



**SANDIA PEAK  
SKI AREA**



# 2016 MASTER DEVELOPMENT PLAN

DECEMBER 2016

Prepared by:







# SANDIA PEAK SKI AREA

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## 2016 MASTER DEVELOPMENT PLAN

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**SANDIA PEAK  
SKI AREA**

**CHAPTER 1.  
INTRODUCTION**

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# CHAPTER 1.

## INTRODUCTION

This Master Development Plan (MDP) has been prepared to provide a thorough assessment of existing operations and facilities at the Sandia Peak Ski Area (SPSA) and to identify a comprehensive plan for future improvements to the ski area. The MDP is designed to guide the ski area in creating a balanced recreation experience that is appealing to guests and is operationally efficient. In addition, the plan is respectful of the natural resources within the study area while incorporating important guest preferences. The MDP is designed to be a dynamic document, which may be amended periodically to reflect advancements in ski/snowboard technology, trends in mountain resort recreation, and expectations of the U.S. Forest Service (Forest Service) special use permit (SUP) and SPSA's ownership.

### A. LOCATION

SPSA is located in the Sandia Mountains approximately 5 miles northeast of the Albuquerque city limits, New Mexico (refer to Figure 1). The summit of Sandia Peak, and the top terminals of the chairlifts, is the nearest point of the ski area to the city. The base of SPSA, and the bottom terminals of the chairlifts, is an additional 2 miles east of the city limit accessible via state highways. The base area, located on State Highway 536, is approximately 23 road miles from the Albuquerque city limits. The summit of Sandia Peak is also accessible via the Sandia Peak Aerial Tramway (Tram), the bottom terminal of which is located approximately 3.5 miles northeast of the Albuquerque city limits and 5 miles by roadway.

### B. RESORT SUMMARY

The ski area occupies approximately 945 acres of forested and developed land and is located entirely on National Forest System (NFS) lands managed by the Cibola National Forest. Elevations range from approximately 8,600 feet elevation at the base to 10,300 feet at the summit (refer to Figure 2).

SPSA currently operates four chairlifts and one beginner handle tow. There are approximately 140 acres of skiable terrain, spread across 49 developed ski trails. Skier support facilities include the Double Eagle II Day Lodge and associated buildings at the base area, and the Tram terminal and Top of Tram Restaurant at the summit. Primary day skier parking is provided in the base area, although a small percentage of visitors do ride the Tram. Snowmaking covers approximately 22 acres of ski trails.

Summer activities include scenic chairlift rides on Chairlift #1 and mountain biking. These activities have attracted an average of approximately 5,800 visitors throughout the past five summer seasons.

SPSA caters primarily to day skiers from the Albuquerque metro area, averaging approximately 20,000 visitors annually, over the past six seasons. In the 2015/16 season, SPSA registered 18,020 skiers. Visitation at SPSA varies significantly depending on conditions—for example, a total of 3,714 skiers were registered in 2012/13 compared with 45,911 in 2011/12. The majority of visitors to SPSA are beginner- and intermediate-level skiers and riders. SPSA does a significant portion of its business during holiday periods. These periods—during Christmas, MLK Weekend, and President's weekend—see the highest visitor levels of the season.





Additionally, the Tram operates almost year-round (with seasonal closures in April and November) and attracts approximately 250,000 visits per year. The majority of these visits (60 to 70 percent) occur during the summer.

## C. BACKGROUND

SPSA is the oldest operational ski area in New Mexico. The first ski operations at this location began in 1937, with a rope tow at Tree Springs. The ski area was originally operated by the Albuquerque Ski Club. In 1947 a t-bar was built at the ski area, then known as "La Madera." The first chairlift was completed in 1963. Construction of the aerial tramway began in May 1964 and was completed 24 months later. Since 1963 SPSA has been owned and operated by the Sandia Peak Ski Company under a SUP from the Forest Service. The SUP boundary encompasses approximately 945 acres of NFS lands.

## D. ABSTRACT OF PLANNED MASTER DEVELOPMENT PLAN

This MDP is divided into five chapters. Chapter 1 introduces the document and the MDP projects. Chapter 2 describes the site inventory of the resort including physical resources, opportunities and limitations, and environmental determinants. Chapter 3 describes the design criteria used for mountain planning purposes specific to SPSA. Chapter 4 addresses the existing conditions at SPSA; evaluates the balance of resort operations, facilities, and infrastructure including components such as lifts, guest services, snowmaking, and parking capacities; and provides the baseline conditions from which the planning strategies for future upgrades are based. Chapter 5 details planned upgrades and improvements to the resort.

In summary, planned projects within this MDP are detailed in the following discussion.

### 1. WINTER

- Chairlift #6, new out-of-base chairlift or conveyor providing service to existing beginner ability level terrain
- Replace Chairlift #1 with a detachable quad chairlift
- Replace Mitey Mite handle tow with a conveyor
- Retain Chairlift #3 for redundancy only, or eventual decommission
- Additional gladed skiing areas
- Tubing area
- Terrain park
- New snowmaking pond and associated infrastructure
- Additional parking areas
- Upgrade existing guest services and maintenance buildings

### 2. SUMMER

- Mountain coaster and guest service yurt
- Zip line
- Convert Chairlift #2 to foot traffic
- Additions and upgrades to the mountain biking trail network
- Disc golf
- Base area activities (climbing wall, ropes course, event/concert area)

## E. DEVELOPMENT PHILOSOPHY (GOALS AND OBJECTIVES)

The purpose of this MDP is to provide direction for the future development of the ski resort to ensure a balance of facilities and variety of year-round amenities to improve the guest experience and operational efficiencies. Developed through the identification of opportunities and constraints at the ski area, the goal of the projects contained in this MDP is to improve the quality of the recreation experience, increase multi-season recreation offerings and better utilize existing infrastructure to meet the demands of visitors year-round. Increased multi-season recreation opportunities are an important part of this MDP because these activities tend to support the increasingly volatile winter operations and attract a more diverse range of visitors compared to skiing, which together could contribute to the sustainability of the ski area. Summer recreation activities on NFS lands have evolved in the past several decades beyond “traditional” activities such as hunting, fishing, and camping, to include a significant variety of activities that allow guests to experience the natural environment while still feeling comfortable in their surroundings, such as mountain biking, disc golf, and other activities. NFS lands managed under ski area SUPs are well-situated to provide these forms of recreation due to their existing infrastructure, base area facilities and dedicated staffing. SPSA’s approach is to provide a sense of adventure and interaction with the setting while eliminating some of the barriers that often prevent guests (particularly families, the elderly/aging or those with disabilities) from participating in outdoor recreational activities. Due to its proximity to Albuquerque and easy access via the Tram, there is a large population of visitors to the SUP area that may not typically visit NFS lands. SPSA is in a unique position to offer them exciting recreational opportunities and a chance to engage with the natural environment.

Consistent with the 2011 Ski Area Recreation Opportunities Enhancement Act (SAREOA) (refer to Chapter 3), planned projects and activities have been designed to harmonize with the natural environment to heighten the user’s experience with their natural surroundings on the Cibola National Forest.

A number of general and specific objectives have been identified to guide the future direction of SPSA including:

- Provide upgraded facilities in order to improve the quality of the alpine ski experience
- Enhance skiing opportunities for entry-level and lower ability level skiers
- Develop a greater variety of ski terrain tailored to the market breakdown in the best way possible
- Provide unique multi-season opportunities for guests to experience the National Forest through recreation activities that are both enjoyable and educational, which is consistent with the SAROE A
- Increase year-round utilization of existing infrastructure
- Provide additional recreation opportunities for Tram passengers
- Improve support facilities and services for the ever-increasing numbers of winter and summer visitors

## F. PURPOSE

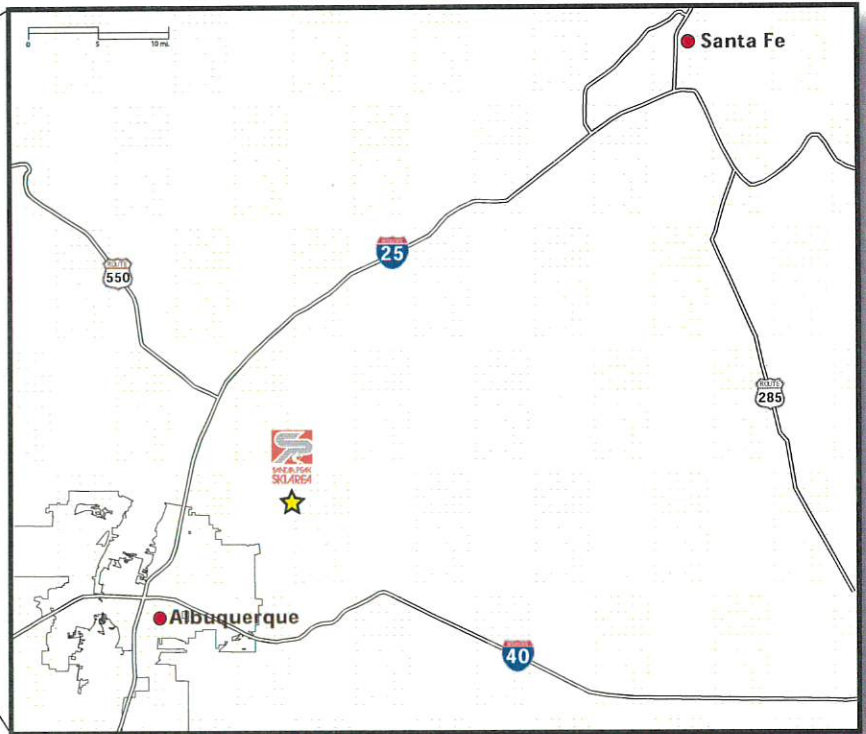
This 2016 update to the 1993 MDP is a conceptual planning document, essentially serving as a “road map” for future improvements at SPSA. By identifying the type, size, capacity, and location of improvements that are appropriate to achieve the goals of the resort, the 2016 MDP establishes the direction and priorities for the physical improvement of mountain and base area facilities at SPSA over the next decade. It is expected that additional site-specific design will be warranted and completed at the time of individual project implementation on NFS lands. It is important to note that this is intended to be a dynamic document, which may be amended periodically in response to changes in SPSA’s market, the evolution of the ski industry, additional year-round amenities and technological innovations.



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**VICINITY MAP**  
MASTER DEVELOPMENT PLAN  
FIGURE 1



Prepared by  
**SE GROUP**



**SANDIA PEAK  
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**CHAPTER 2.  
SITE INVENTORY**

# CHAPTER 2.

## SITE INVENTORY

### A. PHYSICAL RESOURCES

#### 1. TOPOGRAPHY

SPSA is located on the eastern slope of the Sandia Mountains, on the opposite side of the ridge as the Albuquerque city limits. The western slope of the Sandia Mountains faces the City of Albuquerque with steep slopes exceeding 40%. The elevation of the ridge (and the highest point at the ski area) is approximately 10,300 feet (approximately 3,800 feet above the City of Albuquerque). The eastern slope of the ridge, where the ski area is located, is characterized by a consistent pitch of approximately 23% and minimal topographic variation. The ski trails at SPSA extend east from the summit down to the base area. The base area is located approximately 23 road miles from the Albuquerque city limits, at an elevation of approximately 8,600 feet.

#### 2. ASPECT

Slope aspect plays an important role in snow quality and retention. Terrain exposure responds according to changes in sun angle, temperature, wind direction, and shadows. Typical constraints in relation to the various angles of exposure are as follows:

<b>North-facing:</b>	ideal for snow retention, minimal wind scour, minimal sun exposure
<b>Northeast-facing:</b>	ideal for snow retention, minimal wind scour, minimal sun exposure
<b>East-facing:</b>	good for snow retention, some wind scour, morning sun exposure
<b>Southeast-facing:</b>	fair for snow retention, moderate wind scour, morning and early afternoon sun exposure
<b>South-facing:</b>	at lower elevations, poor for snow retention, moderate wind scour, full sun exposure
<b>Southwest-facing:</b>	poor for snow retention, high wind scour, full sun exposure
<b>West-facing:</b>	good for snow retention, high wind scour, late morning and afternoon sun exposure
<b>Northwest-facing:</b>	good for snow retention, moderate wind scour, some afternoon sun

SPSA is located on a generally uniform slope, with an east-northeast exposure. Overall, ski terrain with eastern exposure experiences good snow retention, but is limited by morning sun exposure and can experience wind scour. Northeastern exposure is ideal for snow retention, experiences relatively less wind scour, and minimal sun exposure.





### 3. SLOPE GRADIENTS

Terrain ability level designations are based on slope gradients and terrain features associated with the varying terrain unique to each ski area. Regardless of the slope gradient for a particular trail, if it feeds into a trail that is rated higher in difficulty, its ability level must be rated accordingly. Conversely, if a trail is fed only by trails of a higher ability level than the maximum slope of the trail would dictate, it also must be rated accordingly.

General slope gradients are broken down into the following categories:

- 0 to 8% (0 to 5°):** too flat for skiing and riding, but ideal for lift base terminals and milling areas, base area accommodations and other support facility development
- 8 to 25% (5 to 15°):** ideal for beginners and novices, and typically can support some types of development
- 25 to 45% (15 to 25°):** ideal for intermediates, and typically too steep for development
- 45 to 70% (25 to 35°):** ideal for advanced and expert skiers/riders, and are closely managed by the resort operator for avalanche mitigation
- >70% (>35°):** too steep for all but the highest level of skiing/riding; these areas are typically allocated as expert-only and are closely managed by the resort operator for avalanche mitigation

Slope gradients covering all ability levels are present at SPSA, with the majority of terrain falling between novice to intermediate ability levels. The average slope of the terrain at SPSA is approximately 23%. The maximum slope within the ski area is approximately 60%, which is found on a few expert-level trails.

### B. PERMIT BOUNDARY AND LAND OWNERSHIP

As noted, SPSA's lift and trail network is located within a 945-acre SUP boundary on the Cibola National Forest.



**SANDIA PEAK  
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**CHAPTER 3.  
DESIGN CRITERIA**

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# CHAPTER 3.

## DESIGN CRITERIA AND FOREST SERVICE DIRECTION

### A. BASE AREA DESIGN

#### 1. OVERALL LAYOUT

Design of the base lands for a destination mountain resort involves establishing appropriate sizes and locations for the various elements that make up the development program. The complexion and interrelationship of these elements varies considerably depending on the type of resort and its intended character.

Planners rely on resort layout as one tool to establish resort character. The manner in which resort elements are inter-organized, both inside the resort core and within the landscape setting, along with architectural style, help to create the desired character.

### B. MOUNTAIN DESIGN

#### 1. TRAIL DESIGN

##### a. Slope Gradients and Terrain Breakdown

Terrain ability level designations are based on slope gradients and terrain features associated with the varying ability terrain unique to each mountain. Ability level designations for this analysis are based on the maximum sustained gradient calculated for each trail. Short sections of a trail can be more or less steep without affecting the overall run designation. For example, novice skiers are typically not intimidated by short, steeper pitches of slope, but a sustained steeper pitch may cause the trail to be classified with a higher difficulty rating. The following general gradients are used to classify the skier difficulty level of the mountain terrain.



**Table 3-1. Terrain Gradients**

Skier Ability	Slope Gradient
Beginner	8 to 12%
Novice	to 25%
Low Intermediate	to 35%
Intermediate	to 45%
Advanced	to 55%
Expert	over 55%

Source: SE Group, Mountain Planning Guidelines

The distribution of terrain by skier ability level and slope gradient is compared with the market demand for each ability level. It is desirable for the available ski terrain to be capable of accommodating the full range of ability levels reasonably consistent with market demand. The market breakdown for Rocky Mountain skier market is shown in Table 3-2, illustrating that intermediate skiers comprise the bulk of market demand.

**Table 3-2. Rocky Mountain Skier Ability Breakdown**

Skier Ability	Percent of Skier Market
Beginner	5%
Novice	15%
Low Intermediate	25%
Intermediate	35%
Advanced	15%
Expert	5%

Source: SE Group, Mountain Planning Guidelines

**b. Trail Density**

The calculation of capacity for a ski area is based in part on the target number of skiers that can be accommodated, on average, on a typical acre of ski terrain at any one given time. The criteria for the range of trail densities for North American ski areas are listed below in Table 3-3.

**Table 3-3. Skier Density per Acre**

Skier Ability	Trail Density
Beginner	25 to 40 skiers/acre
Novice	12 to 30 skiers/acre
Low Intermediate	8 to 25 skiers/acre
Intermediate	6 to 20 skiers/acre
Advanced	4 to 15 skiers/acre
Expert	2 to 10 skiers/acre

Source: SE Group, Mountain Planning Guidelines



These density figures account for the skiers that are actually populating the ski trails and do not account for other guests who are either waiting in lift lines, riding the lifts, using the milling areas or other support facilities. Empirical observations and calculations indicate that on an average day approximately 40% of the total number of skiers at a typical resort is on the trails at any given time. Additionally, areas on the mountain, such as merge zones, convergence areas, lift milling areas, major circulation routes, and egress routes, experience higher densities periodically during the ski day.

### c. Trail System

A primary goal for SPSA's trail system design is to provide a wide variety of ski terrain. Each trail should provide an interesting and challenging experience for skiers with the ability level for which the trail is designed. Optimum trail widths vary depending upon topographic conditions and the caliber of the skier being served. The trail network should provide the full range of ability levels consistent with each level's respective market demand.

In terms of a resort's ability to retain guests, both for longer durations of visitation and for repeat business, one of the more important factors has proven to be variation in terrain. This means providing developed runs for all ability levels: some groomed on a regular basis and some not, tree skiing, and terrain parks and pipes.

In summary, a broad range of skiing terrain satisfies skiers from beginner through expert ability levels within the natural topographic characteristics of the ski area.

### d. Terrain Parks

Terrain parks have become a vital part of the operations at most mountain resorts. Considerable time and expense can be spent on the creation, operation, and maintenance of terrain parks, which are now considered an essential mountain amenity. Popularity of terrain parks continues to increase, and, within any given resort, is largely dependent on the extent and quality of the park. Terrain parks affect circulation on the mountain, as the parks are often a guest destination.

## 2. LIFT DESIGN

The goal for lift design is to serve the available ski terrain in an efficient manner, taking into consideration such factors as: wind, visual impacts, wetlands, round-trip skiing, access needs, interconnectability between other lifts and trails, and the need for circulation space at the lower and upper terminal sites. The vertical rise and length of ski lifts for a particular mountain are important measures of overall attractiveness and marketability of a ski area.

## C. CAPACITY ANALYSIS AND DESIGN

Comfortable Carrying Capacity (CCC) is defined as a level of utilization for the ski area (the number of visitors that can be "comfortably" accommodated at any given time) that provides a pleasant recreational experience, without overburdening the resort infrastructure. CCC does not indicate a maximum level of visitation. The accurate estimation of the CCC of a mountain is a complex issue and is the single most important planning criterion for the resort. Related skier service facilities, including base lodge seating, mountain restaurant requirements, sanitary facilities, parking, and other skier services are planned around the proper identification of the mountain's true capacity.

CCC is derived from the resort's supply of vertical transport (the combined uphill hourly capacities of the lifts) and demand for vertical transport (the aggregate number of runs demanded multiplied by the vertical rise associated with those runs). The CCC is calculated by dividing vertical supply (VTF/day) by vertical



demand, and factors in the total amount of time spent in the lift waiting line, on the lift itself and in the downhill descent.

It is not uncommon for ski areas to experience peak days during which skier visitation exceeds the CCC by as much as 25%. However, from a planning perspective, it is not recommended to consistently exceed the CCC due to the resulting decrease in the quality of the recreational experience and thus the resort's market appeal.

## **D. BALANCE OF FACILITIES**

The mountain master planning process emphasizes the importance of balancing recreational facility development. The sizes of the various skier service functions are designed to match the CCC of the mountain. The future development of a ski area should be designed and coordinated to maintain a balance between accommodating skier needs, ski area capacity (lifts and trails) and the supporting equipment and facilities (e.g., grooming machines, day lodge services and facilities, utility infrastructure, access, and parking).

