Tahoe Donner Phase 1 - 4

Technical Assessment and Resort Concept

2018-04-23

Prepared for:

TAHOE DONNER℠

Prepared by:

Ecosign Resort Planners (2016) Ltd.

Whistler, British Columbia, Canada

ecosign Mountain Resort Planners Ltd.

CREATIVE DESIGN FOR WORLD CLASS RESORTS

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I. INTRODUCTION

Ecosign Mountain Resort Planners of Whistler, B.C. Canada has prepared this Master Plan for the Tahoe Donner Downhill Ski Area in response to the Request for Proposal (RFP) provided by the Tahoe Donner Association in April 2017. Our firm was engaged on this project on June 28, 2017, and during the past nine months we have worked closely with the Tahoe Donner planning Task Force and staff members, attended site inspections, and presented a Draft Technical Assessment and Concept Plan to the Homeowners Association in September 2017. After receiving feedback over the 2017/2018 winter season, we have prepared this Master Plan document for the ski area, which is intended to guide investments and provide strategic direction over the next 20 years.

Ecosign previously prepared a Master Plan for the Tahoe Donner ski area in 1994, and the terms of reference for the Master Plan includes the 2013 Downhill Ski Area planning document prepared by Tahoe Donner.

.1 Location and Regional Context

The Tahoe Donner Ski Area is primarily a winter orientated recreation area, operated within the Tahoe Donner Homeowners Association, located northeast of Donner Pass near the Town of Truckee, California.

Tahoe Donner is known as the “Best Place to Begin”, with an intimate and affordable, family-friendly atmosphere. Tahoe Donner also operates one of the top cross-country ski areas in North America, with over 100 kilometers of trails on 2,800 acres of terrain, with five Warming Huts. Figure 1 illustrates the Area Location and Figure 2 shows the Regional Context for Tahoe Donner.

There are three food service facilities at Tahoe Donner, including the Lodge Restaurant and Pub, the Alder Creek Café and Pizza on the Hill.

A daily shuttle bus transports guests from the parking area to the base lodge. Bus, taxi, rental cars and train service are all available in Truckee, and major airline connections can be made through the Reno/Tahoe Airport. The ski area is accessed via Interstate 80 from the west/east and Highway 89 from north/south. The Reno-Tahoe International Airport is within 40 minutes drive and the Sacramento Airport is within 90 minutes. The Tahoe Donner overall study area is illustrated on Figure 3.

Summer activities at Tahoe Donner include swimming and aquatics at Trout Creek Recreation center and the Northwoods Pool. Other recreational activities include Archery, Beach Club Marina, Biking, Hiking, Tennis, Rock Climbing, Golf, Bocce Ball, Camping, Children's Day Camps, Programs for Seniors, Golf, Equestrian and Geocaching.

.2 Historical Perspective

Tahoe Donner was founded by the Dart Corporation in the early 1970s and since that time, has grown into one of the west's premier communities of second home real estate.

Two double chairlifts were installed for the 1971/72 season and a quadruple chairlift was installed in 1995. The base area day lodge was constructed in 1971 and since that time, has undergone several upgrades and remodeling.

In the early 1980s, Dart transferred the management of Tahoe Donner to the Homeowners Association. The Tahoe Donner Homeowners Association is governed by a member elected board of directors and all owners of Tahoe Donner area real estate pay an annual property owners fee. The Tahoe Donner Homeowners Association is responsible for operating the facilities, as well as support functions required for the enjoyment and safety of the primary and second owners of Tahoe Donner area real estate.

.3 Goals and Objectives

By utilizing our standard planning methodologies to assess Tahoe Donner Ski Area's assets and challenges, our goal is to provide conceptual planning solutions for both the mountain and resort base lands to resolve the issues outlined in the RFP and form a strong vision moving forward for the ski area's future development.

The key goals and objectives to be addressed in the master planning at Tahoe Donner are summarized below.

- Create a ski area Master Plan which replaces the aged Snowbird lift and provides customer oriented enhancements to the "Best Place to Begin".
- Create a building program for a new day lodge that will achieve a level of service that meets or exceeds the nearby competition. The building program will be calculated using the latest recommended floorspace calculations and ratios for skier services based on current and future potential demand.
- Vastly improve the overall guest arrival experience, with special consideration to shuttle drop-offs, pedestrian circulation and accessibility requirements.
- Consider a phased implementation that allows for a gradual investment of new facilities, while maximizing the use of available resources.
- Illustrate a creative solution to the vertical separation between the main drop-off and lift terminal / snowfront grading.
- Utilize information from local authorities (provided by the client) to assess the zoning regulations and development constraints within the site to ensure the building will conform to local regulations.
- Create an overall conceptual plan of the base area which illustrates the relationship between the arrival and drop-off zones, new ski area lodge and the bottom terminals of the ski lifts.
- Consider options to optimize and enhance the spatial and circulation relationships between the beginner learn-to-ski zone and the ski lift terminals to the new day lodge.

.4 Glossary

The ski industry has a number of terms and technical jargon specific to ski area development, hence, a glossary is provided.

1. **Skier Visit -** One person visiting a ski area for all or part of a day or night for the purpose of skiing or snowboarding. This is the total number of lift tickets issued and the number of uses in a season by season passholders. Skier visits include a person holding a full-day, half-day, night, complimentary, adult, child, season, or any other ticket type that gives a skier the use of an area's facilities.

2. **Rated Uphill Capacity -** The manufacturer's rated number of skiers per hour a lift can transport to the top of the lift. An area's total rated uphill capacity is the sum of the hourly capacity of each of the individual lifts.

3. **VTF/Hour (000) - (Vertical Transport Feet per Hour) -** The number of people lifted 1,000 vertical feet in one hour (vertical rise of a lift, times the lift capacity per hour, divided by 1,000). An area's total VTF, is the sum of VTF for all lifts.

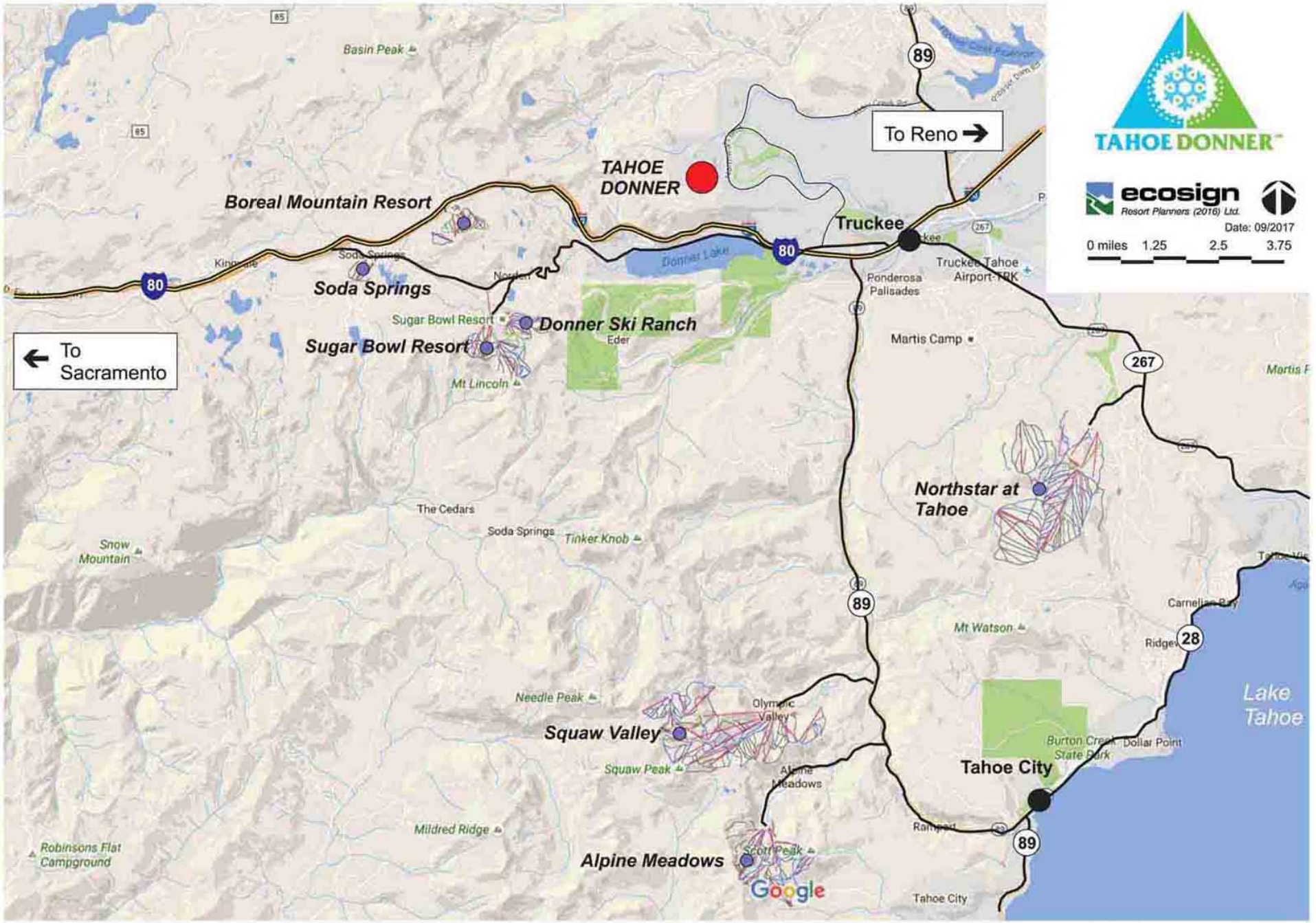
4. **VTF Demand/Skier/Day -** The amount of vertical skied (demanded) each day by a skier, which varies according to the skier's ability level.

5. **Skier (Comfortable) Carrying Capacity (SCC) -** The number of skiers that a given ski area can comfortably support on the slopes and lifts without overcrowding, or those that may be accommodated at one time and still preserve a congenial environment. A ski area's comfortable carrying capacity is a function of VTF demand per skier, VTF supplied per hour, difficulty of terrain and scope of support facilities. The Skier Carrying Capacity of an area is calculated assuming all the terrain is available for skiers and that the skiers are evenly distributed over the available terrain. If weather and or snow conditions make parts of the area more attractive than others, the more attractive areas may feel overcrowded even though there are fewer skiers on the mountain than the area's theoretical SCC. Skier Carrying Capacity assumes that there will be lift queues of up to ~ 10 minutes. SCC is also commonly referred to as "Mountain Capacity", Comfortable Carrying Capacity (CCC), or "Skier's at one time (SAOT).

6. **Utilization -** Utilization is measured as a percent of skier carrying capacity. Comfortable Seasonal Capacity is the product of a ski area's daily skier carrying capacity times its days of operation that season. Utilization compares actual skier visits to calculated comfortable seasonal capacity.

7. **Terrain Pod -** A contiguous area of land deemed suitable for ski lift and trail development due to its slope gradients, exposure and fall line characteristics.

AREA LOCATION 1



REGIONAL CONTEXT 2

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Date: 09/2017

0 feet 150 300 450 600

LEGEND

Existing Lifts.....

Ski Area Boundary.....

II. INVENTORY OF EXISTING FACILITIES

Mapping Setup

Ecosign obtained open source topographic mapping of the 2014 USFS Tahoe National Forest LiDAR data set which was flown between June 10-30, 2014. The accuracy of the LiDAR elevation points is listed at 3.3 centimeters vertically and 0.6 cm horizontally, with an average point spacing of 0.34 meters. The vertical datum of the LiDAR data is NAVD88, which is approximately 260 feet higher than the Nevada State vertical datum found on most USGS maps. Ecosign converted the LiDAR data from metric to imperial units, and created 2-ft. and 10-ft. contour maps from the elevation model. While Ecosign assumes no liability for the accuracy of the maps, in our experience we are confident that the base topographic mapping is extremely accurate, and more than suitable for this planning exercise.

In addition to the LiDAR derived mapping described above, Ecosign obtained planimetric and cadastral (legal) data from Nevada County, a Digital Globe satellite orthophoto taken on July 13, 2016, and a detailed ground survey of the base survey provided by Tahoe Donner. Ecosign compiled the mapping data and created a base map for use in the inventory, technical assessment, and development concepts.

Due to the differing vertical datums between the overall site mapping and the detailed ground survey mapping in the base area, Ecosign has used the NAVD88 vertical datum for reference in all of the overall mountain facilities including the lift and ski trail measurements. For the detailed base lodge study, we have used the local Nevada State vertical datum, which is approximately 260 ft. lower.

.1 Existing Mountain Facilities

1.1 Tahoe Donner Lifts

The Tahoe Donner ski area currently operates 5 lifts, including 1 quadruple fixed grip chairlift, 1 double chairlift and 3 moving carpet conveyor belt surface lifts.

The layout of the existing Tahoe Donner lift system is graphically illustrated on Figure 4a, the Existing Mountain Facilities Map. Table II.1 lists the technical specifications for the Tahoe Donner lift system.

Ecosign has calculated the vertical rise (based on the top and bottom terminal elevations), the estimated slope length, average slope, vertical transport feet per hour and an estimate of each lift's loading efficiency. The facility currently has a lift serviced vertical rise of 510 feet, stretching from 7,040 to 7,550 feet.

The 2 chairlifts and 3 moving carpets at Tahoe Donner have a total operated capacity of 6,063 passengers per hour and generate 1 million vertical transport feet (VTF) per hour.

TABLE II.1
TAHOE DONNER
LIFT INVENTORY – EXISTING AREA

Lift Number	**1**	**2**	**3A**	**3B**	**3C**		
Lift Name	**Eagle**	**Snowbird**	**C1**	**C2**	**C3**		
Year Built	**1995**	**1971**	**1999**	**2007**	**2010**		
Lift Type	**4C**	**2C**	**MC**	**MC**	**MC**	**TOTAL**	
Top Elevation ft.	7,550	7,275	7,052	7,105	7,064		
Bottom Elevation ft.	7,040	7,042	7,045	7,050	7,051		
Total Vertical ft.	510	233	7	55	13	818	
Horizontal Distance ft.	2,020	1,632	80	396	149		
Slope Distance ft.	2,083	1,649	80	400	150	4,362	
Average Slope %	25%	14%	9%	14%	9%	19%	Mean
Operated Capacity pph	1,478	585	800	1,600	1,600	6,063	
V.T.F./Hr.(000)	754	136	6	88	21	1,004	
Rope Speed fpm	400	350	150	160	160		
Trip Time min.	5.21	4.71	0.54	2.50	0.93		
Drive Output (hp)	200	40	7	25	10		
Operating Hr./Day	7.0	7.0	7.0	7.0	7.0	7.0	

Ski/Snowboard Trail Inventory

In order to provide an accurate account of the Tahoe Donner trail systems, the trails have been classified in concert with the International Trail Standards (Table II.2), as well as the seven skier skill classification levels exhibited in Table II.3.

TABLE II.2
INTERNATIONAL TRAIL STANDARDS

TRAIL DESIGNATION	SKIER ABILITY LEVELS
Easier	Beginner & Novice Skiers
More Difficult	Intermediate Skiers
Most Difficult	Advanced & Expert Skiers

TABLE II.3
SKIER SKILL CLASSIFICATION SLOPE GRADIENTS

Skill Classifications		Acceptable Terrain Gradients	Maximum Gradient
1	Beginner	8 - 15%	20%
2	Novice	15 - 25%	30%
3	Low Intermediate	25 - 35%	40%
4	Intermediate	30 - 40%	45%
5	High Intermediate	35 - 45%	50%
6	Advanced	45 - 60%	65%
7	Expert	60% +	

Ski and snowboard trails are classified via an evaluation of the following parameters: slope width, average gradient and the steepest 100-foot vertical pitch. Since the average slope gradient of a trail is generally much lower than the steepest 100-foot vertical pitch, the trails are usually classified to ensure that the steepest 100-foot vertical pitch falls within five percent of the acceptable terrain gradients listed in Table II.3. Furthermore, a gentle novice trail cannot suddenly turn into an advanced trail for obvious reasons.

The existing trails at Tahoe Donner have been plotted on the topographic base mapping with 10-foot contours, as illustrated on the Existing Mountain Facilities Map Figure 4a.

1.2 Tahoe Donner Ski and Snowboard Trails

The presently developed ski/snowboard trail system includes 26 numbered trails which encompass 75.7 acres, which is 61.5 % of the 123 acre total ski area boundary. The trail specifications are listed in Table II.4. In general, the trails have been assigned to the lift that is used to return ski on that particular trail.

