

# SUMMERHAVEN CONGESTION MANAGEMENT CONCEPTS STUDY

## Technical Memorandum 1: Needs Assessment

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Pima County Department of Transportation



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## EXECUTIVE SUMMARY

The purpose of the *Summerhaven Congestion Management Concepts Study* is to identify congestion relief concepts to improve mobility and safety for vehicles, bicyclists, and pedestrians in Summerhaven, Arizona. This *Needs Assessment* memorandum documents transportation issues identified through data collection, field review, and stakeholder and public discussions. Potential solution concepts are proposed which will be evaluated in subsequent steps of the project.

Transportation issues in and around Summerhaven primarily pertain to a lack of parking within Summerhaven and recreation areas near the village. The most prevalent observed issues include:

- Limited parking within Summerhaven to destinations including Sawmill Run, the Community Center, Cookie Cabin, and the Living Rainbow Gift Shop
- Insufficient parking at recreation areas including Marshall Gulch and the Mount Lemmon trailhead
- Overflow on-street parking along Sabino Canyon Park that encroaches into the roadway
- Pedestrians walking in the roadway on Sabino Canyon Park due to a lack of sidewalks and parked vehicles along the side of the road
- Little suitable land for new parking facilities due to steep terrain and property ownership

Other considerations that that will impact investment decisions, include:

- Poor roadway connectivity due to the steep terrain in the study area, leading to reliance on Sabino Canyon Park, Ski Run Road, and General Hitchcock Highway for circulation and access
- A lack of dedicated bicycle and pedestrian infrastructure connections within Summerhaven and between Summerhaven and surrounding recreation areas
- Poor cell phone coverage on the mountain, making technology-based information solutions more difficult
- No existing transit coverage on Mount Lemmon, forcing all visitors to use private vehicles to access and move around the study area
- The amount of investment required to accommodate the peak parking demand, given that the peaks only occur a handful of times per year (holiday weekends, snow events, etc.)

This Technical Memorandum proposes several potential transportation and parking solutions based on an initial stakeholder and public engagement process, and initial analyses of background and field data. These solution concepts provide a range of intervention, from modest investments in temporary fixes, to expensive concepts that could change the nature of traffic circulation and parking on Mt. Lemmon. These concepts are listed in **Table E-1** and concepts for which specific locations have been identified are shown graphically in **Figure E-1**. Additional detail about these concepts is provided in Chapter 4.

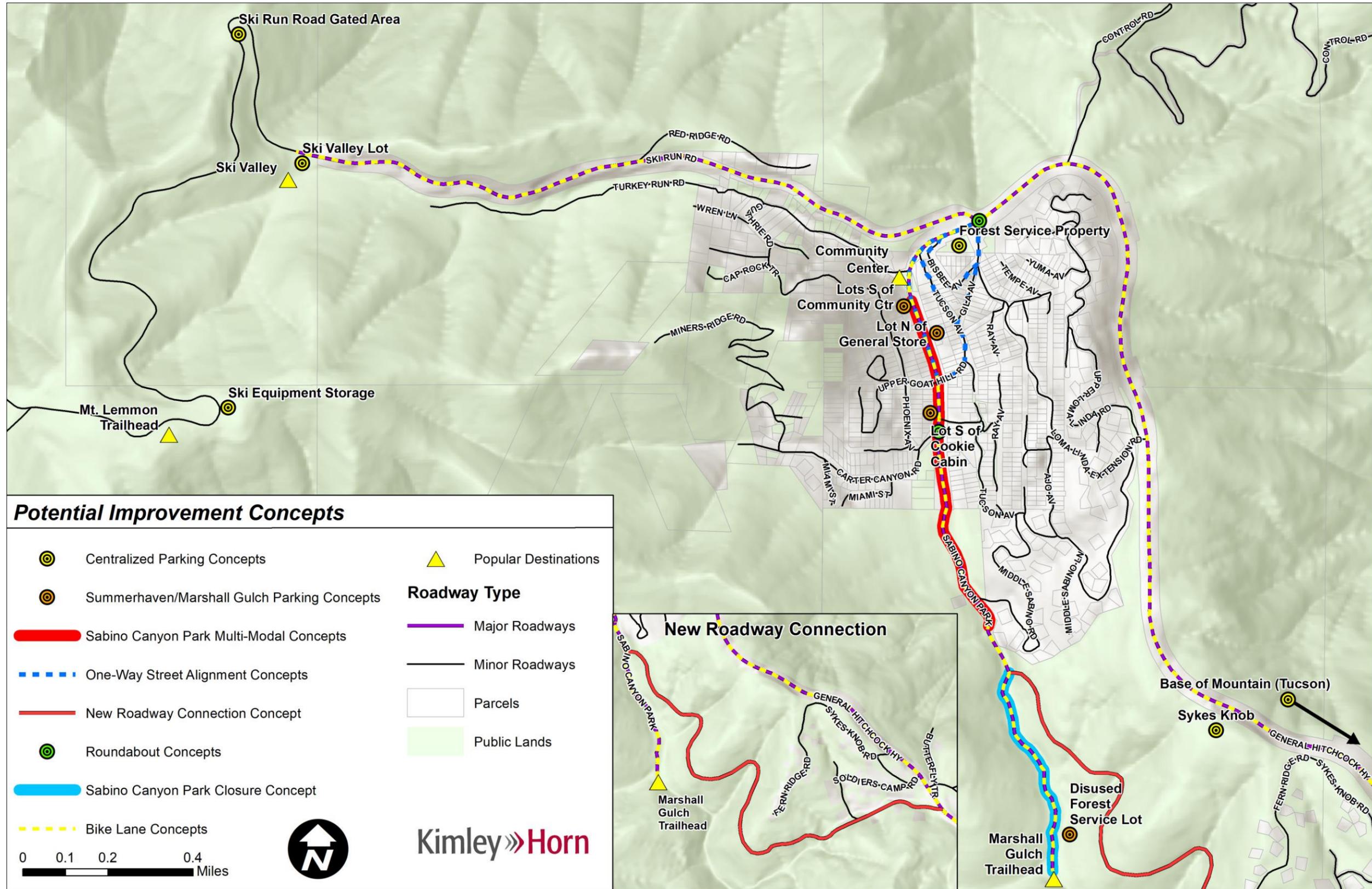
The next steps in the planning process involves evaluating the feasibility of these solutions from capital cost, management, maintenance, and environmental standpoints.

**Table E-1: Potential Improvement Concepts**

Category	Potential Concept	Potential Locations
<b>Parking</b>	Create a centralized parking area outside of Summerhaven and provide shuttle service to the main destinations*	Ski equipment storage area on Ski Run Road, Ski Valley parking lot near Sykes Knob Picnic Area, and Forest Service parcel on the south side of Sabino Canyon Park near Bisbee Avenue
	Create additional off-street parking within Summerhaven and Marshall Gulch*	Carter Canyon Road, redevelopment sites, vacant lots near the water treatment plan, temporary parking on lots south of the community center.
	Create additional on-street parking (parallel, perpendicular, or angled) between Summerhaven and Marshall Gulch*	Along the west side of Sabino Canyon Park between Carter Canyon Road and Marshall Gulch
	Construct public restrooms outside of center of Summerhaven to distribute parking demand away from the community center	The south side of Summerhaven, potentially near the water treatment plant or at Marshall Gulch
	Remove parking from the village center and keep the area strictly for pedestrians; use off-site parking to accommodate demand	-
	Formalize parking at the ski equipment storage area on Ski Run Road as overflow parking for the Mount Lemmon Trailhead lot	Ski equipment storage area
	Promote use of the Sunset Trailhead, located on Solders Camp Road, to access Marshall Gulch recreation areas during peak times	Soldiers Camp Road
<b>Roadways</b>	Create a one-way couplet in Summerhaven using a parallel roadway to Sabino Canyon Park to reduce congestion and increase space for parking	Tucson Avenue, Bisbee Avenue, Loma Linda Extension Road
	Add a connection between Sabino Canyon Park and General Hitchcock Highway south of Summerhaven*	Middle Sabino Road, new alignment through Forest Service land
	Add roundabouts to allow vehicles to turn around and improve circulation*	Sabino Canyon Park at Carter Canyon Road, Sabino Canyon Park at Ski Run Road
	Close Sabino Canyon Park at the forest service gate during peak times and provide shuttle service from centralized parking to Marshall Gulch*	Sabino Canyon Park
	Create a wayfinding plan for parking and local destinations*	Study area-wide
<b>Bicycles</b>	Add bike lanes along main roadways to protect cyclists from traffic	General Hitchcock Hwy and Sabino Canyon Park
<b>Pedestrians</b>	Add additional sidewalks in the Village*	Sabino Canyon Park
	Add multi-modal facilities from Summerhaven to Marshall Gulch*	Sabino Canyon Park
<b>Transit</b>	Create a bus turnaround and warning signage	South side of Summerhaven or Marshall Gulch
<b>Technology</b>	Add dynamic messaging signs that indicate parking available capacity on the mountain	Base of Mount Lemmon
	Add dynamic messaging signs on Mount Lemmon indicating parking constraints and congestion in Summerhaven and point to remote parking.	General Hitchcock Highway
	Additional cell towers to enable implementation of technology-based solutions	Study area
	Add speed feedback signs to reduce speeds entering the study area	General Hitchcock Highway

\*Additional detail on this concept is provided in Chapter 4.

Figure E-1: Potential Improvement Concepts



## 1. INTRODUCTION

The Summerhaven area on Mount Lemmon, within Pima County, is a popular destination for residents and tourists. During busy weekends, holidays, and snow season, the village center and adjacent street system experiences congestion that affects vehicles, bicyclists, and pedestrians. Pima County receives Traffic Action Requests on a regular basis concerning congestion and parking issues.

The *Summerhaven Congestion Management Concepts Study* identifies congestion relief concepts to improve mobility and safety for vehicles, bicyclists, and pedestrians in Summerhaven.

This *Needs Assessment* memorandum documents transportation issues identified through data collection, field review, and stakeholder and public discussions. Potential solution concepts are proposed which will be evaluated in subsequent steps of the project.

## STUDY OBJECTIVES

Objectives for the *Summerhaven Congestion Management Concepts Study* include:

- Assess study area current conditions including congestion, parking capacity and demand, roadway infrastructure, safety, bicycle and pedestrian infrastructure, and potential redevelopment sites
- Identify transportation issues and needs, including off-site parking and shuttle services
- Identify feasible alternatives for addressing the needs
- Prepare planning-level cost estimates
- Recommend high-priority projects for consideration to include in the Pima County capital improvement program (CIP) development or other funding sources, such as federal grants.