## **E. MULTI-SEASON RECREATION ACTIVITIES**

In light of the increasing challenges of operating a sustainable ski resort given the seasonal nature of the typical six-month operating season, there has recently been a great deal of interest within the industry in developing multi-season recreation facilities and activities for guests. As discussed in Chapter 1, multi-season recreational activities tend to attract a more diverse range of new guests than does skiing. This comprehensive resort planning process assesses the best approach and program for adding multi-season activities and facilities in order to have the greatest potential for success given the unique characteristics that define SPSA and its market, and then will create a "road map" for their implementation.

A strategic approach must be taken to identify reasonable and realistic opportunities for multi-season recreational activities. This approach involves a case-by-case examination of several important criteria to determine the multi-season recreation elements that have the greatest potential for success. Criteria such as suitability of available land for recreation facilities and/or activities, operational compatibility with existing or proposed facilities, initial fiscal considerations, and visitation potential are all explored within this MDP. Undertaking such a comprehensive exercise leads to a multi-season recreation program comprised of recreation facilities and/or activities that are suitable for implementation and will align with operational goals and performance expectations.

Providing diverse opportunities to a spectrum of visitors is key to SPSA's summer activity goals. Non-skiing and multi-season activities are, and will continue to be, important guest offerings at SPSA because they tend to attract a more diverse range of new guests than do skiing and snowboarding (e.g., more balanced gender demographics, older median age, and more families), which is essential to the continued success of the ski area.

As a four-season recreation destination, SPSA has the opportunity to both provide and promote interactive, educational, natural resource-based recreation activities for all ages and demographics. Increasingly, there is potential to reach a wide range of ages and demographics, including those not currently being reached, through multi-season recreation activities. Activities such as mountain biking and hiking can appeal to the more fit and skilled user, while activities such as mountain coasters and zip lines can appeal to less adventurous guests and persons with disabilities. SPSA desires to facilitate exciting, challenging and appropriate use of NFS lands, and in the process, to introduce new user groups to the range of recreational opportunities that exist within their National Forests.

Currently, SPSA provides a very limited range of previously-authorized summer activities, including scenic chairlift rides on Chairlift #1, mountain biking, lunch service at the Top of Tram Restaurant, breakfast and



lunch service at the Double Eagle II Café in the base area, and Tram rides. These activities and associated infrastructure currently provide few opportunities for summer guests and, therefore, provide only a limited introduction to the National Forest.

SPSA has a tremendous opportunity to introduce guests, particularly those living in the urban and suburban Albuquerque area, to the National Forest and a natural environment in a fun and comfortable setting. Opportunities for environmental education, stewardship, and overall public lands awareness are present across the SPSA SUP area. Developed activities in an appropriate setting will promote these opportunities, thereby achieving the goal of encouraging guests to further explore their public lands while feeling comfortable doing so. The Forest Service has acknowledged a demonstrated need to encourage the public, particularly youth, to explore the lands within the National Forests. As an identifiable and accessible portal to NFS lands, SPSA has a unique opportunity to meet this need through the provision of a range of recreational opportunities experiences suitable to the diverse public groups that live in and visit the area.

The activities described in this MDP are designed to utilize existing ski area infrastructure (e.g., chairlifts and guest services facilities) to the extent possible in order to enhance existing snow sports activities with multi-season activities. In doing so, the projects included in this MDP will improve utilization of ski area infrastructure and ensure the long-term, year-round viability of SPSA, particularly during the summer months. Snow sports are, and will continue to be, the primary use of NFS within the SPSA SUP area.

At a macro level, the Cibola National Forest Plan identifies the SPSA SUP area as a center for developed recreation (this is further discussed in Section F.2). At a site-specific level, this MDP takes the existing setting, combined with the anticipated use of the area, to establish finer-grain prescriptions. The summer activity zones identified in the Chapter 5 of this MDP are based on the existing setting and level of development.

Through the planning process, distinct zones have been identified within the SPSA SUP area. These zones consider several characteristics similar to the Recreation Opportunity Spectrum (ROS), as discussed in Section F.2 of this chapter and include:

- Access – the number and function of roads within the area
- Remoteness – how far removed an individual feels from human activity
- Naturalness – the extent and intensity of development and disturbance within the area
- Infrastructure – the amount of infrastructure and proximity to the built environment

Each of these characteristics is to be considered within the context of SPSA as a developed ski area. Existing summer recreation and maintenance occurs throughout developed portions of the ski area; therefore, no area within the developed ski area is off limits to administrative access and maintenance.

The SPSA SUP area is characterized by diverse settings, from developed and modified areas to remote and more primitive areas. The settings that exist within the SUP mirror what a guest could see and experience in different locations across the Cibola National Forest. Planned activities within this MDP have been designed to correspond with the characteristics of the visual quality of the area, as defined through the Visual Management System in the Cibola National Forest Plan (see discussion in Section F.3 of this chapter). Throughout implementation of the projects discussed in this MDP, SPSA will work with the Forest Service to exceed these objectives as practicable.



## F. APPLICABLE FOREST SERVICE POLICY DIRECTION

The enabling authorities for the Forest Service are contained in many laws enacted by Congress and in the regulations and administrative directives that implement these laws.<sup>1</sup> These authorities allow the Forest Service to provide recreation opportunities to facilitate the use, enjoyment, and appreciation of National Forests.

The Forest Service is authorized to approve certain uses of NFS lands under the terms of SUPs.<sup>2</sup> Generally, SUPs for recreational developments are issued and administered for uses that serve the public, promote public health and safety, and provide land stewardship. In accomplishing these objectives, the SUP held by SPSA authorizes the following:

*“The operation and maintenance of a winter sports resort, and other year round uses including existing improvements consisting of four chair lifts, ski runs, one lodge, one water system, use of Capulin Springs and 730,000 gallons of water annually, including storage tanks and 6,000 feet of water transmission lines, a waste water treatment system, refuse disposal system, electric utility system, four parking areas, related buildings including a ski shop, ski patrol and first aid, equipment and care taker residence, snowmaking facilities (phases 1-4), access roads, communication system, mountain bike trail system, and related facilities.”*

Downhill skiing is an important component of the recreation opportunities offered by National Forests. The National Recreation Strategy, a result of the 1987 President’s Commission for America’s Outdoors, gives the Forest Service a major role in providing recreation opportunities on National Forests through partnerships such as those with the ski industry.<sup>3</sup>

### 1. 2011 SKI AREA RECREATIONAL OPPORTUNITY ENHANCEMENT ACT

Most of the 122 ski areas operating on NFS lands in the United States are authorized under SUPs per the National Forest Ski Area Permit Act of 1986 (the 1986 Act).<sup>4</sup> As originally enacted, the 1986 Act authorized Nordic and Alpine skiing at ski areas on NFS lands. In November 2011 Congress enacted the Ski Area Recreational Opportunity Enhancement Act (SAROE), which amended the 1986 Act to clarify the authority of the Secretary of Agriculture regarding additional recreational uses of NFS land subject to ski area permits, and for other purposes.

The purpose of SAROE was to amend the 1986 Act in two ways:

- A. to enable snow-sports (other than Nordic and alpine skiing) to be permitted on NFS land subject to ski area permits issued by the Secretary of Agriculture under section 3 of the 1986 Act; and
- B. to clarify the authority of the Secretary of Agriculture to permit appropriate additional seasonal or year-round recreational activities and facilities on NFS land subject to ski area permits issued by the Secretary of Agriculture under section 3 of the 1986 Act.

Per SAROE, subject to the terms of a ski area permit, the Secretary may authorize a ski area permittee to provide such other seasonal or year-round natural resource-based recreational activities and associated facilities (in addition to skiing and other snow-sports) on NFS land subject to a ski area permit as the Secretary determines to be appropriate.

<sup>1</sup> These laws include: the Organic Administrative Act (1897), the Weeks Act (1911), the Multiple-Use Sustained Yield Act (1960), the Forest and Rangeland Renewable Resources Planning Act (1974), the National Forest Management Act (1976), and the National Forest Ski Area Permit Act (1986).

<sup>2</sup> 16 U.S.C. 497: Use and occupation of lands for hotels, resorts, summer homes, stores, and facilities for industrial, commercial, educational or public uses

<sup>3</sup> USDA Forest Service. 1988. National Recreation Strategy. April.

<sup>4</sup> 16 U.S.C. 497b



Importantly, each activity and facility authorized by the Secretary shall:

- A. encourage outdoor recreation and enjoyment of nature;
- B. to the extent practicable:
  - harmonize with the natural environment of the NFS land on which the activity or facility is located; and
  - be located within the developed portions of the ski area;
- C. be subject to such terms and conditions as the Secretary determines to be appropriate; and
- D. be authorized in accordance with the applicable land and resource management plan and applicable laws (including regulations).

Inclusions: Activities and facilities that may, in appropriate circumstances, be authorized under SAROE A include:

- A. zip lines;
- B. mountain bike terrain parks and trails;
- C. frisbee golf courses; and
- D. ropes courses.

Exclusions: Activities and facilities that are prohibited under SAROE A include:

- A. tennis courts;
- B. water slides and water parks;
- C. swimming pools;
- D. golf courses; and
- E. amusement parks.

The Secretary may not authorize any activity or facility if the Secretary determines that the authorization would result in the primary recreational purpose of the ski area permit to be a purpose other than skiing and other snowsports.

## 2. 1985 CIBOLA NATIONAL FOREST PLAN<sup>5</sup>

The Cibola National Forest encompasses approximately 1,618,459 acres surrounding the Albuquerque metropolitan area in west-central New Mexico. It is an administrative unit of the Southwestern Region of the Forest Service. The Forest is divided into four ranger districts—SPSA is administered by the Sandia Ranger District.

Forest Plans define the direction for managing the National Forests. The 1985 Cibola National Forest Plan (Forest Plan) provides for integrated multiple use and sustained yield of goods and services from the Forest in a way that maximizes long-term net public benefits in an environmentally sound manner. Therefore, SPSA's operations that are conducted on NFS lands within its SUP area must be consistent with the management direction provided in the Forest Plan.

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<sup>5</sup> The Cibola National Forest is currently in the process of updating its Forest Plan.



The Forest Plan notes that rapid population growth in New Mexico, Texas, and Oklahoma will likely continue to increase future needs for outdoor recreation on the Cibola National Forest.<sup>6</sup> Increased private sector development, including expansion of SPSA, is identified as a method through which to address a growing demand for developed recreation.<sup>7</sup>

Per the Forest-Wide Recreation Prescription in the Forest Plan, management highlights include:<sup>8</sup>

- Provide dispersed and developed outdoor recreation opportunities and enhance experiences by providing access, services, and facilities consistent with other resource considerations.

**a. Management Areas**

The Forest Plan includes 18 separate Management Areas (MA) for different portions of the Forest based on ecological conditions, historic development, and anticipated future conditions. SPSA falls within the Management Area 2 – Sandia Ranger District. The management emphasis for MA 2 is “on providing opportunities for a variety of year-round recreational experiences consistent with guidelines established for maintaining wildlife populations and ecosystem health. Wildlife diversity and population viability will be maintained or improved through habitat management using such tools as prescribed fire, timber or fuelwood harvest, or structure improvements to attain identified goals and objectives for the management area. Pinyon-juniper slopes of less than 15% will be managed for personal use firewood.”<sup>9</sup>

MA 2 encompasses 44,648 acres of NFS lands in the Sandia Ranger District, excluding the Sandia Mountain Wilderness and the military withdrawals.<sup>10</sup> The MA includes 17 developed recreation sites, the Sandia Peak Tram, SPSA, and Sandia Crest Observation Site.<sup>11</sup> Due to the proximity to the Albuquerque metropolitan area, NFS lands within MA 2 receive heavy dispersed and developed recreation use.<sup>12</sup>

MA 2 Standards and Guidelines specific to SPSA include:<sup>13</sup>

- Expand SPSA base parking capacity to provide average peak day PAOT capacity.
- Expand Sandia Peak Tram and Ski Area to [the] next ridge south of [the] existing area and lower end for additional parking, base facility, runs and lift. Expansion as shown on map on file in Supervisor’s office.

**b. Recreation Opportunity Spectrum**

The Forest Service typically plans and manages for recreation experiences through the application of the ROS. The ROS is a framework for inventorying, planning, and managing the recreational experience and utilizes seven classifications ranging from “Primitive” to “Urban.”

The SPSA SUP area is designated to have a ROS setting of “Rural” and “Roaded Natural.” According to the “1982 ROS User’s Guide,” the “Rural” setting is described as:<sup>14</sup>

*“Area is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A*

<sup>6</sup> USDA Forest Service. 1985. Cibola National Forest Plan, Amend 4. May 1990. Summary of the Analysis of the Management Situation – Recreation.

<sup>7</sup> Ibid.

<sup>8</sup> USDA Forest Service. 1985. Cibola National Forest Plan. Management Direction.

<sup>9</sup> USDA Forest Service. 1985. Cibola National Forest Plan, Amend 8. November 1996. Management Area 2.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

<sup>14</sup> USDA Forest Service. 1982. ROS Users Guide.



*considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided far away from developed sites. Facilities for intensified motorized use and parking are available.”*

The “Roaded Natural” setting is described as:<sup>15</sup>

*“Area is characterized by predominantly natural-appearing environments with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.”*

The assigned desired ROS condition class is the maximum level of use, impact, development, and management that an area should experience over the life of the Forest Plan. The ROS is not prescriptive; it serves as a tool for land managers to identify and mitigate change. Recreational carrying capacity is a consequence of adopting specific ROS classes for which a landscape will be managed.

### 3. VISUAL MANAGEMENT AND THE BUILT ENVIRONMENT IMAGE GUIDE

#### a. Visual Management System

The goal of landscape management on all NFS land is to manage for the highest possible visual quality, commensurate with other appropriate public uses, costs, and benefits. The Forest Service began operating under the guidance of the Visual Management System (VMS) for inventorying, evaluating, and managing scenic resources on NFS lands in the mid-1970s. The VMS is defined in National Forest Landscape Management, Volume 2.<sup>16</sup> The VMS provides a system for measuring the inherent scenic quality of any forest area as well as a measurement of the degree of concern for that quality. It also establishes objectives for alteration of the visual resource.

#### *Visual Quality Objectives*

Per the VMS, NFS lands are assigned Visual Quality Objectives (VQOs) that define the degree of acceptable change to the visual resource from human created management activities. VQOs are based on the physical characteristics of the land and the sensitivity of the landscape setting as viewed by humans. VQOs define how the landscape will be managed, the level of acceptable modification permitted in the area, and under what circumstances modification may be allowed. VQOs are defined below, from most to least constrained.<sup>17</sup>

- *Preservation:* Allows ecological changes only. Management activities, except for very low visual impact recreation facilities, are prohibited. This objective applies to Wilderness areas, primitive areas, areas awaiting classification and some unique management units, which do not justify special classification.
- *Retention:* Provides for management activities that are not visually evident. Under Retention, activities may only repeat form, line, color, and texture, which are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc. should not be evident.

<sup>15</sup> Ibid.

<sup>16</sup> USDA Forest Service. 1974. National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System. April.

<sup>17</sup> In 1995 the Scenery Management System (SMS) was introduced to inventory and analyze aesthetic values on NFS lands. However, the SMS has not been adopted by all national forests, and, until such time that it is (e.g., per Forest Plan revisions), the VMS will continue to be used for inventorying, evaluating, and managing scenic resources.



- *Partial Retention:* Management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape.
- *Modification:* Management activities may visually dominate the original characteristic landscape. However, activities of vegetation and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that their visual characteristics are those of natural occurrences within the surrounding area of character type. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings.
- *Maximum Modification:* Management activities of vegetative and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area of character type.

Per the Forest Plan, the VQO for SPSA's SUP area is Retention.

**b. Built Environment Image Guide**

In concept, the Built Environment Image Guide (BEIG) is designed to ensure thoughtful design and management of the built environment, which includes: administrative and recreation structures, landscape structures, site furnishing, structures on roads and trails, and signs installed or operated by the Forest Service, its cooperators, and its permittees. It focuses on the image, appearance, and structural character of facilities. Three core contexts are stressed throughout the BEIG: (1) environmental; (2) cultural; and (3) economic.

The BEIG provides general guidance regarding the image, aesthetics, and overall quality of recreational and administrative structures on NFS lands, but it does not contain enforceable "standards" pertaining to aesthetic quality as would be found in a typical Forest Plan. As indicated on pages 250–252 of the BEIG, specific direction for the design of administrative and recreational facilities is found in the Forest Service Manual and Forest Service Handbooks.

The environmental, cultural, and economic contexts with which the BEIG is based are important considerations in development of structural facilities (not including lift terminals) within the SPSA SUP area. Furthermore, there are some elements of the BEIG within the "Southwest Province" section (pages 203–229) that should be taken into account when designing and constructing facilities on NFS lands. The ski area should consider such elements in the definition of an "architectural theme" that would drive the design and planning of structure components of the ski area. The theme should merge characteristics of the "Southwest Province" with design elements found in mountain settings.





**SANDIA PEAK  
SKI AREA**

**CHAPTER 4.  
EXISTING FACILITIES**

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# CHAPTER 4.

## EXISTING SKI AREA FACILITIES

The following section contains an examination and analysis of existing skier facilities at SPSA. Completion of a thorough resort inventory is the first step in the master planning process and involves the collection of data pertaining to the resort's existing facilities. This inventory includes lifts, ski trails, the snowmaking system, base area structures, skier services, other resort functions/activities, day use parking, and ski area operations. The analysis of the inventoried data involves the application of ski industry standards to SPSA's existing conditions. This process allows for the comparison of the resort's existing ski facilities to those facilities commonly found at comparison ski resorts of similar size and composition.

The overall balance of the existing ski area is evaluated by calculating the skier capacities of various facility components and then comparing these capacities to the ski area's current CCC. This examination of capacities helps to identify the ski resort's strengths and deficiencies. The next step is the identification of improvements that would bring the existing facilities into better equilibrium, and will assist the resort in meeting the ever-changing expectations of their skier marketplace. Accomplishing these objectives will result in a well-balanced resort that provides an adequate array of services and experiences to satisfy guest expectations for a world-class recreation experience.

### A. SUMMARY OF GUEST EXPERIENCE

Determining the resort CCC is an important first step in evaluating the overall guest experience because it enables planners to understand the overall balance of the resort facility. Empirical observations and a close examination of SPSA's principal components reveal some key surpluses and deficiencies.

SPSA's CCC is computed by analyzing the resort's supply of, and demand for, vertical transport. The capacity of the lift and trail network was determined to be approximately 1,730 guests. From a terrain standpoint, the resort's trail network appears to be capable of providing a good ski terrain experience for about three times SPSA's CCC—a trail capacity estimated at around 4,722 guests.

SPSA does a significant portion of its business during holiday periods. These periods (during Christmas, Martin Luther King weekend, and President's Day weekend) see the highest visitor levels of the season. Other busy periods can occur during major snowfall. Currently, most of the visitors are local Albuquerque residents with the occasional out-of-state visitor. Roughly half of all visitors are beginners, with some more experienced locals taking advantage of the proximity to Albuquerque and the inexpensive pricing.

The current guest experience at SPSA is influenced by aging infrastructure and the limitations of variable natural snowfall. Within an easy distance to Albuquerque, SPSA is a convenient choice for local skiers. The services and facilities are simple and adequate. The recreation experience at SPSA is strongly dependent on weather and natural snow conditions. While there is a snowmaking system currently in place, the variable weather and limited water storage capacity makes it difficult to maintain quality snow conditions, particularly in the early and late winter.



Chapter 5 presents a more detailed analysis of SPSA’s current strengths and weaknesses, followed by a description of improvements and upgrading programs that will help to improve the overall guest experience at SPSA and enhance the resort’s image.

## B. ALPINE FACILITIES

### 1. LIFTS

SPSA’s lift network consists of four aerial chairlifts and one surface lift. These lifts include:

- Four fixed-grip double chairlifts: Chairlifts #1, 2, 3, and 4
- One surface lift: Mitey Mite handle tow
- Total uphill lift design capacity per hour: 3,814 guests

Table 4-1 summarizes the technical specifications for the existing lifts at SPSA.