TABLE II.4
TAHOE DONNER SKI/SNOWBOARD TRAIL INVENTORY
EXISTING AREA

Trail Name	Trail No.	Skill Class	Elevation Top Feet	Elevation Bottom Feet	Total Vert. Feet	Horz. Dist. Feet	Slope Dist. Feet	Percent Slope Avg.	Percent Slope Steep.	Avg. Width Feet	Horz. Area Acres	Slope Area Acres
Lift 1 Eagle Rock												
Vista	1A	2	7,541	7,157	384	2,725	2,752	14%	18%	45	2.82	2.85
Mile Run	1B	2	7,550	7,040	510	6,345	6,365	8%	17%	21	3.08	3.09
Drop In	1C	2	7,345	7,273	72	300	309	24%	24%	64	0.44	0.45
Gully	1D	3	7,410	7,125	285	1,320	1,350	22%	37%	127	3.85	3.94
Donner Face	1E	4	7,518	7,210	308	1,080	1,123	29%	40%	402	9.96	10.36
Cristie Bowl	1F	4	7,546	7,045	501	2,265	2,320	22%	38%	212	11.03	11.30
King Size Terrain Park	1G	3	7,455	7,070	385	1,410	1,462	27%	33%	261	8.44	8.75
Scarlets	1H	3	7,520	7,049	471	1,750	1,812	27%	34%	126	5.06	5.24
Dart	1I	3	7,543	7,355	188	895	915	21%	33%	102	2.10	2.15
Race Course	1J	3	7,461	7,053	408	1,380	1,439	30%	36%	91	2.89	3.01
Skip's Plunge	1K	4	7,395	7,115	280	745	796	38%	40%	121	2.07	2.21
Fire Break	1L	4	7,510	7,200	310	815	872	38%	39%	180	3.37	3.61
Backside	1M	4	7,530	7,235	295	905	952	33%	40%	92	1.91	2.01
Hans Down	1N	3	7,526	7,280	246	930	962	26%	33%	111	2.38	2.46
Leary's Laugh	1O	2	7,535	7,315	220	920	946	24%	28%	92	1.94	1.99
Bite Size Terran Park	1P	2	7,526	7,330	196	855	877	23%	25%	87	1.70	1.74
Walt's	1Q	2	7,510	7,336	174	845	863	21%	22%	51	0.99	1.01
Rocky Road	1R	4	7,544	7,518	26	515	516	5%	5%	23	0.27	0.27
Total Lift 1	18						26,630					66.44
Lift 2 Snowbird												
Snowbird Right	2A	1	7,275	7,042	233	1,762	1,777	13%	16%	84	3.38	3.41
Snowbird Left	2B	2	7,275	7,042	233	1,783	1,798	13%	16%	80	3.29	3.32
Mini Sized Park	2C	2	7,260	7,155	105	742	749	14%	16%	83	1.41	1.42
Total Lift 2	3						4,325					8.15
Lift 3A C1												
	3AR	1	7,052	7,045	7	80	80	9%	9%	54	0.10	0.10
	3AL	1	7,052	7,045	7	80	80	9%	9%	54	0.10	0.10
Total Lift 3A	2						161					0.20
Lift 3B C2 Caterpillar												
	3B	1	7,105	7,050	55	410	414	13%	13%	50	0.47	0.47
Total Lift 3B	1						414					0.47
Lift 3C C3 Learning Center												
	3CR	1	7,064	7,051	13	180	180	7%	9%	65	0.27	0.27
	3CL	1	7,064	7,051	13	150	151	9%	9%	52	0.18	0.18
Total Lift 3C	2						331					0.45
Total All Lifts	**26**						**6.0 miles**					**75.7 Acres**

Skier/Snowboarder Densities

Ecosign has performed on-site research to determine comfortable and safe skier densities at ski areas in many parts of the world. The research consisted of performing on-site guest surveys while simultaneously taking aerial photos of the trails by helicopter. One of the questions on the survey asks skiers for their subjective opinion of the crowding on the particular trail they skied. Their opinions were then compared with the actual densities recorded in the photos. From these comparisons, we estimated skier densities which provide skiers with a high quality, comfortable experience, resulting in good memories and the likelihood of return visits.

Densities used in planning ski areas in different parts of the world are listed in Table II.5 and shown graphically in Plate II.1. In areas such as Europe, Western Canada and the Western United States, skier densities are relatively low compared to the densities at ski areas in Japan or Australia, where skiers have been historically conditioned to higher densities. For example, densities in Japan are generally three times the densities in western North American destination resorts.

Listed in Table II.5 are the “SAOT” (Skiers At One Time) densities and the “On-Slope” densities. The SAOT is based on the total number of skiers/snowboarders at the area, including those in lift queues, riding lifts, in restaurants and on the trails. The “On-Slope” densities take into account only those skiers and snowboarders actually on the trails at any given time.

As shown in Table II.5, acceptable skier/snowboarder slope densities tend to decrease as the proficiency of the skier increases. The lower density for better skiers occurs due to their increased speed, and therefore, longer stopping distances and the general increase in space needed to avoid obstacles and other skiers. As listed, the exception to this rule is that slope densities increase slightly on expert terrain since these steep, ungroomed slopes dictate controlled, short radius turns. Under these conditions, expert skiers have slower speeds and require less space for safe skiing and snowboarding.

Ecosign believes that the “Western Regional Densities” are appropriate for use at Tahoe Donner in determining the potential ski terrain carrying capacity of the total study area, as well as the capacity of the existing and proposed ski trails. Table II.5 and Plate II.1 show the ski and snowboard trail densities.

TABLE II.5
WORLDWIDE COMPARISON OF SKI/SNOWBOARD TRAIL DENSITIES

Skill Classification	1 Beginner	2 Novice	3 Low Intermediate	4 Intermediate	5 High Intermediate	6 Advanced	7 Expert
Western N. America Destination							
SAOT	20	20	16	16	12	6	8
On-Slope	8	8	6	6	5	3	4
Western N. America Regional							
SAOT	30	30	24	24	18	9	12
On-Slope	12	12	9	9	7	4	6
Eastern N. America Regional							
SAOT	40	40	32	32	24	12	16
On-Slope	16	16	13	13	9.6	4.8	6.4
Australia							
SAOT	55	40	32	32	24	12	16
On-Slope	22	16	12	12	10	6	8
Japan							
SAOT	63	63	50	50	40	22	28
On-Slope	25	25	19	19	16	11	14

Note: All of the above densities are in skiers per acre

WORLDWIDE SKIER DENSITIES

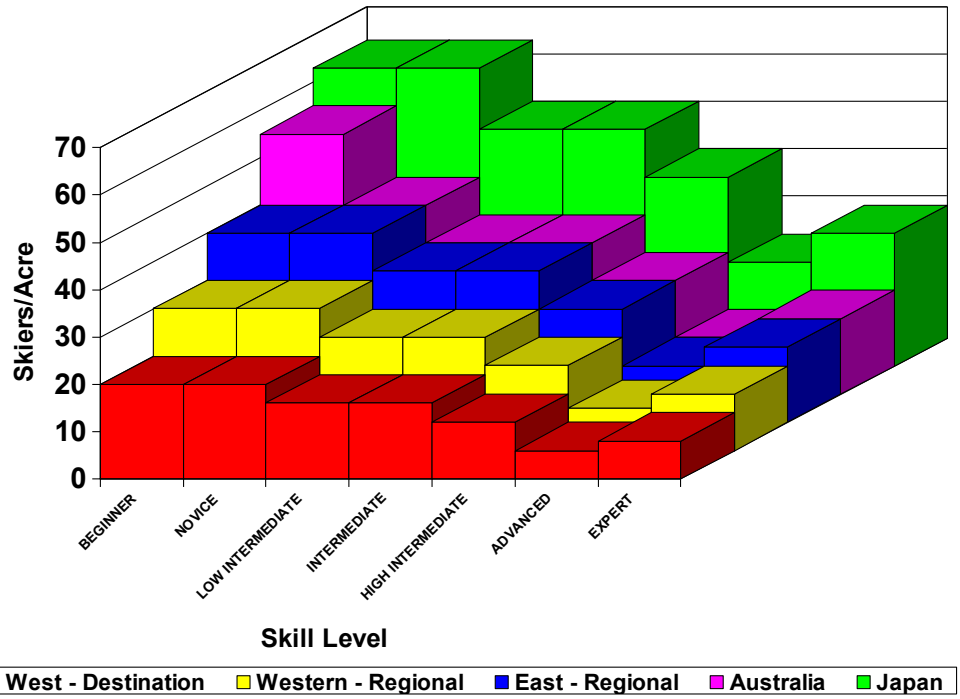

PLATE II.1

The Western Regional densities used for evaluating and analyzing the Tahoe Donner ski areas are listed in Table II.6.

TABLE II.6
TAHOE DONNER SLOPE DENSITIES
SKIERS PER ACRE

	Skier Densities	
Skill Classification	**On Slope**	**At Area**
1 Beginner	12	30
2 Novice	12	30
3 Low Intermediate	9	24
4 Intermediate	9	24
5 High Intermediate	7	18
6 Advanced	4	9
7 Expert	6	12

To accurately portray the terrain balance of the winter resort area, we computed the terrain available to each of the seven skier skill classifications and then multiplied by the appropriate skier densities to illustrate the distribution of the terrain available to each skier skill level. This exercise is often referred to as “area balancing”, and provides management and the planning team with the data necessary to compare the trail development with the apparent proportions of the skier market.

As listed in Table II.7, Tahoe Donner can support a total of 1,980 skiers on 75.7 acres of return cycle skiing/snowboarding trails based on the trail densities shown in Table II.6.

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TABLE II.7
TAHOE DONNER
SKI/SNOWBOARD TRAIL CAPACITIES - EXISTING AREA

Trail Name	Trail No.	Skill Class	Total Vert. Feet	Slope Dist. Feet	Avg. Width Feet	Horz. Area Acres	Slope Area Acres	Skiers At Area Density	Skiers At Area Total
Lift 1 Eagle Rock									
Vista	1A	2	384	2,752	45	2.82	2.85	30	90
Mile Run	1B	2	510	6,365	21	3.08	3.09	30	90
Drop In	1C	2	72	309	64	0.44	0.45	30	10
Gully	1D	3	285	1,350	127	3.85	3.94	24	90
Donner Face	1E	4	308	1,123	402	9.96	10.36	24	250
Cristie Bowl	1F	4	501	2,320	212	11.03	11.30	24	270
King Size Terrain Park	1G	3	385	1,462	261	8.44	8.75	24	210
Scarlets	1H	3	471	1,812	126	5.06	5.24	24	130
Dart	1I	3	188	915	102	2.10	2.15	24	50
Race Course	1J	3	408	1,439	91	2.89	3.01	24	70
Skip's Plunge	1K	4	280	796	121	2.07	2.21	24	50
Fire Break	1L	4	310	872	180	3.37	3.61	24	90
Backside	1M	4	295	952	92	1.91	2.01	24	50
Hans Down	1N	3	246	962	111	2.38	2.46	24	60
Leary's Laugh	1O	2	220	946	92	1.94	1.99	30	60
Bite Size Terran Park	1P	2	196	877	87	1.70	1.74	30	50
Walt's	1Q	2	174	863	51	0.99	1.01	30	30
Rocky Road	1R	4	26	516	23	0.27	0.27	24	10
Total Lift 1	18			26,630			66.44		1,660
Lift 2 Snowbird									
Snowbird Right	2A	1	233	1,777	84	3.38	3.41	30	100
Snowbird Left	2B	2	233	1,798	80	3.29	3.32	30	100
Mini Sized Park	2C	2	105	749	83	1.41	1.42	30	40
Total Lift 2	3			4,325			8.15		240
Lift 3A C1									
	3AR	1	7	80	54	0.10	0.10	60	10
	3AL	1	7	80	54	0.10	0.10	60	10
Total Lift 3A	2			161			0.20		20
Lift 3B C2 Caterpillar									
	3B	1	55	414	50	0.47	0.47	60	30
Total Lift 3B	1			414			0.47		30
Lift 3C C3 Learning Center									
	3CR	1	13	180	65	0.27	0.27	60	20
	3CL	1	13	151	52	0.18	0.18	60	10
Total Lift 3C	2			331			0.45		30
Total All Lifts	**26**			**6.0**			**75.7**	**Acres**	**1,980 skiers**

The Tahoe Donner Cumulative Ski/Snowboard Trail Balance Statement listed in Table II.8 and illustrated in Plate II.2 shows the balance of the existing return cycle skiing/snowboarding trails according to the seven skier skill classifications and compares them to the ideal balance of the skier market.

TABLE II.8
TAHOE DONNER
SKI/SNOWBOARD TRAIL BALANCE STATEMENT

Skill Classification	Acres	Skiers	Balance	Ideal
1 Beginner	4.5	180	9.1%	10%
2 Novice	15.9	470	23.7%	15%
3 Low Intermediate	25.6	610	30.8%	20%
4 Intermediate	29.8	720	36.4%	25%
5 High Intermediate	0.0	0	0.0%	15%
6 Advanced	0.0	0	0.0%	10%
7 Expert	0.0	0	0.0%	5%
TOTALS	**75.7**	**1,980**	**100%**	**100%**

Average Density =	14.9	Skiers/Acre
Optimum Density =	26.0	Skiers/Acre
Weighted Demand =	6,008	VTF/Skier/Day

TAHOE DONNER
CUMULATIVE SKI TRAIL BALANCE

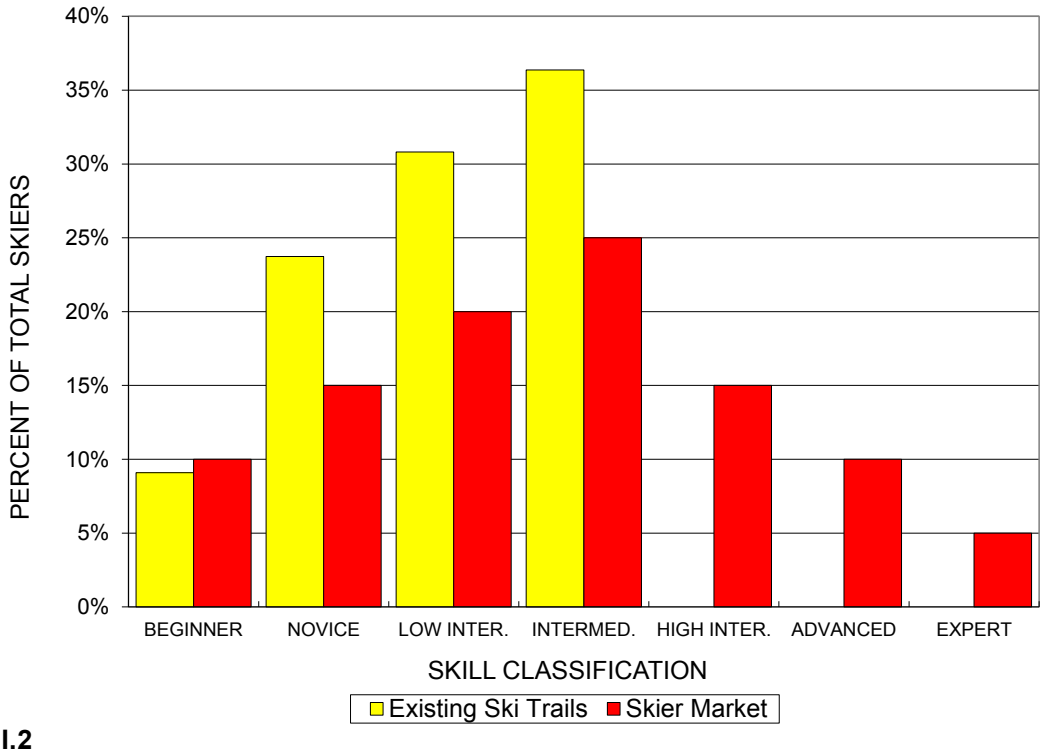

PLATE II.2

Table II.8 and Plate II.2 illustrate that the existing ski terrain is heavily skewed towards the lower skill level ability classes and there is not any high intermediate, advanced, or expert skill level terrain at the resort. As the Tahoe Donner ski area is positioned as “the best place to learn to ski”, and the skill classes of terrain present are in proportion to each other, this bell shaped skill level distribution is ideal for the Tahoe Donner market.

.2 Existing Mountain Capacity Analysis

2.1 Skier Carrying Capacity

The determination of an area's Skier Carrying Capacity (SCC) is perhaps the most critical step in ski area planning. Often referred to as the "Comfortable Carrying Capacity" (CCC) or "Skiers at One Time" (SAOT), this figure represents the number of skiers that the area's lift and ski trail system will provide a “perceived” quality experience for each skier ability level. Skier Carrying Capacity is determined via the integration of lift capacity, operating hours, acceptable slope densities, slope gradients, skier skill classifications and vertical feet of lift-serviced terrain.

Each skier ability level places different demands upon an area's lift and trail system. Empirical observations have determined that each skier ability level will ski a relatively constant number of vertical feet per day. As the proficiency of the skier increases, the demand for vertical feet also increases, as shown in Table II.9.

TABLE II.9
TAHOE DONNER
SKIING DEMAND BY SKILL CLASSIFICATION

Skill Classification	Planning Goals	Skier Demand VTF/Day		
		Low	Average	High
1 Beginner	5%	2,000	2,320	3,090
2 Novice	10%	4,500	5,225	6,950
3 Low Intermediate	20%	6,000	6,970	9,270
4 Intermediate	30%	8,000	9,290	12,360
5 High Intermediate	20%	10,000	12,540	16,680
6 Advanced	10%	12,600	14,628	19,460
7 Expert	5%	18,000	20,904	27,800
Weighted Average		**8,310**	**9,836**	**13,084**

In Europe, Western Canada and the Western United States, we generally use the industry high VTF demand to ensure a quality, uncrowded skiing experience for the better conditioned, more aggressive skiers. The average or low level of demand is commonly found in Japan, Australia and Korea. However, due to Tahoe Donner's unique positioning as a learn-to-ski area, Ecosign feels that the low level of VTF demand is suitable for evaluation and planning of the Tahoe Donner ski area.

Table II.11 summarizes the planning parameters which will be used for evaluating and planning at Tahoe Donner.

TABLE II.10
TAHOE DONNER
PLANNING PARAMETERS

Skill Classification	Skill Mix	Acceptable Terrain Gradients	Skier Demand VTF/Day	Skier Densities	
				On Trail	At Area
1 Beginner	5%	8-15%	2,000	12	30
2 Novice	10%	15-25%	4,500	12	30
3 Low Intermediate	20%	25-35%	6,000	9	24
4 Intermediate	30%	30-40%	8,000	9	24
5 High Intermediate	20%	35-45%	10,000	7	18
6 Advanced	10%	45-60%	12,000	4	9
7 Expert	5%	60% +	18,000	6	12

Based upon the design VTF demand for each lift and ski trail system, we have calculated the Skier Carrying Capacity (SCC) of the existing lift facilities at Tahoe Donner, as listed in Table II.11. Based upon this analysis, we estimate that the existing lift system can comfortably accommodate 1,130 skiers at one time assuming that all lifts are operating at full capacity and that skiers are distributed uniformly throughout the mountain, with the waiting time for each lift roughly equal to the lift's ride time.

TABLE II.11
TAHOE DONNER
SKIERS AT ONE TIME LIFT CAPACITY

Lift No.	Lift Name	Lift Type	Hourly Capacity	Vertical Feet	VTF/Hr (000)	VTF Demand	Loading Effic.	Access Reduc.	Lift Capacity
1	Eagle Rock	4C	1,478	510	754	6,569	90%	0%	**720**
2	Snowbird	2C	585	233	136	3,458	90%	0%	**250**
3A	C1	MC	800	7	6	2,000			**20**
3B	C2 Caterpillar	MC	1,600	55	88	2,000			**100**
3C	C3 Learning Center	MC	1,600	13	21	2,000			**40**
			6,063		**1,004**				**1,130**

.3 Existing Lift and Trail Balance Statement

In general, Tahoe Donner has an excess of marked ski trail capacity relative to the lift system capacity, with a total lift SCC of 1,130 skiers per day and a return cycle ski trail capacity of 1,980 skiers per day. The ski/snowboard trail balance by lift system analysis (Plate II.3) portrays the skier capacity relationship between each of the lift and ski trail systems. Lift/trail systems 2 (Snowbird), 3A & 3C (moving carpets) are well balanced, while Lift 1 Eagle Rock is significantly under lifted, and Moving Carpet 3B has a shortage of ski terrain.