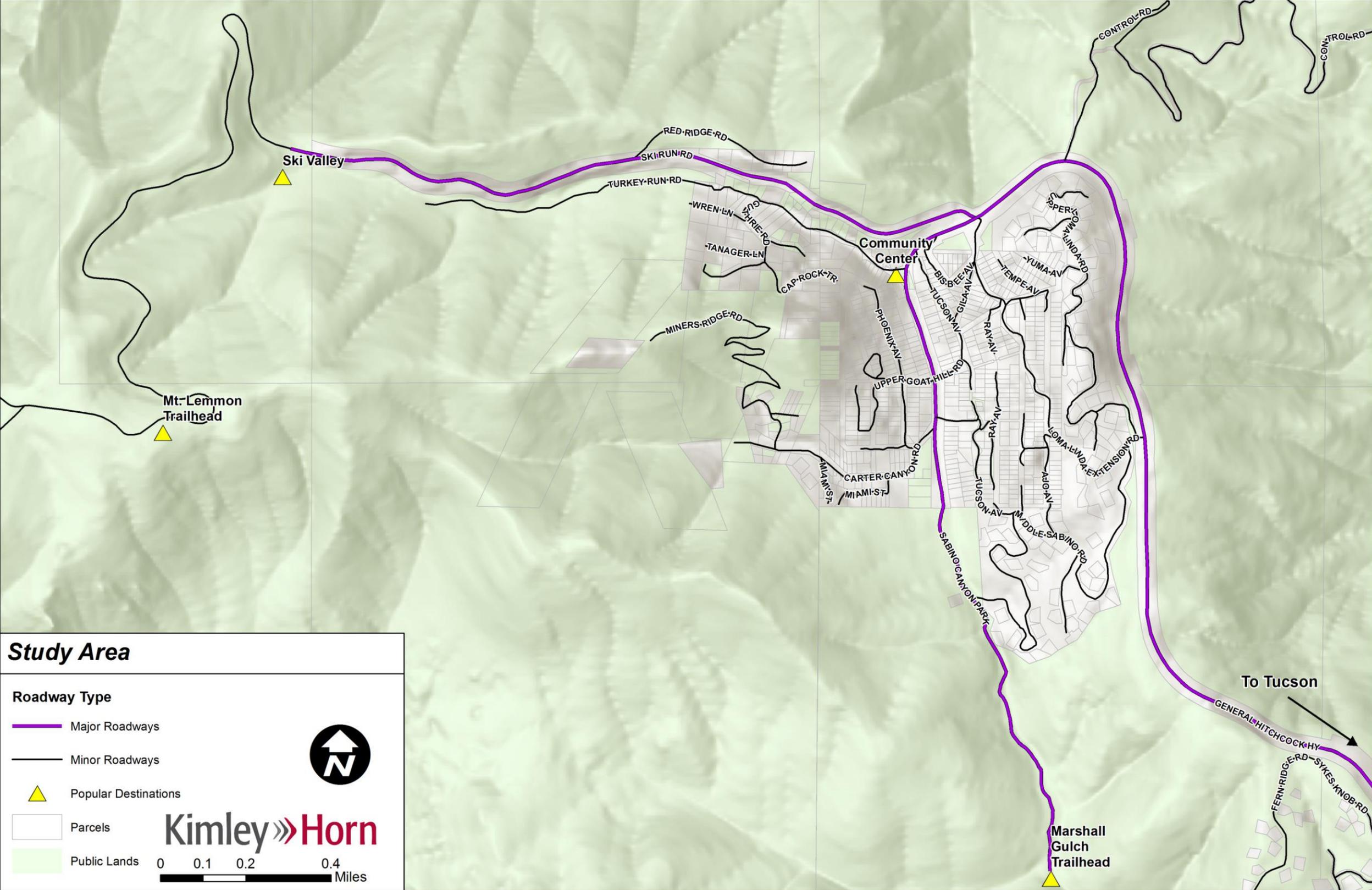
## STUDY AREA

Summerhaven is a small unincorporated community and census-designated place on Mount Lemmon in the Santa Catalina Mountains north of Tucson in Pima County, Arizona, United States. Summerhaven is approximately 45 minutes northeast of Tucson, following the Catalina Highway (also known as General Hitchcock Highway closer to Summerhaven). As of the 2010 U.S. Census, it had a permanent population of 40.

The study area is illustrated in **Figure 1** and includes an approximately eight-square-mile area that encompasses Summerhaven and the surrounding areas of Coconino National Forest.

The area is characterized by steep, mountainous terrain and pine forests. Summerhaven is at an elevation of 7,600 feet and the summit of Mount Lemmon is almost 9,200 feet above sea level. The mild summer temperatures and snowfall during the winter make the area a popular tourist destination.

Figure 1: Summerhaven Study Area



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## 2. DATA COLLECTION

This section describes the existing multimodal transportation system within the study area. It summarizes information and data pertaining to the road network, parking facilities, safety, traffic, sidewalk facilities, bicycle facilities, and potential redevelopment properties.

### ROADWAY INFRASTRUCTURE

General Hitchcock Highway connects Summerhaven to the Tucson metropolitan area. Also known as Catalina Highway or Mount Lemmon Highway, this roadway is a two-way, two-lane rural roadway and is maintained by Pima County. The roadway has two 12- to 13-foot lanes for the entirety of its length within the study area and has varying shoulder widths which are heavily impacted by the steep terrain. The shoulders are predominantly paved; however, several sections of unpaved shoulder are present along the alignment. The speed limit of the roadway is 35 miles per hour (mph) and there are no passing zones through the study area.

The main roadway through the Village of Summerhaven is called Sabino Canyon Park. This roadway is an extension of General Hitchcock Highway and generally runs north-south through the village and ends approximately one mile south of Summerhaven at the Marshall Gulch Picnic Area parking lot, which has approximately 17 parking spaces. Sabino Canyon Park is a two-way, two-lane roadway with varying cross sections ranging from urban (gutter and sidewalk), within Summerhaven, to rural, south of the village (shown in Photo 1). Lane widths range from 11 to 13 feet in Summerhaven to approximately 9 feet in the rural section south of the village. Some shoulders exist within Summerhaven, but are inconsistent in width and paving, and often widen and narrow around trees and boulders. No left- or right-turn lanes exist on the roadway. There is a low-water creek crossing on the roadway approximately 0.15 miles south of Carter Canyon Road. The speed limit for the entire length of the roadway is 25 mph. The roadway is maintained by Pima County until the Forest Service boundary approximately 250 feet south of the Sabino Canyon Park and Middle Sabino Road intersection.

***Photo 1: Sabino Canyon Park on Labor Day Weekend, 2018***



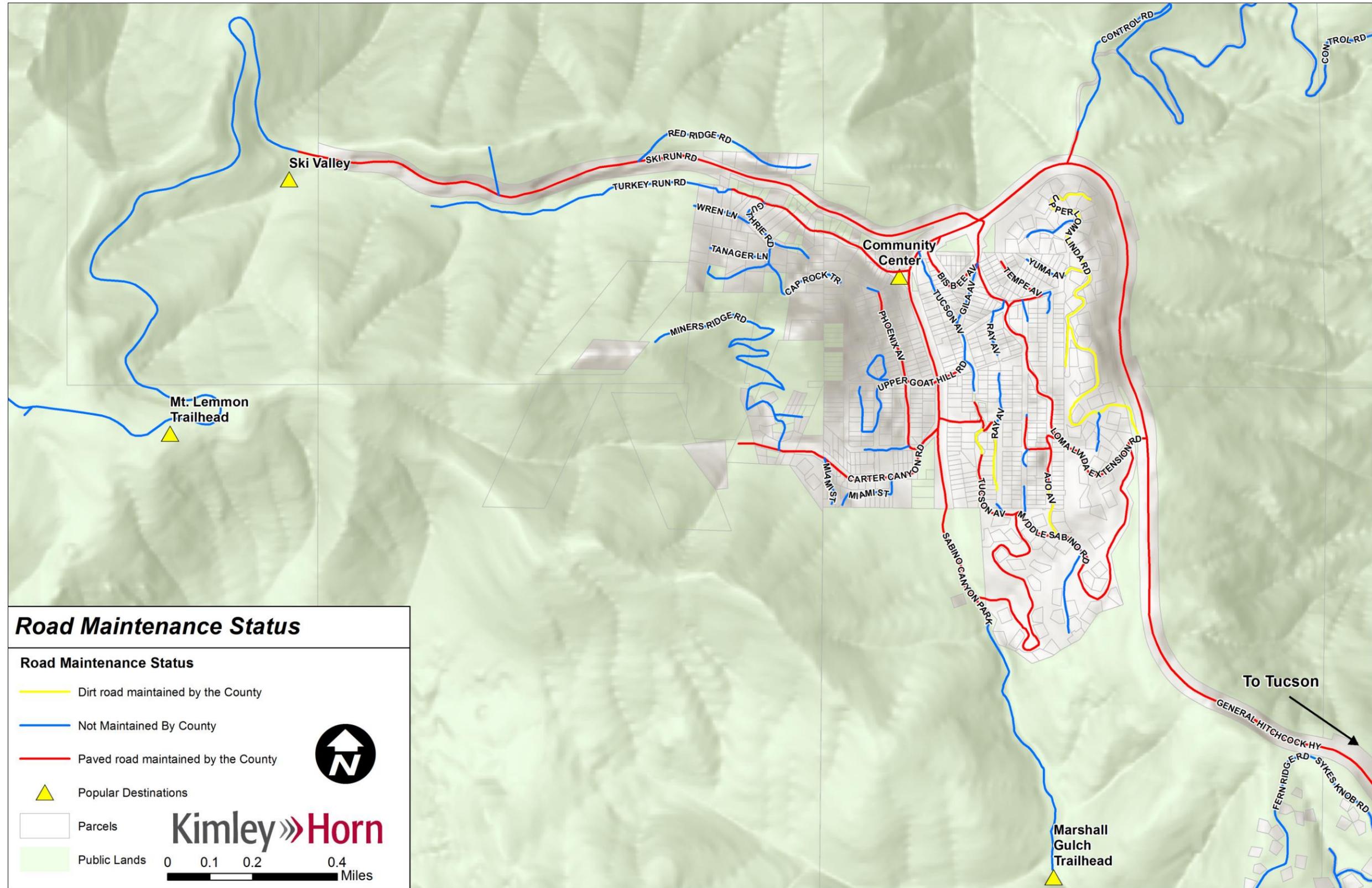
Ski Run Road connects General Hitchcock Highway and Summerhaven with Mount Lemmon Sky Valley, Mount Lemmon Observatory, and the summit of Mount Lemmon. Ski Run Road is a two-way, two-lane roadway with a rural cross-section. Lane widths are approximately 12 feet between General Hitchcock Highway and Ski Valley,

and narrow to widths of 7 to 8 feet between Ski Valley and the summit. Paved shoulders exist between General Hitchcock Highway and Ski Valley and range from 5 to 8 feet in width; there are no shoulders past Ski Valley. No turn lanes or sidewalks exist on Ski Run Road. The roadway's speed limit is 35 mph between General Hitchcock Highway and Ski Valley, and there is an advisory speed limit of 5 mph west of Ski Valley due to narrow lane widths and sharp turns. Ski Run Road is maintained by Pima County, until just west of the Ski Valley Parking lot. Ski Run Road is maintained by the U.S. Forest Service from Ski Valley to the summit.

Other local roadways in Summerhaven serve privately-owned residences and cabins, and range in widths and pavement condition. These roadways largely follow the terrain and do not provide meaningful connectivity for vehicles or pedestrians. There is only one connection between General Hitchcock Highway and Sabino Canyon Park, which is Middle Sabino Road at the south end of the village.

Most of the local roadways are maintained by Pima County, though some are privately maintained. Maintenance responsibility is illustrated in **Figure 2**.

Figure 2: Maintenance Responsibilities



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## PARKING SUPPLY AND OCCUPANCY

There are 78 formal parking spaces in Summerhaven, split among four locations:

- Sawmill Run Lot – 40 spaces
- Sabino Canyon Park on-street spaces south of Mount Lemmon Community Center – 21 spaces
- General Store Lot – 12 spaces (private spaces)
- Cookie Cabin parking – 5 spaces

In addition to the 78 formal parking spaces in Summerhaven, there are several locations along Sabino Canyon Park where informal, and sometimes illegal, parking occurs. The shoulders between Upper Goat Hill Road and Marshall Gulch parking lot are frequently filled with parked vehicles. This informal parking frequently encroaches onto the roadway and, when coupled with pedestrians, restricts two-way traffic flow on Sabino Canyon Park.

Outside of Summerhaven, there are several other parking facilities for the many recreational opportunities available on the mountain. A majority of the parking lots are on Forest Service land including:

- Aspen Vista Point – 17 spaces
- Box Elder Picnic Area – 8 spaces
- Inspiration Rock Picnic Area – 5 spaces
- Alder Picnic Area – 13 spaces
- Loma Linda Picnic Area – 10 spaces
- Mt. Lemmon Trailhead lot – 22 spaces
- Marshall Gulch lot – 17 spaces

There are also two lots on private property:

- Iron Door Restaurant lot – 46 spaces
- Ski Valley lot – 80 spaces

A map of the formal parking locations is provided in **Figure 3**.

## PARKING UTILIZATION

Parking utilization was observed on two days over Labor Day weekend: Saturday, September 1, 2018 and Monday, September 3, 2018. Parking utilization observed during this weekend represents a relative maximum parking demand in Summerhaven and the surrounding area. However, the study team recognizes that there are days, such as following winter snow, where parking demand exceeds that observed on September 1 and 3, 2018.

**Table 1** shows the observed parking demand. Note that parking facilities for the recreational opportunities along General Hitchcock Highway were excluded from the occupancy counts as this study will not address any shortages or surpluses on the east side of Summerhaven.

