ASPEN SNOWMASS®

ASPEN MOUNTAIN

2018 MASTER DEVELOPMENT PLAN

January 2018

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II. DESIGN CRITERIA

Establishing design criteria is an important component in mountain planning. The following is an overview of the basic design criteria upon which this Aspen Mountain MDP is based.

A. DESTINATION RESORTS

One common characteristic of destination resorts is that they cater to a significant vacation market and thus offer the types of services and amenities vacationers expect. At the same time, some components of the destination resort are designed specifically with the day-use guest in mind. Additionally, the employment, housing, and community services for both full-time and second-home residents created by destination resorts all encourage the development of a vital and balanced community. This interrelationship is helpful to the long-term success of the destination resort.

Destination mountain resorts can be broadly defined by the visitation they attract, which is, in most instances, either regional or national/international. Within these categories are resorts that are purpose-built and others that are within, or adjacent to, existing communities. Aspen Mountain and the adjacent City of Aspen is an example of such a resort that exists adjacent to an existing community that is rich in cultural history, and provides a destination guest with a sense of the Mountain West and the mining and ski history of Colorado. This combination of a desirable setting and history supplements the overall experience of a guest visiting Aspen Mountain, which has become a regional, national, and international destination resort.

1. Regional Destination Resorts

Regional destination resorts largely cater to a "drive" market. While day-use guests play a large role, the regional destination resort also appeals to vacationers. At some regional destination resorts, lodging is a component. However, due to the average length of stay, and perhaps more importantly a regional guest's vacation budget, lodging and related services and amenities are usually less extensive than what is common for national/international destination guests. At Aspen Mountain where the regional destination resort has evolved from within, or adjacent to the City of Aspen, services are also supplied by local proprietors in the existing community. Even though a portion of the services offered in the City of Aspen, Town of Snowmass Village, and even Carbondale and Basalt, cater directly to guests of the resort or summer vacationers to Pitkin County, businesses within these towns also supply services to "locals," which helps maintain the balanced lifestyle that permanent residents and second homeowners enjoy.

2. National and International Destination Resorts

National and international destination resorts, including Aspen Mountain and the other three ASC-managed mountains that occupy the Roaring Fork Valley, offer a wide variety of lodging types, including hostels, motels, hotels, inns, bed and breakfast inns, townhomes, condominiums, and single family chalets either in their base areas or on nearby privately owned lands. Visitor participation in the real estate market has diversified substantially in the last two decades and includes ownership—either whole or fractional—as well as "usage," which comes in forms like timeshare and club participation. Typically, where the mountain facility is a primary driver for visitation, lodging is clustered at or near the mountain's base area and in this case on private property within City of Aspen. Amenities usually include a wide variety of restaurants, lounges, shops, conference facilities, and perhaps theatres or concert venues, Recreation centers (e.g., swimming, fitness equipment, and indoor courts), etc. Aside from Alpine skiing, recreational activities may include snow tubing, Nordic skiing, snowshoeing, sleigh rides, snowmobiling, mountain and road biking, walking, golf, tennis, horseback riding, angling, swimming, spa treatments, etc.

A mountain resort that evolves at the edge of an existing community—particularly one that has a tourism-based economy like that of the City of Aspen and Pitkin County—typically benefits from the significant infrastructure already in place (i.e., there is less need for a resort to develop infrastructure and create services at the base of the mountain).

3. Aspen Mountain's Resort "Niche"

The Aspen Snowmass brand is often described as the "Power of Four" which summarizes the Aspen Snowmass experience. In other words, ASC describes and promotes the resort as having four distinct mountains, each one providing very unique yet complimentary options for visitors not available at other mountain resorts. The Aspen Snowmass guest experience includes integrated features and advantages such as:

- All lifts on all four mountains are accessible via one lift pass
- Free and efficient mass transit opportunities from all lodging properties resort-wide
- Convenient equipment rental opportunities between the four mountains
- Trail systems (cross-country ski, hike, and bike) between all four mountains

The following marketing narratives describe Aspen Mountain's "niche" in the context of the other three mountains within the Power of Four brand, as well as its positioning with respect to destination skier markets.