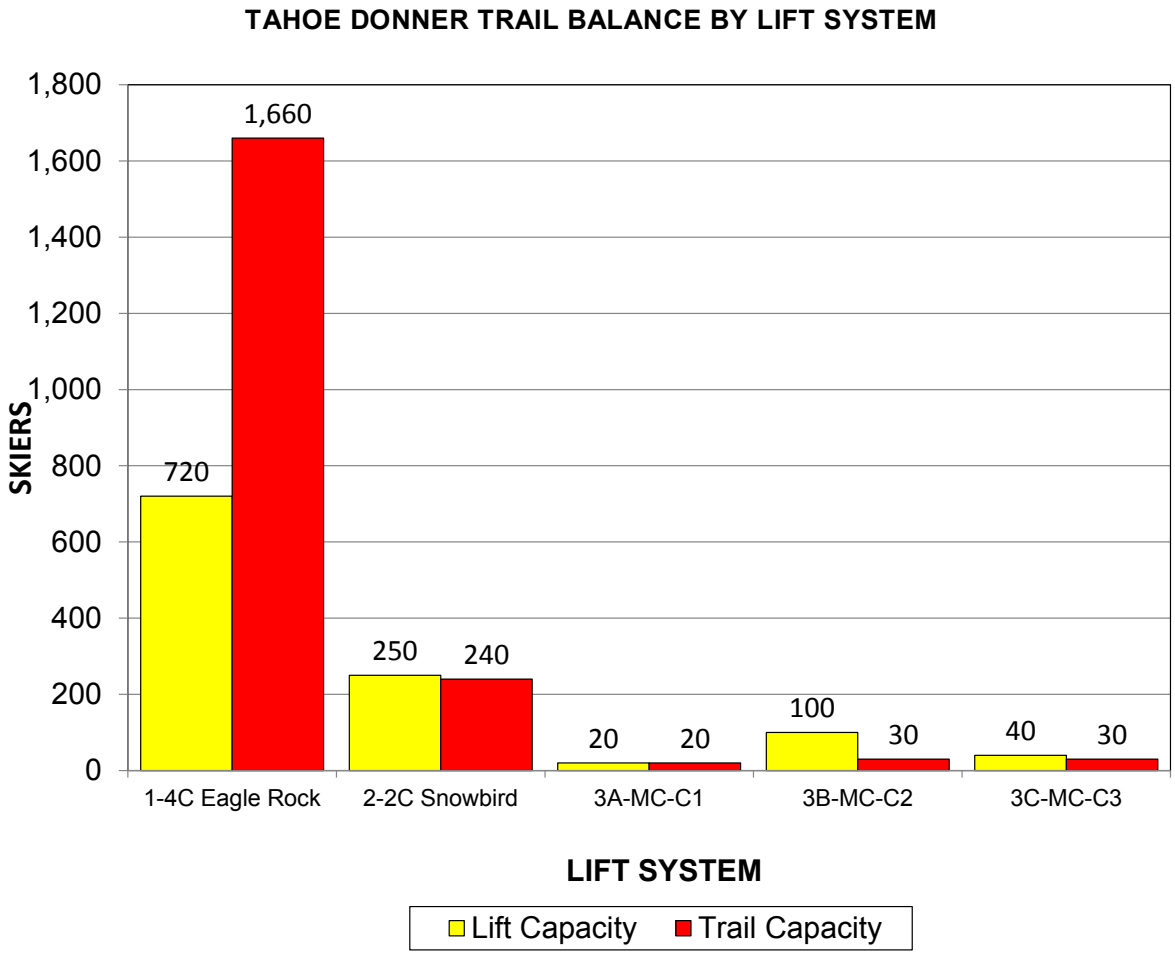

PLATE II.3

.4 Skier Visitation Analysis

4.1 Previous Skier Visitation

According to management, with the existing lodge and parking constraints, Tahoe Donner can comfortably accommodate approximately 1,000 visitors a day, and up to 1,400 with some compromise on service levels. When skier visitation rises above 1,500, the experience for customers and employees is not as desirable.

The historic business levels at Tahoe Donner provided by the client are summarized below:

- 2016/17 Average Top 10 days = 1,249
- 2016/17 Peak Day = 1,632 *(lowering trend but even higher revenue due to increased ticket prices)*
- 2015/16 Average Top 10 Days = 1,468
- 2015/16 Peak Day = 1,812 *(higher revenue due to increased ticket prices)*
- 2014/15 Average Top 10 Days = <1,000 *(minimal snow year, open only select weeks)*
- 2013/14 Average Top 10 Days = <500 *(no snow year, open only select days)*
- 2012/13 Average Top 10 Days = 1,567

Tahoe Donner management supplied Ecosign with detailed annual and daily skier visit records, so that skier visit patterns could be examined. The historical skier visits for Tahoe Donner for the 2015/16 and 2016/17 seasons are illustrated graphically in Plates II.4 and II.5. Table II.12 lists the skier visit origin for Tahoe Donner.

In addition to the skiers, there are a number of onlookers, usually parents or friends of the skiers. While these guests don't purchase a ski ticket or rent equipment, they do purchase food and beverages and use the washroom facilities in the base area.

TAHOE DONNER
HISTORICAL SKIER VISITATION 2015/16

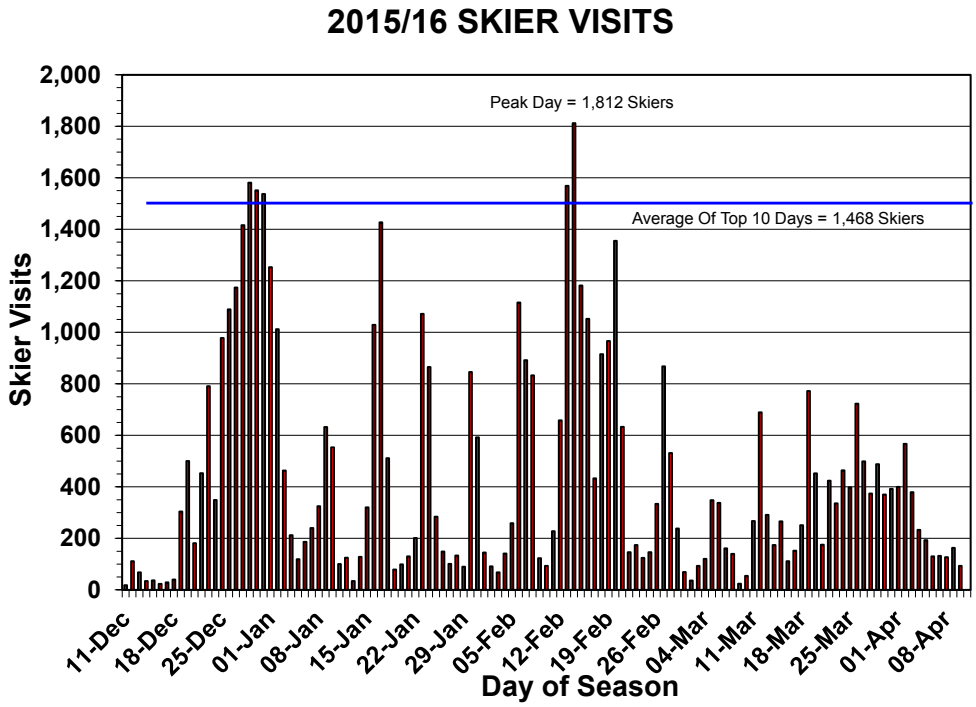

PLATE II.4

TAHOE DONNER
HISTORICAL SKIER VISITATION 2016/17

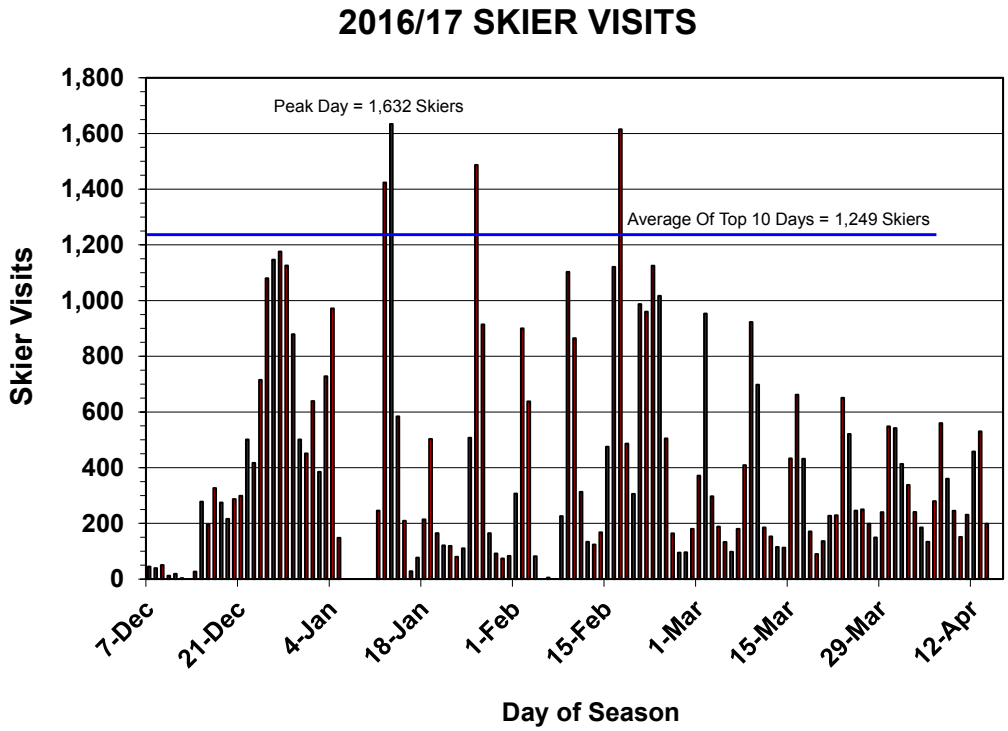

PLATE II.5

TABLE II.12
TAHOE DONNER
SKIER ORIGIN

Skier Origin	% of Total Skiers	# of Skiers during Existing Peak Day (1,700 Skiers)
Public Use (arrive by car for the day)	68%	1,156
Members in HOA	22%	374
Guests of Members	10%	170
TOTAL	**100%**	**1,700**

4.2 Calculation of the Design Day for Base Area Facilities

It is not necessary to build the skier service spaces large enough to service the peak day, since that level may only be achieved once or twice per season. Typically, we select a "Design Day" that is 15 to 25% lower than the anticipated peak business level, which should be adequate for most days of the year. During peak holiday periods, the facilities will be busier than customers would prefer which is acceptable on the 5-10 busiest days of the season. On these days, the lunch period can extend over a longer period allowing the food operation to experience 3.5 - 4 turns per seat, as opposed to the normal 3 turns per seat. However, if the facilities are overcrowded on most weekends, the customers may start to reconsider skiing at that resort.

An analysis of the existing business levels are required so that an accurate guest count can be determined and used as a basis to compare the existing skier service space against the optimal space allowances to discover areas of deficiencies and excesses.

Utilizing data supplied by the client we have calculated the peak and average of the top 10 days for the last two seasons (2015-16 and 2016-17 season) at Tahoe Donner.

According to the data, the peak day was approximately 1,812 in 2015/6 and the average top 10 days was 1,468 skiers. The average peak day during the 2016/17 season was approximately 1,632 and the average top 10 days was 1,249 skiers.

.5 Existing Skier Services

The staff at Tahoe Donner provided Ecosign with the estimated skier service floorspace area inventory for the ski area. Additional skier service space information was also collected during a site visit to Tahoe Donner in May 2017 and further refined during weekly meetings and a secondary site visit in September 2017. This information was analyzed and compared with Ecosign's recommended floorspace standards for similar ski areas of size and target market to create tailored planning standards for use at Tahoe Donner.

5.1 Skier Service Space - Designation and Terms

In 1977, the United States Forest Service performed a detailed inventory of skier service facilities at Western U.S. resorts. This inventory was tabulated and broken down into 12 service functions. Ecosign has since updated this database using the U.S.F.S. format to provide current skier service standards for both North American and European day ski areas, regional resorts and destination resorts.

Guest services are specifically related to the operation and management of the mountain resort area. For planning purposes, these services can be broken down into three distinct categories, as shown below.

Staging Facilities - those services that are required as skiers arrive at the area. These include ticket sales, public lockers, equipment rental and repair, ski and snowboard school check-in, children's programs and retail sales, and are located in the base areas. These services should be sized in relation to the number of skiers staging through the base area portal.

Commercial Services - those services required throughout the day as skiers are on the mountain and during après-ski hours. Commercial facilities are generally located both in the base area and on the mountain, and include food and beverage seating, kitchen and serving areas, restrooms and accessory retail space. Restaurant seats should be planned relative to the number of skiers circulating in the vicinity of the restaurant sites and to service skiers over a two and a half hour lunch period. Restaurants and food service outlets in the base are also used by non-skiing guests. Kitchens and restrooms must be sized in proportion to the amount of seating in each restaurant.

Operational Facilities- those facilities not directly required by guests but which are essential for the day-to-day operation of the mountain. Operational facilities are generally "back of the house" services and include administration, employee lockers and mountain patrol facilities. These facilities are also generally located both on the mountain and in the base area.

5.2 Existing Skier Service Space Inventory

There are two public skier service buildings at Tahoe Donner downhill ski area, the original main daylodge and the more recently constructed Children's yurt. Table II.13 lists the total amount of existing floorspace for these buildings which together amount in 15,838 square feet. Of this, 3,414 square feet are for skier staging functions, 4,070 square feet for commercial functions, 2,449 square feet for administration, employee facilities and ski patrol and approximately 5,195 for storage/mechanical and circulations/wall/waste.

Existing Daylodge (View over Upper Patio)

Existing Children's Yurt Building

TABLE II.13
EXISTING SKIER SERVICE FLOORSPACE

Guest Service Function	Existing Skier Service Floorspace (Main Daylodge) (ft^2)	Existing Skier Service Floorspace (Yurt) (ft^2)	Total Existing Skier Service Space (ft^2)
Staging Facilities			
Ticket Sales	304		**304**
Public Lockers	200		**200**
Equipment Rental & Repair	2,065		**2,065**
Guest Services / Ski School/ Adaptive	260	170	**430**
Children's Programs/Day Care	585	170	**755**
Staging Subtotal	**3,414**	**340**	**3,754**
Commercial Facilities			
Food & Beverage Seating	2,180	350	**2,530**
Kitchen & Scramble, Bar	800		**800**
Bar/Lounge	-		**-**
Restrooms	930		**930**
Accessory Retail	160		**160**
Commercial Subtotal	**4,070**	**350**	**4,420**
Operational Facilities			
Administration	917		**917**
Employee Facilities	1,046		**1,046**
First Aid & Mountain Patrol	486		**486**
Operational Subtotal	**2,449**	**-**	**2,449**
TOTAL FUNCTIONAL SPACE	**9,933**	**690**	**10,623**
Storage	2,915		**2,915**
Mechanical, Circulation/Walls/Waste*	2,280	20	**2,300**
GROSS FLOOR AREA	**15,128**	**710**	**15,838**

It should be noted that the space for storage, mechanical, circulation, walls and waste could not be inventoried and calculated for all service buildings. The most important numbers in Table II.13 are listed in the “Total Functional Space” row, which are the total net useable floorspace areas.

Figure 4b illustrates the Existing Tahoe Donner Resort Base Area Facilities.

Main Entrance to Lower Skier Service Level

Tahoe Donner Ticket Windows

Tahoe Donner Operations Building

5.3 Skier Service Space - Planning Standards

Ecosign's industry planning standards for North American ski resorts are outlined in Table II.14. *These standards have been developed over several years and incorporate data from day ski area and regional and destination resorts in North America, and are used as a benchmark to evaluate the capacity of the existing services provided.* These planning standards establish a recommended amount of floorspace for each function based on a designated level of business and the type of area.

The fourth column of Table II.14 shows Ecosign's recommended planning standards that have been customized for Tahoe Donner based on various data and metrics such as:

- An understanding of their particular market niche
- The surrounding competition
- Planning data supplied by Tahoe Donner[1]
- Ecosign's experience and history with other similar ski areas
- Feedback and insights gleaned through consultation with Tahoe Donner staff

Since Tahoe Donner area caters to a high number of beginner skiers and occasional skiers who need to rent equipment and take lessons, we have used two to three times the average requirements for these functions. Similarly, since there is such a large portion of guests who take lessons we have also increased the employee facilities by a factor of 2 and used the higher resort area metric for calculating locker space.

For the primary restaurant seating, we have used the average of the Day Ski Area and Resort Area. It is likely that the busiest days will also coincide with sunnier days, which could therefore potentially result in less indoor seating required. However, due to feedback from the client, we have allowed for the fact that there are many non-skiing guests who use the restaurant seating. For Tahoe Donner, we have therefore kept the calculation for the seating area as the average metric which will ensure that future demands can be met with the planned size.

