Red Rock Canyon National Conservation Area Transportation Feasibility Study

Summary of Alternatives
February 2012

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Overview

The Transportation Feasibility Study addresses growing concerns with traffic and parking congestion at popular recreation sites within Red Rock Canyon National Conservation Area (RRCNCA), a Bureau of Land Management (BLM) natural area in Clark County, Nevada. The Volpe National Transportation Systems Center/U.S. Department of Transportation (Volpe Center) examined four transportation alternatives that combine parking, transit, and management strategies to address transportation challenges at RRCNCA. The Volpe Center developed parking lot reconfigurations and expansions, designed voluntary transit services, and explored other management options for reducing congestion at parking lots. The alternatives were evaluated based on their ability to achieve the study goals of visitor mobility, visitor safety, visitor experience, resource impacts, and financial and operational feasibility.

What is the problem?

On many days during the busiest months of the year, visitors arrive at RRCNCA only to find the lots along Scenic Drive filled to capacity. With no place to park, visitors may not be able to stop to enjoy the natural features of the site, or may be forced to park illegally or in a dangerous place on the side of the road, having to walk along the road to reach trailheads. On the busiest days, the scene is far from a peaceful natural setting. Cars line up along the side of the road for hundreds of yards. Traffic slows to a crawl. Pedestrians weave their way through parked cars or across the desert on undesignated trails. Safety hazards abound, natural habitats are at risk, and many visitors' only experience of the beauty of RRCNCA's sandstone cliffs is from a car window.

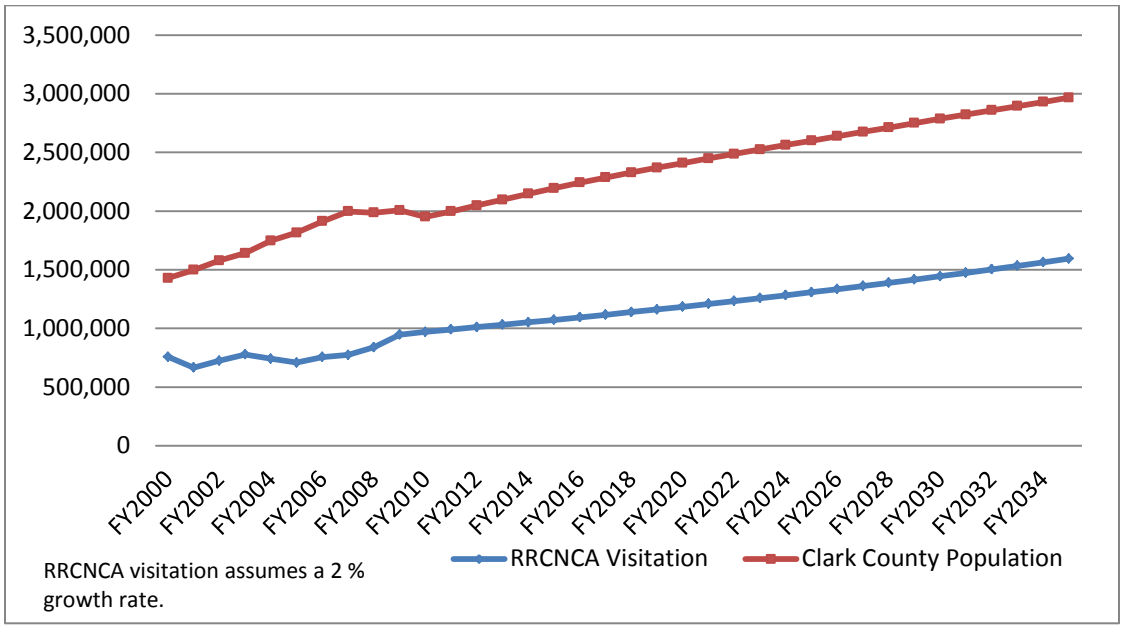
Despite the best efforts of the BLM and its partners, the problem is only getting worse. Over the past twenty years, Las Vegas has grown at a rapid rate, as has the number of tourists visiting the region. More and more people have discovered RRCNCA and visitation has nearly tripled since the 1990s. Today, nearly a million people visit RRCNCA each year. The BLM and its partners have made significant investments in infrastructure to improve the visitor experience at RRCNCA, but little has been done to address the growing transportation problem. Left unaddressed, it is likely that parking and traffic congestion will continue to get worse.

The purpose of this study is to identify potential long-term solutions to this transportation problem. While transportation studies have been conducted before, in 2001 and 2007, this study takes those studies a step further by detailing a set of feasible strategy options for addressing traffic and parking congestion and by proposing eventual implementation strategies. To identify long-term solutions, the study team began by assessing the scale of the problem and projecting how the problem might grow if visitation continues to increase.

The cause of parking congestion is simple: the number of vehicles seeking parking exceeds the number parking spaces available. The demand for parking varies by month of the year, day of the week, and time of day. While on a weekday in the summer or first thing in the morning, a visitor might be able to find a parking space easily, there might not be a space to be found on busy days. The study team developed a model of visitor behavior to help estimate the demand for parking on any given day, at any given time, now or in the future.

The parking demand model is based on observed visitor parking patterns. On Saturday, November 5, 2011, the study team, a group of volunteers, and BLM staff observed vehicles entering and exiting lots along the Scenic Drive from the opening of the Drive to its close. Using these data, the demand model uses simple mathematical formulas to estimate the number of vehicles that are parked or are seeking parking at any given lot at any given hour. To estimate demand in different seasons and growth in demand over time, the model uses historic visitation data to make assumptions about how visitation will grow in the future and vary by season. The study team assumes visitation will grow by two percent annually over the next thirteen years - slightly less than the historic growth rate in visitation and roughly in line with projected increases in the population of Clark County (see Figure 1).

Figure 1: RRCNCA Visitation and Clark County Population Projections (2000 – 2035)



Using this model, the study team developed cost-effective potential solutions to fit the scale of the problem. Too big a solution might be too costly and unduly impact natural resources; too small a solution might not come close to solving the problem. To determine the appropriate size for potential solutions, the study team used the model to estimate parking demand on a very busy day in the year 2025. The study uses the term "design day" to describe a day where overall visitation is equivalent to the 36th busiest day of the year (or 90th percentile) in 2025, which is about 2,433 visitors. This level of visitation would account for all but the busiest holidays and spring weekends in 2025.

The following figures show the current capacity of the Calico I, Calico II, Sandstone Quarry, and Pine Creek parking lots, along with current and projected demand for parking spaces. With the current capacity at these lots (indicated by the dashed red line), parking demand exceeds supply for four to eight hours on a moderately busy fall day. As these figures show, congestion would increase significantly on the design day if nothing is done to address the problem.

