



# STEAMBOAT RESORT

## 2019 MASTER DEVELOPMENT PLAN AMENDMENT



JULY 2019

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# PREFACE

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This Mountain Resort Master Development Plan (MDP) is intended to be the guiding document for future development at Steamboat Resort. Illustration 1 on the following page is a visual representation of the process on which this document is based.

First, an overall resort vision and guiding goals were determined based on market needs, resort niche and long-term outlook. These vision and goal statements help inform the entire process; that is, to help answer questions such as, “*What’s important to our guests?*”, “*What makes our resort special?*”, and “*Where should we invest our time, money and resources?*”

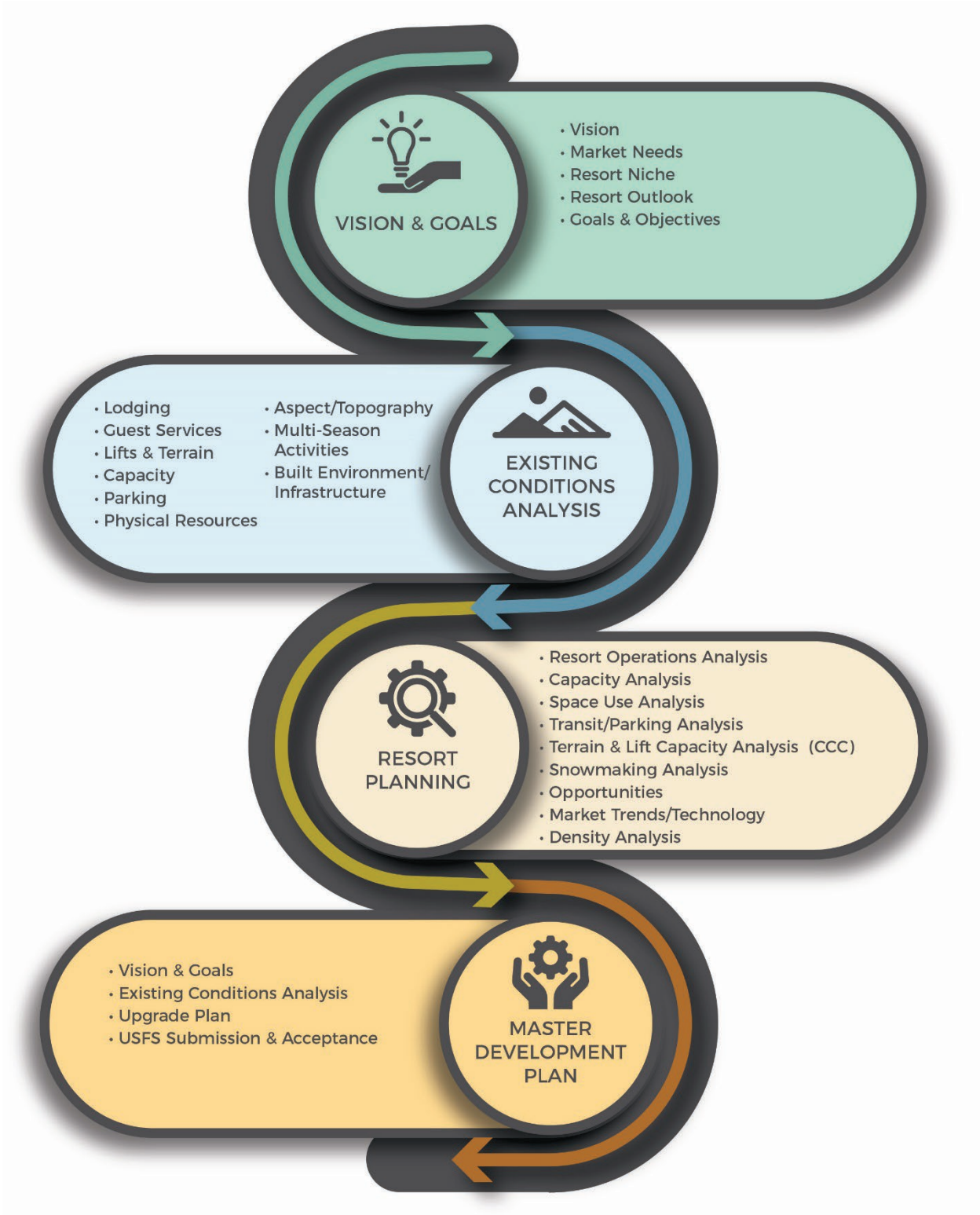
With a vision and goals established, the next step is to inventory existing conditions at the resort to identify existing strengths, weaknesses, opportunities, and constraints. This is critical information that goes into the resort planning phase. Details are collected such as the number of lifts and their conditions, the square footage of guest service spaces and how many parking spaces are available. Physical resources are also inventoried to help identify ideal locations to develop or areas to avoid due to environmental sensitivity.

The next phase of the MDP process is to analyze existing capacities of various facility components to determine imbalances within the operation. Collectively, this analysis leads to the identification of improvements that would bring existing facilities into better balance, help the resort prioritize projects and help the resort to operate more efficiently. Accomplishing these goals will result in a well-balanced resort, which provides an adequate array of services and experiences to satisfy guest expectations for a quality recreation experience. The results of this process are documented in this MDP.

This MDP is divided into five chapters, plus several appendices:

- ◆ *Chapter 1—Introduction:* provides a summary of Steamboat’s location and market, a statement of the plan vision and goals, and a summary of the master plan projects. Refer to Figures 1 and 2 for project location and property boundaries.
- ◆ *Chapter 2—Design Criteria:* provides important master planning considerations which inform and guide the development of the plan including design criteria and Forest Service direction.
- ◆ *Chapter 3—Analysis of Existing Conditions:* describes existing resort facilities for both winter and summer, and evaluates the current balance of resort operations, facilities, and infrastructure. Refer to Figures 5–9 for Steamboat existing conditions.
- ◆ *Chapter 4—Previously Approved, Not Yet Implemented Projects:* describes projects previously approved through NEPA but that have not yet been constructed. Refer to Figure 10 for these projects.
- ◆ *Chapter 5—Upgrade Plan:* describes the proposed upgrades and improvements to the experience at Steamboat. Refer to Figures 11–14 for Steamboat upgrade conditions.
- ◆ *Appendices A–C:* include additional planning information including inventory of physical resources, as well as existing and upgrade conditions data tables. Refer to Figures 3 and 4 for the Slope Analysis and Aspect Analysis.

## Illustration 1: The MDP Process





# CHAPTER ONE INTRODUCTION

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## A. PURPOSE OF A MOUNTAIN RESORT MASTER DEVELOPMENT PLAN

Many mountain resorts across the country are partially or completely located on public lands. Each mountain resort on National Forest System (NFS) lands must obtain a United States Forest Service (Forest Service) special use permit (SUP) to operate on public lands. Forest Service SUPs require the preparation of a Master Development Plan (MDP) that identifies the existing and desired conditions for the resort and the proposed improvements on the NFS lands within the permit boundary.

This document tiers to past inventory and planning efforts completed for the 2011 Steamboat Ski & Resort Corporation Master Development Plan Amendment (2011 MDPA) and the 2017 Steamboat Environmental Impact Statement Recreation Technical Report. The goal of this MDP is to compile these planning efforts and update the upgrade plan with Steamboat’s current vision for the resort.

This MDP fulfills this requirement and provides future direction for the development and improvement of Steamboat Resort (hereinafter referred to as “Steamboat”)—ensuring both a balance of facilities and a wide variety of amenities affording an exceptional recreational experience in a manner which is sustainable to the business, operations, and the surrounding environment. This MDP provides a thorough assessment of existing operations and facilities at Steamboat and identifies a comprehensive plan for future improvements to the resort.

This MDP was created using an iterative and collaborative process among Steamboat planners, Forest Service personnel who administer the SUP, and SE Group planners. Forest Service “acceptance” of this MDP is consistent with the requirements of Steamboat’s SUP and updates the 2011 MDPA. Conceptual projects contained in the MDP are reviewed by the Forest Service to determine if they meet Forest Plan goals and objectives.

Forest Service acceptance of this document as a planning tool for Steamboat does not imply authorization to proceed with implementation of any of the projects that are identified herein. Therefore, all projects identified within this MDP that have not been previously approved will require site-specific environmental analysis and approval per the National Environmental Policy Act of 1970 (NEPA) before they can be implemented. This MDP is intended to be a dynamic document, which may be amended periodically to reflect innovations in facilities and recreation.

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### Planning and Design Nomenclature

*Throughout the document are text boxes like this one, explaining the various planning and design concepts that are utilized throughout the MDP process.*

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## B. RESORT BACKGROUND

### 1. Location

Steamboat is located within the Routt National Forest in Routt County, Colorado (refer to Figure 1: Vicinity Map). The resort is located on the western side of Mt. Werner, within the Park Range Mountains of northwestern Colorado. Steamboat is approximately 3 miles from the center of the City of Steamboat Springs, a historic ranching town on the Yampa River. The resort is located approximately 3 hours from Denver, Colorado and the major urban corridor of the Front Range. Air transportation is available to Denver International Airport and to the Yampa Valley Regional Airport, approximately 20 miles northwest. Steamboat is located within the broader Yampa River Valley and is bordered to the east and north by the Routt National Forest, to the west by Highway 40 and Quarry Mountain, and to the south by open plains of the Yampa River Valley.

The resort operates on a Forest Service 40-year SUP, which is administered by the Hahns Peak/Bears Ears Ranger District of the Medicine Bow-Routt National Forests and Thunder Basin National Grassland (MBRTB). The SUP covers 3,738 acres (refer to Figure 2: Property Boundaries).

### 2. History

The City of Steamboat Springs has a long, rich history in the ski industry. Skiing and ski competitions have been occurring in the area for many decades, with the first official ski competition in 1914 during the first Steamboat Springs Winter Carnival. In 1915, the Winter Carnival Committee developed the wood scaffold and jump takeoff at today's Howelsen Hill ski area and formed the basis for Steamboat Springs' reputation as being "Ski Town USA." The ski area was officially founded in 1958 by Jim Temple on Storm Mountain, as Mt. Werner was called prior to the death of local skier Buddy Werner. The Storm Mountain Corporation was formed in 1959 and the mountain was first officially opened for skiing in January of 1963. The mountain first opened with two lifts: one 2,200-foot beginner's lift called Club Claw and one double chairlift named the Christie lift.

In 1969, the ski area was purchased by LTV Aerospace Corporation. Ten years later, a group of investors called The Northwest Colorado Ski Corporation purchased the ski area and in July of 1979, the company was renamed the Steamboat Ski Corporation. In 1989, Japan-based ski area developer Kamori Kanko Co. Ltd. purchased the ski area and renamed the company of the resort to its current operating name of Steamboat Ski and Resort Corporation (SSRC). In 1997, the American Skiing Company purchased the ski resort and expanded and upgraded the mountain until December of 2006, when it sold the ski resort to Intrawest. In July 2017, KSL Capital Partners and Henry Crown and Company jointly purchased Intrawest and combined a number of ski resorts under a parent company, Alterra Mountain Resorts. During each respective ownership period, the ski resort was upgraded and expanded.

Steamboat's first MDP was produced in the 1970s, which proposed the concept of a year-round destination resort. During the period from this first MDP to the second MDP submitted in 1993, the ski area was continuously upgraded with new lifts, more trails, and additional snowmaking. In July 2004, a Master Development Plan Amendment (MDPA) was submitted containing multiple lift, trail, facility, and activity upgrades. In 2011, another MDPA was submitted containing further upgrades and planning for Steamboat. This MDP will serve to assess what projects that were proposed in previous MDPs and MDPAs have been completed and will update Steamboat's vision for the next decade.

## Steamboat Historic Overview

- 1958 Jim Temple begins development of the ski area
- 1959 Storm Mountain Corporation was formed
- 1961 Steamboat first opens for skiing
- 1963 The resort officially begins operations with a beginner Poma lift called Club Claw and a Swiss-designed double chairlift named the Christie lift
- 1965 The resort is expanded by 80 acres in the Routt National Forest under a permit from the Forest Service
- 1968 The construction of three additional lifts (including the Four Points, Burgess Creek, and Priest Creek lifts) is authorized by the Forest Service
- 1969 The ski area is purchased by LTV Aerospace Corporation of Dallas, Texas
- 1970 The ski area is expanded to include a six-passenger gondola, which doubles the resort’s lift capacity. The Village Inn Hotel and a golf course designed by Robert Trent Jones Jr. are also added
- 1972 The Thunderhead lift and a second Christie lift are added, as well as a 140-seat restaurant named “Thunder Bowl” at the top of the Thunderhead lift
- 1974 The Bashor lift is added to the ski resort
- 1976/77 The snow drought of the 1976/77 season negatively impacts the resort, as the resort opens on December 20th and closes on February 13th; the resort is briefly reopened on March 5th
- 1977 The WJW and Bar-UE lifts are installed
- 1979 The ski area is purchased by the Northwest Colorado Ski Corporation; in July of 1979 the company was renamed the Steamboat Ski Corporation; the original Christie lift is also replaced with the Christie III lift and the South Face and Arrowhead lifts are added
- 1980 The lowest snowfall year on record occurs; the Mt. Werner Circle road is realigned to reduce its grade and the Ski Times Square is converted into a pedestrian mall
- 1981 160 acres of snowmaking coverage is installed
- 1983 The Storm Peak and Sundown lifts, both fixed-grip lifts, are installed to reduce lift lines and a 183-car parking garage is built adjacent to the Sheraton hotel
- 1984 Sunshine Bowl is first opened, adding 400 acres of additional skiing; the Rendezvous Saddle restaurant is opened and the South Peak lift and a new quad chairlift, which replaced the Elkhead double chairlift, are installed
- 1985 Two new trails as well as the Sunshine triple chairlift are developed
- 1986 The Stagecoach gondola is replaced with the Silver Bullet, an 8-passenger gondola with a capacity of 2,800 skiers per hour; the Thunderhead restaurant is also expanded to include more seating and Hazie’s is added, which provides a fine dining experience; the new gondola begins running at night to provide transportation for guests to eat dinner at Hazie’s and the Thunderhead restaurant; the resort also begins using snowcats to pull sleighs from Thunderhead to the Rendezvous Saddle restaurant
- 1987 Snowmaking is expanded by 65 acres





- 1989 Japanese ski area developer Kamori Kanko Co. Ltd purchases the ski area alongside Heavenly Valley in California; the operating company of the ski resort is renamed the Steamboat Ski and Resort Corporation
- 1991 The MDPA is revised to include high-speed detachable lift technology
- 1992 The WJW and the original Four Points lifts are removed, and the Storm Peak lift is shortened and renamed the Four Points lift; the Storm Peak Express, a high-speed detachable lift, is installed; the Four Points Hut facility is also built, and the Sundown lift is replaced with the Sundown Express; planning begins on expansions into what will become Morningside Bowl and Pioneer Ridge, as well as the Chutes, Christmas Tree Bowl, and East Face
- 1996 The Morningside lift installation and associated trail development occurs; approval is also granted for the Morningside Bowl and Pioneer Ridge areas
- 1997 The American Skiing Company purchases both Steamboat and Heavenly Valley; the Thunderhead and Arrowhead lifts are removed and replaced with the Thunderhead Express detachable quad
- 1998 The Pony Express lift installation and Pioneer Ridge trail development occurs; snowmaking is expanded to the summit of Storm and Sunshine Peaks with an additional pump house installed near the bottom of the Bar-UE lift
- 2004 The Burgess Creek lift is replaced with a fixed-grip triple
- 2006 The ski area is purchased by Intrawest; the Sunshine lift is replaced with a high-speed detachable quad lift that is moved from Canyons Resort, Utah; additional trails and snowmaking are installed
- 2007 The base area is heavily redesigned, with additional lifts added, redundant lifts removed, and beginner terrain expanded and improved
- 2010 Work begins on the Promenade project in conjunction with the Urban Renewal Authority, which includes heated walkways and improvement of the base area interface with the Burgess Creek, and other improvements
- 2013 The Four Points Restaurant is built on the site of Four Points hut
- 2017 July, Alterra Mountain Company is formed and purchases Steamboat from Intrawest
- 2018 An Environmental Impact Statement (EIS) approves the expansion of Steamboat's operational boundary, improved beginner terrain/facilities/lifts, and the improvement and expansion of existing ski terrain and guest services facilities

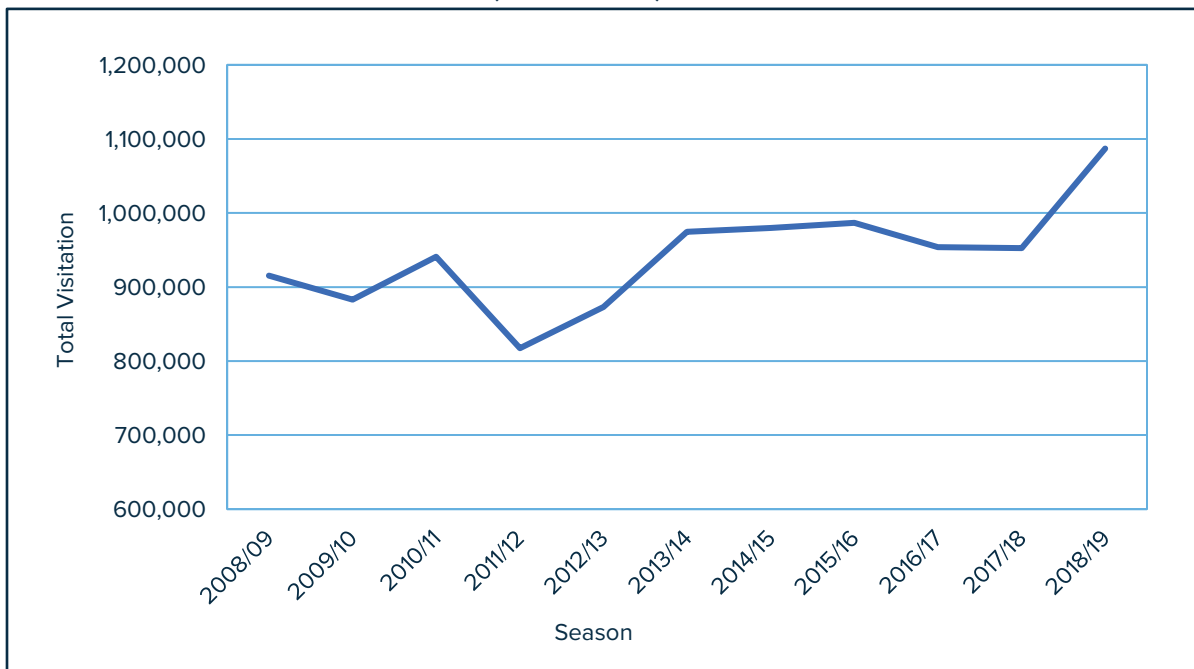
### 3. Resort Summary

Steamboat is an extremely popular destination resort within the broader regional market of the Front Range Urban Corridor—which extends along the eastern front of the Rocky Mountains, from Cheyenne, Wyoming to south of Colorado Springs, Colorado, and contains approximately 5 million people—as well as the communities of Glenwood Springs and Grand Junction, Colorado. In addition, because of the offerings of the resort, with over 2,965 skiable acres as well as the diversity of recreational experiences, Steamboat is a destination for people all over the country and the world. Steamboat is known for its world-class skiing, resort amenities, and classic ski-town feel and this in turn attracts guests from both the regional area and the broader world-wide community.

Steamboat has an extensive array of activities to provide guests in both the summer and winter. The ski area offers an extensive network of trails and lifts, ranging from beginner terrain accessed by surface lifts to high alpine, expert skiing. Steamboat also offers night skiing (5:30 p.m. to 8:30 p.m., most of the season), an expansive snowmaking system, one terrain park, two halfpipes (one half size and one full size), and race training courses. Beyond skiing, Steamboat also offers rides on the Outlaw Mountain Coaster and a variety of other outdoor adventure activities, Movies on the Mountain, Kids Adventure Club (a child-focused summer camp), scenic chairlift rides, and more. Steamboat is also integrated with many other businesses and the City of Steamboat Springs to enhance the offerings provided by Steamboat and the surrounding area.

Steamboat’s current success can be attributed to its long-standing reputation in the ski industry and variety of recreation opportunities. However, in order to provide a guest experience consistent with expectations, upgrades are needed for Steamboat to stay competitive in the international and national destination markets. Over the last decade, guest visitation has varied from year to year as shown in Chart 1. This is partly due to varying snow conditions or the perception of snow conditions; however, Steamboat has consistently drawn the level of crowds that warrant the need for upgrades to improve the guest experience.

**Chart 1. Annual Skier/Rider Visits (2008–2019)**



Steamboat attracts guests in all seasons of the year; however, visitation is generally broken out into the two main seasons, which are winter and summer. Winter visitation is much higher than summer—averaging almost 950,000 annual winter visits compared to just over 50,000 annual summer visits over the last five years.<sup>1</sup> Over the past ten years, visitation during the winter months has fluctuated considerably. The last ten years include growth as high as more than 10 percent from one season to the next; and declines in visitation as high as over 10 percent from one year to the next.<sup>2</sup>

Demand for additional winter recreation opportunities has been a constant for many ski resorts in the western United States for some time; however, recent years have shown an increasing demand for multi-season and summer recreation opportunities at ski areas and other NFS lands nationwide. This trend is evident at Steamboat, which has exhibited growth in summer visitation, ranging from 3 percent to 18 percent yearly increases, in the last five years. While summer visitation to Steamboat has the potential to grow rapidly, it is expected to remain below the visitation generated by winter operations.

Visitation to the City of Steamboat Springs is largely related to visitation to the ski area and reflects similar trends. During the summer months when visitation is more likely to occur for opportunities beyond the ski area, annual visitation to the City of Steamboat Springs is expected to be considerably higher than annual visitation to the ski area. While the exact number of visitors during the summer months is highly speculative, it is expected to be closer to 100,000 annual visitors than the approximately 50,000 visitors of the ski area. Summer lodging trends showed an almost 6 percent growth in visitation to the area from 2014 to 2015.<sup>3</sup> As winter recreation opportunities at Steamboat are the primary driver of visitation to the City of Steamboat Springs during the winter months, visitation trends to the City of Steamboat Springs are more reflective of visitation trends to the ski area. As previously mentioned, visitation during the winter months has remained much higher than summer visitation but has varied considerably over the last decade; the same is expected to be true for the City of Steamboat Springs with annual visitation around 100,000 visitors during the winter months. During both the summer and winter months lodging in the City of Steamboat Springs is used by visitors of the ski area.

Winter visitation to Steamboat is primarily generated by skiing; however, there are other activities that draw visitors to the area. The surrounding Yampa Valley is home to many guide and outfitter services (some of which operate on NFS lands), that offer a multitude of activities other than skiing for both guests and residents to participate in. Activities range from guided snowmobile tours and horseback rides to unguided adventures in the vast amounts of public lands for those with the skills and experience to explore on their own.

While the majority of alternative winter activities happen outside Steamboat's SUP area, Steamboat also offers a limited number of non-skiing activities within its SUP area during the winter season. These non-skiing activities are primarily concentrated around the Thunderhead Lodge as the gondola, which provides direct access to the Thunderhead Lodge for skiers and pedestrians alike, terminates here. The restaurant facilities in the Thunderhead Lodge are available every day during the ski season for both sightseeing and on-mountain dining. During the ski season, evening dining is offered to the public two

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<sup>1</sup> SSRC. 2017. Confidential Visitation Information.

<sup>2</sup> Ibid.

<sup>3</sup> Steamboat Springs Chamber Resort Association. 2015. 2015 Annual Report. Available online at <http://sskra.cms.digital-ridge.com/media/655372/annual-report.pdf>. Accessed April 2017.



times per week and it is often sold out. Steamboat also offers a combination sleigh ride and dinner at Ragnar’s restaurant at the Rendezvous Saddle mountain lodge. Another popular winter activity is snowshoeing, which Steamboat offers through guided snowshoeing tours on Mt. Werner, around the general vicinity of the Thunderhead Lodge. For those wishing to engage in a more educational experience, Steamboat offers the “Ski with a Naturalist” program on the mountain twice a week. This is a free program in partnership with Yampatika (a local non-profit organization dedicated to inspiring environmental stewardship) where participants ski slowly down the *Why Not* trail, stopping frequently to learn about animals and their behavior, forest ecology, and other elements of the surrounding biota.

Summer visitation is primarily generated by the activities and events that exist beyond the ski resort in the surrounding Yampa Valley. The number of activities in the area, combined with the scenery, atmosphere and altitude (with cooler temperatures) draw many visitors during the summer months, some of which spend a portion of their trip at Steamboat. Steamboat provides a variety of multi-season recreation activities that include sightseeing, guided and unguided hiking opportunities, guided and unguided mountain biking opportunities, as well as on-mountain dining and special events on NFS lands. These activities are typically accessed via the gondola, which operates daily from mid-June to late August and on the weekends through mid-October (weather permitting).

As previously mentioned, the surrounding area offers a multitude of structured and dispersed recreation opportunities during the summer months. Recreation opportunities outside of the ski resort range from fly fishing to hot air balloon rides, and more dispersed activities like hiking, biking, and camping that one can engage in on the vast amount of NFS lands and designated wilderness in the surrounding area. The recreational activities offered on NFS lands at Steamboat may attract locals and those already visiting the area, but generally do not generate visits in-and-of themselves. In other words, few summer visitors are coming to Steamboat solely for the recreational activities offered within the SUP area.

## C. PLAN VISION AND GOALS

Steamboat’s parent company, Alterra Mountain Company (Alterra), owns and operates fourteen ski resorts across the United States and Canada. The company is *rooted in the spirit of the mountains and united by a passion for outdoor adventure*. Alterra focuses on providing a high-quality guest experience across all resorts and instills the values of integrity, performance, environment, fun and collaboration across the company.

These values and philosophies have guided this MDP vision and goals. The vision and goal of the plan is to capitalize on Steamboat’s existing assets of being “Home of Champagne Powder” and where outdoor adventure and the wild west collide, while identify and planning for strategic upgrades across the resort to upgrading existing infrastructure in order to continue to deliver an exceptional guest experience at Steamboat.

## D. MASTER DEVELOPMENT PLAN SUMMARY

Below is a summary list of previously approved and development projects detailed in Chapters 4 and 5 and illustrated in Figures 10 through 14. The previously approved projects have been approved through the NEPA process, while the upgrade plan projects would need environmental review before being constructed. Together these projects make up the overall long-term vision at Steamboat.

### 1. Previously Approved Projects

#### a) Lifts

- ◆ Construction of Pioneer Ridge lift
- ◆ Construction of Bashor Gondola
- ◆ Relocation and construction of several magic carpets, and replacement of the Rough Rider surface lift with a fixed-grip triple chairlift in Bashor Bowl
- ◆ Replacement and re-alignment of existing Bashor lift
- ◆ Upgrade the Pony Express lift

#### b) Terrain

- ◆ Bashor Bowl trail development and regrading
- ◆ Development of the new Pioneer Ridge Pod (including glading and hazard tree removal, ski trail construction, construction of two catwalks, and construction of Burgess Creek Bridge)
- ◆ Substantial trail improvements in the Pony Express area

#### c) Snowmaking

- ◆ Installation of 53 acres of snowmaking in the Rough Rider, Bashor Bowl and Pony Express Pods

#### d) Guest Service

- ◆ Bashor Snowsports School Facility and Restaurant
- ◆ Expansion of the existing Four Points Restaurant

#### e) Operations

- ◆ Expansion of Steamboat's operational boundary to include Pioneer Ridge area
- ◆ Relocation of Mavericks Superpipe and expansion of Rabbit Ears Terrain Park
- ◆ Construction of a patrol hut and restroom at top of Pony Express
- ◆ Upgrade PHQ water tank

## 2. Upgrade Plan

### a) Lifts

- ◆ Installation of upper Wild Blue Gondola extending from the top terminal of the approved and unimplemented Bashor Gondola, creating a mid-station at this location, and terminating near the top terminal of the Sundown Express
- ◆ Installation of Sunshine II lift
- ◆ Upgrade the Sunshine Express
- ◆ Upgrade the Storm Peak Express
- ◆ Upgrade Sundown Express
- ◆ Upgrade Thunderhead Express
- ◆ Upgrade Elkhead Express
- ◆ Upgrade South Peak lift
- ◆ Upgrade Wildhorse gondola
- ◆ Removal of the Priest Creek lift
- ◆ Removal of the Preview lift

### b) Terrain

- ◆ Expansion into Sunshine Bowl with intermediate and low intermediate terrain
- ◆ Regrade *Boulevard*
- ◆ Develop egress from Fish Creek terrain to the Burgess Creek Bridge
- ◆ Realign and regrade *Broadway*, *Sundial* and *Spur Run* trails<sup>4</sup>
- ◆ Regrade Intersection of *Why Not* and *BC Skiway*

### c) Snowmaking

- ◆ Expansion of snowmaking coverage and infrastructure on approximately 140 acres, including in the Pony Express and Sunshine Pods and on *BC Ski Way*, upper *Hurricane*, and *Lower Rainbow* trails

### d) Guest Service

- ◆ Restaurant at the top of Sunshine lift
- ◆ Ski Patrol hut at top of Sunshine II
- ◆ Upgrade planned for Thunderhead Lodge

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<sup>4</sup> The Broadway and Spur Run projects were included in the previous MDPA of 2011.

e) **Operations**

- ◆ Additional lighting for tubing operations and night skiing in Bashor Bowl
- ◆ Expand operational boundary into Fish Creek

f) **Multi-Season and Alternative Activities**

- ◆ Expand summer activities in the base area, Bashor Bowl and Sunshine Peak
- ◆ Install aerial adventure park at Thunderhead
- ◆ Expand mountain biking trail network

# CHAPTER TWO

# DESIGN CRITERIA

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This section lays the foundation of the terms and philosophies behind this MDP document. It is broken into three main sections: mountain design; industry trends; and applicable Forest Service Policy Direction.

## A. 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, shown in Table 1, are used by SE Group to classify the skier difficulty level of the mountain terrain.

Table 1. Terrain Gradients

SKIER ABILITY	SLOPE GRADIENT
Beginner	8 to 12%
Novice	to 25%
Low Intermediate	to 35%
Intermediate	to 45%
Advanced Intermediate	to 55%
Expert	to 70%
Extreme	over 70%

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 U.S. skier market is shown in Table 2, illustrating that intermediate skiers comprise the bulk of market demand.

**Table 2. Central Rocky Mountain Skier Ability Breakdown**

SKIER ABILITY	IDEAL DISTRIBUTION
Beginner	5%
Novice	15%
Low Intermediate	25%
Intermediate	30%
Advanced Intermediate	15%
Expert	5%
Extreme	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 that SE Group utilizes are listed below in Table 3.

**Table 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 Intermediate	4 to 15 skiers/acre
Expert	2 to 10 skiers/acre
Alpine Bowls/Extreme	0.5 skier/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. SE Group’s observations and calculations indicate that on an average day approximately 40 percent of the total number of skiers at the 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 ski day.

SE Group has observed that recent trends in trail density design criteria tend to provide for a less crowded skiing experience. As witnessed at many resorts, there is a segment of the market that prefers more natural, unstructured, semi-backcountry and extreme types of terrain commonly referred to as off-piste.<sup>5</sup> Demand is increasing for alpine open bowls, glades, and other similar types of terrain. Skier density per acre numbers are not necessarily applicable to these types of terrain, particularly as there often is not a defined edge to these areas like on a traditional ski run. However, skiers are attracted to these areas for the un-crowded feel, and the experience and challenge that it affords. Planning and design should provide these types of areas if possible. Examples range from glading between existing runs, to providing guided out-of-bounds tours.

### 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 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—bowl, trees, and terrain parks and pipes.

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.

### d) Terrain Parks

Terrain parks have become a vital part of most mountain resorts' operations and are now considered an essential mountain amenity. The presence of terrain parks at mountain resorts has changed various operational and design elements. The demand for grooming can increase, as terrain parks often require specialized or dedicated operators, grooming machines, and equipment (such as half-pipe cutting tools). Terrain parks typically require significant quantities of snow, either natural or man-made, often increasing snowmaking demand. For these reasons, "super" half-pipes (i.e., walls exceeding 18 feet), and to a lesser degree half-pipes in general, are becoming less common at mountain resorts. Terrain parks can affect circulation on the mountain, as the parks are often points of destination.

Current trends in park design are focused on quality and creating progression, so that less experienced riders have the means and ability to learn how to use the more difficult features. Beginner parks are typically located on wide trails and have features that are lower in height, softer, and rounder. The next step usually has small tabletops and more difficult rails. From there, parks will progress up to showcasing huge jumps and technical rails. Steamboat has incorporated mini "pocket parks" around the mountain which is a good differentiator from other western resorts.

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<sup>5</sup> "Piste" is a term commonly borrowed from French vernacular which refers to a groomed, maintained, defined ski trail. Therefore, "off-piste" refers to the ungroomed, less defined natural style of skiing commonly found in high Alpine areas and bowls.

## 2. Lift Design

The goal for lift design is to serve the available ski terrain in an efficient manner, while being sensitive to environmental considerations. A myriad of factors is considered including wind conditions, visual impacts, wetlands, round-trip skiing, access needs, interconnect ability between other lifts and trails, and the need for circulation space at the lower and upper terminal sites. The vertical rise, speed and length of ski lifts for a particular mountain are important measures of overall attractiveness and marketability of a ski area.

## 3. On-Mountain Guest Services

On-mountain guest service facilities are generally used to provide food service (cafeteria-style or table service), restrooms, and limited retail, as well as ski patrol and first aid 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.

## 4. Capacity Analysis and Design

In ski area planning, a “design capacity” is established, which represents a daily 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 25 percent higher than the design capacity.

This MDP uses the term comfortable carrying capacity (CCC) when referring to Steamboat’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.

## 5. 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).

## 6. Multi-Season Recreation Activities

Throughout the ski industry, resorts are reimagining the capabilities and duration of their operation. To combat the inconstant four- to six-month winter operating window, traditionally winter-oriented resorts are pursuing a more sustainable fiscal and economic outlook via the development of multi-season recreation activities. As discussed in this document, multi-season recreational activities tend to attract a more diverse range of new guests than the traditional winter activities. This master planning process assesses the best programs and implementation approaches for developing multi-season activities and facilities to showcase the prospective success given the unique characteristics that define Steamboat and its markets.

To identify reasonable and realistic opportunities, a strategic examination is undertaken involving a case-by-case evaluation of several important criteria to determine the multi-season recreation elements that have the greatest likelihood for success. Criteria defining this strategic analysis consists of the suitability of available land for recreation facilities, consistency with regional, state and national administration's policies and plans, initial fiscal considerations, and visitation potential are 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.

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 through integration 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 Steamboat and the local economy, most evident in the summer months. Snow sports are, and will continue to be, the primary use of NFS lands within the Steamboat SUP area and are the primary economic driver for the greater region.

## B. CURRENT INDUSTRY TRENDS

The challenges that ski resorts face vary and evolve continuously. In times of economic downturns (e.g., 2007–2010), the focus was on affordability. In previous decades, ski industry development was characterized by efforts to attract more first timers, while still retaining the core skiing market, as well as to generally broaden the appeal of skiing to more diverse demographics beyond the typical baby boomer. This included making snowsports more appealing to beginners and better at retaining existing skiers (i.e., better learning centers, rental equipment, and day and season pass deals), as well as offering a more diverse and high-quality skiing experience (i.e., improved skier facilities, food choices, grooming, and customer service). While all of these trends and initiatives are still very much in place (see the NSAA Model for Growth), a focus has shifted towards adapting to a more variable climate, as well as consolidation within the industry.

Previously, ski industry trends were also characterized by the significant expansion of terrain and infrastructure. Terrain expansions have included developing more traditional trails, increasing gladed terrain, and even adding backcountry access. Infrastructure expansions have included modernized lift systems, additional guest service structures, outdoor seating and plazas, and improved shuttle services. However, the expansion of ski area trail systems and infrastructure is ultimately limited by overall ski area capacity—there has proven to be no benefit to expanding terrain beyond the capacity of the resort. If an expansion is to be successful, all components of the resort need to be expanded equally, to increase the overall capacity and allow for reasonable expectation of increased skier visits. As some ski areas are nearing the limits of their potential skier capacity, they are finding fewer opportunities for

physical expansion. In addition, one of the most pressing challenges that ski resorts are facing currently is retaining operational and financial viability in the face of variable climatic conditions. As a result, ski areas are now turning to different mechanisms to improve the guest experience and the performance of the resort. Ski resorts are now focusing on a) efficiency within their operations; b) enhancement of the existing ski experience to attract new demographics and; and c) expansion of non-skiing opportunities to enhance their appeal and bottom line.

## 1. Operational Efficiency

Resorts have always considered cost-effectiveness in their development in order to attract guests while keeping costs down. But given the current difficulty of ski area expansions and unpredictable snow conditions, efficiency is taking on a new importance in order to retain or increase profitability. This efficiency is being developed in three fundamental areas of business: operations, sustainability, and design.

Efficiency in operations includes balancing the amount of terrain groomed on a regular basis with the amount that is required to meet demands of a resort's clientele; producing man-made snow only on necessary acres to meet target slope densities and snow depth; using only those lifts required by demand or eliminating redundant lifts; and balancing food service seating and space with capacity. All of these techniques can lead to reduced cost and, therefore, increased revenue, particularly with the increased importance of snowmaking for trail coverage.

Environmental sustainability focuses on reductions in energy use through use of more efficient products. This includes variable speed AC drives, low-energy snow guns, and more efficient groomers. For example, recent improvements in snowmaking guns allow resorts to produce the same amount of snow with less energy and automated snowmaking guns can turn on and off based on weather conditions, optimizing resort energy and water use. This also includes guest service equipment retrofitting, like upgrading lighting systems, and the optimization of slope maintenance mentioned earlier.

The design and layout of the resort can also be optimized for efficiency. Resorts can properly design their lift and terrain network to have the fewest number of lifts possible to effectively serve the terrain. The terrain network can be designed to meet the needs of the type and size of the resort's skier market without being excessively large or requiring excessive grooming. Lift systems can also be optimized by eliminating redundancy in lift access and focusing on more reliable, high-capacity lifts.

## 2. Enhancement of Existing Ski Experience

As resorts address efficiency in their operations, they are also addressing the increasingly variable snow conditions that the past decade has offered. With more frequently unpredictable winter conditions, resorts are turning to snowmaking to have a predictable opening date and high-quality snow conditions during the early and late season as well as low snow years. This increased snowmaking capacity offers resorts the opportunity to address operational and financial concerns associated with low snow years. In addition, the development of new snowmaking technology allows snow production to be more energy efficient by producing more snow with less energy than in the past. This gives resorts the ability to address operational efficiency while producing snow to improve the guest experience.