**Table 4-1. Lift Specifications – Existing Conditions**

Map Ref.	Lift Name, Lift Type	Top Elev. (ft)	Bottom Elev. (ft)	Vertical Rise (ft)	Slope Length (ft)	Average Grade (%)	Hourly Capacity (pers/hr)	Rope Speed (fpm)	Carrier Spacing (ft)	Lift Maker/ Year Installed
1	Chairlift #1 C-2	10,277	8,684	1,594	7,379	22	566	437	93	Stadeli/1963
2	Chairlift #2 C-2	10,282	9,432	850	3,884	23	800	500	75	Riblet/1972
3	Chairlift #3 C-2	10,270	8,695	1,575	7,259	22	949	445	56	Riblet/1981
4	Chairlift #4 C-2	8,977	8,693	285	1,370	21	749	388	62	Poma/1987
5	Mitey Mite S	8,738	8,718	21	153	14	750	250	20	Stadeli/1993

Source: SE Group

Notes:

C-2 = fixed-grip double chairlift

S = surface lift

#### a. Lift Discussion and Overview

The following is a brief discussion of each lift at SPSA.

**Chairlift #1** is the primary out-of-base lift providing access to all ski trails. This chairlift is the most consistently operated and reliable chairlift on potentially troublesome high wind days. In the summer, Chairlift #1 is the only chairlift at SPSA to transport foot and uphill bike traffic. The bottom terminal of Chairlift #1 is adjacent to the base lodge and the top terminal is at the summit of the ski area, adjacent to the Tram station and the Top of Tram Restaurant. This fixed-grip double chairlift was installed in 1963 and is used by skiers of all ability levels. Due to the age of the lift and the increasing cost of repairs, it is likely that the lift will need to be removed in the relatively near future. Typically Chairlift #1 operates every day the ski area is open—Friday, Saturday, and Sunday. Due to a relatively slow operating speed and low number of chairs, the capacity of Chairlift #1 is relatively low. This imposes a serious constraint on skier circulation and access. During peak days or during high wind advisories, the lift line at Chairlift #1 can exceed 15 to 20 minutes if Chairlift #2 and/or #3 are on a wind hold or experiencing mechanical failures. The capacity of Chairlift #1 should be increased in the future.

**Chairlift #2** provides access from mid-mountain to the summit. Chairlift #2 is located to the south of Chairlift #1. It serves trails of all ability levels on the upper mountain. This fixed-grip double chairlift was



installed in 1972. Due to the location of Chairlift #2, it can be particularly susceptible to wind. This chairlift currently operates occasionally to accommodate periods of high use. This chairlift was operated more consistently prior to the installation of snowmaking on the lower mountain, and now serves a more limited role.

**Chairlift #3**, a fixed-grip double chairlift installed in 1981, ascends parallel to Chairlift #1 from the base area to the summit. This chairlift operates during weekends to provide duplicate service to the terrain accessed by Chairlift #1, as well as access to the Tram terminal and Top of Tram Restaurant. Chairlift #3 can also provide base-to-summit service in the event that Chairlift #1 requires service or maintenance. While it operates at a speed similar to Chairlift #1, it has more chairs which results in a larger overall capacity. As with Chairlift #2, this lift is susceptible to wind, which can limit its operation. The primary constraints on this lift are the height of the loading area (the chair loads about 15 vertical feet above the Chairlift #1 loading area), some circulation issues around the base terminal, and the design of the unload deck area.

**Chairlift #4**, a fixed-grip double chairlift installed in 1987, services beginner terrain near the base area as well as the terrain park. On an average weekend with no new snow this chairlift frequently has the longest lift line.

The Mitey Mite surface lift (a handle tow) was installed in 1993 and is used exclusively by ski school for children's classes.

Overall, uphill lift capacity is limited when there is new snow or on windy days. When new snow has fallen, the largest lift lines occur on Chairlift #1 and #3. If all chairlifts are running, the lift lines during peak periods are generally a maximum of 10 minutes. Lift lines occasionally exceed 10 minutes on windy days, which force the closure of Chairlifts #2 and #3.

## 2 DEVELOPED ALPINE TERRAIN NETWORK

The developed, or formalized, terrain network at SPSA consists of the named, defined, lift-serviced, maintained runs at the resort. Most of these runs are groomed on a regular basis, although some are intentionally left ungroomed. These runs represent the baseline of the terrain at any resort, as they are where the majority of guests ski, and they are usually the only place to ski during the early season, periods of poor or undesirable snow conditions, and uncertain weather conditions. Typically, terrain off the developed network is only used by advanced and expert level skiers, during periods of fresh powder, spring corn, and other desirable snow and weather conditions. As such, the developed terrain network represents a true reflection of acreage used by the average skier on a consistent basis, as well as the terrain used by all skiers during the aforementioned conditions. Therefore, the total acreage of the terrain and the ability level breakdown must be sufficient to accommodate the full skier capacity of the resort. As a result, only the developed terrain network is applied to the trail acreage calculations, skier classification breakdown, trail capacity, and density formulas. If terrain outside of the developed network were included, it would have a misleading effect on all of those calculations. However, terrain outside of the developed network is very important to terrain variety and the overall quality of the guest experience, and as such is addressed in the next section.

### a. Alpine Trails Discussion

The existing trail configuration is shown on Figure 2. The ski area is served by a network of approximately 49 trail segments accommodating a variety of ability levels, as depicted in Table 4-2. The trail system accounts for about 140 acres of terrain.

First-time beginner skiers are restricted to the relatively small area that is accessed off of the Mitey Mite handle tow and Chairlift #4; there is currently not enough acreage of true beginner terrain to meet the demand. The Mitey Mite handle tow is used only by ski school students, requiring all other beginners to use Chairlift #4.





The terrain network is also limited in regards to variety—there are currently not sufficient alternative terrain offerings (such as gladed terrain and terrain parks) for advanced and expert skiers seeking some diversity in their recreation experience.

**Table 4-2. Terrain Specifications – Existing Conditions**

Map Ref.	Trail/Area Name	Top Elev. (ft)	Bottom Elev. (ft)	Vertical Drop (ft)	Slope Length (ft)	Average Width (ft)	Slope Area (acres)	Average Grade (%)	Max Grade (%)	Skier/Rider Ability Level
1	La Madera	10,273	9,696	577	2,570	65	3.9	23	34	Low Intermediate
2	Rob's Run	10,253	10,039	214	742	98	1.7	30	45	Advanced
3U	Fred's Run Upper	10,061	9,693	368	1,681	88	3.4	22	27	Novice
3L	Fred's Run Lower	9,693	9,252	441	2,854	61	4.0	16	27	Novice
4	Fred's Run Ramp	9,845	9,758	88	469	38	0.4	19	23	Low Intermediate
5	Inhibition	10,294	9,434	861	4,001	124	11.4	22	45	Intermediate
6	Upper Upper Ramp	10,227	10,205	22	178	52	0.2	13	14	Novice
7	Upper Ramp	10,186	10,136	49	251	59	0.3	20	22	Novice
8U	Cibola Upper	10,213	10,059	154	761	33	0.6	21	25	Novice
8M	Cibola Middle	10,005	9,434	571	3,126	85	6.1	19	25	Novice
8L	Cibola Lower	9,427	8,683	743	4,470	78	8.0	17	25	Novice
9U	Exhibition Upper	10,274	9,597	677	3,133	158	11.3	22	33	Low Intermediate
9M	Exhibition Middle	9,573	9,513	60	603	40	0.6	10	14	Low Intermediate
9L	Exhibition Lower	9,515	9,176	338	2,003	94	4.3	17	29	Low Intermediate
10	Prohibition	10,254	9,618	636	2,976	63	4.3	22	39	Intermediate
11	Sandia Ridge Road	10,065	10,012	53	344	36	0.3	16	20	Low Intermediate
12	Sandia	10,235	9,635	600	2,979	73	5.0	21	32	Low Intermediate
13	Aspen	10,146	9,591	554	2,589	90	5.3	22	29	Low Intermediate
14	Diablo	10,125	9,351	774	3,658	41	3.5	22	39	Advanced
15	Double Eagle	10,269	9,222	1,047	5,314	65	8.0	20	38	Intermediate
16	Fred's Cut Off	9,475	9,417	58	465	40	0.4	13	29	Intermediate
17	Lift 2 Cut Off	9,468	9,437	31	569	23	0.3	6	21	Novice
18	Inhibition Canyon	9,497	9,326	171	995	58	1.3	17	22	Intermediate
19	Exhibition Canyon	9,586	9,395	191	733	116	2.0	27	35	Intermediate
20	Do Drop Road	9,652	9,587	65	540	23	0.3	12	18	Intermediate
21	Do Drop In	9,627	9,532	96	229	179	0.9	46	51	Advanced
22	Aspen Bowl	9,591	9,394	197	806	112	2.1	25	30	Low Intermediate
23	Aspen Narrows	9,395	9,224	171	1,018	50	1.2	17	25	Intermediate
24	Cibola Cut Off	9,479	9,232	247	1,187	53	1.5	21	37	Intermediate

Table 4-2. Terrain Specifications – Existing Conditions

Map Ref.	Trail/Area Name	Top Elev. (ft)	Bottom Elev. (ft)	Vertical Drop (ft)	Slope Length (ft)	Average Width (ft)	Slope Area (acres)	Average Grade (%)	Max Grade (%)	Skier/Rider Ability Level
25U	Foster Murphy Upper	9,513	9,149	363	1,928	72	3.2	19	38	Intermediate
25L	Foster Murphy Lower	9,181	8,892	289	1,648	82	3.1	18	27	Low Intermediate
26	Short Swing	9,330	9,225	104	374	38	0.3	29	30	Low Intermediate
27	Dipsy	9,276	9,132	144	421	69	0.7	37	42	Intermediate
28	Tower 6 Road	9,166	9,132	34	205	24	0.1	17	19	Advanced
29	Cys Os	9,136	9,060	76	156	48	0.2	56	56	Expert
30	Upper Slalom	9,177	9,042	135	360	121	1.0	41	52	Advanced
31	South Upper Slalom	9,152	9,020	132	435	92	0.9	32	52	Advanced
32	Bum	9,098	8,973	125	284	85	0.6	50	61	Expert
33	Greg's	8,998	8,891	107	244	46	0.3	49	51	Advanced
34	Tower 4 Road	8,934	8,865	70	398	15	0.1	18	21	Low Intermediate
35	Little Suicide	8,893	8,796	97	264	31	0.2	41	56	Expert
36	Suicide	8,844	8,724	120	267	124	0.8	51	60	Expert
37U	Hups Upper	9,272	9,041	231	1,730	54	2.1	14	20	Novice
37L	Hups Lower	9,039	8,745	294	1,738	54	2.2	17	25	Novice
38	Cibola Ridge Road	9,041	9,008	33	333	29	0.2	10	10	Novice
39	Cibola Ridge	9,050	8,809	242	1,439	49	1.6	17	24	Novice
40	Lower Slalom	9,227	8,687	540	2,553	106	6.2	22	38	Intermediate
41	Race Arena	9,069	8,687	383	1,791	103	4.2	22	34	Low Intermediate
42	Sliver Arrow	9,209	8,969	240	969	50	1.1	26	34	Low Intermediate
43	Double Eagle II	9,223	8,728	495	2,378	69	3.8	21	28	Low Intermediate
44	Beginner Trail I	8,957	8,763	194	1,028	159	3.7	19	32	Low Intermediate
45	Beginner Trail II	8,847	8,696	151	948	137	3.0	16	21	Novice
46	Cubby Corner	8,739	8,718	20	212	59	0.3	10	12	Beginner
47	Headwall-Terrain Park	8,787	8,738	49	289	82	0.5	17	22	Novice
48	Bambino	8,974	8,690	284	1,419	107	3.5	20	26	Novice
49	North Bambino	8,981	8,822	159	700	125	2.0	23	26	Novice
<b>TOTAL</b>					<b>75,754</b>		<b>138.4</b>	<b>23</b>		

Source: SE Group



b. Terrain Distribution by Ability Level

The terrain classification breakdown of the existing ski area is shown in Table 4-3 and Chart 4-1. The last column in this table represents what can be considered the ideal skill level distribution in the relevant skier market and provides a comparison with the existing breakdown at SPSA. Note that the large skier capacity is a result of the high percentages of novice and low intermediate terrain.

**Table 4-3. Terrain Distribution by Ability Level – Existing Conditions**

Skier/Rider Ability Level	Trail Area	Skier/Rider Capacity	SPSA Skier/Rider Distribution	Skier/Rider Market
	(acres)	(guests)	(%)	(%)
Beginner	0.3	8.6	0.5%	5
Novice	38.1	686.0	37.0%	15
Low Intermediate	49.6	694.5	37.4%	25
Intermediate	40.3	403.4	21.7%	35
Advanced	8.4	58.6	3.2%	15
Expert	1.7	5.0	0.3%	5
<b>TOTAL</b>	<b>138.4</b>	<b>1,856</b>	<b>100%</b>	<b>100</b>

**Chart 4-1. Terrain Distribution by Ability Level – Existing Conditions**

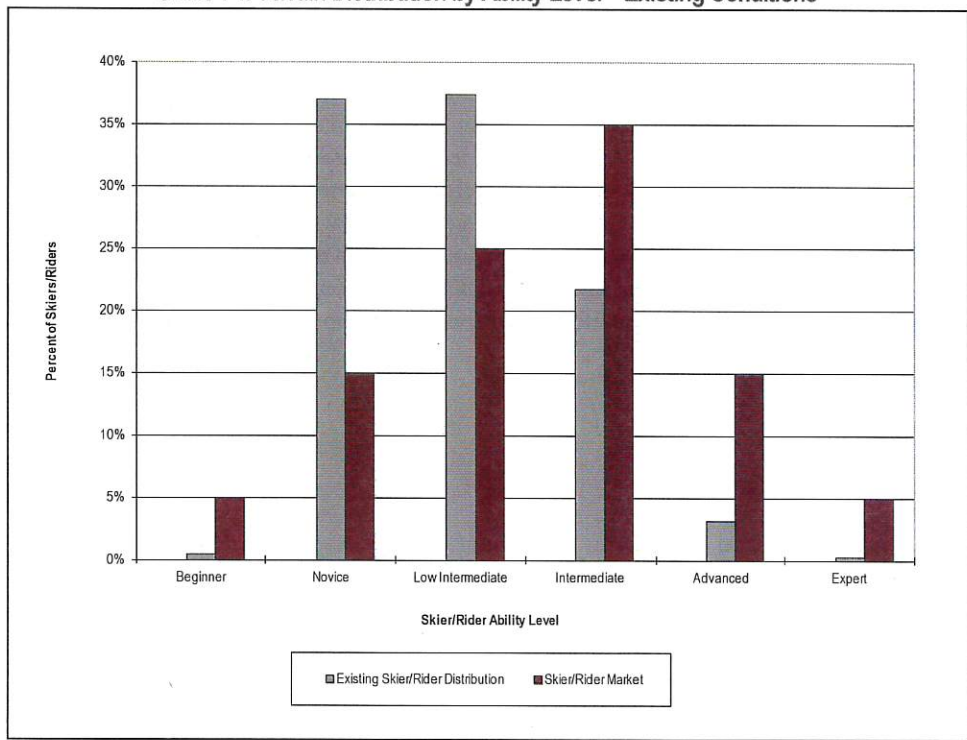


Table 4-3 and Chart 4-1 both clearly illustrate the discussed deficiency of first-time beginner, advanced, and expert terrain. The percentages of advanced- and expert-level terrain are well below the skier market.



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### c. Density Analysis

An important aspect of ski area design is the balancing of uphill lift capacity with downhill trail capacity. Trail densities are derived by contrasting the uphill, at-one-time capacity of each lift system (CCC) with the trail acreage associated with each lift pod. At any one time, skiers are dispersed throughout the resort, while using guest facilities and milling areas, waiting in lift mazes, riding lifts, or enjoying descents. For the trail density analysis, 25% of each lift's capacity is presumed to be inactive—using guest service facilities or milling areas.

The active skier population can be found in lift lines, on lifts, or on trails. The number of skiers waiting in line at each lift is a function of the uphill hourly capacity of the lift and the assumed length of wait time at each lift. The number of guests on each lift is the product of the number of uphill carriers and the capacity of the lift's carriers. The remainder of the skier population (the CCC minus the number of guests using guest facilities, milling in areas near the resort portals, waiting in lift mazes, and actually riding lifts) is assumed to be enjoying downhill descents.

Trail density is calculated for each lift pod by dividing the number of guests on the trails by the amount of trail area that is available within each lift pod. The trail density analysis compares the calculated trail density for each lift pod to the desired trail density for that pod (i.e., the product of the ideal trail density for each ability level and the lift's trail distribution by ability level).

The trail density analysis considers only the acreage associated with the developed trail network, as described above (see Figure 2). The density analysis for the existing conditions at SPSA is illustrated in Table 4-4. This table shows that there is a surplus of downhill terrain capacity in relation to uphill lift capacity. The overall downhill terrain capacity was calculated at around 4,756 people, or around 2.7 times higher than the uphill lift capacity. This situation is favorable from the quality of skiing perspective, and is reflected in the low skier densities.

The density figures set forth show that for all the lift/trail systems, the actual trail densities are lower than the acceptable design criteria. The average density numbers for the overall resort are listed along the bottom row of the table. These averages have been weighted for the lift system's CCC. When compared with industry standard criteria, the actual average skier densities experienced at SPSA are approximately 43% of the target standard. This is an indication that, on the average, trail crowding is not a common occurrence at SPSA. Note that specific trails, such as egress trails towards the end of the day, can consistently have high densities. However, the low density numbers also indicate under-utilization of the existing terrain, indicating that there may be more skiers than necessary waiting in long lift lines or on slow lifts. This can indicate an opportunity to upgrade existing lifts and/or install new lifts within the existing boundaries of the resort, without creating undesirably high skier densities.



Table 4-4. Density Analysis – Existing Conditions

Map Ref.	Daily Lift Capacity	Guest Dispersal				Density Analysis				Density Index (%)
		Support Fac./Milling (guests)	Lift Lines (guests)	On Lift (guests)	On Terrain (guests)	Terrain Area (acres)	Terrain Density (guests/ac)	Desired Trail Density (guests/ac)	Diff. (+/-)	
1	410	103	28	119	160	49.9	3	13	-10	23%
2	270	68	10	78	114	19.8	6	14	-8	43%
3	720	180	27	219	294	58.7	5	13	-8	38%
4	290	73	74	37	106	9.7	11	17	-6	65%
5	40	16	11	7	6	0.3	21	30	-9	70%
<b>TOTAL</b>	<b>1,730</b>	<b>440</b>	<b>150</b>	<b>460</b>	<b>680</b>	<b>138.4</b>	<b>6</b>	<b>14</b>	<b>-8</b>	<b>43%</b>

Source: SE Group

### 3. TERRAIN VARIETY/ALTERNATE TERRAIN

In terms of a resort’s ability to retain guests, both for longer durations of visitation and for repeat business, one of the more important factors has proven to be variation in terrain. This means having developed runs of all ability levels, some groomed on a regular basis and some not, as well as mogul runs, bowl skiing, tree skiing, backcountry style (hike-to) skiing, and terrain parks and pipes. To provide the highest quality guest experience, resorts should offer some level of all terrain types to the extent it is practical. Even though some of these types of terrain only provide ski opportunities when conditions warrant, terrain variety is increasingly becoming a crucial factor in guests’ decisions of ski destinations.

#### a. Glades, Bowls, and Backcountry-Style Terrain

SPSA does not currently provide any “official” glade skiing on the sides of, or in between, the developed trails. However, some areas are skied to a limited extent, depending on snow conditions, by SPSA’s more advanced guests. Some selective thinning and management could help develop and improve the glade skiing and make it more functional for a wider range of skiers. Due to topographical constraints, there are no open bowls, natural meadows, or chutes at SPSA.

The upgrading and expansion program, described in Chapter 5, is intended to increase the use of the gladed and alternate terrain.

#### b. Terrain Parks

Terrain parks have become a vital part of most mountain resorts’ operations, and are now considered an essential mountain amenity. Popularity of terrain parks continues to increase, and is dependent on regional location of the resort, demographics of the resort’s target guests, and, significantly, the quality of the parks. Currently, SPSA has one terrain park, “the Scrapyard,” which is accessed from Chairlift #4. The park is small and features rails and boxes.



## C. COMFORTABLE CARRYING CAPACITY

As stated earlier, the accurate calculation of a ski area's CCC is an important, complex analysis and is the single most important planning criterion for the ski area. All other related skier service facilities can be evaluated and planned based on the proper identification of the mountain's capacity.