ASPEN MOUNTAIN

With its famous black-diamond terrain, Aspen Mountain has been a renowned world-class resort since 1947. Inbounds terrain provides a variety of glades, bumps and steeps revered by locals and visitors alike. Access to this terrain is via the Silver Queen Gondola providing fast/efficient bottom-to-top access, with great summit views and food at the Sundeck Restaurant. A unique out-of-bounds experience is also available through Aspen Mountain Powder Tours offering fresh tracks on the backside. Lastly, Aspen Mountain also provides a legendary Alpine World-Cup venue that has challenged the world's best skiers since the 1950s.

ASPEN HIGHLANDS

With breathtaking 360-degree views of the Maroon Bells and an abundance of expert terrain as well as groomed cruisers, it's no wonder Aspen Highlands has been the locals' favorite for over fifty years. Visitors can hike to the 12,392 feet summit of Highland Bowl for the ultimate inbounds backcountry rush, or venture to the additional steeps and glades accessed via the Deep Temerity lift. It all adds up to some of the most challenging big-mountain terrain in North America.

SNOWMASS MOUNTAIN

At 4,406 vertical feet, Snowmass has the most in the country. And with 3,132 acres of terrain, 91 trails, 21 lifts and access to a varied choice of cruisers, glades, steeps, terrain parks and halfpipes, visitors always come back for more, while their kids create their own memories at the state-of-the-art Treehouse Kids' Adventure Center.

BUTTERMILK MOUNTAIN

Buttermilk built its fifty-plus years legacy on wide-open and gently rolling trails that cater to beginners and families. Today it's famous for hosting the ESPN Winter X Games through 2019 and being recently voted #1 by Transworld Snowboarding Magazine Reader's Poll for Best Park. The 22-foot superpipe, and the renowned variety of terrain park features for all levels, do not disappoint—as many X Games winners, Olympians, and up-and-comers can attest.

B. BASE AREA DESIGN

The relationship between planning at a resort's base area developments and on-mountain lift and terrain network is critically important. This relationship affects the overall function and perception of a resort.

Design of the base lands at a 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. However, fundamental objectives of base area planning are to integrate the mountain with the base area for the creation of an attractive, cohesive, and functional recreational and social experience. This is essential to creating the feeling of a mountain community, and can only be achieved by addressing base area components such as (but not limited to): guest service locations, skier/rider circulation, pedestrians, parking/access requirements, and mass-transit drop-offs.

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.

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

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

As has been discussed throughout this section, Aspen Mountain is unique in the sense that its base area services are primarily provided within the City of Aspen by a variety of businesses and facilities, including those of Aspen Skiing Company and other third parties. While the Gondola Plaza/ ticket office and the Shadow Mountain base areas serve the most basic and essential functions of mountain resort base lands, the vast majority of the base area experience is served by local proprietors within the City of Aspen. Further, many functions of a typical resort base area are provided by the City of Aspen rather than the resort itself. Guest parking is a prime example of this, as Aspen Mountain provides no guest parking facilities and all needs are accommodated by the City of Aspen. The base area configuration at Aspen Mountain will be discussed in greater detail throughout this document.

C. 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 terrain unique to each mountain. Ability level designations are based on the maximum sustained gradient calculated for each trail, in combination with other factors present that may make a trail more difficult. While short sections of a trail can be more or less steep without affecting the overall run designation, a sustained steeper pitch may cause the trail to be classified with a higher difficulty rating. It is important to understand that slope gradient is not the only factor in assigning a trail ability designation to a specific trail. A variety of factors, such as trail width, terrain features, and the context of other trails on the mountain can cause a trail to be classified under a higher designation.