**Table 1: Parking Supply and Utilization**

Ownership	Location	Parking Supply	Saturday Utilization	Monday Utilization
Forest Service	Marshall Gulch Lot	21	21	19
Pima Co./USFS	Sabino Canyon Park On-Street south of Carter Canyon Road*	-	43	109
Pima Co.	Carter Canyon Road On-Street*	-	14	11

Ownership	Location	Parking Supply	Saturday Utilization	Monday Utilization
Pima Co./ Private	Cookie Cabin Parking**	5	34	34
Pima Co.	Sabino Canyon Park On-Street	24	22	24
Private	Vacant lots south of the Community Center	-	11	17
Pima Co.	Sawmill Run Lot	40	39	34
Private	Iron Door Lot	46	21	38
Private	Ski Valley Lot	80	21	64
USFS	Ski Valley Equipment Storage Lot*	-	10	39
USFS	Mt. Lemmon Trailhead Lot	20	14	20
USFS	Ski Run Road On-Street near Mt. Lemmon Trailhead*	-	17	22
Total:		<b>231</b>	<b>267</b>	<b>431</b>

\*Informal/illegal parking location

In general, parking was observed to be full within Summerhaven, with people parking vehicles in informal spaces along Sabino Canyon Park, in vacant lots south of the Community Center, and along Carter Canyon Road. **Photo 2** shows parking on Sabino Canyon Park in central Summerhaven and vehicles parked in the vacant lots south of the Community Center. Additionally, people were creating informal parking spaces along the length of Sabino Canyon Park between Summerhaven and the Marshall Gulch parking area. It is estimated that there is a total demand of 150 to 200 vehicles that cannot be accommodated within existing marked parking spaces between Summerhaven and Marshall Gulch. Parking along Ski Run Road between General Hitchcock Highway and just east of the Mt. Lemmon Trailhead area, with the two largest parking facilities at Ski Valley and Iron Door restaurant, were observed to be providing an adequate parking supply. However, the area around the Mt. Lemmon Road trailhead was over capacity, with people parking along Ski Run Road and in a ski equipment storage area. Overall, parking demand outpaced overall supply within the study area on both days when observations were performed. **Figure 4** shows the parking occupancy of the formal parking areas as well as locations where informal parking was observed for Monday, September 3, 2018 (Labor Day).

**Photo 2: Parking on Sabino Canyon Park and Vacant Lots**



Figure 3: Parking Facilities

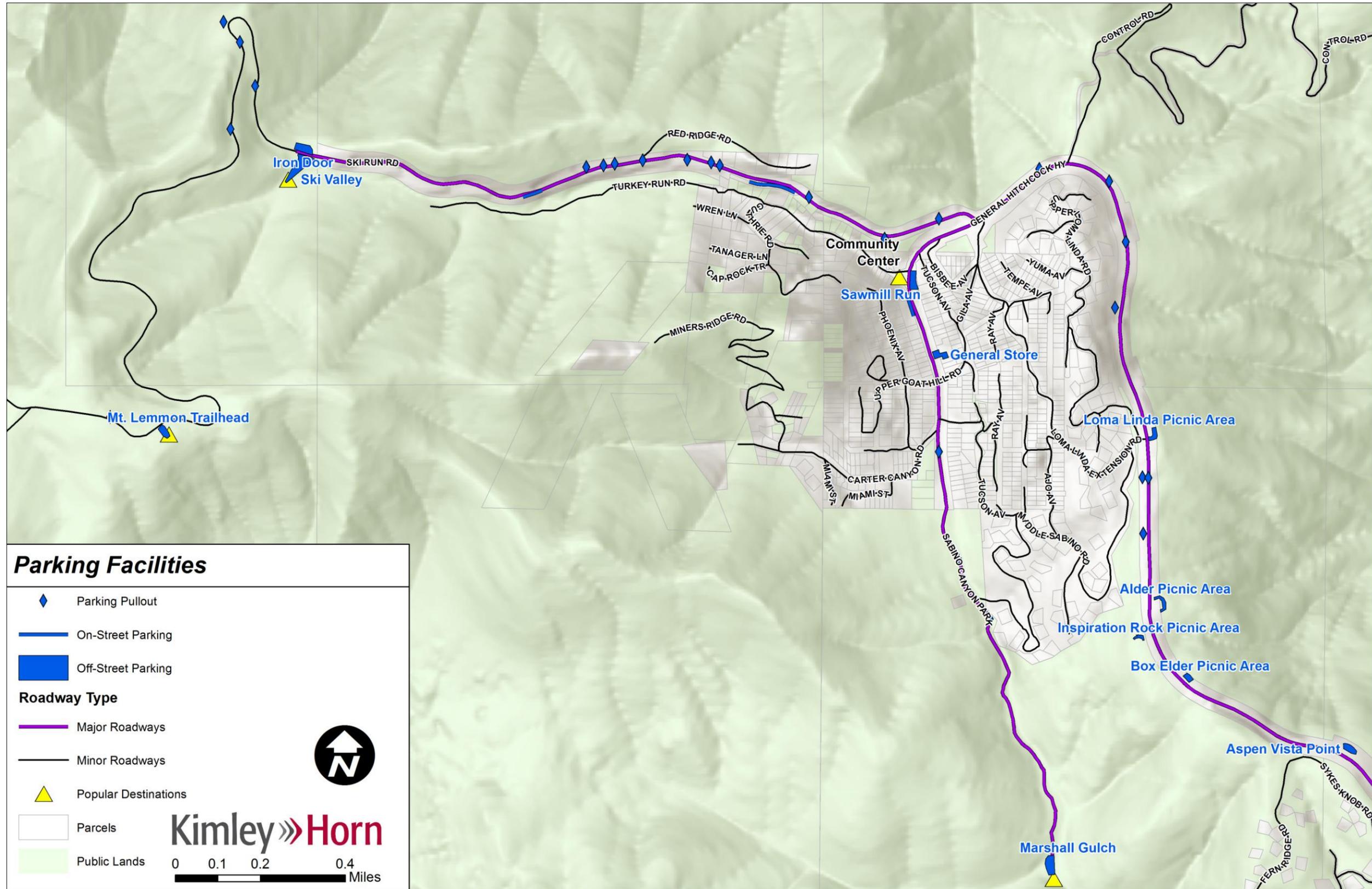
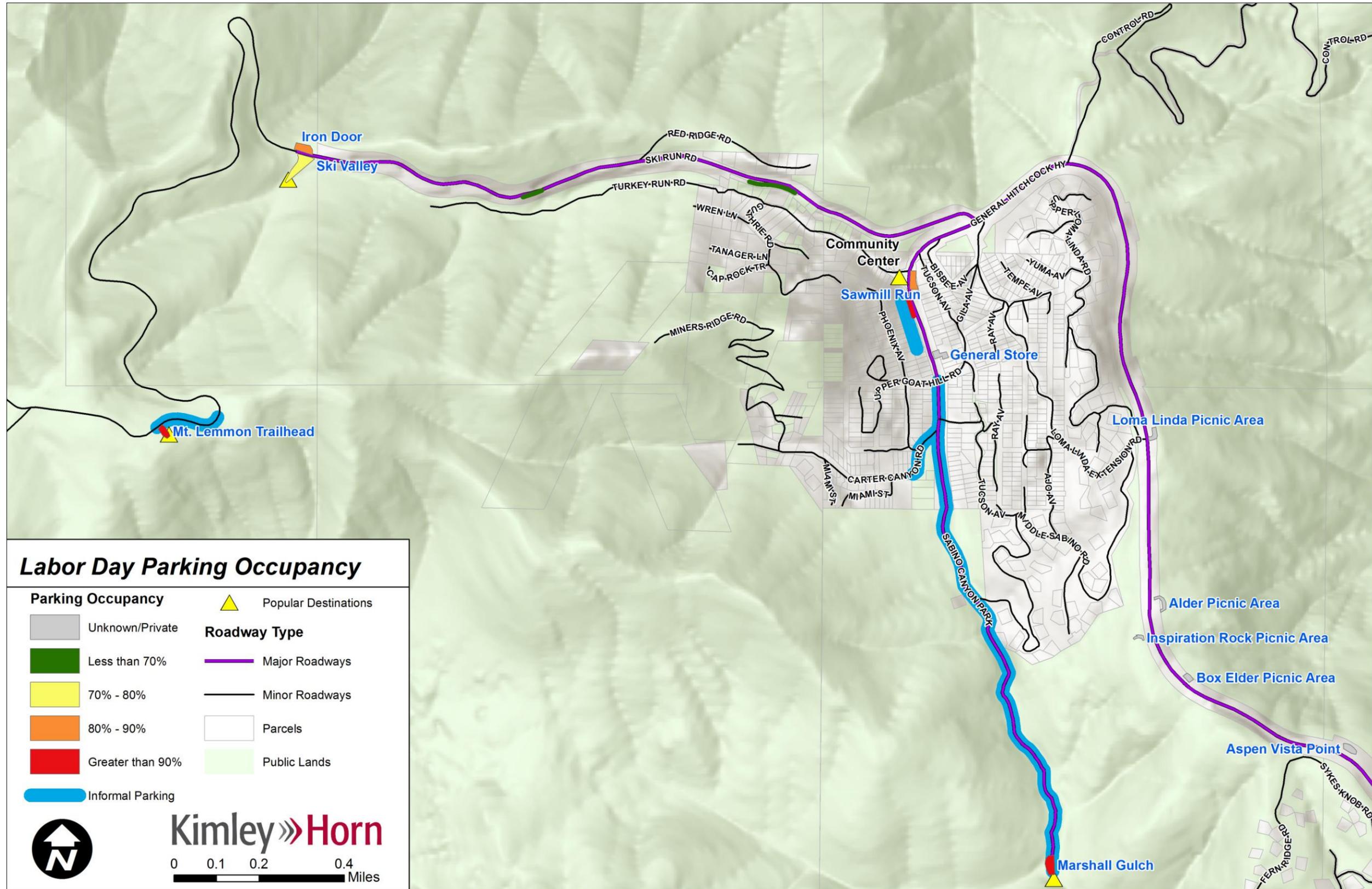


Figure 4: Labor Day Parking Occupancy



Parking at informal locations as observed along Sabino Canyon Park, Carter Canyon Road, and Ski Run Road, poses a unique challenge because of the narrow roadway widths, as well as the frequent horizontal and vertical curvature. The shoulders along these roadways are discontinuous and vary in width, leading to vehicles parking partially on the pavement for the travel lanes. The limited sight distances, narrow roadway width, and disorganized parking lead to potential conflicts between vehicles, as well as between vehicles and pedestrians. However, with the parking demand so far above the parking supply, these informal spaces are the only location for people to park within the study area. **Photo 3** shows the informal parking along Sabino Canyon Park and pedestrians walking in the roadway.

**Photo 3: Informal Parking and Pedestrians in the Roadway on Sabino Canyon Park**



## TRAFFIC DATA

Traffic counts were collected at three locations within the study area. Two of the traffic count locations are on General Hitchcock Highway, just east of the intersection with Ski Run Road; the remaining count location is on Ski Run Road just northwest of the intersection with General Hitchcock Highway.

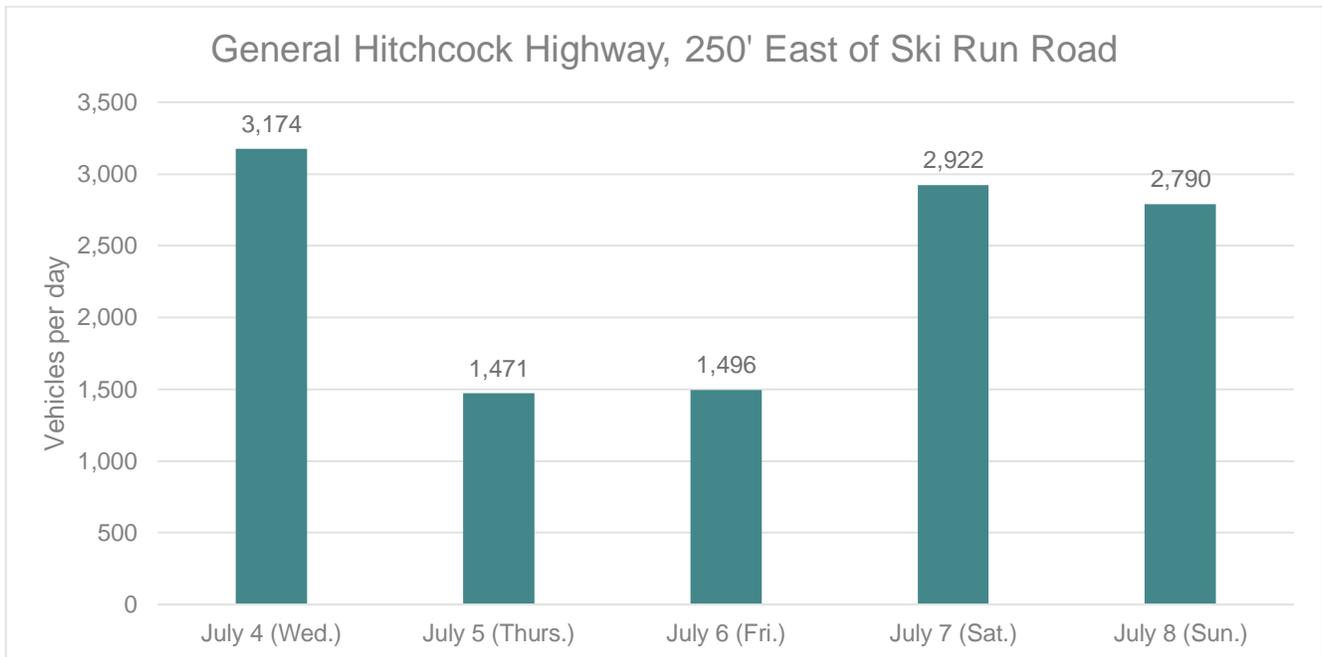
**Table 2** presents the average daily traffic (ADT) counts. The count periods were each over holiday weekends, Memorial Day in 2016 and July 4 in 2018, to show the impact of weekend and holiday traffic. The traffic on General Hitchcock Highway ranges from a low of 1,225 vehicles to a maximum of 3,174 vehicles on July 4, indicating that holidays and weekends have a major impact on local traffic volumes as shown in **Figure 5**.