Ski resorts are also working to expand their market base beyond the traditional skier. This includes integrating new technology and programs to attract new skier participants as well as expanding beyond winter skiing opportunities to attract non-skiers to the resort. In this regard, Steamboat offers Ski with a Naturalist, guided bike tours, interpretive programs, fall hiking excursions, Crane Festival, Yoga on the Mountain, and other events and programs. As the baby boomer generation ages and their participation in skiing declines, ski resorts are working to attract the younger generations to their slopes through integrating more technology with skiing. This includes offering on-mountain shared workspaces, mountain tours that promote the use of action cameras to capture guest adventures, and apps that let guests track their runs and stay connected with each other across the mountain.<sup>6</sup> Ski resorts are also focusing on skiers who traditionally may not be *able* to ski. Steamboat’s STARS (Steamboat Training Recreational Sports) program, and other programs like Vermont Adaptive Ski and Sports, the National Ability Center, and the Breckenridge Outdoor Education Center, offer skiers with physical or mental disabilities the chance to participate in snowsports.

### 3. Expansion of Non-Skiing Opportunities

Ski resorts are also expanding beyond typical winter operations into multi-season operations to both attract a more diverse group of guests and provide additional income in the face of variable winter conditions. This maximizes the use of existing ski infrastructure, like ski lifts and buildings, and can help supplement expenses from bad winters.

Additional, non-skiing winter opportunities include tubing, sleigh rides, scenic lift rides and dining (gondolas or trams to mountain-top restaurants for sightseeing or lunch/dinner), mountain coasters, snow biking, fat-tire mountain biking, and other various activities. These additional activities can be appealing to families or groups where not all members ski.

Summer and fall recreation opportunities are also numerous and have become more popular in recent years. This growth has been driven by new technologies in summer recreation equipment and an increase in people who seek recreational opportunities in the managed setting of the ski resorts. The 2011 Ski Area Recreational Opportunity Enhancement Act (SAROE) provided the opportunity for the Forest Service to authorize additional seasonal and year-round recreation activities at ski areas on NFS lands. With that permission, many ski areas have created multi-season recreation opportunities for guests to enjoy.

Activities can range from more challenging, on-mountain activities to family-friendly adventure zones in the base area. On-mountain activities can include Via Ferratas (a protected climbing route containing iron rungs, pegs or even ladders), mountain coasters, zip lines, hiking trails, and mountain biking trails. These activities can offer guests a high alpine, adventurous experience in seasons other than winter. Mountain biking, in particular, can offer the thrills and ability-level progression that skiing does. Base area activities can include adventures zones (with bungee trampolines, climbing walls, an aerial adventure or obstacle course, or interpretive/educational centers), summer tubing, disc golf, and special event/gather sites. These offer guests the opportunity to explore the ski resort and surrounding natural setting in a more controlled and easily accessible area.

The development of these multi-season recreation opportunities allows ski resorts to become a “four-season” resort and may appeal to non-skiers who would not normally visit the resort. This can diversify a ski resort’s income streams beyond just skiing, which is largely dependent on increasingly unpredictable natural seasonal snow conditions.

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<sup>6</sup> <https://skift.com/2017/11/05/ski-resorts-embrace-experiences-as-millennial-interest-wanes/>



## C. APPLICABLE FOREST SERVICE POLICY DIRECTION

The Forest Service nationally supports the recreational opportunities that private ski areas provide. The Forest Service and National Ski Areas Association work in partnership to achieve common goals of managing and promoting active participation in alpine recreation and sports by all people.

Steamboat operates under a SUP authorized under the National Forest Ski Area Permit Act of 1986, 16 U.S.C. § 497b. The Act authorizes the Forest Service to issue ski area permits:

*“...for the use and occupancy of suitable lands within the National Forest System for Nordic and alpine skiing operations and purposes.” The Act states that a permit “shall encompass such acreage as the Secretary [of Agriculture] determines sufficient and appropriate to accommodate the permittee’s needs for ski operations and appropriate ancillary facilities.”*

The basis for determining the types of activities and facilities appropriate for permitted winter sports resorts operating on NFS lands are expressed in federal laws and Forest Service policy directives, such as the 2003 Forest Plan. This guiding document provides the Forest Service with authority and direction pertaining to ski area management on NFS lands.

Steamboat and the Forest Service are connected through a committed long-term partnership to provide quality recreational opportunities on NFS lands. By satisfying its current and future visitors, Steamboat will grow as a healthy and competitive ski resort within its market niche. This, in turn, would help fulfill Forest Service policy, objectives, and direction for ski area management on the MBRTB and the vitality of the local economy.

### 1. Laws and Policy Directives

The following consists of the formative legal and policy mandates guiding the Forest Service administration of NFS lands and “winter sports” resorts:

- The Multiple-Use Sustained-Yield Act of 1960 mandates that the Forest Service manage National Forest System lands for “outdoor recreation, range, timber, watershed, and wildlife and fish purposes.” 16 U.S.C. § 528 (emphasis added).
- The National Forest Management Act (NFMA) requires the Forest Service to develop Forest Plans that provide for multiple uses of forests, including “coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness.” 16 U.S.C. § 1604(e)(1) (emphasis added).
- The National Forest Ski Area Permit Act of 1986 specifically endorses developed winter recreation on National Forest System lands and authorizes the Forest Service to issue special use permits that encompasses “such acreage” as the Forest Service “determines sufficient and appropriate to accommodate the permittee’s needs for ski operations and appropriate ancillary facilities.” 16 U.S.C. § 497b(b)(3).
- The service-wide Memorandum of Understanding between the National Ski Areas Association and the Forest Service (FS Agreement No. 07-SU-11132424-246), recognizes “that ski areas can help meet increased demand for recreational opportunities in a managed setting.” The Forest Service stated its commitment to “evaluate four-season recreation at ski areas to improve economic stability and enhance outdoor recreation opportunities during policy formation, master development planning, and project plans.”

- The 2011 Ski Area Recreational Opportunity Enhancement Act (SAROE) amended the National Forest Ski Area Permit Act of 1986. The 2011 SAROE enables snow sports (other than Nordic and Alpine skiing) to be permitted on NFS lands subject to ski area permits issued by the Secretary of Agriculture. In addition, it clarifies the authority of the Secretary of Agriculture to permit appropriate additional seasonal or year-round recreational activities and facilities on NFS lands subject to ski area permits issued by the Secretary of Agriculture. More information on SAROE is provided in Section 2.

## 2. 2011 Ski Area Recreational Opportunity Enhancement Act

The 2011 SAROE amended the National Forest Ski Area Permit Act of 1986. The 2011 SAROE enables snow sports (other than Nordic and alpine skiing) to be permitted on NFS lands subject to ski area permits issued by the Secretary of Agriculture. In addition, it clarifies the authority of the Secretary of Agriculture to permit appropriate additional seasonal or year-round recreational activities and facilities on NFS lands subject to ski area permits issued by the Secretary of Agriculture. Activities and facilities that may, in appropriate circumstances, be authorized under the Act include, but are not limited to, both zip lines and ropes courses, mountain biking trails, and disc golf.

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### Ski Area Recreational Opportunity Enhancement Act

*National Forests are, and have always been, the greatest opportunity for Americans to use and enjoy their public lands. Because ski areas serve as portals to the National Forests for millions of people every year, they have a unique opportunity to involve the recreating public in natural resource-based recreation in new and exciting ways that promote an appreciation of the environment and the natural world through both adventure and discovery.*

*The 2011 Ski Area Recreational Opportunity Enhancement Act embraces this notion and provides authority for mountain resorts operating on NFS lands to offer an expanded range of outdoor recreation activities in order to further recreational opportunities for the public, allow year-round utilization of existing resort facilities, and stimulate job creation and economic growth within local communities.*

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In April 2014 the Forest Service provided a Final Directive for Additional Seasonal or Year-Round Recreation Activities at Ski Areas that includes guidance for implementing the 2011 SAROE. Forest Service Manual (FSM) 2343.14 states that the Forest Service will apply the following screening criteria during review of site-specific proposals prior to the initiation of a NEPA review process. During this master planning stage, projects are conceptual and do not, nor should they, include the level of design to complete all of the screening criteria. This site-specific detail would be provided during the project proposal stage to initiate the NEPA process. The screening criteria included in FSM 2343.14 guide the development of projects on NFS lands and the activities and associated facilities must:

1. Not change the primary purpose of the ski area to other than snow sports;
2. Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities;
3. To the extent practicable, be located within the portions of the ski area that are developed or that will be developed pursuant to the MDP;
4. Not exceed the level of development for snow sports and be consistent with the zoning established in the applicable MDP;
5. To the extent practicable, harmonize with the natural environment of the site where they would be located by:
  - Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape, and
  - Not requiring significant modifications to topography to facilitate construction or operations.
6. Not compromise snow sports operations or functions; and
7. Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.

Again, the above screening criteria should be applied for the proposed activities in this MDP during the NEPA process. At this point, more detailed design plans would be available compared to the concepts generated during the master planning process.

FSM 2343.14(8) also provides guidance for elements to be included in the master planning process. The process should:

1. Establish zones to guide placement and design of additional seasonal or year-round recreation facilities, basing the zones on the existing natural setting and level of development to support snow sports;
2. Depict the general location of the facilities; and
3. Establish an estimated timeframe for their construction.

### 3. Medicine Bow-Routt National Forests and Thunder Basin National Grassland

The Land and Resource Management Plan for the Routt National Forest (1998 Forest Plan) provides current direction, management goals, objectives, and standards and guidelines for activities across the Routt National Forest that are general requirements for the administration of NFS lands. Steamboat's MDP is consistent with these management goals, objectives, and standards and guidelines.

Four priorities aided in the revision process of the 1998 Forest Plan: ensuring the long-term health of the land; implementing a balanced program featuring a sustainable output of multiple uses; continuing the emphasis on high-quality dispersed recreation opportunities; and being a good neighbor to the people and communities who rely on and value the forest.

Below are the applicable desired conditions described in the 1998 Forest Plan for 8.22 Ski Based Resorts – Existing/Potential where Steamboat is located:

*Ski runs will be designed to blend and harmonize with the natural terrain. Recreation facilities, such as buildings, lifts, and groomed trails, will be evident. At the base development, services and facilities will be designed to complement the overall forest setting and will serve the needs of forest visitors. Opportunities to experience solitude will be very limited during the winter sports season.*

*Changes to vegetation composition and structure will result in forested areas interspersed with openings of varying widths and shapes. Forested areas will be managed for esthetics and recreation and for their resistance to windthrow, fire, and insect and disease infestation. Artificial openings and other disturbed areas will be revegetated and maintained with drainage structures to protect soil productivity and minimize erosion.*

*Opportunities to view wildlife and their habitat will be available throughout the year, but may be limited by the amount of recreational use. Habitat for sensitive species may be enhanced where opportunities exist, but the focus will be on protection and maintenance.*

*Livestock may be present during the summer. Forest Service and permittee objectives will be met within the development boundary. Rangeland vegetation will occur in a mix of seral stages but will predominantly be in upper mid seral to late seral stages of development.*

*The road system will be developed and maintained by the permittee. These roads will be subject to seasonal closure. Only permitted motor-vehicle use will be allowed. The trail system may include trails designed for hiking, horseback riding, mountain biking, and ski touring. Trails will be designed and maintained for heavy seasonal use. All trails will be closed to summer and winter motorized use, except by permit. Forest trailheads will be maintained, both on private and public land, to provide and encourage easy access to forest lands. Trail signs will be consistent with the ski area sign plan.*

## 4. Built Environment Image Guide

The Built Environment Image Guide has been 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.<sup>7</sup> It focuses on the image, appearance, and structural character of facilities. Three core contexts are stressed throughout the Built Environment Image Guide: (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.

## 5. Accessibility to Public Lands

In June 2005 the Forest Service released the *Accessibility Guidebook for Ski Areas Operating on Public Lands, 2005 Update*. This guidebook provides information for ski areas authorized under a SUP to work with the Forest Service in providing equal opportunities for all people, including those with disabilities. Steamboat will maintain consistency with this guidebook for future development projects occurring on public lands.

Ski areas operating under special-use authorization from the Forest Service are required to comply with both the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973 (Section 504). The ADA applies because Steamboat would operate as a “public accommodation;” moreover, Steamboat is a business open to the public. Section 504 applies because Steamboat would operate under a SUP authorized by the Forest Service. Through the SUP, the ski area agrees to abide by these and all other laws, regulations, and policies of the federal government.

Significant legislation that preceded the ADA includes the Architectural Barriers Act (ABA) of 1968 and the Rehabilitation Act of 1973, as amended. ABA was the first measure passed by Congress to ensure access to facilities. The ABA requires that all facilities built, bought, or leased by or for a Federal agency be accessible. Section 504 of the Rehabilitation Act states: “No otherwise qualified individual with a disability in the United States shall, solely by reason of his disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program or activity conducted by any Executive Agency.”

Through future site-specific NEPA and design development reviews, Steamboat work closely with the Forest Service to ensure accessibility measures are taken to provide equal opportunity to all users of public lands.

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<sup>7</sup> USDA Forest Service. 2001. The Built Environment Image Guide for the National Forests and Grasslands.

# CHAPTER THREE

## ANALYSIS OF EXISTING CONDITIONS

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### A. SUMMARY OF THE EXISTING GUEST EXPERIENCE

Steamboat has long been known as an international destination resort. The resort’s reputation has always been intertwined with the region’s history resulting in a uniquely western skiing experience and gaining international recognition as “Ski Town U.S.A.®.” Other key elements of Steamboat’s brand are Real Town/Real People, Western Hospitality, Family Friendly, and Champagne Powder®.

Steamboat’s lift and terrain networks serves a broad range of guest demographics and ability levels through its winter operations, with the majority of its terrain being designed for low to advanced intermediate ability levels but also providing lesser amounts of beginner and expert terrain. In addition to skiing terrain within Steamboat’s operational boundary, the backcountry access points at Steamboat are popular among expert-level skiers. Existing backcountry use in the Fish Creek area of Pioneer Ridge (outside of Steamboat’s operational boundary) has become very popular and has resulted in increasing responses by ski patrol due to use by skiers unfamiliar with the terrain or lacking adequate abilities to ski beyond the operational boundary. While Steamboat currently serves a broad range of guest demographics and ability levels there are existing challenges associated with, and demands that are not met by, existing operations.

The examination of existing facilities presented in this chapter correlates with Figures 5–9, which illustrate existing conditions during the winter and summer, and include snowmaking, mountain roads, and summer use. Additional information that contributed to the examination of existing conditions, including inventory of physical resources and supporting existing condition tables, can be found in Appendices A and B.

### B. EXISTING LIFT NETWORK

There are a total of twenty-three existing lifts and carpets at Steamboat—one gondola, sixteen lifts, and six carpets (see Table 4 for detailed specifications of the lift network). In general, the lift network services the available terrain efficiently and effectively; however, some upgrades are needed to modernize the system and improve circulation and skier/rider distribution. The majority of the existing lifts were built more than twenty years ago. This may indicate that certain lifts are reaching the end of their operational life and that replacements could be necessary in the near future.

The existing gondola is one of three main lifts out of the base area, the only staging portal at Steamboat. The other lifts out of the base area are the Christie Peak Express, a detachable six-person lift installed in 2007, and the Christie III triple chairlift installed in 1979. During the summers of 2018 and 2019, the existing gondola was substantially replaced and upgraded to a higher capacity in order to improve out-of-base capacity. Prior to these upgrades, the gondola functioned well but often experienced prolonged wait times. In the base area of Steamboat, skier circulation and lift use are hindered by the entry (ingress) and exit (egress) of guests, combined with simultaneous use of this area as teaching terrain. The base area of Steamboat receives upwards of 16,000 skiers on peak days, and the existing gondola is



guests' preferred access route to the upper mountain.<sup>8</sup> Prior to the recent upgrades, on days with over 10,000 skiers, the gondola lift line exceeded 20 minutes, and exceeded 45 minutes on peak days. These wait limits approached or exceeded guest's approximately 20-minute wait tolerance. The improvements to the gondola completed in summer 2019 are expected to materially shorten lift wait times, but it is unlikely that wait times on peak days will fall to less than 20 minutes.

Other lifts in the network with operations and aging concerns are the Bashor, Preview, Pony Express, Priest Creek, Sunshine Express, South Peak, Thunderhead Express, Storm Peak Express, and Elkhead Express. The Wildhorse Gondola, which is not owned but is operated by Steamboat, is also discussed below.

The Bashor lift is the second oldest chairlift on the mountain and receives heavy use due to the existing terrain park. In general, the lift is outdated, having been constructed in 1974. It is also not optimally located to provide service to the surrounding terrain, as the elevation of the top terminal and current alignment restrict the ease of access to certain trails.

The Preview lift is a fixed grip triple constructed in 2003. The lift services beginner terrain in the base area. Due to the value of space in the base area as noted above, a similar type of lift could better service beginners in a less crowded zone of the mountain which would improve the guest experience of beginners and free up valuable land and space at the base of the mountain. For this reason, the Preview lift should be considered for removal.

The Pony Express is the northern most chairlift at Steamboat and an important lift to service side-country terrain in Pioneer and Fish Creek areas. The existing lift is underutilized in its current state with a capacity of 1,200 people per hour (pph), although approval at the time of construction allowed for a capacity of 1,800 pph. This chairlift could be better utilized to transport a greater number of skiers through the Pony Express Pod.

The Sundown Express and Priest Creek lift alignments are remnants from prior fixed-grip era when increasing capacity required parallel lifts. Sundown Express was replaced in 1992 to a detachable quad, while the Priest Creek lift, a fixed grip double constructed in 1972, was left as is for backup capacity during high visitation days. Although Priest Creek lift does operate during the season (average of about ten days), the licensing, operating and maintenance cost likely exceed the utility of the lift.

The Sunshine Express is a detachable quad installed at Steamboat in 2006. The lift was originally installed in 1997 at the Canyons Resort in Park City, Utah as Tombstone lift. While both resorts were owned by American Ski Company, the lift was moved to Steamboat to replace a fixed grip triple. The Sunshine Pod is one of the more popular locations on the mountain. The guest experience could be improved by replacing this lift with newer technology.

South Peak, also located in the Sunshine Pod, is a fixed grip triple installed in 1984. The lift provides an important egress out of the Sunshine Pod and to Rendezvous Saddle Lodge, the southern-most on-mountain guest service facility. The guest experience could be improved by replacing this lift with newer technology.

Elkhead Express is another important egress lift out of the Sunshine Pod. The lift is a detachable quad constructed in 2016 with an hourly capacity 2,400 pph. Although this is a newer lift, Elkhead Express is a critical part of the lift network and often experiences longer lift lines at the end of the day.

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<sup>8</sup> SSRC. 2011. Master Development Plan Amendment. Prepared by Ecosign Mountain Resort Planners Ltd.

Thunderhead Express is a detachable quad constructed in 1997 with an hourly capacity of 2,400 pph. This pod is a popular area and easy to access from the base area. The lift is over twenty years old and is starting reach the end of its operating life. The existing lift experiences lines in excess of 25 to 40 minutes during morning staging periods on busy days. The lift ride analysis performed in 2008 found that, on a 12,000-skier day, there were significant lift lines of 5 to 9 minutes over a 2-hour period, peaking at about 15 minutes in duration. The analysis also found that the loading efficiencies on this lift were only 70 to 80 percent during the busiest time of the day.

Storm Peak is a detachable quad constructed 1992 with an hourly capacity of 2,400 pph. This is an important lift for skiers to access Storm Peak and the Morningside Park. The lift is over twenty-five years old and is starting reach the end of its operating life.

The Wildhorse Gondola, which is not owned but is operated by Steamboat, is a transportation gondola that connects the Wildhorse Meadows development near the Meadows Lot to the base area. This pulse gondola (meaning that cabins are grouped together and that the entire lift slows down for loading and unloading) was constructed in February 2010 and has a capacity of 340 pph. The upper terminal of the gondola is located between One Steamboat Place and the Gondola Square Building.



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

LIFT NAME, LIFT TYPE	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	AVG. GRADE (%)	HOURLY CAPACITY (PPH)	ROPE SPEED (FPM)	CARRIER SPACING (FT)	LIFT MAKER/ YEAR INSTALLED
Gondola	9,075	6,900	2,175	8,856	25	3,600	1,200	160	Doppelmayr/1986 – Upgraded 2019
Preview/C3	7,044	6,922	129	741	17	1,450	362	45	Lift Engineering/2007
Christie Peak Express/D6	8,017	6,920	1,102	4,636	24	3,200	1,000	113	POMA/2007
Christie III/C3	8,016	6,983	1,033	3,738	28	1,710	500	53	Yan/1979
Bashor/C2	7,755	7,455	300	1,301	23	1,200	475	48	Yan/1974
Thunderhead Express/D4	9,075	7,445	1,630	5,539	29	2,400	1,000	100	Doppelmayr/1997
Burgess Creek/C3	9,202	8,267	939	3,490	27	1,800	500	50	POMA/2004
Storm Peak Express/D4	10,380	8,213	2,159	6,884	31	2,400	1,000	100	Doppelmayr/1992
Four Points/C3	9,761	8,400	1,361	4,050	34	1,411	500	64	Yan/1983
Bar-UE/C2	10,371	9,015	1,356	4,814	28	1,025	500	59	Lift Engineering/1977
Sundown Express/D4	10,386	8,450	1,936	5,530	35	2,800	1,000	86	Doppelmayr/1992
Elkhead Express/D4	9,204	8,446	762	2,394	32	2,400	1,000	100	Doppelmayr/2016
Priest Creek/C2	10,384	8,500	1,884	5,077	37	1,050	500	57	Heron-Poma/1972
South Peak/C3	9,387	9,075	312	1,683	19	1,703	450	48	Yan/1984
Sunshine Express/D4	10,390	9,137	1,256	5,563	23	2,400	1,000	100	POMA/1997
Buckaroo/C	--	--	8	80	10	1,200	64	3	Magic Carpet/1996
Rough Rider/S	7,645	7,500	145	758	19	513	382	45	Doppelmayr/1989

**Table 4. Lift Specifications – Existing Conditions (cont.)**

LIFT NAME, LIFT TYPE	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	AVG. GRADE (%)	HOURLY CAPACITY (PPH)	ROPE SPEED (FPM)	CARRIER SPACING (FT)	LIFT MAKER/ YEAR INSTALLED
Desperado/C	--	--	20	201	10	1,200	100	5	Magic Carpet/1998
Sundance/C	--	--	25	202	12	1,200	80	4	Magic Carpet/1994
Easy Rider/C	--	--	20	201	10	1,200	100	5	Magic Carpet/1998
Wrangler/C	--	--	20	201	10	1,200	100	5	Magic Carpet/2002
Morning Side/C3	10,532	9,990	542	2,683	20	1,800	500	50	Garaventa CTEC/1996
Pony Express/D4	9,735	8,085	1,650	4,967	33	1,200	1,000	200	Garaventa CTEC/1998

Source: SE Group

Notes:

S = surface lift, C = carpet, C2 = fixed-grip double chairlift, C3 = fixed-grip triple chairlift, D4 = detachable quad chairlift, D6 = detachable six-person chairlift

## C. EXISTING TERRAIN NETWORK

Evaluation of the existing terrain network requires equal consideration of many factors, chief among them being terrain variety and the distribution of terrain by ability level. Assessment of either of these factors on their own will not provide a complete picture of the current state of terrain at the resort.

Steamboat's existing terrain network encompasses approximately 171 traditional, cleared ski trails, ski-ways and gladed ski trails that cover approximately 1,364 acres and have a combined length of over 62 miles. The ski trail network accommodates the entire range of skier ability levels from beginner to expert. For details of the existing conditions terrain specifications, refer to Appendix B. *Note:* This does not include unnamed areas and tree islands that users choose to ski outside of the developed terrain network, which are also included in Steamboat's published skiable terrain acreage. All of the terrain within Steamboat's operations boundary is skiable when conditions are right.

An important part of Steamboat's terrain network is the learning center facilities, all of which are located within the lower mountain, and all ability levels descend through the beginner ability terrain on their way to the base area.<sup>9</sup> This mixing of ability levels is intimidating for lower level skiers, and is inconsistent with the type of recreational offering Steamboat strives to provide. Steamboat has explored expanding the teaching facilities in their current location to better meet skier market demands for beginner ability level terrain; however, there is insufficient area to accommodate these facilities in the base area.

### 1. Terrain Variety

Steamboat has a wide variety of terrain options, from developed terrain to undeveloped, off-piste terrain to terrain parks and features. This analysis accounts for three separate types of terrain at Steamboat, totaling 2,965 skiable acres:

- Lift-accessed, developed trails and bowls for beginner, intermediate, and expert skiers and riders—totaling about 1,364 acres
- Developed and undeveloped (non-thinned or maintained) glades and natural terrain within the ski area boundary that are routinely skied—totaling approximately 1,601 acres of terrain
- Developed terrain parks and freestyle features are located in Bashor Bowl (Bashor, Mavericks and Rabbit Ears Terrain Parks) and near the base area in the Lil' Rodeo Terrain Park

Within Steamboat's terrain network, there is a developed ski trail network that consists of named, defined, lift-served, maintained (groomed) ski trails. These trails represent the baseline of the terrain at any resort and are shown in Appendix B. These trails are where most guests ski and are usually the only place to ski during the early season, periods of poor or undesirable snow conditions, avalanche closures, and certain weather conditions.

There is also an undeveloped portion of the terrain network that provides an undeveloped, natural, and unstructured style of terrain that is typically used by advanced intermediate to expert ability level skiers. Steamboat's entire terrain network and thus the undeveloped terrain network is almost entirely below treeline; however, the undeveloped terrain network still includes a wide variety of terrain that features expansive bowls, chutes, open meadows, natural glades and abundant tree skiing.

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<sup>9</sup> Ibid.

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## Terrain Typology at Steamboat

*1. DEVELOPED ALPINE TERRAIN – The existing developed, or formalized alpine terrain network at Steamboat consists of the resort’s named, defined, lift-serviced, maintained trails. Despite the importance of undeveloped, alternate-style terrain, formalized runs represent the baseline of the terrain at any resort, as they are where the majority of guests ski/ride. Additionally, developed terrain is usually the only place to ski/ride during the early season, periods of poor or undesirable snow conditions, avalanche closures, and in certain weather conditions. As such, the developed trail network represents an accurate picture of the acreage utilized by the average skier/rider on a consistent basis, as well as that used by virtually all guests during the aforementioned conditions. Therefore, the full capacity of the resort must be accommodated by the total acreage of the developed terrain network, rather than relying on undeveloped terrain (which is not always available).*

*2. UNDEVELOPED TERRAIN – Undeveloped terrain consists of unnamed terrain that is routinely skied. There is some gladed and undeveloped terrain at Steamboat; the topography within the SUP area includes steeper terrain and glades intermingled within, and outside of, the developed and maintained terrain network. This terrain is primarily on the upper half of the mountain. This terrain is monitored by Steamboat ski patrol to control access in the early season, periods of poor or undesirable snow conditions, avalanche closures, and in certain weather conditions. There are also densely-treed and less accessible gladed areas. This consists primarily of the natural (non-thinned or maintained) forested areas between the defined skiing areas and ski runs, and also accounts for some of the less accessible treed areas at Steamboat.*

*3. TERRAIN PARKS – Terrain parks consist of various types of freestyle features including jibs, jumps and pipes.*

*Common jib features are benches and tables, boxes, kink (box or rail with one or more changes in direction or elevation), tubes, pole jam (rail attached to a jump at an upward angle), C-rail (arched box or rail), rails, S-rail (S-shaped box or rail), and wall ride (wall-like feature with broad surface for gridding).*

*Common jumps are hip (jump with landing perpendicular to the takeoff), spine (jump with two landings perpendicular to the takeoff), step-up (jump with a higher landing than takeoff) and table top (jump with a flat top).*

*Common pipes are halfpipe, quarterpipe (half of halfpipe) and superpipe (oversized halfpipe).*

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## 2. Terrain Distribution by Ability Level

This terrain distribution analysis considers the 1,364 acres within the developed terrain network at Steamboat, and the resort's off-piste offerings. As shown in Table 5 and Chart 2, the ideal skier ability breakdown is 5 percent for beginner ability level, 25 percent for low intermediate ability level, and 5 percent for extreme terrain. However, the current terrain capacities fall short of adequately accommodating these guests as Steamboat only has terrain distribution of 1 percent for beginner ability level skiers, 16 percent for low intermediate ability level skiers, and 1 percent for extreme skiers, resulting in an imbalance between current terrain and Steamboat's skier/rider market. The biggest deficiencies at Steamboat are in beginner, low intermediate and extreme terrain. Deficiencies in beginner and low intermediate terrain can pose a challenge for Steamboat in maintaining its appeal as a family-oriented resort and facilitating a comfortable learning progression for lower ability level guests. The shortage of extreme terrain makes Steamboat less desirable for more adventure-seeking skiers.

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### The Importance of Terrain Variety

*Terrain variety is the key factor in evaluating the quality of the actual skiing and riding guest experience (as opposed to lift quality, restaurant quality, or any other factor). Terrain variety is consistently ranked as one of the most important criterion in skiers' choice of a ski destination, typically behind only snow quality, and ahead of such other considerations as lifts, value, accessibility, resort service, and others. This is a relatively recent industry trend, representing an evolution in skier/rider tastes and expectations. The implication of the importance of terrain variety is that a resort must have a diverse, interesting, and well-designed developed trail system, but also must have a wide variety of alternate-style terrain, such as mogul runs, bowls, gladed trees, open parks, in-bounds "backcountry-style" (i.e., hike-to) terrain, and terrain parks and pipes. At resorts across the nation, there is a growing trend favoring these more natural, unstructured types of terrain, since the availability of this style of terrain has become one of the more important factors in terms of a resort's ability to retain guests, both for longer durations of visitation and for repeat business.*

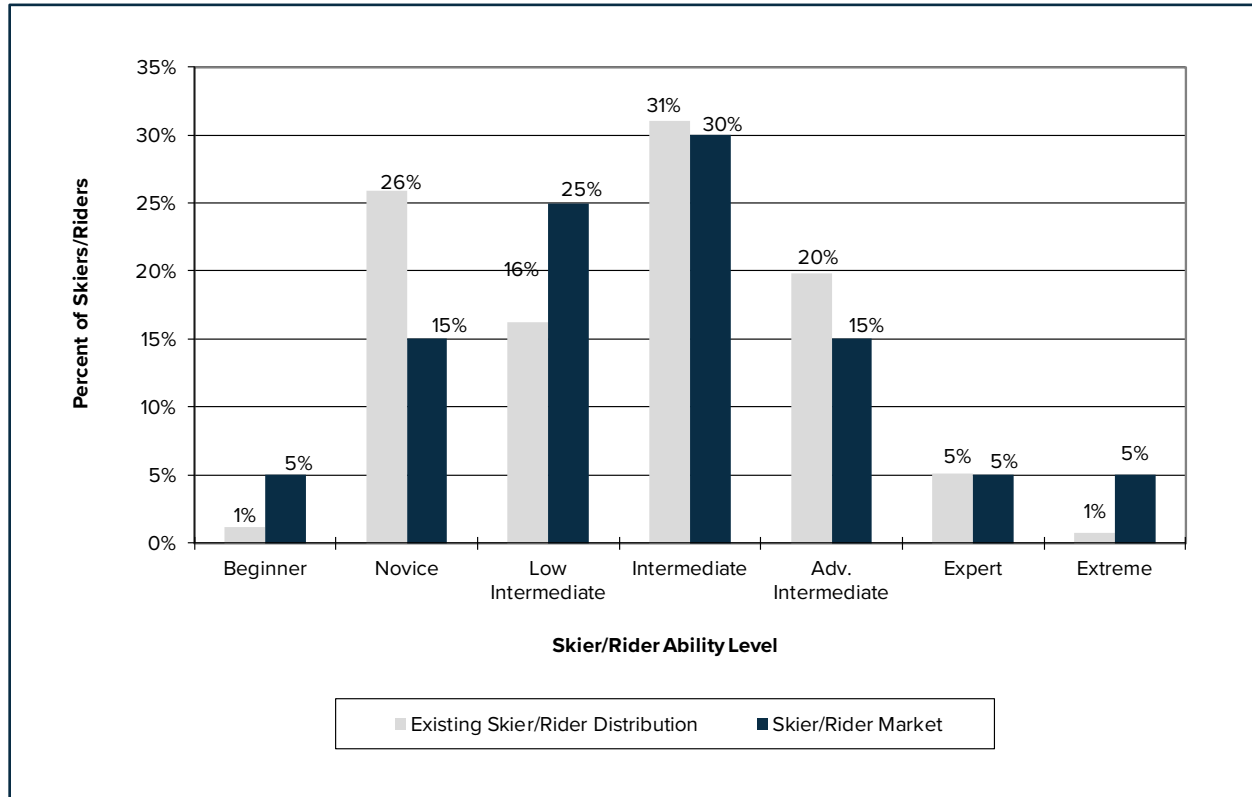
*To provide the highest quality guest experience, resorts should offer groomed runs of all ability levels and some level of each of the undeveloped terrain types. Undeveloped terrain is primarily used by advanced and expert level skiers/riders during desirable conditions (e.g., periods of fresh snow, spring corn, etc.). Even though some of these types of terrain only provide skiing/riding opportunities when conditions warrant, they represent the most intriguing terrain, and typically are the areas that skiers/riders strive to access. Terrain variety is increasingly becoming a crucial factor in guests' decisions on where to visit.*

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**Table 5. Terrain Distribution by Ability Level – Existing Conditions**

SKIER/RIDER ABILITY LEVEL	TRAIL AREA (ACRES)	SKIER/RIDER CAPACITY (GUESTS)	SKIER/RIDER DISTRIBUTION (%)	SKIER/RIDER MARKET (%)
Beginner	5	154	1	5
Novice	191	3,437	26	15
Low Intermediate	154	2,155	16	25
Intermediate	413	4,125	31	30
Advanced	376	2,634	20	15
Expert	225	676	5	5
Extreme	NA	100	1	5
<b>TOTAL</b>	<b>1,364</b>	<b>13,282</b>	<b>100</b>	<b>100</b>

**Chart 2. Terrain Distribution by Ability Level – Existing Condition (Use By Capacity)**



## D. EXISTING CAPACITY ANALYSIS

### 1. Comfortable Carrying Capacity

A detailed calculation of the existing CCC was completed for this MDP and is shown in Appendix B, Table B-2. The existing conditions CCC of Steamboat is calculated at 13,050 guests. The majority of Steamboat's CCC is attributed to the gondola and detachable quads, highlighting the importance of consistent operations and maintenance of these lifts and the need for more higher capacity lifts. It should also be noted that the existing CCC of 13,050 is in alignment with Steamboat's current visitation levels and reflective of the current business and market demand.

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#### What is Comfortable Carrying Capacity?

*In ski area planning, a "comfortable carrying capacity" (CCC) is established, which represents an 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.*

*Accordingly, the design capacity does not normally indicate a maximum level of visitation or a "cap" on 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 percent higher than the 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.*

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## 2. Density Analysis

An important aspect of resort design is the balancing of uphill lift capacity with downhill trail capacity. Trail densities are derived by comparing the uphill, at-one-time capacity of each individual lift pod (CCC) with the trail acreage associated with that lift pod.

Trail densities, which are derived by comparing the uphill, at-one-time capacity of each individual lift pod (i.e., CCC as shown in Table B-2) with the trail acreage associated with that lift pod, can be used to determine skier circulation. At any one time, skiers and riders are dispersed throughout the resort, using guest facilities and milling areas, waiting in lift mazes, riding lifts, or descending on ski terrain. For the trail density analysis, 25 percent of each lift's CCC is presumed to be "inactive" (i.e., using guest service facilities or milling areas and otherwise not actively skiing or riding lifts).

The active skier/rider population can be found in lift lines, on lifts, or on trails. The number of people 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 people on each lift is the product of the number and capacity of uphill carriers. The remainder of the skier/rider population (the CCC minus the number of guests using guest facilities, milling in areas near the resort portals, waiting in lift mazes, and riding lifts) is assumed to be descending.

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).

Table B-3 shows that the average trail density at Steamboat is 8 skiers per acre, which is lower than the industry standard of 10 skiers per acre. It is not uncommon for ski areas to have lower trail densities than the industry standard, as generally lower trail densities reflect a higher quality recreation experience and less instances of overcrowding. Although the industry standard is 10 skiers per acre, the industry standard can be thought of as a range where the lowest skier densities indicate underutilization of the existing terrain. Underutilization of terrain means that there could comfortably be more skiers/riders on the terrain at any one time than there are at current visitation levels. This situation indicates that the amount of effort required to properly maintain the quantity of terrain could be disproportionately high when compared to the overall number of skiers/riders on the mountain. Therefore, it is beneficial for a ski area to be below the industry standard of 10 skiers per acre, but densities that are too low may indicate that there is a surplus of trail acreage. While certain areas (i.e., Christie Peak Express) are above the industry standard of density, the existing conditions depict an overall positive recreational experience. At an average trail density of 8 skiers per acre there is not an underutilization scenario at Steamboat, and there is also not overcrowding on the vast majority of the mountain; maintaining a similar average trail density would be ideal in providing the desired recreation experience.

Further, Table B-3 shows that for all the individual lift/trail systems at Steamboat, except for the Christie Peak Express and the carpet and surface lifts, the actual trail densities are at or below the target design criteria, meaning that trails are generally less crowded than at most resorts. The Christie Peak Express is a detachable six-passenger chairlift that contains a mid-offload station for beginners and is used for novice skiing as well as morning staging (i.e., skiers accessing the mountain at the beginning of the day). At the same time of day when maximum staging capacity is needed, morning ski school activity also begins, resulting in decreases in lift loading and staging capacity for the area.<sup>10</sup> This affects both the learning experience, from longer lines due to the presence of staging skiers, as well as the experience of the staging skiers, from the presence of beginners and their loading and unloading

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<sup>10</sup> Ibid.

difficulties. The overall low densities are desirable from the standpoint of the quality of the skiing experience; however, there are certain areas like the Christie Peak Express that are currently affected by operational and circulation inefficiencies.