Figure 2: Estimated Design Day Parking Demand: Calico I

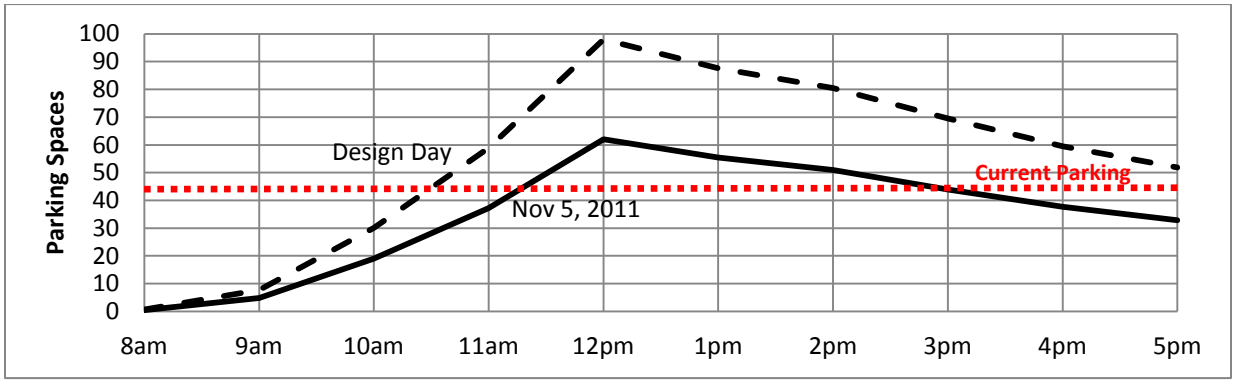


Figure 3: Estimated Design Day Parking Demand: Calico II

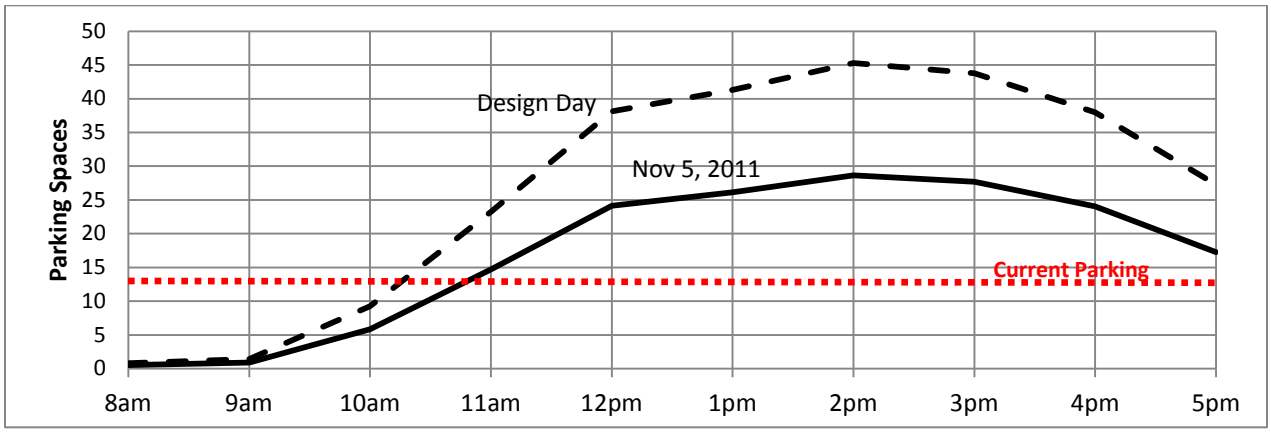


Figure 4: Estimated Design Day Parking Demand: Sandstone Quarry

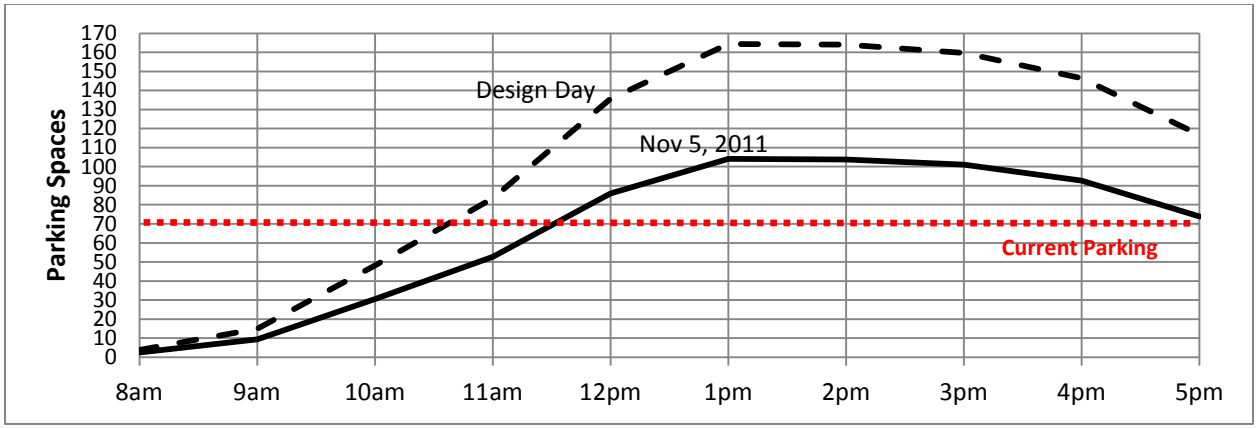
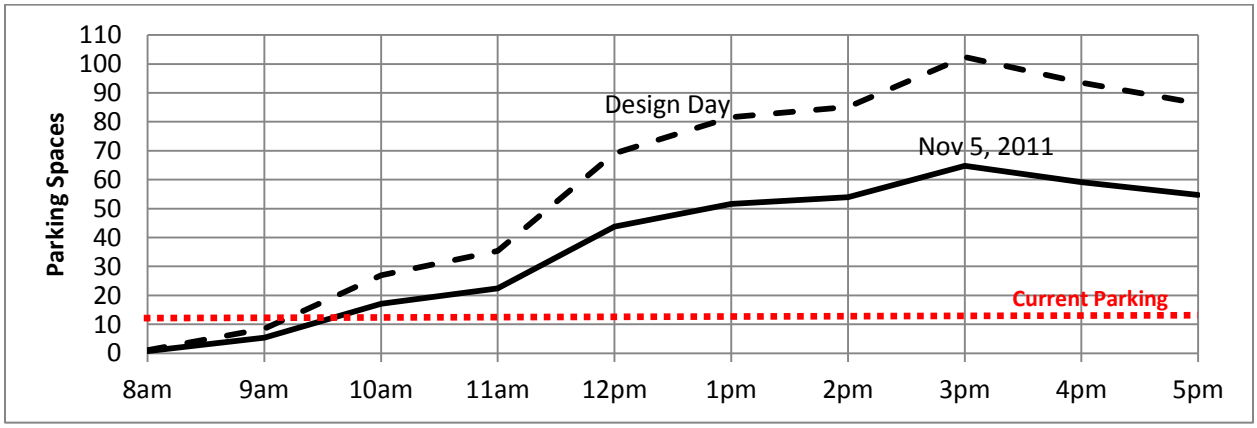


Figure 5: Estimated Design Day Parking Demand: Pine Creek



These charts show numerically that RRCNCA needs to either add many more parking spaces at their busiest lots or find a way to reduce the number of visitors who want to park their vehicles at those lots, such as through the use of transit or carpooling. Without making these changes, the challenges to visitor safety and resource impacts will grow much larger in the future.

What are some potential solutions?

After discussions with the BLM and stakeholder representatives, and a public meeting in July 2011, the study team developed a list of initial strategies in the areas of parking and road expansion, transit operations, and management, which the study team classified into core and supporting strategies.

- **Core strategies** have the potential to *significantly* reduce traffic and parking congestion at RRCNCA. These strategies address one or more of the *causes* of congestion by reducing the number of vehicles on site, improving transportation infrastructure to accommodate more visitors, and/or influencing drivers to operate more efficiently.
- **Supporting strategies** improve the effectiveness of core strategies in achieving study goals, but may only have a minor impact on congestion when used independently.

The study team did not consider strategy feasibility or cost at this stage, so the range of strategies presented in Table 1 includes many ideas that were later considered infeasible. The table represents all strategies presented to the BLM for consideration. Supporting strategies are indicated in italics.

Table 1: Initial Transportation Strategies

Transit Strategies Considered
• Mandatory seasonal shuttle running during peak hours
• Seasonal voluntary shuttle with high-frequency headways
• Seasonal voluntary shuttle, with hourly headways and strong interpretation element
• Shuttle between campground and climbing areas
• Two-way shuttle operating only between Visitor Center and Sandstone Quarry
• *Van or bus available on as needed basis (school or interpretive programs, high-congestion days)*
• *Allow permitted tour operators to pick up additional customers at Visitor Center*
• *Bus/shuttle connection to off-site location (Red Rock Casino/Bus Rapid Transit)*
Parking and Road Improvements Considered
• Add two-way road between Sandstone Quarry and Visitor Center for use by shuttle only
• Add a two-way road between the Scenic Drive exit and Pine Creek lot for use by shuttle only
• Create a new lot and trailhead area at Calico III or elsewhere
• Expand congested parking areas
• Selectively widen Scenic Drive for additional short-term pullout areas, parallel parking, and passing lanes
• *Reconfigure lots by restriping within existing paved footprint*
• *Build out overflow parking at Visitor Center*
• *Institute carpool lot near fee booth*
• *Extend Scenic Drive to expand visitor use areas*
• *Open old service road for emergency access*
• *Add a bike lane painted on Scenic Drive*
• *Add a separated bicycle/pedestrian path*

Management Strategies Considered
• Higher fees on peak days • Use of traffic counters to monitor lot capacity and use of variable message signs to indicate lots at or under capacity • Close Scenic Drive when a specific vehicle threshold is reached • Close specific lots when a vehicle threshold is reached • Signage for short-term and long-term parking (self-enforcing) • *Signage to clarify designated parking, overflow parking, queuing lines, and no parking zones* • *Signage for passing zones and pullouts on Scenic Drive* • *Signage for greater bicycle/pedestrian awareness* • *Driver education displays and programs (at Visitor Center and throughout the Scenic Drive)* • *Expand visitor amenity/trails at other areas outside of Scenic Drive and promote use* • *Use of web tools or mobile applications to assist visitors in trip planning*

How do we move from potential strategies to a set of feasible alternatives?

To assess potential strategies, the study team identified a subset of objectives that represent measurable conditions aligned with the five goal areas (visitor mobility, visitor safety, visitor experience, resource impacts, and financial and operational feasibility). The goals and objectives, along with their evaluation criteria (as applied to the four alternatives) are in Table 5 (on page 11).

Several strategies would have positive impacts in one or more study goal areas with minimal cost, controversy, and planning. The study team created a "management strategies bundle" to be included in all alternatives. The management strategies bundle consists of the following:

- Designation of self-enforcing long-term and short-term parking at select parking lots, with signage delineating parking space allocation.
- Signage to direct driver behavior, including passing zones in safe areas and bicyclist caution signs near steep or curved road sections.
- Reconfigure parking lots by restriping to allow for the addition of 4 to 21 spaces per lot. The reconfiguration would not involve any construction or expansion of the total paved footprint.
- Installation of traffic counters at the paved parking lots with trailheads along Scenic Drive.
- Re-opening of the carpool lot such that visitors can park prior to paying the amenity fee.

The BLM will need additional changes to significantly reduce its congestion, and the study team developed three alternatives that address congestion by significantly increasing parking supply (Alternative A) and by adding different levels of transit service with moderate increases in parking supply (Alternatives B and C). A fourth, No Action alternative is the baseline for comparison and represents conditions at RRCNCA on the design day with no changes to infrastructure, transit service, or management of the site.

What are the proposed alternatives?

Table 2: Proposed Alternatives

		Alternative A	Alternative B	Alternative C

Parking and Management	Management Strategy Bundle
	- Signage
	  ○ Scenic Drive passing
	  ○ Short and long term parking
	- Traffic counters at all lots
	- Re-open carpool lot
		✓	✓	✓

	Parking lot reconfiguration	✓	✓	✓
	Limited parking expansion		✓	✓
	Maximum parking expansion	✓		
Transit	Climber/Hiker shuttle from campground		✓	✓
	Voluntary shuttle of the full loop (one-way)		✓	✓
	Two-way shuttle between Visitor Center and Sandstone Quarry			✓
	Expansion of Visitor Center lots (to accommodate transit users)		✓	✓
	Widening Scenic Drive for two-way transit use			✓

Alternative A – Parking Expansion and Management

Alternative A reduces congestion through a combination of management strategies and an increase in the amount of parking on the Scenic Drive. Major expansion and reconfiguration of existing parking areas is proposed. This alternative also includes the management strategies bundle.

Table 3 refers to the parking changes at each lot for all alternatives. Appendix I contains illustrations of parking reconfigurations and expansions under Alternative A.

Table 3: Parking Lot Expansion Proposals under all Alternatives

Lot Name	Current Spaces	Reconfigure	Alt A # of Spaces	Alt B/C # of Spaces	Alt A % of Pavement Expansion	Alt B/C % of Pavement Expansion
Calico I	42	46	106	75	80 %	30%
Calico II	13	19	19	19	0%	0%
Calico III	-	-	12	5	-	-
Sandstone Quarry	70	74	108	108	25%	25%
Willow Creek/ Lost Spring	81	85	103	85	22%	0%
Ice Box Canyon	23	27	27	27	0%	0%
Pine Creek	11	36	112	61	120%	20%

Alternatives B and C – Voluntary Transit and Parking Expansion

Alternatives B and C consist of voluntary transit service to reduce congestion and the overall demand for parking spaces. Appendix I contains illustrations of parking reconfigurations and limited expansions under Alternatives B and C. Appendix II shows the transit routes under Alternatives B and C.

Alternative B consists of the following strategies:

- One-way, voluntary transit with stops at the Visitor Center and each lot along the Scenic Drive.
- Construction of a small, transit-oriented lot at Calico III.
- Hiker/climber shuttle with stops at the campground, the Visitor Center, and lots along Scenic Drive, operating during the early morning and evening hours.
- Limited expansion and reconfiguration of existing parking areas (see Table 3).
- Management strategies bundle.
- Interpretation available to visitors who wish to participate.

Alternative C adds to Alternative B the following:

- Two-way, voluntary transit with stops at the Visitor Center, Calico I, Calico II, Calico III and Sandstone Quarry.
- Construction of a reverse-direction, median-separated transitway between the Visitor Center and Sandstone Quarry.

Alternative C significantly shortens the travel time, by 28 minutes, for visitors who want to visit these popular destinations without circumnavigating the entire Scenic Drive, and also reduces overall traffic congestion.

Ridership Demand

Voluntary transit allows visitors to elect to either drive their own vehicles or take a shuttle. There would be restrictions on entry at all parking lots such that lots would be closed to private vehicles (and accessible only to transit riders) during times that all parking spaces were occupied. Ridership depends on visitor demand; current projections estimate between 26,000 and 52,000 riders annually for Alternative B and between 31,000 and 62,000 riders annually for Alternative C. These estimates assume that between 5 and 12 percent[1] of total visitors arriving when the shuttle is operational (October through May) will elect to ride the shuttle.

Transit Operations

Table 4 details transit service characteristics for both transit alternatives. The peak season is March and April, and the shoulder season is October through February as well as May. During the shoulder season, service operates only Saturday and Sunday, while during the peak season daily service is available. Operating hours for transit are 9:00 AM through 5:00 PM, with the exception of two hiker-climber shuttle runs that operate early in the morning from the campground. The study team recommends that the BLM test these

[1] Based on experience at four public lands sites with transit services (Acadia National Park, Bryce Canyon National Park, Sequoia & Kings Canyon National Park, and Rocky Mountain National Park).

transit service characteristics through a transit pilot, which would run on weekends for a two month period during a peak season. Table 4 provides additional information on how often a bus arrives at each stop.

