuttle (for special events and/or during the regular season) so that they can plan accordingly. Maps, schedules, and other information should be posted on the website so that visitors will know where they need to park, when the shuttle will pick them up, and when a shuttle will drop them off.
- During special events, portable changeable message signs (Figure 7) could be borrowed or leased from the Colorado Department of Transportation (DOT), or perhaps Archuleta County's DOT. These signs could be used to tell visitors to park in the base area parking lot or overflow parking areas with a message like "Parking for Shuttle →."

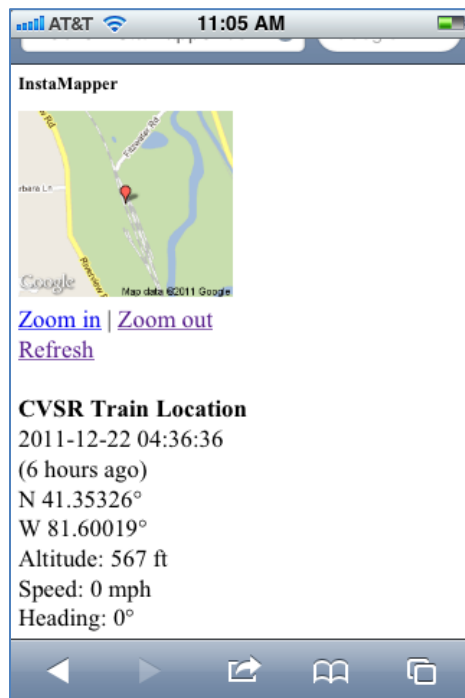
**Figure 7: An example of a portable changeable message sign**



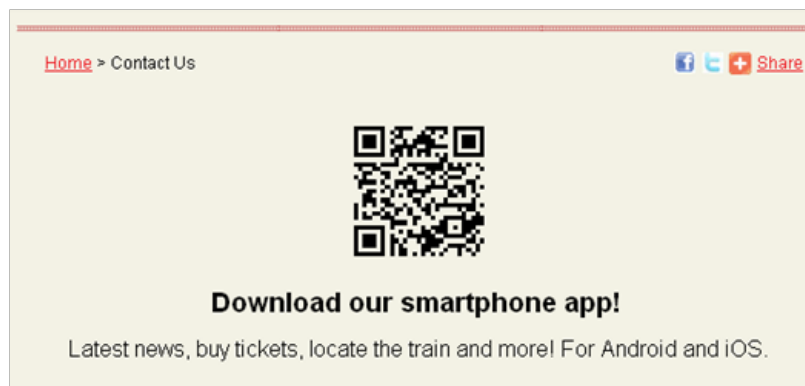
- An app for a smartphone could be developed at a low cost. Cuyahoga Valley Scenic Railroad (CVSR) developed such an app so that visitors could see how far away the train

is from picking them up at stations within Cuyahoga Valley National Park (Figure 8). The app can be downloaded via quick response (QR) codes, which are currently posted on CVSR's website (Figure 9) and at each station within the National Park. A GPS-enabled cell phone must be placed in the vehicle for this app to work. With this information in hand, visitors to Chimney Rock can know how long they may need to wait for a shuttle, particularly during special events, so that they can then plan to see more sites while they are waiting. While cell phone coverage at Chimney Rock is currently very limited, new cell phone towers planned for the area may help and enable this option to be pursued.

**Figure 8: Screenshot of CVSR's train locator app**



**Figure 9: QR code to download the app on CVSR's website**



## **Conclusion**

Piloting a shuttle system at Chimney Rock is a relatively low-cost option that the USFS could pursue along with its partners. Since the need for a shuttle – due to safety and resource degradation concerns – is significant and the cost is not prohibitive, piloting a shuttle for two full seasons, including pertinent special events would be prudent. Ideally, to maximize the benefits of the shuttle system, it should run every day with shuttle bus driver volunteers who have CDLs driving one 24-passenger shuttle bus. Unfortunately, this scenario may not be attainable. This recommendation is dependent on CRIA or the USFS finding enough volunteers who would be willing and able to shuttle visitors every day and are willing and able to qualify for, and maintain, a CDL. Therefore, other scenarios for implementing a shuttle system could also be piloted, such as those explored under “Benefits of a Shuttle System”. The scenarios could include (in no particular priority): 1) Using paid drivers to drive the 24-passenger shuttle bus; 2) Using CRIA volunteers and two smaller vans/multi-passenger vehicles for all operations, 3) Same as 2) but with paid driver(s); 4) Lease one or two larger shuttles for special events only and utilize two smaller vans/multi-passenger vehicles for daily operations. The San Juan National Forest and CRIA would need to do additional research to determine which alternative for a pilot shuttle system would be optimal given their specific situation.

For any alternative, additional modest investments in ITS/visitor information would help acquaint visitors to the shuttle system prior to their visit and upon entering Chimney Rock.

If the pilot shuttle system is successful, it is recommended that a survey be administered to riders to evaluate their experience. Chimney Rock should then work with its partners to either continue funding the lease of a vehicle (or vehicles) or apply for funding for a vehicle through a grant program. If Chimney Rock can continue to use volunteers for shuttle drivers, the seasonal O&M cost of the system can be held at a low level and could be covered by a nominal increase in admission tickets.



## Appendix A: Photographs of Facilities

**Figure A-10: Base area facilities (top left – Visitor’s Center, top right – picnic and amphitheater area, middle – parking lot, bottom – restrooms and dog kennel)**



**Figure A-11: Summit area facilities (top left – sitting area in foreground with lower-tier parking lot and Great Kiva Trail Loop trailhead in background, top right – Pueblo Trail trailhead, bottom – upper-tier parking lot in foreground with restrooms in background)**



**Figure A-12: Chimney Rock entrance area off of Colorado highway 151**



**Figure A-13: Access road from the summit area to the base area**



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