**Table 2: Average Daily Traffic Counts**

Location	Year	Date	ADT
General Hitchcock Highway – 250' E of Ski Run Road	2018	July 4 (Wed.)	3,174
		July 5 (Thurs.)	1,471
		July 6 (Fri.)	1,496
		July 7 (Sat.)	2,922
		July 8 (Sun.)	2,790
	2016	April 22 (Fri.)	1,225
		April 23 (Sat.)	1,804

Location	Year	Date	ADT
Ski Run Road – 200' N of General Hitchcock Highway	2018	April 24 (Sun.)	1,753
		May 24 (Thurs.)	472
		May 25 (Fri.)	588
		May 26 (Sat.)	1,059
		May 27 (Sun.)	1,462
		May 28 <sup>th</sup> (Mon. – Memorial Day)	1,241
		July 4 (Wed.)	1,257
		July 5 <sup>th</sup> (Thurs.)	731
		July 6 <sup>th</sup> (Fri.)	666
		July 7 <sup>th</sup> (Sat.)	1,521
July 8 <sup>th</sup> (Sun.)	1,453		

**Figure 5: Traffic Volume Data, July 4<sup>th</sup> Weekend, 2018**



## SIDEWALKS

The only sidewalks in the study are present along Sabino Canyon Park near the center of Summerhaven. There is sidewalk, approximately four feet in width, along the west side of Sabino Canyon Park from the Community Center at the intersection with Turkey Run Road to the south end of the on-street parking along the west side of the roadway, approximately 500 feet in total length. There is also sidewalk, ranging from five to seven feet wide, along the east side of Sabino Canyon Park from the south end of the Sawmill Run parking lot to the intersection with Upper Goat Hill Road, approximately 1,000 feet in length.

There are three marked crosswalks across Sabino Canyon Park within Summerhaven. The northernmost is located on the south leg of the intersection with Turkey Run Road; the central crosswalk connects the south end of the community center to just south of the main Sawmill Run parking lot; the southernmost crosswalk is on the south and east legs of the intersection with Upper Goat Hill Road. The northern two crosswalks are “ladder

striped”, with both transverse and longitudinal pavement markings, and the southern crosswalk has standard striping, with just transverse pavement markings.

The sidewalk appears to be in relatively good repair. The sidewalk along the west side of the roadway and the northernmost 90 feet along the east side of the roadway was constructed in 2006 when the roadway was reconstructed. The remainder of the sidewalk on the eastern side of the roadway was constructed in 2013. **Photo 4** shows the heavy utilization of the sidewalks in Summerhaven on Labor Day weekend.

**Photo 4: Sidewalk Utilization in Summerhaven**



## BICYCLE FACILITIES

There are currently no designated on-street bicycle facilities within the study area. The shoulders are commonly used by cyclists on General Hitchcock Highway, Sabino Canyon Park, and Ski Run Road; however, as vehicles are commonly parked on these shoulders, cyclists frequently ride in traffic lanes.

## CRASH DATA

There were 38 crashes reported during the 10-year period from April 1, 2008 through March 31, 2018. There were zero fatalities, three suspected serious injuries, six suspected minor injuries, and four possible injury crashes. **Figure 6** shows the location and severity of the crashes in the study area.

Most of the crashes (25 of 38) were single-vehicle crashes, many of which were a result of excessive speed. There was also a relatively high proportion (approximately 35%) of crashes that took place during inclement weather, including rainy, snowy, or icy conditions.

The highest density of crashes occurred along General Hitchcock Highway, between Ski Run Road and Aspen Vista Point. There were approximately 12 crashes per mile, compared to 3.9 crashes per mile on Sabino Canyon Park and 2.8 crashes per mile on Ski Run Road.

## LAND PARCELS AND PROPERTY OWNERSHIP

**Figure 7** shows the parcels and ownership of larger parcel groups in central Summerhaven. Pima County owns several parcels along Sabino Canyon Park, as does the Arizona Board of Regents (University of Arizona). United States Forest Service lands surround Summerhaven.

**Figure 7** highlights vacant parcels along Sabino Canyon Park. Future development on these parcels could include additional public parking (in addition to parking required for the commercial development).

Figure 6: Crashes by Severity (April 2008 - March 2018)

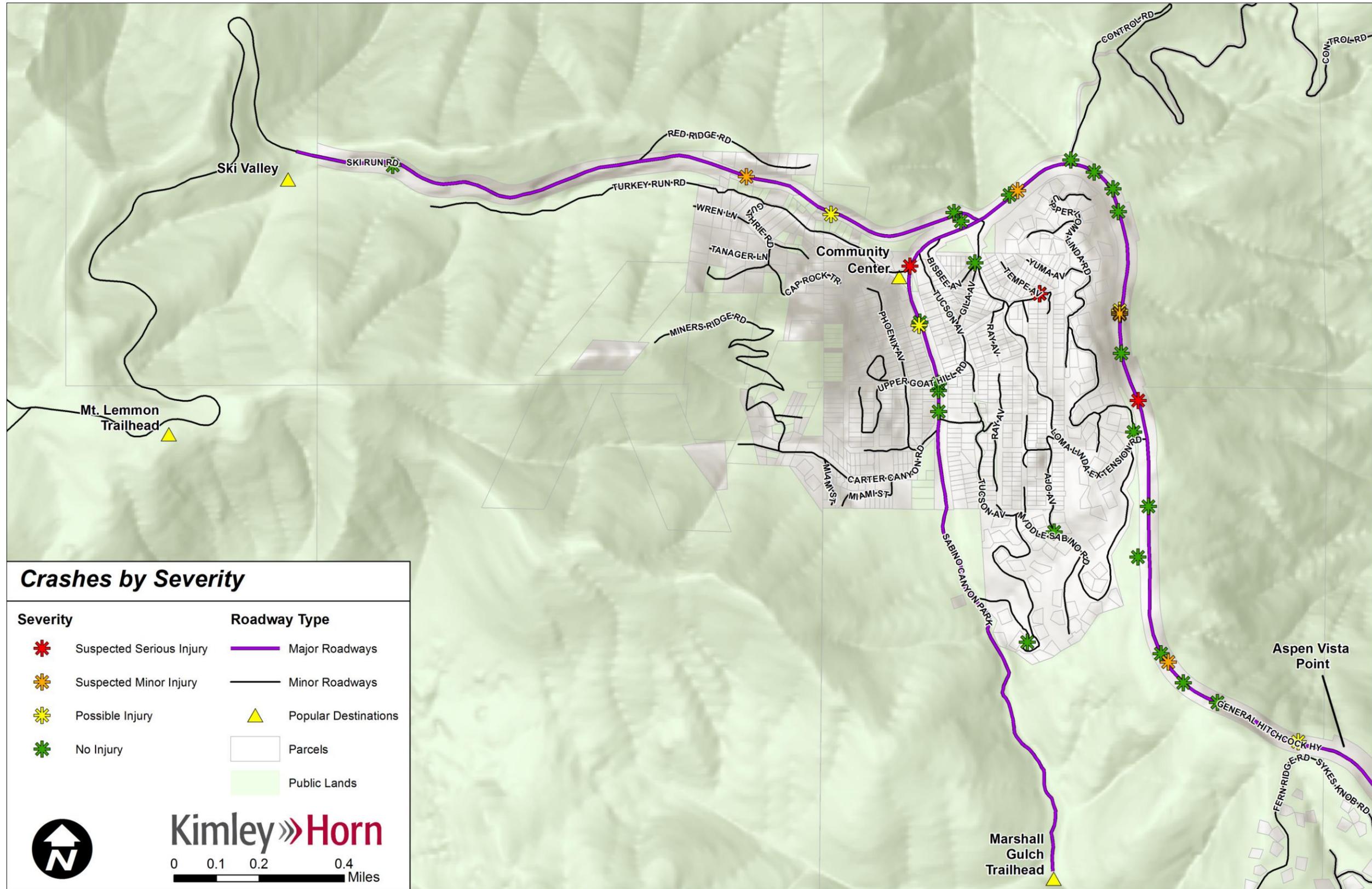
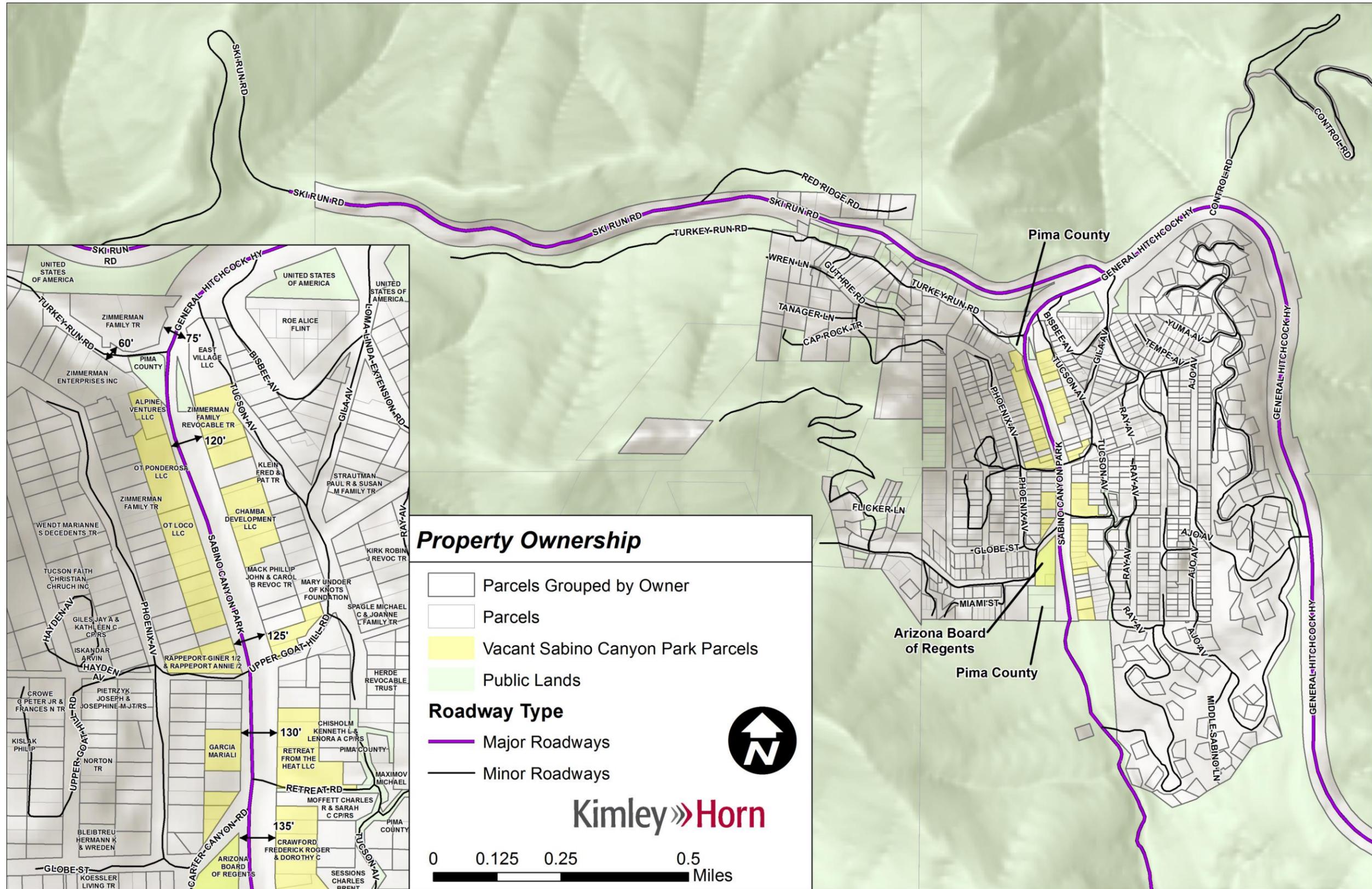


Figure 7: Property Ownership and Vacancy



### 3. LOCALLY-IDENTIFIED TRANSPORTATION ISSUES

This section describes multimodal transportation, congestion, and parking issues identified by the stakeholders and the public.