Table 4: Transit Service Characteristics

	Alternative B		Alternative C	
Frequency of service in minutes	**Shoulder**	**Peak**	**Shoulder**	**Peak**
Weekend	45	20	60 (30)	40 (20)
Weekday	No Service	45	No Service	60 (30)
Hiker/Climber shuttle*	90	90	90	90
Service hours	9:00 AM – 5:00 PM*			
Additional Transit Service Characteristics				
Buses required	4		4	
Number of stops	14		17	
Total number of daily runs	12	25	9 (18)	13 (26)
Total number of bus seats available from Visitor Center	360	750	540	780
90% design day demand	N/A	625	N/A	750
% of bus seats filled on design day	N/A	83%	N/A	96%

() indicates frequency of service at the Visitor Center, Calico I, II, III and Sandstone Quarry.
*Campground shuttle operates twice in the morning (departs at 5:45 AM and 7:15 AM) and twice in the evening (two loop shuttles operate to the campground).

Transit vehicle

The recommended vehicle type is a medium-duty, large cutaway diesel bus. These buses are a compromise between a 30 or 40 feet bus and a full-sized passenger van. Ridership at RRCNCA is projected to be low enough that a traditional transit bus is not feasible, but high enough that the use of a fleet of full-size passenger vans would increase the operating cost, primarily due to the cost of additional drivers. Figure 6 shows an example of a large cutaway vehicle.

Figure 6: Large cutaway bus

Transit infrastructure

Alternative B requires 14 shuttle stops at a cost of about $11,000 each, while Alternative C requires an additional three stops on the opposite side of Scenic Drive at Calico I, II and III. A typical transit stop would have a paved landing area, benches, a shelter and an information panel. Transit stops at lots with lower usage would have fewer amenities and a lower cost.

The largest infrastructure investment is the construction of a transitway in Alternative C. This would take the form of widening the Scenic Drive from the Visitor Center to Sandstone Quarry. Roadway profile expansion may be required, as will about 2.5 miles of new pavement. A short (3-inch) concrete barrier (see Figure 7) at a cost of about $8,000 per mile would provide visual and physical separation between the busway and the

Scenic Drive. Emergency vehicles could also use the busway, and the BLM may consider allowing official BLM business, cyclists, and pedestrians to use the busway when the bus is not operating.

Figure 7: Grade separated busway[2]

Transit service maintenance

Maintenance and fueling can occur at Las Vegas public or private facilities to save the cost of building, maintaining and administering a garage and fueling depot. The BLM should work with private or public entities to facilitate maintenance of transit vehicles.

How will the alternatives address congestion and meet the goals of the study?

The application of evaluation criteria to the four proposed alternatives in Table 5 shows the strengths and weaknesses of each alternative by goal area.

[2] Image source: http://www.skyscrapercity.com/showthread.php?t=314069&page=12. Accessed February 9, 2012.

Table 5: Evaluation of Alternatives

Goal	Objective	Evaluation Criterion	No Action	Alternative A	Alternative B	Alternative C
Visitor Mobility	Parking lots sufficiently accommodate all visitors	Average hours of congestion per lot for the busiest 7 lots	6.25 hours	2.4 hours	3.9 hours	0.9 hours
		Number of lots that do not meet demand on the 90th percentile day in 2025	7 of 11 lots	5 of 11 lots	1-7 of 11 lots	1-7 of 11 lots
Safety	There is a reduction in unsafe travel conditions due to infrastructure	Annual number of bicycle or pedestrian injuries or fatalities	Baseline	Equal to No Action baseline	Smaller reduction from No Action baseline	Larger reduction from No Action baseline
		Annual number of vehicle collisions	Baseline	Equal to No Action baseline	Smaller reduction from No Action baseline	Smaller reduction from No Action baseline
		Response time of emergency vehicles	Slower than current	Faster than current	Faster than current	Faster than current
	There is a reduction in unsafe travel behavior	Frequency of parked vehicles obstructing roadway	Greater than current	Reduced from current number	No change/Reduced from current number	No change/Reduced from current number
Visitor Experience	The strategy does not detract from the visitor experience	Interpretation elements	Does not include interpretation	Does not include interpretation	Includes interpretation	Includes interpretation
		Travel time around Scenic Drive for hikers and climbers	Increased	No change	No change	Reduced
Resource Protection	Scenic and aesthetic resources can be enjoyed by current visitors and future generations	Visual impact of transportation infrastructure and vehicle congestion	No visible change in amount of paved areas visible from Scenic Drive, trails, or other visitor amenities	Large increase in the amount of paved areas and vehicles that are visible from the Scenic Drive, trails, or other visitor amenities	Small increase in amount of paved areas visible from Scenic Drive, trails, or other visitor amenities	Large increase in the amount of paved areas and vehicles that are visible from the Scenic Drive, trails, or other visitor amenities
	Cultural resources are preserved	Impact on cultural resources	No direct impact to resource from vehicles	Potential for minor impact that could be easily mitigated or avoided	Potential for minor impact that could be easily mitigated or avoided	Potential for minor impact that could be easily mitigated or avoided
	Natural resources are preserved	Anticipated impact on vegetation, soils, hydrology, habitat, or species	Potential for impact	Potential for impact	Potential for minor impact that could be easily mitigated or avoided	Potential for impact
Financial and Operational Feasibility	Strategy is financially feasible and sound	Capital costs	$0	Parking: $2,400,000	Transit: $632,000; Parking: $884,000	Transit: $2,382,000 (includes $1.75 million for two-way road); Parking: $884,000
		Operations and maintenance costs (annual)	$0	$0	$240,000	$257,000
	BLM has the capability to operate and maintain	Staff capacity of operations and maintenance	BLM operates and maintains with current or anticipated staff levels	BLM can operate and maintain with support from current partners or Friends groups	BLM will need management assistance for operations and maintenance	BLM will need management assistance for operations and maintenance

No Action Alternative

- Strengths: The No Action Alternative has the fewest immediate impacts on aesthetic, cultural and natural resources. However, an increase in vehicles in the future without new accommodations may increase impacts to resources from vehicles and visitors. This alternative also has the lowest costs, but the costs may increase in the future if new management actions are needed to handle rising visitation levels.
- Weaknesses: The No Action Alternative has the greatest negative impacts in the areas of visitor mobility, safety, and experience.

Alternative A: Parking and Management

- Strengths: Alternative A has the greatest improvements for some safety measures by removing vehicles parked in the Scenic Drive right-of-way. It also has the lowest annual operating costs.
- Weaknesses: Alternative A will add large amounts of paved areas, with the potential to impact aesthetic, cultural, and natural resources. By not removing drivers from the Scenic Drive, this alternative has potential negative impacts on safety.
- Other considerations: Alternative A has a large upfront cost and the BLM would likely require some assistance for operation and management. The alternative does not eliminate congestion from many lots, but it does reduce the hours of congestion for all lots on peak days.

Alternative B: One-Way Transit and Parking Expansion

- Strengths: Alternative B has the potential for significant reduction in lot congestion in a scenario of high transit ridership, with reduced hours of congestion in lower ridership scenarios. It also has benefits in response time of emergency vehicles and interpretation for visitor experience.
- Weaknesses: Alternative B has a significant annual operating cost, and it would likely require the BLM to seek outside assistance for operations and management. The capital costs are significant, but less than Alternative C. The benefits in the area of safety are small but difficult to quantify. This alternative has the potential for resource impacts but less so than the more intensive infrastructure expansion alternatives.

Alternative C: Intensive Voluntary Transit with Limited Parking Expansion

- Strengths: Alternative C has the potential for significant reduction in lot congestion in a scenario of high transit ridership, which may be more likely with the addition of two-way transit. It would also reduce hours of congestion in low ridership scenarios. This alternative has positive impacts in the areas of safety and visitor experience.
- Weaknesses: Alternative C has the highest upfront capital costs, due mostly to the widening of Scenic Drive for a dedicated transitway, which would also impact aesthetic and natural resources. This alternative has a high annual operating cost, and it would likely require the BLM to seek outside assistance for operations and management.

How much will this cost?

The costs for each alternative are show in Table 6. Alternative C has the highest upfront capital costs, largely due to the construction of a dedicated transitway. Both Alternatives B and C have a relatively low cost for limited parking expansion, with capital costs for transit (including vehicles, bus shelters, and other start-up costs) at around $600,000. The annual operating costs are approximately $250,000 per year. Alternative A has high upfront costs for parking, with no annual operating costs above the baseline for BLM staff to manage site amenities.

While the No Action alternative appears to be the least expensive option, the BLM should consider that the resulting parking congestion and impacts to resources, safety, and visitor experience may require costly interventions in the future.

Table 6: Costs of Alternatives

Type of Cost		No Action	Alternative A	Alternative B	Alternative C
Capital costs	Parking	$0	$2,400,000	$884,000	$884,000
	Transit	$0	$0	$632,000	$2,382,000 (includes $1.75 million for two-way road)
Operations and maintenance costs		Baseline	Baseline	$240,000	$257,000

Parking Costs

Parking costs are based on an assumed cost of $40 per square foot for parking expansion. This number is derived from previous BLM estimates for parking expansion at RRCNCA and includes expenses for design, engineering, and site work.

Transit Costs

Transit cost components include capital costs and operational costs, which include fuel and maintenance. Capital costs are detailed in Figure 8 and Figure 9 for both transit alternatives. These costs are in addition to the limited parking lot expansions proposed for these alternatives (at a cost of $884,000). Alternative C also includes the infrastructure cost of constructing the reverse-direction transitway and three additional stops between the Visitor Center and Sandstone Quarry.