CCC is a planning tool used to determine the optimum level of daily utilization for a resort—one that facilitates a pleasant recreational experience without over-crowding the resort infrastructure. In essence, CCC is a guest attendance level where resort operations remain functional and optimal. CCC is used to ensure that capacities are balanced across facilities, and are sufficient to meet anticipated demand. CCC is derived from a comparison of uphill vertical lift supply to downhill vertical skiing demand and as such represents the on-mountain capacity of the resort. Balancing all components of the resort to CCC allows for efficient operations, but also ensures that there won't be a resort component that limits visitation. The implication of this statement is that if a single component of the resort (parking spaces, restaurant seats, lift hourly capacity, etc.) has a capacity that is significantly lower than the other components, that one component will act as a limiting factor and visitation numbers will follow the capacity of that lowest component.

The detailed calculation of SPSA's current CCC is described in Table 4-5 and is calculated at 1,730 guests per day. Visitation should exceed CCC on holidays and peak weekends, often by around 25%. This is evidenced at SPSA where peak days can approach 2,200. However, from a planning perspective, it is not recommended to consistently exceed the CCC due to the resulting decrease in the quality of the recreational experience, and thus, the resort's market appeal.

At SPSA, the CCC of 1,730 is rarely exceeded except for on holidays and peak weekends. This condition suggests that, on peak days, the uphill lift capacity is slightly limiting the ski area, whereas other factors, such as lack of sufficient parking or inadequate day lodge space, are limiting factors to achieving increased daily and annual skier visitation. Further analyses later in this chapter compares the skier capacity of supporting ski area functions with the CCC. These analyses may uncover imbalances that, if rectified, could help SPSA achieve a CCC that is more in-line with peak-day visitation and that would attract higher visitation during non-peak periods.

Table 4-5. Comfortable Carrying Capacity (CCC) – Existing Conditions

Map Ref.	Lift Name, Lift Type	Slope Length (ft)	Vertical Rise (ft)	Actual Capacity (pers/hr)	Oper. Hours (hrs)	Up-Mtn. Access Role (%)	Misload/ Lift Stop (pers/hr)	Adj. Hourly Capacity (guests/hr)	VTF/ Day (000)	Vertical Demand (ft/day)	Daily Lift Capacity (guests)
1	Chair #1 C-2	7,379	1,594	566	7.00	10	15	425	4,735	11,610	410
2	Chair #2 C-2	3,884	850	800	7.00	10	15	600	3,572	13,115	270
3	Chair #3 C-2	7,259	1,575	949	7.00	0	15	807	8,893	12,344	720
4	Chair #4 C-2	1,370	285	749	7.00	0	15	637	1,269	4,394	290
5	Mitey Mite S	153	21	750	7.00	0	15	638	93	2,187	40
<b>TOTAL</b>		<b>20,045</b>		<b>3,814</b>				<b>3,105</b>	<b>18,562</b>		<b>1,730</b>





## D. SKIER SERVICES FACILITIES AND FOOD SERVICE SEATING

### 1. SKIER SERVICES LOCATIONS

Skier service facilities are located at base area staging locations and in on-mountain buildings. Base area staging locations, or portals, are “gateway” facilities that have three main functions:

- Receiving arriving guests (from a parked car or bus)
- Distributing the skiers onto the mountain’s lift and trail systems
- Providing the necessary guest services (e.g., tickets and rentals)

Portal-related skier services are currently offered in the base area at the Double Eagle II Day Lodge at the base of Chairlifts #1, #3, and #4. Additionally, some skiers access the ski area via the Tram (approximately 5% of visitors). Skiers can park, buy a ticket, and ride the Tram to access this ski area, but there are no other skier services (such as rentals) at the Tram terminal. Skier access via the Tram is more popular during bad weather, but wait times can be significant for skiers downloading at the end of the day, which generally limits use.

On-mountain skier service facilities are generally used to provide restaurant seating, as well as ski patrol and first aid services, in closer proximity to upper-mountain ski terrain. At SPSA, on-mountain services are provided at the Top of Tram Restaurant, at the top of Chairlifts #1, #2, and #3, and the top terminal of the Tram.

#### a. Base Area

SPSA’s main base area is the primary day skier portal to the mountain. Skier service facilities in the base area include day skier parking lots (accommodate roughly 602 cars), the Double Eagle II Day Lodge, the Rental/Ski School/Office Building, Vehicle Maintenance Building, Lift Maintenance Shop, Adaptive Building, and Children’s Building. The various skier service functions that are available in the base area include: food service, restrooms, guest services, ski school, rental/repair shop, retail, ticket sales, public lockers, ski patrol/first aid, and administrative offices.

#### b. Sandia Peak Tramway

The Tram provides an additional access point for the ski area. The bottom terminal of the Tram is east of Albuquerque, at the foot of the western slope of the Sandia Mountains. Tickets can be purchased at the base terminal of the Tram, but no other skier services are offered. Skiers can ride the Tram to the summit of the ski area, near the Top of Tram Restaurant, and access the lift and trail network. They can then ride the Tram back down to their car at the end of the day.

#### c. Summit Facilities

On-mountain skier services are available at the summit of the ski area, near the top terminals of Chairlifts #1, #2, and #3, at the Tram terminal building and the Top of Tram Restaurant.<sup>18</sup> The Top of Tram Restaurant is owned and operated by the Sandia Tram Company under a separate SUP, but the facility is used by skiers and, therefore, included as an existing amenity in this document. This facility is open for the summer season as well, and operates for the same hours as scenic lift rides are offered on Chairlift #1 and the Tram. Services available at the restaurant are limited to food service, bar/lounge, and restrooms. The facility is approximately

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<sup>18</sup> Recent approval has been given to rebuild the Top of Tram Restaurant, with construction scheduled to begin in the fall of 2016. As such, this Existing Facilities section treats this new facility as part of the current infrastructure. Completion of the Top of Tram Restaurant is anticipated for spring 2018.

12,255 square feet in size and hosts approximately 190 guests. Services including restrooms are also available at the Tram terminal building.

## 2 SPACE USE ANALYSIS

Sufficient guest service space should be provided to accommodate the existing resort CCC of 1,730 guests per day. The distribution of the CCC is utilized to determine guest service capacities and space requirements for skier services at base area portals and on-mountain facilities. The CCC should be distributed between each guest service facility location according to the number of guests that would be utilizing the lifts and terrain associated with each facility.

In addition to distributing the CCC amongst the base area and on-mountain facilities, guest service capacity needs and the resulting spatial recommendations are determined through a process of reviewing and analyzing the current operations to determine specific guest service requirements that are unique to the resort.

Based upon a CCC of 1,730 skiers, Table 4-6 compares the current space use allocations of the visitor service functions to industry norms for a resort of similar market orientation and regional context as SPSA. Square footage contained in this table is calculated to illustrate how the ski area compares to industry averages, and should not be considered absolute requirements.

Service functions include:

**Restaurant Seating:** All areas designated for food service seating including: restaurants, cafeterias, and brown bag areas. Major circulation aisles through seating areas are designated as circulation/waste, not seating space.

**Kitchen/Scramble:** Includes all food preparation, food service, and food storage.

**Bar/Lounge:** All serving and seating areas designated as restricted use for the serving and consumption of alcoholic beverages. If used for food service, seats are included in seat counts.

**Restrooms:** All space associated with restroom facilities (separate women, men, and employees).

**Guest Services:** Services including resort information desks, kiosks, and lost and found.

**Adult Ski School:** Includes ski school booking area and any indoor staging areas. Storage and employee lockers directly associated with ski school are included in this total.

**Kid's Ski School:** Includes booking areas and lunch rooms associated with ski school functions. Storage and employee lockers directly associated with ski school are included.

**Rentals/Repair:** All rental shop, repair services, and associated storage areas.

**Retail Sales:** All retail shops and associated storage areas.

**Ticket Sales:** All ticket and season pass sales areas, and associated office space.

**Public Lockers:** All public locker rooms. Any public lockers located along the walls of circulation space are included, as well as the 2 feet directly in front of the locker doors.

**Ski Patrol/First Aid:** All first aid facilities, including clinic space. Storage and employee lockers directly associated with ski patrol are included in this total.

**Administration/Employee Lockers & Lounge/Storage:** All administration/ employee/storage space not included in any of the above functions.

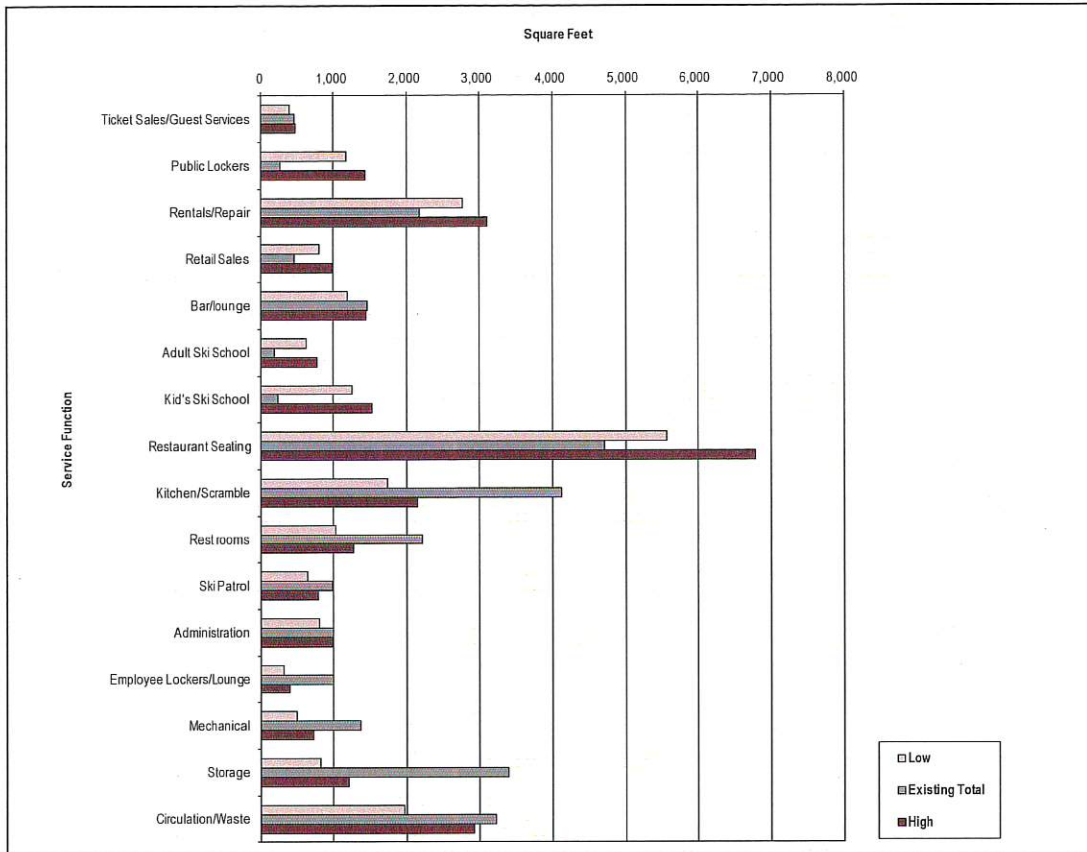


Table 4-6. Industry Average Space Use (Resort Total – Existing Conditions)

Service Function	Existing Total	Recommended Range	
		Low	High
Ticket Sales/Guest Services	467	390	480
Public Lockers	266	1,170	1,430
Rentals/Repair	2,170	2,770	3,110
Retail Sales	464	800	970
Bar/lounge	1,465	1,190	1,450
Adult Ski School	180	620	760
Kid's Ski School	240	1,250	1,520
Restaurant Seating	4,709	5,560	6,800
Kitchen/Scramble	4,130	1,740	2,140
Restrooms	2,198	1,030	1,270
Ski Patrol	984	640	780
Administration	987	800	980
Employee Lockers/Lounge	986	320	390
Mechanical	1,370	490	720
Storage	3,396	820	1,210
Circulation/Waste	3,232	1,970	2,920
<b>TOTAL SQUARE FEET</b>	<b>27,244</b>	<b>21,560</b>	<b>26,930</b>



Chart 4-2. Total Space Use and Recommendations – Existing Conditions



While there is a deficit of space in the base area and a surplus at the summit (described below), the total amount of space in existing facilities is generally sufficient, although in need of relatively minor upgrades and improvements. The following tables and text address the existing space use at each guest service facility. The space recommendations are directly related to the distribution of the resort's capacity to the various guest service facilities located in the base area and on-mountain.



a. Base Area

The SPSA base area facilities provide guest services in a series of buildings: the Double Eagle II Day Lodge, the Rental/Ski School/Office Building, Vehicle Maintenance Building, Lift Maintenance Shop, Adaptive Building, and Children’s Building. A complete inventory of existing guest services by building is shown in Table 4-7.

**Table 4-7. Industry Average Space Use (Base Area – Existing Conditions)**

Service Function	Existing Total	Recommended Range	
		Low	High
Ticket Sales/Guest Services	467	390	480
Public Lockers	236	1,170	1,430
Rentals/Repair	2,170	2,770	3,110
Retail Sales	464	640	780
Bar/lounge	0	950	1,160
Adult Ski School	180	620	760
Kid's Ski School	240	1,250	1,520
Restaurant Seating	2,419	2,360	2,890
Kitchen/Scramble	1,680	740	910
Restrooms	868	440	540
Ski Patrol	856	270	330
Administration	712	800	980
Employee Lockers/Lounge	836	320	390
Mechanical	125	340	500
Storage	891	570	840
Circulation/Waste	1,147	1,370	2,020
<b>TOTAL SQUARE FEET</b>	<b>13,291</b>	<b>15,000</b>	<b>18,640</b>

As shown in Table 4-7, the SPSA base area facilities fall below the low end of the recommended range in the total square footage in most categories. In particular, there are significant deficits of space in lockers, bar/lounge, and ski school. These deficits directly impact the guest experience, especially new guests as they are attempting to learn a new sport. There is a slight surplus for employee space, ticket sales/guest services and ski patrol.

b. Summit Facilities

Skier services facilities at the top of the mountain are located in the Tram top terminal building, the ski patrol shack, and the Top of Tram Restaurant.<sup>19</sup> Skier services available include food service, bar/lounge, restrooms, lockers, ski patrol, and administrative and employee space. These facilities are open year-round and are highly used by visitors who have ridden the Tram.

**Table 4-8. Industry Average Space Use  
(Summit Facilities – Existing Conditions)**

Service Function	Existing Total	Recommended Range	
		Low	High
Ticket Sales/Guest Services	--	--	--
Public Lockers	30	--	--
Rentals/Repair	--	--	--
Retail Sales	--	160	190
Bar/lounge	1,465	240	290
Adult Ski School	--	--	--
Kid's Ski School	--	--	--
Restaurant Seating	2,290	3,200	3,910
Kitchen/Scramble	2,450	1,000	1,230
Restrooms	1,330	590	730
Ski Patrol	128	370	450
Administration	275	--	--
Employee Lockers/Lounge	150	--	--
Mechanical	1,245	150	220
Storage	2,505	250	370
Circulation/Waste	2,085	600	900
<b>TOTAL SQUARE FEET</b>	<b>13,953</b>	<b>6,560</b>	<b>8,290</b>

This analysis of space use suggests that there is a surplus of space available at the summit. However, calculations for this space use do not specifically reflect or include the year-round use of the Tram and Top of Tram Restaurant (approximately 250,000 riders).

<sup>19</sup> The Top of Tram Restaurant has recently been approved to be rebuilt with construction beginning fall 2016. As such, this Existing Facilities section treats this new facility as part of the current infrastructure.





### 3. FOOD SERVICE SEATING

Food service seating at SPSA is provided at the following locations:

- Base Area: Double Eagle II Day Lodge
- On-Mountain: Top of Tram Restaurant

A key factor in evaluating restaurant capacity is the turnover rate of the seats. A turnover rate of 2 to 5 times is the standard range utilized in determining restaurant capacity. Sit-down dining at ski areas typically results in a lower turnover rate, while “fast food” cafeteria style dining is characterized by a higher turnover rate. Furthermore, weather has an influence on turnover rates at ski areas, as on snowy days skiers will spend more time indoors than on sunny days. As a result of input from SPSA management, an average turnover rate of 4 times was used for the base area and 3 times for on-mountain at SPSA.

Table 4-9 summarizes the seating requirements at SPSA, based on a logical distribution of the CCC to each service building/location.

**Table 4-9. Recommended Restaurant Seating**

	Base Area	On-Mountain	Total Resort
Lunchtime Capacity (CCC)	750	1,015	1,765
Average Seat Turnover	4	3	
Existing Seats	331	190	521
Required Seats	187	338	525
Difference	144	-148	-4
Existing Seating Capacity	1,324	570	1,894

*Notes:*

Turnover rates supplied by SPSA.

Despite the overall shortage of seats, there is a surplus of seating capacity due to the higher turnover rate at the base area. There is higher demand for the Top of Tram restaurant, but lower turnover rate at this facility.

As shown in Table 4-9, there is a surplus of indoor seating capacity at the base area. There is outdoor seating available at the base area when weather permits. There is a deficit of indoor seating on-mountain at the Top of Tram Restaurant.

Seating and restaurant space recommendations are directly related to the lunchtime capacity. The lunchtime capacity is determined by the distribution of each lift’s CCC. It is assumed that skiers will prefer to dine at the facility closest to the area where they are skiing. To allow for this convenience, it is important to provide restaurant seating to accommodate the lunchtime capacity requirement of the area.

## E. PARKING CAPACITY

The majority of day skiers at SPSA park at the base area. There are two parking lots maintained by SPSA; the main lot is located adjacent to the base area, on the southwestern side of State Highway 536, and the lower lot is located across the road from the base area. Additionally, on peak days, SPSA has an agreement that allows for roadside parking on State Highway 536.

The main parking lot, which is part-asphalt and part-gravel, can accommodate approximately 415 cars. The lower lot, which is entirely gravel, can hold about 187 cars. Together, these parking lots hold approximately 602 cars. Considering SPSA's CCC, there is a deficit of almost 200 parking spaces (see Table 4-10). This deficit is currently addressed on peak days by staffing parking attendants who direct and manage the parking activity in these lots, which can increase capacity by approximately 15%. An additional 280 cars (approximate) can park along State Highway 536. However, parking along the road is inconvenient for guests and creates operational difficulties related to snow removal; therefore, these spaces are not included in this analysis.

Average vehicle occupancy is assumed to be 2.3 people per car, a ratio that is in line with the national average of 2.3 to 2.7 people per car. In general, day use ski areas have below average vehicle occupancy. Due to SPSA's proximity to the Albuquerque metro area, fewer skiers choose to carpool.

It is important to note that approximately 75 parking spaces are required for employees in the base area lots.

Table 4-10 analyzes SPSA's existing parking capacity.

**Table 4-10. Existing Parking**

	Total
CCC	1,730 guests
Guests arriving by Tram	80 guests
Guests parking at portal	1,650 guests
Average vehicle occupancy	2.3 guests/car
Employee parking spaces	75 cars
Total required spaces	779 cars
Existing parking spaces	602 cars
Deficit	-177 cars

In summary, there is a deficit of existing parking spaces available; therefore, SPSA does not have sufficient parking lot capacity to accommodate existing skier numbers.

## F. MULTI-SEASON RECREATION ACTIVITIES

Currently, multi-season activities are available daily from July through Labor Day, and for ten days during the balloon festival. These activities include scenic chairlift rides on Chairlift #1, mountain biking, hiking, lunch service at the Top of Tram Restaurant, breakfast and lunch at the Double Eagle II Café, and Tram rides. These are popular activities with annual summer chairlift rides averaging around 10,000, and summer mountain biking visits around 3,000. The Tram experiences roughly 60% to 70% of its total 250,000 annual visits occurring during the summer season (between May and October). Weddings are also hosted periodically throughout the summer season.