#### STAKEHOLDER-IDENTIFIED ISSUES

**Table 3** provides the transportation issues identified by local agency stakeholders during the project kick-off meeting held on August 8, 2018. The issues are grouped by mode of travel. Parking issues received most of the comments during the kick-off meeting.

**Table 3: Agency Stakeholder-Identified Issues**

Category	Comment
<b>Parking</b>	Parking proximate to Summerhaven village is constrained, and it is difficult/expensive to construct additional parking facilities.
	People frequently park on the shoulders of Sabino Canyon Park near the Cookie Cabin and Living Rainbow Gift Shop.
	The parking lot at the summit overflows on weekends; people park along the roadway.
	The Ski Valley lot overflows frequently, and people park outside the gate.
<b>Bicycles</b>	Illegally parked vehicles prevent cyclists from using the shoulders, so they ride in traffic lanes.
	There are no bicycle racks anywhere on Mount Lemmon.
<b>Pedestrians</b>	Sidewalks are limited to a short distance in Summerhaven, elsewhere people walk in the roadway.
<b>Transit</b>	Large vehicles have no place to turn around on the main roadways, the only location where turnarounds are possible is at the Community Center.
	The distance is likely too far to provide shuttle service all the way from the bottom of the mountain to Summerhaven and/or Ski Valley.
<b>Other Issues</b>	Emergency vehicles cannot access Summerhaven or the other points of interest during snow events.
	Cell service on the mountain can be poor, limiting the technology-based solutions that can be implemented.
	Many tourists to the area are from Mexico and there is no Spanish-language signage on the mountain.

#### PUBLICLY-IDENTIFIED ISSUES

**Table 4** provides the transportation issues identified by residents and business owners during a public meeting conducted August 16, 2018.

The issues are grouped by mode of travel. Parking and traffic were the most common issues identified by the residents and business owners; specifically, the safety hazards surrounding the mix of modes on constrained roadways, such as Sabino Canyon Park and General Hitchcock Highway.

**Table 4: Residents/Business Owners-Identified Issues**

Category	Comment
<b>Parking</b>	There are only 78 parking spaces in Summerhaven and people leave the mountain because of inadequate parking availability.
	Illegal parking causes safety hazards for pedestrians and drivers.
	Parking near Marshall Gulch is difficult and frequently overflows. There is double-parking that occurs on Sabino Canyon Park, blocking traffic.
<b>Roadways</b>	There is little street connectivity in Summerhaven, causing total reliance on main roadways.
	Middle Sabino Road is the only street connection on the south side of Summerhaven and it is inadequate for through traffic.
	Tucson Road is a connection that parallels Sabino Canyon Park, but is too steep for through traffic.
<b>Bicycles</b>	There are no bicycle facilities on the mountain.
	Cyclists travel too fast through Summerhaven.
<b>Pedestrians</b>	People walk in the street due to a lack of sidewalks.
<b>Transit</b>	There are no turnarounds for buses or shuttles.
	People bring ice chests and other equipment, serving them with transit would be difficult.
<b>Other Issues</b>	There have not been traffic counts conducted year-round to evaluate traffic conditions at different times of the year.
	There are not enough public restrooms in Summerhaven.

## 4. POTENTIAL SOLUTION CONCEPTS

Considering public and stakeholder input, potential solutions are identified (**Table 5**) to address mobility issues. Improvement concepts for which specific locations are identified are shown graphically in **Figure 8**. Note that the feasibility and effectiveness of these solutions have not yet been evaluated; these solutions are presented for additional input and feedback from the stakeholders group.

### CENTRALIZED REMOTE PARKING LOCATIONS

As an alternative to constructing additional parking in Summerhaven, an idea proposed during the public and stakeholder engagement is to create a larger, centralized parking facility outside of the village and use a shuttle service to bring visitors to village destinations. Locations suggested for the remote parking areas are mapped in **Figure 9**.

Locations and further definition of the shuttle service will be evaluated in subsequent steps of the planning process; however, potential issues exist with each of the identified locations. Parking at the base of Mount Lemmon would require a long distance on a shuttle service and be expensive to operate. Other locations outside of Summerhaven, including Sykes Knob, Ski Run Road gated area, and the ski equipment storage area (**Photo 5**) are far enough away that drivers would likely drive into the Village first to find open parking, then must backtrack to the centralized location, causing extra travel. The Ski Valley location often has excess capacity but it is sometimes heavily utilized for on-site purposes and would require coordination and liability agreements with the USFS and Ski Valley management.

*Photo 5: Ski Equipment Storage Area*



**Table 5: Potential Improvement Concepts**

Category	Concept	Potential Locations	Considerations	Source
<b>Parking</b>	Create a centralized parking area outside of Summerhaven village and provide shuttle service to the main destinations*	The storage area for old ski equipment on Ski Run Road, the Ski Valley parking lot, near Sykes Knob Picnic Area, and the Forest Service property parcel on the south side of Sabino Canyon Park between Bisbee Avenue and Loma Linda Extension Road	The cost of the parking facility and providing shuttle service between the remote parking and the village, as well as frequency, vehicle type (buses vs. golf carts), seasons, and days of the week when the service will be provided	Stakeholder Group/Public
	Create additional off-street parking within Summerhaven and Marshall Gulch*	Carter Canyon Road, incorporate parking into redevelopment sites, vacant lots near the water treatment plan, temporary parking on vacant lots south of the community center.	The cost of grading a parking area or constructing a parking structure, working with private developers to incorporate public parking into redevelopment	Stakeholder Group/Public
	Create additional on-street parking (parallel, perpendicular, or angled) between Summerhaven and Marshall Gulch*	Along the west side of Sabino Canyon Park between Carter Canyon Road and Marshall Gulch	The cost of widening the roadway given the steep slopes at points along the west side of the roadway, safely accommodating pedestrians from the parking area to nearby destinations, and safety implications of perpendicular parking	Stakeholder Group
	Add additional public restrooms outside of the center of Summerhaven to distribute parking demand away from the community center	The south side of Summerhaven, potentially near the water treatment plant or at Marshall Gulch	Construction costs and maintenance responsibilities	Public
	Remove parking from the village center and keep the area strictly for pedestrians; use off-site parking to accommodate demand	N/A	Traffic circulation through or around the village, cost of the new parking area and shuttle service	Public
	Formalize parking at the ski equipment storage area on Ski Run Road as overflow parking for the Mount Lemmon Trailhead lot and connect the two lots with a trail or sidewalk and prohibit parking on Ski Run Road	Ski equipment storage area	Removal cost of the existing ski equipment and alternative storage accommodations if needed, cost of paving or marking the storage area as a parking lot	Kimley-Horn
	Promote use of the Sunset Trailhead, located on Solders Camp Road, to access Marshall Gulch hiking opportunities during peak times to mitigate congestion and parking constraints in Summerhaven and on Sabino Canyon Park.	Soldiers Camp Road	It is an approximately one-mile hike from the Sunset Trailhead to Marshall Gulch.	Pima County
<b>Roadways</b>	Create a one-way couplet in Summerhaven using a parallel roadway to Sabino Canyon Park to reduce congestion and increase space for parking	Tucson Avenue, Bisbee Avenue, Loma Linda Extension Road	None of the side streets in Summerhaven are adequate for creating the one-way loop and would require substantial upgrades; access to properties along the one-way segments	Public
	Add a connection between Sabino Canyon Park and General Hitchcock Highway south of Summerhaven*	Middle Sabino Road, new alignment through Forest Service land	Middle Sabino Road in its current state is inadequate for higher traffic volumes due to grades and curves. A new roadway alignment would be expensive and require clearance from the Forest Service.	Public
	Add roundabouts to allow vehicles to turn around and improve circulation*	Sabino Canyon Park at Carter Canyon Road, Sabino Canyon Park at Ski Run Road	Right-of-way requirements for constructing a roundabout and grading of steep slopes, safety of pedestrians and bicycles at roundabouts.	Stakeholder Group
	Close Sabino Canyon Park at the forest service gate during peak times and provide shuttle service from centralized parking to Marshall Gulch*	Sabino Canyon Park	The cost of the centralized parking and shuttle service, reduction in the need to construct pedestrian/bike facilities along Sabino Canyon Park, frequency and times when shuttle service must be provided	Kimley-Horn
	Create a wayfinding plan for parking and local destinations*	Study area-wide	Cost of planning, constructing and maintaining signage	Kimley-Horn
<b>Bicycles</b>	Add bike lanes along main roadways to protect cyclists from traffic	General Hitchcock Highway and Sabino Canyon Park	Right-of-way for roadway widening where shoulders do not currently exist, enforcement of parking restrictions	Public
<b>Pedestrians</b>	Add additional sidewalks in the Village*	Sabino Canyon Park	The cost of constructing sidewalks due to limited right-of-way, grading, and creek encroachment	Stakeholder Group
	Add multi-modal facilities from Summerhaven to Marshall Gulch*	Sabino Canyon Park	Steep grades along the creek and side street crossings	Public
<b>Transit</b>	Create a bus turnaround and warning signage	South side of Summerhaven or Marshall Gulch	The location and right-of-way requirements to create a bus turnaround	Stakeholder Group/Public
<b>Technology</b>	Add dynamic messaging signs that indicate the remaining capacity of parking on the mountain	Base of Mount Lemmon	How to monitor parking capacity and update the sign(s) accordingly	Public
	Add dynamic messaging signs on Mount Lemmon indicating parking constraints and congestion in Summerhaven and point to remote parking.	General Hitchcock Highway	Access from remote parking to Summerhaven or Marshall Gulch, and how to monitor parking capacity and update the sign(s) accordingly	Pima County
	Add additional cell towers on the mountain to be able to implement technology-based solutions	Study area	What entity would construct and maintain the towers	Public
	Add speed feedback signs to reduce speeds entering the study area	General Hitchcock Highway	Maintenance needs of signage, power supply if they are not solar	Pima County