The general terrain gradients shown in Table II-1 are reflective of industry norms, and are used as the basis to classify the skier difficulty level of the mountain terrain. As previously mentioned, additional considerations can compound with slope gradient and cause a trail to be classified under a higher designation.

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 the Rocky Mountain skier market is shown in Table II-2.

b. Trail Density

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

ASC strategically maintains low trail densities across its resorts to ensure the high-quality experience expected by its destination guests. Therefore, this MDP will use the lower end of the ranges for planning purposes.

These density figures account for the skiers that are actually populating the trails and do not account for other guests who are either waiting in lift lines, riding the lifts, or 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/riders at a typical resort are 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 day.

c. Trail System

A resort's trail system should be designed to provide a wide variety of terrain to meet the needs of the entire spectrum of ability levels as well as the resort's particular market. Each trail should provide an interesting and challenging experience within the ability level for which the trail is designed. Optimum trail widths vary depending upon topographic conditions and the caliber of the skier/rider being served. The trail network should provide terrain for 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 terrain variety. This means providing developed runs for all ability levels: some groomed on a regular basis and some not—bowls, trees, and terrain parks and pipes.

Table II-1. Terrain Gradients

Skier Ability	Slope Gradient
Beginner	8 to 12% (5–7°)
Novice	to 25% (15°)
Low Intermediate	to 35% (20°)
Intermediate	to 45% (25°)
Advanced Intermediate	to 55% (30°)
Expert	over 55% (30°)

Table II-2. Skier Ability Breakdown

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

Table II-3. Skier Density per Acre

Skier Ability	Trail Density
Beginner	25–35 skiers/acre
Novice	12–25 skiers/acre
Low Intermediate	8–20 skiers/acre
Intermediate	6–15 skiers/acre
Advanced	4–10 skiers/acre
Expert	2–5 skiers/acre
Bowls/Glades	0.5 skier/acre

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

Aspen Mountain does not currently operate any terrain parks; however, should it choose to do so in the future, this would only affect the trail system from an operational standpoint. Terrain parks are not part of the trail system themselves but rather an operational combination of certain trails and uses within the trail system (e.g., moving snow, creating terrain features, additional fencing and signage).

2. Lift Design

The goal for lift design is to serve the available terrain in an efficient manner (i.e., having the minimum number of lifts possible while fully accessing the terrain and providing sufficient uphill capacity to balance with the available downhill terrain capacity). In addition, the lift design has to take into consideration such factors as wind, round-trip utilization of the terrain pod, access needs, the ability to connect with other lift pods, the need for circulation space at the lower and upper terminal sites, access to residential development, and the presence of natural resources (e.g., visual impacts, wetlands, and riparian areas). The vertical rise, length, and ride time of lifts across a mountain are important measures of overall attractiveness and marketability of any resort.

3. On-Mountain Guest Services

On-mountain guest service facilities are generally used to provide shelter, food service (cafeteria-style or table service), restrooms, and limited retail, as well as patrol/first aid and other guest services, in closer proximity to upper-mountain terrain. This eliminates the need for skiers and riders to descend to the base area for similar amenities. It has also become common for resorts to offer ski/board demo locations on-mountain, so skiers and riders can conveniently test different equipment throughout the day.

D. CAPACITY ANALYSIS AND DESIGN

In ski area planning, a "design capacity" is established, which represents a daily, at-one-time guest population to which all ski resort functions are balanced. The design capacity is a planning parameter that is used to establish the acceptable size of the primary facilities of a ski resort: ski lifts, ski terrain, guest services, restaurant seats, building space, utilities, parking, etc.

Design capacity is commonly expressed as "Comfortable Carrying Capacity," "Skier Carrying Capacity," "Skiers at One Time," and other ski industry-specific terms. These terms refer to a level of utilization that provides a pleasant recreational experience, without overburdening the resort infrastructure. Accordingly, the design capacity does not normally indicate a maximum level of visitation, but rather the number of visitors that can be "comfortably" accommodated on a daily basis. Design capacity is typically equated to a resort's fifth or tenth busiest day, and peak-day visitation at most resorts is at least 10% higher than the design capacity.