There are four mountain biking trails totaling approximately 12.5 miles (see Figure 3). Guests can use Chairlift #1 for biking access. The Golden Eagle trail is rated as a “downhill green,” or the easiest category of downhill trail. This trail begins at the top of Chairlift #1 and descends to the base area (approximately 5.7 miles). The Service Road is categorized as “level green,” and is an out-and-back trail on mountain roads for novice riders. The King of the Mountain trail is an “uphill black” or “downhill blue” trail, depending on the direction ridden. With a total length of approximately 6.8 miles, the trail connects the base area to the summit of the ski area. When ridden uphill this trail is “most difficult,” and when ridden downhill is “intermediate.” The Falcon Ridge trail begins at the base area and ascends the lower portion of the King of the Mountain trail for 1.6 miles as an “uphill blue,” or more difficult, trail to an elevation of 9,180 feet where riders connect to the Golden Eagle trail and descend back to the base area. Guests can also hike on the mountain biking trail network, as well as on trails outside the ski area SUP such as the North Crest Trail, La Luz Trail, and South Crest Trail.

## **G. SKI AREA OPERATIONS**

### **1. SKI PATROL/FIRST AID**

There are currently two ski patrol/first aid facilities at SPSA: one at the base area and one at the summit, adjacent to the top terminal of Chairlift #1. Both of the ski patrol facilities are staffed by certified medical personnel.

### **2. SNOWMAKING COVERAGE**

SPSA’s snowmaking system is somewhat limited, covering approximately 22 acres of terrain on the lower half of the ski area, as illustrated on Figure 4. This snowmaking system is critical because natural snow conditions at SPSA are typically marginal. Increasingly warm winter temperatures, the exposure of the ski area, and wind scouring make it difficult to maintain quality snow conditions. Between 1999 and 2012, the median snowfall at SPSA was approximately 106 inches, and there were five seasons with less than 60 inches. During four of those seasons the upper mountain never opened.

The snowmaking season usually lasts from mid- to late-November through the middle of February. Approximately 3.5 million gallons of water are used to produce 19.5 acre-feet of snow, which is spread around the bottom third of the mountain.

The snowmaking system collects runoff and surface flow in the permitted drainage located below the ski area. The majority of the water is collected during the spring runoff and is stored in two ponds. The smaller pond (approximately 1 million gallons) is located below the ski area and State Highway 536. The larger pond (approximately 2 million gallons) is located on the lower half of the mountain between Cibola and Foster Murphy trails. SPSA has private water rights with availability up to 35 million gallons (107 acre-feet of water).

The snowmaking system is composed of fan guns with fixed electrical services and stick guns with on-board compressors. The system does not require air lines. Figure 4 includes a schematic layout of the snowmaking system.

The snowmaking system has a positive effect on SPSA’s operation, supplementing poor natural snowfall to improve snow conditions throughout the season and contributing to the early season base allowing for the ski area to typically open in December. Snowmaking has allowed the ski area to be open more days, thereby achieving greater continuity of operation and a resultant increase in ski area utilization. However, the area covered by snowmaking is limited to the lower portions of the mountain.



SPSA's snowmaking plant is limited by a lack of on-site water storage. While SPSA does have two existing snowmaking ponds, additional storage capacity would help the ski area utilize the system to its maximum potential and efficiency when weather conditions are ideal. SPSA believes that additional water storage and improvements to the infrastructure could allow them to further improve the reliability of snow conditions and increase the area of coverage.

### 3. GROOMING OPERATIONS

The grooming fleet at SPSA presently consists of four vehicles. Approximately 90% (180 acres) of SPSA's terrain is groomed nightly.

### 4. MAINTENANCE FACILITIES

There are currently two maintenance facilities for the ski area located in the base area. The vehicle maintenance and snowmaking facility is approximately 2,500 square feet and was constructed in 1985. This building includes three vehicle maintenance bays, as well as space for mechanical repairs, welding, storage, restrooms, and an office. The lift maintenance building is approximately 1,500 square feet and was built in 1963. This building includes one vehicle maintenance bay and space for mechanical repairs, carpentry storage, storage, employee lockers, and a lift office. Access to the facilities is provided by a mountain road from the parking lot through the base area. During winter access to these facilities is over-the-snow.

The outdoor storage yard (0.4 acre) is located in the north end of the parking lot. This area is referred to as The Boneyard.

### 5. INFRASTRUCTURE AND UTILITIES

#### a. Water

The domestic water system for all of the base area buildings and facilities is a private system consisting of a pumping station and storage tank located approximately 1.3 miles north of the base area. The water source is the Capulin Spring that produces approximately 3 to 4 gallons per minute (gpm). The water is collected in an adjacent underground steel tank with a capacity of approximately 1,000 gallons. The domestic water is then pumped to two existing aboveground steel tanks with capacities of 50,000 gallons and 80,000 gallons. The water is fed by gravity to base area buildings. The three-year annual average consumption is approximately 256,000 gallons.

#### b. Sewer

The sewer system for the base area facilities processes up to 12,900 gallons per day (gpd). The domestic wastewater is discharged into a synthetically lined lagoon treatment system, which evaporates effluent into the atmosphere. The system is very efficient and naturally digests solids. The sewage treatment plant for the Top of Tram Restaurant and Tram processes up to 7,500 gpd and is in excellent condition. Both facilities are permitted through the State of New Mexico Environmental Department.

#### c. Power

Power is supplied to the ski area using a combination of above and underground lines. All of the buildings are serviced using underground lines. However, overhead lines provide power to the base area.

#### d. Fuel Storage

Fuel is stored at three locations at the resort. The first is an aboveground tank located approximately 250 yards north of the base area. It stores diesel fuel and has a capacity of 1,800 gallons. This diesel storage tank



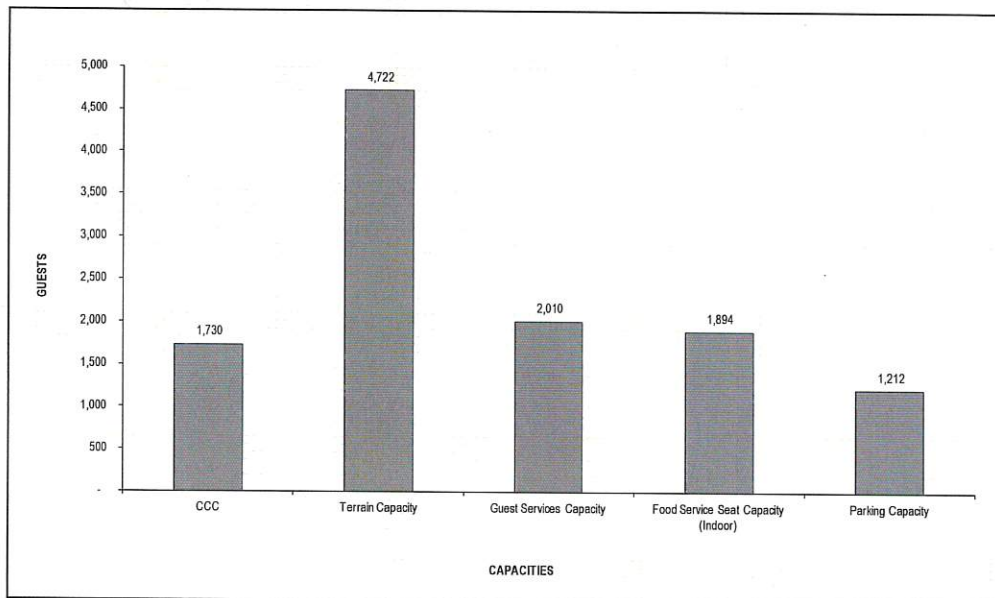
contains an adequate supply for existing and future needs of the ski area. The second fuel storage location is in the lift maintenance building, where 5-gallon plastic and steel containers store gasoline. The overall capacity of storage in the lift maintenance building is 20 gallons. The third location is in the vehicle maintenance building, where gasoline is also stored in 5-gallon plastic and steel containers, with an overall capacity of 20 gallons. The gasoline storage capacity is not adequate to meet existing and future needs of the ski area.

Fuel, oil, and other hazardous materials are delivered and stored in a way to reduce the potential and severity of spills. In the occurrence of a spill, SPSA operations contain, clean-up, and dispose of in accordance to local regulations. Sandia Peak Utility and Sandia Peak Services have a Spill Prevention, Control, and Countermeasures Plan in place with Bernalillo County that can easily be modified to include the ski area.

## H. RESORT CAPACITY BALANCE AND LIMITING FACTORS

The overall balance of the existing ski area is evaluated by calculating the capacities of the resort's various facilities and comparing those facilities to the resort's CCC. The discussed capacities are shown in Chart 4-3.

Chart 4-3. Resort Balance – Existing Conditions



As Chart 4-3 indicates, the existing developed ski terrain capacity of 4,722 skiers is significantly higher than the CCC of 1,730. This is an indication that average skier-per-acre slope densities are quite low and that trails are generally uncrowded. However, it can also indicate underutilization of the terrain, which is caused by not enough lift capacity. The typical effect of this situation is long lift lines on days with higher skier visits, and terrain densities that are significantly below target. The density analysis shows an average density index of 43%, which is less than half of target densities. These conditions indicate that the ski area is “under-lifted,” meaning that there is not enough uphill lift capacity to balance with the terrain capacity. As discussed, part of the reason that the terrain capacity is so relatively high is the high percentage of novice and low intermediate ability level runs. While there is a deficit of space in the base area and a surplus at the summit, the total amount of space in existing facilities is generally sufficient. Parking capacity is currently insufficient at SPSA to accommodate existing skier numbers. In summary, both guest experience and visitation numbers are limited by lift and parking capacity.

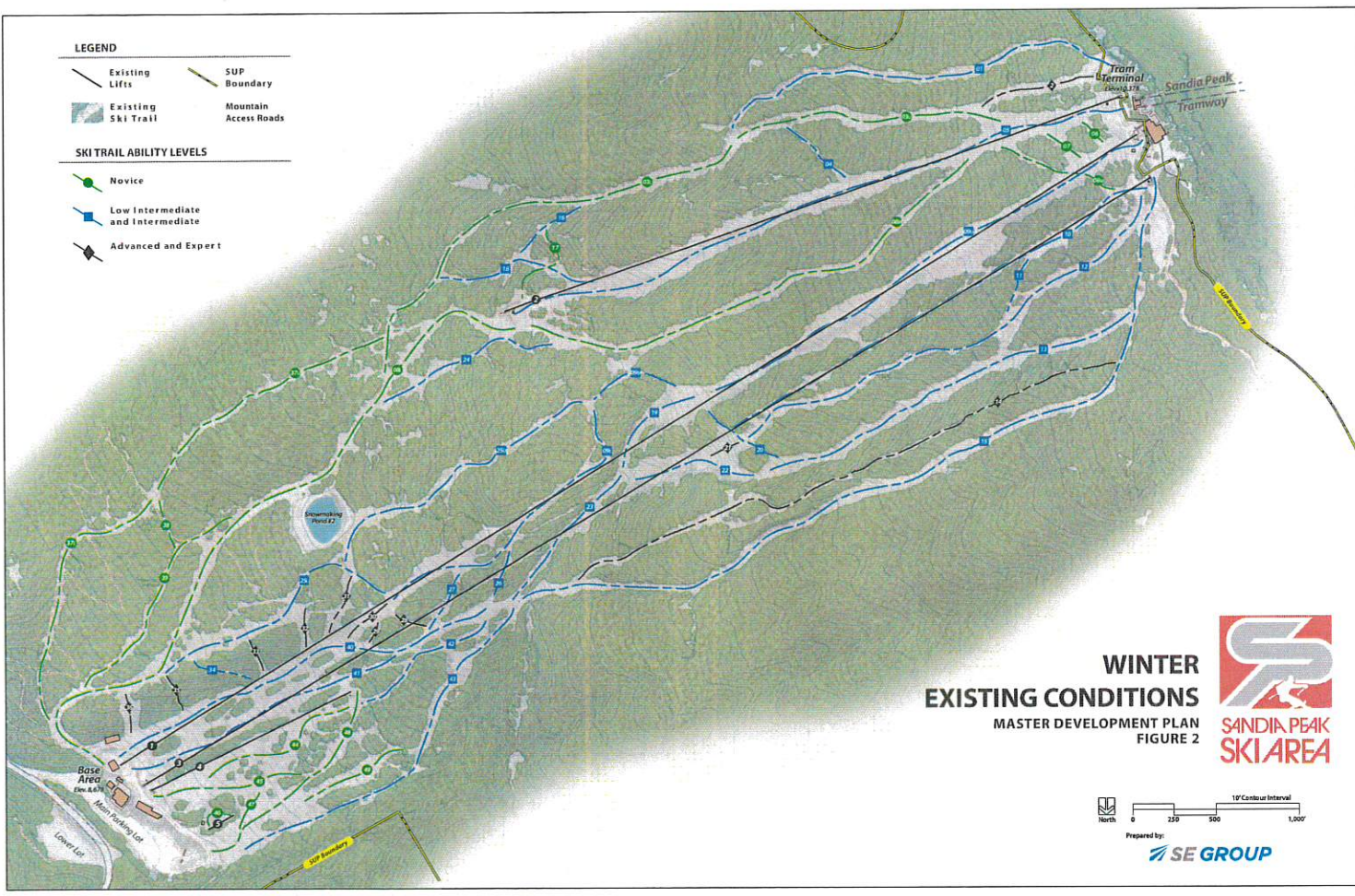


**LEGEND**

- Existing Lifts
- Existing Ski Trail
- SUP Boundary
- Mountain Access Roads

**SKI TRAIL ABILITY LEVELS**

- Novice
- Low Intermediate and Intermediate
- Advanced and Expert



**WINTER EXISTING CONDITIONS**  
MASTER DEVELOPMENT PLAN  
FIGURE 2



Prepared by: **SE GROUP**

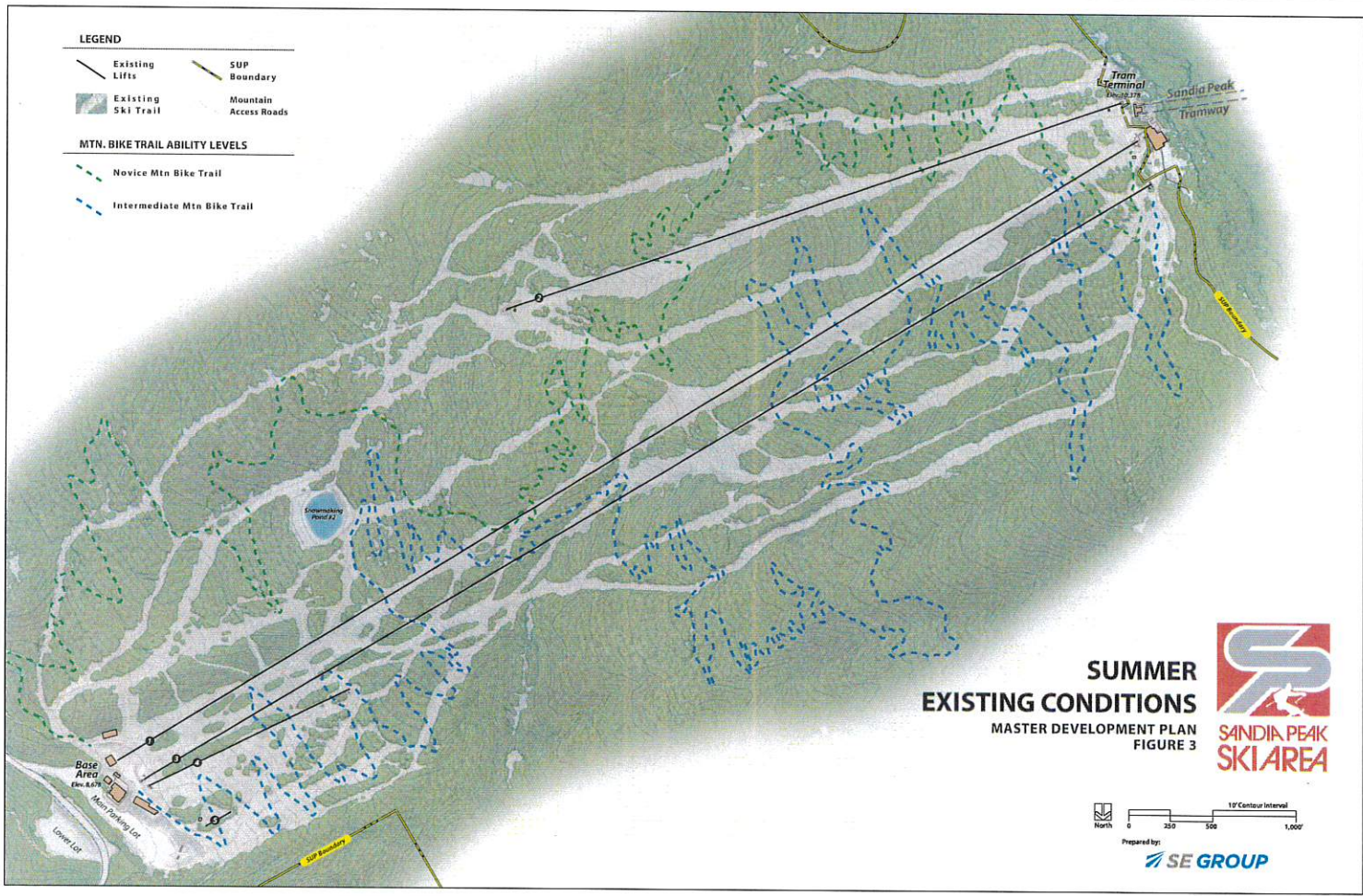


**LEGEND**

- Existing Lifts
- Existing Ski Trail
- SUP Boundary
- Mountain Access Roads

**MTN. BIKE TRAIL ABILITY LEVELS**

- Novice Mtn Bike Trail
- Intermediate Mtn Bike Trail



**SUMMER  
EXISTING CONDITIONS**  
MASTER DEVELOPMENT PLAN  
FIGURE 3

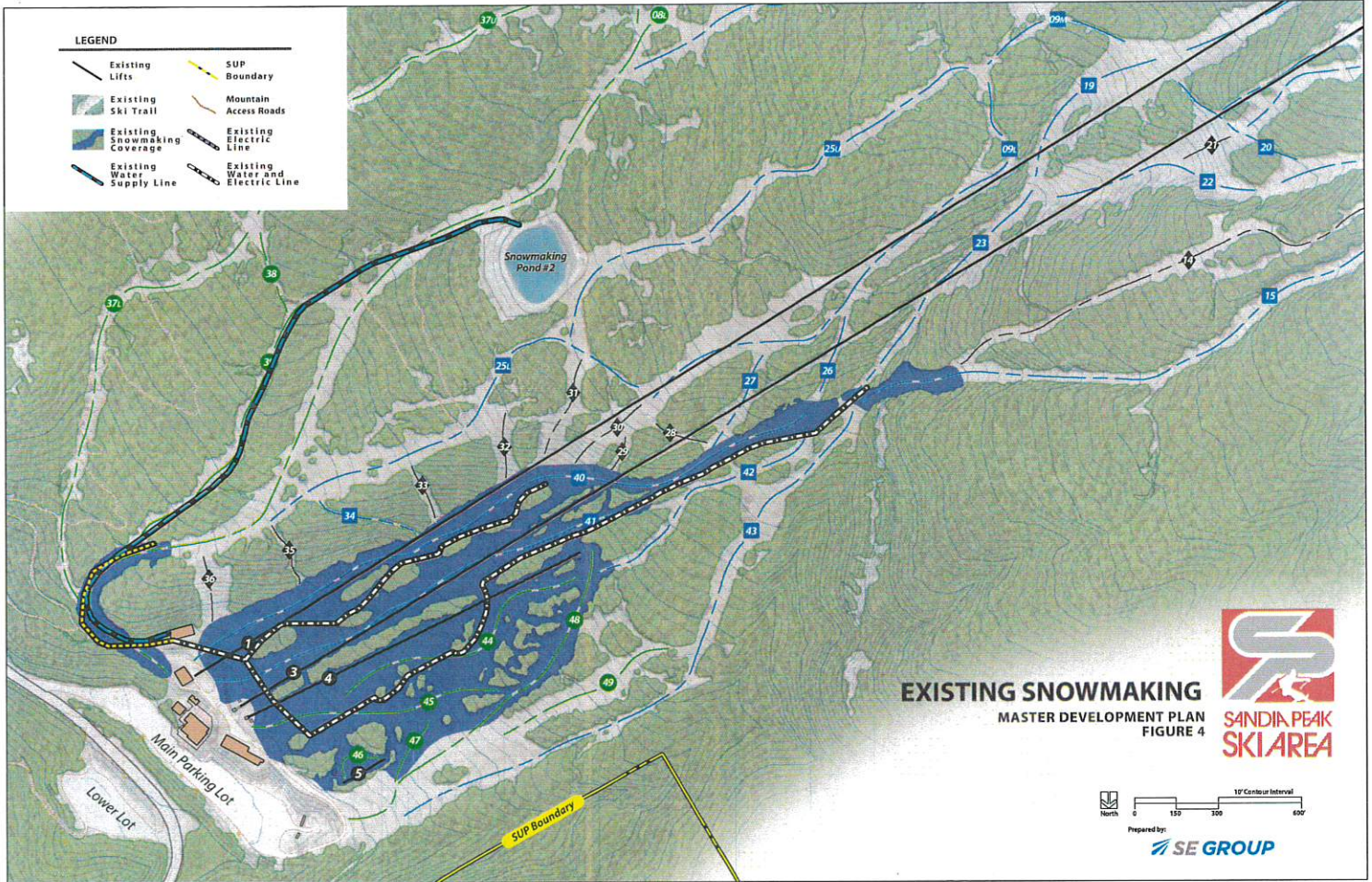


North  
0 500 1,000  
1' Contour Interval  
Prepared by  
**SE GROUP**



LEGEND

- Existing Lifts
- Existing Ski Trail
- Existing Snowmaking Coverage
- Existing Water Supply Line
- SUP Boundary
- Mountain Access Roads
- Existing Electric Line
- Existing Water and Electric Line



EXISTING SNOWMAKING  
MASTER DEVELOPMENT PLAN  
FIGURE 4



North

10' Centesimal Interval

Prepared by: SE GROUP



**SANDIA PEAK  
SKI AREA**

**CHAPTER 5.  
UPGRADE PLAN**



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# CHAPTER 5. UPGRADE PLAN

The purpose of this Upgrade Plan is to provide direction for the future development of the ski resort, which ensures a balance of facilities and variety of amenities—all leading to an improved guest experience and operational efficiencies. This plan will allow SPSA to help retain existing guests and attract new visitors. The Upgrade Plan is depicted on the Figure 5.