Figure 8: Capital and Operating Costs for Alternative B

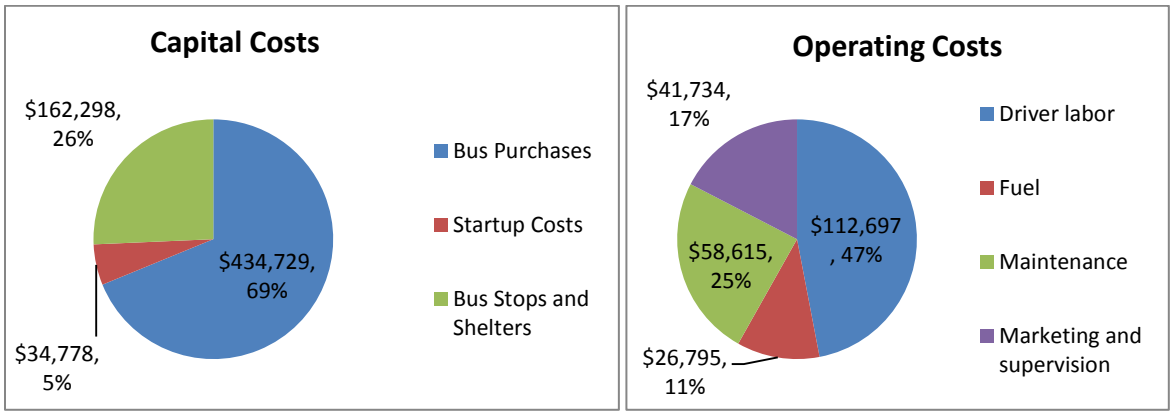


Figure 9: Capital and Operating Costs for Alternative C

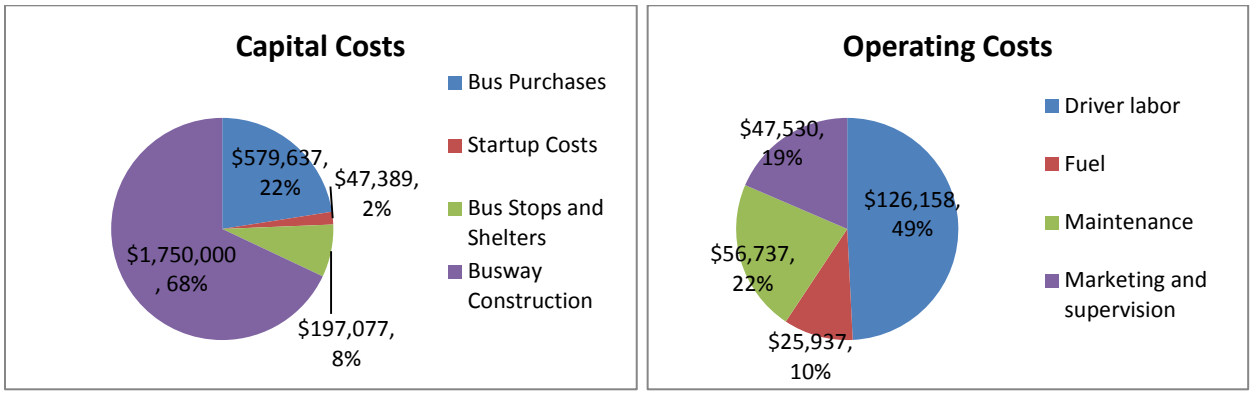


Table 7 shows transit operating costs based on estimates of labor, fuel, and maintenance costs from the Bureau of Labor Statistics, U.S. Energy Information Administration, and a Bus Lifecycle Cost Model developed by the Volpe Center in conjunction with the U.S. Department of the Interior. All costs are in 2015 dollars.

Table 7: Cost Assumptions

Cost Component	Rate
Driver hourly wage and benefits (per hour)	$42.89
Diesel fuel cost (per mile*)	$0.66
Maintenance cost (per mile)	$1.45

*Based on a diesel fuel cost of $4.64/gallon
http://www.bls.gov/oco/ocos242.htm

The infrastructure necessary to support a shuttle service at RRCNCA is simplified by its proximity to Las Vegas. Easy access to diesel fueling stations and maintenance facilities in the city eliminates the need for dedicated fuel and maintenance depots at RRCNCA, resulting in savings of approximately $900,000.

How can the BLM pay for it?

Potential funding sources for parking expansion may include Southern Nevada Public Land Management Act funds, future funding from the Federal Highway Administration (FHWA),[3] deferred maintenance and new capital construction funding from the BLM, and the use of amenity fees.[4] Grant programs through the Federal Transit Administration and FHWA may offer capital expenses for transit funds. Each funding source has constraints, and the study team will help the BLM consider appropriate funding sources for the selected alternative after the completion of the Environmental Assessment.

To cover the annual operating costs of transit under Alternatives B and C, the BLM can consider an entrance fee increment or charging fares for transit riders. The study team recommends the use of an entrance fee, which would add between $0.60 -$0.75 per vehicle (based on annual visitation of 430,000

[3] Forthcoming transportation legislation may include the BLM as an eligible agency to compete for federal highway funds. The BLM is currently not an eligible agency to receive federal highway funds.
[4] Subject to updates to the RRCNCA Business Plan.

visitors). The entrance fee would distribute costs among all users, since all visitors would benefit from reduced traffic and parking congestion. The use of fares for transit riders is not recommended, as it would discourage visitors from using transit and therefore make it harder to achieve congestion-reduction goals.

What happens next?

The study team is currently seeking feedback from the public to understand how these alternatives would affect visitors' use of the site and to check the assumptions behind the alternatives to make sure they would actually result in reduced congestion. The study team will make changes to the alternatives based on public feedback and will work with the BLM to identify an alternative to implement at RRCNCA.

The second component of the study will be an Environmental Assessment. The Environmental Assessment, scheduled to be completed in 2013, will study the environmental impacts of the selected alternative in greater detail and help the BLM prepare to put the selected transportation strategies into action.

Parking Reconfiguration (All alternatives)

- Examples shown for:
  - Calico II
  - Lost Creek
  - Ice Box Canyon
  - Pine Creek Canyon