[1] Downhill Ski Area Planning Document 2013 - Version 1.0 - For GPC - 08-21-2013

TABLE II.14
SKIER SPACE USE PLANNING STANDARDS

Guest Service Function	Day Ski Area ft²/skier	Average ft²/skier	Resort Area ft²/skier	Ecosign Recomm. area / Skier for Tahoe Donner (Consultation with TD) ft²/skier
Staging Facilities	-	-	-	
Ticket Sales	0.10	0.13	0.15	0.42
Public Lockers	0.70	0.95	1.20	0.56
Equipment Rental & Repair	0.80	0.90	1.00	2.46
Guest Services / Ski School/ Adaptive	0.25	0.38	0.50	1.40
Children's Programs/Day Care	0.35	0.43	0.50	-
Staging Subtotal	**2.20**	**2.78**	**3.35**	**4.85**
Commercial Facilities	-	-	-	0
Food & Beverage Seating	3.25	3.50	4.00	3.19
Kitchen & Scramble, Bar	1.75	2.50	3.00	1.60
Bar/Lounge	0.30	0.40	0.50	0.27
Restrooms	0.75	0.88	1.00	0.84
Accessory Retail	0.40	0.57	0.75	0.36
Commercial Subtotal	**6.45**	**7.85**	**9.25**	**6.27**
Operational Facilities	-	-	-	0
Administration	0.60	0.80	1.00	0.70
Employee Facilities	0.30	0.40	0.50	1.47
First Aid & Mountain Patrol	0.25	0.30	0.35	0.32
Operational Subtotal	**1.15**	**1.50**	**1.85**	**2.49**
TOTAL FUNCTIONAL SPACE	**9.80**	**12.13**	**14.45**	**13.61**
Storage	0.98	1.21	1.45	1.24
Mechanical, Circulation/Walls/Waste*	2.45	3.03	3.61	3.11
GROSS FLOOR AREA	**13.23**	**16.37**	**19.51**	**17.96**
Food Service Seating	-	-	-	-
Turns/Indoor Seat (Cafeteria)	4.00	3.50	3.00	3.50
Turns/Indoor Seat (Table Service)	3.00	2.50	2.00	2.50
Indoor Seats/ Skier	0.25	0.29	0.33	0.29
Outdoor Seats/Skier	0.13	0.15	0.17	0.15
Square Feet/ Indoor Food Service Seat	12.00	12.00	12.00	12.00

5.4 Existing Skier Service Space - Comparative Analysis

As a result of establishing a planning standard for Tahoe Donner skier service space, we can now compare this against the actual skier service space to discover any excess and deficiencies and understand where bottlenecks and shortfalls occur.

For the purposes of the comparative analysis, we have used an estimated Peak Day at 1,700 (as indicated in Section .4) which results in a design day of 1,300 skiers.

Based on this assumption, Table II.15 shows that the skier service space per skier is currently at 12.18 sq. foot per skier, which is significantly lower than the calculated skier service planning standards from Section 5.3.

Column 6 in Table II.15 represents the theoretical skiers served if the interior space was reconfigured according the recommended space per function. If reconfiguring the interior space is unlikely, this is still a useful exercise to determine that even if the interior space was reconfigured there would still be a major shortfall.

As listed in Table II.15 and shown graphically in Plate II.6, Tahoe Donner Resort currently provides 68% of the recommended total functional floor space for 1,300 skiers, based on Ecosign's standards. According to the target space/skier, the existing ski area could comfortably satisfy 882 skiers (or a theoretical peak of 1,150 skiers) which is much lower than usual busier periods confirming the feedback from users and the task force.

As shown in this analysis, skier service functions with the most critical shortfalls in floor area are Public Lockers, Guest Services, Children's Program Space, Restrooms and Accessory Retail. The only two areas showing a surplus of space are Storage and First Aid/Ski Patrol.

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TABLE II.15
TAHOE DONNER SKIER SERVICE SPACE - COMPARATIVE ANALYSIS
DESIGN DAY – 1,300 SKIERS

Guest Service Function	Total Existing Skier Service Space (ft²)	Existing Skier Service Space per Skier ft²/skier	Ecosign Recomm. area / Skier for Tahoe Donner (Consultation with TD) ft²/skier	Recomm. Floorspace (ft²)	Percent of Recomm. Floorspace	Theoretical Skiers Served
Staging Facilities						
Ticket Sales	**304**	**0.23**	0.42	547	56%	722
Public Lockers	**200**	**0.15**	0.56	730	27%	356
Equipment Rental & Repair	**2,065**	**1.59**	2.46	3,202	64%	838
Guest Services / Ski School/ Adaptive	**430**	**0.33**	1.40	1,825	24%	306
Children's Programs/Day Care	**755**	**0.58**	-	-		
Staging Subtotal	**3,754**	**2.89**	**4.85**	**6,304**	**60%**	**774**
Commercial Facilities			0			
Food & Beverage Seating	**2,530**	**1.95**	3.19	4,151	61%	792
Kitchen & Scramble, Bar	**800**	**0.62**	1.60	2,075	39%	501
Bar/Lounge	**-**	**-**	0.27	356	0%	-
Restrooms	**930**	**0.72**	0.84	1,095	85%	1,104
Accessory Retail	**160**	**0.12**	0.36	474	34%	438
Commercial Subtotal	**4,420**	**3.40**	**6.27**	**8,151**	**54%**	**705**
Operational Facilities			0			
Administration	**917**	**0.71**	0.70	912	101%	1,307
Employee Facilities	**1,046**	**0.80**	1.47	1,916	55%	710
First Aid & Mountain Patrol	**486**	**0.37**	0.32	411	118%	1,539
Operational Subtotal	**2,449**	**1.88**	**2.49**	**3,239**	**76%**	**983**
TOTAL FUNCTIONAL SPACE	**10,623**	**8.17**	**13.61**	**17,694**	**60%**	**780**
Storage	**2,915**	**2.24**	1.24	1,613	181%	2,349
Mechanical, Circulation/Walls/Waste*	**2,300**	**1.77**	3.11	4,042	57%	740
GROSS FLOOR AREA	**15,838**	**12.18**	**17.96**	**23,349**	**68%**	**882**

TAHOE DONNER
SKIER SERVICE SPACE - COMPARATIVE ANALYSIS BY TYPE

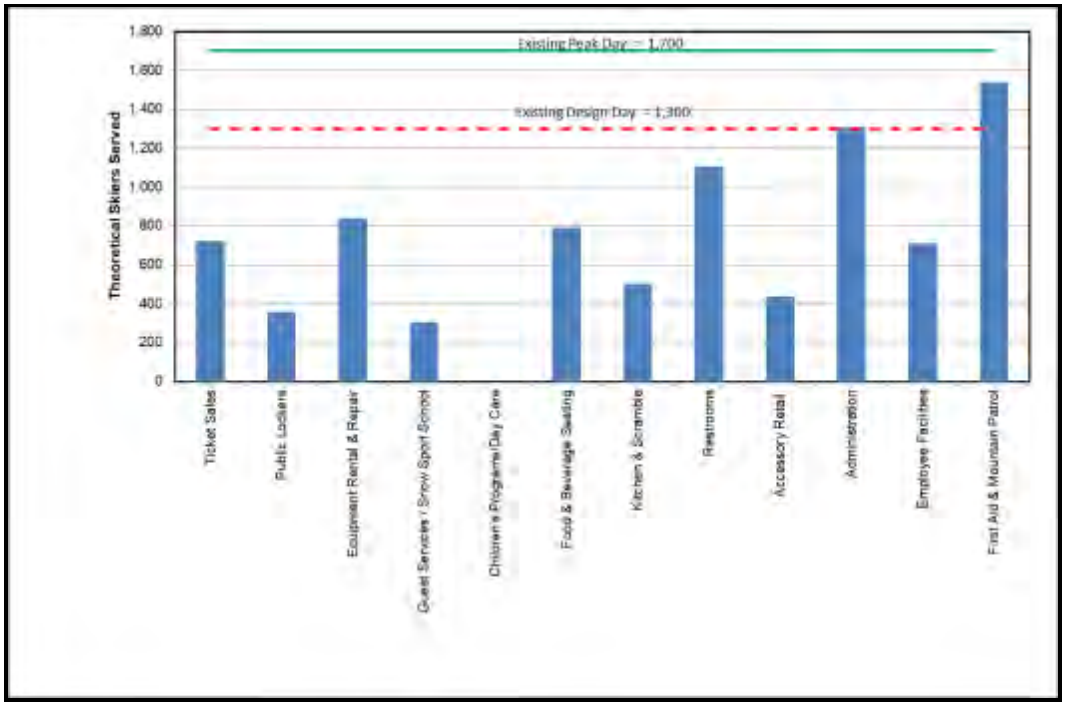


PLATE II.6

5.5 Existing Restaurant Seating Inventory

Tahoe Donner serves food in both the existing Daylodge and Children's Yurt. On busy days, the both the outdoor patio and indoor seating is completely full.

The restaurant seat inventory is listed in Table II.16. We have used the following assumptions as part of our analysis of the seating situation.

- The number of seats has been provided by Tahoe Donner Staff
- The main lunch period is based from 11:30 a.m. to 2:00 p.m.
- Because of the nature of Tahoe Donner, an average 50-minute lunch break per guest was used. This results in 3 turns per seat over the 2.5-hr. lunch period.
- The number of outdoor seating on the patio was supplied by the client. Based on an approximate area of 5,000 square feet, results in approximately 22 sq.ft. per seat.

TABLE II.16
TAHOE DONNER
EXISTING FOOD AND BEVERAGE SEATING

Building/Restaurant	Indoor Seats			Outdoor Seats			Total Seats	
	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Guests Served
Daylodge	150	3.0	450	220	3.0	660	370	1,110
Children's Yurt Buidling	29	3.0	87	30	3.0	90	59	177
TOTAL	**179**		**537**	**250**		**750**	**429**	**1,287**

As shown in Table II.16, the restaurant seating in both facilities amounts to 179 indoor seats and 250 outdoor seats. We estimate that the Tahoe Donner restaurant seating can service 537 patrons indoors and an additional 750 patrons outdoors at an average of 3 turns per seat which totals to 1,287 seats in total both inside and outside.

According to our calculations, currently indoor seats represent 42% of total seats (indoor & outdoor).

.6 Existing Day Visitor Parking

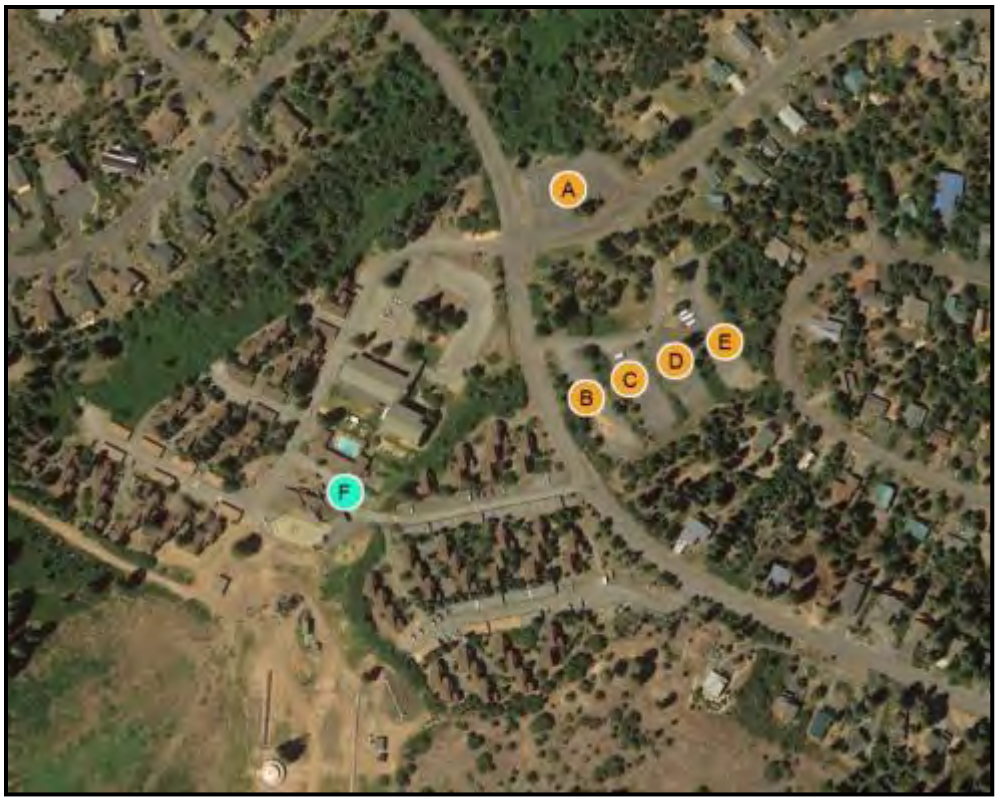
According to the document prepared in 2013 “Planning Document – Version 1.0” approximately 68% of skiers arrive from outside the Tahoe Donner HOA as day visitors. Of the remaining 32% of skiers, approximately 22% are homeowners within the HOA and 10% of their guests. Because many of the homeowners are located outside the comfortable walking distance, they drive their vehicles and park in the day skier lots thereby further limiting the capacity of the lots for the public use.

Currently, the main parking lots are located near the intersection of Slalom Way and Snowpack Way. These lots consist of the "4 tier lots" which account for 194 stalls; the slalom lot (60 stalls) and the City of Truckee has allowed for roadside parking for skiers along the side of Snowpeak and slalom way (65 stalls). These lots are on the threshold considered as skier walking distance (SWD) and it is noted by management that some of the guests arriving to P1, P2 and P3 will utilize the free shuttle bus. According to management, on an average day perhaps 60% of people arriving at P1, P2 & P3 will use the shuttle and the remaining 40% will walk the approximately 800ft. to the day lodge and base area.

On busy weekends and peak periods, the existing parking at the Lodge (Tahoe Donner's Golf Course) is utilized, which is shared with the overflow parking required for the cross-country skiing area (at an approximate 50/50 ratio). Parking Lot P4 is estimated to supply 53 stalls for use for Tahoe Donner downhill ski area skiers. Parking Lot P5 provides additional parking located further southeast at the Northwoods clubhouse and is estimated to supply approximately 25 stalls.

Currently, the Tahoe Donner Downhill Ski Area has shuttles with a capacity of 24-28 riders. These free shuttles operate on a flexible route and schedule depending on demand. Guests are picked up from Parking Lots P1-P5 and dropped off on the north side of the existing daylodge where they can buy tickets, rent equipment or walk up the steps/snow slope to access the main staging lifts.

Current Primary Route Skiers use from Shuttle Drop-Off to Staging Lifts



Existing Parking Lots (A, B, C, D, E) and Main Shuttle Drop-Off at F

All existing public parking lots serving Tahoe Donner are illustrated on Figure 4c, the Existing Parking and Circulation Plan and listed in Table II.17.

TABLE II.17
TAHOE DONNER
ESTIMATED PEAK PARKING CAPACITY

Lot Number	Lot Name	Number of Cars	AVERAGE Number of Visitors 2.6 pp/car	PEAK Number of Visitors 3.0 pp/car	PEAK Number of Skiers at 80% Participation
Tahoe Donner					
Within SWD					
P1	Roadside - Snowpeak Way & Slalom Way	65	169	195	156
P2	4 tier lots (60% take shuttle / 40% walk)	194	504	582	466
P3	Slalom lot	60	156	180	144
Subtotal Within SWD		**319**	**829**	**957**	**766**
Outside SWD					
P4	The Lodge (Golf Course Parking, half used for XC)	53	137	158	126
P5	Northwoods Clubhouse Parking	25	65	75	60
Subtotal Outside SWD		**78**	**202**	**233**	**186**
Total Tahoe Donner		**397**	**1,031**	**1,190**	**952**

Staff Parking

Currently, allowance for employee parking is tentative in condo development which may be removed in future. An inventory of staff parking requirements will need to be provided to Ecosign in order to estimate how many stalls will be required at build out.

.7 Existing Resort Accommodation

Accommodation at Tahoe Donner consists of the large Homeowners Association that includes approximately 6,500 lots. An analysis of the actual skier yield from the surrounding accommodation was outside the scope of this report. For the purposes of this study and since some of this accommodation is located within skier walking distance, we have assumed 40 skiers arrive at the resort from the adjacent accommodation.

.8 Existing Base Area Staging Capacity

The base area staging capacity analysis calculates the number of skiers that the base area can supply to the mountain during periods of peak occupancy, and also looks at the circulation of guests and skiers in the base area. For this process, skiers are divided into two groups: “Day Skiers” who are skiers that originate from outside the resort and are coming to ski for one day, and “Overnight Skiers” who are skiers generated from accommodation within the resort. The base area capacity is the sum of the number of skiers who come from walk-in or ski-in/ski-out accommodation, plus the number of skiers that can be supplied to the mountains from the available day skier parking and from drop-off from private vehicles, ski charters, taxis or hotel lodging shuttles.

Table II.18 lists the theoretical capacity of the base areas at Tahoe Donner to supply skiers to the mountain during peak periods. In addition to guests arriving from the parking areas (from walking or shuttle) there are also those that arrive via charter buses or are dropped off from surrounding accommodation within and outside the Tahoe Donner boundaries. As there are no accurate counts of the number of skiers who arrive via the drop-off we have assumed that drop-offs represent 8% of guests arriving from parking.

Other factors that could affect the total amount of guests staging could be:

- The average vehicle occupancy rate is higher than we have assumed.
- The fact that some skiers leave at the end of the morning freeing up their parking stall for an afternoon guests.
- The number of skiers walking in from accommodation could be higher than we estimated.
- The number of skiers dropped off at the base areas is higher than we assumed.

TABLE II.18
THEORETICAL BASE AREA STAGING CAPCITY

	Number of Visitors	Number of Skiers	Skiers as a %
Tahoe Donner			
Within SWD			
From Pillows (Walking)	50	40	4%
From Parking (Walking)	957	766	73%
Charter Bus, Private Drop Off from surrounding homes (8%)	77	61	6%
Subtotal Within SWD	**1,084**	**867**	**82%**
Outside SWD			
From Parking (Arrive by Shuttle)	233	186	18%
Total Tahoe Donner	**1,317**	**1,053**	**100%**

.9 Existing Ski Area Facilities Balance

Throughout the previous sections, we have prepared an inventory of all existing facilities for the winter operation of Tahoe Donner. We have subsequently analyzed the "Skiers At One Time" (SCC) capacity of the following operational elements: lifts, trails, skier service floorspace, food service seating and staging capacity which includes parking, accommodation and passenger drop-off. We have prepared a graphic representation of the overall balance of these facilities, as shown in Plate II.7. To easily compare these diverse facilities, all capacities have been calculated in terms of the number of skiers that can be accommodated at one time.

Traditionally, the lift system capacity is the governing factor which determines the Skier Carrying Capacity (SCC) in terms of Skiers At One Time (SAOT). Other facilities such as ski trails and skier service space are not logistically limiting factors with respect to the carrying capacity of the resort but can be underutilized or over crowded based on their capacity when compared to the lift system's SAOT. The base area staging capacity must be equal to, or greater than the lift capacity in order for a ski area to reach the Skier Carrying Capacity.