\*Additional concept details discussed in this section

Figure 8: Potential Improvement Concepts

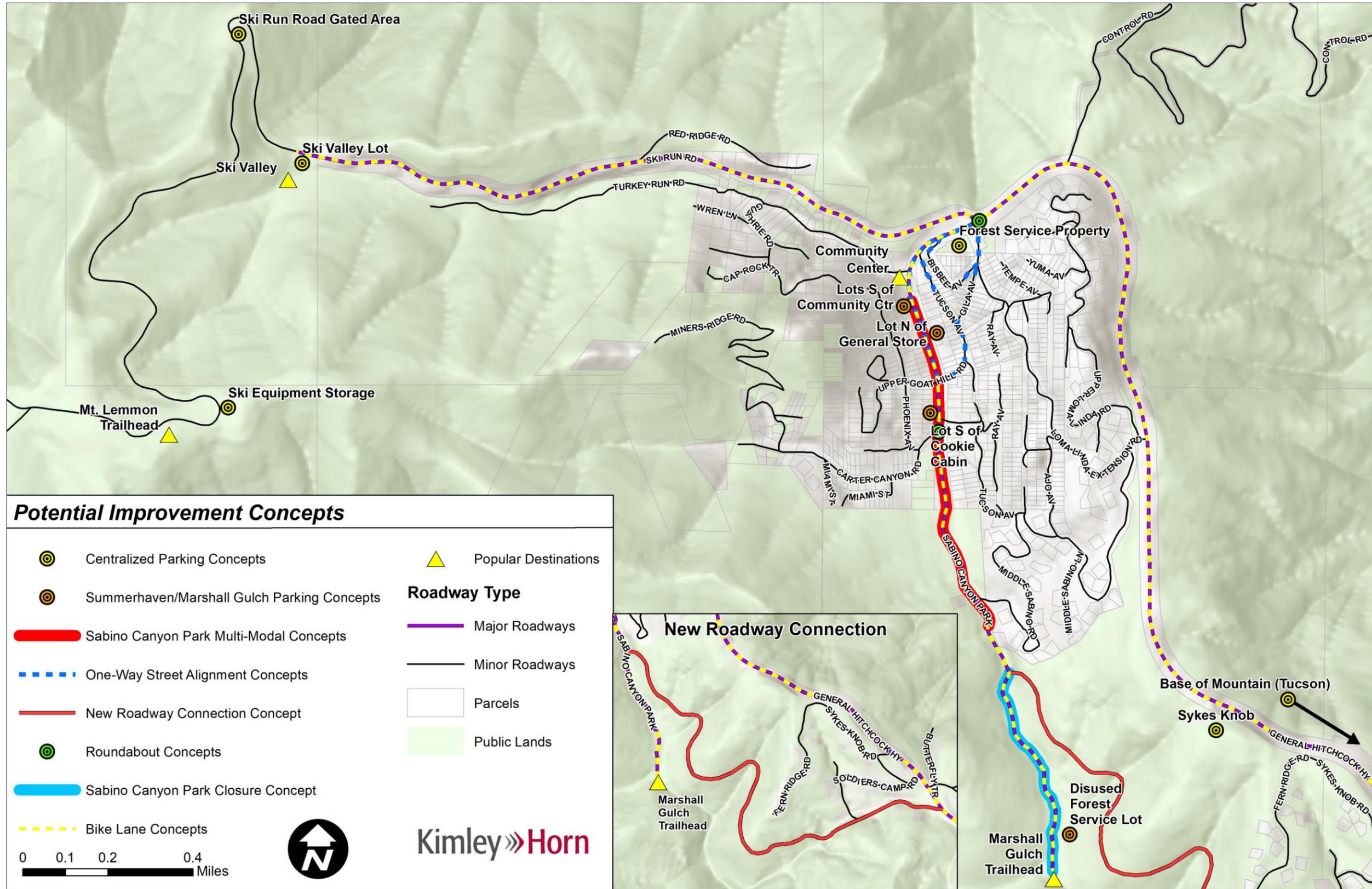
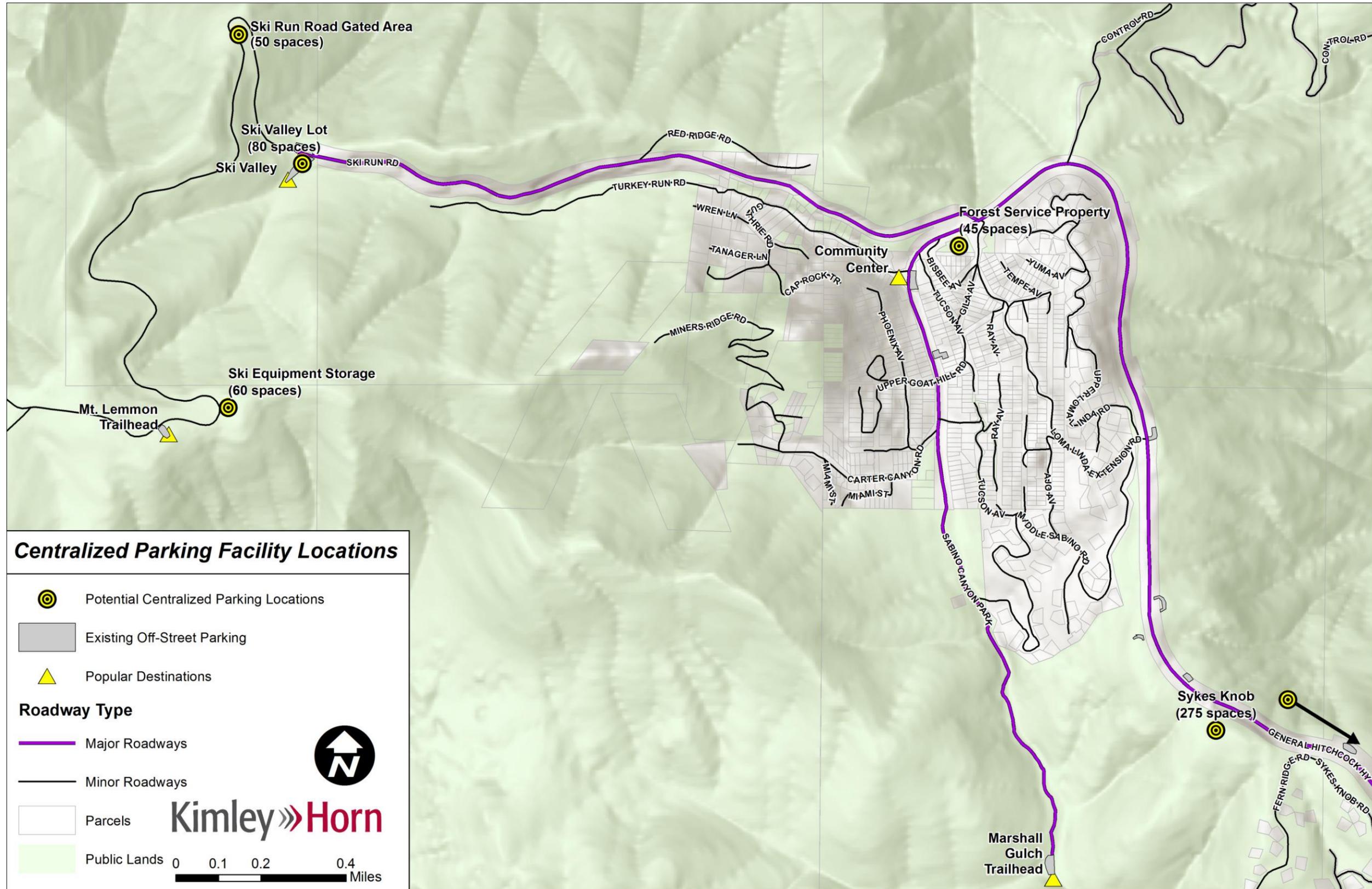


Figure 9: Potential Centralized Parking Facility Locations



*[Page Intentionally Left Blank]*

The U.S. Forest Service property (**Photo 6**) is the most proximate potential parking location to Summerhaven. Vehicular access to a parking lot on this site could gain access from General Hitchcock Highway just west of Ski Run Road. The lot could accommodate approximately 45 vehicles. Pedestrian access could be provided from the west end of the lot near Bisbee Avenue. Due to previous fire damage, tree removals may be minimal. However, the lot has substantial grade issues which would require excavation to lower the existing grades and flatten slopes.

**Photo 6: Forest Service Parcel as seen from Loma Linda Extension Road**



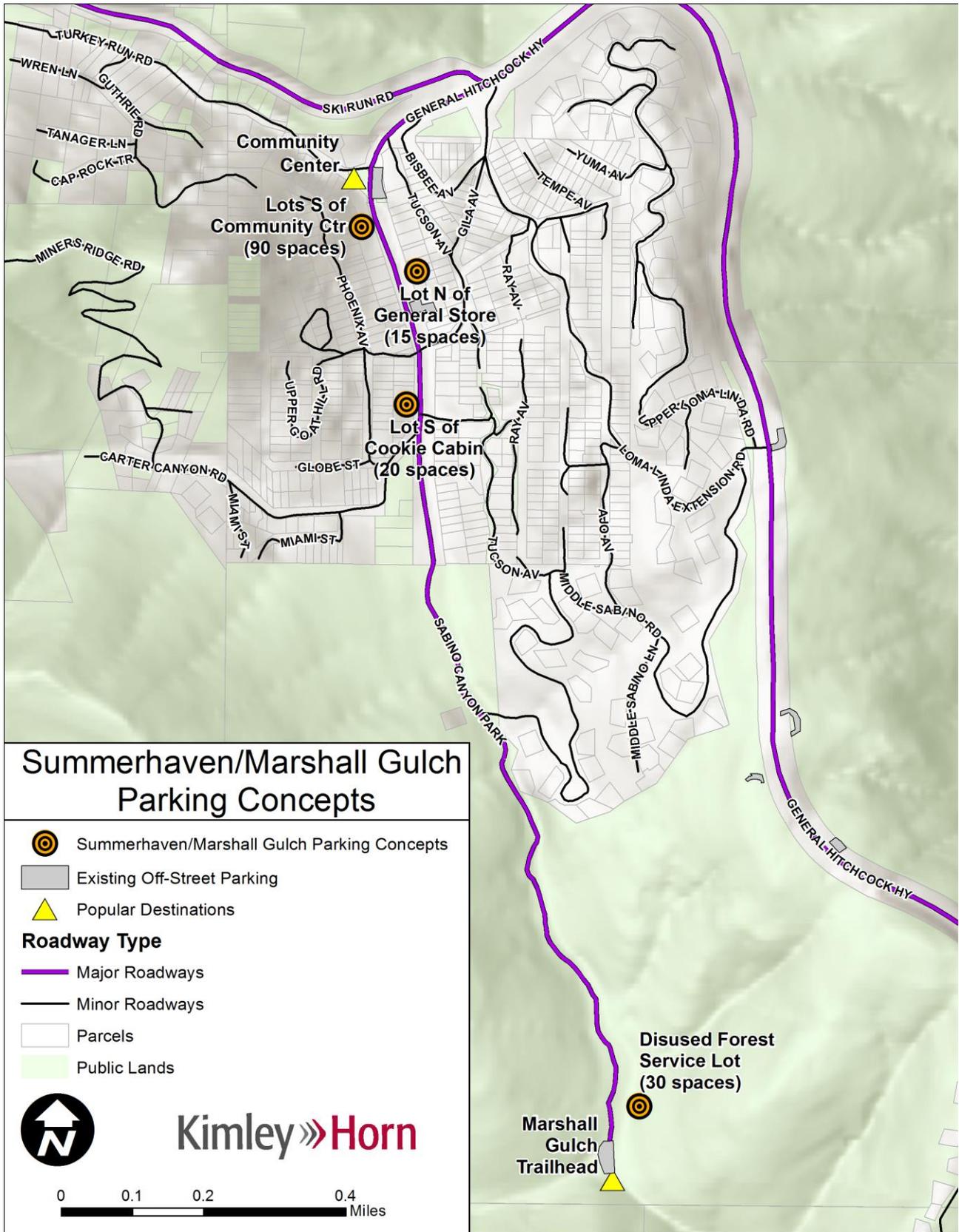
### ADDITIONAL OFF-STREET PARKING IN SUMMERHAVEN & MARSHALL GULCH

Potential locations for parking within the village and near Marshall Gulch are shown in **Figure 10**.

*Concept A – Lots South of Community Center:* Six vacant parcels are currently serving as overflow parking lots through agreements with the private property owners. These parcels are relatively flat, as shown in **Photo 7**, and could be improved to maximize their use and accessibility. The vacant parcels are located along the west side of Sabino Canyon Park between the Community Center and Upper Goat Hill Road as shown in **Photo 8**. Parking improvements could consist of gravel parking lots with minimal infrastructure.

If improved as a temporary lot (rather than purchased by the County), a maintenance and easement agreement would need to be reached with property owners. The parking could be removed when redevelopment of the parcels occurs and parking is incorporated into the redevelopment. Improvement of the parcels could potentially accommodate up to 90 parking spaces.