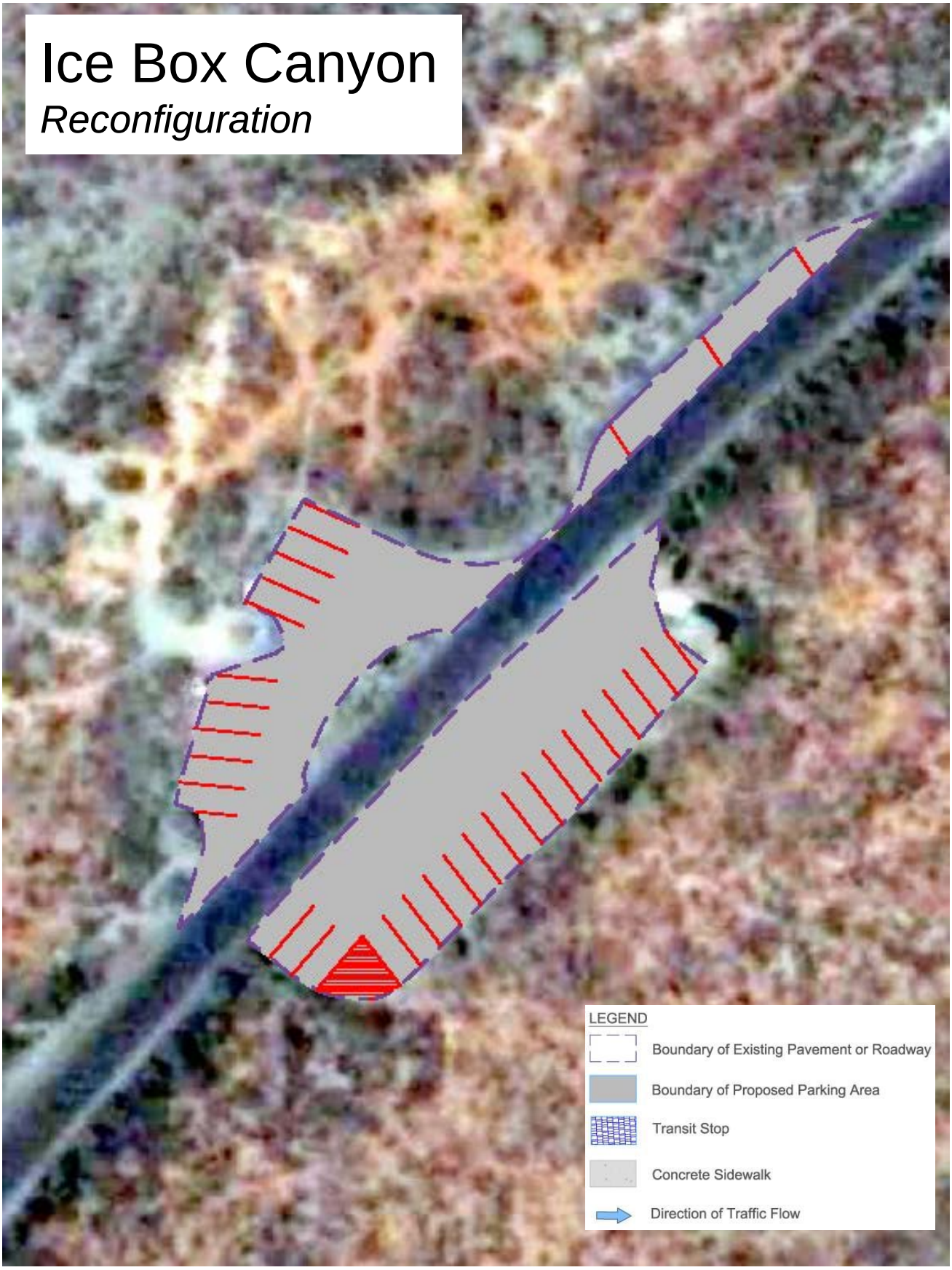
Calico Vista II

Reconfiguration

Lost Creek
Reconfiguration

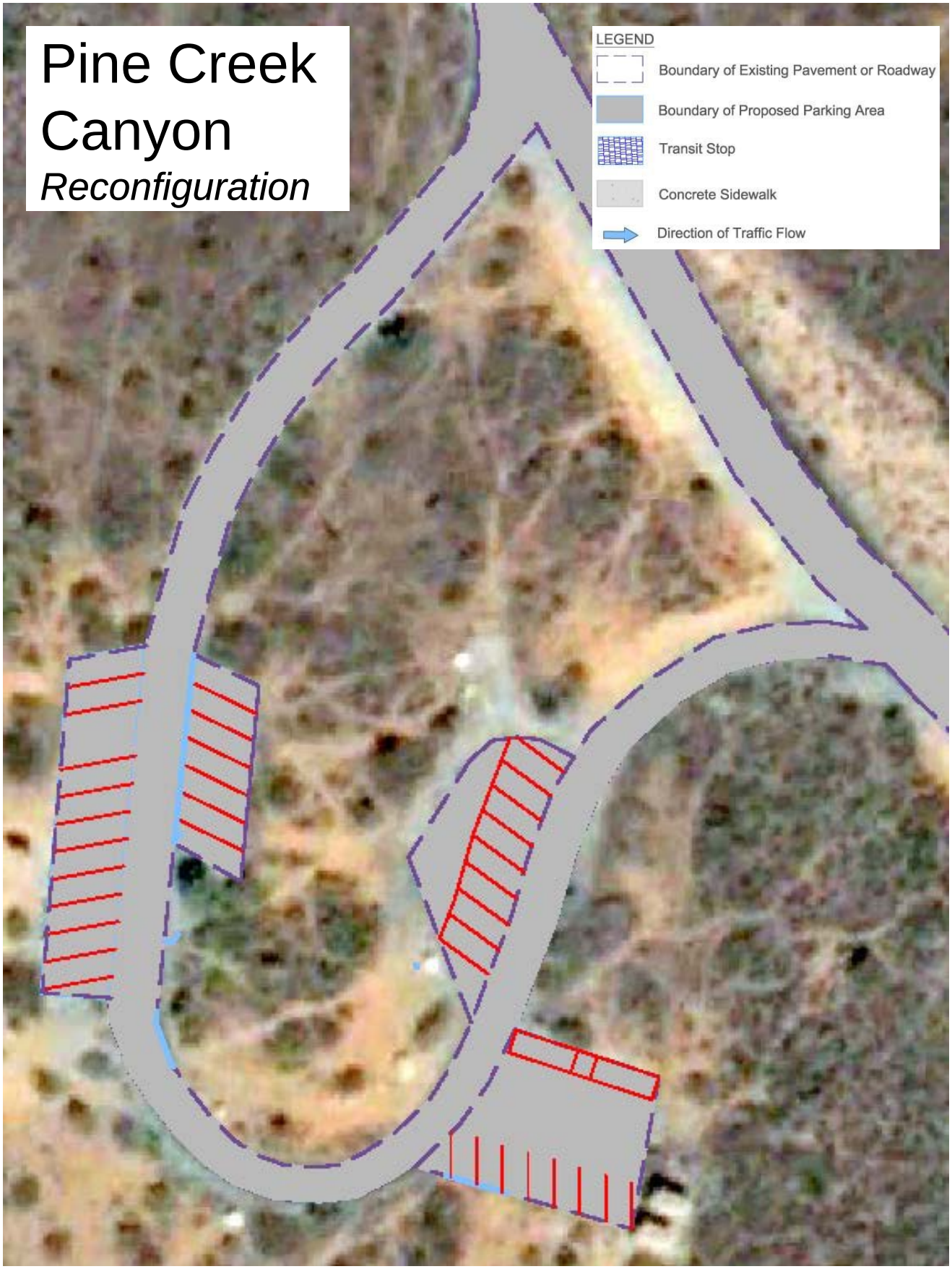
Ice Box Canyon

Reconfiguration



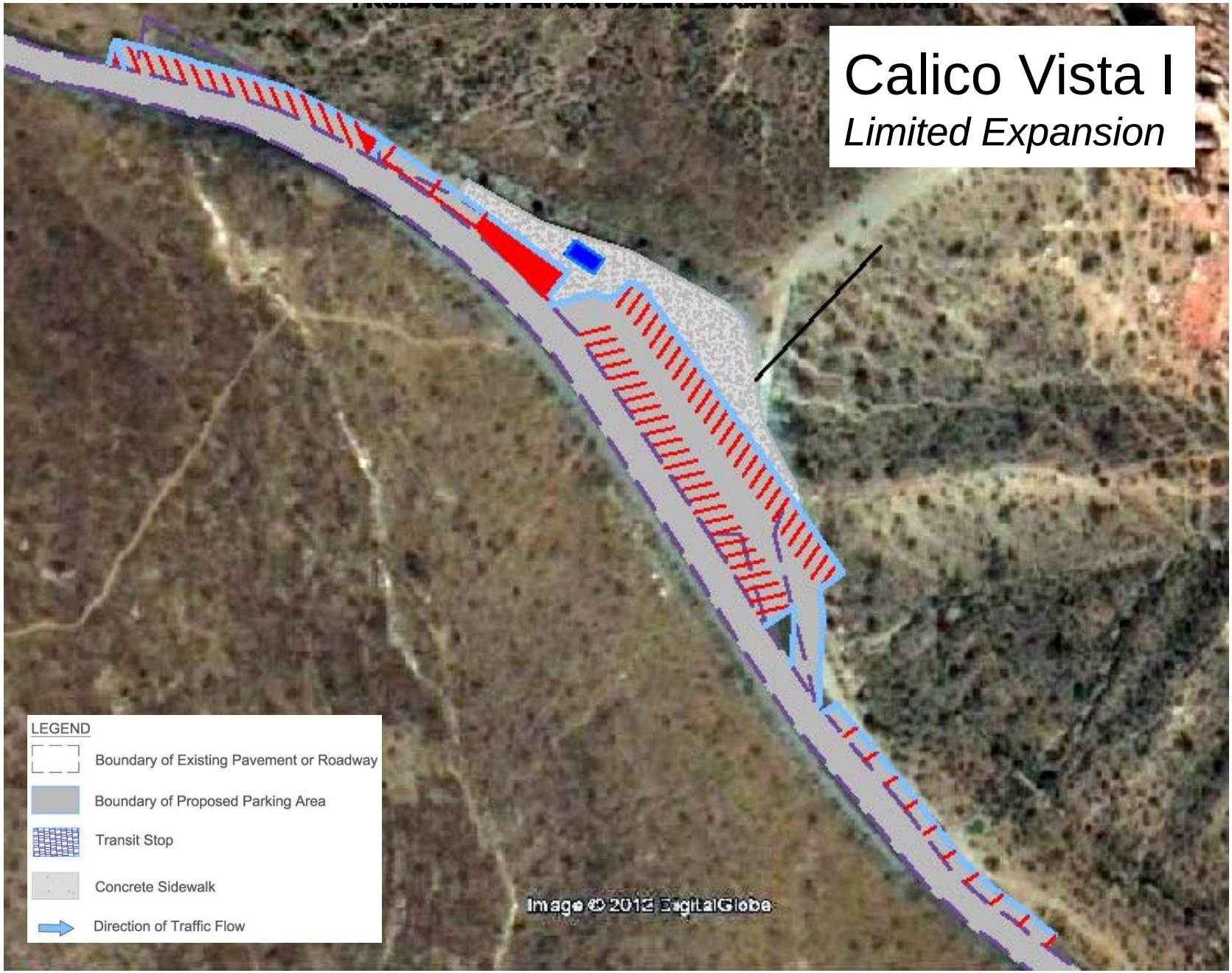
Pine Creek Canyon

Reconfiguration



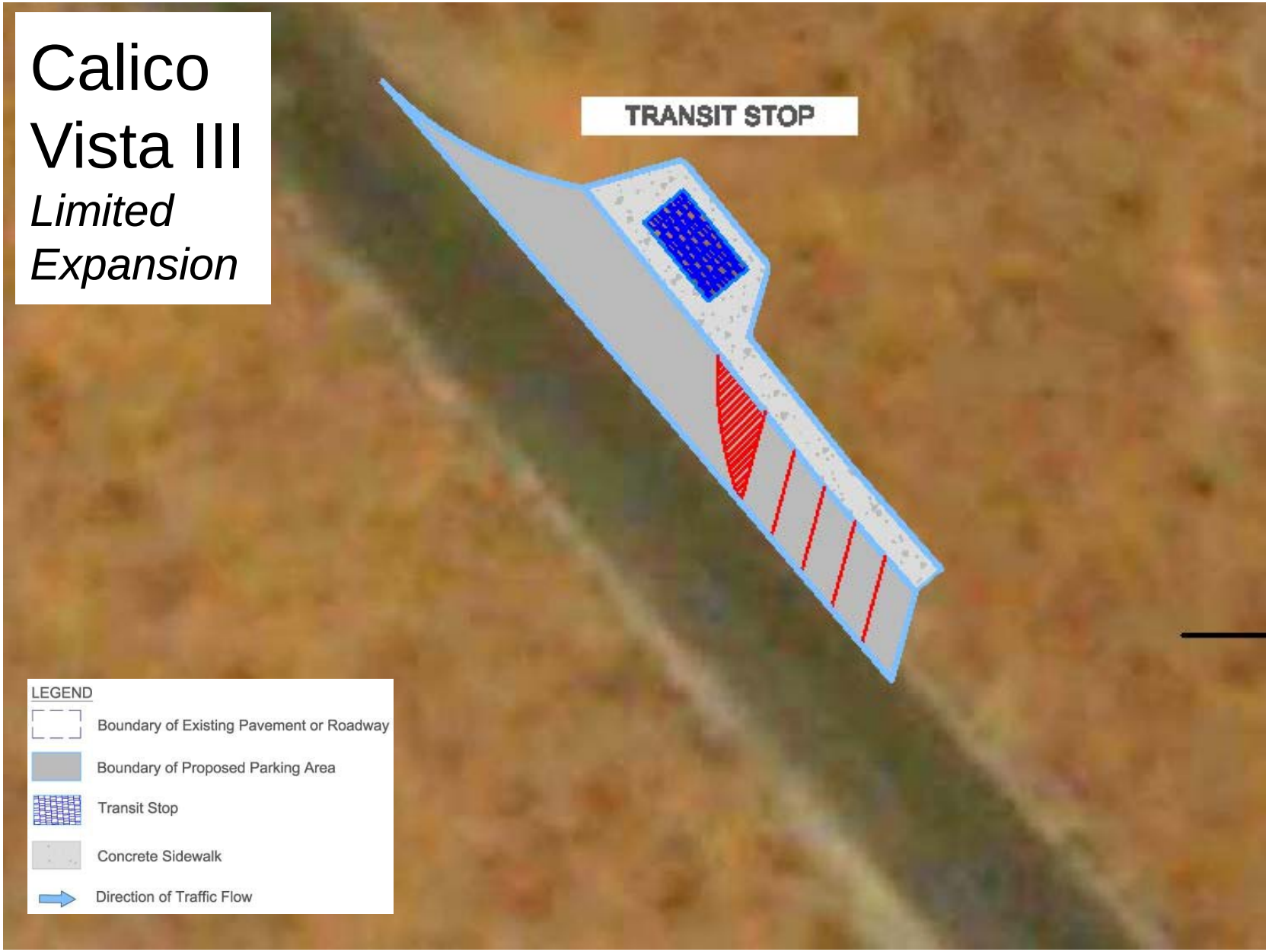
Limited Parking Expansion (Alternatives B and C)

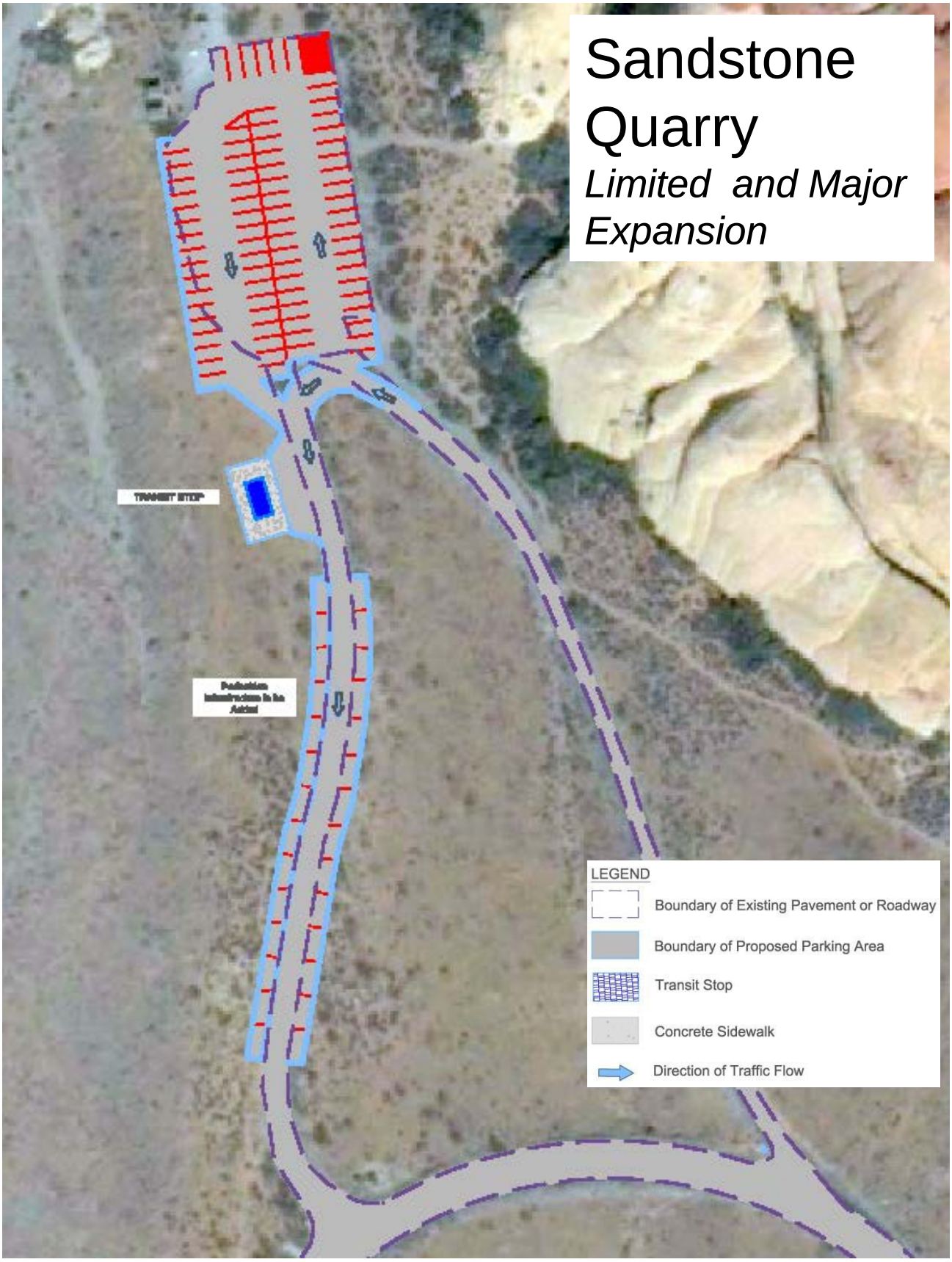
- Examples shown for:
  - Calico I
  - Calico III (new lot)
  - Sandstone Quarry
  - Pine Creek Canyon
- Reconfiguration with transit added (for Alt. B and C):
  - Lost Creek
  - Ice Box Canyon