Aside from the trail densities reflected in comparing the number of guests on the trails to the amount of trail area available, there are also observed conditions that create circulation inefficiencies. In its existing location within the lower mountain, Steamboat's learning center facilities often face challenges associated with snow conditions. In the early and late portions of the season, variable snow conditions at lower elevations of the mountain can be difficult to maneuver for guests learning to ski, which makes it hard to circulate lower ability level guests through the base area. Typically, it is much easier for guests to learn to ski in areas that hold consistent snow and aren't as likely to be affected by changes in temperature.

Within the Rough Rider/Bashor Bowl area, the narrowness of *Boulevard* and varying slope gradients create inconsistent skier speeds and difficult passing conditions.<sup>11</sup> *Short Cut* is an important access route from mid-mountain to the base; however, additional snowmaking on *Short Cut* is needed to improve skier traffic flow and extend the use of *Short Cut* through the spring. Additionally, the lift maze at the bottom terminal of the Bashor lift often experiences crowding from staging combined with pass-through skiers accessing *Short Cut* and Lower Mavericks Terrain Park. Mavericks Superpipe, which is located in a central location within Bashor Bowl, has experienced reduced skier utilization yet dominates the Bashor Bowl skiing terrain. Finally, the entire Rough Rider/Bashor Bowl area contains aging snowmaking infrastructure as well as insufficient snow coverage on heavily trafficked and proposed terrain.

Another area that has low skier densities but observed skier circulation issues is the Pony Express Pod. Overall, the Pony Express Pod offers challenging terrain, but inconsistent early season snow conditions, limited lift capacity, insufficient ski patrol facilities, and limited connection to nearby pods. As previously mentioned, egress from the popular Pioneer Ridge backcountry terrain back into the Pony Express Pod is done via the "100 steps," which leads users back to lift-served terrain within the operational boundary. This constrains circulation throughout the area as it is time consuming and challenging for many users who are unfamiliar with the terrain. Without clearly defined ingress into the Pony Express Pod, the Pioneer Ridge backcountry terrain will continue to create circulation issues in the existing Pony Express Pod. This issue is compounded by the lack of snowmaking on the *BC Skiway*, an important egress from the "100 steps" and out of the Pony Express Pod. Beyond circulation within the Pony Express Pod, skiers wishing to move to the adjacent Four Points Pod must exit the Pony Express Pod through *BC Skiway* to the base terminal of Thunderhead Express, and then ski from the top terminal of Thunderhead Express to Four Points lift or Storm Peak Express. Skier utilization is reduced in early season due to variable natural snow, absence of snowmaking, and unfinished trail and lift improvements that were not completed at the time the Pony Express Pod was originally developed. Similar to the existing issues of the *BC Skiway* that are caused by the lack of snowmaking, *the Crux* is a major collector for the Pony Express Pod yet is very narrow and experiences inconsistent early and late season snow conditions.<sup>12</sup> These factors contribute to the underutilization of the Pony Express Pod, which if addressed would better disperse skiers across Steamboat's operational boundary and would improve the overall circulation of the mountain.

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<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

### a) Lift Network Efficiency

Within the context of ski area design efficiency, the term “Lift Network Efficiency” refers to the amount of effort and cost required to operate and maintain the lift network, as compared to the number of guests served by the lift network. The energy and costs related to the lifts include, but are not limited to: power use, operational labor, maintenance costs and labor, increased indirect administrative costs, and various direct and indirect costs associated with higher staff levels to perform these tasks. From this standpoint, the most efficient scenario is to have the fewest number of lifts possible that can comfortably and effectively serve the capacity and circulation requirements of the resort.

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## Lift and Terrain Network Efficiency

*Overall resort efficiency is becoming an increasingly important factor in the industry. This relates not only to energy efficiency and operational efficiency, but also to efficiency of the design and layout of the resort. The idea behind ski area design efficiency is to have a well-balanced lift and trail network (i.e., the uphill lift capacity balances with the downhill trail capacity that it serves) that is efficiently served by the fewest number of lifts possible, while maintaining desired trail densities, circulation routes, and service to the full spectrum of skier ability levels and types.*

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One way to analyze Lift Network Efficiency is to calculate the average CCC per lift at a given resort. While this calculation does not relate to the overall capacity of the resort, it can indicate if: 1) the resort is not getting maximum utilization out of its lifts; or 2) if there are more lifts than necessary for the capacity levels of the resort. When calculating this average, conveyors used for teaching, as well as lifts that are used for access only, are not included. Optimally, and in general, the average CCC per lift would likely be close to 1,000 guests. Industry-wide, the average CCC per lift is approximately 650. The average CCC per lift at Steamboat is 736, which reflects a very efficient lift network.

## b) Terrain Network Efficiency

To further the above discussion, an offshoot of the terrain density analysis is an analysis that provides an indication of the efficiency of the terrain network as compared to the lift network serving it. In this usage, the term “Terrain Network Efficiency” refers to the amount of effort required to properly maintain the terrain (e.g., costs related to snowmaking, grooming, energy, ski patrol, summer trail maintenance, administration, etc.).

From this standpoint, the most efficient scenario is to have a quantity of terrain that closely meets the target density requirements. This can be easily achieved by reviewing the density analysis in Table B-3. A terrain density index of 100 percent would imply that the resort had exactly the right amount of terrain to match target densities. Steamboat has an index of 69 percent, meaning that densities are 69 percent that of target densities. It is important to note that only the developed terrain network is used in these calculations, because it is largely the developed terrain that incurs the highest operational and maintenance costs.

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### Balancing Uphill and Downhill Capacities

*An important aspect of resort design is the balancing of uphill lift capacity with downhill trail capacity. Trail densities are derived by comparing the uphill, at-one-time capacity of each individual lift pod (CCC) with the trail acreage associated with that lift pod. The trail density analysis considers only the acreage associated with the developed trail network. A high trail density can restrict skiing space, degrade snow conditions, and detract from the recreational experience. A low trail density can indicate under-utilization of the existing terrain and inefficient operations.*

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## E. EXISTING GUEST SERVICES FACILITIES, FOOD SERVICE SEATING & SPACE USE ANALYSIS

### 1. Guest Services

On-mountain services and facilities are a necessary component of the recreation experience at ski areas. These areas provide visitors with shelter from the elements, bathrooms, and food; the capacity of these facilities is important in understanding whether the needs of visitors are being met. The Forest Plan provides the following direction for facilities within Management Area 8.22 Ski Based Resorts (Existing/Potential):

*“Recreation facilities, such as buildings, lifts, and groomed trails, will be evident. At the base development, services and facilities will be designed to complement the overall forest setting and will serve the needs of forest visitors.”<sup>13</sup>*

In serving the needs of visitors, the capacity of restaurant facilities is particularly important. Restaurant facilities provide an array of amenities under one roof, and utilization of these amenities is determined through the availability of seating space. Steamboat has three full service on-mountain guest service facilities at Thunderhead Lodge, Rendezvous Saddle Lodge and Four Points Lodge. There is lunch time overcrowding at all on-mountain restaurants, even on days with moderate visitation. When weather permits the use of outdoor space, the congestion and overcrowding are greatly reduced at these facilities.

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<sup>13</sup> USDA Forest Service. 1998. Final Environmental Impact Statement and Record of Decision, Routt National Forest Revised Land and Resource Management Plan. p.45 Available online at [https://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3\\_025110](https://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3_025110).

## Service functions

<i>Restaurant Seating</i>	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.
<i>Kitchen/Scramble</i>	All food preparation, food service, and food storage.
<i>Bar/Lounge</i>	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.
<i>Restrooms</i>	All space associated with restroom facilities (separate women, men, and employees).
<i>Guest Services</i>	Services including resort information desks, kiosks, and lost and found.
<i>Adult Ski School</i>	Ski school booking area and any indoor staging areas. Storage directly associated with ski school is included in this total.
<i>Kid's Ski School</i>	All daycare/nursery facilities, including booking areas and lunchrooms associated with ski school functions. Storage and employee lockers directly associated with ski school are included.
<i>Rentals/Repair</i>	All rental shop, repair services, and associated storage areas.
<i>Retail Sales</i>	All retail shops and associated storage areas.
<i>Ticket Sales</i>	All ticketing and season pass sales areas and associated office space.
<i>Public Lockers</i>	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.
<i>Ski Patrol/First Aid</i>	All first aid facilities, including clinic space. Storage and employee lockers directly associated with ski patrol are included in this total.
<i>Administration/ Employee Lockers &amp; Lounge/Storage</i>	All administration/employee/storage space not included in any of the above functions.

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## 2. Space Use Analysis

Based upon a CCC of 13,050 guests, the current space use allocations of the guest service functions at Steamboat can be compared to industry norms for a resort of similar market orientation and regional context. This comparison demonstrates that Steamboat should have between 170,000 and 210,000 square feet of guest services space to accommodate a CCC of 13,050 guests, and current resort facilities combine for 175,600 square feet of guest services space.

When analyzing the total resort square footage (including the base area, Thunderhead Lodge, Four Points Lodge and Rendezvous Saddle Lodge) in the context of industry norms, Steamboat is within the recommended range. However, empirical observation indicates that the resort has shortages in rentals, restaurant seating, rest rooms, ski patrol, mechanical and storage. Analyzing the guest distribution by on-mountain facility, Four Points Lodge and Rendezvous Saddle Lodge could both use additional restaurant seating space.

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### Space Use Planning

*To provide a balanced resort experience, sufficient guest service space should be provided to accommodate the existing resort CCC. The distribution of the CCC is utilized to determine guest service capacities and space requirements at base area 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.*

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### 3. Food Service Seating

Steamboat has food and beverage outlets at the base area and at their three on-mountain facilities (Thunderhead Lodge, Four Points Lodge, and Rendezvous Saddle Lodge). A turnover rate of 2 to 5 times throughout the day is the standard range utilized in determining restaurant capacity; turnover rates of 2.5 and 3.5 were used for the various facilities included in this analysis. The turnover rate is multiplied by the existing number of seats to determine the seating capacity of each of these restaurants. Table 6 summarizes the seating requirements at Steamboat, which provide a seating capacity for approximately 11,940 guests.

#### Restaurant Seat Turnover

*A key factor in evaluating restaurant capacity is the turnover rate of the seats. A turnover rate of two to five times is the standard range utilized in determining restaurant capacity. Fine dining at ski areas typically results in a turnover rate of two, while “fast food” cafeteria style dining is characterized by a higher turnover rate. Occasionally a turnover rate greater than 5 may be utilized, to reflect the true ‘fast food’ nature of the facility. Weather also has an influence on turnover rates at ski areas; for example, on snowy days skiers will spend more time indoors than on sunny days.*

As highlighted in the table, the base area restaurants and the Four Points Lodge have the greatest deficiency of seats, represented by the gap between the existing and recommended number of seats. The base area restaurants include only those facilities owned and operated by Steamboat or that are directly accessible from the slope (Gondola Joe’s, Gnarly Charlie’s, Timber & Torch, KVC, Round Up Room, Seven’s, Truffle Pig, the Grand (The Cabin and the Grand Café), and Slopeside Grill). While Table 6 highlights the largest deficiency of seats being in the base area, it is important to understand that there are additional restaurants in the base area that are not owned by Steamboat, which provide additional seating. As none of the non-Steamboat restaurants in the base area are considered but provide additional seating capacity, it is assumed that the current deficiency is in part made up by these private restaurants. None of the restaurants at Steamboat have a surplus of seating, indicating that these facilities are not being underutilized.

**Table 6. Recommended Restaurant Seating – Existing Conditions**

	BASE AREA RESTAURANTS	THUNDERHEAD LODGE	FOUR POINTS LODGE	RENDEZVOUS SADDLE LODGE	RESORT TOTAL
Lunchtime Capacity (CCC)	5,006	4,038	1,200	3,460	13,703
Average Seat Turnover	2.5	3.5	3.5	3.5	
Existing Seats	1,560	1,120	263	914	3,857
Required Seats	2,002	1,154	343	988	4,487
Difference	-442	-34	-80	-74	-630
Existing seating capacity	3,900	3,920	921	3,199	11,940

## F. EXISTING PARKING CAPACITY AND RESORT ACCESS

Parking at Steamboat is provided at five permanent day skier parking lots in the base area: Meadows Lot, Upper Knoll Lot, Lower Knoll Lot, Gondola Square Parking Garage, and Ski Time Square Parking Garage. Table 7 describes Steamboat's existing parking capacity at staging portals. SSRC seasonally leases additional overflow parking at Strings and the UC Health Yampa Valley Medical Center.

The Meadows Lot is a paved surface parking lot located at the entrance to Mt. Werner Circle, approximately 100 feet below the elevation of the staging lifts. The capacity of the Meadows Lot is 1,100 parking spaces. Steamboat now owns approximately 1.1 acres (the former Arnold Barn Lot), which may be developed for parking in the future, and also has a license to park on the west portion of the Wildhorse property adjacent to the Meadows Lot that can accommodate approximately 34 more vehicles. Steamboat operates a free shuttle service to move skiers and employees from the Meadows Lot to the Gondola Transit Center. Six shuttle buses with a capacity of 25 people circulate between the parking lot and the base area throughout the day. The parking lot entry counts carried out during the transportation survey on Sunday, February 17, 2008 revealed that average car occupancy in the Meadows Lot is 1.9 people per car.

The Knoll Lots are comprised of a larger, upper section to the west (mainly used by employees since it is closest to the lift and often fills up early before skiers arrive) and a small, lower section on the east side. The Upper Knoll Lot provides the only free parking within skier walking distance of the lifts. The Lower Knoll Lot is paid parking. On the day the parking lot surveys were carried out only 8 percent of the vehicles surveyed contained skiers. The Upper and Lower Knoll Lots have a capacity of 450 and 60 vehicles, respectively. Parking in the Lower Knoll Lot is paid parking while the Upper Knoll Lot is free. Both lots typically fill up by mid-morning on weekends.

The Gondola Square Parking Garage provides the closest parking to the base area. There is a \$15 charge to park in the Gondola Square structure for the day and as a result, observed occupancy rates are 2.5 people per car, significantly higher than the free lots. The total number of stalls available for skier parking is 230 cars. Fifteen stalls are dedicated as commercial parking for the Steamboat Grand. The Ski Time Square Parking Garage also costs \$15 and has a capacity of approximately 183 cars for skiers. Sixty stalls in this garage are reserved for overflow parking for the Steamboat Grand Hotel.

Steamboat has only one base area, which limits the amount of space available for day skier parking. This situation has been mitigated through a large, efficient system of hotel/condo shuttles which has eliminated the need for many guests to use vehicles.

**Table 7. Existing Parking at Staging Portals – Existing Conditions**

	TOTAL
CCC	13,050
Guests getting dropped-off	2,400
Guests in walking distance lodging	3,975
Guests arriving via public transit	2,500
Guests requiring parking	4,175
Guest Per Vehicle	1.9
Required car parking spaces	2,197
Existing parking spaces	2,123
surplus/deficit	-74
Existing staging and parking capacity (guests)	4,034

*Notes:*

Existing parking spaces are currently available at the following parking lots: Meadows Lot = 1,200, Lower Knoll Lot= 60, Upper Knoll Lot = 450, Ski Time Square Garage = 183, Gondola Square Garage = 230

## G. EXISTING RESORT OPERATIONS

### 1. Snowmaking

In February 2015, Steamboat completed a Snowmaking Master Plan Update by Sno.matic Controls and Engineering, Inc. The snowmaking master plan is being updated again in 2019. The existing snowmaking terrain at Steamboat covers 295 acres. This includes 273 acres of terrain covered by in-ground snowmaking infrastructure and an additional 22 acres covered by manually stretching snowmaking hose. At the time of the report, Steamboat had a snowgun inventory of 187 stick guns, 12 fan guns and 70 high energy guns. Current snowmaking operations consume an average of 87.4 million gallons of water each year. In general, the snowmaking operates well, but will need upgrading to modernize the system to allow for the use of low energy equipment.

### 2. Grooming

Groomed terrain is important to the majority of guests who visit destination resorts, including Steamboat's guests. Steamboat grooms most of the beginner through lower intermediate terrain regularly, typically 500 acres of terrain each night. The resort operates with a fleet of about twelve snowcats.

### 3. Night Skiing

Steamboat has night skiing operations on the Christie Peak Express and on approximately 50 acres of terrain, including *Sitz*, *See Me*, *Vogue*, *Stampede* and *Lil' Rodeo* terrain park. Night skiing operations run from 6:00 p.m. to 8:30 p.m. on Thursday to Monday and nightly over the Christmas holiday.

### 4. Ski Patrol/First Aid

Steamboat's ski patrol currently consists of 52 full-time ski patrollers, 12 part-time ski patrollers, 12 volunteer medical ski patrollers, 7 courtesy patrollers (also known as Steamboat Ambassadors), and 24 volunteer courtesy patrollers.<sup>14</sup> Courtesy patrollers are tasked with providing information and directions and do not typically carry their responsibilities beyond Steamboat's operational boundary; ski patrol and volunteer medical ski patrollers actively monitor the entire operational boundary, responding to medical and safety related calls. Ski patrol will also respond to incidents beyond the operational boundary, including those in the nearby Fish Creek backcountry area that is within the existing SUP boundary, but ski patrol only patrols and enforces avalanche safety procedures inside the operational boundary. Ski patrol operations are currently located at the top of the Gondola and at the top of Sundown Express.<sup>15</sup> There is also a small temporary yurt at the top of the Pony Express that is used as a satellite location to facilitate ski patrol operations in this area of the operational boundary.<sup>16</sup> The existing avalanche safety program is well equipped to perform mitigation work within the operational boundary and does not face operational challenges or deficiencies.

As previously mentioned, existing conditions at Steamboat do present several challenges for certain aspects of ski patrol operations. Most these challenges revolve around the existing Pony Express Pod and the adjacent Pioneer Ridge backcountry. The Pony Express Pod is limited in connectivity to nearby pods and lacks sufficient ski patrol facilities. In addition to constraining factors within the existing operational boundary, the Pony Express also provides the most direct access to the adjacent Pioneer Ridge backcountry via two established access points that allow skiers to exit the operational boundary

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<sup>14</sup> Miles and Feiges. 2017. Personal communication with Lance Miles, Project Coordinator and John Feiges, Ski Patrol Supervisor.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

and access unmaintained NFS lands. Despite this area being outside of the operational boundary, ski patrol still responds to incidents related to skiers inexperienced with the terrain and exit routes needing assistance. There is also a more severe issue associated with the large cliff bands that characterize the topography of the area. Without adequate knowledge of the terrain, it is very easy for skiers to find themselves stranded on cliff bands or skiing in terrain that exceeds their ability level. Ski patrol responds to many of these cliff related issues every season but lacks adequate rescue access, hindering ski patrol response in this area. Based on the current levels of use in the Pioneer Ridge backcountry, safety measures and egress for emergencies are not sufficient.

## **5. Maintenance Facilities**

Steamboat's grooming and vehicle maintenance shop is located at the end of Burgess Creek Road, just above the bottom terminal of the Thunderhead lift. This 10,600-square foot shop, including four maintenance bays, is ideally located with both easy road access and direct ski slope access. Lift maintenance, wood shop, and electrical maintenance are located in an 8,800-square foot shop space in the Thunderhead Lodge, including two maintenance bays. Both facilities are in fair condition. Building maintenance is located in the bottom terminal of the gondola and the main snowmaking control systems are located in the main pump house at the top of Christie Peak. Steamboat's current maintenance facilities are in fair condition and provide sufficient operational space for their current needs, but storage space is deficient and additional covered storage would improve operations.

## **6. Utilities and Infrastructure**

To support its on-mountain operations, Steamboat has water, wastewater, electrical and communication lines across the mountain (refer to Figure 13 for Steamboat Utilities). Below is a brief description of each utility.

### **a) Potable Water**

The Mount Werner Water and Sanitation District provides potable water for the buildings in and around the base area, while potable water on-mountain is supplied in several separate systems operated by the mountain. The Thunderhead Lodge and Four Points Lodge are supplied from the Rainbow and Moonlight storage tanks (250,000 and 10,000 gallons, respectively). These tanks are supplied by several springs including the Four Points Spring #1, Four Points Spring #2 and the Moonlight Spring.

Water for the Rendezvous Saddle Lodge is collected in an infiltration gallery and stored in a 55,000-gallon tank near the restaurant. The volume of water coming from this gallery was sometimes insufficient; however, conversion to low flow toilets and sinks has mitigated this issue. Approximately 11 miles of potable water distribution system is located across Steamboat.

### **b) Wastewater**

The Thunderhead, Four Points, and Rendezvous facilities are connected to the base area by an underground sanitary sewer pipe which connects into the sewer system operated by the Mount Werner Water and Sanitation District. The Patrol Headquarters is serviced by a septic tank and leach field. Steamboat also has several waterless restrooms, located at the bottom of Sundown Express, Bar-UE, Sunshine Express, and Storm Peak Express. Approximately 7 miles of wastewater lines is located across Steamboat.

### **c) Electrical Power**

The Yampa Valley Electric Association provides electricity to all the base area and on-mountain facilities. Electricity is supplied via an underground electrical distribution system for approximately 21 miles.



**d) Communications**

The distribution system for on-mountain communications lines connect to all on-mountain facilities and lift infrastructure to support day-to-day operations. Approximately 48 miles of communication lines is located across Steamboat.

**e) Fuel Storage**

Underground gas and diesel storage tanks are located at the Slope Maintenance Shop as well as at the Thunderhead Lodge. Diesel tanks are also located at the Rendezvous Saddle Lodge and lift drive terminals.

**7. Mountain Roads**

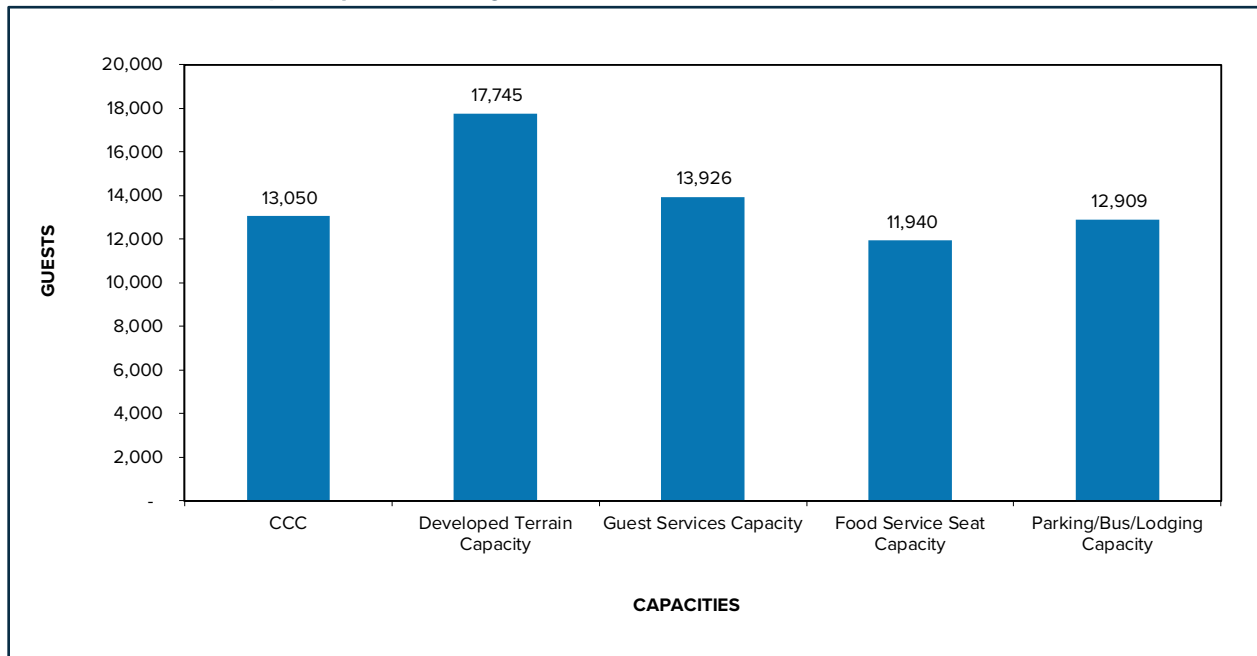
The mountain road system at Steamboat provides access from the base area to the top of Steamboat's operations on approximately 23 miles of mountain roads. In general, the mountain roads provide good access to the existing facilities for maintenance and support activities.

## H. RESORT CAPACITY BALANCE AND LIMITING FACTORS

The overall balance of the existing resort is evaluated by calculating the capacities of the resort’s various facilities and comparing those facilities to the resort’s CCC. The existing capacities are shown in Chart 3.

Steamboat’s base area and on-mountain facilities are out of balance with existing visitation levels. Because Steamboat only has one base area portal, the resort has done a good job in developing this portal to be as efficient as possible. Food service seating capacity is low given the level of CCC and is reflected in long wait times at on-mountain restaurants during the busy lunchtime rush. Parking capacity is also seemingly low with capacity to park approximately 4,034 guests. The remaining capacity shown in Chart 3 comes from transportation from major lodging locations, guests within walking distance of lifts and public transportation. Over the years, Steamboat has been able to maximize their parking and access to the resort by providing usable transportation from major lodging locations and public transportation and will need to continue to develop efficient transportation systems to the resort.

**Chart 3. Resort Capacity – Existing Conditions**



# I. MULTI-SEASON AND ALTERNATIVE ACTIVITIES

## 1. Summary of the Existing Multi-Season and Alternative Activities Guest Experience

Steamboat is a hub of outdoor recreation in both the summer and winter months and has been for a number of years. Not only has the resort of Steamboat invested heavily in attracting guests during the summer months, but the City of Steamboat Springs has established events throughout the summer to attract visitors.

In the last five years, Steamboat has transformed the base area into a summer activities hub. The daylighting of Burgess Creek and enhancement of the stream has created a welcoming environment for guests to stop after a long hike or let kids play in the water on the Burgess Creek beach. Other activities in the base area include the mountain coaster, climbing wall, mini golf, summer tubing, ropes course, guided E-Bike tours, among other activities.

Farther up on the mountain, guests typically have a more remote mountain experience compared to the base area. During the summer operating season (typically mid-June to late August) Steamboat operates the gondola daily to provide access to the mountain and a selection of activities on-mountain. After the end of August, the gondola is operated on weekends through mid-October (weather permitting). The gondola provides an easy ride directly from the base area up to the Thunderhead Lodge, providing spectacular views on the gondola ride itself as well as from the lodge. A selection of restaurants is available at Thunderhead Lodge for on-mountain dining during normal operations. Steamboat also operates at night on selected days for evening dining and sightseeing. The Thunderhead Lodge can be booked for special events. Steamboat also offers a 'Guided Gourmet Hike' which consists of a gondola ride up to Thunderhead, a guided interpretive hike to Four Points, a gourmet lunch, and a hike back to the Thunderhead Lodge.

For those seeking a hiking experience at their own pace, a network of hiking trails is available on Mt. Werner ranging in difficulty from easy to moderately difficult. Hikes range from an easy loop near the Thunderhead Lodge (Vista Nature Trail) to long hikes into the alpine or a hike back down to the base area via the Thunderhead hiking trail. Steamboat also has 15 mountain bike trails covering approximately 50 miles. These are primarily traditional "cross country" style mountain bike trails; however, there are some downhill, lift-served, mountain biking trails, which have become highly popular in recent years. Guests can either go biking on their own or hire a guide to show them the trails and/or teach them mountain biking skills. Mountain bikes are available for rental at the mountain and mountain bike clinics are offered periodically during the year. Steamboat is currently in the process of constructing more mountain biking trails (primarily downhill trails), which were approved by the Forest Service in summer 2011. The current and proposed trail network spans the entire operational boundary. Located in the Thunderhead and Bashor areas is a 19-hole disc golf course. Disc golf has become popular on NFS lands as natural terrain and topography is left undisturbed and required infrastructure is typically limited to an elevated metal basket for each hole. Similar to traditional golf, users try to land their flying disc in the hole in as few shots possible.

Steamboat also offers developed recreation opportunities for those lacking the necessary skills or experience to engage in traditional activities like hiking or mountain biking. Developed recreation opportunities are those with characteristics that enable to accommodate or be used for intense recreation. Such sites are often enhanced to augment the recreational value. Improvements range from those designed to provide great comfort and convenience to the user to rudimentary improvements in isolated areas. Every summer, Steamboat organizes a variety of activities in and around the plaza and base area bounded by the Ski School building, the Timber and Torch and the Headwall ski runs on



private lands. This adventure zone includes activities such as a bungee trampoline, inflatable bouncy structures, climbing wall, human gyro, mechanical bull, and ropes courses.

Steamboat also offers alternative winter activities for guests who may choose not to ski or ride. These activities include snowshoeing, tubing, cross country skiing and sleighrides. Some of these activities are located offsite.

Refer to Figures 8 and 9 for existing summer conditions at Steamboat.

## **2. Summer “Activity Zones”**

In October 2016, the MBRTB accepted an MDPA to incorporate summer zones into Steamboats accepted 2011 MDP. Following the guidance provided in Forest Service Manual 2343.14 – Additional Seasonal and Year-Round Recreation at Ski Areas, the MDPA established “zones to guide placement and design of additional seasonal or year-round recreation facilities, basing the zones on the existing natural setting and level of development to support snow sports.” Zone designations were carried out through the planning process and evaluated on existing ski area infrastructure. Refer to Figure 9 for illustration of existing summer zones at Steamboat. Each zone setting, desired condition and compatible activities are described in detail in Chapter 5.

# CHAPTER FOUR PREVIOUSLY APPROVED, NOT YET IMPLEMENTED PROJECTS

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## A. SUMMARY OF PREVIOUSLY APPROVED PROJECTS

Steamboat recently completed an Environmental Impact Statement (2018 EIS) with the final Record of Decision signed in September 2018. The EIS analyzed a number of projects in the Bashor Bowl area, as well as projects in the Pony Express/Pioneer Ridge Pod. As detailed in the 2018 EIS Recreation Technical Report, based on the Alternative 2 projects, CCC would increase to 14,420 guests. These projects are graphically shown in Figure 10 and described in detail below.

### Other Steamboat Approval Documents

- Steamboat Proposed Improvements 2006 EA
- Steamboat Summer Trails EA 2011
- Steamboat Ski Area Thunderhead Disk Golf Course CE
- Steamboat Ski Area Four Points Lodge SIR and CE
- Steamboat Ski Area 2010 Summer Maintenance Projects CE
- Steamboat Ski Area 2009 Maintenance Projects CE
- Steamboat Construction Projects for 2005 CE
- Steamboat Construction Projects for 2003/04 CE
- Steamboat Construction Projects for 2002 CE
- Steamboat Mountain Bike Trail Reroute CE
- Steamboat Snowmaking Line Construction CE
- Steamboat Ski Area Projects 2015 CE
- Steamboat Mountain Bike Trail Construction CE

Many of the projects approved in these approval documents have either been previously implemented or are listed below as important projects for this MDP. There are other projects approved in these documents that have not been previously implemented and are not discussed below, which may be implemented some time within the term of this MDP.

## B. PREVIOUSLY APPROVED LIFTS

Previously approved lift infrastructure projects include the installation of Bashor Gondola, the realignment and upgrade of Rough Rider lift, the installation of several beginner carpets, the replacement and realignment of Bashor lift, the upgrade of Pony Express lift, and the installation of Pioneer Ridge lift.

The Bashor Gondola was approved from the base area to Bashor Bowl. The top and bottom terminals and gondola alignment are located entirely on private lands. The gondola would reduce skier traffic congestion at the base area by moving ski school operations and beginner terrain to the Rough Rider Learning Center. The gondola would be ideal transportation for getting children and beginner skiers to the Learning Center.

The EIS analyzed the realignment and upgrade of the existing Rough Rider lift, as well as the installation of three new carpets in the Rough Rider Learning Center. The Rough Rider lift was approved as a new fixed-grip or detachable lift. The existing Rough Rider platter would be removed to accommodate the new lift and three carpets that would become the center of Steamboat's new learning center.

The EIS also approved the realignment of the Bashor lift. The lift is located on private lands, is one of Steamboat's oldest lifts, and is nearing the end of its operational life. Replacement of the lift also provides an opportunity to realign the chairlift to accommodate greater utilization of surrounding terrain and resolve circulation issues experienced with the current alignment.

The Pony Express was originally constructed at a capacity of 1,200 pph, although approval at the time of construction allowed for a capacity of 1,800 pph. To accommodate the increased use of the Pony Express anticipated to occur from the trail corridor enhancements and development of the new Pioneer Ridge area, Steamboat proposes to add an additional 27 chairs to the existing lift to increase capacity to the previously approved capacity of 1,800 pph.

The Pioneer lift was approved as a fixed grip or detachable quad with a capacity of 1,800 pph. The lift would become Steamboat's northern most lift and would service the gladed terrain approved in the EIS.

## C. PREVIOUSLY APPROVED TERRAIN

A number of terrain improvements were approved in the 2018 EIS in the Bashor Bowl area, as well as in the Pony Express/Pioneer Pod. These project total nearly 130 acres of terrain expansion and improvements.

A new skier bypass (Trail A) is planned to be constructed from *Boulevard* to the Rough Rider Learning Center. This bypass would improve Learning Center access for beginners, as well as allow more experienced skiers to bypass the Learning Center as they move toward Thunderhead Express. Re-grading of *Boulevard* would incorporate the portion of *Main Drag* between *Heavenly Daze* and *Big Foot* into *Boulevard*. The remainder of *Main Drag* would be reclaimed.

To provide terrain for novice skiers transitioning from the proposed Rough Rider Learning Center to Bashor Bowl, Steamboat plans to construct a new novice ski trail (Trail D). This trail, which would be approximately 950 feet long, would connect from *Yoo Hoo* near the intersection with *Big Foot* and continue to *Giggle Gulch* east of the Rabbit Ears Terrain Park.

Several trails would be renovated to increase the utilization of the Pony Express Pod and enhance skiability. Anticipated trail renovations include portions of *Longhorn*, *Middle Rib*, and *the Crux*. Portions

of *Longhorn* would be widened, and portions of *Longhorn* and *Middle Rib* would be re-contoured in areas severely off fall line and containing rock obstructions to facilitate snow grooming. *The Crux*, the major collector for the Pony Express Pod, would be regraded and is anticipated to require rock blasting. Additional enhancements would include select tree removal and mowing. Individual winch points, fixed anchor points that enhance the safety and efficiency of grooming steep trails, would be field selected and installed.

In order to improve access between the Pony Express and Storm Peak lifts and increase utilization of the Pony Express Pod, a ski-way would be constructed from the junction of *Lower Middle Rib* and *Chaps* trails to the Storm Peak Express (Trail E).

Pioneer Ridge skier exit paths are not readily defined and often involve hiking. To create a safer and more efficient path for ski patrol toboggan evacuations, and to guide skiers toward the Pioneer lift and *BC Skiway*, Steamboat plans to construct a 30-foot-wide groomable collector ski trail (Trail F) along the new operational boundary. The ski trail would originate from the top of the Pony Express, traverse north to Pioneer lift, and follow along the expanded northern operational boundary to the bottom of the Pioneer Ridge Pod. The trail would then cross Burgess Creek via a new bridge (Burgess Creek Bridge) and connect to *BC Skiway*. Permanent boundary fence, fenceposts, and signage may be installed to define the operational boundary.

Throughout the Pioneer Ridge area, trees would be removed as part of hazard tree removal, construction of ski trails, and construction of glading corridors.

## D. OTHER PREVIOUSLY APPROVED PROJECTS

Other projects included in the 2018 EIS include the Bashor Snowsports School Facility and Restaurant, a ski patrol and restrooms at the top of Pony Express and additional snowmaking infrastructure.

The Bashor Snowsports School Facility and Restaurant would be located at the top terminal of the previously approved Bashor Gondola on private lands (referred to as Wild Blue Gondola Stage 1). The facility was approved for approximately 8,000 square feet footprint; however, the final design would be subject to design regulations, review, and approval by the City of Steamboat Springs. This facility would include a children's ski school, restaurant with a seating capacity of approximately 400 guests, small retail shop, special events area, and storage. The facility would require sewer, potable water, natural gas (not in prior EIS approval), and electric. A sewer line would be trenched east of the proposed facility and tie into the existing sewer line that currently services the Bashor Pavilion and bathroom facilities, both of which would be removed as part of the proposed project, or north and tie into the existing sewer service at the *Right of Way* trail (not in prior EIS approval). Prior to connecting to the existing sewer line, the capacity and condition of either line would be evaluated and upgraded if necessary. Potable water and electric would be provided to the proposed facility from trenched utility lines originating on NFS lands from the Thunderhead Express bottom terminal.

To reduce ski patrol response time and provide additional manpower and equipment in the Pony Express Pod, a ski patrol hut and restroom would be constructed and maintained at the top terminal of the Pony Express, which is currently occupied by a temporary yurt. This patrol hut would act as a satellite station for ski patrol during day operations for six to ten people, as well as supplementing search and rescue needs both within the SUP boundary and out-of-bounds areas. Storage for ski patrol and lift operations would be included, as would restrooms for ski patrol, lift operations, and the public as needed. Potable water would be hauled by SSRC to the patrol hut and either composting toilets or a



leach field would be installed for the operation of the restroom facilities. No potable water or sewer lines are proposed.

In total, approximately 53 acres of new snowmaking coverage are planned. The areas approved for snowmaking coverage include the new teaching areas and trails, areas surrounding the Rough Rider lift and surface lifts, the new bypass connecting *Boulevard* to the Rough Rider Learning Center, and existing *Short Cut* trail. Within the Pony Express Pod, installation of snowmaking infrastructure would occur to provide coverage to *Upper* and *Lower Middle Rib*, *the Crux*, *Upper* and *Lower Longhorn*, Lower Pony Express lift line, *Upper* and *Lower Storm Peak Express Connectors*, *BC Skiway*, and *Chaps*.

The 2011 Summer Trails EA approved construction of up to 36 miles of new mountain bike and multi-use trails, including 15 miles of machine-built trails and 21 miles hand-built. The approved trails are described in the 2010 Steamboat Summer Trails Master Plan.

The Steamboat Ski Area Projects 2015 CE approved the expansion of the Four Points lodge by adding 40 feet to the west side of the building. The proposed expansion would include a food station, bar, dining area, retail space, and enlarged restrooms. The expansion would add an additional 174 restaurant seats.



# CHAPTER FIVE UPGRADE PLAN

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## A. SUMMARY OF THE GUEST EXPERIENCE UPGRADE

The proposed Upgrade Plan builds upon previous planning and approvals at Steamboat to continue the evolution of the recreational experience and better accommodate the growth in recreational demand that Steamboat has witnessed in recent years.