As shown in Plate II.7, the ski trail capacity greatly exceeds all other facilities with the lift system. According to our calculations, the skier service space is not close to meeting the existing Design Day (1,300 skiers), which will make the day lodge space feel overcrowded on most weekends and holidays. Base area staging also does not meet the existing peak day demand and may in fact help the situation by not further overcrowding the skier service facilities. Food service seating appears to satisfy demand as long as the outdoor seating is totally utilized. On marginal weather days, this would make for a very uncomfortable experience with skiers being stuck using the patio, or overcrowding the indoor space.

TAHOE DONNER
SKI AREA FACILITIES BALANCE

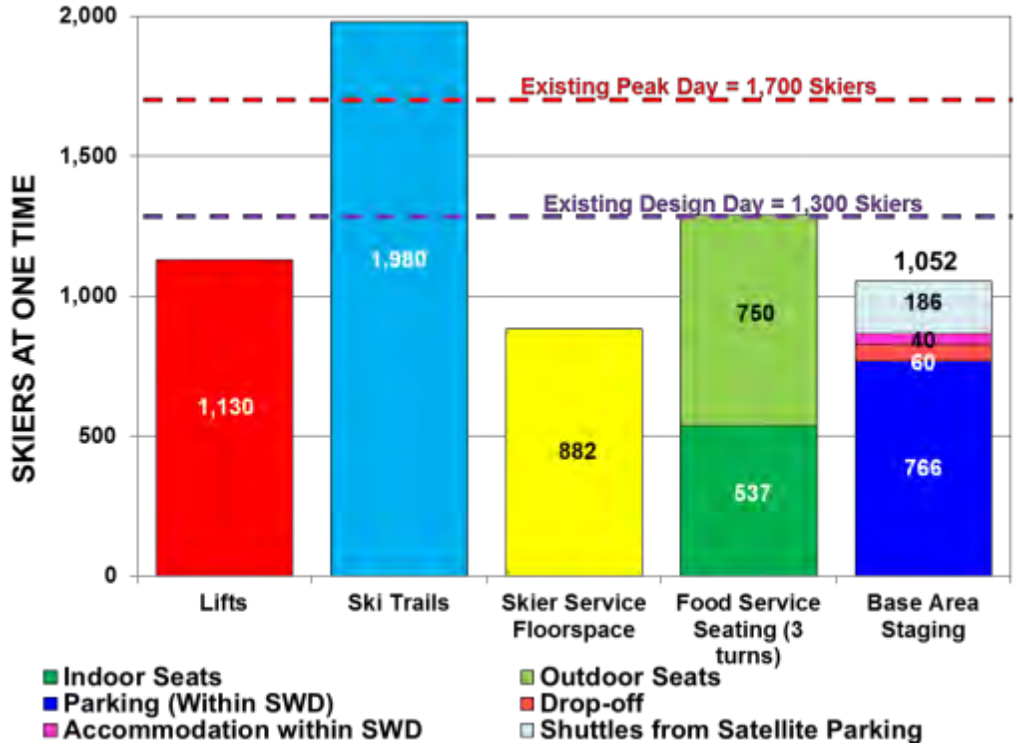
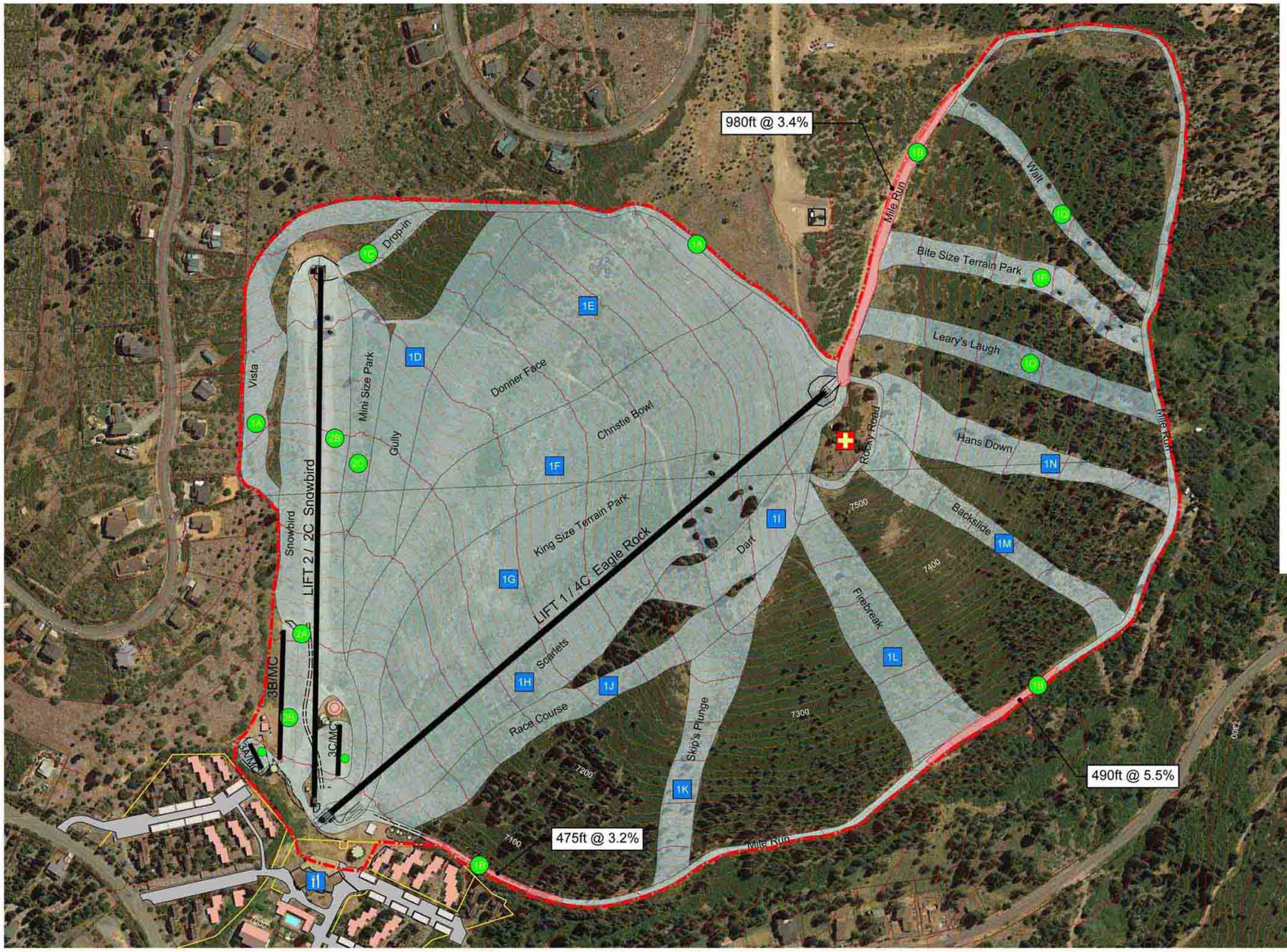


PLATE II.7



TAHOE DONNER™

ecosign
Mountain Resort Planners Ltd.

Box 62 Whistler, B.C. Canada V0N 1B0 (604)932-5978 Fax:(604)932-1897
www.ecosign.com info@ecosign.com

Contours: 10ft Date: 04/2018

0ft 150 300 450 600

SKI TRAIL ABILITY LEVEL

- Easiest
- More Difficult
- Most Difficult

*see text for lift and trail details

- Existing Lift
- Existing Trail
- Restaurant
- Ski Patrol
- Ski Area Boundary (123 Acres)
- Areas too Flat for Downhill Skiing and Snowboarding

EXISTING MOUNTAIN FACILITIES 4a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Contours: 2ft
Date: 04/2018
0ft
25
50
75
100
Maintenance Building
LIFT 1 / 4C Eagle Rock
LIFT 2 / 2C Snowbird
3C/MC
ELEC. TRANS.
Top of Slope
Dirt Road
EXISTING DAYLODGE
SHUTTLE DROP OFF
ELEC. VAULT
Garage Existing
Existing Building
Pool
Existing Condominium
6760
6770
6780
6790
6800
6810
6820
6830

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Contours: 50ft Date:04/2018

0ft 600 1200 1800 2400

LEGEND

Existing Parking Area P

Primary Circulation Route

Road Side Parking

Northwood Clubhouse
25 Stalls

The Lodge
53 Stalls

4 Tier Lots
194 Stalls

Accessible Stalls & Maintenance
±5 Stalls

Roadside Parking
65 Stalls

Slalom Lot
60 Stalls

Tahoe Donner Downhill Ski Area

EXISTING PARKING AND CIRCULATION PLAN 4c

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Contours: 10ft

Date: 04/2018

0ft 200 400 600 800

NOTES:

PERIOD OF CALCULATION:
Daily
Dec 1, 2016 to Mar 31, 2017

DAILY EXTENTS OF CALCULATION:
03:00 hrs - 22:00 hrs

INTERVAL OF CALCULATION:
15 minutes

NUMBER OF DAYS ANALYZED:
121 days

AVERAGE NUMBER OF DAYLIGHT HRS:
10.09 hours/day

MINIMUM INCOMING ENERGY:
214.2 KWh/ft2

MAXIMUM INCOMING ENERGY:
1592.2 KWh/ft2

AVERAGE INCOMING ENERGY:
1057.2 KWh/ft2

Incoming Energy (KWh/ft²)
1500
1400
1300
1200
1100
1000
900
800
700
600
0.0

SUNRISE **SUNSET**

DEC 21
08:18 hrs.
Az = 120.2°

WINTER SOLSTICE

DEC 21
17:41 hrs.
Az = 239.8°

JUNE 21
05:35 hrs.
Az = 58.31°

SUMMER SOLSTICE

JUNE 21
20:31 hrs.
Az. = 301.7°

NORTH

LATITUDE = 39° 21' 1.74" North
LONGITUDE = 120° 15' 44.78" West
8 hrs. behind of UTC

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Contours: 10ft

Date:04/2018

0ft 200 400 600 800

MOUNTAIN SLOPE GRADIENT

- 0-8%
- 8-25%
- 25-45%
- 45-70%
- 70% +
- Existing Lift
- Ski Pod
- Straight Line Slope

A

B

C

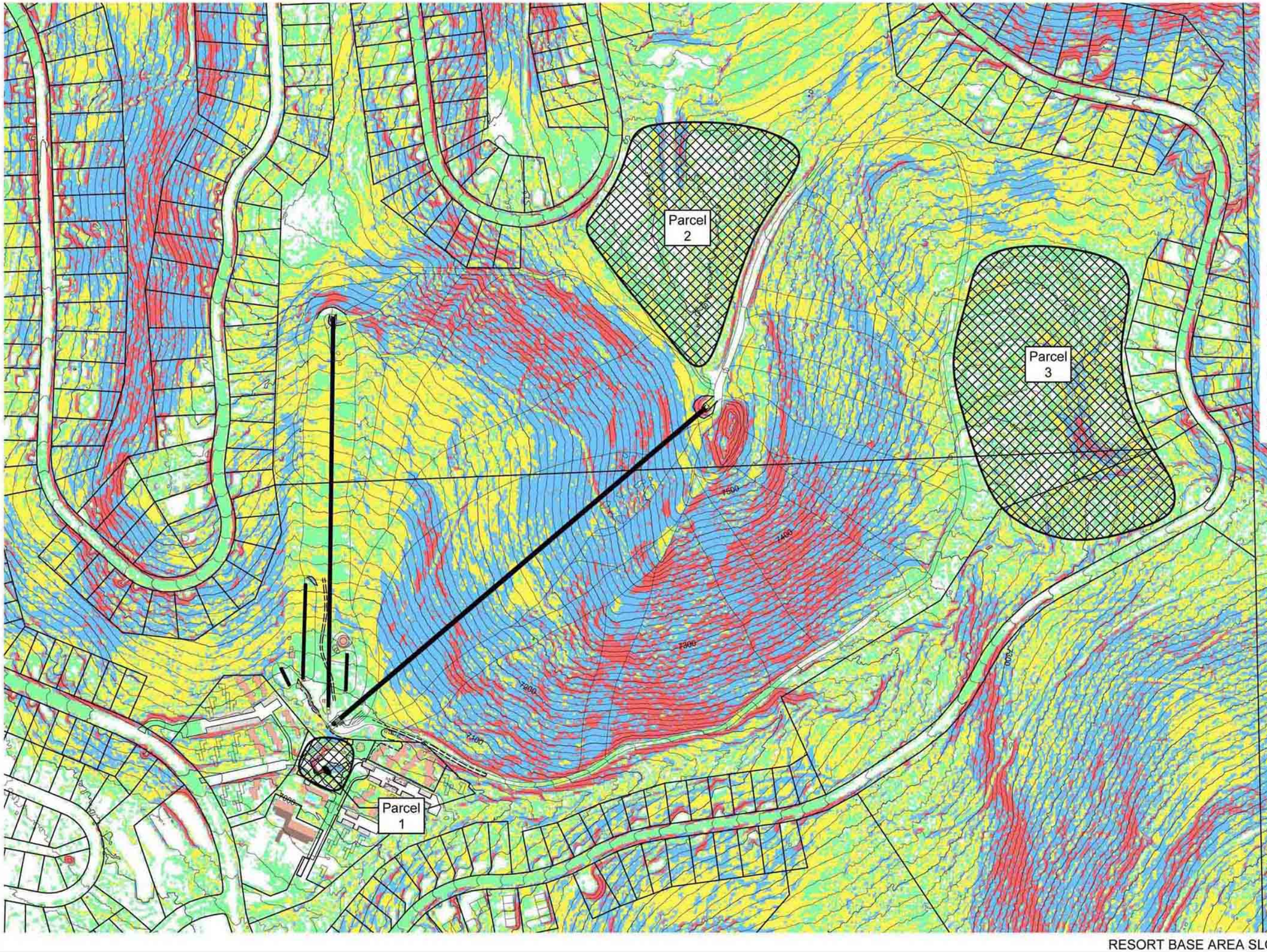
D

E

F

G

H



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Contours: 10ft

Date:04/2018

0ft 200 400 600 800

BASE SLOPE GRADIENT

- 0-8%
- 8-15%
- 15-25%
- 25-40%
- 40% +
- Existing Lift

III. DEVELOPMENT ANALYSIS

The purpose of the Development Analysis section is to blend the information and/or constraints identified in the Inventory section with acceptable ski industry planning and design parameters. The results of the analysis undertaken in this section of the report are used to assist in the design of the concepts presented in Section IV of this report.

.1 Mountain Planning Parameters

In order to determine the potential skier carrying capacity of the terrain within the Tahoe Donner Resort area, we will utilize the planning parameters established in the Inventory section of this report (Table II.10).

Solar Radiation Analysis

Predicting the potential amount of solar radiation is important in the planning of a ski resort. The amount of solar radiation impacting the surface varies strongly with elevation, slope, aspect and solar shading from surrounding topographic features. Topographic shading decreases the temperature near the ground which causes the snow to last longer. Even small changes in aspect can result in substantial differences in surface warming.

With this in mind, we have calculated the cumulative quantity of potential incoming solar radiation for each month during the winter ski season from December 1, 2016 to March 31, 2017. The time of year, sun position (azimuth and altitude), shadows cast by surrounding terrain, terrain slope, and aspect are all analyzed to simulate and calculate direct, diffuse and reflected radiation. By combining these radiation values, an accurate representation of potential energy coming in Kilowatt-hours per square foot (KWh/ft^2) over the entire study area is determined. The calculation is repeated every 15 minutes from sunrise to sunset for each day in a grid system. The resulting graphic on Figure 5 illustrates, with a warm to cool color spectrum, the warm and cool zones within the study area. The vast majority of the ski area is located in “cool” zones which receive less than 1100 KWh/ft^2 and allows for a high-quality snow surface with minimal solar affect. The warmest areas within the ski resort are located on east/southeast facing terrain below the upper section of the Eagle Rock chairlift in Christie Bowl, and west/southwest facing terrain near the top of Hans Down, Leary’s Laugh and the Bite Size Terrain Park.

.2 Mountain Design Analysis

Utilizing the LiDAR based topographic mapping, the most critical analysis map for the ski area design and evaluation process was prepared: the Mountain Slope / Terrain Capacity Analysis Map (Figure 6). The Slope Analysis Map delineates the areas that can be negotiated by the various skier ability levels, as well as areas that are considered too flat or too steep for skiing and snowboarding. The natural slope gradients were carefully measured and color-coded into the following five classifications.

Slope Gradients	Color	Type of Skiing
0 - 8%	white	flats, marginal skiing
8 - 25%	green	beginner and novice skiing
25 - 45%	yellow	intermediate skiing
45 - 70%	blue	advanced and expert skiing
70% +	red	too steep for skiing

This map was then utilized in the evaluation of the terrain and plays a critical role in developing conceptual alternatives.

.3 Terrain Capacity Analysis

We have analyzed the natural terrain within the entire study area which possesses commercial ski potential to accurately establish the area's overall ski development potential. We identified areas with suitable slopes for ski development, whether or not they were within the current Ski Area Boundary to illustrate where there may be room for expansion. The Ski Terrain Suitability / Terrain Capacity Analysis Map (Figure 6) graphically illustrates terrain "pods" contained within the study area which possess potential for ski development. The pods were selected by consulting the Mountain Slope Map and observing the following criteria:

- continuous fall line skiing from top to bottom
- suitable upper and lower lift terminal locations (e.g., 0.5 acres less than 25 percent slope)
- good slope continuity to allow interesting skiing from top to bottom for one or more skier ability levels
- natural slope gradients primarily greater than 8 percent and less than 70 percent

Within each terrain pod, the upper and lower points are joined to establish the total vertical rise, horizontal distance, straight line slope and average slope gradient. The total pod area was measured and calculated. The above data comprises the inputs to our terrain capacity computer program. The final program input is a judgment which identifies the "primary" skier skill classification for each terrain pod. The program outputs are as follows.

AVAILABLE SKI TERRAIN – Net developable terrain within the pod. It is assumed that pods will be able to support skiing on about 30 to 90 percent of the useable terrain within the pod, depending on topography, as well as the shape of the pod. Very smooth terrain that does not contain trees and is already developed may support skiing on up to 90 percent of the usable pod terrain.