SPSA is planning a series of improvement projects, as detailed in this section. In a broad context, these projects include:

- Additional lifts, as well as replacing existing lifts, which will increase lift capacity and improve access to existing terrain
- New gladed ski terrain
- New tubing area and terrain park
- New snowmaking pond and additional snowmaking coverage
- Improvements and additions to the variety of multi-season recreation offerings, including mountain biking trails, zip line, mountain coaster, and other activities
- Upgrades to existing guest services and maintenance buildings
- Additional parking

## A. SUMMARY OF GUEST EXPERIENCE

The principal operational goal for SPSA is to provide for continued improvements in order to increase utilization while enhancing the quality of the customer experience. The Upgrade Plan presented in this chapter describes project proposals that are driven and guided by the ski area's primary goal and operational objectives.

A fundamental component of SPSA's Upgrade Plan is to improve the quality of the recreational experience, including upgrades to the lift system. Chairlift #1 will be replaced and access to beginner level terrain will be improved. These additions and improvements are designed to continue to decrease lift lines and improve the guest experience, especially during peak holiday periods.

Enhancements will be made to the developed trail network, consisting of new gladed skiing areas within the existing trail network. Approximately 80 acres of gladed terrain will be added to the network.

Upon completion of the upgrading projects, SPSA's CCC will increase from 1,730 skiers to 1,790, an increase of 60 skiers (3%).

Improvements to the snowmaking system and capacity will improve the consistency of conditions to improve the guest experience, and the addition of tubing, a terrain park, and multi-season recreation activities will provide a variety of diverse activities for guests to enjoy.



Summer and multi-season projects, including mountain biking trails, a mountain coaster, and a zip line are planned in accordance with the summer zone designations. These projects will greatly increase the variety of recreation opportunities available to a diverse range of visitors.

Improvements to existing guest service and maintenance buildings will also improve the quality of the recreational experience.

In summary, the Upgrade Plan is designed to increase utilization while enhancing the quality of the skiing and customer experience on a year-round basis. The mountain master planning process emphasizes the importance of balancing recreational facility development, and the sizes of the various skier service functions are designed to match the CCC of the mountain.

## B. ALPINE FACILITIES

### 1. LIFTS

SPSA's lift network consists of four aerial chairlifts and one surface lift (refer to Table 4-1). The Upgrade Plan identifies the following improvements to be made:

- Replace Chairlift #1 with a detachable quad chairlift, which increases the capacity to 2,400 people per hour
- Install Chairlift #6, a new conveyor or chairlift to serve existing beginner terrain, at 800 people per hour
- Replace Mitey Mite handle tow with a conveyor
- Designate Chairlift #2 as foot traffic
- Retain Chairlift #3 for redundancy only, or eventual decommission

#### a. Lift Discussion and Overview

The existing lift network serves SPSA's ski terrain in a logical and relatively efficient manner. The age and low capacity of the ski area's lift network is such that it should be improved and expanded in order to better serve and utilize the available terrain. Weather conditions (primarily wind) also limit the operation of existing lifts; updated, modern infrastructure would be able to withstand these weather conditions and provide more efficient service.

The following is a brief discussion of the upgrades planned for each lift at SPSA.

The aging Chairlift #1 is planned to be replaced with a detachable quad chairlift. The alignment of the chairlift will not change. This project will dramatically increase the uphill capacity from the base area and provide a shorter and more comfortable lift ride. Due to the identified aging issues with this lift, it is possible that the existing lift may need to be removed prior to replacement with the new detachable lift. If this is the case, Chairlift #3 would temporarily become the sole base-to-top lift.

In the short term, if Chairlift #3 operates as the only access to the summit, some improvements will be made including constructing stairs from the base lodge up to the bottom terminal of the lift to improve access to the loading area. Additionally, some minor grading would occur in existing disturbed areas around the bottom terminal. At the top terminal, some improvements will be made to the deck structure to improve the unload area. Once the replacement for Chairlift #1 is constructed, Chairlift #3 will remain in place as it provides a redundant system for skier access and transport to the top of the mountain. Chairlift #3 would only be used in emergency situations, should the upgraded Chairlift #1 cease operations for any reason. However, it is likely that Chairlift #3 would eventually require significant maintenance and would be removed. Even when

both lifts are potentially operational, it is not anticipated that the two lifts would run simultaneously; therefore, Chairlift #3 would not contribute to the overall CCC and is not included in the CCC analysis in Section C below.

A new fixed-grip chairlift or conveyor north of the existing Chairlift #4 will improve access to existing beginner terrain and also provide access to a new tubing/terrain park area. This lift will reduce congestion on Chairlift #4.

Replacing the Mitey Mite handle tow with a conveyor will improve the recreational experience for beginners at SPSA.

Chairlift #2 will be designated as foot traffic only for year-round access to the zip line. Therefore, this lift will no longer be used by skiers to access terrain on the upper half of the mountain (this terrain is all accessible from Chairlift #1). Because this chairlift will no longer provide uphill service for skiers, it will no longer contribute to the resort's CCC (see discussion below).

No upgrades are planned for Chairlift #4.

Table 5-1 includes detailed information of the lift specifications in the Upgrade Plan.

**Table 5-1. Lift Specifications – Upgrade Plan**

Map Ref.	Lift Name, Lift Type	Top Elev. (ft)	Bottom Elev. (ft)	Vertical Rise (ft)	Slope Length (ft)	Average Grade (%)	Actual Design Capacity (pers/hr)	Rope Speed (fpm)	Carrier Spacing (ft)	Lift Maker/ Year Installed
1	Chairlift #1 DC-4	10,277	8,684	1,594	7,379	22	2,400	1,000	100	New
2	Chairlift #2 C-2	10,282	9,432	850	3,884	23				Riblet/1972
3	Chairlift #3 C-2	10,270	8,695	1,575	7,259	22	949	445	56	Riblet/1981
4	Chairlift #4 C-2	8,977	8,693	285	1,370	21	749	388	62	Poma/1987
5	Mitey Mite Conveyor	8,738	8,718	21	153	14	600	120	12	New
6	Beginner/Terrain Park	8,809	8,701	108	555	20	800	400	90	New

Source: SE Group

Notes:

C-2 = fixed-grip double chairlift

DC-4 = detachable quad chairlift

Chairlift #2 will be designated as *Foot Traffic Only*





## 2 DEVELOPED ALPINE TERRAIN NETWORK

As discussed in the Chapter 4, the developed, or formalized, terrain network at SPSA consists of the named, defined, lift-serviced, maintained runs at the resort. These runs represent the baseline of the terrain at any resort, as they are where the majority of guests ski, and they are usually the only places to ski during the early season periods of poor or undesirable snow conditions, and uncertain weather conditions. This is particularly true at SPSA, where much of the clientele is not advanced enough to ski off of the developed trails and conditions are rarely adequate for skiing in these areas. Typically, terrain off the developed network is only used by advanced and expert level skiers, during periods of fresh powder, spring corn, and other desirable snow and weather conditions. As such, the developed terrain network represents a true reflection of acreage used by the average skier on a consistent basis.

### a. Alpine Trails Discussion

#### *New Trails*

No new trails are planned in this MDP. However, approximately 80 acres of new gladed terrain is planned to provide additional variety for advanced intermediate and expert ability levels.

### b. Terrain Distribution by Ability Level

No new developed terrain is planned at SPSA; therefore, the terrain classification breakdown of the Upgrade Plan for the ski area will not change from existing conditions (refer to Table 4-3). As discussed in Chapter 4, there is a deficiency in beginner, advanced, and expert terrain. The need for additional advanced and expert terrain is addressed by the additional planned gladed terrain, discussed below. Adding a lift to access existing beginner terrain will improve the experience for lower ability level skiers.

### c. Density Analysis

As discussed in Chapter 4, an important aspect of ski area design is the balancing of uphill lift capacity with downhill trail capacity. Trail densities are derived by contrasting the uphill, at-one-time capacity of each lift system (CCC) with the trail acreage associated with each lift pod. At any one time, skiers are dispersed throughout the resort, while using guest facilities and milling areas, waiting in lift mazes, riding lifts, or enjoying descents.

Trail density is calculated for each lift pod by dividing the number of guests on the trails by the amount of trail area that is available within each lift pod. The trail density analysis compares the calculated trail density for each lift pod to the desired trail density for that pod (i.e., the product of the ideal trail density for each ability level and the lift's trail distribution by ability level).

The trail density analysis considers only the acreage associated with the developed trail network, as described above. The density analysis for the planned upgrades at SPSA is illustrated in Table 5-2. This table shows that with the upgrades to the lift system, a closer balance will be achieved between uphill and downhill capacities. The overall density index shows that there will still be desirable low skier densities on the terrain (below target densities), but that the developed terrain network will be better utilized.

Table 5-2. Density Analysis – Upgrade Plan

Map Ref.	Daily Lift Capacity	Guest Dispersal				Density Analysis				Density Index (%)
		Support Fac./Milling (guests)	Lift Lines (guests)	On Lift (guests)	On Terrain (guests)	Terrain Area (acres)	Terrain Density (guests/ac)	Desired Trail Density (guests/ac)	Diff. (+/-)	
1	1,360	340	34	251	735	126.7	6	13	-7	46%
4	290	73	74	37	106	8.2	13	16	-3	81%
5	50	20	10	12	8	0.3	28	30	-2	93%
6	90	36	11	16	27	1.5	18	18	0	100%
<b>TOTAL</b>	<b>1,790</b>	<b>469</b>	<b>129</b>	<b>316</b>	<b>876</b>	<b>136.6</b>	<b>8</b>	<b>14</b>	<b>-6</b>	<b>59%</b>

Source: SE Group

### 3. TERRAIN VARIETY/ALTERNATE TERRAIN

In terms of a resort's ability to retain guests, both for longer durations of visitation and for repeat business, one of the more important factors has proven to be variation in terrain. This means having developed runs of all ability levels, some groomed on a regular basis and some not, as well as mogul runs, tree skiing, and terrain parks and alternative features. To provide the highest quality guest experience, resorts should offer some level of all terrain types to the extent it is practical. Even though some of these types of terrain only provide opportunities when conditions warrant, terrain variety is increasingly becoming a crucial factor in guests' decisions of ski destinations.

#### a. Glades, Bowls, and Backcountry Style Terrain

Development of gladed skiing within the existing alpine terrain will provide more terrain variety and skiing opportunities. SPSA has designated seven areas within the existing ski area to be improved for gladed skiing; three near the top of the mountain adjacent to the Prohibition, Sandia, and Aspen trails, two mid-mountain near the Cibola Cut Off and Foster Murphy trails, one between the Hups and Cibola trails, and one near the base near the Slalom, Burn, Greg's, and Little Suicide trails. These areas encompass approximately 80 acres and will provide a gladed skiing experience for intermediate and advanced skiing and riding guests. These areas will be thinned out to make them accessible to more guests.

Due to topographical constraints, there are no open bowls, natural meadows, or chutes at SPSA.

#### b. Terrain Parks

A terrain park program is part of SPSA's operations and is maintained on a continual basis. The current "Scrapyard" terrain park near Chairlift #4 will likely continue to operate. However, options are being considered to improve and enlarge the terrain park, with an emphasis on quality of features.

#### c. Tubing Area

A tubing area is planned in the vicinity of Chairlifts #4 and #5 as an alternative winter recreation activity. The tubing area would be approximately 550 feet long. It would be accessed by the planned Chairlift/Surface Conveyor #6.





## C. COMFORTABLE CARRYING CAPACITY

As stated earlier, the accurate calculation of a ski area's CCC is an important, complex analysis and is the single most important planning criterion for the ski area. All other related skier service facilities can be evaluated and planned based on the proper identification of the mountain's capacity. The detailed calculation of SPSA's planned CCC is described in Table 5-3 and is calculated at 1,790 guests per day. It is intended that ski areas experience peak days during which skier visitation exceeds the CCC by as much as 25%. However, from a planning perspective, it is not recommended to consistently exceed the CCC due to the resulting decrease in the quality of the recreational experience, and thus the resort's market appeal.

Table 5-3. Comfortable Carrying Capacity (CCC) – Upgrade Plan

Map Ref.	Lift Name, Lift Type	Slope Length (ft)	Vertical Rise (ft)	Actual Capacity (pers/hr)	Oper. Hours (hrs)	Up-Mtn. Access Role (%)	Misload/Lift Stop (pers/hr)	Adj. Hourly Capacity (guests/hr)	VTF/Day (000)	Vertical Demand (ft/day)	Daily Lift Capacity (guests)
1	Chair 1 DC-4	7,379	1,594	2,400	7.00	10	5	2,040	22,756	16,675	1,360
4	Chair 4 C-2	1,370	285	749	7.00	0	15	637	1,269	4,394	290
5	Mitey Mite Conveyor	153	21	600	7.00	0	5	570	83	1,695	50
6	Beginner/Terrain Park	555	108	800	7.00	0	15	680	514	5,861	90
<b>TOTAL</b>		<b>13,342</b>		<b>4,549</b>				<b>3,927</b>	<b>24,622</b>		<b>1,790</b>

## D. SKIER SERVICES FACILITIES AND FOOD SERVICE SEATING

### 1. SKIER SERVICES LOCATIONS

SPSA will continue to function with one primary base area staging portal, with limited skier access from the Tram. Base area skier service improvements include upgrades to existing facilities at the main base area.

On-mountain skier services will continue to be offered at the top terminal of the Tram, the existing ski patrol facility, and the Top of Tram Restaurant.

#### a. Base Area

Improvements to existing guest service facilities and maintenance buildings are planned at the base area. In particular, SPSA plans to upgrade the Rental/Ski School/Office Building in the base area; improve or replace the Adaptive Building to enhance ADA access; improve the Double Eagle II Café with a focus on modernizing the interior, enhancing ADA access, and possibly adding an elevator; and improve or replace the Children's Building, which is old and undersized.

#### b. Summit Facilities

Skier services facilities at the top of the mountain will remain in the Tram top terminal building, the ski patrol shack, and the new Top of Tram Restaurant. Available skier services include food service, bar/lounge, restrooms, lockers, ski patrol, and administrative and employee space. The new Top of Tram Restaurant facility provides excellent service and space for guests.



## 2. SPACE USE ANALYSIS

As discussed, the distribution of CCC is utilized to determine guest service capacities and space requirements for skier services at base area portals and on-mountain facilities. The CCC should be distributed between each guest service facility location according to the number of guests that would be utilizing the lifts and terrain associated with each facility. Sufficient guest service space should be provided to accommodate the planned CCC of 1,790 guests per day. The existing base area and on-mountain facilities provide sufficient space to accommodate the planned CCC. No additional guest service facilities are planned, but upgrades to the existing base area facilities will improve the guest experience.

## 3. FOOD SERVICE SEATING

Food service seating will continue to be provided at all existing restaurants.

Seating and restaurant space recommendations are directly related to the lunchtime capacity. The lunchtime capacity is determined by the distribution of each lift area's CCC. It is assumed that skiers will prefer to dine at the facility closest to the area where they are skiing. To allow for this convenience, it is important to provide restaurant seating to accommodate the lunchtime capacity requirement of the area. Existing seating capacity at the base area and on-mountain facility is sufficient to accommodate the planned CCC of 1,790 guests per day.

## E. PARKING CAPACITY

The existing day skier parking lots at SPSA will continue to provide parking space. A new parking lot is planned adjacent to the existing North Parking Lot for an additional capacity of 260 cars. With the addition of this parking area, need for parking along Highway 536 on peak days would decrease.

Table 5-4 analyzes SPSA's parking capacity under the Upgrade Plan. Vehicle occupancy counts are assumed to remain at 2.3 people per car, a ratio that is consistent with the national average of 2.3 to 2.7 people per car.

**Table 5-4. Planned Parking Upgrades**

	Total
CCC	1,790 guests
Guests arriving by Tram	80 guests
Guests parking at portal	1,710 guests
Average vehicle occupancy	2.3 guests/car
Employee parking spaces	75 cars
Total required spaces	805 cars
Existing parking spaces	602 cars
Planned additional parking spaces	260 cars
Total upgrade spaces	862 cars
Surplus	+57 cars

In summary, the planned skier parking lots will accommodate a total of 1,810 skiers at 2.3 people per car, plus charter buses. This is above SPSA's planned CCC.



## F. MULTI-SEASON RECREATION ACTIVITIES

### 1. SUMMER AND MULTI-SEASON OFFERINGS – ZONES CONCEPT

As discussed in Chapter 3, SPSA identified four characteristics (access, remoteness, naturalness, and infrastructure) that define the summer and multi-season setting and guest experience within different landscapes across the SUP area. The first step in the zone designation process was a careful consideration of the setting and the proximity to infrastructure supporting snow sports. Features such as topography, vegetation structure, level of existing disturbance, and existing infrastructure were considered in establishing zone boundaries across the SUP area.

The exercise resulted in the creation of nine areas unique in their location and/or features. The second step of the zone designation process was applying a score for each characteristic on a scale of 1 to 3, with 1 being the most disturbed and 3 being the least disturbed. Figure 7 illustrates the zone designations within SPSA's SUP area.

#### a. Zone 1

##### *Setting*

The existing setting of Zone 1 is highly developed and disturbed. Within Zone 1, the built environment dominates the landscape. Within the context of the overall SUP area, the following summarizes the setting in Zone 1:

- Road access and roads are prevalent, including parking and transportation hubs;
- Considerable human activity (people recreating and/or resort operations) occur within and proximate to this setting—there is little to no feeling of remoteness;
- Terrain modifications (ground disturbance and vegetation removal) dominate the area; and
- Infrastructure, including chairlifts and buildings, is present.

Three areas were designated as Zone 1: Areas 1, 4 and 6. These areas are located adjacent to the Tram terminal, base area, and road and parking infrastructure.

##### *Desired Experience*

Within Zone 1, guests are expected to encounter a high concentration of other guests and feel completely safe within their surroundings. The level of development will reflect the current setting and function of these areas as hubs of activity and portals to other activities across the ski area. Most guests visiting Zone 1 will initially access it from the Tram or Chairlift #1. Within Zone 1, adherence to the concepts in the BEIG will ensure appropriate design guidelines for both landscape architecture and built architecture are implemented. Zone 1 will offer interpretive opportunities in a developed setting, with goals of enhancing guests' understanding of the natural environment as they prepare to venture into less-developed areas.