Figure 10: Summerhaven/Marshall Gulch Parking Concepts



**Photo 7: Vacant Lots South of the Community Center**



Photo 8: Vacant Lots South of the Community Center – Aerial Image

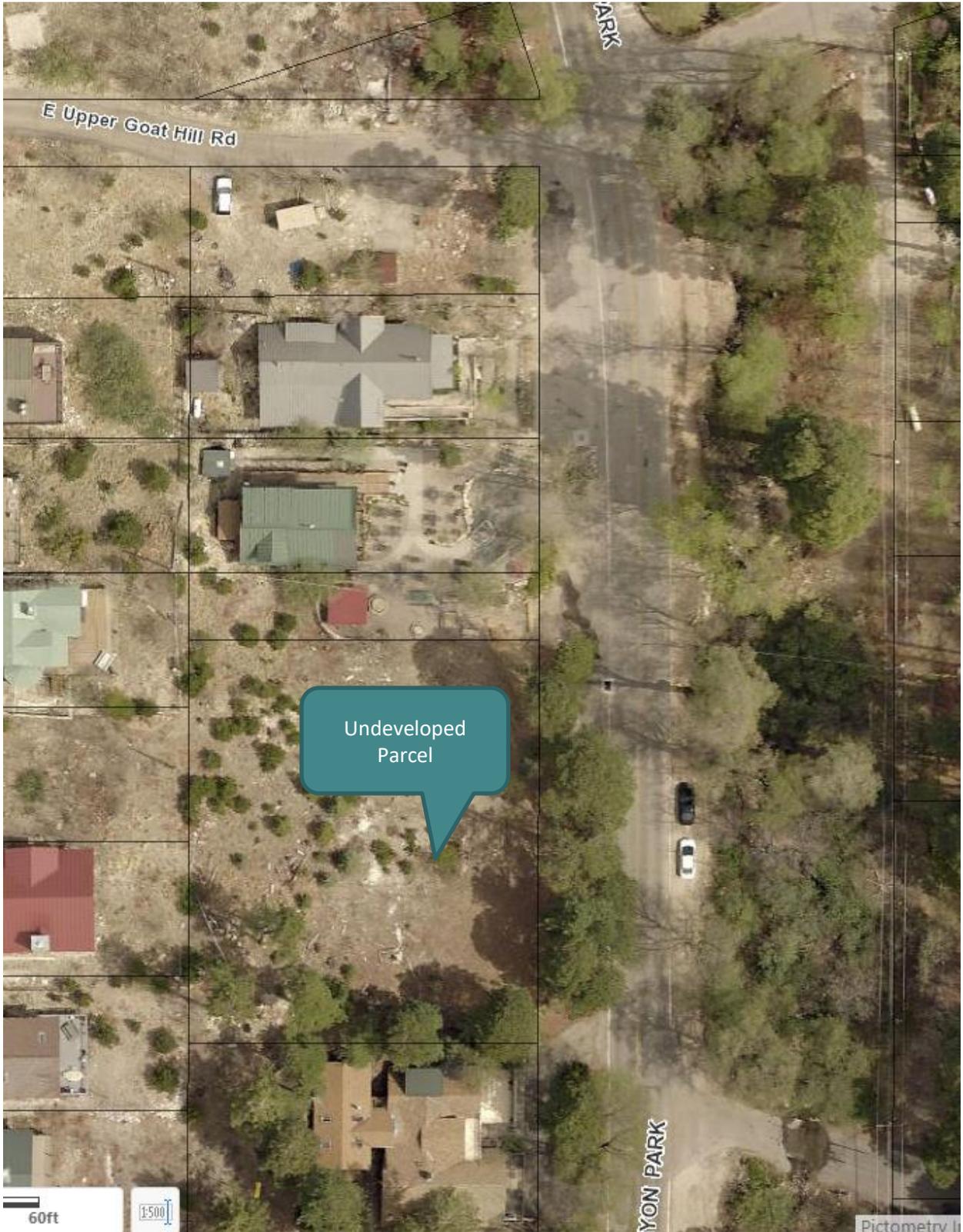


*Concept B – Lot South of Cookie Cabin:* Another potential parking area is the vacant lot south of the Cookie Cabin. This lot is relatively flat and has reasonable access from Sabino Canyon Park. The property is shown in **Photo 9**. The property appears to be deep enough to create two rows of parking stalls and it is preliminarily estimated that 20 to 25 parking spaces could be created on this parcel. An aerial view of the parcel is shown in **Photo 10**.

***Photo 9: Vacant Parcel South of Cookie Cabin***



Photo 10: Vacant Parcel South of Cookie Cabin – Aerial View



*Concept C – Lot north of General Store:* New public parking (surface or structured), in addition to parking required for the development itself, could be incorporated into new development on vacant parcels located north of the General Store. Development ideas include constructing public parking on the bottom level of a two- or three-story building, with commercial and retail uses above. It is anticipated that **Photo 11** shows a view of the lot from the General Store. The lot would be excavated to be at street level.

**Photo 11: Potential Location of Future Parking Facility under New Development**



*Concept D – Disused U.S. Forest Service Lot:* North of the Marshall Gulch Picnic Area along Sabino Canyon Park, there is a parking lot owned by the Forest Service, currently inaccessible and out of service, that could absorb a portion of the overflow demand. Currently, the access to the parking lot over the creek is washed out, as shown in **Photo 12**. This crossing could be rehabilitated or reconstructed to provide access to the parking lot.

The parking lot, in its current configuration (**Photo 13**), could accommodate approximately 20 vehicles. However, with some additional grading to cut into the hillside at certain locations (likely less than 10 feet of additional width is required to create the opportunity for more perpendicular parking) the capacity of the parking lot could increase to approximately 30 vehicles. This lot already has a substantial amount of infrastructure, including bathrooms, display boards, and trash facilities, and would therefore be less expensive and have fewer environmental impacts than creating a new parking facility near Marshall Gulch.

An aerial view of the bridge and parking lot is provided in **Photo 14**.

**Photo 12: Washed-Out Access to Inaccessible Forest Service Lot**



**Photo 13: Inaccessible Forest Service Parking Lot**



Photo 14: Inaccessible Forest Service Parking Lot – Aerial View



## SABINO CANYON PARK ON-STREET PARKING AND MULTIMODAL ACCOMMODATIONS

Several constraints contribute to parking challenges on Sabino Canyon Park between Upper Goat Hill Road and Marshall Gulch. An insufficient number of parking stalls, combined with a lack of pedestrian and bicycle facilities, a narrow roadway, steep grades, and the proximity of the creek, lead to constrained operations for all users. Improvements to Sabino Canyon Park, from the center of Summerhaven south to the Marshall Gulch Picnic Area, could include accommodations for parking, pedestrians, and cyclists. Several concepts have been developed for various segments of Sabino Canyon Park.

### UPPER GOAT HILL ROAD TO CARTER CANYON ROAD

Improvement concept alternatives for this segment of Sabino Canyon Park are provided in graphic format in **Figure 11** and listed below.

**Figure 11: Sabino Canyon Park (Upper Goat Hill Road to Carter Canyon Road)**



- **Concept E – Extend sidewalk east side:** Extend the sidewalk on the east side of Sabino Canyon Park south from the current terminus at Upper Goat Hill Road, to south of Carter Canyon Road, to accommodate pedestrian demand.
- **Concept F – Perpendicular parking and extend sidewalk west side:** Extend the sidewalk on the west side of Sabino Canyon Park south from the current terminus 350 feet south of the Community Center to Carter Canyon Road and provide perpendicular parking in front of Cookie Cabin and Living Rainbow.
- **Concept G – Parallel Parking:** Formalize parallel parking on the east side of Sabino Canyon Park from Retreat Road northward approximately 115 feet to accommodate five parallel spaces and southward approximately 45 feet to accommodate two parallel spaces.

- *Concept H – Perpendicular Parking:* Formalize perpendicular parking in front of the Living Rainbow Gift Shop and Cookie Cabin. Stabilize surface and add pavement markings. This formalization should result in approximately 12 to 13 parking spaces.
- *Concept I – Carter Canyon Parking:* Stripe parallel or perpendicular parking spaces on Carter Canyon Road between Sabino Canyon Park and Phoenix Avenue. Parallel parking could be accommodated on both sides of the roadway within the existing pavement. Perpendicular parking on the south side of the roadway may require slight widening of the existing pavement. It is estimated that approximately 20 spaces could be formalized on this section of Carter Canyon Road.

Basic graphics showing the parking concepts on Sabino Canyon Park from a ground-level perspective are provided in **Photo 15** and **Photo 16**.

**Photo 15: Potential Improvements on Sabino Canyon Park Looking South from Upper Goat Hill Road (Concepts E, F, and H)**

Before



After



**Photo 16: Potential Improvements on Sabino Canyon Park Looking North from Retreat Road (Concepts E & G)**

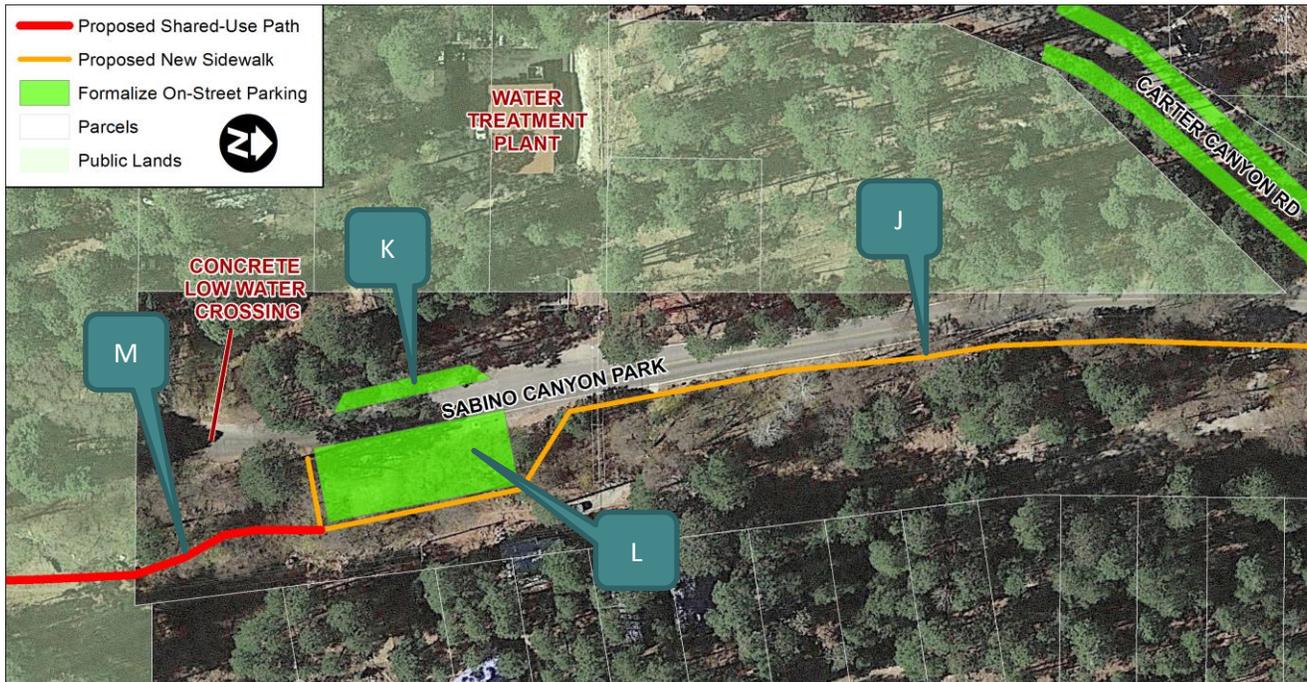


#### CARTER CANYON ROAD TO FOREST SERVICE BOUNDARY

The recommendations for this segment of Sabino Canyon Park are provided in graphic format in **Figure 12** and listed below.

- *Concept J – Extend sidewalk east side:* This is a continuation of Concept F, to further extend the sidewalk on the east side of Sabino Canyon Park to approximately 30 feet north of the concrete low-water crossing. The sidewalk would be constructed to accommodate perpendicular parking near the water treatment plant.
- *Concept K – Parallel parking west side:* Widen the west side of the roadway to formalize parallel on-street parking south of the water treatment plant entrance. The grades at this location are relatively flat compared to surrounding areas, which would allow for approximately 8 feet of additional pavement for a length of 120 feet. It is estimated that five to six additional parallel parking spaces could be gained at this location.
- *Concept L – Perpendicular parking east side:* Widen the east side of the roadway to accommodate perpendicular parking near the water treatment plant. Approximately 120 linear feet of widening is feasible, which would accommodate approximately 13 perpendicular spaces.
- *Concept M – Shared Use Path:* Construct a shared-use path starting at the proposed perpendicular parking spaces on the east side of Sabino Canyon Park that crosses the creek and roughly follows the power lines that run along the east side of the creek.