TOTAL SKIERS/SNOWBOARDERS – Number of skiers possible in the pod within developable terrain at acceptable densities.

DEMAND VTF (000) – Vertical transport feet required to service the total skiers.

LIFT CAPACITY/HR. – The net hourly lift capacity necessary to maximize the development of each pod.

The Mountain Slope & Terrain Capacity Analysis Map and program printouts provide a reliable indication of the maximum development potential of each pod and the lift capacity necessary to balance with the terrain. As listed in Table III.1, we have identified 8 terrain pods suitable for alpine ski development within the Tahoe Donner Ski area. These pods encompass a total of 147.8 acres and could support 2,130 skiers on 80.4 acres of developed ski trails. The existing ski facility already uses ~6.5 of the pods identified, with only about half of Pod G and Pod H containing ski terrain which is currently undeveloped.

TABLE III.1
TAHOE DONNER
TERRAIN CAPACITY ANALYSIS

Terrain Pod	A	B	C	D	E	F	G	H	TOTAL
Top Elevation ft.	7,276	7,320	7,543	7,550	7,546	7,546	7,560	7,670	
Bottom Elevation ft.	7,045	7,180	7,254	7,045	7,104	7,296	7,336	7,515	
Total Vertical ft.	231	140	289	505	442	250	224	155	2,236
Horizontal Distance ft.	1,630	630	1,165	1,940	1,510	1,145	1,300	1,185	
Slope Distance ft.	1,646	645	1,200	2,005	1,573	1,172	1,319	1,195	10,756
Average Slope %	14%	22%	25%	26%	29%	22%	17%	13%	
Max. 100 ft. Slope %	16%	22%	40%	40%	40%	30%	22%	14%	
Skill Class	1	2	4	3	4	2	2	1	
Skier Density/Acre	30	30	24	24	24	30	30	30	
VTF Demand/Day	2,000	4,500	8,000	6,000	8,000	4,500	4,500	2,000	
Total Area Ac.	13.9	6.4	12.3	36.8	30.0	17.7	15.5	15.2	147.8
Unusable Terrain	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.6
% Ski Terrain Developable	90%	90%	90%	75%	30%	30%	30%	30%	
Available Ski Terrain	12.5	5.8	11.1	27.6	8.8	5.3	4.7	4.6	80.4
Total Skiers	**380**	**170**	**270**	**660**	**210**	**160**	**140**	**140**	**2,130**
Demand VTF (000)	121	121	343	629	267	114	100	44	
Required Lift Capacity/Hr	522	867	1,186	1,245	603	457	446	287	5,614

We have calculated the balance of terrain encompassed by the eight pods, as listed in Table III.2 and graphically illustrated in Plate III.1. As Pod G is class 2 Novice ski terrain, and Pod H is class 1 Beginner, the overall skier skill class balance becomes more unbalanced towards the easiest skill classes as compared to the skier market. As Pods G and H are located quite far from the existing base area, it would be difficult for lower ability skiers to reach this area of the resort.

TABLE III.2
TERRAIN POD BALANCE

Skill Classification	Acres	Skiers	Balance	Ideal
1 Beginner	17.1	520	24.4%	10%
2 Novice	15.8	470	22.1%	15%
3 Low Intermediate	27.6	660	31.0%	20%
4 Intermediate	19.9	480	22.5%	25%
5 High Intermediate	0.0	0	0.0%	15%
6 Advanced	0.0	0	0.0%	10%
7 Expert	0.0	0	0.0%	5%
Total	**80.4**	**2,130**	**100%**	**100%**

Optimum Density =	26.8	Skiers/Acre
Weighted Demand =	5,143	VTF/Skier/Day

TERRAIN POD BALANCE

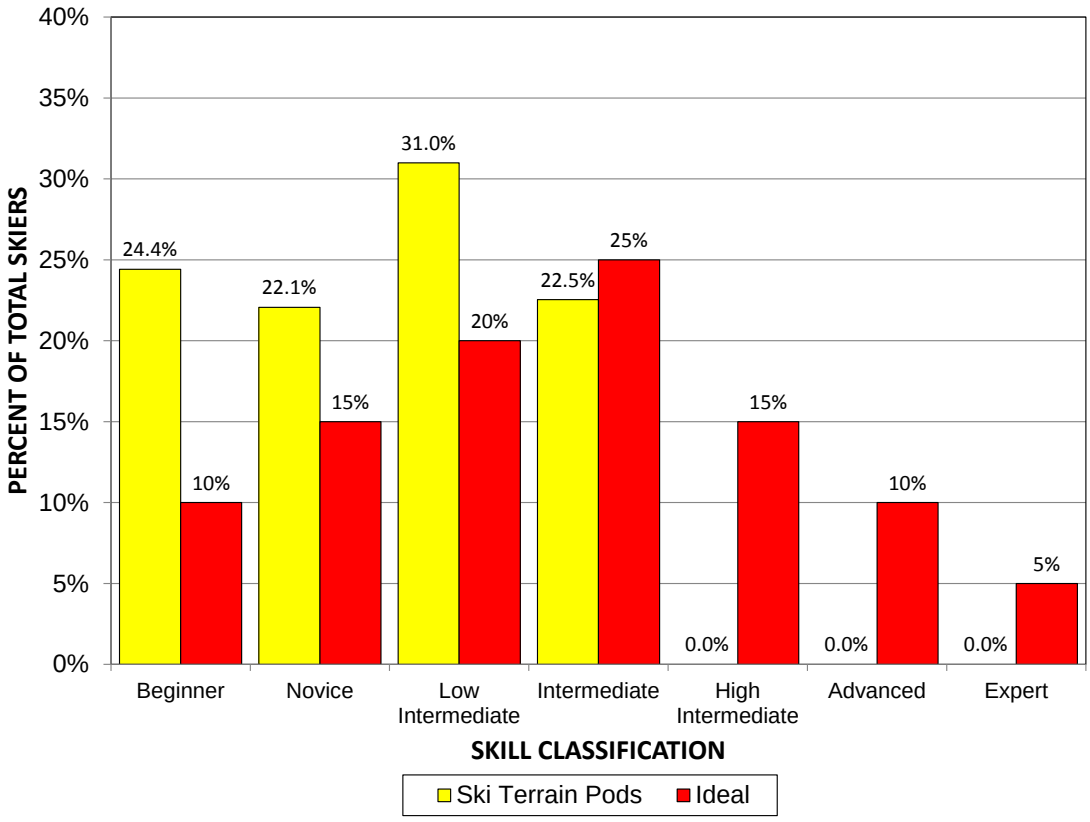


PLATE III.1

.4 Base Area Design Analysis and Development Potential

The objectives of the base area design analysis are to illustrate the suitability of the Tahoe Donner ski area base lands to support further development. The first step is to identify potential terrain for base area facilities and service functions that are required to support all guest activities such as skiing/snowboarding, snowplay, and other four-season recreation. The results of this analysis will help identify the best configuration for Tahoe Donner's base area land use, visitor access, pedestrian and vehicle circulation, parking and guest staging development concepts.

Development potential of the base area depends on the biophysical limitations and opportunities of the site and the proposed location of ski lifts and trails. The biophysical analysis process for Tahoe Donner will include the following issues.

- A detailed slope analysis from which the area, size and location of developable terrain is determined (Figure 7 - Resort Base Area Slope and Design Analysis)
- Potential access to the resort
- Accessibility of developable terrain in relation to the base of the lifts and skier zones
- The geological composition of the ground and its geotechnical ability to support structures
- Solar Analysis
- Protection and enhancement of the site's natural features such as creeks, ponds and existing vegetation

Base Area Design Criteria - Resort Base Area Slope Analysis

The slope gradients within the base area are analyzed in order to determine the size and location of developable land parcels for real estate, commercial, parking, recreational activities and lift staging zones. The development potential for each class of slope gradient is outlined below.

0 - 8% **White** - Considered essentially "level" for roads, parking and larger structures. Can also be used for creation and expansion of beginner ski/ snowboard areas, snow tubing, snowplay, recreational activities, golf, RV and tent camping.

8 - 12% **Green** - Usable for roads, parking and larger structures but with major terrain modification. Ideal for the development of beginner ski/ snowboard terrain and snow tubing. Terrain can easily be terraced to create additional snowplay or winter family fun areas. Good for medium density real estate development, golf and RV and tent camping with some minor terrain modification.

12 - 20% **Yellow** - Best suited for multi-family townhouse developments and single family development and for more advanced level of beginner skiers or snowboarders. Suitable for additional four-season recreational activities and tent camping.

20 - 30% **Orange** – Marginal suitability for low density single family development with minor to major terrain modification.

30 - 40% **Blue** – Very marginal suitability for low density single family development and requires major terrain modification.

40%+ **Red** – Too steep for development

Figure 7, the Resort Base Area Slope and Design Analysis map, provides a graphic portrayal of the aforementioned slope gradients as they relate to the Tahoe Donner Resort base lands.

Base Area Development Potential

Also shown on Figure 7, are three areas that could be potential base area development.

Parcel 1 is the existing base area where the daylodge is located. Approximately 0.9 acres, this area already has established operations and infrastructure, although new construction may be subject to additional restrictions due to the zoning and the adjacent existing development.

Parcel 2 is a large area of flatter land located at the top of the Eagle Rock chair. Approximately 12 acres in size, Parcel 2 is of sufficient size to allocate all the skier service space and the required parking in one location. The average elevation is 7,550 feet and this parcel will have great sun exposure and expansive views. Vehicle access will run up the existing Skislope Way road which is steeper than our recommended 8% grade (with sections up to 11% grade).. The additional traffic on the road may be undesirable for other residences accessed from that road.

Parcel 3 is a large area of flatter land located to the west of the existing ski area at an average elevation of approximately 7,320 feet. Roughly 19 acres in size, this parcel is of sufficient size to allocate all the skier service space and the required parking in one location. Vehicle access will run up the existing Skislope Way road which is steeper than our recommended 8% grade (with sections up to 11% grade). The additional traffic on the road may be undesirable for other residences accessed from that road.

.5 Summary / Conclusions

Mountain Summary

A thorough analysis of the site has revealed that although there is additional ski development potential at Tahoe Donner, it consists of only beginner and novice ski terrain which is located far away from the existing base area. The existing Snowbird chairlift is logically aligned to maximize the majority of the beginner ski terrain at the site, although the lift travels up the center of the natural ski pod.

Base Area Summary

Through the process of meeting with the task force and owners' representatives, it was determined that multiple concepts should be investigated with one concept exploring the potential layout of Parcel 2 and three concepts focused on potential redevelopment of Parcel 1.

IV. DEVELOPMENT CONCEPTS

.1 Introduction

Ecosign has prepared four alternative concepts and one preferred concept for the future development of the Tahoe Donner downhill ski area. The first four concepts were presented to the Tahoe Donner Homeowners Association in September 2017. Three of the initial concepts involved variations on the redevelopment of the existing base area and lift upgrades. The forth explored an idea to relocate the main base area to the top of the mountain and add lifts to create a well-rounded resort. After receiving feedback from the Tahoe Donner Planning Task Force, Ecosign has prepared a Preferred Concept for both the mountain and base lodge replacement.

.2 Goals and Objectives

The primary goals and objectives for the Tahoe Donner Master Plan Concepts are to modernize the resort to be more competitive with other areas in the Tahoe region.

On-Mountain Improvements

- Upgrade snowbird lift
- Maintain the brand identity of the “Best Place to Begin”
- Improve the learn-to-ski experience with moving carpet area realignment
- Improve the “skiability” of Mile Run by removing long flat areas.
- Propose future Eagle Rock lift upgrade to balance Lift Capacity to Ski Trail Capacity
- Identify future Snowmaking coverage areas

Base Area Improvements

- Consider options for a new skier service facilities of sufficient size to satisfy the existing demand using and industry appropriate level of service.
- Balance the size of skier service space with the future mountain’s lift and skier trail capacity.
- Provide a visitor experience that is convenient and for both kids and adults when learning to ski and snowboard.

- Improve the guest arrival experience by improving the drop-off, minimizing vertical grade change and improving the layout of service spaces to create a good flow.
- Provide enough parking stalls to meet the target peak day demand of 1,900 skiers.
- Consider other winter and summer activities to leverage utilize capital improvements year round.

.3 Mountain Planning Parameters

3.1 Lift and Trail Design Parameters

When designing a system of lifts and ski trails, the ultimate development should be planned in order that future lifts and additional ski trails will not create conflicts, congestion, crowding or worn-out snow conditions. Utilization of various lift loading and unloading patterns, as well as ski trail grading can direct skiers onto preferred ski trail systems to improve ski trail utilization or avoid major congestion areas.

Ski trails and slopes should be designed to provide the best skiing opportunities and then, subsequently, lifts located to best serve these ski trails since lifts are merely a means of access. The type of lift may vary, depending on the natural terrain it must cross and serve, as well as the required hourly capacity and type of skier being served.

Lifts should not be located simply because good or suitable upper and lower terminal locations have been selected, or to minimize construction costs. There are many lift design alternatives available to accommodate a wide variety of sites. Lift construction costs, although important, should normally be a secondary consideration when compared to skiing quality, aesthetics or environmental factors. Ski lift loading and unloading terminals are preferably located in protected areas on slopes less than 20 percent. Adequate space must be allotted for lift line ups, safe stopping, unloading areas and general congregation areas at both the upper and lower lift terminals.

3.2 Skier Carrying Capacity - Lifts

As outlined in Section II, the determination of an area's Skier Carrying Capacity (SCC) is perhaps the most critical step in ski area planning. The Skier Carrying Capacity is measured in terms of “Skiers at One Time” (SAOT); this figure represents the number of skiers that can be safely supported by an area's lift and ski trail system, while providing a quality experience to each skier ability level. Skiers at One Time capacity is determined via the integration of lift capacity, acceptable slope densities; slope gradients, skier skill classifications and vertical feet of lift serviced terrain.

In preparing the Master Plan Concepts, we have applied the Mountain Planning Parameters previously described in the Inventory section of this report and shown in Table II.11. Number and letter codes have been utilized to indicate the type of proposed lift installation in the Concept Plans, as shown below.

4C	Fixed Grip Four-Passenger Chairlift
3C	Fixed Grip Three-Passenger Chairlift
MC	Moving Carpet Conveyor Lift (for beginners and short distance uphill transportation)

.4 Mountain Development Concepts

The Tahoe Donner Mountain Concepts are illustrated on Figures 8a-c and the Master Plan Preferred Concept is illustrated on Figure 8d. Concepts A-D explore different ski lift and ski trail improvements at Tahoe Donner. After consultation, the Master Plan Preferred Concept was prepared.

Mountain Concepts A & B Summary

- Mountain Concept A/B (to match base area concepts) provides a Buildout SCC of 1,700 skiers at one time to match theoretical business levels. Eagle Rock is upgraded (replaced if necessary) to provide 2,400 pph (up from current 1,970 pph rated / 1,478 operated)
- Snowbird is replaced by a 4-passenger fixed-grip lift with 1,200 pph capacity and is shortened at the top and bottom to improve skier circulation.

- A novice route down Christie Bowl, which would require earth moving provides a high quality “green circle” ski route down Eagle Rock.
- Mile Run is improved; an 8% alignment (minimum) is illustrated, as well as an “ideal” 10% alignment for reference

Pros – Minimal changes from existing, lowest cost.

Cons – Ski back route for all west facing Eagle Rock ski trails is very long & although improved, uphill lift capacity does not balance with downhill ski trail capacity.

Mountain Concept C Summary

- Mountain Concept C provides a Future SCC of ~1,900 to 2,000 skiers at one time to maximize the natural terrain. Eagle Rock is upgraded to provide 2,400 pph and two new 4-passenger fixed-grip lifts are envisioned.
- Snowbird is replaced and realigned and extended.
- Moving Carpet 3B is aligned to west side of snowbird.
- Lift C4 is aligned skiers left down Leary’s laugh. The top terminal allows for an 8% skiway above the upper Mile Run flat section.
- Lift C5 extends high enough to allow ski-back 5D to connect to 1A. This lift services novice (class 2) ski terrain.

Pros – Snowbird accesses otherwise unused terrain & lift towers are moved to the side of a very wide Snowbird ski trail. Maximizes class 2 ski terrain.

Cons – Snowbird steepest slope increases from 16% to 20% and is longer meaning slightly more difficult than existing. Backslide and Firebreak still have a long return ski on Eagle Rock. Lift C5 Ski trail crossings at Mile Run (manageable with fencing). Novice ski terrain accessed by Lift C5 is located far away from base area which is not ideal for low ability skiers. Two additional lifts will require considerable capital costs and higher operating costs.

Mountain Concept D Summary

- Mountain Concept D provides a Future SCC of ~1,900 to 2,000 skiers at one time. Eagle Rock is upgraded to provide 2,400 pph and two new 4-passenger fixed-grip lifts are envisioned.
- Snowbird is replaced on existing alignment per Concept A/B.
- Lift C4 is aligned to allow skiers from Backslide and Firebreak to return cycle.
- Lift C5 extends to the top of the mountain adjacent to Top shop.
- Concept D includes a mountain top skier staging area.

Pros - Maximizes class 1 ski terrain on Lift C5 and provides additional ski-in-ski-out access to home sites- no ski crossings at Mile Run. Lift C5 low-end ski terrain is adjacent to new staging area for comfort and convenience of low ability guests.

Cons - Requires new skier staging area to be located adjacent to new Class 1 beginner ski terrain; otherwise the terrain serviced by Lift C5 is too far from the existing base area. Two new ski lifts and new base area has highest capital and operating costs- access to mountain top staging area is via existing residential roads which are steep and require snow clearing to remain open.

Mountain Master Plan –Preferred Concept Summary

- Snowbird Lift is replaced as a SkyTrac triple chair, aligned along the eastern edge of the Snowbird ski trail in order to provide a wide, ski lift tower-free experience for guests.
- Moving Carpet Lift 3B is realigned to the old Snowbird chairlift alignment, and shortened from 400 ft. to 300 ft. in length. Shortening the lift provides more circulation space at the base area, avoids the steeper terrain-break (higher skill class), and provides direct and convenient access to the Yurt.
- Three sections of Mile Run are realigned to improve the skiability of the run by removing the three long flat sections of the existing run. Slope gradients at or slightly above 8% are maintained which will ensure that low ability guests can slide without needing to push.
- In the future, Eagle Rock is upgraded to 2,400 pph which provides a future resort SCC of 1,900 skiers at one time.