##### *Compatible Activities and Facilities*

Services and activities in Zone 1 include food and beverage operations, shelter and emergency services, restroom facilities, landscaped areas, and other activities. At SPSA, Area 1 serves as the on-mountain hub, from which guests will access surrounding activities and refuel between activities. The Tram terminal and base area already host several multi-season recreation activities, including live music and events, food and beverage, hiking and mountain biking. These activities are intended to attract guests from a built environment to NFS lands.



Activities on NFS lands with Zone 1 may include a mountain coaster, challenge courses, canopy tours, zip lines, singletrack, flow, and larger, more developed mountain biking trails, a mountain biking skills park, hiking trails, climbing walls, more developed pathway systems, equestrian trails and facilities, and other natural resource-based recreation activities. In summary, activities appropriate in Zone 1 would rely more heavily on lift-service and guest services, and they would be activities that concentrate people resulting in a diminished sense of remoteness. The activities will not compromise the existing skiing activity that occurs in Zone 1 during winter months.

b. Zone 2

### *Setting*

The setting of Zone 2 is less disturbed when compared with Zone 1 and provides more naturalness due to a lesser degree of disturbance from the surrounding ski area. Within the context of the overall SUP area, the following summarizes the setting in Zone 2:

- Road access and roads are present;
- Human activity (people recreating) occurs within and proximate to this setting—there is little feeling of remoteness;
- Terrain modifications (ground disturbance and vegetation removal) are evident in the area, but past disturbance blends with the landscape; and
- Infrastructure, including chairlifts and buildings, are present.

Four areas within SPSA's SUP area were designated as Zone 2: Areas 2, 7, 8, and 9 where summer trails, roads, chairlifts, and snowmaking infrastructure currently exists. While infrastructure is minimally present within Area 8, the proximity of State Highway 536 to the north and communications infrastructure along the ridge outside the ski area SUP boundary contribute to the character of this area. These areas provide supportive recreation opportunities to the adjacent built environment of Zone 1.

### *Desired Experiences*

Most guests will access Zone 2 from Zone 1 via either the Tram or a scenic chairlift ride on Chairlift #1. In addition to beautiful views of the landscape, this “fly over” exposure will allow guests to see diverse vegetation types and topographic features as they make their way up or down the mountain. In moving between these zones, guests will transition from the built environment to a setting characterized by both developed and passive activities proximate to existing infrastructure and facilities, but still offering a more natural feel. For many guests of SPSA, this may be their first real experience in the mountains, and providing a safe, comfortable environment for exploration is critical to the success of Zone 2 and the overall program of activities and experiences. Zone 2 provides the initial opportunity for guests to learn about and engage in their natural surroundings through hands-on recreational, interpretive, and educational offerings. Zone 2 serves as a buffer between higher levels of development within Zone 1, and the more natural settings of Zones 3 and 4.

### *Compatible Activities and Facilities*

Passive activities within Zone 2 include educational/interpretive opportunities, sightseeing and light hiking. Zone 2 will provide enhanced sightseeing opportunities when compared to Zone 1. Potential activity offerings include zip lines and canopy tours, guided hikes and interpretative opportunities, extended hiking trails, singletrack and developed mountain biking trails, equestrian trails, challenge courses, climbing walls, open-air vehicular tours, disc golf and other natural resource-based activities.





As mentioned above, Zone 2 serves two primary purposes—to provide activities in a natural setting in proximity to existing infrastructure and services, and to provide a buffer between Zones 3 and 4 and more developed Zone 1 areas. Thus, areas within Zone 2 serve as transitional zones, encouraging guest exploration into more natural portions of the National Forest in a setting that still feels comfortable for less-experienced Forest users. The setting of Zone 2 and the activities that occur within will offer sufficient challenge for first-time guests, and will prepare others to venture into the less developed areas of Zones 3 and 4. Overall, developed activities requiring infrastructure are appropriate within Zone 2, but would entail a lesser concentration of guests compared to Zone 1.

### c. Zone 3

#### *Setting*

The setting of Zone 3 contains areas of disturbance from ski trail and chairlift development, but guests can still find a greater degree of remoteness and naturalness depending on their location within the zone. Within the context of the overall SUP area, the following summarizes the setting in Zone 3:

- Road access and roads are present, but limited to certain areas;
- Human activity (people recreating) can be seen at a distance or is out of sight from within this setting—a stronger feeling of remoteness is present;
- The area is moderately disturbed by ski area activity, including vegetation removal from ski trail development and some ground disturbance; and
- Minimal infrastructure may be present.

One area within the SUP area was designated as Zone 3: Area 5, where roads, summer trails, and snowmaking infrastructure presently exist.

#### *Desired Experiences*

Most guests will not access Area 5 as this is separated from the ski area by State Highway 536. Access to Area 8 would be primarily via SPSA's hiking and mountain biking trail network.

The desired experience in Zone 3 will be focused on dispersed, natural resource-based recreation. Guests will enjoy nature hikes with interpretive signage that will provide education on their biological, cultural, and historical surroundings. Guests will hike to locations with expansive views of the surrounding geography, including scenic outlooks of the Sandia Crest and forested environment. Guests will ride mountain biking trails through forested settings and learn the importance of forest health and stewardship. The mountain biking trail network would be less dense compared to Zone 2.

Zone 3 offers a diverse set of experiences for guests, which will promote the Cibola National Forest as a recreationally-, biologically-, and geographically-diverse landscape.

#### *Compatible Activities and Facilities*

Activities include mountain biking trails, hiking trails, equestrian trails, canopy tours, and other similar natural resource-based activities. Select activities such as interpretive tours and canopy tours may occur on a year-round basis. Activities within Zone 3 will not require substantial modifications to natural topography to facilitate construction and will require limited infrastructure to support the activity. Existing ski area development (ski trails and chairlifts) exist to varying degrees within Zone 3, and potential seasonal and year-round facilities and activities will be consistent with the level of existing development for the ski area operation.

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d. Zone 4

**Setting**

The setting of Zone 4 is more remote and provides a high degree of naturalness. Ski area development is limited and, where ski trails are present, larger tree islands are present. Within the context of the overall SUP area, the following summarizes the setting in Zone 4:

- Little to no road access occurs;
- Human activity (people recreating and/or resort operations) is distant or out of sight, facilitating a high degree of remoteness;
- The area is completely natural or has limited disturbance; and
- Minimal infrastructure is present.

One area within the SPSA SUP area was designated as Zone 4: Area 3. Existing ski area infrastructure is almost entirely absent from this area, with the exception of a few small segments of summer trails.

**Desired Experiences**

The desired experiences in Zone 4 are closely tied to the natural and remote setting of the area itself. This relatively undisturbed area of the National Forest offers opportunities for quiet, solitude, and exploration. Additionally, because natural processes are more evident in these areas as compared with more developed zones, greater educational and experiential learning opportunities exist for guests. The setting in Zone 4 will directly affect the guest experience, and maintaining this more remote setting will meet the guests' expectations.

**Compatible Activities and Facilities**

Activities will promote the surroundings and inform guests of similar environments throughout the National Forest. Activities include slower-moving actions to match the setting and character, which provide even greater opportunities for environmental education and exposure to unique environments. These activities include hiking trails with signage and interpretation, equestrian trails, and singletrack mountain biking trails. Activities within Zone 4 will require minimal site modification to maintain the current level of naturalness. In this zone, the low density of guests is expected to maintain the feeling of remoteness. In Zone 4, additional infrastructure would be limited to signage.

e. Zone 5

Zone 5 is the least developed of all zones. No areas within the SPSA SUP area were classified as Zone 5.



## 2 SUMMARY OF MULTI-USE ZONES

Table 5-5 describes the characteristics of each zone, and Table 5-6 provides information about each zone at SPSA.

Table 5-5. Zone Characteristics

Zone Characteristics	Scores
<b>Access</b>	
Road Access within Area	1
Limited Road Access/Trails	2
No Road Access	3
<b>Remoteness</b>	
Proximate to Human Activity	1
Distant Sight of Human Activity within SUP	2
Out of Sight of Human Activity within SUP	3
<b>Naturalness</b>	
Heavily Disturbed by Ski Area Activity	1
Moderately Disturbed by Ski Area Activity	2
Undisturbed by Ski Area Activity	3
<b>Infrastructure</b>	
Adjacent to 2 or More Ski Area Infrastructure	1
Ski Area Infrastructure in Area	2
Out of Sight of Ski Area Infrastructure	3
<i>Minimum Score Possible</i>	4
<i>Maximum Score Possible</i>	12
<b>Zones</b>	<b>Score Range</b>
1	4
2	5 to 6
3	7 to 9
4	10 to 11
5	12



Table 5-6. SPSA Summer Use Zones

Area Boundaries	Score	Appropriate Zone
<b>Area 1</b>		
Access	1	
Remoteness	1	
Naturalness	1	
Infrastructure	1	
<b>Total Score</b>	<b>4</b>	<b>Zone 1</b>
<b>Area 2</b>		
Access	2	
Remoteness	1	
Naturalness	2	
Infrastructure	1	
<b>Total Score</b>	<b>6</b>	<b>Zone 2</b>
<b>Area 3</b>		
Access	3	
Remoteness	2	
Naturalness	3	
Infrastructure	3	
<b>Total Score</b>	<b>11</b>	<b>Zone 4</b>
<b>Area 4</b>		
Access	1	
Remoteness	1	
Naturalness	1	
Infrastructure	1	
<b>Total Score</b>	<b>4</b>	<b>Zone 1</b>
<b>Area 5</b>		
Access	2	
Remoteness	2	
Naturalness	2	
Infrastructure	2	
<b>Total Score</b>	<b>8</b>	<b>Zone 3</b>
<b>Area 6</b>		
Access	1	
Remoteness	1	
Naturalness	1	
Infrastructure	1	
<b>Total Score</b>	<b>4</b>	<b>Zone 1</b>
<b>Area 7</b>		
Access	1	
Remoteness	1	
Naturalness	2	
Infrastructure	1	
<b>Total Score</b>	<b>5</b>	<b>Zone 2</b>
<b>Area 8</b>		
Access	1	
Remoteness	1	
Naturalness	2	
Infrastructure	2	
<b>Total Score</b>	<b>6</b>	<b>Zone 2</b>
<b>Area 9</b>		
Access	2	
Remoteness	1	
Naturalness	2	
Infrastructure	1	
<b>Total Score</b>	<b>6</b>	<b>Zone 2</b>



### 3. SUMMER AND MULTI-SEASON ACTIVITIES AND FACILITIES

This Upgrade Plan includes expansions to additional, non-skiing recreation activities in SPSA's SUP area. The current offering of scenic chairlift rides on Chairlift #1, mountain biking, lunch service at the Top of Tram Restaurant, breakfast and lunch at the Double Eagle II Café, and Tram rides will continue. Overall, the additional planned activities are not anticipated to substantially increase weekend and holiday visitation to SPSA, but would provide a wider variety of activities for guests who are already at the ski area. During the non-winter months in particular, the vast majority of guests access SPSA via the Tram. The Tram is currently a popular activity; guests ride the Tram for sightseeing or to dine at the Top of Tram Restaurant. Due to the nature of the lift, the Tram has a limited capacity and there are a set number of available Tram rides each day. For much of the year, particularly weekends and holiday periods, the Tram operates near this capacity. Therefore, there is limited potential for increased visitation, because it is unlikely that significant numbers of guests would access these activities from the base area. Increased visitation is expected on weekdays and during shoulder seasons (spring and fall). These activities are designed to offer short-duration activities for guests who are already at the summit of Sandia Peak for sightseeing or dining.

SPSA plans to expand on these alternative recreation activities with five primary projects, all of which are identified on Figure 5:

- **Mountain Coaster** – This mountain coaster will provide a unique multi-season experience for guests. The mountain coaster is planned for the area southeast of Chairlift #2. The mountain coaster would begin and end near the top terminal of Chairlift #2, near the Tram terminal. Guests would begin the activity with a descent of approximately 400 vertical feet over approximately 3,000 feet of track including turns and other features, and would then ascend back to the summit on a return track approximately 1,400 feet long. This activity would provide a short-duration activity for guests that have ridden the Tram and are spending time at the summit of Sandia Peak. A yurt-type structure would be constructed near the top of the mountain coaster to serve some limited food and beverage options.

The mountain coaster and support facilities are designed to incorporate similar design and materials as existing ski area infrastructure (e.g., colored steel). BEIG concepts and criteria will be incorporated into the final design. The mountain coaster will be situated in two inter-trail forested islands with much of the infrastructure on the periphery of existing ski trails. The track location and design will utilize existing vegetation to visually screen it from other activities and enhance visitor experiences. Construction access will be designed to retain as much vegetation as possible.

- **Zip Line** – A series of two zip lines are planned for the area adjacent to Chairlift #2.<sup>20</sup> As with the mountain coaster, this activity would be accessible from the top terminal of the Tram and would provide a short-duration activity for guests in the area of the summit. This zip line is planned as a multi-stage zip line that would generally parallel the alignment of Chairlift #2. Guests would begin this activity near the top terminal of Chairlift #2 and descend approximately 790 feet of elevation over two zips. After reaching the bottom of the zip line, guests would return to the top of the mountain via Chairlift #2. To accommodate this use, Chairlift #2 will be designated as foot-traffic only year-round. Therefore, the lift will not be used for skier access.

The zip lines are designed to minimize and avoid tree removal, blend with the forest canopy (towers), and utilize natural materials in its construction. They will be situated in discrete, forested locations adjacent to and on the periphery of existing snow sports infrastructure. Tower stations will not be higher than the canopy in which they're located to blend towers from multiple viewpoints.

<sup>20</sup> Final project design would determine whether one or two zip lines is appropriate in the planned location.



- **Mountain Biking Trails** – Improvements and additions to the existing mountain biking trail network will improve the variety of recreation experiences for all ability levels. A new trail will be built in the northern portion of the SUP area and features (such as banked turns, wooden features, and jumps) will be added to existing trails. A bike park or pump track could also be constructed near the base area (roughly adjacent to Chairlift #4) for use as a learning area.
- **Disc Golf** – A disc golf course is planned to add to the variety of summer activities offered at SPSA. The course would extend from the top of Chairlift #1 to the base area. Users would hike down through the ski area on a series of trails.
- **Base Area Activities** – A climbing wall, ropes course, events/concert area, and other small activities are planned for the base area. These would increase the variety of activities for guests to engage in outdoor recreation.

Special events are currently limited to weddings, which will continue to be hosted periodically throughout the summer season. SPSA is looking to host additional types of special events on a year-round basis in the future. Additional recreation opportunities that are in line and scale with the SPSA facility will continue to be considered in the future.

## 4. CONSTRUCTION TIMEFRAME

SPSA expects to implement Phase 1 projects within one to five years subsequent to review and potential approval in accordance with the National Environmental Policy Act. At this time, Phase 1 projects may consist of the mountain coaster, zip line, and conversion of Chairlift #2 to foot traffic only. This satisfies the master planning process requirement identified in FSM 2343.14(8)(c).

## G. SKI AREA OPERATIONS

### 1. SKI PATROL/FIRST AID

The current ski patrol facilities at the base area and at the summit (adjacent to the top terminal of Chairlift #1) will remain.

### 2. SNOWMAKING COVERAGE

SPSA plans to increase the area of snowmaking coverage from 22 acres to 65 acres. Planned upgrades to the snowmaking system are displayed on Figure 6. This includes additional coverage on existing trails that currently do not have snowmaking (43 acres). The existing snowmaking system has proved to be valuable and effective, supplementing natural snowfall to provide adequate snow coverage and improve the quality of the recreational experience. The expansion of snowmaking coverage to other existing trails higher on the mountain will provide more consistent conditions on a wider variety and larger area of terrain. The trails proposed for coverage include Lower and Middle Cibola, the connection of Middle Exhibition with Middle Cibola, Double Eagle II, Silver Arrow, Short Swing, Aspen Narrows, Aspen Bowl, and Exhibition (Lower, Middle, and Upper). Additional pipelines, pumps, snow guns, etc. will be required for this expansion and detailed engineering will be performed prior to project implementation. An additional snowmaking water storage pond (Pond 3) is planned on-mountain near the Cibola and Hups trails. This pond would have a storage capacity of approximately 10 million gallons.

The snowmaking system upgrades are planned in two phases. Phase 1 would consist of pipeline and power extensions of the current snowmaking system. These extensions would not increase the amount of water used currently but would allow for spot snowmaking in areas thin on natural snowfall. The areas to be included in Phase 1 are: Double Eagle II (and associated terrain adjacent to planned Chairlift/Surface Lift #6), Lower





Cibola up to Pond 2, Silver Arrow, Short Swing, and Lower Exhibition, totaling 15 acres of additional coverage.

Phase 2 includes construction of the planned pond (Pond 3) and associated expansion of snowmaking infrastructure and coverage. A pump house and booster station would be constructed adjacent to Pond 3 and snowmaking and power distribution lines would be installed on Middle Cibola, Middle and Upper Exhibition, Aspen Narrows, Aspen Bowl and the connection between Middle Exhibition and Middle Cibola, totaling 28 acres of additional coverage.

Phase 1 and 2 would increase snowmaking coverage by 43 acres, which would give SPSA approximately 65 acres of total coverage. Ponds 1, 2 and 3 combined would have 13 million gallons of storage capacity or 72 acre feet of snow, which falls within their private water rights of 107 acre feet.

### **3. GROOMING OPERATIONS**

No changes to grooming operations are anticipated. Vehicles from the existing fleet may be replaced as necessary according to age and hours of operation.

### **4. MAINTENANCE FACILITIES**

Improvements or upgrades are planned for the Vehicle Maintenance Building and Lift Maintenance Shop. The Lift Maintenance area would be relocated to the Vehicle Maintenance Building. One additional bay would be added to the Vehicle Maintenance Building to accommodate additional repairs.

### **5. INFRASTRUCTURE AND UTILITIES**

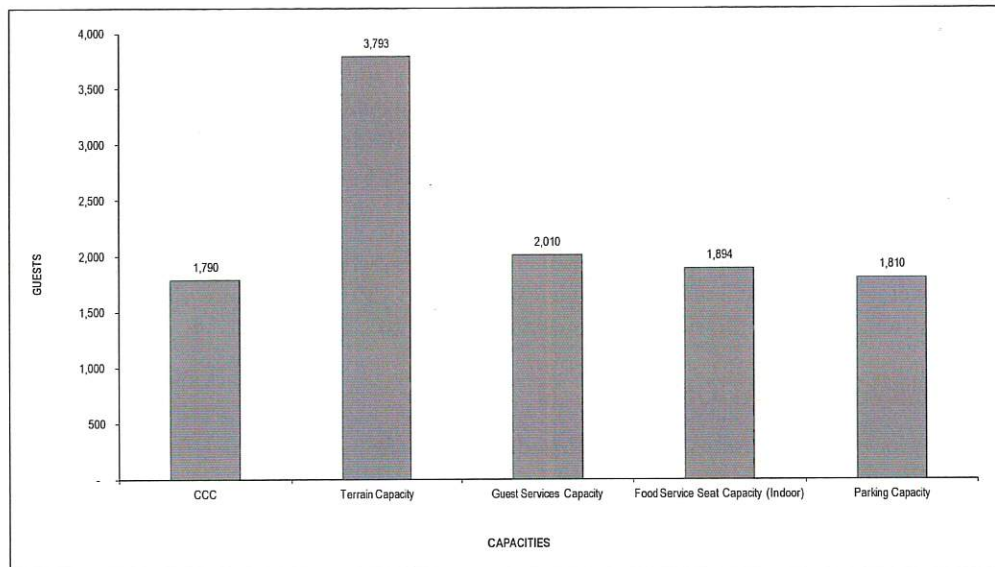
No specific utilities are planned as part this MDP. Upgrades and improvements to existing and planned infrastructure such as power, water, and sewer will take place commensurate to the individual project. Any upgrades will be compliant with codes requirements.

Fuel, oil, and other hazardous materials are delivered and stored in a way to reduce the potential and severity of spills. In the occurrence of a spill, SPSA operations contain, clean-up, and dispose of in accordance to local regulations. Sandia Peak Utility and Sandia Peak Services have a Spill Prevention, Control, and Countermeasures Plan in place with Bernalillo County, which could be modified to include the ski area.