**Figure 12: Sabino Canyon Park (Carter Canyon Road to Forest Service Boundary) Recommendations (Concepts J – M)**



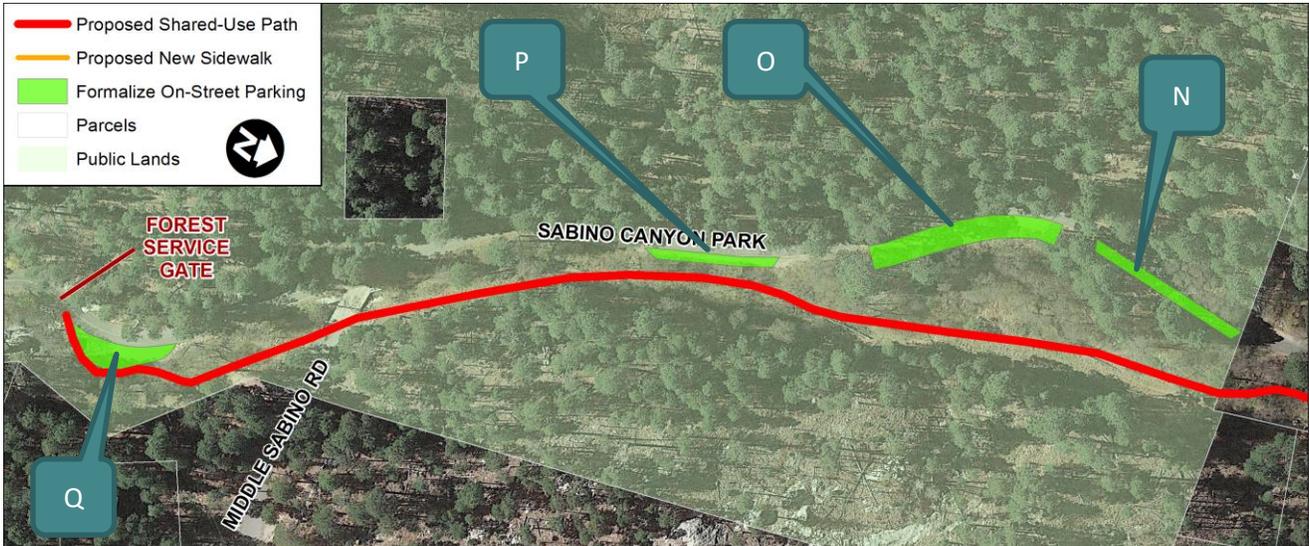
#### FOREST SERVICE BOUNDARY TO FOREST SERVICE GATE

The recommendations for this segment of Sabino Canyon Park are provided in graphic format in **Figure 13** and listed below.

- *Concept N – Parallel parking east side:* Beginning at the Forest Service boundary moving southward, Sabino Canyon Park could be widened to accommodate parallel parking on the east side of the roadway for approximately 110 feet, which would accommodate four to five vehicles.
- *Concept O – Perpendicular parking east side:* Starting approximately 20 feet south of the widening above, Sabino Canyon Park could be widened to accommodate perpendicular parking for approximately 250 linear feet along the east side of the roadway, which would accommodate approximately 27 parking spaces.
- *Concept P – Perpendicular parking east side:* Beginning approximately 110 feet south of Concept O, the roadway can be widened on the east side of the roadway to accommodate parallel parking for approximately 120 feet. This widening could accommodate approximately five to six vehicles.
- *Concept Q – Turnaround:* The turnaround north of the Forest Service Gate can be striped to accommodate perpendicular parking, for eight to 10 vehicles.
- *Concept R – Cable barrier:* On segments of Sabino Canyon Park where it has not been widened to allow for formal parking, decorative cable barriers would be placed along the roadway to prohibit on-street parking. These barriers would prevent vehicles parking partially on the pavement.
- *Concept S – Shared use path:* A shared-use path would extend south, along the east side of the creek, generally following an existing social trail and power lines until just south of Middle Sabino Road, where it would cross the creek and connect to the existing paved turnaround area just north of the Forest Service Gate. A pedestrian bridge(s) would connect the shared-use path and the new formalized parking facilities along Sabino Canyon Park to provide access from visitors' vehicles and the shared use path to,

so that visitors are not forced to walk in the roadway. **Photo 17** shows a view of the potential trail location north of Middle Sabino Road.

**Figure 13: Sabino Canyon Park (Forest Service Boundary to Forest Service Gate) Recommendations (Concepts N – S)**



**Photo 17: Proposed Location of Shared-Use Path Parallel to Sabino Canyon Park**



## CLOSE SABINO CANYON PARK DURING PEAK TIMES

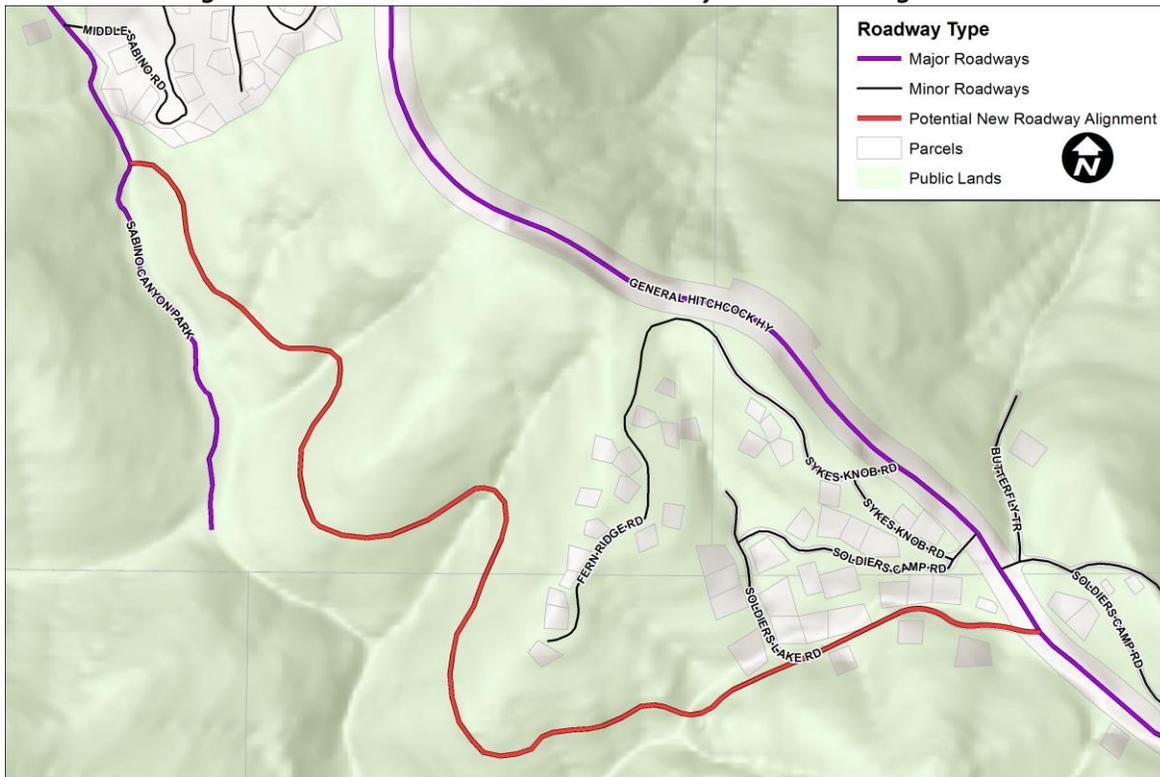
Another concept to reduce congestion during peak periods is to close Sabino Canyon Park to vehicle traffic south of the Forest Service Gate. Sabino Canyon Park would become pedestrian-only south of the Forest Service Gate or require travel via shuttle golf carts driven by volunteers. This concept only be constructed if parking improvements in Summerhaven are constructed to accommodate the parking demand at the Marshall Gulch picnic area, which is estimated at 150 to 200 vehicles. Removal of private vehicles from Sabino Canyon Park during peak holidays and weekends would eliminate the need for expense (and perhaps unfeasible) pedestrian and bicycle infrastructure along Sabino Canyon Park south of the Forest Service Gate. Pedestrians and bicyclists could walk in the roadway without having to avoid parked vehicles or worry about staying out of the way of traffic. The gate closure and shuttle service would only be required on peak weekends and holidays, due to substantially lower demand outside of the summer months and weekends.

## NEW ROADWAY CONNECTION SOUTH OF SUMMERHAVEN

Providing an additional roadway connection between General Hitchcock Highway and Sabino Canyon Park south of Summerhaven might alleviate congestion in the village by providing an alternate route to Marshall Gulch. Any new roadway in the area would be a major project and would require extensive environmental studies.

**Figure 14** shows a potential alignment for a new roadway as suggested by Pima County staff. The roadway would intersect Sabino Canyon Park at the turnaround near the Forest Service gate and intersect General Hitchcock Highway just south of Soldiers Camp Road, generally following an elevation of 7,600 feet.

**Figure 14: Potential New Southern Roadway Connection Alignment**



## WAYFINDING PLAN

A comprehensive wayfinding plan that directs drivers and pedestrians to public parking facilities would reduce vehicles circulating unnecessarily looking for parking or trying to turn around on main roadways. Standardized

and branded wayfinding would maximize usage of the existing parking infrastructure to avoid overinvesting in public parking. It could also assist in branding Summerhaven and Mount Lemmon as a premier tourist destination in the area.

Major recreation destinations such as Marshall Gulch, Mount Lemmon Trailhead, and Ski Valley would be the prime targets for inclusion on wayfinding signage; public parking facilities should also be included on the signage.

### ROUNDAABOUT AT GENERAL HITCHCOCK HIGHWAY AND SKI RUN ROAD

The speed limit along General Hitchcock Highway, which turns into Sabino Canyon Park as it enters Summerhaven, changes from 35 mph to 25 mph at the intersection with Ski Run Road and Loma Linda Extension Road.

A strategy to reduce speeds as vehicles approach Summerhaven is to construct a roundabout at the closely-spaced intersections at Ski Run Road and Loma Linda Extension Road. Limited roadway widening would be required to accommodate a roundabout at this location. In addition to slowing vehicles entering Summerhaven, the roundabout would replace two closely-spaced intersections. The roundabout may also serve as a Gateway into Summerhaven. A photo of the existing intersection is provided in **Photo 18**.

**Photo 18: General Hitchcock Highway and Ski Run Road/Loma Linda Extension Road**



### FORMALIZE PARKING AT THE SKI EQUIPMENT STORAGE AREA

To provide overflow parking for the Mount Lemmon trailhead, the old ski equipment could be removed and the parking area formalized to maximize capacity. The lot will likely require additional gravel to even out the surface and improve drainage; parking barriers can be added to demarcate parking spots. A photo of the lot as it currently exists is provided in **Photo 19**. It is anticipated that approximately 60 to 65 vehicles be accommodated after it is formalized.

**Photo 19: Ski Equipment Storage Area**



## 5. CONCLUSIONS

Transportation issues in and around Summerhaven primarily relate to a lack of parking within Summerhaven and recreation areas near the village. The most prevalent observed issues include:

- Limited parking within Summerhaven to destinations including Sawmill Run, the Community Center, Cookie Cabin, and the Living Rainbow Gift Shop
- Insufficient parking at popular recreation areas including Marshall Gulch and the Mount Lemmon trailhead
- Overflow on-street parking along Sabino Canyon Park that encroaches into the roadway
- Pedestrians walking in the roadway on Sabino Canyon Park due to a lack of sidewalks and parked vehicles along the side of the road
- Little suitable land for new parking facilities due to steep terrain and property ownership

Other considerations that will impact transportation investments, including:

- Poor roadway connectivity due to the steep terrain in the study area, causing a reliance completely on Sabino Canyon Park, Ski Run Road, and General Hitchcock Highway for circulation and access
- A lack of dedicated bicycle and pedestrian infrastructure connections within Summerhaven and between Summerhaven and surrounding recreation areas
- Poor cell phone coverage on the mountain, making technology-based information solutions more difficult
- No existing transit coverage on Mount Lemmon, forcing all visitors to use private vehicles to access and move around the study area
- The amount of investment required to accommodate the peak parking demand, given that the peaks only occur a handful of times per year (holiday weekends, snow events, etc.)

Several potential transportation and parking solutions have been proposed based on initial stakeholder and public engagement process, and initial analysis of background and field data. These solution concepts provide a wide range of intervention, from modest investments in temporary fixes, to expensive concepts that could change the entire nature of traffic circulation and parking on the mountain.

The next steps in the planning process will involve evaluating the feasibility of these solutions from capital cost, management, maintenance, and environmental standpoints.