Calico Vista I
Limited Expansion
LEGEND
Boundary of Existing Pavement or Roadway
Boundary of Proposed Parking Area
Transit Stop
Concrete Sidewalk
Direction of Traffic Flow
Image © 2013 DigitalGlobe

Calico Vista III

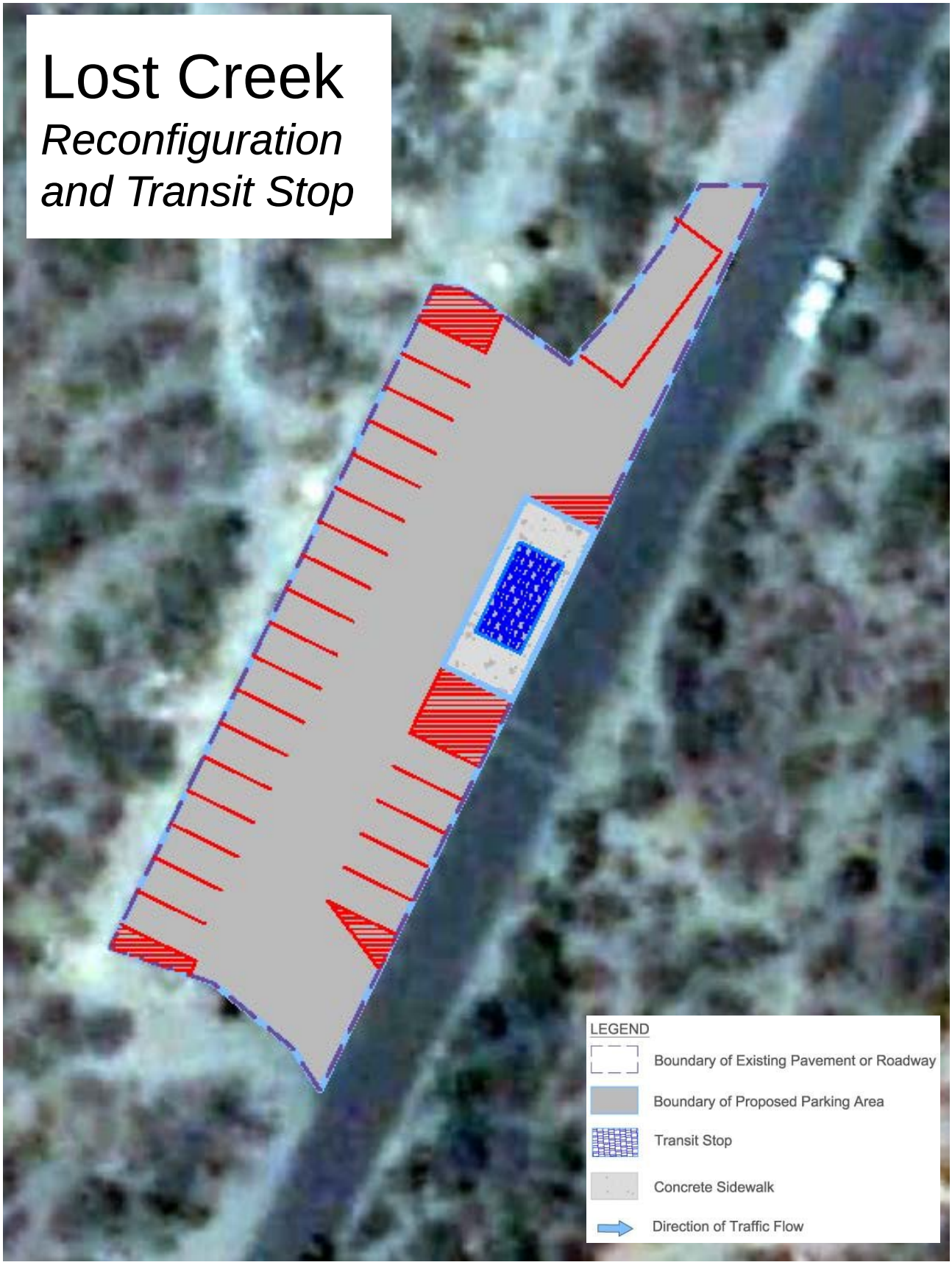
Limited Expansion




Sandstone Quarry
Limited and Major Expansion
LEGEND
Boundary of Existing Pavement or Roadway
Boundary of Proposed Parking Area
Transit Stop
Concrete Sidewalk
Direction of Traffic Flow