## **H. RESORT CAPACITY BALANCE AND LIMITING FACTORS**

The overall balance of the existing ski area is evaluated by calculating the capacities of the resort's various facilities and comparing those facilities to the resort's CCC, shown in Chart 5-1.

Chart 5-1. Resort Balance – Upgrade Plan



The mountain master planning process emphasizes the importance of balancing recreational facility development. The sizes of the various skier service functions are designed to match the CCC of the mountain. Planned improvements described in this MDP have been configured to match the capacities of key ski area operations, including lifts, terrain, guest services, food service seating, and parking with the resort CCC of 1,790 skiers at one time. As the above chart indicates, CCC will not change significantly from the existing condition, and will remain in line with the capacity of guest service facilities. Additional parking will provide sufficient capacity for guests. Note that the developed ski terrain capacity actually decreases from existing conditions. While the physical capacity of the terrain does not change (1,856, see Table 4-3), the dispersal of guests does change with the upgrade to a detachable, high-speed lift. As shown in Table 5-2, there will be a higher number of guests on the terrain and fewer sitting on slow lifts. This improvement is also reflected in the higher (but still within target) terrain densities shown. In effect, this means that 39% of guests currently are on the ski runs on average at any given time, but with the lift upgrades, 49% of skiers will be on the ski runs. The result of this improvement is a lower overall terrain capacity that balances better with the new lift capacity. As stated in Chapter 4, there is an existing imbalance of uphill lift capacity to terrain capacity. These improvements will significantly improve the situation.



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**UPGRADE PLAN**  
**MASTER DEVELOPMENT PLAN**  
**FIGURE 5**



**LEGEND**

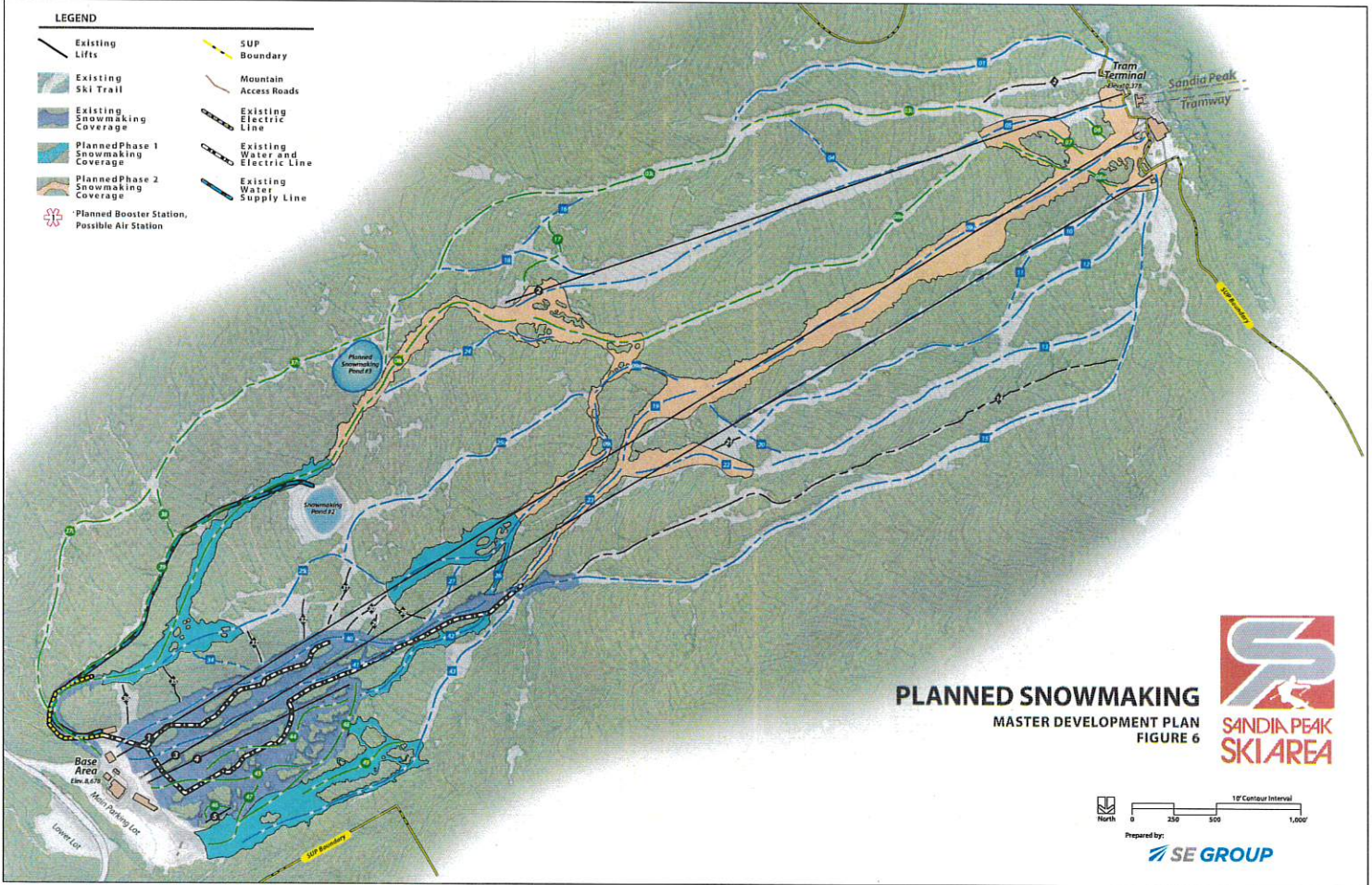
Existing Lifts	SUP Boundary
Planned Lift	Planned Lift Upgrade
Planned Disc Golf Course	Existing Lift Converted To Be Foot Traffic Only
Planned Glading	Existing Mtn Bike Trails
Four Season Activity Area	Planned Mtn Bike Trails
Planned Existing Building Upgrades	Planned Zip Line
	Planned Mtn Coaster





**LEGEND**

- Existing Lifts
- Existing Ski Trail
- Existing Snowmaking Coverage
- Planned Phase 1 Snowmaking Coverage
- Planned Phase 2 Snowmaking Coverage
- Planned Booster Station, Possible Air Station
- SUP Boundary
- Mountain Access Roads
- Existing Electric Line
- Existing Water and Electric Line
- Existing Water Supply Line



**PLANNED SNOWMAKING**  
 MASTER DEVELOPMENT PLAN  
 FIGURE 6



North

0 250 500 1,000'

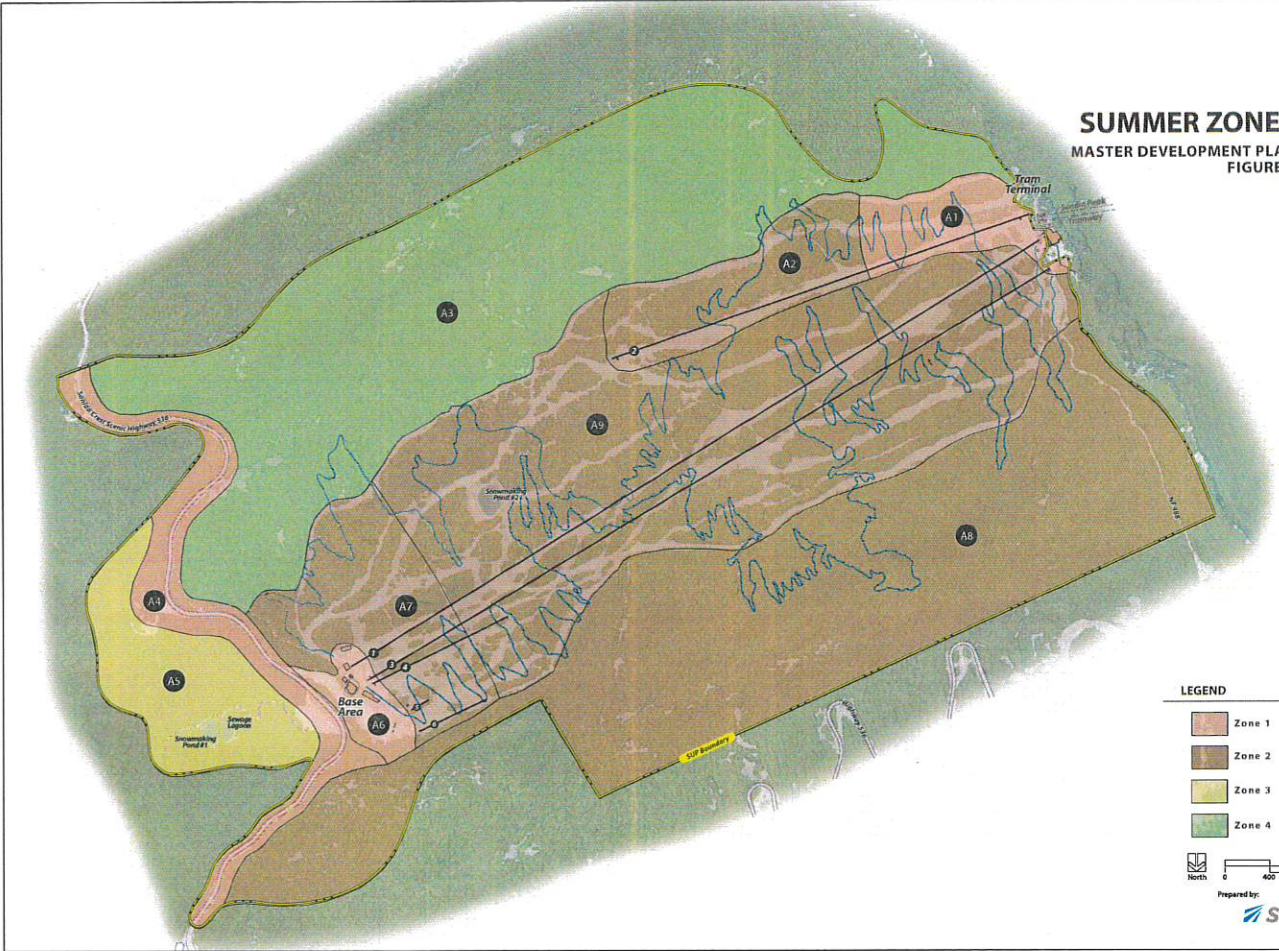
10' Contour Interval

Prepared by:



**SUMMER ZONES**  
MASTER DEVELOPMENT PLAN  
FIGURE 7

**SANDIA PEAK  
SKI AREA**



**LEGEND**

	Zone 1		SUP Boundary
	Zone 2		Existing Lifts
	Zone 3		Existing Mtn Bike Trails
	Zone 4		

North 10' Contour Interval  
Prepared by:





**SANDIA PEAK  
SKI AREA**

**CHAPTER 6.  
GLOSSARY**

# CHAPTER 6.

## GLOSSARY

**Ability Level:** The relative rank of a skier or snowboarder, or the relative rank given to alpine terrain. The six ability levels relied upon by SE Group are as follows: beginner, novice, low intermediate, intermediate, advanced intermediate, and expert.

**Trail Density:** The maximum number of skiers and snowboarders that can slide on an acre of trail at any given time without causing uncomfortable crowding on the trail. Acceptable trail density is measured in skiers and snowboarders per acre. As a general rule, the difficulty of the trail and acceptable trail density share an inverse relationship.

**Active Skiers and Snowboarders:** Skiers and snowboarders are considered active if they are: (1) waiting in a lift line, (2) riding a lift, or (3) enjoying a downhill descent. Depending primarily upon weather and snow conditions, 70 to 85% of a resort's skiers and snowboarders are active. The remaining 15 to 30% of a resort's skiers and snowboarders are either using a resort's support facilities and amenities or are circulating in a resort's various staging and milling areas. These guests are considered non-active.

**Comfortable Carrying Capacity (CCC):** Comfortable Carrying Capacity is a planning tool used to determine the optimum level of utilization that facilitates a pleasant recreational experience. This is a planning figure only and does not represent a regulatory cap on visitation. CCC is used to ensure that different aspects of a resort's facilities are designed to work in harmony, that capacities are equivalent across facilities, and sufficient to meet anticipated demand. CCC is based on factors such as vertical transport and trail capacities.

**Conveyor Lift:** A conveyor is a type of surface lift used to transport passengers in a standing position. Passengers slide onto the belt at the base of the conveyor and remain standing on the moving belt to the top, where they slide off the belt onto the snow. They are the easiest, least threatening form of lift, and as such are ideal for first-time beginner skiers or snowboarders, children's ski school, and tubing. Typically installed at snow level, the machinery and return belt are located below the surface. Options include covers or enclosures and raised sections. Maximum speed is 200 feet per minute and maximum (practical) length is around 1,000 feet.

**Day Use Skier/Snowboarder:** Generally speaking, a skier or snowboarder that lives within the resort's day-use skier/snowboarder market. Given normal road and weather conditions, the day skier/snowboarder market is defined as the geographic area found within a 100-mile radius, or two-hour drive, of the resort. Day use skiers and snowboarders drive to the resort and park in day use lots.

**Destination Skier/Snowboarder:** Generally speaking, a skier or snowboarder that resides beyond a 250-mile, or five-hour, drive from the resort. On average, destination skiers and snowboarders stay at a resort for longer periods of time (i.e., ranging from three to seven days) and commonly comprise a majority of a resort's mid-week visitation. Destination skiers/snowboarders typically rely upon air travel and shuttle service for transport to the resort, and obligate overnight lodging and numerous other resort amenities.



**Detachable Grip Chairlift:** An aerial tramway system on which chairs circulate around the system—alternately attaching and detaching from a moving haul rope. Chairlift detachment occurs at the lower and upper terminals for ease of lift loading and unloading.

**Developed Trail Network:** The trails and other named terrain delineated on a resort's trail map. In addition to traditional trail corridors, the network might include named and patrolled bowls, glades, chutes, couloirs, hike-to areas, and tree skiing/snowboarding areas.

**Fall-Line:** The path an object would naturally take as it descends a slope under the influence of gravity. Fall-line paths indicate the natural flow of potential trails, from the top of ridges to the elevations below. Fall-line terrain allows skiers and snowboarders to make equally weighted, left and right turns.

**Fixed-Grip Chairlift:** An aerial tramway system on which chairs remain attached to a haul rope.

**Food Service Seat Turnover Rate:** The turnover rate is used to evaluate a resort's aggregate food service seating capacity. The turnover rate is the estimated number of times a food service seat is used during a resort's peak food service operations. Sit-down dining at a resort lodge typically has a turnover rate of 3, while cafeteria-style dining is characterized by a turnover rate in the range of 4 to 5. In addition to the type of food service, a resort's climate also impacts turnover rate (i.e., cold and snowy climates have lower turnover rates).

**Forest Plan:** A comprehensive management plan prepared under the National Forest Management Act of 1976 that provides standards and guidelines for management activities specific to each National Forest.

**Formalized Trail Network:** The trails and other named terrain delineated on a resort's trail map. In addition to traditional trail corridors, the network might include named and patrolled bowls, glades, chutes, couloirs, hike-to areas, and tree skiing/snowboarding areas.

**Glades:** are trees stands that have been thinned specifically in varying degrees to improve the skiing experience by increasing the spacing between individual trees. Stands with less thinning are sometimes described as "Tree Skiing" areas. Stands with tree clearing to the extent that they can be groomed are described as "Groomable Glades."

**Gradient:** The vertical distance divided by the horizontal distance (i.e., commonly known as "rise over run"), which is measured as a percent, or a degree. Slope gradient is used to determine the ability level distribution of a resort's alpine terrain.

**Grooming:** The preparation and smoothing of the developed trail network's snow surface, using large over-the-snow vehicles (commonly referred to as "snow cats" or "grooming machines"). Grooming machines are equipped with front-mounted blades to push snow and a rear-mounted implement to flatten and/or till the snow to an improved consistency.

**Guest Services Facilities or Guest Services:** Facilities or services that are supplied by a resort to accommodate guests and enhance the quality of the recreational experience. Examples of guest services facilities include: restaurants, warming huts, general information desks, resort lost and found departments, restrooms and lounges, ski school, daycare, public lockers and ski-check facilities, ski patrol, first aid clinics, etc.

**Management Area:** Used by the Forest Plan to define where different management activities may be carried out and to show where different kinds of public uses occur.

**Maze:** A waiting area used to line up skiers and snowboarders just prior to lift loading (i.e., the corral area immediately adjacent to the loading point of the lift).



**Mitigation:** Actions taken to avoid, minimize, or compensate for adverse environmental impacts.

**Misloading:** The lift loading efficiency; for example, when lift has to stop due to a misload or unload.

**Access Capacity:** The resort's capacity to carry skiers and snowboarders to other, up-mountain lifts within an acceptable time frame. By comparing the aggregate staging requirement for each access lift to the access lift's uphill access capacity, the length of the access period for each access lift can be determined. Per industry standards, a destination resort should have dedicated access lifts (with sufficient hourly capacities) that supply the resort's up-mountain lifts with guests (numbers commensurate with lift hourly capacities) within an access period ranging from 90 to 120 minutes.

**Mountain Access Roads:** On-mountain primary and secondary roads that provide summertime access (for rubber tire vehicles) to all mountain buildings and lift terminal locations.

**National Forest System (NFS) lands:** National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

**Pod:** A delineated parcel of land that, due to its favorable terrain characteristics, is suitable for lift and trail development. Pods are areas of relatively consistent terrain (both slope gradient and fall-line) that may be serviced by one or more lifts and may be easily integrated into the existing skier and snowboarder circulation patterns.

**Ridge:** The line of separation (i.e., a divide) between drainage basins.

**Quad:** A common abbreviation for a four-passenger chairlift.

**Rider:** A commonly used term for a snowboarding guest.

**Special Use Permit (SUP):** A legal document, similar to a lease, issued by the U.S. Forest Service. These permits are issued to private individuals or corporations to conduct commercial operations on National Forest System lands. They specify the terms and conditions under which the permitted activity may be conducted.

**Staging:** An area, or zone, where guests assemble and are prepared for a particular recreational pursuit. Examples of staging areas include milling and maze areas, check-in and guest drop-off areas, plazas, etc.

**Surface Lift:** A lift on which passengers are propelled by means of a circulating overhead wire rope while remaining in contact with the snow surface. Connection between the overhead wire and the passenger is by means of a towing device (e.g., T-bar, J-bar, platter, etc.) attached and circulating with the lift's haul rope. (Note: For definitional purposes, conveyor and belt lifts are considered surface lifts.)

**Desire Trail Density:** The maximum number of skiers and snowboarders that can slide on an acre of trail at any given time without causing uncomfortable crowding on the trail. Acceptable trail density is measured in skiers and snowboarders per acre. As a general rule, the difficulty of the trail and acceptable trail density share an inverse relationship.

**Terrain Park:** An area dedicated to the development and maintenance of a collection of alternative terrain features, which may include, but is not limited to, elements like halfpipes, quarterpipes, big air hits, ollies, spines, jibbing elements, barrel bonks, table tops, etc.

**Trail Density Per Acre:** The number of skiers and snowboarders that occupy an acre of trail at any one given time. Trail density is reported in a persons-per-acre ratio.



**Uphill Hourly Capacity:** A calculation of the number of skiers and snowboarders transported—per hour—from the lower to the upper terminal of the lift. A resort's combined uphill hourly capacity is the aggregation of the resort's individual lift capacities.

**Up-Mountain Access Role:** Amount that a lift is used to access other lifts.

**Utilization Rate:** A comparison of a resort's actual annual skier visits to the theoretical annual ski area design capacity. Calculated by dividing the actual annual visitation by a number that represents the theoretical annual design skier capacity, which is obtained by multiplying the resort's CCC by the number of operating days. Typical utilization rates vary from 25% to 55% (depending on market niche, geographical location, etc.).

**Vertical Demand:** The vertical demand of a lift is the by-product of the lift's vertical rise, the average round-trip interval (i.e., number of runs per hour), and the number of hours the lift is used by an average skier or snowboarder. In short, vertical demand is the product of the lift's vertical rise and the number of runs skied/rode in a day of typical operation.

**Vertical Transport Feet per Hour (VTF/hr.) (000):** The number of persons a lift is able to transport 1,000 vertical feet in one hour. VTF/hour is derived by multiplying a lift's uphill capacity (measured in persons per hour) by the lift's vertical rise (measured in feet) and dividing by 1,000.

**Zone Designations:** Areas at a resort identified for summer and multi-season activity offerings based on landscape characteristics, available infrastructure, and setting.