This chapter responds to the findings of the existing facilities analysis. The Upgrade Plan is tailored to improve Steamboat's ability to respond to its market/skier demands through the development of a continued balanced terrain distribution, improved efficiency of lift operations, better utilization of and access to available terrain, increased capacity of guest service facilities, and enhanced snowmaking capabilities.

The Upgrade Plan includes a number of lift upgrades at Steamboat. Under this MDP, Steamboat would upgrade lifts to improve access to the Sunshine Pod as well as install and remove a variety of lifts to enhance the overall lift network efficiency. It also includes a diversity of improvements to existing trails and a proposed egress route from the Pioneer Ridge/Fish Creek area. Steamboat would also expand its guest services through the expanded Thunderhead Lodge, a new Ski Patrol hut at the top of Sunshine II, and a new restaurant at the top of the Sunshine lift. Enhanced operational improvements, like improved lighting for tubing operations and night skiing as well as an upgraded Four Points Road, and additional mountain bike trails are also included. In addition to the upgrade projects listed below, the previously approved projects are included in the analysis and consideration of planned projects in this chapter.

## B. UPGRADE LIFT NETWORK

The Upgrade Plan includes three new lift projects, six lift upgrade projects and two lift removal projects. With the implementation of the Upgrade Plan, Steamboat would have twenty-four lifts in its lift network—two gondolas, seventeen chairlifts and five carpets. These improvements to the lift network will increase lift network efficiency, provide better circulation and skier distribution, and make better use of the available terrain within Steamboat's SUP. Project details are described below. Refer to Table 8 for a complete list of Steamboat's lift network upgrades.

A critical aspect of the Upgrade Plan is the Wild Blue Gondola, which is designed to transport guests from the base area, through an angled mid-station at the Bashor Bowl area, to the top of Sunshine Peak. The gondola is critical for a number of reasons, including increasing out-of-base capacity, providing access to the Bashor Bowl proposed beginners' area, servicing the planned Sunshine Restaurant, and creating direct ingress and egress to the popular Sunshine Pod terrain.

### 1. New Lift and Carpet Projects

Three new lift projects and new beginner carpets are planned at Steamboat: Wild Blue Gondola, Sunshine II, Pioneer Ridge and Bashor Bowl beginner carpets.

The Wild Blue Gondola is a two-stage gondola planned from the base area to the top of Sunshine Peak. The lower leg of the gondola alignment (Stage 1) is planned to follow the same or similar alignment as

the previously approved Bashor Gondola from the base area to Bashor Bowl, and the upper segment (Stage 2) extends from Bashor Bowl to the top of Sunshine Peak near the top terminal of Sundown Express. The mid-station, connecting the lower and upper gondola sections, will be located in the same location as the previously analyzed top Bashor Gondola terminal. Both the upper and lower components of the Wild Blue Gondola may be powered by the mid-station; that is, Wild Blue Gondola Stage 1 would be top drive in design and Wild Blue Gondola Stage 2 would be bottom drive, or Stage 2 of the gondola may be top-drive. Final design will be determined prior to construction.

With the construction of the Wild Blue Gondola, challenges outlined in the existing conditions will be addressed, including insufficient out-of-base capacity and unacceptable access times to popular terrain. The gondola will transport 3,200 skiers and riders per hour from the base area to higher elevations on the mountain. Not only will guests have an additional option out of the base area, they will also be able to access certain areas of the ski area more quickly. Currently, for guests to get from the base area to the top of Sunshine Peak takes nearly an hour by taking the gondola to Thunderhead, skiing down *Spur Run* to the base of Sundown Express, and then riding Sundown Express to access the top of Sunshine Peak. Access to the top of Sunshine Peak would take skiers and riders about half as long riding on the Wild Blue Gondola.

Sunshine II was conceptualized in past MDPs. The new lift and expanded terrain network in this area is warranted due to the demand for this type of terrain, the popularity of the current Sunshine Express, the availability of similar terrain in the same general vicinity and the excess trail capacity on the existing lift. The new Sunshine II lift is planned as a detachable quad with an hourly capacity of 2,400 pph. The lift would service the mountain to the south of the existing Sunshine Express.

The third new lift, Pioneer Ridge, and several beginner carpets in the Bashor Bowl area have been previously approved through the 2018 EIS. A complete description of the lifts can be found in Chapter 4. At this time, Steamboat intends to install five carpets in Bashor Bowl—four of them relocated from the base area and one new carpet.

## 2. Upgrade Lift Projects

Six lift upgrade projects are planned: Sunshine Express, Storm Peak Express, Sundown Express, Thunderhead Express, Elkhead Express, and South Peak lift.

Sunshine Express and Storm Peak Express are both currently detachable quads from 1997 and 1992, respectively. Due to their age and popularity, the lifts are planned to be replaced with newer technology in the same alignment and with the same capacity of 2,400 pph.

Sundown Express, Thunderhead Express, and Elkhead Express are all planned to be upgraded from detachable quad to detachable six-person lifts with a capacity of 3,200 pph. The new lifts are planned in the same alignment as the existing lifts. Depending on design of the lift and construction, widening may be needed to accommodate the lift aerial corridors. The increased capacity is needed due to the popularity of each of these areas, the importance of egress in the case of Elkhead Express, and the removal of the Priest Creek lift in the case of Sundown Express.

South Peak lift is also planned to be upgraded due to aging lift infrastructure. The existing lift was constructed in 1984. The lift would be replaced with either a fixed grip or detachable quad.

The Rough Rider lift and the realignment of Bashor lift in the Bashor Bowl area have been previously approved through the 2018 EIS. A complete description of the lift upgrade can be found in Chapter 4.

### 3. Lift Removal Projects

Due to redundancy in the existing lift network, the Priest Creek lift is planned to be removed. Depending on site-specific conditions, tower and terminal foundations would be abandoned in place or chipped down to grade if determined to obstruct the skiing experience.

The Preview lift is also planned for removal in order to open up valuable space in the base area, improve skier circulation in this busy lower mountain egress zone and improve the guest experience by moving beginner terrain from the busy base area skier zone to the spacious Bashor Bowl area.

### 4. Other Lift Projects

As part of the Upgrade Plan, the existing pulse gondola, Wildhorse, would ideally be replaced with a higher capacity gondola and aligned for easier access to the lift from the Meadows Lot. Alternatively, a parallel lift would be installed by SSRC. In either scenario, this would eliminate the need to provide shuttles from this parking lot. Because the gondola is not owned but is operated by Steamboat, additional arrangements would need to be made for this investment to be realized.

As needed, Steamboat would also replace any lifts due to aging infrastructure or identified needed upgrade.



**Table 8. Lift Specifications –Upgrade Plan**

LIFT NAME, LIFT TYPE	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	AVERAGE GRADE (%)	HOURLY CAPACITY (PPH)	ROPE SPEED (FPM)	CARRIER SPACING (FT)	LIFT MAKER/ YEAR INSTALLED
Gondola	9,075	6,900	2,175	8,856	25	3,600	1,200	160	Doppelmayr/1986 – Upgraded 2019
Pioneer Ridge II/D4	9,795	7,910	1,885	6,670	28	1,800	1,000	133	Previously Approved
Christie Peak Express/D6	8,017	6,920	1,102	4,636	24	3,200	1,000	113	POMA/2007
Christie III/C3	8,016	6,983	1,033	3,738	28	1,710	500	53	Yan/1979
Wild Blue Gondola Stage 1/G8	7,502	6,915	587	4,699	16	3,200	1,200	169	Previously Approved
Wild Blue Gondola Stage 2/G8	10,369	7,502	2,867	12,351	24	3,200	1,200	169	New
Bashor Bowl/C4	7,831	7,485	346	1,615	21	2,400	500	50	Previously Approved
Desperado/C	--	--	25	251	10	600	100	10	Relocated to Bashor
Sidewinder/C	--	--	20	201	10	600	100	10	Relocated to Bashor
Sundance/C	--	--	20	201	10	600	100	10	Relocated to Bashor
Wrangler/C	--	--	20	201	10	1,200	100	5	Relocated to Bashor
Bashor Beginner/C	--	--	20	201	10	600	100	10	New
Thunderhead Express/D6	9,075	7,445	1,630	5,539	29	3,200	1,000	75	Upgrade
Burgess Creek/C3	9,202	8,267	939	3,490	27	1,800	500	50	POMA/2004
Storm Peak Express/D4	10,380	8,213	2,159	6,884	31	2,400	1,000	100	Doppelmayr/1992
Four Points/C3	9,761	8,400	1,361	4,050	34	1,411	500	64	Yan/1983
Bar-UE/C2	10,371	9,015	1,356	4,814	28	1,025	500	59	Lift Engineering/1977

**Table 8. Lift Specifications –Upgrade Plan (cont.)**

LIFT NAME, LIFT TYPE	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	AVERAGE GRADE (%)	HOURLY CAPACITY (PPH)	ROPE SPEED (FPM)	CARRIER SPACING (FT)	LIFT MAKER/ YEAR INSTALLED
Sundown Express/D6	10,386	8,450	1,936	5,530	35	2,800	1,000	86	Upgrade
Elkhead Express/D6	9,204	8,446	762	2,394	32	3,200	1,000	113	Upgrade
South Peak/D4	9,387	9,075	312	1,683	19	2,400	450	45	Upgrade
Sunshine Express/D4	10,390	9,137	1,256	5,563	23	2,400	1,000	100	Upgrade
Buckaroo/C	--	--	8	80	10	1,200	64	3	Magic Carpet/1996
Rough Rider/C4	7,645	7,500	145	758	19	1,800	450	60	Previously Approved
Morning Side/C3	10,532	9,990	542	2,683	20	1,800	500	50	Garaventa CTEC/1996
Pony Express/D4	9,735	8,085	1,650	4,967	33	1,800	1,000	133	Garaventa CTEC/1998
Sunshine II/D4	10,080	9,050	1,030	6,048	17	2,400	1,000	100	New

## C. UPGRADE TERRAIN NETWORK

The Upgrade Plan adds nearly 190 acres of new or improved terrain at Steamboat for a total of 1,550 acres. These upgrades would allow for expanded ski terrain and resort capacity, and more efficient use of existing and proposed ski area facilities by improving skier circulation and offering more terrain popular with Steamboat guests.

For details of the Upgrade Plan terrain specifications, refer to Appendix C.

### 1. Planned Terrain Projects

The two main terrain projects in this Upgrade Plan that have not been previously proposed include the Sunshine II trails, and encompassing Fish Creek terrain into Steamboat's operational boundary. Both are within Steamboat's existing SUP boundary. The 90 acres of gladed terrain as part of the Pioneer Ridge Pod and the beginner terrain and ski run modifications in Bashor Bowl have been previously approved and are described in detail in Chapter 4.

Sunshine Pod terrain expands Steamboat's trail network by approximately 60 acres across 11 trails, plus another approximately 60 acres of tree skiing between the designated trails. The trails are designed as novice to intermediate terrain. This project will add needed terrain across these ability levels which is in high demand at Steamboat.

The second main Upgrade Plan terrain project is to encompass Fish Creek terrain into Steamboat's operational boundary. The terrain would increase Steamboat's operational boundary by 260 acres. Currently within the Fish Creek area, skier exit paths are not readily defined and often involve hiking. To create a safer and more efficient path for ski patrol toboggan evacuations, and to guide skiers to the previously approved Pioneer lift and Burgess Creek Bridge, an approximately 10,400-foot-long and 15-foot-wide groomable egress snow trail is planned beginning at Fish Creek and connecting to previously approved Trail F. Selective thinning would improve the skiing experience in this area as well.

This area contains unique terrain features not found within the current operational boundary. It is routinely skied by locals and guests seeking untracked and expert terrain. Guests inexperienced with the terrain and unprepared for the area's technical difficulty, such as cliff bands present in the northern portion of the area, often require ski patrol assistance to safely exit or to respond to medical emergencies. Despite the area being outside of the operational boundary, Steamboat ski patrol has responded to 42 rescues within the Fish Creek area since the 2016/17 season. Currently, ski patrol response is hindered by undefined skier paths, which increases response times and challenges ski patrol's ability to transport skiers to developed terrain and emergency facilities.

The *Broadway* trail, the easiest route out of the Sunshine Pod, was originally constructed in a less than ideal manner, with several narrow and steeper sections. The upper portion of *Broadway* trail has been widened and re-graded. While that measure made the upper section much better, the lower section, just after the switchback, has now become a point of concern, causing a bottleneck with crowding, and creating apprehension in skiers. Improvements to the *Broadway* trail will greatly increase skier capacity, further easing egress congestion. The *Broadway* project was included in the previous MDPA of 2011.

The *Sundial* trail, including the straightening of the trail to merge better with *Tomahawk*, the widening of the bottom of the trail, and the blasting of large boulders, is planned concurrent with the installation of snowmaking infrastructure on the trail. The improvements would widen and smooth the ski trail and make the transition into *Tomahawk* easier for skiers.

The *Spur Run* trail, a key access route from Thunderhead Lodge to Sunshine Pod, has challenges due to grade. The trail is planned to be regraded and realigned to provide for a better guest experience on this trail. The Spur Run project was included in the previous MDPA of 2011.

A number of other planned terrain projects in Bashor Bowl and Pioneer Ridge have been proposed in prior MDPA documents and have approvals. A complete description of these projects can be found in Chapter 4.

In addition to the above trail improvements, Steamboat plans to modify the Maverick halfpipe. As with all ski areas, modification of terrain park operations is dynamic and constantly evolving to meet guest expectations and improve the guest experience.

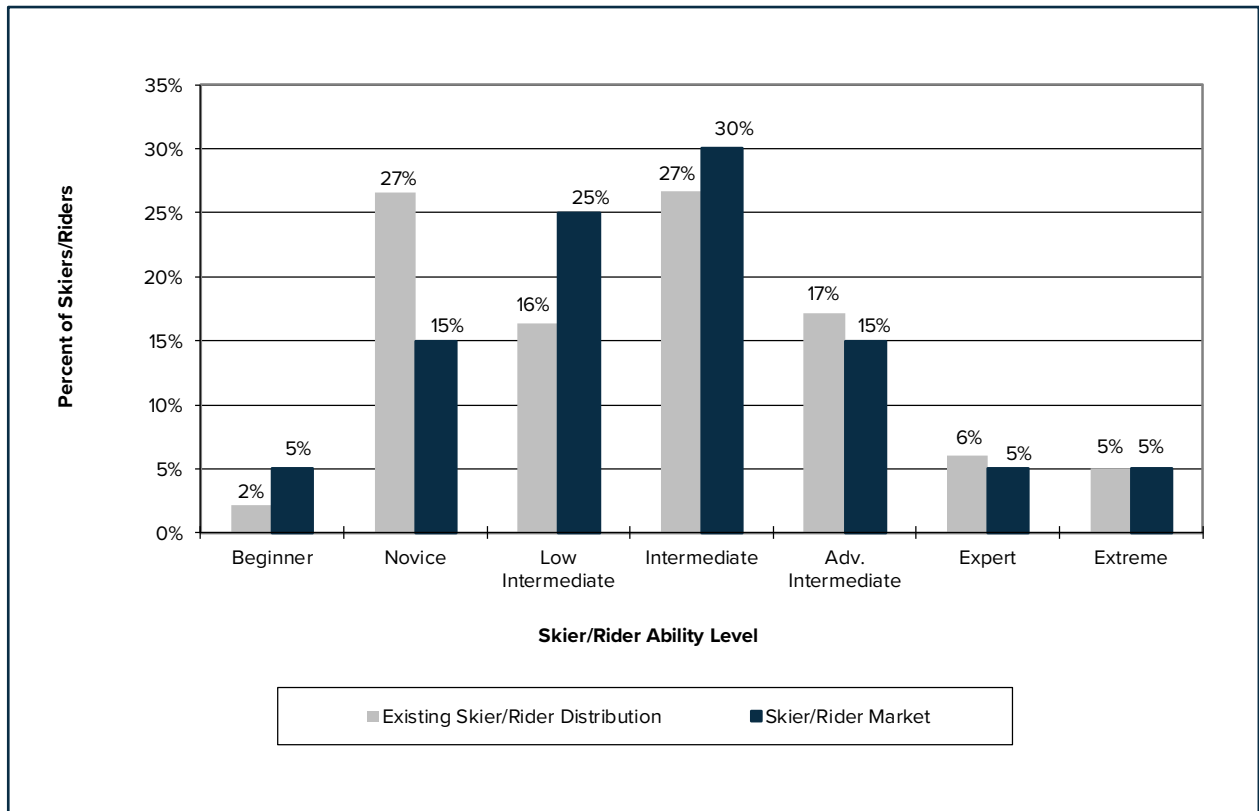
## 2. Terrain Distribution by Ability Level

An analysis of the distribution of terrain by skier ability level for Steamboat’s upgraded trail network demonstrates an improvement over existing conditions for the balance of skier ability levels.

**Table 9. Terrain Distribution by Ability Level – Upgrade Plan**

SKIER/RIDER ABILITY LEVEL	TRAIL AREA (ACRES)	SKIER/RIDER CAPACITY (GUESTS)	SKIER/RIDER DISTRIBUTION (%)	SKIER/RIDER MARKET (%)
Beginner	12	347	2	5
Novice	233	4,185	27	15
Low Intermediate	184	2,577	16	25
Intermediate	420	4,202	27	30
Advanced	387	2,707	17	15
Expert	315	945	6	5
Extreme	NA	800	5	5
TOTAL	1,550	14,963	100	100

Chart 4. Terrain Distribution by Ability Level – Upgrade Plan





## D. CAPACITY ANALYSIS UPGRADE

### 1. Comfortable Carrying Capacity

The calculation of Steamboat’s CCC under the Upgrade Plan is an important measure by which the resort’s guest service facilities can be evaluated and planned. As a result of the lift and terrain network upgrades, Steamboat’s CCC increases from 13,050 guests to 16,310 guests. The proposed CCC represents a 25 percent increase in the number of guests that can be comfortably accommodated at Steamboat as a result of the recommended lift and terrain improvements.

For detailed calculations of the Upgrade Plan daily lift capacity, refer to Appendix C.

### 2. Density Analysis

Trail density analysis compares the calculated trail density of each lift pod to the desired trail density for that area. The existing Steamboat trail density analysis illustrated the resort was well-balanced with regards to trail density and density index. The Upgrade Plan essentially maintains that balance with a terrain density of 9 guests per acre (compared to the target trail density of 11 guests per acre) and maintains the density index of 80 percent (existing density index is 69 percent). This situation is the result of the amount of planned new terrain balancing with the planned lift capacities.

For detailed calculations of the Upgrade Plan density analysis, refer to Appendix C.

#### a) Lift Network Efficiency

As previously discussed, this document analyzes Lift Network Efficiency by calculating the average CCC per lift. Optimally, the average CCC per lift would likely be close to 1,000. Industry-wide, the average CCC per lift is approximately 650. The existing average CCC per lift for Steamboat is 736, meaning that the Steamboat lift network operates above the industry average. With the recommended improvements to the lift network, the average Lift Network Efficiency would increase by 3 percent, to 758. This is a very significant increase and is the result of replacing existing lifts with higher capacity or newer infrastructure.

#### b) Terrain Network Efficiency

As previously discussed, Terrain Network Efficiency refers to the amount of effort required to properly maintain a resort’s terrain. The most efficient scenario is to have a quantity of terrain that closely meets the target density requirements. An effective way to review terrain efficiency is to interpret the density analysis. Under the Upgrade Plan conditions, the overall “Density Index” figure remains similar at 67 percent, maintaining a balanced and efficient terrain network.

## E. GUEST SERVICES FACILITIES, FOOD SERVICE SEATING & SPACE USE ANALYSIS UPGRADE

### 1. Guest Services

New on-mountain guest service facilities are focused in the Sunshine Pod and Bashor Bowl because these areas are currently very popular with guests and will become more so with the proposed upgrades. The Upgrade Plan guest service improvement projects include a new on-mountain facility at the top of Sunshine Peak, the previously approved Bashor Restaurant and an expansion of the ski services at Thunderhead Lodge. These facilities will provide space to accommodate the Upgrade Plan CCC of 16,310 guests per day. Even with these on-mountain expansions, Steamboat should continue to explore the need to expand and improve base area operations at the resort. Also, the 2011 MDPA includes a new restaurant near the Sunshine II lift beside *Lower Tomahawk*. Once the proposed Sunshine Restaurant is operational, Steamboat will observe operations in the Sunshine Pod and reassess the need for the Sunshine II restaurant; Sunshine II restaurant remains as a potential project under this MDP.

The Sunshine Restaurant is a much-needed addition to on-mountain services at Steamboat and will provide guest services for the Sunshine Pod. This pod provides a large quantity of the low intermediate and intermediate terrain for Steamboat and currently lacks sufficient guest service space, particularly food and beverage services. Under existing conditions, when the Rendezvous Lodge is overcrowded (a very common occurrence) guests must take Elkhead Express to access Thunderhead Lodge and the base area or take an additional lift ride to access Four Points Lodge. The addition of the Sunshine Restaurant will allow skiers to spend the entire day within the pod without having to leave for these guest services. The restaurant is planned to be approximately 17,000 square feet over two floors and provide 350 restaurant seats. It would be located near the top terminals of the Wild Blue Gondola and Sundown Express. Sewer, potable water tank, water supply line and electricity would be needed for the construction of the facility.

The Bashor Restaurant, approved for an 8,000-square foot footprint, is also planned at the mid-station of the Wild Blue Gondola. The restaurant is planned to be two to three floors with approximately 20,000 to 24,000 square feet of guest service space and seating for approximately 500 guests. This restaurant was previously approved in the 2018 EIS and is reflected in the Upgrade Plan tables and charts. Refer to Chapter 4 for more details about the planned restaurant and Figure 11c for Bashor mid-station site plans.

The Steamboat Ski Area Projects 2015 CE approved the expansion of the Four Points Lodge by adding 40 feet to the west side of the building. The proposed expansion would include a food station, bar, dining area, retail space, and enlarged restrooms. The expansion would add an additional 174 restaurant seats and is reflected in the Upgrade Plan tables and charts. Refer to Chapter 4 for more details about the Four Points Lodge expansion.

Thunderhead Lodge is planned for minor changes, including the installation of a new elevator and expansion of skier services areas on level one.

## 2. Space Use Analysis

Based on an upgraded CCC of 16,310 guests, the recommended ranges and programming of the guest service functions at Steamboat can be estimated by applying industry averages for space use by service function at resorts of similar market orientation and regional context. This exercise suggests that Steamboat should have between 215,000 and 270,000 square feet of guest services space to accommodate a CCC of 16,310 guests.

Given the existing space use total of 175,600 square feet, plus the additional 17,000 square feet planned at Sunshine Restaurant, approximately 20,000 to 24,000 square feet planned at Bashor Restaurant, and other space use improvements planned for Four Points Lodge, Thunderhead Lodge, and the base area, Steamboat space use would be within the recommended industry average range.

## 3. Food Service Seating

The Upgrade Plan adds more restaurant seats to curb the demand for food service seating currently experienced at Steamboat. Under existing conditions, a deficit of approximately 630 seats is shown (refer to Table 10). Seating space at the new Sunshine Restaurant and Bashor Restaurant will create a significant enhancement to the on-mountain guest experience by providing food and beverage services at popular areas on the mountain.

The Upgrade Plan is projected to add an additional 1,024 seats between the Sunshine Restaurant, Bashor Restaurant and expansion of Four Points Lodge. Table 10 summarizes the seating requirements at Steamboat, based on a logical distribution of the CCC to each service building/location, and the need to balance the location of guests during the lunch period to alleviate crowding of lifts, terrain, and guest service facilities. The total resort balance shows a deficit of 404 seats; however, much of this would be provide by third party vendors in the base area.

Because of the needed food service seating in the Sunshine Pod, the previous 2011 MDPA planned a temporary solution to expand the existing outdoor seating deck at Rendezvous Lodge and cover portions of the deck to provide some shelter on inclement weather days. This improvement could provide a quick solution to food service seating demand in this pod. Also, as mentioned earlier, the potential Sunshine II restaurant would address the identified shortage of seats in the Sunshine Pod and at Thunderhead Lodge.



**Table 10. Recommended Restaurant Seating – Upgrade Plan**

	BASE AREA RESTAURANTS	THUNDERHEAD LODGE	FOUR POINTS LODGE	RENDEZVOUS SADDLE LODGE	BASHOR RESTAURANT	SUNSHINE RESTAURANT	TOTAL RESORT
Lunchtime Capacity (CCC)	5,184	4,014	1,537	3,408	1,754	1,230	17,126
Average Seat Turnover	2.5	3.5	3.5	3.5	3.5	3.5	
Existing Seats plus Approved/Planned Seats	1,760	1,120	437	914	500	350	5,081
Required Seats	2,073	1,147	439	974	501	351	5,485
Difference	-313	-27	-2	-60	-1	-1	-404
Existing seating capacity	4,400	3,920	1,530	3,199	1,750	1,225	16,024

## F. PARKING CAPACITY UPGRADE

Table 11 analyzes Steamboat’s parking capacity and needs under the Upgrade Plan, demonstrating a need for 314 parking spaces. Steamboat has been proactive in recent years to address parking and resort access deficiencies; however, these efforts will need to be continued to accommodate the additional visitation. Under the Upgrade Plan, the hotel and lodging shuttles and public transit account for over 30 percent of guests arriving at the resort, 25 percent of guests stay within walking distance of the resort, and 5 percent of guests are dropped off. The remaining guests are parking in the parking lots. SSRC will continue to seasonally lease additional overflow parking at Strings and the UC Health Yampa Valley Medical Center as demand warrants.

As visitation increases at Steamboat, parking and resort access will become even more important to maximize the utilization of the resort’s single on-mountain portal. Under existing conditions, the number of guests per vehicle was 1.9, as surveyed during a 2008 analysis. As anticipated in the Upgrade Plan, the number of guests per vehicle would increase to 2.3 guests per vehicle. Increasing this number accommodates for more guests per parking space. To reach this number, one option is to improve parking efficiency by incentivizing skiers and riders to carpool and increase average vehicle occupancy. Other solutions could include promoting public transit and remote parking facilities and increase the number of guests within walking distance of base areas. These parking solutions will improve the guest experience at Steamboat by reducing congestion and guest confusion when guests arrive at the resort, and by providing adequate parking and transportation to accommodate average visitation.

**Table 11. Recommended Parking at Staging Portals – Upgrade Plan**

	TOTAL
CCC	16,310
Guests getting dropped-off	5,175
Guests in walking distance lodging	4,375
Guests arriving via public transit	2,900
Guests requiring parking	5,835
Guest Per Vehicle	2.3
Required car parking spaces	2,537
Existing parking spaces	2,223
surplus/deficit	-314
Existing staging and parking capacity (guests)	15,588

*Notes:*

Existing parking spaces are currently available at the following parking lots: Meadows Lot = 1,200, Lower Knoll Lot = 60, Upper Knoll Lot = 450, Ski Time Square Garage = 183, Gondola Square Garage = 230

## G. RESORT OPERATIONS UPGRADE

### 1. Snowmaking

Snowmaking is a critical part of Steamboat's operations to ensure a consistent and reliable snow surface for a quality guest experience, combined with the relatively low elevation of the base area compared to other major Colorado ski resorts. Steamboat currently has 295 acres of snowmaking coverage, 22 acres of which are manually covered by dragging guns and hoses from adjacent trails and snowcats to cover critical zones. As outlined in Steamboat's 2015 Snowmaking MDP, an additional 125 acres is planned for snowmaking coverage, for a total of 420 acres. This represents over 25 percent of Steamboat's developed terrain network. Through this MDP process, an additional 13 acres of snowmaking coverage is also planned on *One O'Clock* and *Two O'Clock* in the Sunshine Pod. Refer to Figure 12 for the planned snowmaking coverage areas.

As discussed in Chapter 4, 53 acres of snowmaking coverage and infrastructure in Bashor Bowl and the Pony Express Pod were approved in the 2018 EIS.

Steamboat's Snowmaking Master Plan also details snowmaking system-wide upgrades to allow for more snowmaking infrastructure to be added to the system. This includes improving pressure throughout the system to allow for low energy snowguns to be installed at upper ranges, installing new equipment in critical zones and adding a booster pump station at higher elevations.

### 2. Grooming

Grooming is another important mountain operation that directly impacts the guest experience at Steamboat. Due to the additional 80 acres of terrain planned as part of the Upgrade Plan in the Sunshine Pod and the previously approved terrain in Bashor Bowl and Pony Express Pod, one to two new snowcats would be needed if Steamboat choose to groom all of this terrain regularly. The existing maintenance shop at the bottom of Thunderhead Express is currently at capacity accommodating the existing fleet. Modifications to the shop or an addition may be necessary if more snowcats are determined necessary.

### 3. Night Skiing

Current night skiing operations would continue as-is under the Upgrade Plan. Additional lighting is also planned in the Bashor Bowl area for tubing and night skiing operations. This would be supported by the lower segment of the Wild Blue Gondola and the realigned Bashor lift.

### 4. Ski Patrol/First Aid

A ski patrol duty station is planned for the top of Sunshine II and a second duty station is previously approved at the top of Pony Express. Both facilities are planned to be small structures/outposts (approximately 10 feet by 15 feet) with the capacity for three patrollers and storage of equipment.

When the new Sunshine Restaurant is constructed at Sunshine Peak, the ski patrol functions currently staged out of the Sunshine Peak PHQ facility may be moved into the new building, and the existing PHQ building would either be used for other functions or demolished. The decision whether to move ski patrol into the new building and repurpose or demolish the existing facility will be made when detailed site planning and architecture is undertaken for the Sunshine Restaurant.

## 5. Maintenance Facilities

Steamboat's current maintenance facilities are in fair condition and provide sufficient storage for current needs. With the implementation of the Upgrade Plan and depending on resort operations, Steamboat may need to add storage and maintenance space to their existing operations. For example, Steamboat intends to enlarge the outdoor storage area located uphill of the maintenance shop for summer storage of equipment such as terrain park rails, etc. Additionally, if cabin storage of the Wild Blue Gondola is determined beneficial, a separate storage facility at the mid-station would need to be constructed. To store all the gondola cabins, approximately 28,000 square feet of storage would be needed. This is planned on two floors adjacent to the gondola mid-station and the Bashor Restaurant. Refer to Figure 11c for gondola storage site plans.

## 6. Utilities and Infrastructure

### a) Potable Water

Potable water would be provided to the Sunshine Restaurant through the construction of the Beaver Creek pumphouse and collection gallery, the expanded Rendezvous potable water storage tank, and feed line connecting the pumphouse, storage tank, and Sunshine Restaurant. The Beaver Creek pumphouse and collection gallery would be constructed adjacent to the bottom terminal of the South Peak lift and would be approximately 10 feet by 10 feet.

Currently, the Rendezvous storage tank has the capacity for 55,000 gallons. The expanded Rendezvous storage tank would need to be approximately doubled in size and would have a capacity of at least 100,000 gallons. The final size of the expanded storage tank would be based on the final size of the Sunshine Restaurant.

Potable Water Option A would require installation of a potable water pipeline traveling approximately 9,500 feet from the Beaver Creek pumphouse along *Spike* to the beginning of *High Noon*, where it would travel up *High Noon* to the Rendezvous storage tank and then on to the Sunshine Restaurant.

Potable Water Option B would entail the potable water line traveling through an approximately 7,630-foot-long pipeline starting at the Beaver Creek pumphouse, traveling along *Spike* then up *Fawn* to the Rendezvous water tank and pumphouse, and from there to the Sunshine Restaurant along *High Noon*.

### b) Wastewater

Sewer/Electric Option A for the Sunshine Restaurant includes an approximately 5,120-foot-long sewer and electric line that would be trenched southwest of the proposed facility down *High Noon* and tie into the existing sewer and power lines that currently service the Rendezvous Saddle Lodge.

Sewer/Electric Option B would require an approximately 6,050-foot-long trench containing both sewer and electrical lines that would tie into the existing sewer and power lines that currently service the existing Four Points Lodge. This trench would traverse southeast across the *Storm Peak North* and *Storm Peak South* trails to the *Storm Peak Catwalk* and *Traverse* trails to the proposed restaurant.

Prior to connecting to the existing sewer and electrical lines, the capacity and condition of the existing lines would be evaluated and upgraded if necessary.

### c) Electrical Power

To improve on-mountain communication and operations, additional power supply lines and fiberoptic communication lines are proposed. These lines would be trenched with existing utility lines where possible. Power supply lines would be connected to all new facilities, snowmaking equipment, and lift terminals. Power to the mid-station of the Wild Blue Gondola would be provided from the existing Burgess Creek lift. Power would be supplied by the Yampa Valley Electric Association, which currently provides electricity to all the base area and on-mountain facilities.

### d) Communications

Fiberoptic communications would be installed to all new lift terminals and the Sunshine Restaurant in order to ensure smooth operations and communications between areas of the mountain. Fiberoptic communications to the top of the Sunshine Peak would be provided along the proposed upper Wild Blue Gondola extension.

### e) Fuel Storage

No additional fuel storage is planned at this time.

## 7. Mountain Roads

Two sections of road are planned to be improved as part of the Upgrade Plan: the Four Points Road above Four Points Lodge and the Why Not/Thunderhead Maintenance Shop road.

The Four Points Road is proposed to be upgraded above the Four Points Lodge to the top terminal of the Storm Peak Express. This road would be upgraded to a similar condition as the road segment below the Four Points Lodge. The road would be graded and widened. Large boulders would be removed where necessary, with a focus on improving the existing switchbacks, in order to improve access for maintenance vehicles. Approximately 1.6 miles of road would be improved. The road would be expanded to be about 15 feet wide, with the switchbacks being graded and widened to be approximately 20 feet wide, as necessary. Drainage on the road segment would also be improved.

The Why Not/Thunderhead Maintenance Shop road and trail improvement area would improve skier circulation and mountain operations access to the Why Not Road. The area would be graded and the ski trail would be realigned for better flow. Approximately 2.5 acres of terrain, existing ski trail and mountain road would be impacted by the project.

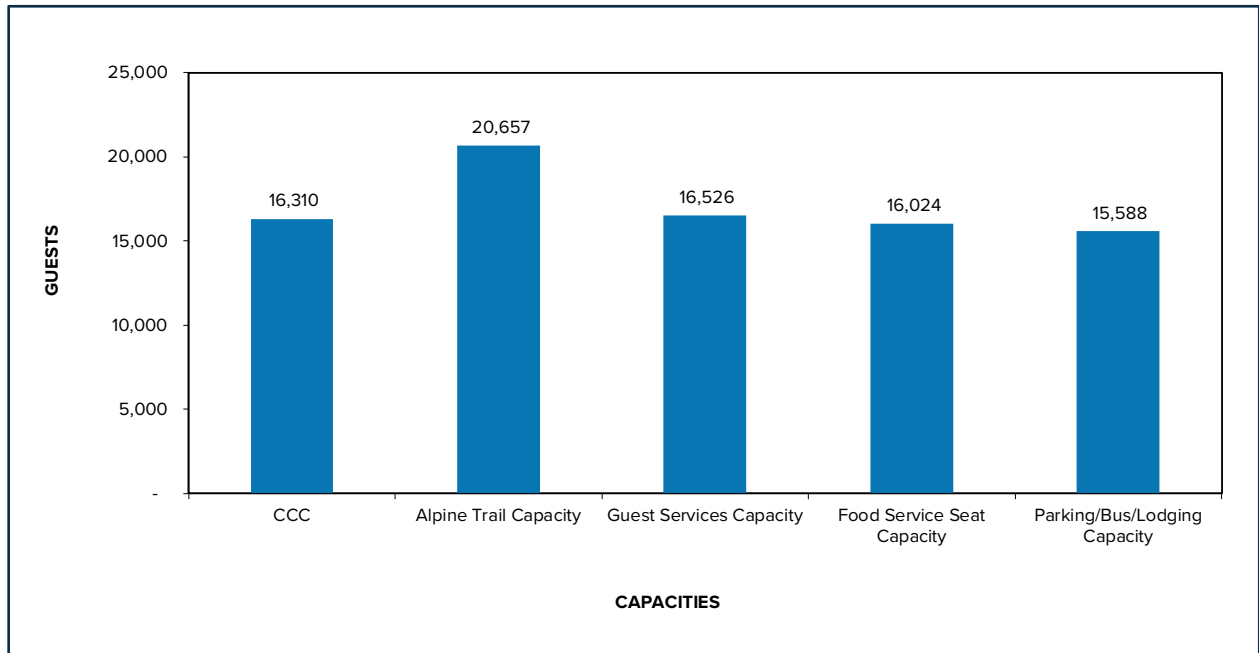
A new road would be built from the Maintenance Shop to the proposed Bashor Restaurant for maintenance and servicing. The proposed road would bridge over *Right-O-Way* and *Swinger*.



## H. UPGRADE PLAN RESORT CAPACITY BALANCE AND LIMITING FACTORS

The overall balance of the Upgrade Plan 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 5. The Upgrade Plan increases capacity of the resort by 25 percent from 13,050 to 16,310 guests on a design day. As compared to the existing conditions capacities (refer to Chart 3), capacities for guest services, food service seating and parking and resort access have all increased to accommodate the additional on-mountain lift and terrain capacities. The Bashor Bowl improvements will upgrade the beginner guest experience while the Sunshine Pod improvements will provide additional on-mountain guest services and a better overall experience for guests using this pod. As Steamboat improves these areas, the one base area portal to service 16,000 guests will need to be a focus in order to efficiently transport guests to the base area and provide adequate services at the beginning and end of day.

Chart 5. Resort Capacity – Upgrade Plan



# I. MULTI-SEASON AND ALTERNATIVE ACTIVITIES UPGRADE

Multi-season and alternative activities at ski areas, both on private and NFS lands, have become increasingly popular in recent years. This growth has been driven by new technologies in summer recreation equipment, as well as an increasing number of people who seek available recreational opportunities in safe and well-managed settings throughout the year.

The SAROEA provided an opportunity for the Forest Service to authorize additional seasonal and year-round recreation activities at ski areas on NFS lands. With that guidance, Steamboat has identified conceptual multi-season and alternative activities with the goal of increasing the number and variety of available recreational opportunities to guests of the Routt National Forest throughout the year.

Steamboat has created an upgraded plan for multi-season and alternative activities commensurate with the current market demand for forest-based recreation. Details on planned upgrades are presented below, but specific project locations and associated maps will be developed during site-specific analysis, as required by NEPA. These multi-season and alternative activities are anticipated to be implemented in accordance with the zone characteristics, as described in Chapter 3.