This MDP will use the term Comfortable Carrying Capacity (CCC) when referring to Aspen Mountain's design capacity. 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, restrooms, parking, and other guest 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 vertical feet served combined with the uphill hourly capacities of the lifts) and demand for vertical transport (the aggregate number of runs desired 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 descent.

E. BALANCE OF FACILITIES

The mountain master planning process emphasizes the importance of balancing recreational facility development. The sizes of the various guest service functions are designed to match the CCC of the mountain. The future development of a resort should be designed and coordinated to maintain a balance between accommodating guest needs, resort capacity (lifts, trails, and other amenities such as tubing), and the supporting equipment and facilities (e.g., grooming machines, day lodge services and facilities, utility infrastructure, access, and parking). Note that it is also important to ensure that the resort's CCC balances with these other components, facilities, and services at the resort. Since CCC is primarily derived from the resort's lift network, it is possible to have a CCC that is effectively lower or higher than the other resort components.

F. 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 I, summer 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 Aspen Mountain and its markets, 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 Aspen Mountain's summer activity goals. Non-skiing and multi-season activities are, and will continue to be, important guest offerings at Aspen Mountain because summer recreational activities 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 resort.

As a four-season recreation destination, Aspen Mountain 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 challenge courses, climbing features, zip lines, site seeing and scenic overlooks can appeal to those desiring less strenuous experiences. 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, Aspen Mountain 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 Aspen Mountain and the local economy, particularly during the summer months. Snow sports are, and will continue to be, the primary use of NFS lands within the Aspen Mountain SUP area, and in combination with

snow sports at other ASC resorts are the primary economic driver for Pitkin County.

At a macro level, the Aspen Mountain SUP area is designated within the 2002 Forest Plan to have a Recreation Opportunity Spectrum (ROS) setting of "Rural," which is described as:

> *"Predominantly a culturally modified setting where the natural environment has been substantially modified, i.e., structures are readily apparent, pastoral or agricultural or intensively managed, wildland landscapes predominate as viewed from visually sensitive roads and trails. Access is primarily via conventional motorized use on roads. Contact frequency with other users may be moderate to high in developed sites and moderate away from developed sites."*

As stated in the 2002 Forest Plan Final Environmental Impact Statement:

> *"Recreational benefits from ski areas include managed, convenient access to National Forest System lands for visitors participating in such activities as hiking, mountain biking, viewing scenery, skiing, and snowboarding. Ski areas provide year-round natural resource-based recreation. The number of recreation opportunities enhanced by lift served access generally is proportional to the number of acres allocated to the 8.25 management area."*

At a site-specific level, this MDP takes the existing setting, combined with the anticipated use of the area, to establish finer-grain prescriptions. There are five distinct summer activity zone concept designations that are considered in the planning process. Zone designations are developed utilizing four characteristics similar to the ROS, including:

- *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 and proximity to the built environment

Each of these characteristics is to be considered within the context of Aspen Mountain as a developed ski area. The summer activity zones identified in this MDP are based on the existing setting and level of development. 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 Aspen Mountain 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 WRNF, ranging from high alpine environments, to riparian and wetland ecosystems, to forested settings in remote locations. The Scenery Management System (SMS) Scenic Integrity Objective (SIO) of the SUP area is officially designated in the 2002 Forest Plan as Low and Very Low, which are defined as:

> *Low – The valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.*
>
> *Very Low – The valued landscape character "appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural opening, vegetative type changes or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.*

To harmonize with these characteristics, planned activities within this MDP have been designed to correspond with the characteristics of these SIOs. Throughout implementation of the projects discussed in this MDP, ASC will work with the Forest Service to exceed these objectives as practicable.