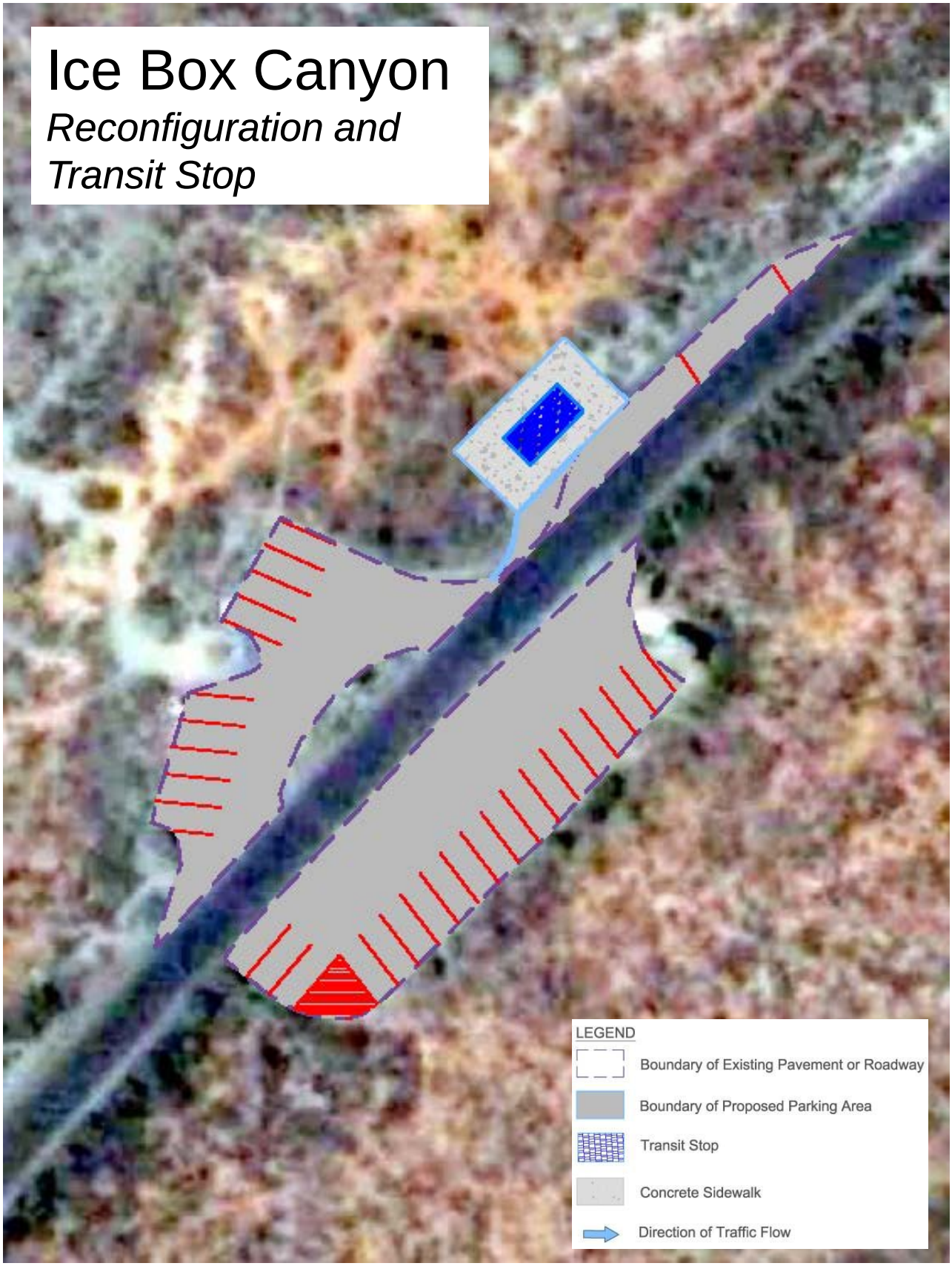
Lost Creek

Reconfiguration and Transit Stop



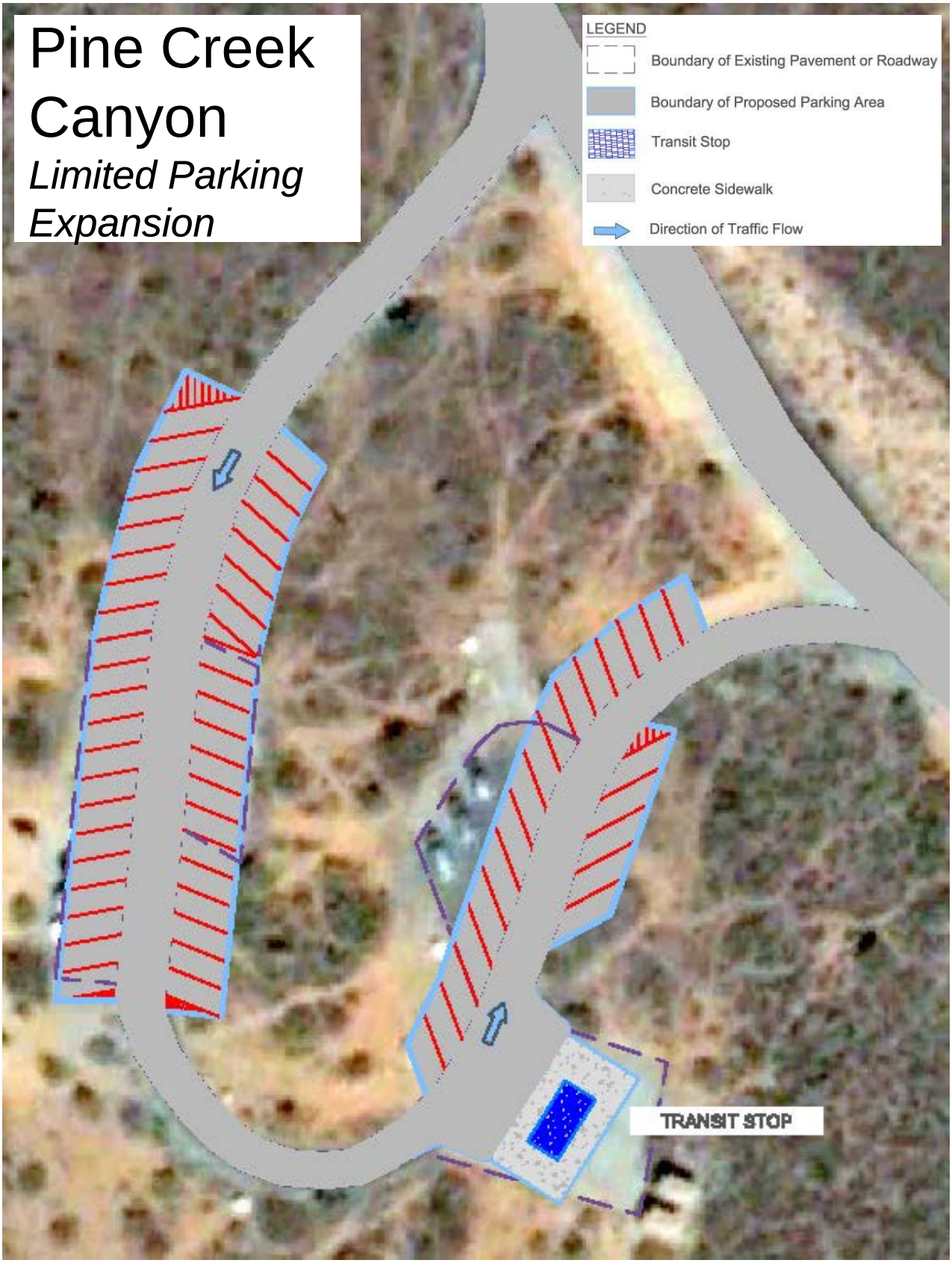
Ice Box Canyon

Reconfiguration and Transit Stop



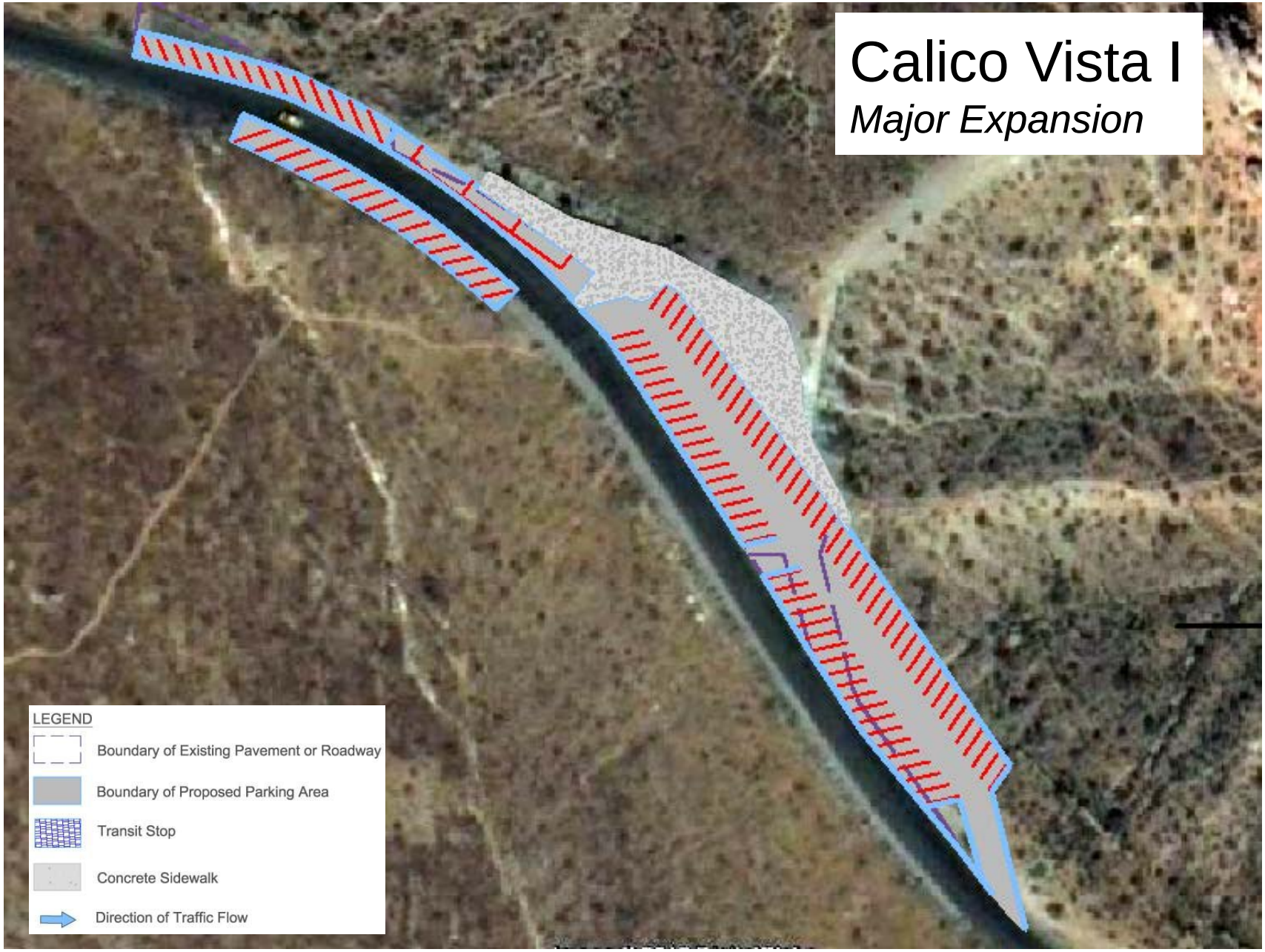
Pine Creek Canyon

Limited Parking Expansion



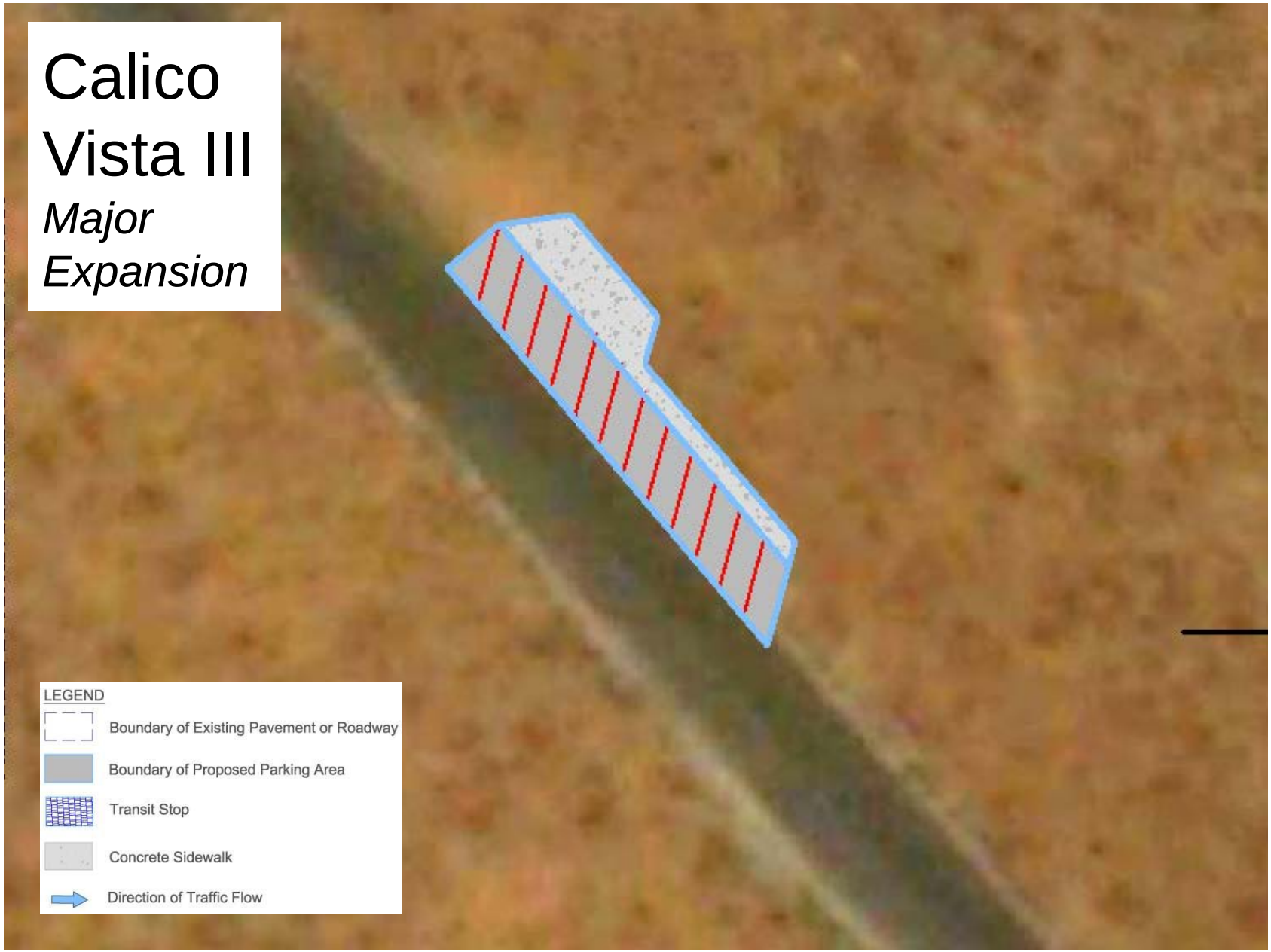
Major Parking Expansion (Alternative A)

- Examples shown for:
  - Calico I
  - Calico III (new lot)
  - Pine Creek Canyon
- Other lots will be the same as in Limited Parking Expansion


Calico Vista I
Major Expansion
LEGEND
Boundary of Existing Pavement or Roadway
Boundary of Proposed Parking Area
Transit Stop
Concrete Sidewalk
Direction of Traffic Flow