Table IV.1 lists the lift specifications of the Tahoe Donner Preferred Development Concept, including the upgraded SkyTrac triple chair purchased in 2018, the realigned and shortened moving carpet lift, and an upgraded Eagle Rock chairlift to 2,400 pph.

TABLE IV.1
TAHOE DONNER
PREFERRED CONCEPT LIFT SPECIFICATIONS

Lift Number	**1**	**2R**	**3A**	**3B**	**3C**		
Lift Name	**Eagle**	**Snowbird**	**C1**	**C2**	**C3**		
Year Built	**1995**	**2018**	**1999**	**2007**	**2010**		
Lift Type	**4C**	**3C**	**MC**	**MC**	**MC**	**TOTAL**	
Top Elevation ft.	7,550	7,278	7,052	7,078	7,064		
Bottom Elevation ft.	7,040	7,047	7,045	7,045	7,051		
Total Vertical ft.	510	231	7	33	13	794	
Horizontal Distance ft.	2,020	1,507	80	300	149		
Slope Distance ft.	2,083	1,525	80	302	150	4,140	
Average Slope %	25%	15%	9%	11%	9%	20%	Mean
Operated Capacity pph	2,400	1,500	800	1,600	1,600	7,900	
V.T.F./Hr.(000)	1,224	347	6	53	21	1,650	
Rope Speed fpm	400	400	150	160	160		
Trip Time min.	5.21	3.81	0.54	1.89	0.93		
Drive Output (hp)	200	-	7	25	10		
Operating Hr./Day	7.0	7.0	7.0	7.0	7.0	7.0	
V.T.F. Demand/Day	6,569	3,458	2,000	2,000	2,000		
Loading Eff. %	90%	90%					
Access Reduction	0%	0%					
Daily Lift Capacity	**1,170**	**630**	**20**	**80**	**40**	**1,940**	

For the upcoming 2018/19 season, the Eagle Rock chairlift will not be upgraded and remain with an operating capacity of 1,478 pph and a daily lift capacity of 720 skiers at one time, resulting in an overall Lift Capacity of **1,490** skiers at one time. In the future, Eagle Rock can either be upgraded to 2,400 pph, which is the maximum capacity of a fixed-grip four passenger chairlift (as listed above per Table IV.1), or, if a detachable six-passenger chairlift is considered, the ultimate capacity of Eagle Rock could be as high as 3,200 pph in order to provide a perfect balance between the capacity of the ski lift and the ski trails that it services. In this scenario, the daily lift capacity of Eagle Rock would be 1,660 skiers and the total daily lift capacity at Tahoe Donner would increase to approximately 2,430 skiers at one time.

.5 Base Area Concepts

5.1 Peak Day and Design Day Standards

Ecosign met with Tahoe Donner staff on semi-weekly conference calls over the length of the design period. Through discussion, it was decided that the proposed base area would be designed to a target peak day of 1,900 skiers and the resulting target Design Day of 1,425 skiers (calculated at 75% of the target Peak Day).

According to the planning standards outlined in Section II. Inventory, the amount of skier service space per skier is 17.96. When this metric is applied to the target design day of 1,425 it results in a target base lodge floor area of 25,594 sq.ft.

5.2 Base Area Concepts Outline

There are three concepts located within Parcel #1 at the location of the existing base lodge and one concept located in Parcel #2 at the top of Eagle Rock lift. Certain conditions on the development within Parcel #1 are as follows:

1. Local planning regulations indicate that the height limit for this parcel is 35'.
2. Explore options to respect either 5' setback or 30' setback.
3. Turn around and road modifications might be located outside of the main boundary.

Note that the following concepts assume that in some cases, variances may be required from the Town of Truckee.

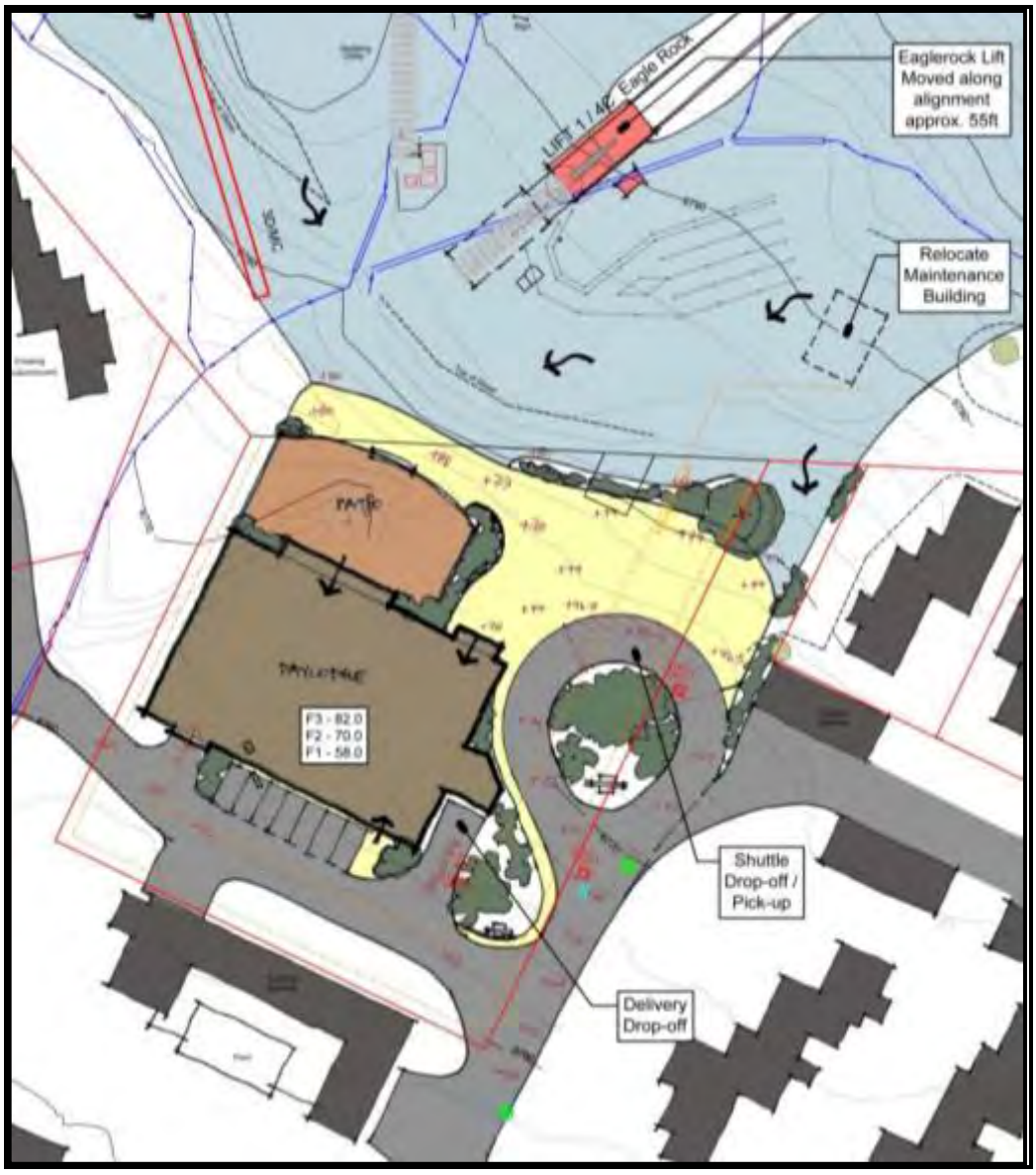
5.3 Base Area Concept A

5.3.1 Design Basis

Base Area Concept A could be built over one construction phase and house all the skier service facilities in one building. Table IV.2 outlines the Concept A proposed construction schedule and Table IV.3 lists the skier services program. Figure 9a illustrates the Base Concept A Plan.

5.3.2 Design Explanation

A main feature of Concept A is that by lowering the Eagle Rock chair approximately 8 feet, it will greatly improve the relationship between the new drop-off and the Eagle Rock loading level where no stairs of vertical barrier will be required.



Phase 2 – Existing Base Lodge Renovated / Reconfigured with Drop-Off Improvement

TABLE IV.2
CONCEPT A - PROPOSED CONSTRUCTION SCHEDULE

Concept A	GFA	Theoretical Skiers Served (75% of Peak)
PHASE 1		
TEMP ATCO Trailer for staff (14' X 40')	1,500	82
TEMP ATCO Trailer for Staging Facilities (14' X 40')	15,000	815
Demolish Existing Daylodge	-	-
Keep Yurt	754	41
TOTAL PH1	**17,254**	**938**
PHASE 2		
Keep Yurt	754	41
Build New Daylodge (over 2 summers)	25,500	1,386
TOTAL PH2	**26,254**	**1,427**

TABLE IV.3
CONCEPT A - SKIER SERVICES PROGRAM

Daylodge Building Program - CONCEPT A			
Elevation	**Level**	**Description**	**GFA**
6782.0	L3	Restaurant & Patio	10,200
6770.0	L2	Daylodge General Space	10,200
6758.0	L1	Drop Off Level & UG Parking	5,100
TOTAL			**25,500**

PROS:

- Single development area
- Perhaps more efficient to construct (single building)
- Lowered the lift to load at +78 improves vertical connection to drop off
- Because the building sits lower (due to the snowfront being lowered 8 feet) the building can have higher floor to ceiling heights
- 18 Stalls UG (not included in GFA) + 7 short term stalls

CONS:

- Difficult to phase construction
- Will need to rely on temporary building if built over two summers – ATCO trailers. (3 for Staff, 27 for Staging)
- Additional cost by shifting the lift terminal alignment up and lowering to +78 elevation
- Uses the 5' setback (may require variance)

5.3.3 Restaurant Seating for Concept A

Table IV.4 shows the restaurant seating capacity for Concept A. In calculating the seating capacity, we have used the following assumptions:

- Lunch period is based from 11:30 a.m. to 2:00 p.m. At 3.5 turns per seat, this equates to a 42 minute lunch period.
- Designed to 75% of Target Peak Day (1,425 skiers), there are enough seats to have everyone seated inside comfortably (based on 3.5 turns per seat)
- Approximately 67% of total seats are indoor.

TABLE IV.4
CONCEPT A – RESTAURANT SEATING PROGRAM

Building/Restaurant	Indoor Seats			Outdoor Seats			Total Seats	
	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Guests Served
New Base Daylodge	416	3.5	1,456	200	3.0	600	616	2,056

5.4 Base Area Concept B

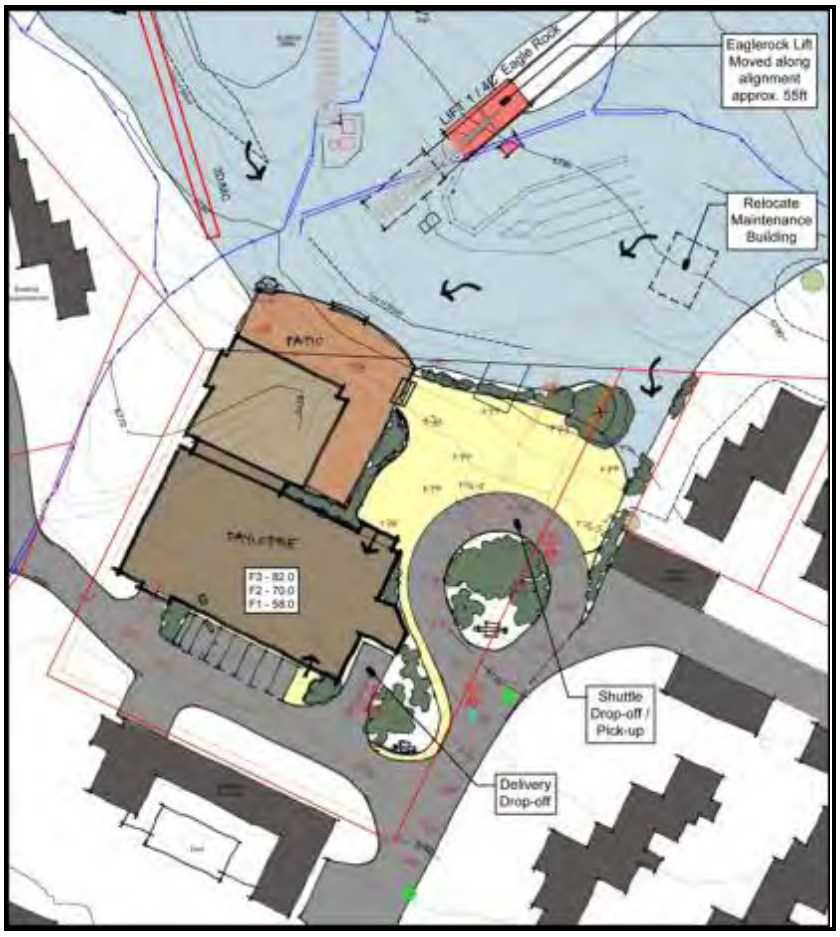
5.4.1 Design Basis

Concept B, offers a potentially phased approach where a new restaurant seating area and patio can be built in front of the existing base lodge. Table IV.5 outlines the Concept B proposed construction schedule and Table IV.6 lists the skier services program. Figure 9b illustrates the Base Concept B Plan.

5.4.2 Design Explanation

This concept also relies on both sliding the Eagle Rock terminal up the alignment and lowering it by ±8ft. This allows the rotary drop-off to not have to push so far towards the snowfront in order to gain the necessary elevation. A few steps between the plaza and the patio would still be required but the area will feel large and open with views between the drop-off and the main staging lifts.

Phase 1 – Keep Existing Base Lodge, Construct New Phase 1 Building



Phase 2 – Construct Remaining Base Lodge Expansion. Drop-Off Improvements.

TABLE IV.5
CONCEPT B – PROPOSED CONSTRUCTION SCHEDULE

Daylodge Building Program - CONCEPT B				
Phase	**Elevation**	**Level**	**Description**	**GFA**
P1	6782.0	L3	Restaurant & Patio	3,300
P1	6770.0	L2	Daylodge General Space	3,300
TOTAL PH1				**6,600**
PH2	6782.0	L3	Restaurant & Patio	8,000
PH2	6770.0	L2	Daylodge General Space	8,000
PH2	6758.0	L1	Drop Off Level & UG Parking	3,800
TOTAL PH2				**19,800**
TOTAL BUILDING				**26,400**

TABLE IV.6
CONCEPT B - SKIER SERVICES PROGRAM

Concept B	GFA	Theoretical Skiers Served (75% of Peak)
PHASE 1		
Keep existing Daylodge	15,128	822
Operate new PH1 Building	6,600	359
Modify Drop-off		
Keep Yurt	754	41
TOTAL PH1	**22,482**	**1,222**
PHASE 2		
Keep Yurt	754	41
TEMP ATCO Trailer for staff (14' X 40')	1,500	82
TEMP ATCO Trailer for Staging Facilities (14' X 40')	10,000	543
Demolish Existing Daylodge		
Operate new PH1 Building	6,600	359
TOTAL PH2	**18,854**	**1,045**
PHASE 3		
Keep Yurt	754	41
Operate PH1 Daylodge	6,600	359
Operate PH2 Daylodge	19,800	1,076
TOTAL PH3	**27,154**	**1,475**

PROS:

- Allows for Phasing. (PH1 6,600sqft, PH2 19,800sq.ft.)
- Lowered the lift to load at +78 improves vertical connection to drop-off
- Building is lower in the ground and so can have higher floor to ceiling heights
- 18 Stalls UG (not included in GFA) + 7 short term stalls

CONS:

- Pushes further into the snowfront and limits available circulation. In Ecosign recommendation, this option will require the moving of the Eagle Rock Lift to 55 feet up the existing alignment.
- Need temporary buildings if constructed over two seasons. (3 staff, 18 for Staging)
- Uses the 5’ setback (may require variance)

5.4.3 Restaurant Seating for Concept B

Table IV.7 shows the restaurant seating capacity for Concept B. In calculating the seating capacity, we have used the following assumptions:

- Lunch period is based from 11:30 a.m. to 2:00 p.m. At 3.5 turns per seat, this equates to a 42 minute lunch period.
- Designed to 75% of Target Peak Day (1,425 skiers), there are enough seats to have everyone seated inside comfortably (based on 3.5 turns per seat)
- Approximately 67% of total seats are indoor

TABLE IV.7
CONCEPT B – RESTAUARANT SEATING PROGRAM

Building/Restaurant	Indoor Seats			Outdoor Seats			Total Seats	
	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Guests Served
New Base Daylodge	416	3.5	1,456	200	3.0	600	616	2,056

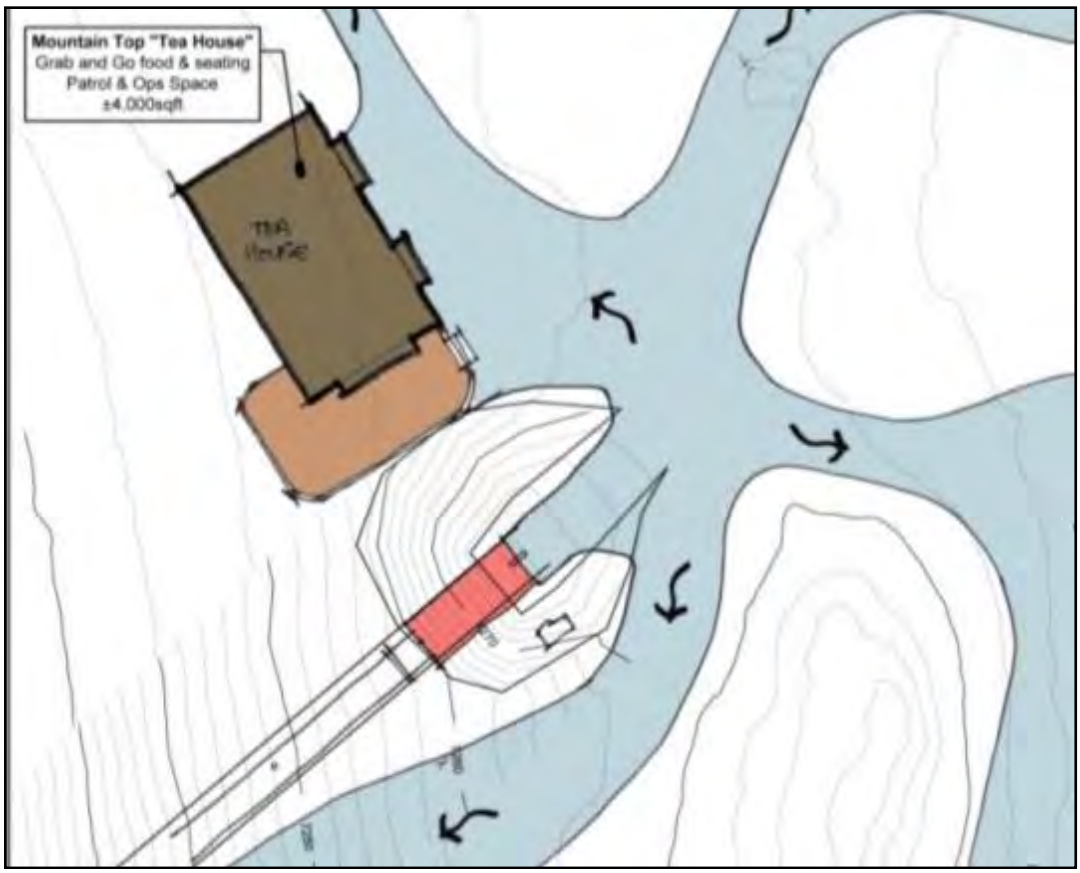
5.5 Base Area Concept C

5.5.1 Design Basis

The goal for Concept C was to provide an option that could be implemented over many years. The mountain top restaurant / tea house would provide relief from the major shortfall in restaurant seating space during peak times, and the base lodge could be upgraded / replaced at a later date. Table IV.8 outlines the Concept C proposed construction schedule and Table IV.9 lists the skier services program. Figure 9c illustrates the Base Concept C Plan.