The proposed activities are illustrated on Figures 14 and 15. A description of the proposed projects follows.

## 1. Multi-Season and Alternative Activities Guest Experience Upgrade

As discussed in Chapter 3, Steamboat has a robust summer activities program in the base area. As part of the Upgrade Plan, Steamboat would expand upon their existing offerings. Steamboat has a unique opportunity to offer summer guests, typically a more diverse demographic than the winter guest, access directly to NFS lands and provide programming to introduce them to the surrounding environment.

Steamboat's Upgrade Plan for the multi-season offerings include expanding summer activities in the base area with intensive summer programming and activities, in Bashor Bowl with summer tubing and other similar activities and at Sunshine Peak with special events and guided programs, installing an Aerial Adventure Park near Thunderhead Lodge, as well as expanding their existing hiking and mountain biking trail network. Each of these activities will be located in appropriate zones across the mountain as further described in detail in this section.

## 2. Summer "Activity Zones" Upgrade

Following the guidance provided in Forest Service Manual 2343.14 – Additional Seasonal and Year-Round Recreation at Ski Areas, this MDP has established "zones to guide placement and design of additional seasonal or year-round recreation facilities, basing the zones on the existing natural setting and level of development to support snow sports." Each zone is described according to its desired setting, experience and compatible activities and facilities. Exact activities and alignments have not been designed, rather what is appropriate for a given zone is described below.

## 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;
- Considerable human activity (people recreating and/or resort operations) occurs 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 lifts and buildings, are present.

The base of Steamboat is the only Zone 1. This area includes Steamboat private property, maintenance buildings, and infrastructure, as this is where human activity and development is most concentrated at the resort.

### Desired Experiences

Within Zone 1, guests are expected to encounter a high concentration of other guests. 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. Guests will encounter a higher degree of maintenance and operations facilities and activities within Zone 1. Within Zone 1, the concepts in the BEIG will be followed to ensure appropriate design guidelines for both landscape architecture and built architecture are followed. Zone 1 is completely surrounded by Zone 2 on the fringes of developed base and on-mountain areas. This allows guests to experience a gradual transition between the built environment (Zone 1) and more-natural areas that still contain activities and facilities blending with the area's natural setting (Zone 2). 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<sup>17</sup>

Services and activities within a Zone 1 may include food and beverage operations, lodges, special event venues, shelter and emergency services, restroom facilities, landscaped areas, and other activities. At Steamboat, Zone 1 serves as the mountain's gateways, hubs and activity centers, from which guests will access surrounding activities and refuel between activities. A wide range of guest service facilities and recreational, interpretive, and educational offerings are appropriate for Zone 1.

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<sup>17</sup> Because summer and multi-season uses are continually being developed, and activities that do not currently exist may be popular within the next several years, a list of compatible activities is provided for each zone. The intent of the list of compatible activities is to allow for a certain amount of flexibility, since it is impossible to foresee exactly what new activities will be developed over this time. Steamboat will continue to work with the Forest Service to ensure that proposed summer and multi-season activities are suitable for the setting and desired experience within each zone.

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.

## b) Zone 2

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 lifts and buildings, are present.

Three areas within the Steamboat SUP area were designated as Zone 2. These include the Thunderhead Lodge and surrounding area, Four Points Lodge and Sunshine Peak.

### Desired Experiences

Most summer guests entering Zone 2 areas at Steamboat will do so from a Zone 1 area or via the lift network. 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 Steamboat, 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 plan. 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. In addition to hosting these types of activities, Zone 2 should serve 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 as these areas are typically elevated and further within the mountain landscape. Activity offerings could include access to zip lines and canopy tours, guided hikes and interpretative opportunities, extended hiking trails, mountain biking trails, challenge/aerial adventure courses, other natural resource and gravity-based activities and special events venues.

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 areas within Zone 1. 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.

### c) Zone 3

#### **Setting**

The setting of Zone 3 contains areas of disturbance from ski trail and lift development, but guests can still find a greater degree of remoteness and naturalness depending on their location within the zone. Generally speaking, Zone 3 includes areas where existing lifts are present; however, this was not the determining factor for the designation. 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
- Infrastructure, including lifts and buildings, are present.

Four areas within the Steamboat SUP are designated as Zone 3. These include a small area at the top of Burgess Creek and Elkhead lifts, Rendezvous Saddle Lodge and the area surrounding Four Points Lodge and Sunshine Peak.

#### **Desired Experiences**

The majority of guests will access Zone 3 from the existing trails network. Once in Zone 3, guests will have a variety of opportunities to engage in their surroundings in a more natural and remote environment.

The desired experience in Zone 3 is to offer a diverse set of experiences for guests, which will promote the National Forest as a recreationally, biologically, and geographically diverse landscape. Guests may enjoy interpretive signage that will provide education on their biological, cultural, and historical surroundings. Trail activities—including both hiking and mountain biking—and other recreational activities should be provided in forested settings. This will provide opportunities to learn about the importance of forest health and stewardship.

#### **Compatible Activities and Facilities**

Activities could include mountain biking trails, scenic lift rides, hiking trails, multiple-use trails, canopy tours, challenge/aerial adventure course 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. Existing ski area development (ski trails and lifts) 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.

#### d) Zone 4

The setting of Zone 4 is more remote and provides a great degree of naturalness. Ski area development is limited and, where ski trails are present, larger tree islands and natural terrain prevail. 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
- Infrastructure, including a lift and small buildings, are present.

One area within the Steamboat SUP is designated as Zone 4. It is primarily characterized by dense trees, challenging/isolated topography, minimal trail access, negligible ski resort development, a lack of notable infrastructure/facilities, and predominately located in the more remote portions of the SUP area.

#### **Desired Experiences**

In Zone 4, guests will connect with the more natural setting in a relatively undisturbed environment. Dispersed hiking opportunities will allow guests to experience and interpret areas of the National Forest where natural processes are more evident, allowing for educational opportunities that are not available in more developed zones. The setting in Zone 4 will directly affect the guest experience, and maintaining a more remote setting with opportunities for solitude 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 and 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.

## e) Zone 5

### **Setting**

The setting of Zone 5 is currently physically unaltered by ski area activities. Very few people recreate in these areas of the SUP boundary during the summer. No ski area roads or infrastructure are present in Zone 5. Within the context of the overall SUP area, the following summarizes the setting in Zone 5:

- No ski area roads are present;
- Human activity (people recreating and/or resort operations) is predominantly out of sight, so one would feel completely remote;
- Area is undisturbed or physically unaltered by ski area activity; and
- Ski area infrastructure is only visible at a distance.

Three areas within the Steamboat SUP are designated as Zone 5. It is primarily characterized by remote and challenging terrain on the edges of the SUP.

### **Desired Experiences**

Zone 5 represents the most remote sectors within the SUP. The desired experience is remote and more natural. Guests within this zone would not expect to encounter many other guests.

### **Compatible Activities and Facilities**

The areas with the Zone 5 designation should be left as is with no developed seasonal or year-round activities or facilities.

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# FIGURES

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Figure 2. Property Boundaries

Figure 3. Slope Analysis

Figure 4. Aspect Analysis

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Figure 8. Existing Summer Conditions

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Figure 11b. Bashor Bowl Upgrade Plan

Figure 11c. Wild Blue Gondola Mid-station

Figure 11d. Base Area Upgrade Concepts

Figure 12. Snowmaking Upgrade Plan

Figure 13. Road and Utilities Upgrade Plan

Figure 14. Summer Upgrade Plan

Figure 15. Summer Zones Upgrade Plan

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Figure 1. Vicinity Map  
June 2019

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**SE GROUP**

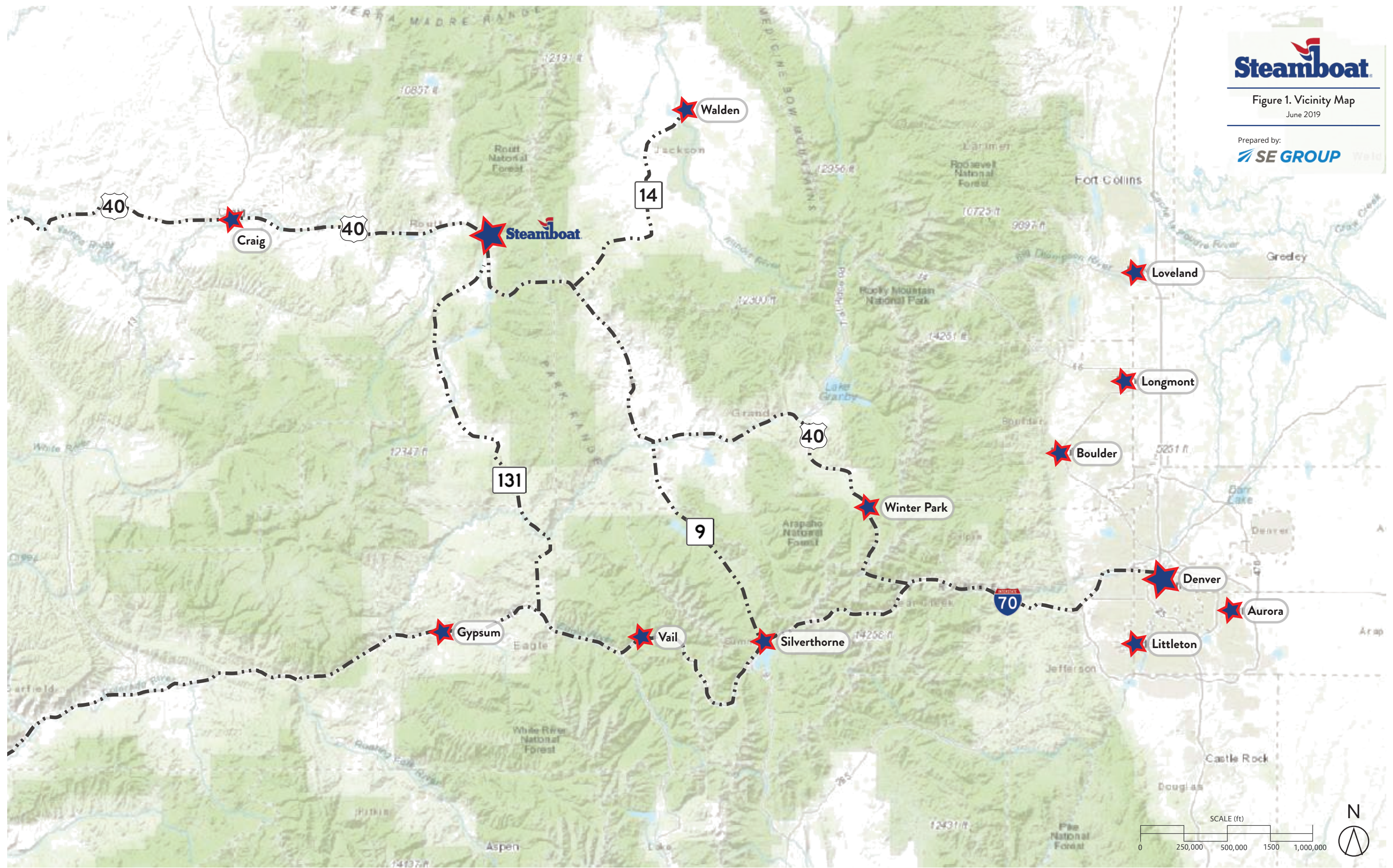




Figure 2.  
Property Boundaries

June 2019

Legend

- SUP Boundary
- Steamboat Property Boundary
- Steamboat Operations Boundary
- Parcel Boundary
- Existing Lift
- Ski Trail by Ability Level
- Existing Mountain Road
- BLM Land
- USFS Land

Prepared by:

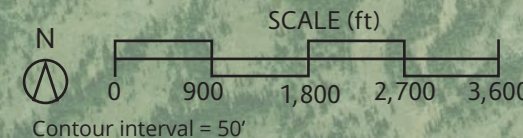
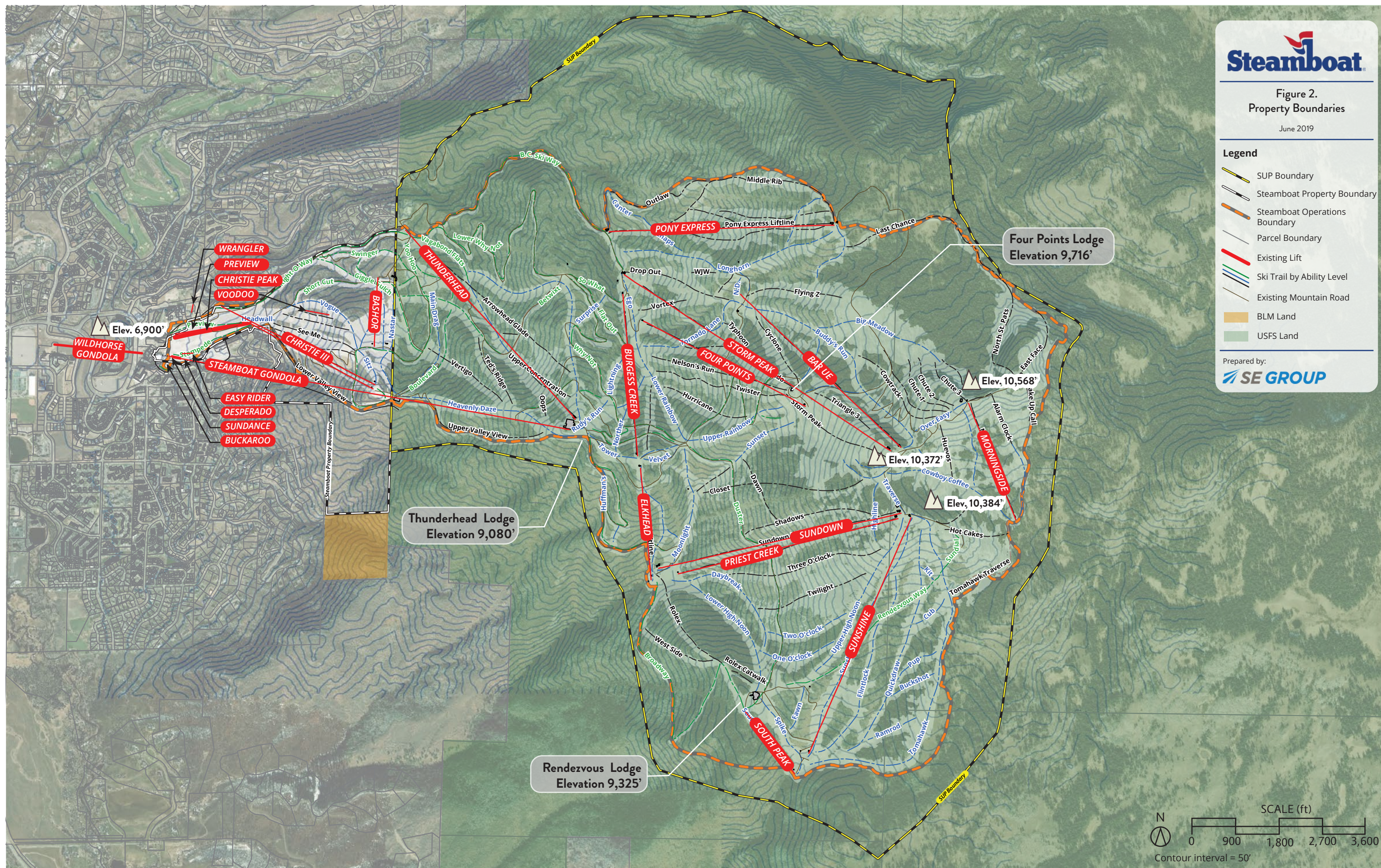
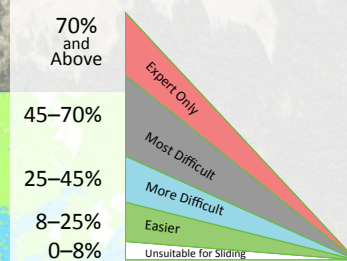




Figure 3. Slope Analysis  
June 2019

Legend

- SUP Boundary
- Parcel Boundary
- Existing Lift
- Ski Trail by Ability Level
- Existing Mountain Road



Prepared by:  
**SE GROUP**

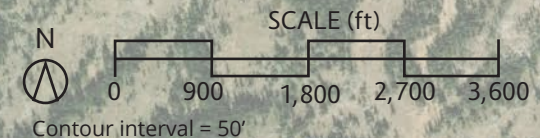
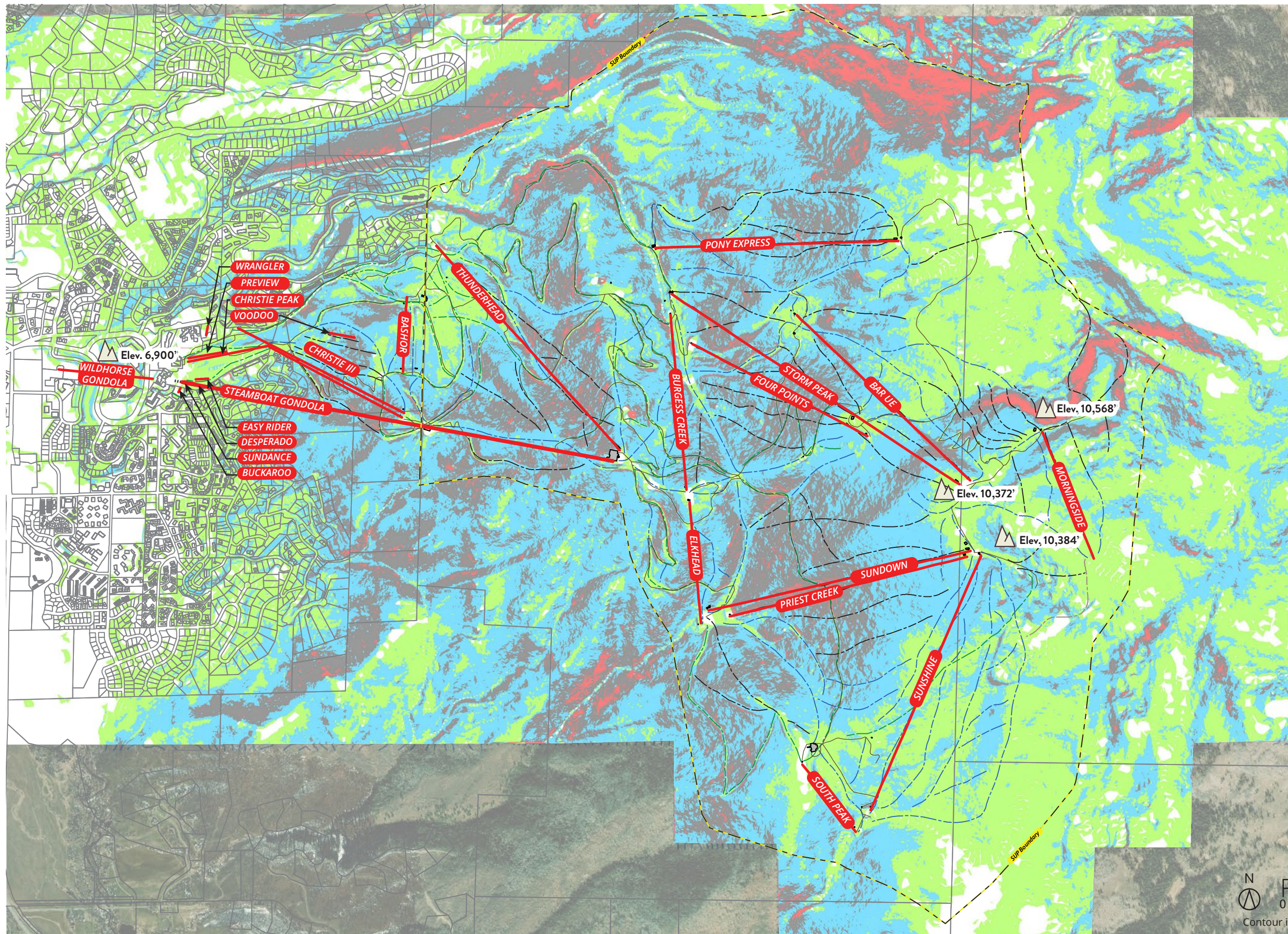
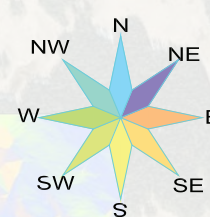




Figure 4. Aspect Analysis  
June 2019

Legend

- SUP Boundary
- Parcel Boundary
- Existing Lift
- Ski Trail by Ability Level
- Existing Mountain Road



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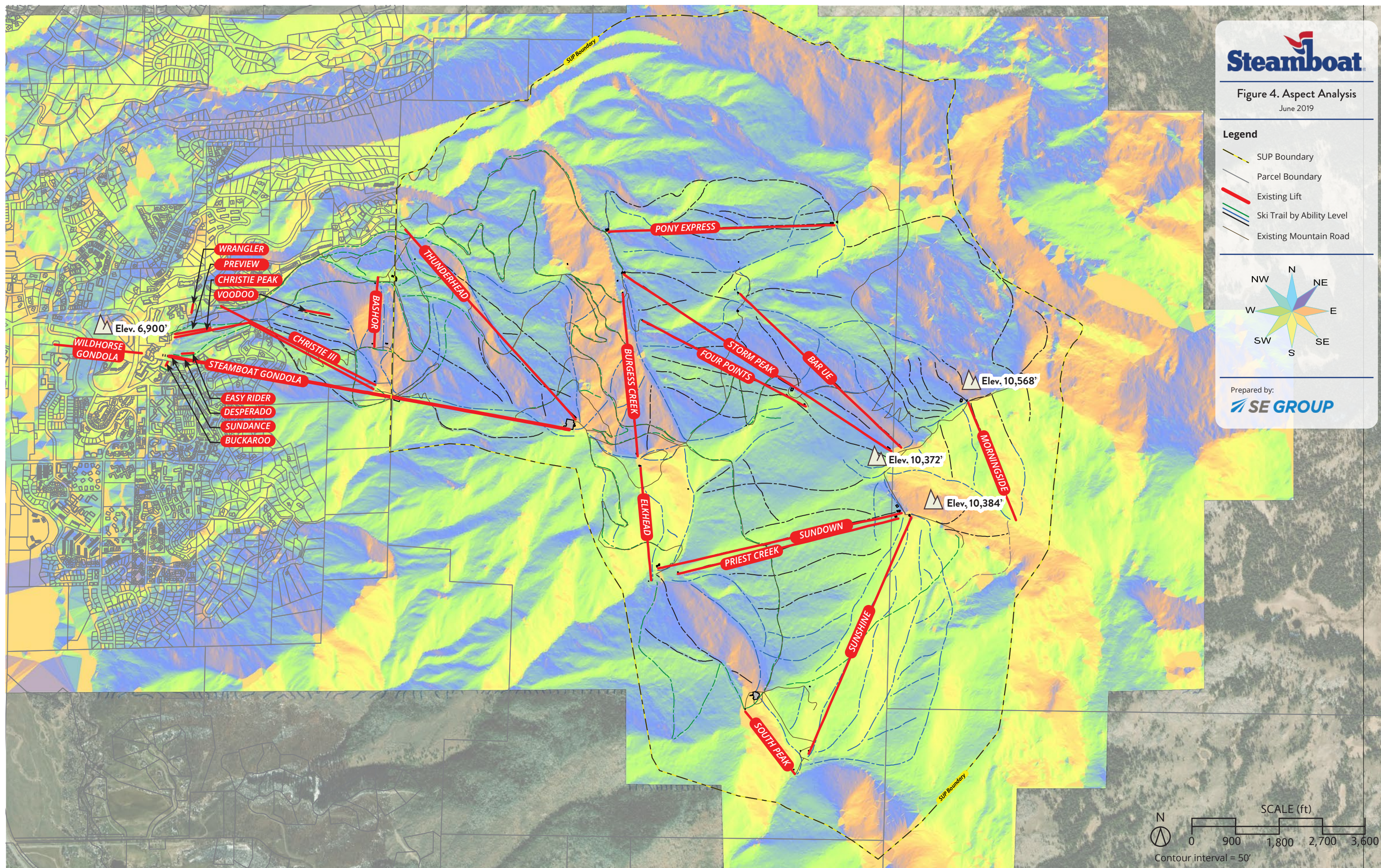




Figure 5. Existing Winter Conditions

June 2019

Legend

- SUP Boundary
- Parcel Boundary
- Steamboat Property Boundary
- Existing Lift
- Ski Trail by Ability Level
- Existing Mountain Road
- Ski Patrol

Prepared by:

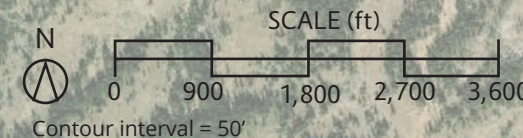
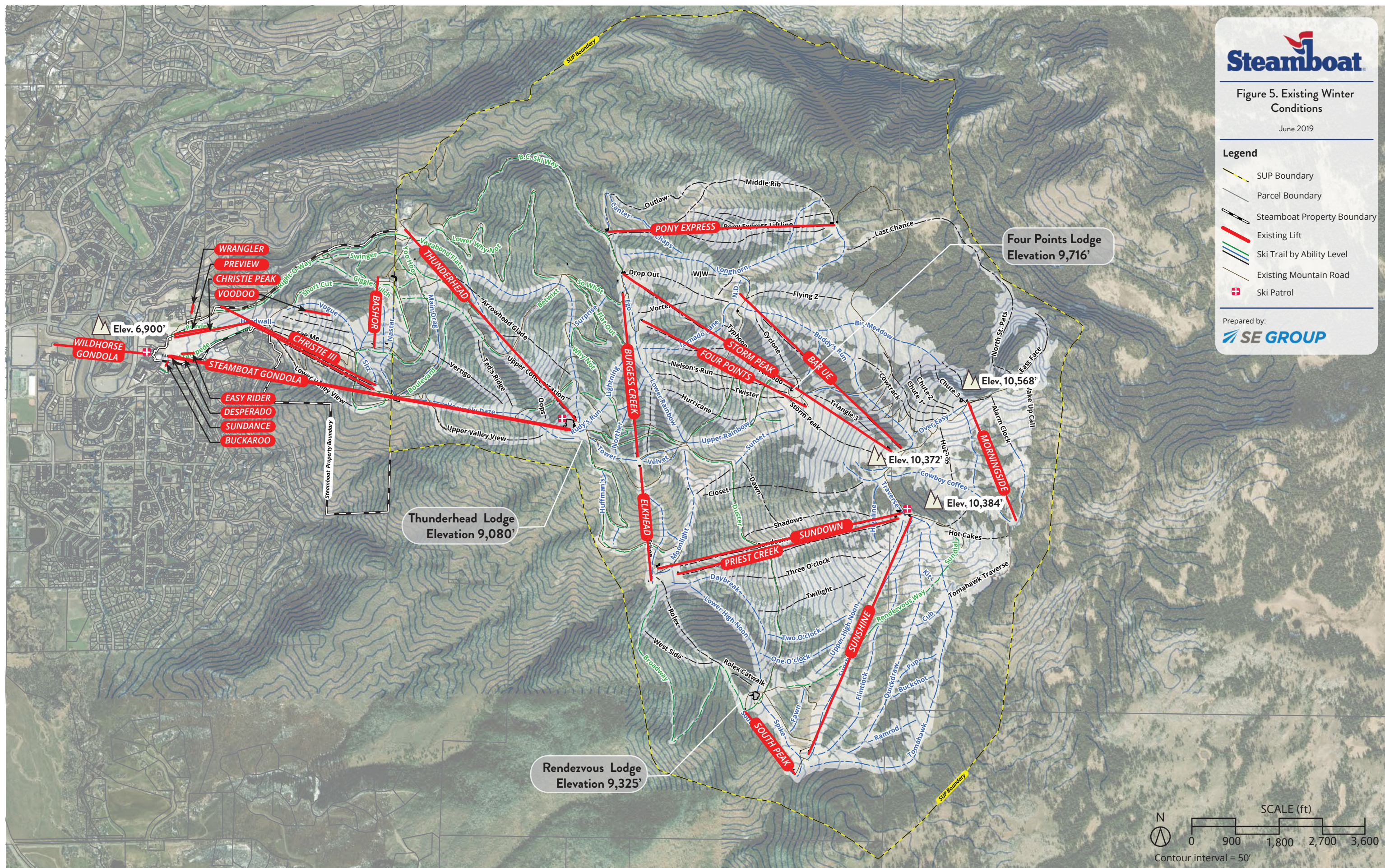




Figure 6. Existing Snowmaking  
June 2019

Legend

- SUP Boundary
- Parcel Boundary
- Steamboat Property Boundary
- Existing Lift
- Ski Trail by Ability Level
- Existing Snowmaking Coverage
- Existing Snowmaking Pipe

Prepared by:

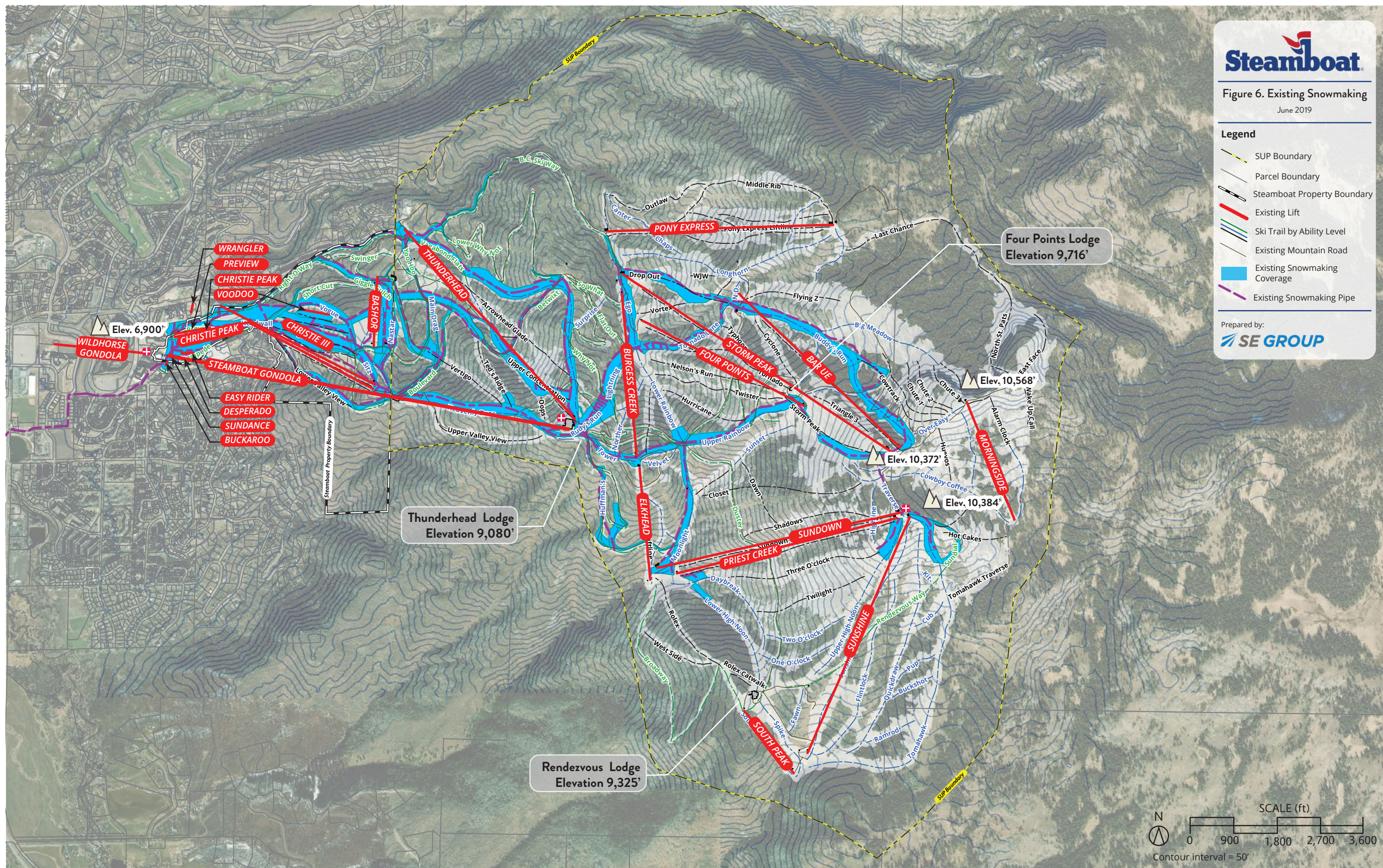




Figure 7. Existing Roads and Utilities

June 2019

Legend

- SUP Boundary
- Parcel Boundary
- Steamboat Property Boundary
- Existing Lift
- Ski Trail by Ability Level
- Existing Mountain Road
- Communication Lines
- Sewer Lines
- Electrical Lines
- Water Lines
- Snowmaking Pipe
- Culvert
- Drainage
- Light
- Ski Patrol

Prepared by:

SE GROUP

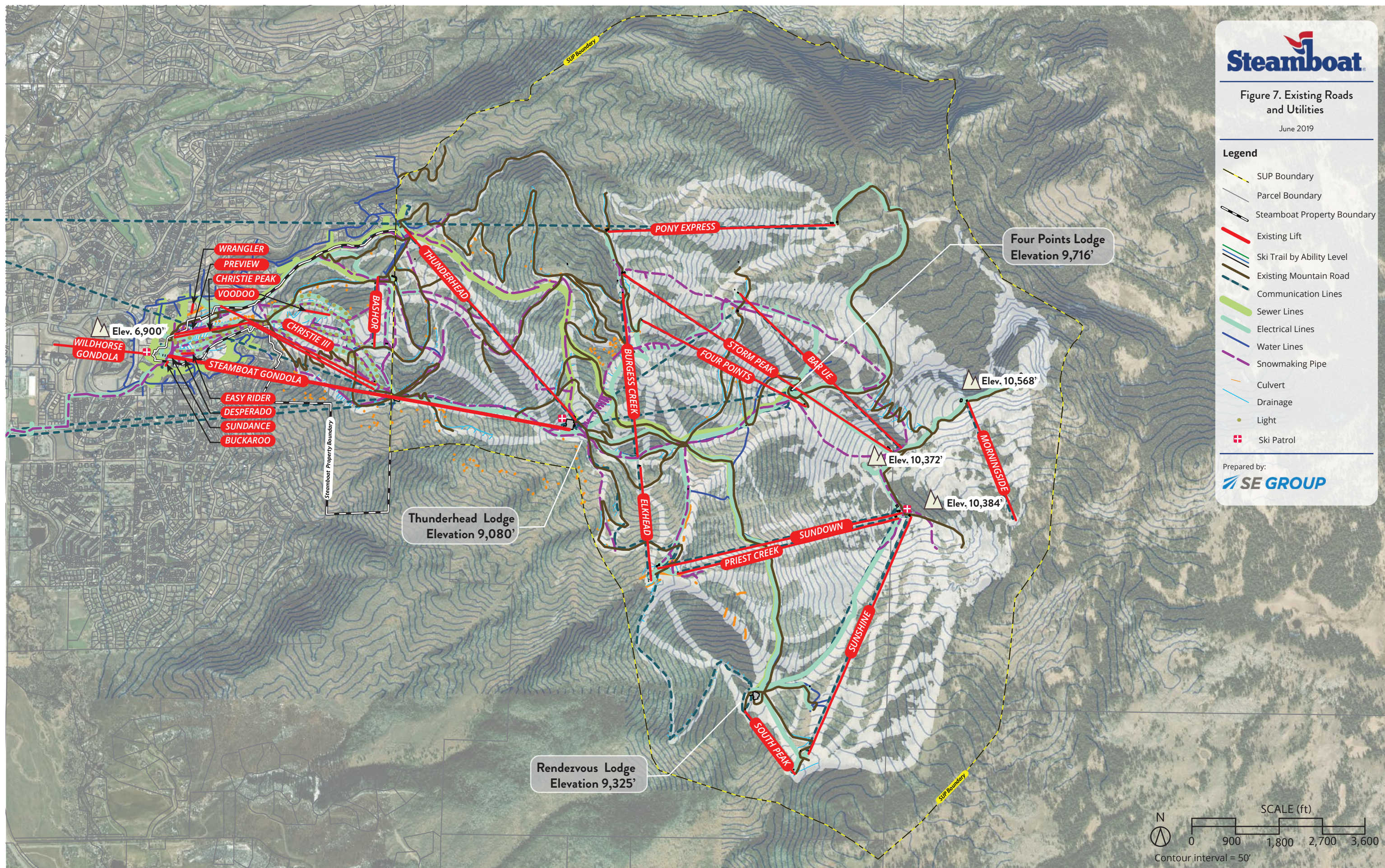




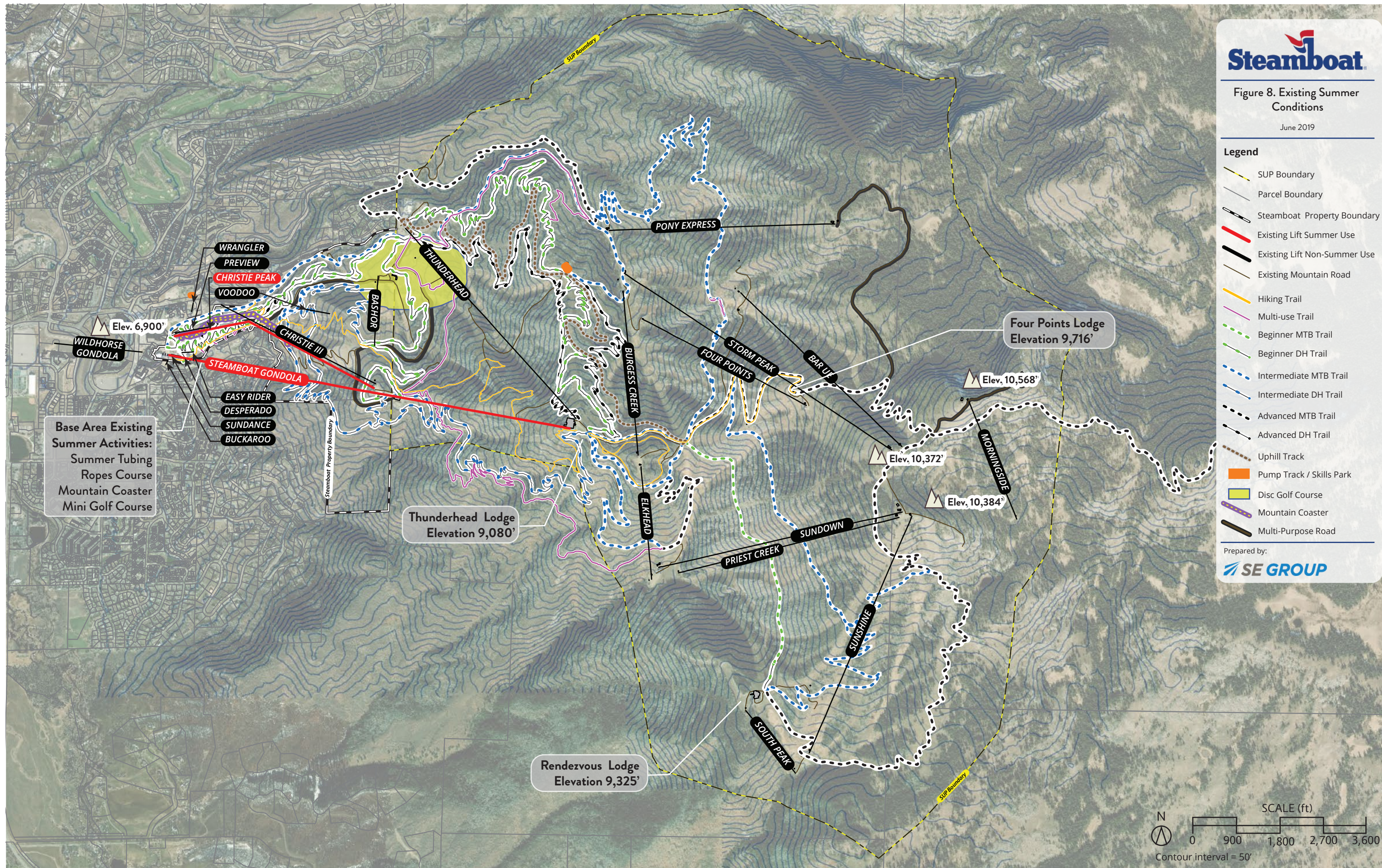
Figure 8. Existing Summer Conditions

June 2019

Legend

- SUP Boundary
- Parcel Boundary
- Steamboat Property Boundary
- Existing Lift Summer Use
- Existing Lift Non-Summer Use
- Existing Mountain Road
- Hiking Trail
- Multi-use Trail
- Beginner MTB Trail
- Beginner DH Trail
- Intermediate MTB Trail
- Intermediate DH Trail
- Advanced MTB Trail
- Advanced DH Trail
- Uphill Track
- Pump Track / Skills Park
- Disc Golf Course
- Mountain Coaster
- Multi-Purpose Road