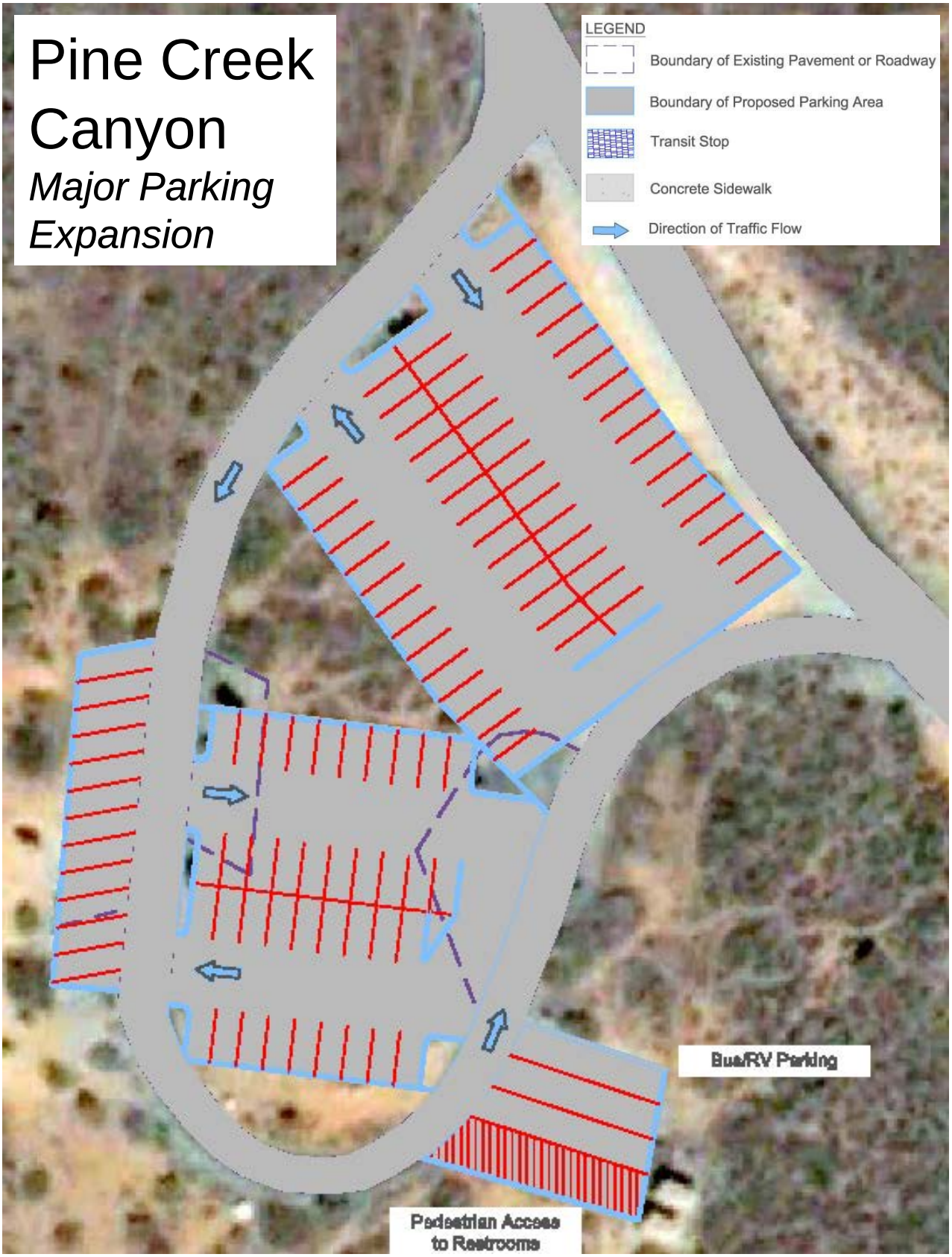
Calico Vista III

Major Expansion

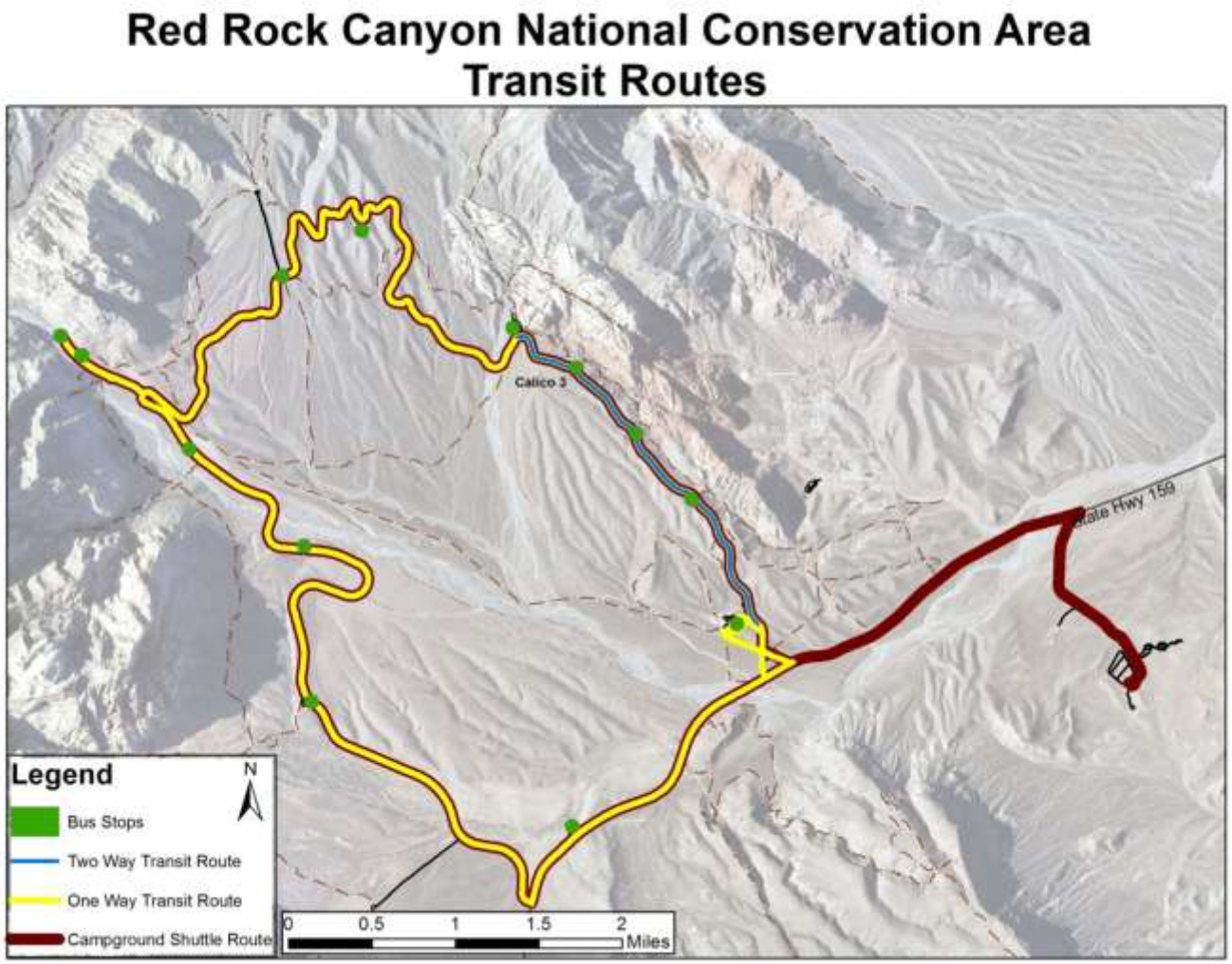


Pine Creek Canyon

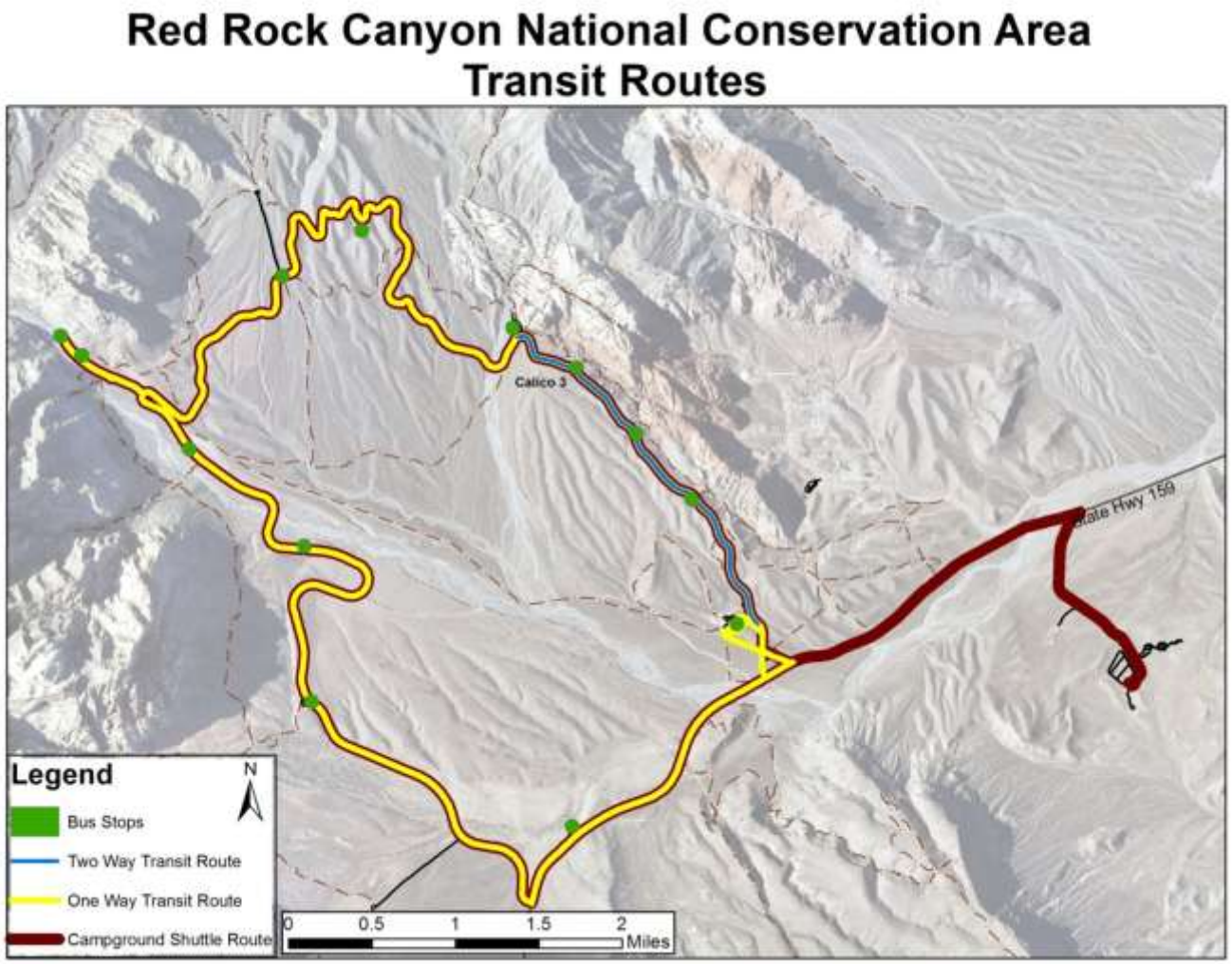
Major Parking Expansion



Appendix II


Red Rock Canyon National Conservation Area
Transit Routes
Calico 3
State Hwy 159
Legend
N
Bus Stops
Two Way Transit Route
One Way Transit Route
Campground Shuttle Route
0
0.5
1
1.5
2
Miles

Appendix II


Red Rock Canyon National Conservation Area
Transit Routes
Calico 3
State Hwy 159
Legend
N
Bus Stops
Two Way Transit Route
One Way Transit Route
Campground Shuttle Route
0
0.5
1
1.5
2
Miles