Prepared by:



Base Area Existing Summer Activities:  
 Summer Tubing  
 Ropes Course  
 Mountain Coaster  
 Mini Golf Course

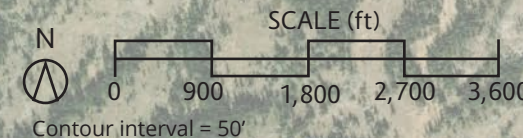




Figure 9. Existing Summer Zones

June 2019

Legend

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5

- SUP Boundary
- Parcel Boundary
- Steamboat Property Boundary
- Existing Lift Summer Use
- Existing Lift Non-Summer Use
- Existing Mountain Road

Prepared by:

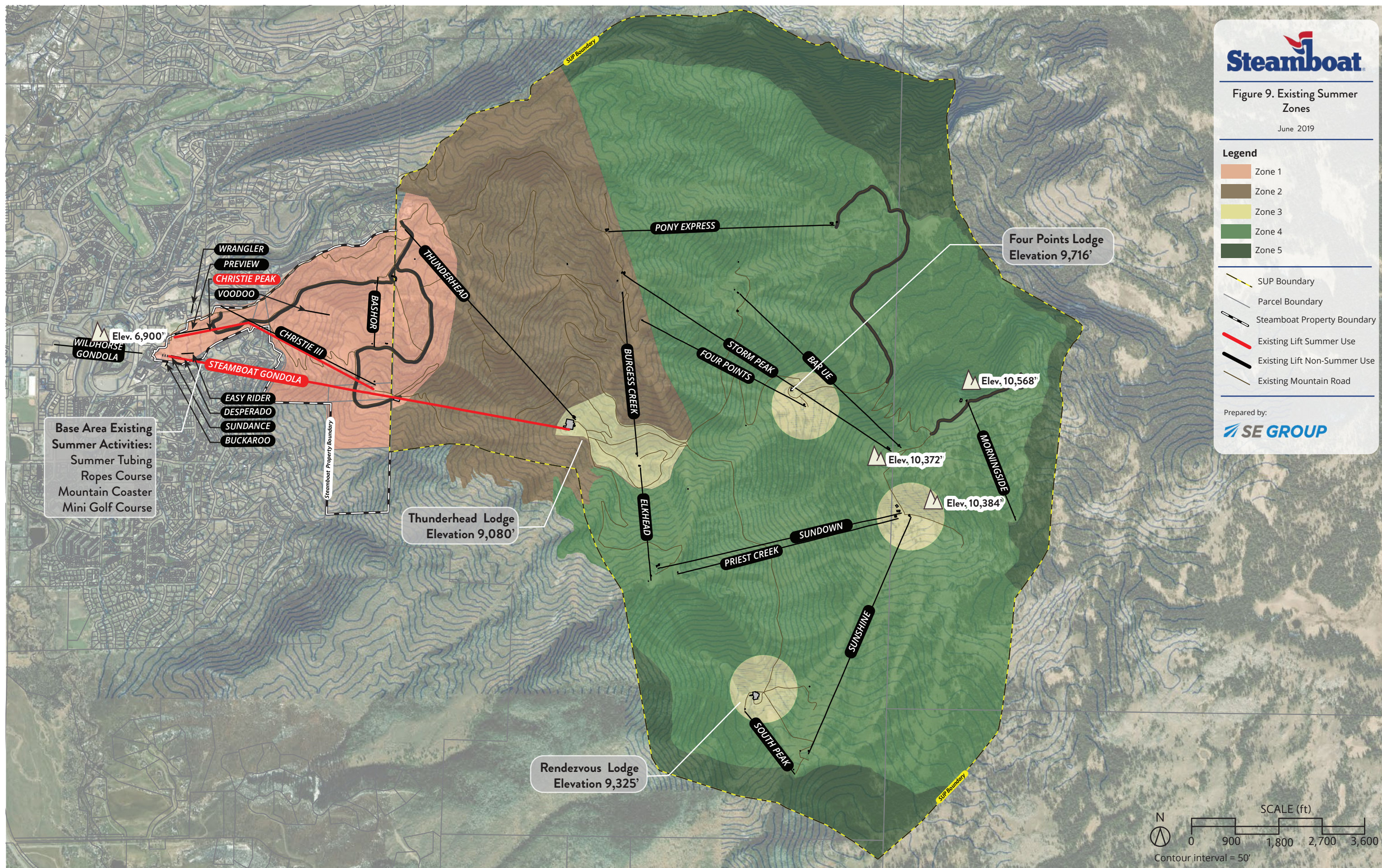




Figure 10. Previously Approved, Not Yet Implemented

June 2019

**Legend**

- SUP Boundary
- Parcel Boundary
- Steamboat Property Boundary
- Existing Ski Patrol
- Existing Lift
- Existing Lift to be Upgraded
- Previously Approved Lift
- Lift to be Realigned
- Ski Trail by Ability Level
- Planned Gladed Ski Terrain

Prepared by:

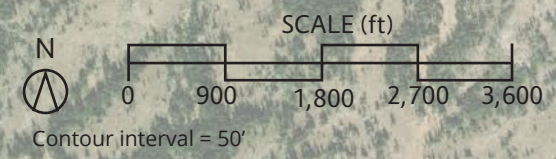
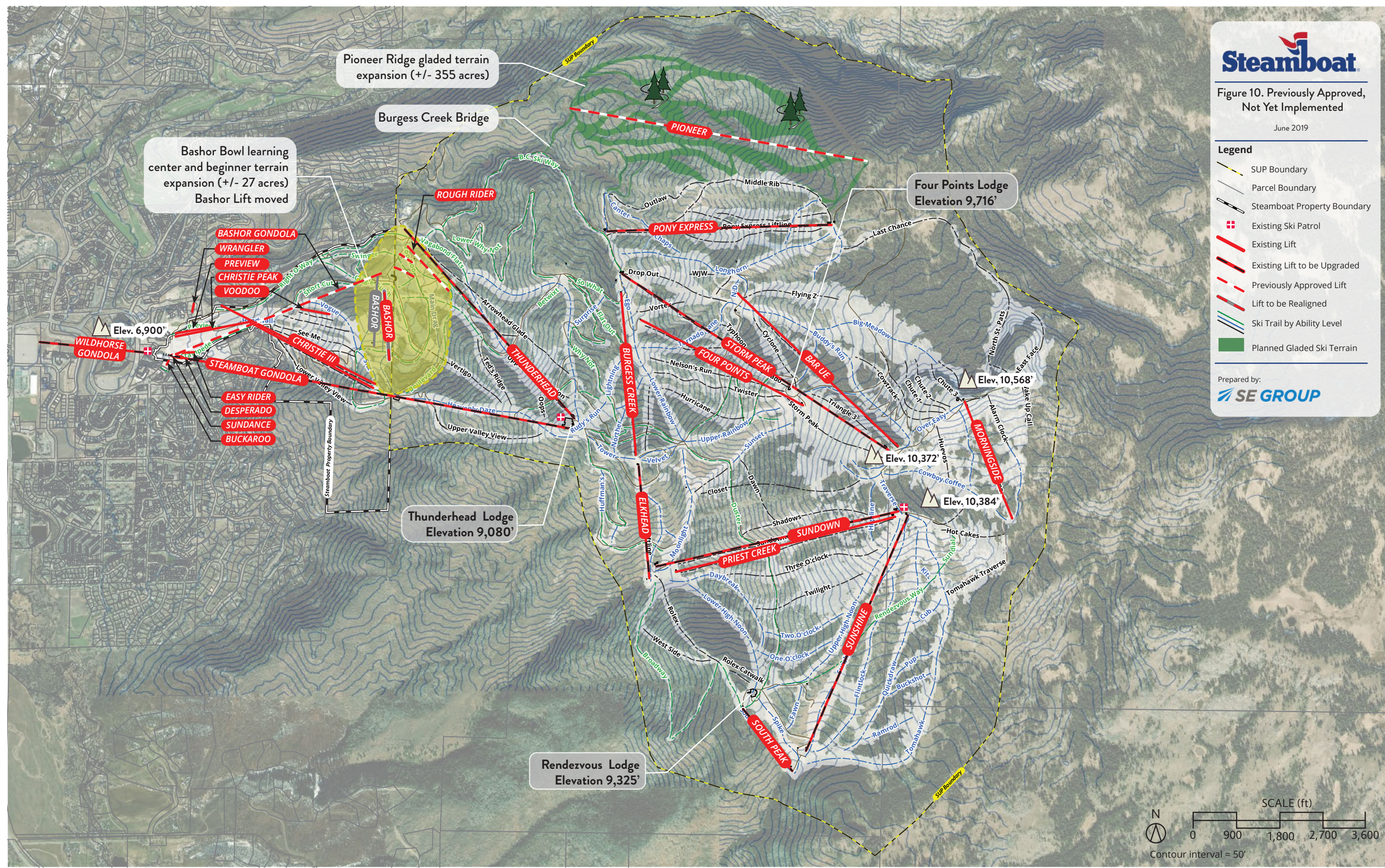
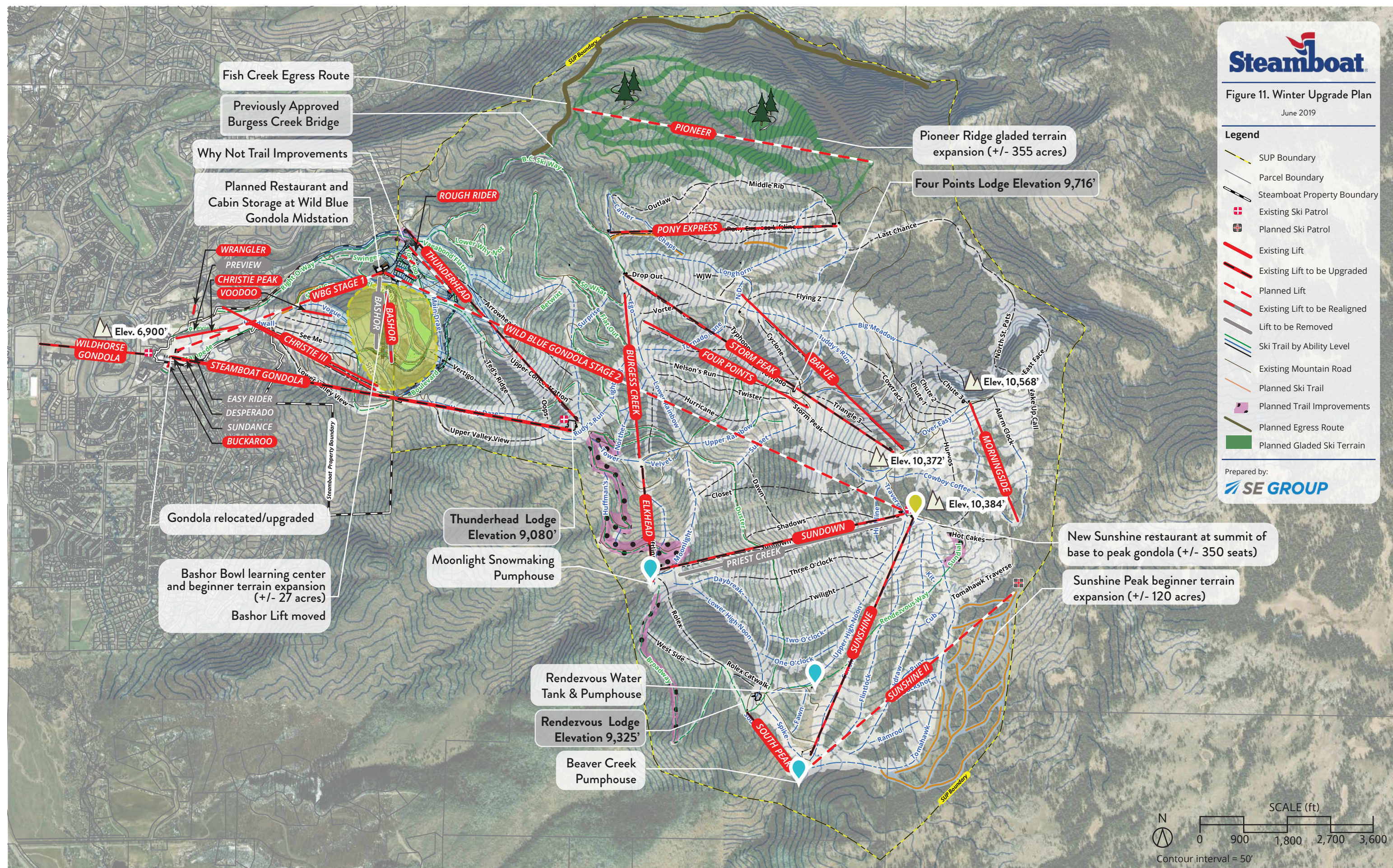




Figure 11. Winter Upgrade Plan  
June 2019

- Legend**
- SUP Boundary
  - Parcel Boundary
  - Steamboat Property Boundary
  - Existing Ski Patrol
  - Planned Ski Patrol
  - Existing Lift
  - Existing Lift to be Upgraded
  - Planned Lift
  - Existing Lift to be Realigned
  - Lift to be Removed
  - Ski Trail by Ability Level
  - Existing Mountain Road
  - Planned Ski Trail
  - Planned Trail Improvements
  - Planned Egress Route
  - Planned Gladed Ski Terrain

Prepared by:



Fish Creek Egress Route

Previously Approved Burgess Creek Bridge

Why Not Trail Improvements

Planned Restaurant and Cabin Storage at Wild Blue Gondola Midstation

Pioneer Ridge gladed terrain expansion (+/- 355 acres)

Four Points Lodge Elevation 9,716'

WRANGLER  
PREVIEW  
CHRISTIE PEAK  
VOODOO

WBG STAGE 1

BASHOR

CHRISTIE III

STEAMBOAT GONDOLA

EASY RIDER  
DESPERADO  
SUNDANCE  
BUCKAROO

Gondola relocated/upgraded

Bashor Bowl learning center and beginner terrain expansion (+/- 27 acres)  
Bashor Lift moved

Thunderhead Lodge Elevation 9,080'

Moonlight Snowmaking Pumphouse

Rendezvous Water Tank & Pumphouse

Rendezvous Lodge Elevation 9,325'

Beaver Creek Pumphouse

New Sunshine restaurant at summit of base to peak gondola (+/- 350 seats)

Sunshine Peak beginner terrain expansion (+/- 120 acres)

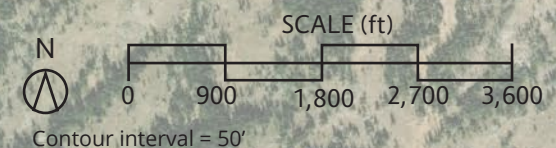




Figure 11a. Sunshine Peak Upgrade Plan  
June 2019

- Legend**
- SUP Boundary
  - Parcel Boundary
  - Existing Ski Patrol
  - Planned Ski Patrol
  - Existing Lift
  - Existing Lift to be Upgraded
  - Planned Lift
  - Lift to be Removed
  - Ski Trail by Ability Level
  - Existing Mountain Road
  - Planned Ski Trail

Prepared by:

New Sunshine restaurant at summit of Wild Blue gondola (+/- 350 seats)

Sunshine Peak beginner terrain expansion (+/- 120 acres)

Rendezvous Lodge  
Elevation 9,325'

Rendezvous Water  
Tank & Pumphouse

Beaver Creek  
Pumphouse

Moonlight Snowmaking  
Pumphouse

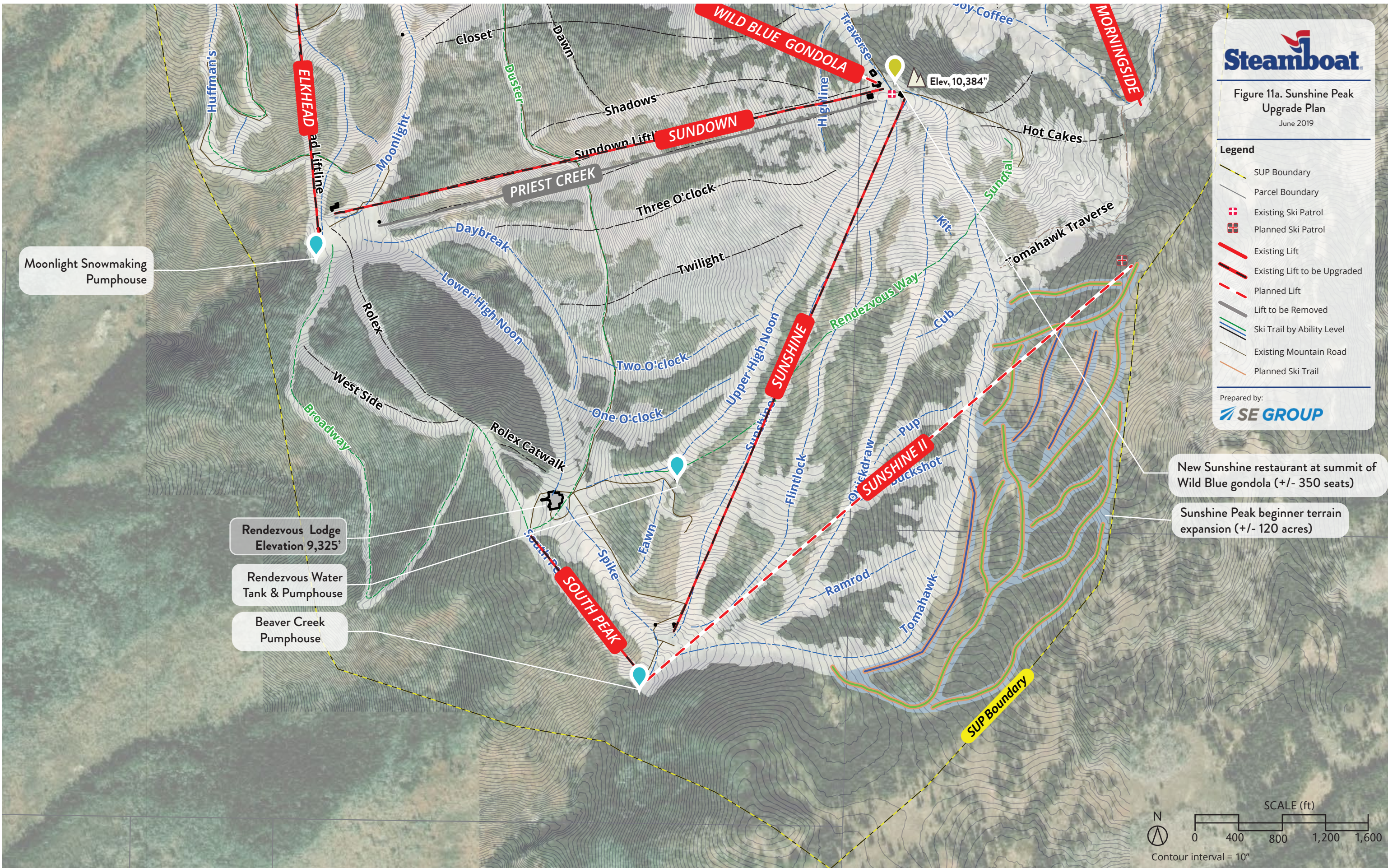
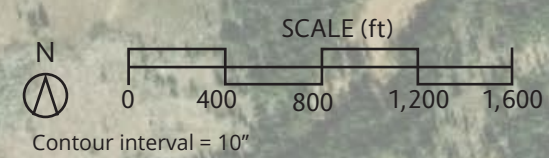




Figure 11b. Bashor Bowl Upgrade Plan

June 2019

Legend

- SUP Boundary
- Steamboat Property Boundary
- Parcel Boundary
- Existing Lift
- Existing Lift to be Upgraded
- Planned Lift
- Lift to be Realigned
- Lift to be Removed
- Ski Trail by Ability Level
- Planned Ski Trail
- Planned Road Improvements
- Planned Trail Improvements
- Planned Tree Clearing

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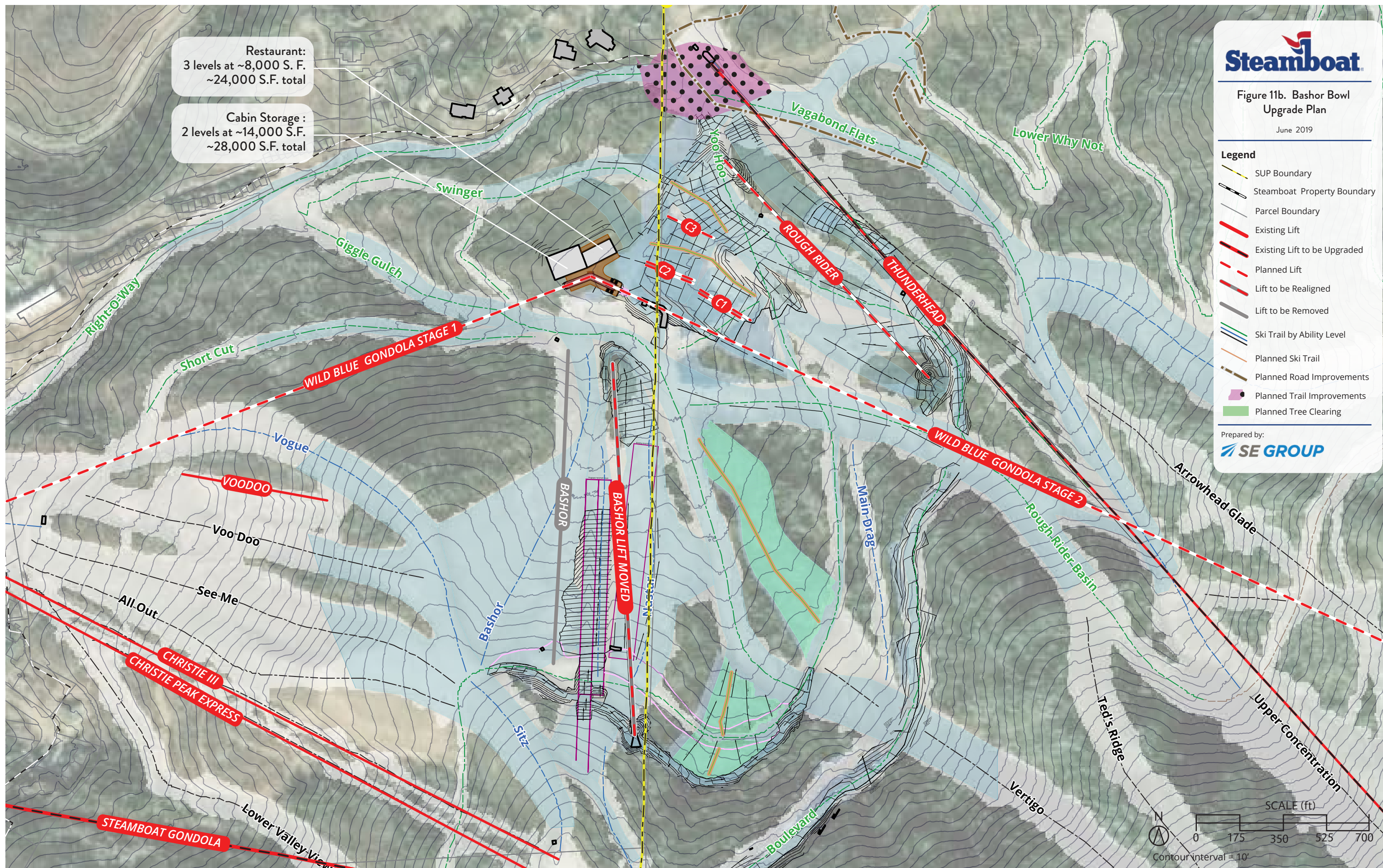






Figure 11c. Wild Blue Gondola  
Mid-Station Zoom-in

June 2019

- Legend**
- Existing Lift
  - Existing Lift to be Upgraded
  - Planned Lift
  - Lift to be Realigned
  - Lift to be Removed
  - Ski Trail by Ability Level
  - Existing Mountain Road
  - Planned Grading

Prepared by:  
**SE GROUP**

**Restaurant:**  
3 levels at ~8,000 S.F.  
~24,000 S.F. total

**Cabin Storage:**  
2 levels at ~14,000 S.F.  
~28,000 S.F. total

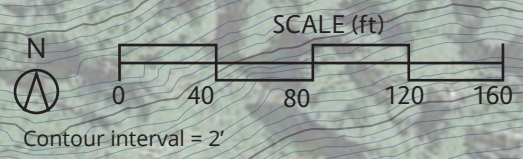
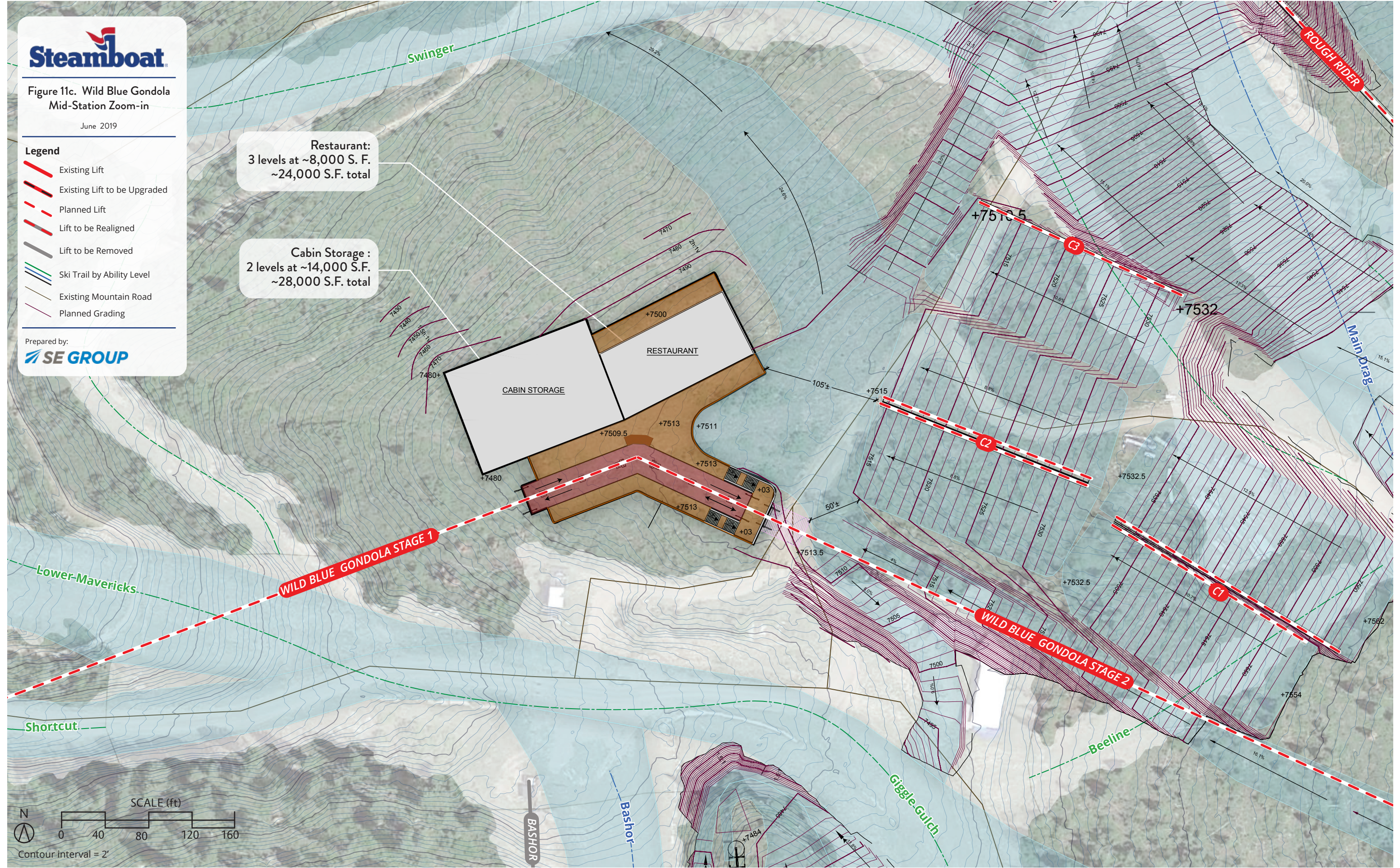






Figure 11d. Base Area Upgrade Concepts  
June 2019

- Legend**
- Steamboat Property Boundary
  - Parcel Boundary
  - Existing Lift
  - Existing Lift to be Upgraded
  - Proposed Lift
  - Lift to be Removed
  - Future Redevelopment Area
  - Ski Trail by Ability Level
  - Mountain Coaster
  - Summer Tubing
  - Ropes Course
  - Climbing Wall
  - Existing Parking

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**SE GROUP**

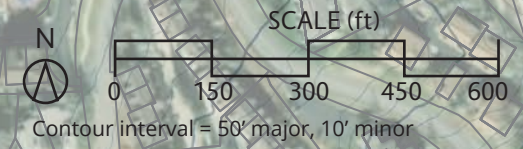
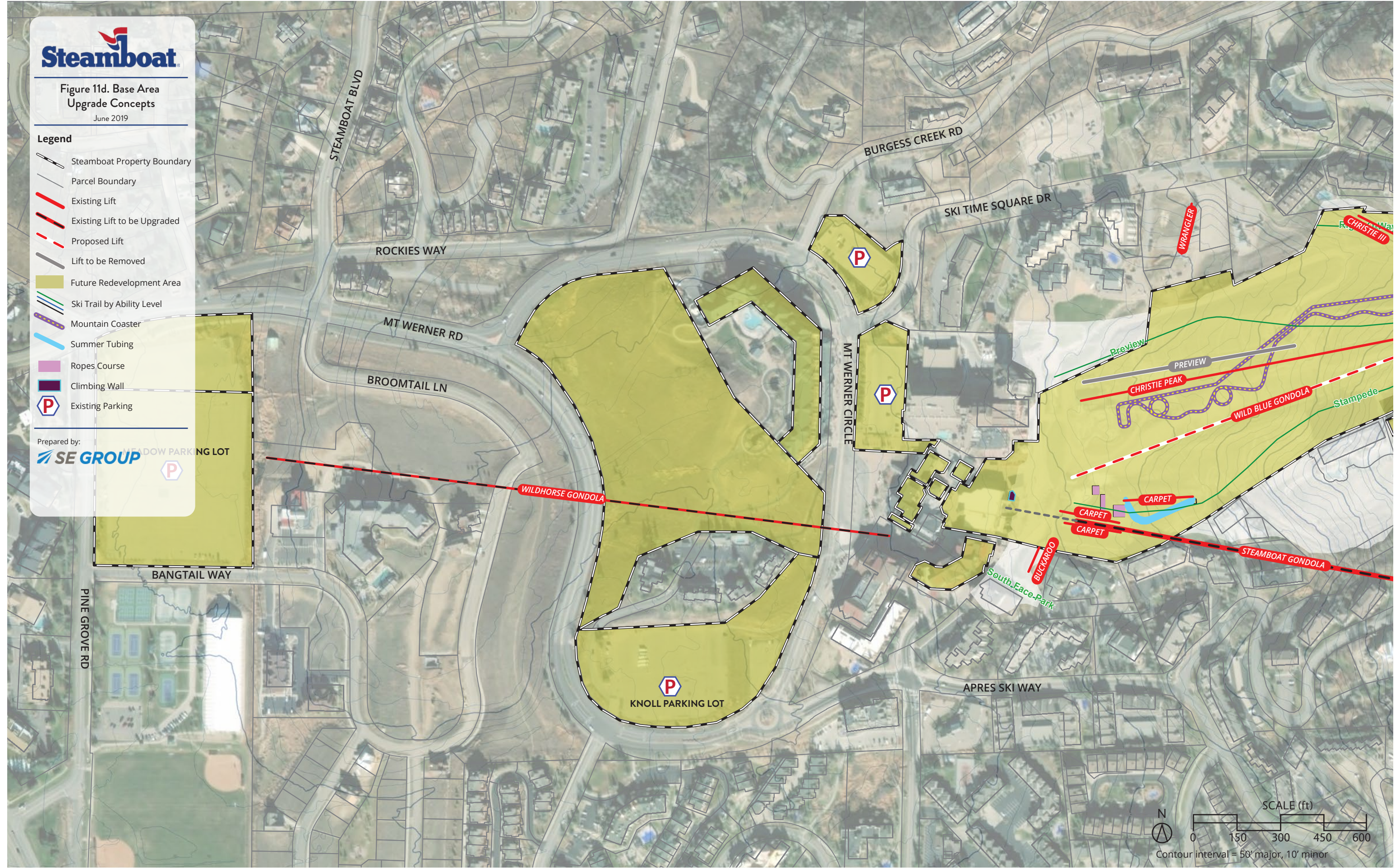




Figure 12. Snowmaking Upgrade Plan

June 2019

Legend

- SUP Boundary
- Parcel Boundary
- Existing Lift
- Existing Lift to be Upgraded
- Planned Lift
- Lift to be Realigned
- Ski Trail by Ability Level
- Existing Mountain Road
- Existing Snowmaking Coverage
- Planned Snowmaking Coverage
- Existing Snowmaking Pipe
- Planned Snowmaking Pipe
- Proposed Ski Trail
- Planned Egress Route
- Planned Trail Improvements
- Planned Gladed Ski Terrain

Prepared by:

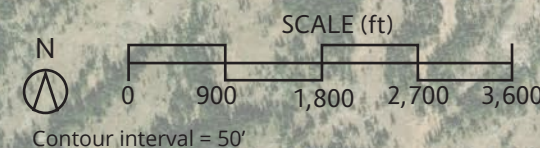
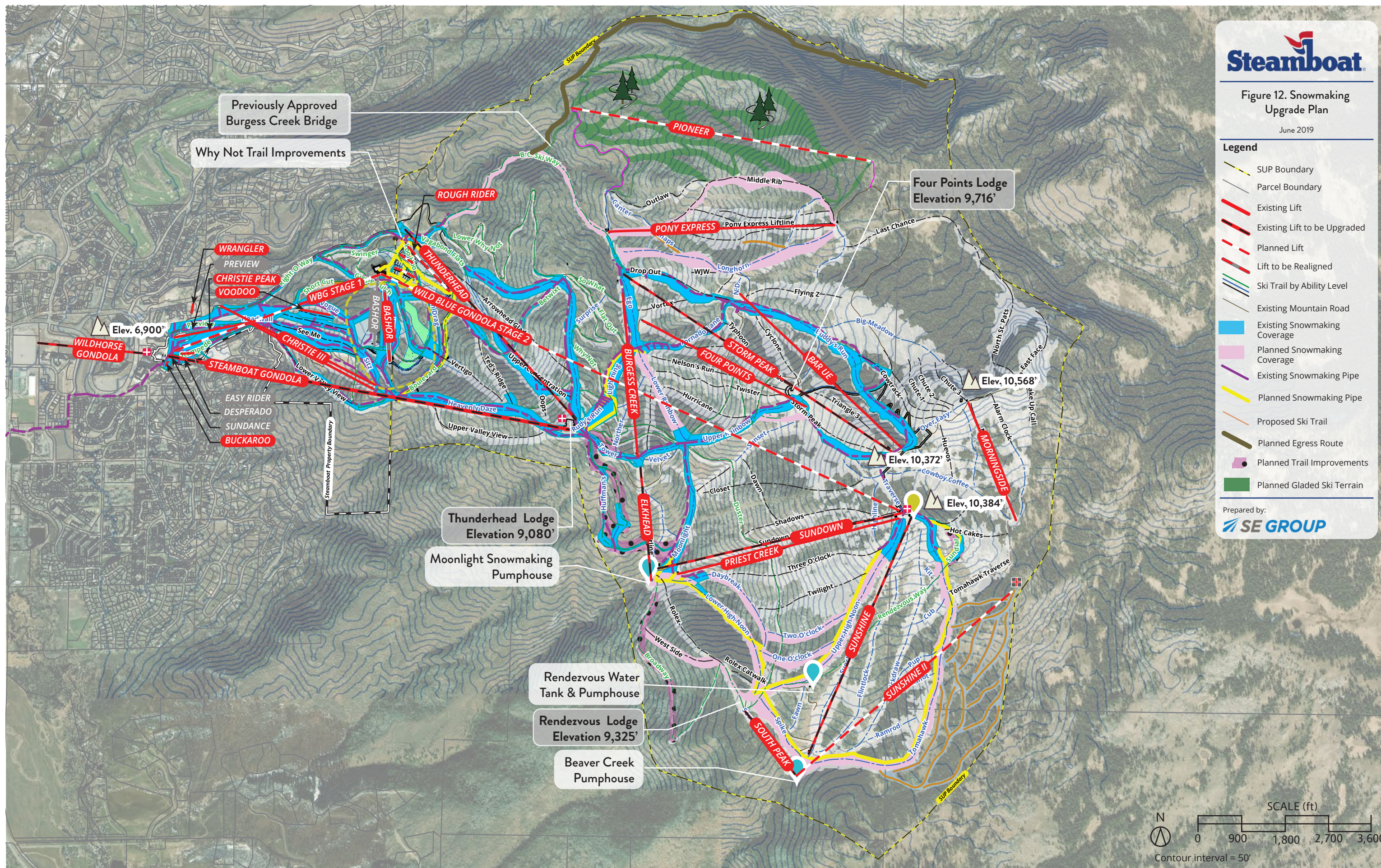




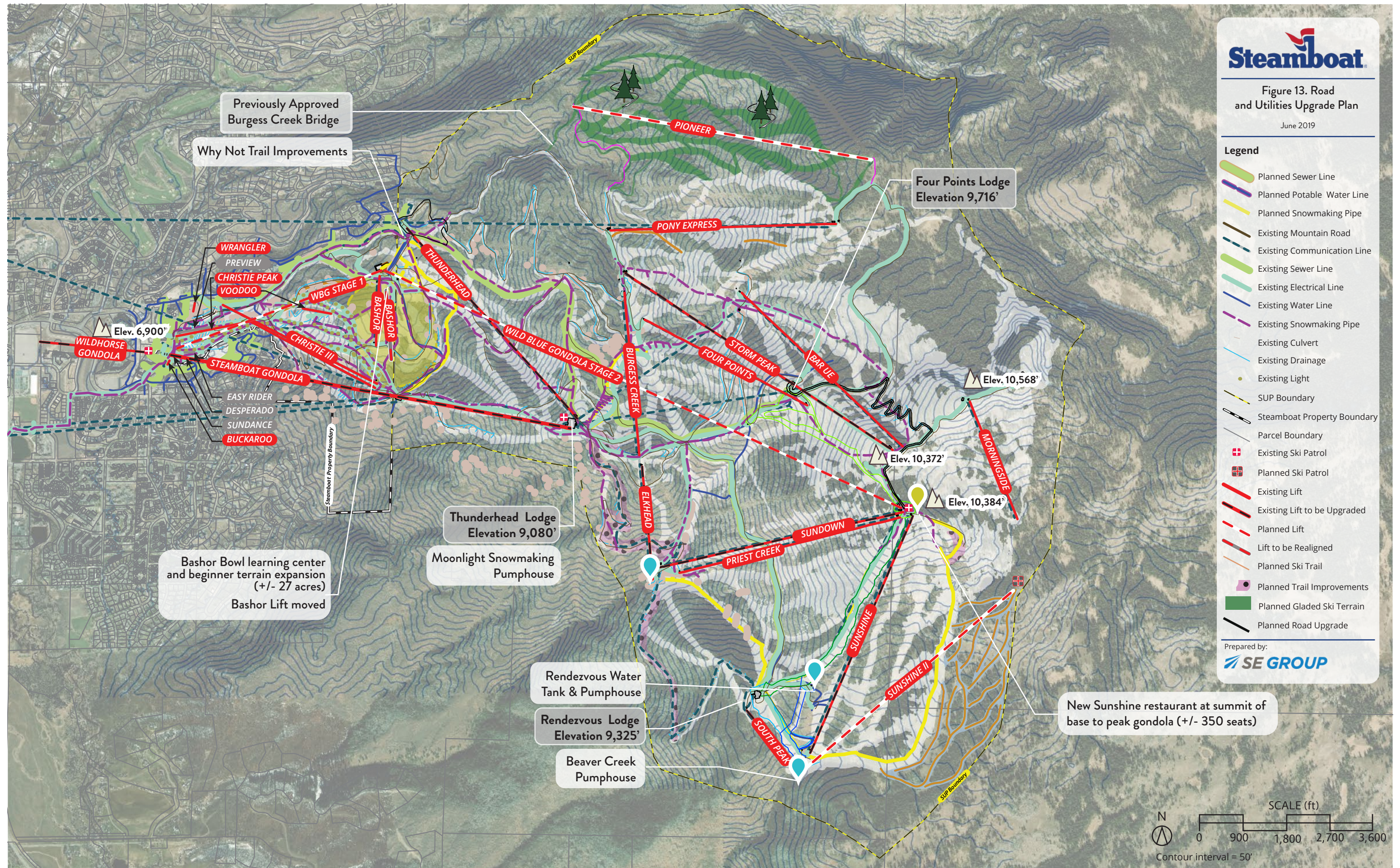
Figure 13. Road and Utilities Upgrade Plan

June 2019

Legend

- Planned Sewer Line
- Planned Potable Water Line
- Planned Snowmaking Pipe
- Existing Mountain Road
- Existing Communication Line
- Existing Sewer Line
- Existing Electrical Line
- Existing Water Line
- Existing Snowmaking Pipe
- Existing Culvert
- Existing Drainage
- Existing Light
- SUP Boundary
- Steamboat Property Boundary
- Parcel Boundary
- Existing Ski Patrol
- Planned Ski Patrol
- Existing Lift
- Existing Lift to be Upgraded
- Planned Lift
- Lift to be Realigned
- Planned Ski Trail
- Planned Trail Improvements
- Planned Gladed Ski Terrain
- Planned Road Upgrade

Prepared by:



Previously Approved Burgess Creek Bridge

Why Not Trail Improvements

Four Points Lodge  
Elevation 9,716'

Elev. 6,900'

Elev. 10,568'

Elev. 10,372'

Elev. 10,384'

Thunderhead Lodge  
Elevation 9,080'

Moonlight Snowmaking  
Pumphouse

Bashor Bowl learning center  
and beginner terrain expansion  
(+/- 27 acres)  
Bashor Lift moved

Rendezvous Water  
Tank & Pumphouse

Rendezvous Lodge  
Elevation 9,325'

Beaver Creek  
Pumphouse

New Sunshine restaurant at summit of  
base to peak gondola (+/- 350 seats)

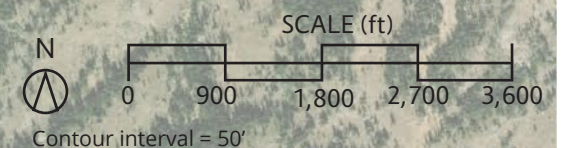




Figure 14. Summer Upgrade Plan

June 2019

Legend

- SUP Boundary
- Steamboat Property Boundary
- Parcel Boundary
- Existing Lift Summer Use
- Existing Lift Non-Summer Use
- Planned Lift Summer Use
- Planned Lift Non-Summer Use
- Lift to Upgrade Non-Summer Use
- Lift to be Realigned Non-Summer Use
- Existing Mountain Road
- Hiking Trail
- Multi-Use Trail
- Beginner MTB Trail
- Beginner DH Trail
- Intermediate MTB Trail
- Intermediate DH Trail
- Advanced MTB Trail
- Advanced DH Trail
- Mountain Coaster
- Disc Golf Course
- Multi-Purpose Road
- Uphill Track
- Pump Track / Skills Park

Prepared by:

Base Area Existing Summer Activities:  
 Summer Tubing  
 Ropes Course  
 Mountain Coaster  
 Mini Golf Course

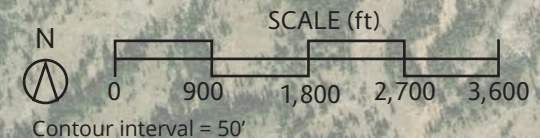
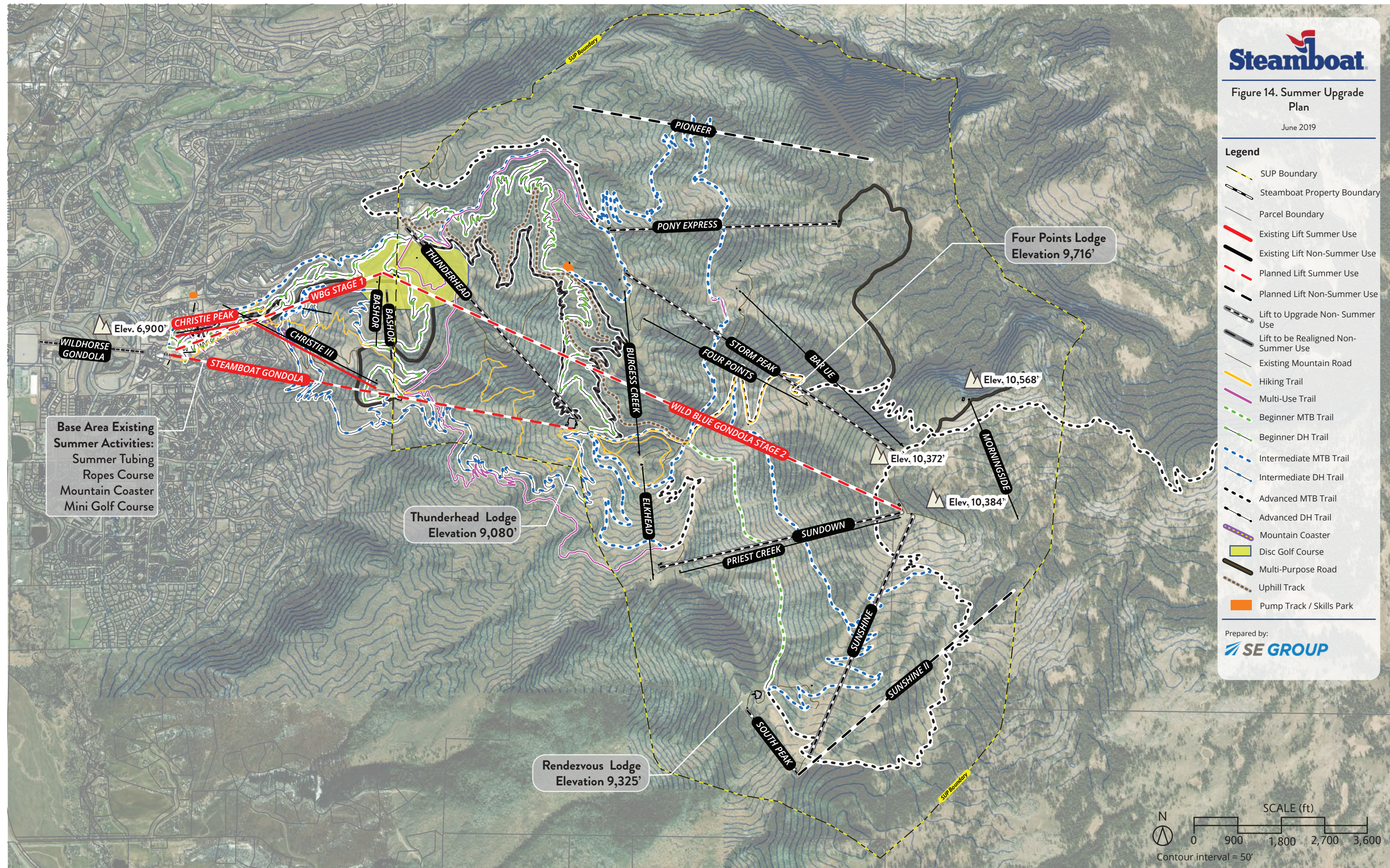




Figure 15. Summer Zones Upgrade Plan

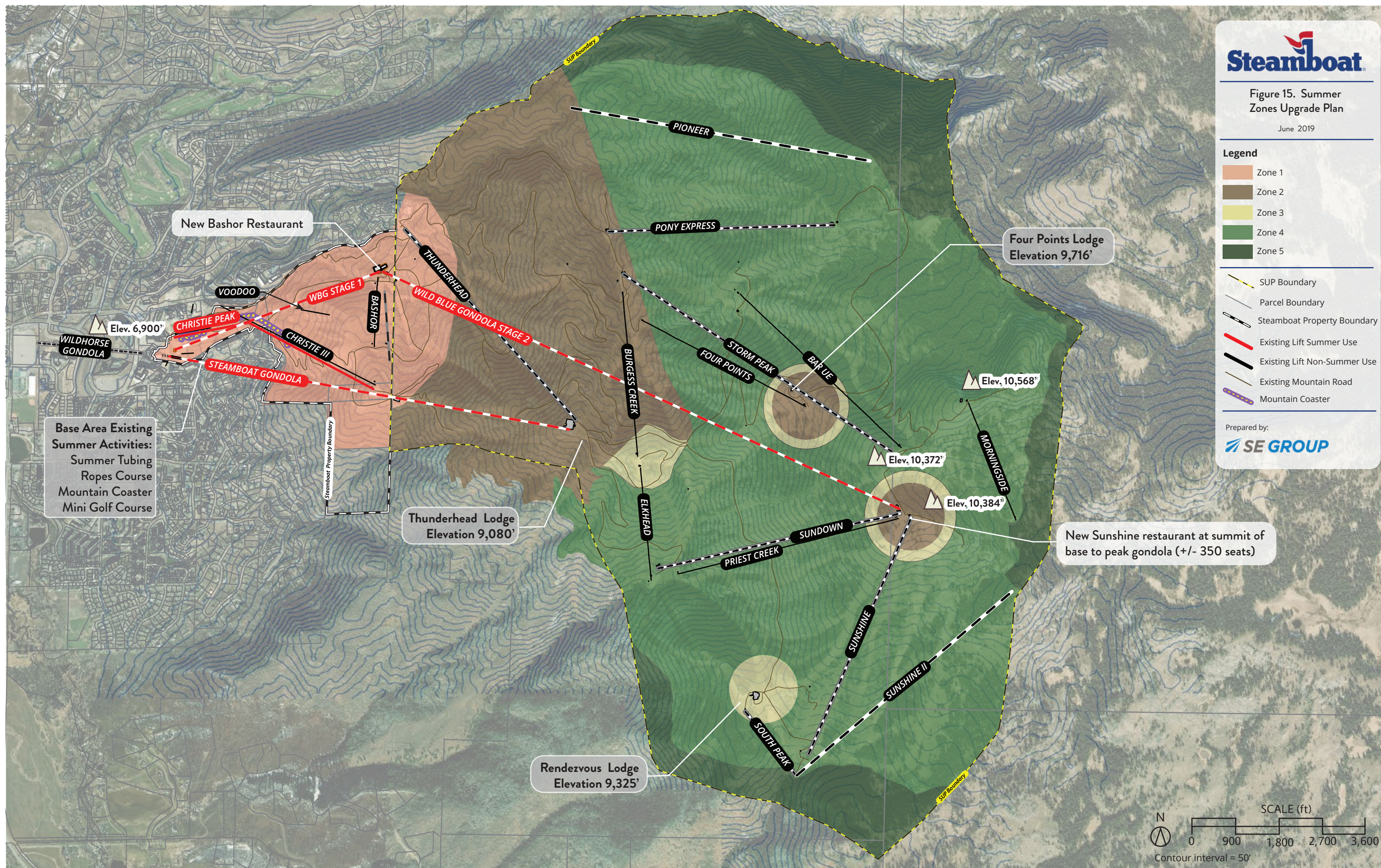
June 2019

Legend

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5

- SUP Boundary
- Parcel Boundary
- Steamboat Property Boundary
- Existing Lift Summer Use
- Existing Lift Non-Summer Use
- Existing Mountain Road
- Mountain Coaster

Prepared by:



Base Area Existing Summer Activities:  
 Summer Tubing  
 Ropes Course  
 Mountain Coaster  
 Mini Golf Course

New Bashor Restaurant

Four Points Lodge  
 Elevation 9,716'

Thunderhead Lodge  
 Elevation 9,080'

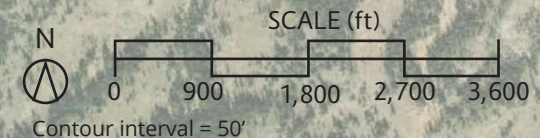
Rendezvous Lodge  
 Elevation 9,325'

Elev. 10,568'

Elev. 10,372'

Elev. 10,384'

New Sunshine restaurant at summit of base to peak gondola (+/- 350 seats)





# APPENDICES

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Appendix A– Inventory of Physical Resources

Appendix B – Supporting Existing Conditions Tables

Appendix C – Supporting Upgrade Plan Tables

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# APPENDIX A

# INVENTORY OF

# PHYSICAL RESOURCES

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## A. TOPOGRAPHY

Topography is the arrangement of natural and artificial physical features of an area and includes the general surface shapes and features within Steamboat. Topography, along with slope gradient, is important to a ski area because it partly defines terrain variety, which is consistently ranked as the second most important criterion in skier choice of a ski destination in Ski Magazine's Reader Resort Ratings, behind only snow quality. Steamboat lies within the Park Mountains of the Routt National Forest in Colorado and encompasses three peaks that run north to south: Mt. Werner, Storm Peak, and Sunshine Peaks. These peaks are 10,568, 10,372, and 10,384 feet above sea level, respectively. Steamboat is primarily located on the west-facing valleys, slopes, and drainages of the area adjacent to Mt. Werner. However, Steamboat does also include terrain along the ridgeline between Mt. Werner and Storm Peak as well as the east-facing valley south of Mt. Werner. The ski terrain of Steamboat starts on the summit of these three peaks and runs primarily down the west facing slopes of the ridgeline they form; however, the Morningside Park terrain runs down the east facing slopes and offers guests increased terrain variety. The base of Steamboat is located at 6,900 feet above sea level at the Gondola Square, meaning Steamboat has a vertical rise of approximately 3,668 feet to the summit of Mt. Werner.

The lift and trail pods incorporate a variety of terrain topography, ranging from the steep chutes adjacent to the Christmas Tree Bowl directly south of Mt. Werner to the gentle, more moderate terrain on Sunshine Peak. Slopes range from steep, technical sections to low angle beginner trails. This type of topography allows for a range of ski opportunities. Steamboat's infrastructure, parking lots, and lodges are currently found at the base of the mountain as well as in the City of Steamboat Springs. This is a good topographic scenario for a ski area because, when combined with the free shuttle system to the base of Steamboat, it provides a variety of topographical terrain as well as efficient access and circulation around that terrain.



## B. SLOPE GRADIENTS

Slope gradient defines the angle of the trail, relative to a completely flat surface. As mentioned above, slope gradient helps define terrain variety. In addition, slope gradient defines the difficulty of terrain and, therefore, what types of skiers are able to ski that terrain (novice, intermediate, etc.). Slope gradient also dictates trail and infrastructure development, as both completely flat trails and cliff faces are un-skiable and steep slopes are more difficult to build structures on.

The steepest slopes of Steamboat are located on western slopes directly below the summit of Mt. Werner. Overall, slopes vary across the mountain, with the more moderate slopes being located on the western side Sunshine Peak and near the summit of the Burgess Creek lift and more advanced slopes being located after the mid-station of the Christie Peak Express near the base area as well as the northwestern slopes near Storm Peak and Mt. Werner. Steamboat also provides a variety of undeveloped ski opportunities with a significant amount of acreage dedicated to gladed skiing. The resort also has a variety of terrain parks, including a full and half-size halfpipe. Terrain parks have their own set of topographic guidelines with north facing, 18 to 35 percent grade terrain generally considered to provide the best opportunities for terrain park building.

Terrain ability level designations are based on slope gradients and terrain features associated with the varying terrain unique to each mountain. 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 defined below, and the slope gradients at Steamboat are depicted on Figure 3.

- 0 to 8% (0 to 5 degrees): too flat for skiing and riding, but ideal for base area accommodations, and other support facility development.
- 8 to 25% (5 to 15 degrees): ideal for beginners and novices, and typically can support some types of development.
- 25 to 45% (15 to 25 degrees): ideal for intermediates, and typically are too steep for development.
- 45 to 70% (25 to 35 degrees): ideal for advanced and expert skiers/riders, and pose intermittent avalanche hazards.
- >70% (>35 degrees): 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 control.

## C. ASPECT

Slope aspect, or the positioning of a slope in relation to the four cardinal directions, plays an important role in snow quality and retention as it plays a role in the intensity of solar radiation the slope receives. The variety of exposures present opportunities to provide a range of slope aspects that can respond to the changes in sun angle, temperature, wind direction, and shadows. Steamboat is primarily located on west facing slopes but the terrain extends into north-, east-, and south-facing slopes. Generally, within the Northern Hemisphere, northern slopes are the coolest and most shaded, south slopes are the warmest with the most sun exposure, and eastern/western slopes are in between. Because of Steamboat's generally west facing aspect, it is in a moderate position for snowpack retention and the amount of solar energy it receives is significantly less than that of the south facing side of the ridge. Furthermore, the relative abundance of different terrain aspects means guests can choose different terrain based on snow and weather conditions (i.e., guests can use east-facing slopes, which soften faster in the morning, on cold mornings and transition to other sections of the mountain later). In addition, east and west facing slopes within ski areas can be beneficial for softening snow and improving skiing conditions on cold winter days. The placement and location of snow features, such as halfpipes and terrain parks, must factor in the effects of sun on elements of the feature, (i.e., snow softening, and the recurring process of melting and freezing). Typical constraints in relation to the various angles of exposure are discussed below:

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

## D. SOILS AND GEOLOGY

The soils and geology within and around a ski area are an important factor to take into consideration because they influence the erosion potential of the area, the drainage capabilities, the vegetation that grows in the area, and other factors that influence ski area management. The City of Steamboat Springs and the Park Range lie along the Continental Divide and are characterized by rugged mountains with over a mile of vertical relief in some places. The Park Range, including Mt. Werner, was formed by tectonic uplift along the Continental Divide. Steamboat Springs specifically is characterized by the presence of a geologic fault, as evidenced by the hot springs in the area, and is geologically associated with sedimentary rocks.

A custom Soil Resource Report from the NRCS' Web Soil Survey was developed for the project area. Soil data was available on the western edge of Steamboat but was not available for the majority of the project area. Soils in the project area have low mean annual air temps, ranging from 35 to 43 degrees, and have a relatively low frost-free period that ranges from 30 to 70 days. The soils on the ski slopes are primarily comprised of Bucklon, Skyway complex, Mine family loam, and Dorpat-Reddles complex families. Slopes range from 30 to 75 percent. Soil material is primarily colluvium weathered from granite and gneiss but includes slope alluvium weathered from sandstone and shale. Soils are primarily a form of loam, including sandy loam to clay loam. These soils are generally well drained and have a very high runoff class. Depth to the water table is higher than 80 inches and the soils have moderate to very low water storage. No flooding or ponding is present in any of the soils. The base area is characterized primarily by Routt loam with slopes ranging from 25 to 65 percent. The other soil adjacent to the base area is Foidel loam, with 25 to 50 percent slopes. These soils are very stony, well drained, and are formed from colluvium derived from sandstone and shale. They are similar to the ski slope soils in other characteristics: they are within a high runoff class, have a depth to the water table of over 80 inches, no flooding or ponding is likely, and they have a high water storage capacity.

## E. HYDROLOGY

Hydrology influences the availability of water in the project area as well as the movement of snowmelt and groundwater. This can influence a ski area's ability to make snow as well as how snowmelt travels through and impacts the project area. Steamboat is located on the western side of the Continental Divide in the Wyoming Basin physiographic province; drainage is provided by the headwaters of the Yampa River. Because groundwater can be difficult to reach, both because of the depth to the water table as well as relatively limited replenishment of the water, most consumptive water including snowmaking is drawn from surface resources in the region. As opposed to the two adjacent valleys—the Fish Creek Glacial Valley and the Walton Glacial Valley, which were carved by glaciers—Steamboat is primarily located on land that has been carved out by rivers and streams. As discussed above, Steamboat is located adjacent to areas of hydrothermal activity and there are a variety of hot springs present within the area.

Steamboat Springs is located within the Upper Yampa River Watershed, which is approximately 1,800 square miles and extends from the headwaters of the Yampa River to the confluence of the Yampa River with Elkhead Creek. Steamboat specifically is located in the Fish Creek Sub-basin. The Yampa River is a river system that is heavily influenced by snow melt, which is typical of drainage basins located at high elevations with high annual snowfall. The majority of annual precipitation in this watershed occurs as snow in the winter months and then melts and runs off in the spring and early summer. The stream channels are well incised in deep V-shaped gorges. Stream flows within the watershed fluctuate significantly from high-volume rapidly peaking flows of short duration to minimal flows. The Yampa River, including the runoff from Steamboat, carries large quantities of sediment down to its confluence

with the Green River in Dinosaur National Monument. Both human settlements, like the City of Steamboat Springs, and the plants and animals near the project area depend on snowmelt runoff and the Yampa River for water.

## F. FISH AND WILDLIFE

Fish and wildlife, as being federally monitored (in the case of the Endangered Species Act) as well as generally being in the public eye, are also an important consideration for ski area development. The variety of wildlife in the vicinity of Steamboat is typical of the species found at this elevation in the Routt National Forest and includes a variety of national and state threatened and endangered species. Species that have the potential to be in the project area include the yellow-billed cuckoo, the northern leopard frog, tiger salamander, and more. More common species like elk, deer, bears, and raccoons are present as well. Site-specific NEPA analysis of Forest Service sensitive, management indicator, and federally-listed, threatened and endangered species will be conducted, as warranted, and will be based on current information provided by the MBRTB, U.S. Fish and Wildlife Service, and State of Colorado.

## G. VEGETATION

The vegetative composition of a ski area, beyond influencing the wildlife discussed above, also influences the erosion potential of the land and its ability to retain water. It is, therefore, important to analyze vegetation within a ski area boundary. General vegetation habitats that occur within the Steamboat include aspen forests, mixed conifer forests mainly comprised of Engelmann spruce and subalpine fir, lodgepole pine forests, native subalpine meadows, open ski trail habitats, rock outcrop vegetation, and riparian and wetland habitats. Vegetation ranges from prairie grassland at the lowest elevations through discontinuous successive zones of scrub oak, aspen, lodgepole pine, and spruce to alpine meadows. A majority of the ski area is forested, with the aspen and aspen/conifer stands being predominant throughout the mid-elevations and Engelmann spruce-subalpine fir stands more prevalent in the upper elevations of Steamboat. Riparian and wetland vegetation follow the streams that flow throughout Steamboat. Vegetation at Steamboat is typical of the Routt National Forest at these elevations; however, site-specific NEPA analysis will be conducted, as warranted.

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# APPENDIX B

## SUPPORTING EXISTING CONDITIONS TABLES

Table B-1. Terrain Specifications – Existing Conditions

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Alarm Clock	10,492	10,231	261	1,138	1.035	799	20.9	24	47	Advanced Intermediate
Ambush	8,972	8,574	399	1,115	1.073	163	4.2	38	46	Advanced Intermediate
Arrowhead Glade	8,817	7,512	1,306	4,222	1.068	134	13.0	33	62	Expert
B.C. Liftline	9,189	8,309	879	3,133	1.050	112	8.1	29	47	Advanced Intermediate
B.C. Skiway	8,210	7,574	637	6,028	1.013	83	11.5	11	24	Novice
Bashor Terrain Park	7,749	7,458	291	1,387	1.025	339	10.8	21	32	Low Intermediate
Bear Claw	7,874	7,780	94	293	1.057	302	2.0	34	36	Intermediate
Beeline	7,563	7,514	49	385	1.010	46	0.4	13	14	Novice
Betwixt	8,325	8,124	201	1,894	1.013	77	3.3	11	19	Novice
Big Meadow	10,046	9,544	501	2,826	1.020	659	42.8	18	38	Intermediate
Blizzard	8,856	8,561	294	948	1.056	154	3.4	33	43	Intermediate
Boulevard	7,965	7,748	217	2,133	1.014	55	2.7	10	18	Novice
Broadway	9,249	8,449	800	5,613	1.017	73	9.5	14	27	Low Intermediate
Buckshot	9,700	9,437	263	1,053	1.037	130	3.1	26	39	Intermediate
Buddy's Run	10,373	8,988	1,384	5,506	1.037	230	29.1	26	44	Intermediate
Cabin Fever	9,704	9,484	220	658	1.068	172	2.6	36	52	Advanced Intermediate
Calf Roper	9,875	9,753	122	1,168	1.008	119	3.2	10	15	Novice



Table B-2. Terrain Specifications – Existing Conditions (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Canter	8,315	8,165	149	1,329	1.048	65	2.0	12	56	Expert
Chaps	8,631	8,346	285	741	1.086	105	1.8	42	47	Advanced Intermediate
Chisolm Trail	9,588	9,082	506	4,124	1.014	32	3.0	12	19	Novice
Christie II Liftline	7,990	7,289	701	2,165	1.072	47	2.4	35	54	Advanced Intermediate
Christie III Liftline	7,987	7,235	752	2,337	1.069	49	2.6	34	56	Expert
Christmas Tree Bowl	10,367	10,040	327	792	1.124	251	4.6	46	83	Expert
Chuckwagon	9,085	8,961	124	545	1.028	132	1.7	23	28	Low Intermediate
Chute 1	10,478	9,942	537	1,629	1.066	169	6.3	35	57	Expert
Chute 2	10,501	9,984	517	1,457	1.078	158	5.3	38	64	Expert
Chute 3	10,536	10,048	488	1,192	1.117	167	4.6	46	89	Expert
Cinch	9,652	9,426	227	1,273	1.021	99	2.9	18	31	Low Intermediate
Closet	10,255	8,823	1,432	3,690	1.089	177	15.0	42	54	Advanced Intermediate
Corridor	10,536	10,501	36	472	1.007	350	3.8	8	15	Novice
Cowboy Coffee	10,325	10,008	317	2,903	1.009	192	12.8	11	25	Novice
Cowtrack	10,426	9,766	661	2,416	1.046	226	12.5	29	54	Advanced Intermediate
Cub	9,913	9,739	174	823	1.032	235	4.4	22	35	Intermediate
Cyclone	9,716	9,095	621	1,827	1.068	219	9.2	36	49	Advanced Intermediate
Dawn	9,544	9,204	340	1,543	1.032	50	1.8	23	38	Intermediate
Daybreak	9,167	8,487	681	2,993	1.035	147	10.1	24	44	Intermediate
Diamond Hitch	9,448	8,607	841	2,363	1.075	184	10.0	38	51	Advanced Intermediate
Drop Out	8,982	8,220	761	2,431	1.065	339	18.9	33	53	Advanced Intermediate

Table B-3. Terrain Specifications – Existing Conditions (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Duster	9,363	9,063	300	6,788	1.007	60	9.4	4	13	Novice
East Face	10,535	10,082	453	1,631	1.068	463	17.3	30	61	Expert
Ego	8,419	8,219	200	1,418	1.012	250	8.2	14	21	Novice
Elkhead Liftline	9,073	8,502	572	1,444	1.096	255	8.4	43	62	Expert
Fawn	9,447	9,255	192	985	1.022	99	2.2	20	30	Low Intermediate
Feather	8,910	8,847	63	497	1.076	134	1.5	14	24	Novice
Flat Out	8,477	8,373	104	1,864	1.005	48	2.1	6	11	Beginner
Flintlock	10,014	9,154	860	4,342	1.023	158	15.8	20	37	Intermediate
Flying Z	9,706	9,038	668	2,132	1.059	383	18.8	33	55	Expert
Flying Z Gulch	9,737	9,478	259	1,454	1.023	154	5.1	18	34	Low Intermediate
Fools Gold	9,717	9,517	200	658	1.055	147	2.2	32	44	Intermediate
Four Points Liftline	9,269	8,423	846	2,252	1.088	108	5.6	41	62	Expert
Frying Pan	10,341	10,196	145	522	1.042	115	1.4	29	34	Low Intermediate
Giggle Gulch	7,720	7,200	521	3,292	1.015	144	10.9	16	32	Low Intermediate
Headwall/Stampede	7,196	6,898	298	2,487	1.009	459	26.2	12	21	Novice
Heavenly Daze	9,036	7,965	1,071	4,121	1.043	250	23.7	27	44	Intermediate
Highline	10,301	10,185	116	1,231	1.009	36	1.0	9	17	Novice
Hot Cakes	10,292	10,008	283	1,370	1.028	442	13.9	21	37	Intermediate
Huevos	10,404	10,133	271	1,151	1.035	196	5.2	24	42	Intermediate
Huffman's	8,986	8,782	205	854	1.039	103	2.0	25	42	Intermediate
Hurricane	9,424	8,657	767	2,026	1.084	215	10.0	41	51	Advanced Intermediate
Jess' Cut Off	7,965	7,874	91	641	1.019	107	1.6	14	19	Novice
Jump Start	10,292	10,094	198	876	1.036	175	3.5	23	37	Intermediate





**Table B-4. Terrain Specifications – Existing Conditions (cont.)**

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Kit	10,013	9,971	43	268	1.016	91	0.6	16	22	Novice
Lariat	8,165	8,085	80	881	1.012	88	1.8	9	15	Novice
Last Chance	9,968	9,629	340	4,329	1.006	115	11.5	8	23	Novice
Lightning	8,792	8,487	305	1,007	1.050	272	6.3	32	36	Intermediate
Lights Out	9,088	8,789	299	893	1.066	274	5.6	36	49	Advanced Intermediate
Longhorn	9,724	8,226	1,498	4,864	1.056	194	21.7	33	48	Advanced Intermediate
Lower Bar-UE Liftline	9,826	9,165	661	2,296	1.050	90	4.8	30	47	Advanced Intermediate
Lower Concentration	8,140	7,683	457	1,780	1.039	169	6.9	27	38	Intermediate
Lower High Noon	9,342	8,557	785	2,996	1.039	194	13.3	27	42	Intermediate
Lower Rainbow	9,051	8,419	632	2,434	1.041	249	13.9	27	38	Intermediate
Lower Storm Peak Traverse	10,327	10,144	184	1,060	1.017	144	3.5	18	24	Novice
Lower Thunderhead Liftline	7,824	7,498	326	1,887	1.019	60	2.6	18	32	Low Intermediate
Lower Vagabond	8,325	7,659	666	2,091	1.056	244	11.7	34	40	Intermediate
Lower Valley View	7,867	7,188	679	2,488	1.052	115	6.6	29	49	Advanced Intermediate
Lower Why Not	8,335	7,432	903	8,028	1.014	80	14.8	11	25	Novice
Main Drag	7,958	7,642	315	2,210	1.017	43	2.2	15	20	Novice
Maverick's Super Pipe	7,768	7,525	243	970	1.037	164	3.7	26	39	Intermediate
Meadow Lane	9,684	9,576	108	940	1.011	64	1.4	12	18	Novice
Middle Rib	9,733	8,457	1,275	4,491	1.050	142	14.7	30	51	Advanced Intermediate
Moon Dog	8,729	8,619	110	284	1.089	109	0.7	42	48	Advanced Intermediate

Table B-5. Terrain Specifications – Existing Conditions (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Moonlight	9,036	8,450	586	2,915	1.024	232	15.5	21	37	Intermediate
Morningside Liftline	10,526	10,005	521	2,625	1.028	143	8.6	20	56	Expert
Mother Nature	8,183	8,023	160	365	1.114	96	0.8	49	51	Advanced Intermediate
N.D.	9,059	9,015	44	391	1.017	611	5.5	11	23	Novice
Nastar	7,757	7,533	224	1,090	1.024	42	1.1	21	29	Low Intermediate
Nelson's Run	9,706	8,545	1,161	3,128	1.083	125	9.0	40	52	Advanced Intermediate
North St. Pats	10,547	9,968	579	2,302	1.076	303	16.0	27	76	Expert
Norther	9,086	8,804	282	976	1.047	145	3.3	30	35	Intermediate
One O'Clock	9,688	9,158	530	1,755	1.051	177	7.1	32	42	Intermediate
Oops	8,877	8,674	202	505	1.096	145	1.7	44	53	Advanced Intermediate
Outlaw	8,769	8,224	545	2,421	1.055	98	5.4	24	59	Expert
Over Easy	10,539	10,298	241	1,276	1.020	187	5.5	19	26	Low Intermediate
Park Lane	9,035	8,918	116	1,179	1.011	42	1.1	10	15	Novice
Park Smalley Freestyle	7,551	7,285	267	784	1.074	131	2.4	37	50	Advanced Intermediate
Pony Express Liftline	9,728	8,083	1,645	4,930	1.068	118	13.3	36	52	Advanced Intermediate
Preview	6,990	6,921	69	698	1.007	346	5.5	10	18	Novice
Priest Creek Liftline	10,362	8,529	1,833	4,958	1.084	120	13.6	40	63	Expert
Pup	9,764	9,497	267	1,059	1.038	160	3.9	26	38	Intermediate
Quickdraw	10,264	9,240	1,024	5,127	1.023	189	22.3	20	37	Intermediate
Rainbow Cut Off	9,599	9,496	103	414	1.035	71	0.7	26	32	Low Intermediate



Table B-6. Terrain Specifications – Existing Conditions (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Ramrod	9,538	9,302	237	1,121	1.025	232	6.0	22	28	Low Intermediate
Right-O-Way	7,432	6,982	450	4,451	1.010	77	7.8	10	25	Low Intermediate
Road to Eagles Nest	8,124	7,523	601	2,645	1.033	179	10.9	23	40	Intermediate
Rolex	9,255	8,447	809	2,513	1.068	139	8.0	34	53	Advanced Intermediate
Rolex Catwalk	9,320	9,292	28	486	1.004	38	0.4	6	11	Beginner
Rooster	10,509	10,098	411	1,720	1.041	106	4.2	25	52	Advanced Intermediate
Rough Rider Basin	7,724	7,544	181	1,216	1.013	187	5.2	15	20	Novice
Royal Flush	9,463	8,778	685	1,684	1.101	247	9.6	45	55	Advanced Intermediate
Rudy's Run	9,072	8,834	238	994	1.037	381	8.7	25	34	Low Intermediate
See Me	7,753	7,191	561	1,916	1.052	218	9.6	31	48	Advanced Intermediate
See Me Race Course	7,757	7,197	560	1,962	1.049	99	4.5	30	41	Intermediate
Shadows	10,228	9,206	1,022	2,894	1.071	144	9.6	38	48	Advanced Intermediate
Short Cut	7,392	7,253	139	1,483	1.012	67	2.3	9	17	Novice
Sitz	8,018	7,757	261	845	1.053	176	3.4	33	36	Intermediate
Skyline	9,196	9,062	134	821	1.019	128	2.4	17	29	Low Intermediate
Snooze Bar	10,231	10,003	227	1,586	1.014	232	8.5	15	30	Low Intermediate
So What	8,369	8,268	101	1,294	1.008	60	1.8	8	14	Novice
South Face Park	6,894	6,890	4	203	1.001	207	1.0	2	3	Beginner
South Peak Flats	9,369	9,255	114	1,076	1.007	234	5.8	11	16	Novice
South Peak Liftline	9,370	9,067	302	1,613	1.025	108	4.0	19	33	Low Intermediate
Spike	9,332	9,064	267	1,896	1.013	308	13.4	14	24	Novice
Spur Run Face	8,825	8,713	113	373	1.050	171	1.5	32	33	Low Intermediate

Table B-7. Terrain Specifications – Existing Conditions (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Spur Run Road	9,059	8,582	477	4,953	1.014	90	10.2	10	25	Low Intermediate
Storm Peak	10,362	9,694	668	2,694	1.043	670	41.4	26	50	Advanced Intermediate
Storm Peak Liftline	8,815	8,328	487	1,680	1.080	90	3.5	31	57	Expert
Stormpeak Traverse	10,352	10,226	126	744	1.017	191	3.3	17	24	Novice
Sundown Liftline	10,363	8,542	1,820	4,974	1.083	134	15.3	40	67	Expert
Sunnyside	9,200	8,440	760	2,739	1.048	147	9.2	29	39	Intermediate
Sunset	9,682	9,140	541	1,581	1.066	213	7.7	37	45	Advanced Intermediate
Sunshine Liftline	10,381	9,127	1,254	5,615	1.029	233	30.0	23	32	Low Intermediate
Surprise	8,587	8,318	269	889	1.054	134	2.7	32	40	Intermediate
Swinger	7,560	7,204	356	2,211	1.015	79	4.0	16	23	Novice
Swinger Road	7,411	7,354	57	455	1.014	45	0.5	13	17	Novice
Ted's Ridge	8,645	8,036	609	1,678	1.076	171	6.6	39	53	Advanced Intermediate
The Ridge	10,464	9,865	598	2,157	1.050	112	5.5	29	57	Expert
Three O'Clock	10,165	8,825	1,340	3,528	1.086	263	21.3	41	60	Expert
Thunderhead Service Road	9,055	9,031	25	1,705	1.005	43	1.7	1	11	Beginner
Tomahawk	10,379	9,116	1,262	7,828	1.016	258	46.4	16	37	Intermediate
Tomahawk Traverse	10,010	9,937	73	2,304	1.008	61	3.2	3	26	Low Intermediate
Tornado	9,707	8,757	950	2,635	1.078	226	13.7	39	52	Advanced Intermediate
Tornado Lane	8,988	8,481	507	2,398	1.029	154	8.5	22	37	Intermediate
Tower	9,194	9,059	136	1,212	1.012	171	4.7	11	27	Low Intermediate
Tower 3 Road	8,867	8,744	123	1,129	1.012	32	0.8	11	19	Novice
<i>Trail G</i>	8,147	7,947	199	3,111	1.007	32	2.3	6	14	Advanced Intermediate



Table B-8. Terrain Specifications – Existing Conditions (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Trap	9,974	9,906	69	345	1.021	154	1.2	20	23	Novice
Traverse	10,380	10,313	67	839	1.004	186	3.6	8	14	Novice
Triangle 3	10,216	9,788	428	1,439	1.052	236	7.8	31	49	Advanced Intermediate
Twilight	9,965	9,080	885	2,549	1.070	312	18.3	37	49	Advanced Intermediate
Twister	9,684	8,568	1,116	2,981	1.085	158	10.8	41	57	Expert
Two O’Clock	9,778	9,178	601	1,872	1.060	127	5.5	34	45	Advanced Intermediate
Typhoon	9,265	8,926	339	905	1.086	193	4.0	41	52	Advanced Intermediate
Upper Bar-UE Liftline	10,372	10,060	312	1,023	1.057	79	1.9	32	47	Advanced Intermediate
Upper Concentration	8,912	8,157	755	1,753	1.111	325	13.1	48	59	Expert
Upper High Noon	10,377	9,330	1,047	4,918	1.026	221	25.0	22	35	Intermediate
Upper Rainbow	9,629	9,051	579	2,294	1.037	178	9.4	26	40	Intermediate
Upper Thunderhead Liftline	9,065	8,786	280	710	1.093	151	2.5	43	50	Advanced Intermediate
Upper Vagabond	9,068	8,325	743	3,221	1.033	191	14.1	24	37	Intermediate
Upper Valley View	8,925	8,093	832	2,707	1.061	154	9.6	33	54	Advanced Intermediate
Vagabond Flats	7,683	7,483	200	1,257	1.016	113	3.3	16	23	Novice
Velvet	9,190	9,076	114	791	1.016	70	1.3	15	25	Low Intermediate
Vertigo	8,572	7,731	841	2,108	1.095	209	10.1	44	59	Expert
Vogue	7,752	7,218	533	2,090	1.040	157	7.5	27	42	Intermediate
Voo Doo	7,709	7,232	477	1,496	1.063	176	6.0	34	49	Advanced Intermediate
Vortex	8,786	8,347	439	1,119	1.094	301	7.7	43	61	Expert

Table B-9. Terrain Specifications – Existing Conditions (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Wake Up Call	10,563	10,312	251	783	1.072	165	3.0	34	61	Expert
Wapiti	9,092	9,050	42	519	1.009	110	1.3	8	14	Novice
West Side	9,204	8,612	592	1,743	1.067	143	5.7	36	48	Advanced Intermediate
White out	9,169	8,615	554	1,449	1.086	175	5.8	42	49	Advanced Intermediate
Why Not	9,032	8,373	659	6,014	1.011	59	8.2	11	24	Novice
WJW	8,969	8,709	261	600	1.115	211	2.9	48	56	Expert
Yoo Hoo	8,021	7,459	562	6,099	1.010	81	11.3	9	29	Low Intermediate
Resort Total				330,292			1,364.2			



**Table B-10. Comfortable Carrying Capacity – Existing Conditions**

LIFT NAME/LIFT TYPE	SLOPE LENGTH (FT)	VERTICAL RISE (FT)	ACTUAL CAPACITY (PPH)	OPERATING HOURS (HRS)	UP-MTN ACCESS ROLE (%)	MISLOAD/ LIFT STOPPAGES (%)	ADJUSTED HOURLY CAPACITY (PPH)	VTF/ DAY (000)	VERTICAL DEMAND (FT/DAY)	CCC (GUESTS)
Gondola	8,856	2,175	3,600	7.00	40	0	2,160	32,886	15,634	2,100
Preview/C3	741	129	1,450	7.00	5	15	1,160	1,047	3,632	290
Christie Peak Express/D6	4,636	1,102	3,200	7.00	20	10	2,240	17,279	14,042	1,230
Christie III/C3	3,738	1,033	1,710	7.00	40	10	855	6,183	14,289	430
Bashor/C2	1,301	300	1,200	6.50	10	10	960	1,872	7,377	250
Thunderhead Express/D4	5,539	1,630	2,400	6.50	20	5	1,800	19,071	18,006	1,060
Burgess Creek/C3	3,490	939	1,800	6.50	25	10	1,170	7,141	13,776	520
Storm Peak Express/D4	6,884	2,159	2,400	6.50	0	5	2,280	31,996	25,081	1,280
Four Points/C3	4,050	1,361	1,411	6.50	0	10	1,270	11,234	21,487	520
Bar-UE/C2	4,814	1,356	1,025	6.50	5	10	871	7,680	18,291	420
Sundown Express/D4	5,530	1,936	2,800	6.50	5	5	2,520	31,712	25,276	1,250
Elkhead Express/D4	2,394	762	2,400	6.50	70	5	600	2,972	23,327	130
Priest Creek/C2	5,077	1,884	1,050	6.50	0	10	945	11,572	26,637	430
South Peak/C3	1,683	312	1,703	6.00	70	10	341	638	8,014	80
Sunshine Express/D4	5,563	1,256	2,400	6.00	0	5	2,280	17,182	11,443	1,500
Buckaroo/C	80	8	1,200	4.00	0	5	1,140	36	416	90
Rough Rider/S	758	145	513	6.50	0	5	487	459	3,971	120
Desperado/C	201	20	1,200	4.00	0	5	1,140	91	814	110
Sundance/C	202	25	1,200	4.00	0	5	1,140	114	937	120
Easy Rider/C	201	20	1,200	4.00	0	5	1,140	91	814	110
Wrangler/C	201	20	1,200	4.00	0	5	1,140	91	814	110
Morning Side/C3	2,683	542	1,800	6.00	5	10	1,530	4,976	11,027	450
Pony Express/D4	4,967	1,650	1,200	6.50	0	5	1,140	12,227	27,078	450
<b>Resort Total</b>	<b>73,591</b>		<b>40,062</b>				<b>30,309</b>	<b>218,550</b>		<b>13,050</b>

Table B-11. Density Analysis – Existing Conditions

LIFT NAME/LIFT TYPE	CCC	GUEST DISPERSEMENT				DENSITY ANALYSIS				DENSITY INDEX (%)
		SUPPORT FACILITY/MILLING (GUESTS)	LIFT LINES (GUESTS)	ON LIFT (GUESTS)	ON TERRAIN (GUESTS)	TERRAIN AREA (ACRES)	TERRAIN DENSITY (GUESTS/ACRE)	TARGET TRAIL DENSITY (GUESTS/ACRE)	DIFF. (+/-)	
Gondola	2,100	525	360	266	949	89.1	11	11	0	100
Preview/C3	290	73	97	40	80	8.2	10	18	-8	56
Christie Peak Express/D6	1,230	308	187	173	562	41.7	13	13	0	10
Christie III/C3	430	108	43	107	172	25.4	7	11	-4	64
Bashor/C2	250	63	80	44	63	18.3	3	13	-10	23
Thunderhead Express/D4	1,060	265	150	166	479	128.1	4	11	-7	36
Burgess Creek/C3	520	130	59	136	195	46.8	4	11	-7	36
Storm Peak Express/D4	1,280	320	190	262	508	225.4	2	8	-6	25
Four Points/C3	520	130	42	171	177	26.1	7	8	-1	88
Bar-UE/C2	420	105	29	140	146	47.1	3	8	-5	38
Sundown Express/D4	1,250	313	210	232	495	170.2	3	8	-5	38
Elkhead Express/D4	130	33	20	24	53	48.7	1	10	-9	10
Priest Creek/C2	430	108	16	160	146	28.1	5	8	-3	63
South Peak/C3	80	20	6	21	33	17.4	2	17	-15	12
Sunshine Express/D4	1,500	375	190	211	724	170.3	4	11	-7	36
Buckaroo/C	90	36	29	16	10	0.2	40	30	10	133
Rough Rider/S	120	30	32	16	42	5.2	8	18	-10	44
Desperado/C	110	44	29	25	12	0.3	46	30	16	153
Sundance/C	120	48	29	32	12	0.2	63	30	33	210
Easy Rider/C	110	44	29	25	12	0.3	39	30	9	130
Wrangler/C	110	44	29	25	12	0.2	58	30	28	193
Morning Side/C3	450	113	51	137	149	146.5	1	8	-7	13
Pony Express/D4	450	113	57	94	186	110.0	2	8	-6	25
<b>Total</b>	<b>13,050</b>	<b>3,348</b>	<b>1,962</b>	<b>2,524</b>	<b>5,217</b>	<b>1,353.9</b>	<b>8</b>	<b>11</b>	<b>-3</b>	<b>69</b>



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# APPENDIX C

## SUPPORTING UPGRADE PLAN TABLES

Table C-1. Terrain Specifications – Upgrade Plan

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Alarm Clock	10,492	10,231	261	1,138	1.035	799	20.9	24	47	Advanced Intermediate
Ambush	8,972	8,574	399	1,115	1.073	163	4.2	38	46	Advanced Intermediate
Arrowhead Glade	8,817	7,512	1,306	4,222	1.068	134	13.0	33	62	Expert
B.C. Lifeline	9,189	8,309	879	3,133	1.050	112	8.1	29	47	Advanced Intermediate
B.C. Skiway	8,210	7,574	637	6,028	1.013	83	11.5	11	24	Novice
Bashor Terrain Park	7,749	7,458	291	1,387	1.025	339	10.8	21	32	Low Intermediate
Bear Claw	7,874	7,780	94	293	1.057	302	2.0	34	36	Intermediate
Beeline	7,563	7,514	49	385	1.010	46	0.4	13	14	Novice
Betwixt	8,325	8,124	201	1,894	1.013	77	3.3	11	19	Novice
Big Meadow	10,046	9,544	501	2,826	1.020	659	42.8	18	38	Intermediate
Blizzard	8,856	8,561	294	948	1.056	154	3.4	33	43	Intermediate
Boulevard	7,965	7,748	217	2,133	1.014	55	2.7	10	18	Novice
Broadway	9,249	8,449	800	5,613	1.017	73	9.5	14	27	Low Intermediate
Buckshot	9,700	9,437	263	1,053	1.037	130	3.1	26	39	Intermediate
Buddy's Run	10,373	8,988	1,384	5,506	1.037	230	29.1	26	44	Intermediate
Cabin Fever	9,704	9,484	220	658	1.068	172	2.6	36	52	Advanced Intermediate
Calf Roper	9,875	9,753	122	1,168	1.008	119	3.2	10	15	Novice



**Table C-2. Terrain Specifications – Upgrade Plan (cont.)**

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Canter	8,315	8,165	149	1,329	1.048	65	2.0	12	56	Expert
Chaps	8,631	8,346	285	741	1.086	105	1.8	42	47	Advanced Intermediate
Chisolm Trail	9,588	9,082	506	4,124	1.014	32	3.0	12	19	Novice
Christie II Liftline	7,990	7,289	701	2,165	1.072	47	2.4	35	54	Advanced Intermediate
Christie III Liftline	7,987	7,235	752	2,337	1.069	49	2.6	34	56	Expert
Christmas Tree Bowl	10,367	10,040	327	792	1.124	251	4.6	46	83	Expert
Chuckwagon	9,085	8,961	124	545	1.028	132	1.7	23	28	Low Intermediate
Chute 1	10,478	9,942	537	1,629	1.066	169	6.3	35	57	Expert
Chute 2	10,501	9,984	517	1,457	1.078	158	5.3	38	64	Expert
Chute 3	10,536	10,048	488	1,192	1.117	167	4.6	46	89	Expert
Cinch	9,652	9,426	227	1,273	1.021	99	2.9	18	31	Low Intermediate
Closet	10,255	8,823	1,432	3,690	1.089	177	15.0	42	54	Advanced Intermediate
Corridor	10,536	10,501	36	472	1.007	350	3.8	8	15	Novice
Cowboy Coffee	10,325	10,008	317	2,903	1.009	192	12.8	11	25	Novice
Cowtrack	10,426	9,766	661	2,416	1.046	226	12.5	29	54	Advanced Intermediate
Cub	9,913	9,739	174	823	1.032	235	4.4	22	35	Intermediate
Cyclone	9,716	9,095	621	1,827	1.068	219	9.2	36	49	Advanced Intermediate
Dawn	9,544	9,204	340	1,543	1.032	50	1.8	23	38	Intermediate
Daybreak	9,167	8,487	681	2,993	1.035	147	10.1	24	44	Intermediate
Diamond Hitch	9,448	8,607	841	2,363	1.075	184	10.0	38	51	Advanced Intermediate
Drop Out	8,982	8,220	761	2,431	1.065	339	18.9	33	53	Advanced Intermediate
Duster	9,363	9,063	300	6,788	1.007	60	9.4	4	13	Novice

Table C-3. Terrain Specifications – Upgrade Plan (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
East Face	10,535	10,082	453	1,631	1.068	463	17.3	30	61	Expert
Ego	8,419	8,219	200	1,418	1.012	250	8.2	14	21	Novice
Elkhead Liftline	9,073	8,502	572	1,444	1.096	255	8.4	43	62	Expert
Fawn	9,447	9,255	192	985	1.022	99	2.2	20	30	Low Intermediate
Feather	8,910	8,847	63	497	1.076	134	1.5	14	24	Novice
Flat Out	8,477	8,373	104	1,864	1.005	48	2.1	6	11	Beginner
Flintlock	10,014	9,154	860	4,342	1.023	158	15.8	20	37	Intermediate
Flying Z	9,706	9,038	668	2,132	1.059	383	18.8	33	55	Expert
Flying Z Gulch	9,737	9,478	259	1,454	1.023	154	5.1	18	34	Low Intermediate
Fools Gold	9,717	9,517	200	658	1.055	147	2.2	32	44	Intermediate
Four Points Liftline	9,269	8,423	846	2,252	1.088	108	5.6	41	62	Expert
Frying Pan	10,341	10,196	145	522	1.042	115	1.4	29	34	Low Intermediate
Giggle Gulch	7,720	7,200	521	3,292	1.015	144	10.9	16	32	Low Intermediate
Headwall/Stampede	7,196	6,898	298	2,487	1.009	459	26.2	12	21	Novice
Heavenly Daze	9,036	7,965	1,071	4,121	1.043	250	23.7	27	44	Intermediate
Highline	10,301	10,185	116	1,231	1.009	36	1.0	9	17	Novice
Hot Cakes	10,292	10,008	283	1,370	1.028	442	13.9	21	37	Intermediate
Huevos	10,404	10,133	271	1,151	1.035	196	5.2	24	42	Intermediate
Huffman's	8,986	8,782	205	854	1.039	103	2.0	25	42	Intermediate
Hurricane	9,424	8,657	767	2,026	1.084	215	10.0	41	51	Advanced Intermediate
Jess' Cut Off	7,965	7,874	91	641	1.019	107	1.6	14	19	Novice
Jump Start	10,292	10,094	198	876	1.036	175	3.5	23	37	Intermediate
Kit	10,013	9,971	43	268	1.016	91	0.6	16	22	Novice
Lariat	8,165	8,085	80	881	1.012	88	1.8	9	15	Novice
Last Chance	9,968	9,629	340	4,329	1.006	115	11.5	8	23	Novice
Lightning	8,792	8,487	305	1,007	1.050	272	6.3	32	36	Intermediate



Table C-4. Terrain Specifications – Upgrade Plan (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Lights Out	9,088	8,789	299	893	1.066	274	5.6	36	49	Advanced Intermediate
Longhorn	9,724	8,226	1,498	4,864	1.056	194	21.7	33	48	Advanced Intermediate
Lower Bar-UE Liftline	9,826	9,165	661	2,296	1.050	90	4.8	30	47	Advanced Intermediate
Lower Concentration	8,140	7,683	457	1,780	1.039	169	6.9	27	38	Intermediate
Lower High Noon	9,342	8,557	785	2,996	1.039	194	13.3	27	42	Intermediate
Lower Rainbow	9,051	8,419	632	2,434	1.041	249	13.9	27	38	Intermediate
Lower Storm Peak Traverse	10,327	10,144	184	1,060	1.017	144	3.5	18	24	Novice
Lower Thunderhead Liftline	7,824	7,498	326	1,887	1.019	60	2.6	18	32	Low Intermediate
Lower Vagabond	8,325	7,659	666	2,091	1.056	244	11.7	34	40	Intermediate
Lower Valley View	7,867	7,188	679	2,488	1.052	115	6.6	29	49	Advanced Intermediate
Lower Why Not	8,335	7,432	903	8,028	1.014	80	14.8	11	25	Novice
Main Drag	7,958	7,642	315	2,210	1.017	43	2.2	15	20	Novice
Maverick's Super Pipe	7,768	7,525	243	970	1.037	164	3.7	26	39	Intermediate
Meadow Lane	9,684	9,576	108	940	1.011	64	1.4	12	18	Novice
Middle Rib	9,733	8,457	1,275	4,491	1.050	142	14.7	30	51	Advanced Intermediate
Moon Dog	8,729	8,619	110	284	1.089	109	0.7	42	48	Advanced Intermediate
Moonlight	9,036	8,450	586	2,915	1.024	232	15.5	21	37	Intermediate
Morningside Liftline	10,526	10,005	521	2,625	1.028	143	8.6	20	56	Expert
Mother Nature	8,183	8,023	160	365	1.114	96	0.8	49	51	Advanced Intermediate
N.D.	9,059	9,015	44	391	1.017	611	5.5	11	23	Novice
Nastar	7,757	7,533	224	1,090	1.024	42	1.1	21	29	Low Intermediate
Nelson's Run	9,706	8,545	1,161	3,128	1.083	125	9.0	40	52	Advanced Intermediate

Table C-5. Terrain Specifications – Upgrade Plan (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
North St. Pats	10,547	9,968	579	2,302	1.076	303	16.0	27	76	Expert
Norther	9,086	8,804	282	976	1.047	145	3.3	30	35	Intermediate
One O'Clock	9,688	9,158	530	1,755	1.051	177	7.1	32	42	Intermediate
Oops	8,877	8,674	202	505	1.096	145	1.7	44	53	Advanced Intermediate
Outlaw	8,769	8,224	545	2,421	1.055	98	5.4	24	59	Expert
Over Easy	10,539	10,298	241	1,276	1.020	187	5.5	19	26	Low Intermediate
Park Lane	9,035	8,918	116	1,179	1.011	42	1.1	10	15	Novice
Park Smalley Freestyle	7,551	7,285	267	784	1.074	131	2.4	37	50	Advanced Intermediate
Pony Express Liftline	9,728	8,083	1,645	4,930	1.068	118	13.3	36	52	Advanced Intermediate
Preview	6,990	6,921	69	698	1.007	346	5.5	10	18	Novice
Priest Creek Liftline	10,362	8,529	1,833	4,958	1.084	120	13.6	40	63	Expert
Pup	9,764	9,497	267	1,059	1.038	160	3.9	26	38	Intermediate
Quickdraw	10,264	9,240	1,024	5,127	1.023	189	22.3	20	37	Intermediate
Rainbow Cut Off	9,599	9,496	103	414	1.035	71	0.7	26	32	Low Intermediate
Ramrod	9,538	9,302	237	1,121	1.025	232	6.0	22	28	Low Intermediate
Right-O-Way	7,432	6,982	450	4,451	1.010	77	7.8	10	25	Low Intermediate
Road to Eagles Nest	8,124	7,523	601	2,645	1.033	179	10.9	23	40	Intermediate
Rolex	9,255	8,447	809	2,513	1.068	139	8.0	34	53	Advanced Intermediate
Rolex Catwalk	9,320	9,292	28	486	1.004	38	0.4	6	11	Beginner
Rooster	10,509	10,098	411	1,720	1.041	106	4.2	25	52	Advanced Intermediate
Rough Rider Basin	7,724	7,544	181	1,216	1.013	187	5.2	15	20	Novice
Royal Flush	9,463	8,778	685	1,684	1.101	247	9.6	45	55	Advanced Intermediate



**Table C-6. Terrain Specifications – Upgrade Plan (cont.)**

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Rudy's Run	9,072	8,834	238	994	1.037	381	8.7	25	34	Low Intermediate
See Me	7,753	7,191	561	1,916	1.052	218	9.6	31	48	Advanced Intermediate
See Me Race Course	7,757	7,197	560	1,962	1.049	99	4.5	30	41	Intermediate
Shadows	10,228	9,206	1,022	2,894	1.071	144	9.6	38	48	Advanced Intermediate
Short Cut	7,392	7,253	139	1,483	1.012	67	2.3	9	17	Novice
Sitz	8,018	7,757	261	845	1.053	176	3.4	33	36	Intermediate
Skyline	9,196	9,062	134	821	1.019	128	2.4	17	29	Low Intermediate
Snooze Bar	10,231	10,003	227	1,586	1.014	232	8.5	15	30	Low Intermediate
So What	8,369	8,268	101	1,294	1.008	60	1.8	8	14	Novice
South Face Park	6,894	6,890	4	203	1.001	207	1.0	2	3	Beginner
South Peak Flats	9,369	9,255	114	1,076	1.007	234	5.8	11	16	Novice
South Peak Liftline	9,370	9,067	302	1,613	1.025	108	4.0	19	33	Low Intermediate
Spike	9,332	9,064	267	1,896	1.013	308	13.4	14	24	Novice
Spur Run Face	8,825	8,713	113	373	1.050	171	1.5	32	33	Low Intermediate
Spur Run Road	9,059	8,582	477	4,953	1.014	90	10.2	10	25	Low Intermediate
Storm Peak	10,362	9,694	668	2,694	1.043	670	41.4	26	50	Advanced Intermediate
Storm Peak Liftline	8,815	8,328	487	1,680	1.080	90	3.5	31	57	Expert
Stormpeak Traverse	10,352	10,226	126	744	1.017	191	3.3	17	24	Novice
Sundown Liftline	10,363	8,542	1,820	4,974	1.083	134	15.3	40	67	Expert
Sunnyside	9,200	8,440	760	2,739	1.048	147	9.2	29	39	Intermediate
Sunset	9,682	9,140	541	1,581	1.066	213	7.7	37	45	Advanced Intermediate
Sunshine Liftline	10,381	9,127	1,254	5,615	1.029	233	30.0	23	32	Low Intermediate
Surprise	8,587	8,318	269	889	1.054	134	2.7	32	40	Intermediate
Swinger	7,560	7,204	356	2,211	1.015	79	4.0	16	23	Novice

Table C-7. Terrain Specifications – Upgrade Plan (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Swinger Road	7,411	7,354	57	455	1.014	45	0.5	13	17	Novice
Ted's Ridge	8,645	8,036	609	1,678	1.076	171	6.6	39	53	Advanced Intermediate
The Ridge	10,464	9,865	598	2,157	1.050	112	5.5	29	57	Expert
Three O'Clock	10,165	8,825	1,340	3,528	1.086	263	21.3	41	60	Expert
Thunderhead Service Road	9,055	9,031	25	1,705	1.005	43	1.7	1	11	Beginner
Tomahawk	10,379	9,116	1,262	7,828	1.016	258	46.4	16	37	Intermediate
Tomahawk Traverse	10,010	9,937	73	2,304	1.008	61	3.2	3	26	Low Intermediate
Tornado	9,707	8,757	950	2,635	1.078	226	13.7	39	52	Advanced Intermediate
Tornado Lane	8,988	8,481	507	2,398	1.029	154	8.5	22	37	Intermediate
Tower	9,194	9,059	136	1,212	1.012	171	4.7	11	27	Low Intermediate
Tower 3 Road	8,867	8,744	123	1,129	1.012	32	0.8	11	19	Novice
Trap	9,974	9,906	69	345	1.021	154	1.2	20	23	Novice
Traverse	10,380	10,313	67	839	1.004	186	3.6	8	14	Novice
Triangle 3	10,216	9,788	428	1,439	1.052	236	7.8	31	49	Advanced Intermediate
Twilight	9,965	9,080	885	2,549	1.070	312	18.3	37	49	Advanced Intermediate
Twister	9,684	8,568	1,116	2,981	1.085	158	10.8	41	57	Expert
Two O'Clock	9,778	9,178	601	1,872	1.060	127	5.5	34	45	Advanced Intermediate
Typhoon	9,265	8,926	339	905	1.086	193	4.0	41	52	Advanced Intermediate
Upper Bar-UE Liftline	10,372	10,060	312	1,023	1.057	79	1.9	32	47	Advanced Intermediate
Upper Concentration	8,912	8,157	755	1,753	1.111	325	13.1	48	59	Expert
Upper High Noon	10,377	9,330	1,047	4,918	1.026	221	25.0	22	35	Intermediate
Upper Rainbow	9,629	9,051	579	2,294	1.037	178	9.4	26	40	Intermediate





Table C-8. Terrain Specifications – Upgrade Plan (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
Upper Thunderhead Liftline	9,065	8,786	280	710	1.093	151	2.5	43	50	Advanced Intermediate
Upper Vagabond	9,068	8,325	743	3,221	1.033	191	14.1	24	37	Intermediate
Upper Valley View	8,925	8,093	832	2,707	1.061	154	9.6	33	54	Advanced Intermediate
Vagabond Flats	7,683	7,483	200	1,257	1.016	113	3.3	16	23	Novice
Velvet	9,190	9,076	114	791	1.016	70	1.3	15	25	Low Intermediate
Vertigo	8,572	7,731	841	2,108	1.095	209	10.1	44	59	Expert
Vogue	7,752	7,218	533	2,090	1.040	157	7.5	27	42	Intermediate
Voo Doo	7,709	7,232	477	1,496	1.063	176	6.0	34	49	Advanced Intermediate
Vortex	8,786	8,347	439	1,119	1.094	301	7.7	43	61	Expert
Wake Up Call	10,563	10,312	251	783	1.072	165	3.0	34	61	Expert
Wapiti	9,092	9,050	42	519	1.009	110	1.3	8	14	Novice
West Side	9,204	8,612	592	1,743	1.067	143	5.7	36	48	Advanced Intermediate
White out	9,169	8,615	554	1,449	1.086	175	5.8	42	49	Advanced Intermediate
Why Not	9,032	8,373	659	6,014	1.011	59	8.2	11	24	Novice
WJW	8,969	8,709	261	600	1.115	211	2.9	48	56	Expert
Yoo Hoo	8,021	7,459	562	6,099	1.010	81	11.3	9	29	Low Intermediate
<i>Trail A</i>	7,961	7,502	459	3,835	1.014	73	6.4	12	32	Low Intermediate
<i>Trail B</i>	7,811	7,741	70	818	1.010	59	1.1	9	14	Novice
<i>Trail C</i>	7,807	7,771	36	475	1.014	93	1.0	8	18	Novice
<i>New Beginner/Upper Swinger</i>	7,563	7,520	43	505	1.005	555	6.4	9	11	Beginner
<i>Swinger South</i>	7,597	7,500	97	568	1.016	242	3.1	17	20	Novice
<i>Trail D</i>	7,702	7,541	161	909	1.019	186	3.9	18	24	Novice

Table C-9. Terrain Specifications – Upgrade Plan (cont.)

SKI RUN/AREA NAME	TOP ELEVATION (FT)	BOTTOM ELEVATION (FT)	VERTICAL RISE (FT)	SLOPE LENGTH (FT)	PERCENT INCREASE (%)	AVERAGE WIDTH (FT)	SLOPE AREA (ACRES)	AVERAGE GRADE (%)	MAX GRADE (%)	SKIER/RIDER ABILITY LEVEL
<i>Main Drag West</i>	7,785	7,747	39	155	1.033	261	0.9	26	25	Novice
<i>Giggle Gulch Upper West</i>	7,738	7,675	62	281	1.026	191	1.2	23	25	Novice
<i>Trail E</i>	8,366	8,313	53	860	1.008	143	2.8	6	14	Novice
<i>Trail F</i>	9,720	7,862	1,858	9,612	1.027	32	7.1	20	52	Advanced Intermediate
<i>Trail G</i>	8,147	7,947	199	3,111	1.007	32	2.3	6	14	Advanced Intermediate
<i>Trail H</i>	8,582	8,180	401	4,076	1.009	20	1.9	10	15	Advanced Intermediate
<i>Pioneer Glading</i>							90.4			Expert
<i>22A</i>	10,055	9,900	155	1,091	1.010	123	3.1	14	16	Novice
<i>22B</i>	10,085	9,870	215	1,654	1.009	119	4.5	13	16	Novice
<i>22C</i>	9,920	9,745	175	887	1.020	165	3.4	20	24	Low Intermediate
<i>22D</i>	9,970	9,720	250	1,109	1.027	347	8.8	23	39	Intermediate
<i>22E</i>	10,010	9,720	290	1,244	1.028	228	6.5	24	29	Low Intermediate
<i>22F</i>	10,045	9,645	400	1,912	1.022	172	7.6	21	23	Low Intermediate
<i>22G</i>	9,665	9,505	160	1,062	1.011	146	3.6	15	19	Novice
<i>22H</i>	9,760	9,290	470	3,928	1.007	129	11.6	12	19	Novice
<i>22I</i>	9,800	9,600	200	922	1.024	109	2.3	22	24	Low Intermediate
<i>22J</i>	9,870	9,520	350	2,060	1.015	125	5.9	17	23	Low Intermediate
<i>22K</i>	9,725	9,375	350	2,524	1.010	166	9.6	14	17	Novice
<b>Resort Total</b>				<b>394,797</b>			<b>1,550</b>			



Table C-10. Comfortable Carrying Capacity – Upgrade Plan

LIFT NAME/LIFT TYPE	SLOPE LENGTH (FT)	VERTICAL RISE (FT)	ACTUAL CAPACITY (PPH)	OPERATING HOURS (HRS)	UP-MTN ACCESS ROLE (%)	MISLOAD/LIFT STOPPAGES (%)	ADJUSTED HRLY CAPACITY (PPH)	VTF/ DAY (000)	VERTICAL DEMAND (FT/DAY)	CCC (GUESTS)
Gondola	8,856	2,175	3,600	7.00	40	0	2,160	32,886	15,634	2,100
Pioneer Ridge II/D4	6,670	1,885	1,800	7.00	30	10	1,080	14,251	20,596	690
Christie Peak Express/D6	4,636	1,102	3,200	7.00	20	10	2,240	17,279	14,042	1,230
Christie III/C3	3,738	1,033	1,710	7.00	40	10	855	6,183	14,289	430
Wild Blue Gond. Stage 1/G8	4,699	587	3,200	7.00	75	5	640	2,630	4,788	550
Wild Blue Gond. Stage 2/G8	12,351	2,867	3,200	7.00	90	5	160	3,211	17,083	190
Bashor Bowl/C4	1,615	346	2,400	6.50	10	15	1,800	4,048	7,937	510
Desperado/C	251	25	600	6.00	0	10	540	81	1,049	80
Sidewinder/C	201	20	600	6.00	0	10	540	65	965	70
Sundance/C	201	20	600	6.00	0	10	540	65	965	70
Bashor Beginner/C	201	20	600	6.00	0	10	540	65	965	70
Thunderhead Express/D6	5,539	1,630	3,200	6.50	20	5	2,400	25,428	18,006	1,410
Burgess Creek/C3	3,490	939	1,800	6.50	25	10	1,170	7,141	13,776	520
Storm Peak Express/D4	6,884	2,159	2,400	6.50	0	5	2,280	31,996	25,081	1,280
Four Points/C3	4,050	1,361	1,411	6.50	0	10	1,270	11,234	21,487	520
Bar-UE/C2	4,814	1,356	1,025	6.50	5	10	871	7,680	18,291	420
Sundown Express/D6	5,530	1,936	3,200	6.50	5	5	2,880	36,242	25,276	1,430
Elkhead Express/D6	2,394	762	3,200	6.50	70	5	800	3,962	23,327	170
South Peak/D4	1,683	312	2,400	6.00	70	10	480	899	8,014	110
Sunshine Express/D4	5,563	1,256	2,400	6.00	0	5	2,280	17,182	11,443	1,500
Buckaroo/C	80	8	1,200	6.00	0	10	1,080	52	527	100
Rough Rider/C4	758	145	1,800	6.50	0	5	1,710	1,612	3,371	480
Wrangler/C	201	20	1,200	6.00	0	10	1,080	130	965	130
Morning Side/C3	2,683	542	1,800	6.00	5	10	1,530	4,976	11,027	450
Pony Express/D4	4,967	1,650	1,800	6.50	10	5	1,530	16,409	27,078	610
Sunshine II/D4	6,048	1,030	2,400	6.00	0	5	2,280	14,090	11,420	1,230
Resort Total	98,105		52,746				34,736	259,486		16,310

Table C-11. Density Analysis – Upgrade Plan

LIFT NAME/LIFT TYPE	CCC	GUEST DISPERSEMENT				DENSITY ANALYSIS				DENSITY INDEX (%)
		SUPPORT FACILITY/MILLING (GUESTS)	LIFT LINES (GUESTS)	ON LIFT (GUESTS)	ON TERRAIN (GUESTS)	TERRAIN AREA (ACRES)	TERRAIN DENSITY (GUESTS/ACRE)	TARGET TRAIL DENSITY (GUESTS/ACRE)	DIFF. (+/-)	
Gondola	2,100	525	360	266	949	86.2	11	11	0	100
Pioneer Ridge II/D4	690	173	54	120	343	101.7	3	3	0	100
Christie Peak Express/D6	1,230	308	187	173	562	43.2	13	12	1	108
Christie III/C3	430	108	43	107	172	16.5	10	11	-1	91
Wild Blue Gond. Stage 1/G8	550	138	53	44	315	23.5	13	13	0	100
Wild Blue Gond. Stage 2/G8	190	48	8	29	105	28.1	4	8	-4	50
Bashor Bowl/C4	470	118	90	97	165	29.9	6	15	-9	39
Desperado/C	80	20	9	12	40	1.45	27	30	-3	90
Sidewinder/C	70	18	9	9	34	1.45	23	30	-7	77
Sundance/C	70	18	9	9	34	1.45	23	30	-7	77
Bashor Beginner/C	70	18	9	9	34	1.45	23	30	-7	77
Thunderhead Express/D6	1,410	353	200	222	635	126.4	5	11	-6	45
Burgess Creek/C3	520	130	59	136	195	46.8	4	11	-7	35
Storm Peak Express/D4	1,280	320	190	262	508	225.3	2	8	-6	26
Four Points/C3	520	130	42	171	177	26.1	7	8	-1	88
Bar-UE/C2	420	105	29	140	146	47.1	3	8	-5	37
Sundown Express/D6	1,430	358	240	265	567	170.2	3	8	-5	37
Elkhead Express/D6	170	43	27	32	68	48.7	1	10	-9	10
South Peak/D4	110	28	8	30	44	17.4	3	17	-14	18
Sunshine Express/D4	1,500	375	190	211	724	170.3	4	17	-13	23
Buckaroo/C	100	40	18	15	27	0.24	113	30	83	377
Rough Rider/C4	480	120	143	48	169	8.87	19	18	1	106
Wrangler/C	130	52	18	24	36	0.21	172	30	142	573
Morning Side/C3	450	113	51	137	149	146.5	1	8	-7	12
Pony Express/D4	610	153	77	127	253	114.4	2	8	-6	24
Sunshine II/D4	1,230	308	76	230	616	66.9	9	9	0	105
<b>Total</b>	<b>16,310</b>	<b>4,120</b>	<b>2,199</b>	<b>2,695</b>	<b>6,450</b>	<b>1,550</b>	<b>9</b>	<b>11</b>	<b>-2</b>	<b>80</b>