5.5.2 Design Explanation

The mountain top tea house constructed in Phase 1 is located at the top of Eagle Rock Chair. Phase 2 consists of improving the drop-off and arrival experience by climbing as much as possible to minimize the amount of stairs to get to the snowfront.



Phase 1 - Restaurant / Tea House located at top of Eagle Rock Chair

Phase 2 – Existing Base lodge Renovated/Reconfigured. Drop-Off Improvement

Phase 3 – Construct New Base Lodge

TABLE IV.8
CONCEPT C – PROPOSED CONSTRUCTION SCHEDULE

Concept C	GFA	Theoretical Skiers Served (75% of Peak)
PHASE 1		
Build New Mountain Top Tea House	4,000	217
Keep existing Daylodge (possible reconfig.)	15,128	822
Keep Yurt (possible relocate)	754	41
Construct Drop-off		
TOTAL PH1	**19,882**	**1,080**
PHASE 2		
Demolish Existing Daylodge		
Operate Yurt	754	41
Operate Mountain Top Tea House	4,000	217
TEMP ATCO Trailer for staff (14' X 40')	1,485	81
TEMP ATCO Trailer for Staging Facilities (14' X 40')	8,941	486
TOTAL PH2	**15,180**	**825**
PHASE 3		
Keep Yurt	754	41
Operate New Daylodge	21,500	1,168
Operate Mountain Top Tea House	4,000	217
TOTAL PH3 (with tea house open)	**26,254**	**1,427**
Mid week usage (tea house closed)	**22,254**	**1,209**

TABLE IV.9
CONCEPT C - SKIER SERVICES PROGRAM

Daylodge Building Program - CONCEPT C				
Phase	**Elevation**	**Level**	**Description**	**GFA**
P1	Detailed Mapping Req.	L2	Restaurant	2,000
P1	Detailed Mapping Req.	L1	Restaurant & Patio, Patrol	2,000
TOTAL PH1				**4,000**
PH2	6790.0	L3	Restaurant & Patio	7,000
PH2	6776.0	L2	Daylodge General Space	10,500
PH2	6764.0	L1	Drop Off Level & UG Parking	4,000
TOTAL PH2				**21,500**
TOTAL BUILDING				**25,500**

PROS:

- Shuttle drop-off is located much closer to the existing snowfront elevation of +88/+86 then existing. However, because the elevation of the Eagle Rock is maintained, there will need to be about 18 steps
- Planned using the 30' setbacks (except for the delivery area)
- Possibility for underground parking (24 stalls) plus 10 short term/ADA outside building
- Ability to close the 4,000 sq. ft. mountain top restaurant mid-week or periods of low demand
- Mountain top building could be iconic building at DSA, event space, recreation use in summer
- Option to maintain the existing Eagle Rock terminal location

CONS:

- Phasing requires the use of temporary structures. ATCO trailers can be leased for 1 year; 3 for staff and 16 for staging based on 14' X 40'.
- Building is hitting the 35' height limit with 12-14' floor to floor heights. Would greatly improve the interior space if the floor to ceiling heights could be raised.

5.5.3 Restaurant Seating for Concept C

Table IV.10 shows the restaurant seating capacity for Concept C. In calculating the seating capacity, we have used the following assumptions:

- Lunch period is based from 11:30 a.m. to 2:00 p.m. At 3.5 turns per seat, this equates to a 42 minute lunch period.
- Designed to 75% of Target Peak Day (1,425 skiers), there are enough seats to have everyone seated inside comfortably (based on 3.5 turns per seat)
- Approximately 71% of total seats are indoor

TABLE IV.10
CONCEPT C – RESTAURANT SEATING PROGRAM

CONCEPT C

Building/Restaurant	Indoor Seats			Outdoor Seats			Total Seats	
	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Guests Served
New Daylodge	300	3.5	1,050	140	3.0	420	440	1,470
Mountain Top Tea House	142	3.5	497	40	3.0	120	182	617
Children's Yurt Building	-	3.0	-	-	3.5	-	-	-
TOTAL	**442**		**1,547**	**180**		**540**	**622**	**2,087**

5.6 Base Area Concept D

5.6.1 Design Basis

Base Area Concept D is significantly different from the previous 3 concepts in that it is located at the top of the Eagle Rock lift on Development Parcel #2. Figure 9d illustrates the Base Concept D Plan.

Table IV.11 outlines the Concept D proposed construction schedule and Table IV.12 lists the skier services program.

5.6.2 Design Explanation

All guests would drive up to the top plateau on Skislope Way. From here, they would have ample parking and could easily walk to the base lodge or, if they have passes, put on their skis and start their ski day. Great views, plenty of sun and new facilities would provide a very positive guest experience.

Phase 1 – Entire development can be constructed while the original base area is still in operation.

TABLE IV.11
CONCEPT D – PROPOSED CONSTRUCTION SCHEDULE

Concept D	GFA	Theoretical Skiers Served
PHASE 1		
Operate Existing Daylodge	15,128	822
Build Full Facilities at top of Mountain over multiple seasons		
Keep Yurt	754	41
TOTAL PH1	**15,882**	**863**
PHASE 2		
Demolish Existing Daylodge		
Operate Mountain Top Facilities - Building 1	18,000	978
Operate Mountain Top Facilities - Building 2	9,000	
Build Accommodation Buidling at Existing Base?		
TOTAL PH2	**27,000**	**1,467**
Mid week usuage (one building closed)	**18,000**	**978**

TABLE IV.12
CONCEPT D – SKIER SERVICES PROGRAM

Daylodge Building Program - CONCEPT D				
Phase	**Elevation**	**Level**	**Description**	**GFA**
PH2	Detailed Mapping Req.	L2	Restaurant	9,000
PH2	Detailed Mapping Req.	L1	Staging Facil.Restaurant & Patio	9,000
TOTAL BUILDING 1				**18,000**
PH2	Detailed Mapping Req.	L2	Childrens Facil. Employee	4,500
PH2	Detailed Mapping Req.	L1	Childrens Facil. Employee	4,500
TOTAL BUILDING 2				**9,000**
TOTAL GFA				**27,000**

PROS:

- Very easy to phase construction. Can run the existing base while fully constructing the top development. Can break the mountain top development into multiple phases as desired.
- No temporary buildings required

- Potential to construct new development at existing base area site to offset costs. (Private real estate/ hostel/ Rental Accom./ Condos etc.)
- More flexibility for potential design, (less implications of property boundaries, fewer existing services issues)
- Close connection to ski area – no uphill walking required. All parking is within walking distance to lifts / trails
- No Shuttle Buses required
- Overall improvement in visitor experience. Clear arrival process.
- Increased views & sun exposure

CONS:

- Road access – some parts of road go to 12% Unlikely to be able to re-align road to decrease steep sections.
- Potential negative response from homeowners with increased traffic on road.
- Existing cellphone tower will need to be screened from view.
- Additional cost to construct new infrastructure (water, power, etc., as required)

.6 Preferred Base Area Concept

6.1 Design Basis

After presentation of the Concepts, feedback from the task force was obtained and used to create a Preferred Base Area Concept that included the following directives:

- Respect the 30’ setbacks
- Respect the 35’ height limit
- Eagle Rock lift will not be modified at this time (no lowering or shifting the terminal up the alignment.)
- Utilize the refined base lodge building program that was refined through feedback and comments provided by the staff at Tahoe Donner.
- Utilize standardized prefabricated construction methods and dimensions to minimize construction time.
- Ensure the new sun deck replaces the full 5,000 sq.ft. of the existing deck.
- Incorporate the ski back trail on the East side of the site that crosses road back towards the existing parking.

6.2 Design Explanation

The Preferred Concept is illustrated on Figure 11, the Base Lodge & Snow Front Site Plan. The overall plan seeks to solve the identified issues with the existing situation using practical design solutions in order to improve the overall guest experience. Some of the design elements include:

- The main shuttle drop-off extends and climbs in elevation up to approximately 6,775 feet so that there is minimal vertical grade change to get guests up to the staging lifts as easily as possible. Guests can access the F2 level directly or go up the approximate 20 steps to the upper deck and snowfront level.
- The building consists of 3 levels. F1 at +61.0, F2 at +74.0, and F3 at +87.0. With 13' floor to floor heights, the building fits within the current height limit using assumptions on where the average ground elevation datum is taken from.
- Large sunny deck space
- Increase the size of the snow front, include space for ski racks, lift maze and allow for a 2' snow pillow. There is a slight uphill (around 2-3%) between the edge of the deck and the loading elevation of the Eagle Rock lift.

The preferred concept is further illustrated on Figure 12, the Base Lodge Building Sections which shows two sections through the site and base lodge. Figure 13 illustrates a conceptual grading plan for the base lodge site and snow front and Figures 14a and 14b show a conceptual spatial layout of the interior spaces for each of the 3 main levels of the base lodge building.

Table IV.13 summarizes the building program for each of the three levels of the proposed base lodge which together total 25,600 square feet of skier service space.

TABLE IV.13
PROPOSED BASE LODGE BUILDING PROGRAM

Guest Service Function	F1 at 63.0 elevation	F2 at 76.0 elevation	F3 at 89.0 elevation	TOTAL
Staging Facilities				
Ticket Sales		600		600
Public Lockers	800			800
Equipment Rental & Repair		3,510		3,510
Guest Services / Ski School/ Adaptive		1,500	500	2,000
Children's Programs/Day Care				-
Staging Subtotal	**800**	**5,610**	**500**	**6,910**
Commercial Facilities				-
Food & Beverage Seating			4,550	4,550
Kitchen & Scramble, Bar			2,275	2,275
Bar/Lounge			390	390
Restrooms		1,200		1,200
Accessory Retail		520		520
Commercial Subtotal	**-**	**1,720**	**7,215**	**8,935**
Operational Facilities				-
Administration	1,000			1,000
Employee Facilities	2,100			2,100
First Aid & Mountain Patrol	450			450
Operational Subtotal	**3,550**	**-**	**-**	**3,550**
TOTAL FUNCTIONAL SPACE	**4,350**	**7,330**	**7,715**	**19,395**
Storage	1,000	590	178	1,768
Mechanical, Circulation/Walls/Waste*	1,480	1,480	1,480	4,440
TOTAL AREA BY FLOOR	**6,830**	**9,400**	**9,373**	**25,603**

6.3 Restaurant Seating for the Preferred Concept

Table IV.14 shows the restaurant seating capacity for the Preferred Concept. In calculating the seating capacity, we have used the following assumptions:

- Lunch period is based from 11:30 a.m. to 2:00 p.m. At 3.5 turns per seat, this equates to a 42 minute lunch period.
- The planned indoor seats are designed to satisfy 70% of Target Peak Day (1,330 skiers). A slightly more aggressive target then the previous 75% to allow for tighter seating arrangements during peak times and the assumption that peak days usually coincide with good weather when outdoor seating can also be maximized.
- Approximately 62% of total seats are indoor.

- For comparison, the existing base lodge has 370 seats indoor and outside the base lodge and the preferred concept allows for 610 seats (indoor and outdoor)
- Together indoor and outdoor seating areas will fully satisfy target peak days with an approximate 2,020 guests seated over the lunch period (at 3.5 turns per seat).

TABLE IV.14
PREFERRED CONCEPT – RESTAURANT SEATING PROGRAM

Building/Restaurant	Indoor Seats			Outdoor Seats			Total Seats	
	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Turns per Seat	Guests Served	Number of Seats	Guests Served
New Base Daylodge	380	3.5	1,330	230	3.0	690	610	2,020

6.4 Maintenance Building

As part of the preferred concept it is recommended to remove the small maintenance building in order to open up the snow front and remove any barriers to skier circulation. The space will be relocated under the patio as noted on Figure 14a.

Small Existing Maintenance Building

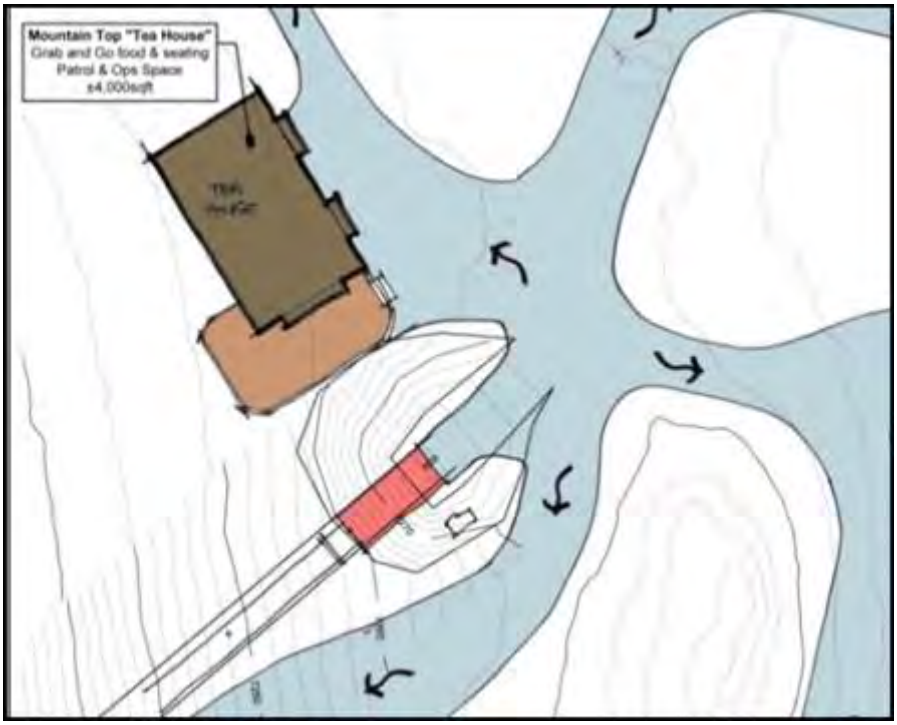
6.5 Children's Yurt Building

A decision on whether to retain or remove the children's yurt building was not formally decided upon during the design development with the client. For the purposes of planning the preferred concept it was determined that the full amount of required space would be allowed for within the single new base lodge building.

6.6 Mountain Top Tea House

The plateau at the top of the Eagle Rock chairlift is an ideal location for the construction of a Tea house, BBQ hut or small restaurant. As outlined in previous concepts, this facility could be used for extra restaurant space during peak periods, additional operations space, a venue for special events or a recreational activity based in the summer.

Facility could be used for Special Events such as Weddings



Possible location of Mountain Top "Tea House"

.7 Proposed Parking Concept

Due to the limitation of available land for parking expansion, creative solutions were required to maximize parking and supply enough stalls to meet the demand of the target peak day of skiers.

Some strategies included renovating existing mailbox sites to increase parking capacity or utilizing other Tahoe Donner facilities for overflow parking. Figure 15 shows the location and capacity of all proposed parking areas within Tahoe Donner and Table IV.15 lists the capacities and estimated skier counts from each parking location. Because all the new parking areas are located outside walking distance, the dependency on shuttles will still be required and an increase in the shuttle fleet may also need to be considered.

As part of the preferred concept we have allowed for approximately 9 short term / ADA parking stalls on the north and west side of the building as illustrated on figure 11, the Base Lodge and Snow front site plan.

TABLE IV.15
PROPOSED PARKING CAPACITY

Lot Number	Lot Name	Number of Cars	% Total Within/ Outside SWD	AVERAGE Number of Visitors 2.6 pp/car	PEAK Number of Visitors 3.0 pp/car	PEAK Number of Skiers at 80% Participation
Tahoe Donner						
Within SWD						
P1	Roadside - Snowpeak Way & Slalom Way	65		169	195	156
P2	4 tier lots (60% take shuttle / 40% walk)	194		504	582	466
P3	Slalom lot	60		156	180	144
P12	Base Area Preferred Concept - Short Term Stalls	9		23	27	22
Subtotal Within SWD		**328**	*50%*	**852**	**984**	**788**
Outside SWD						
P4	The Lodge (Golf Course Parking, half used for XC)	53		137	158	126
P5	Northwoods Clubhouse Parking	25		65	75	60
P6	Corner Lot	45		117	135	108
P7	Alder Creek Mail*	15		39	45	36
P8	Hansel Mail*	18		47	54	43
P9	Zurich Mail*	10		26	30	24
P10	Tahoe Donner Trailhead Parking incl. roadside parallel**	40		104	120	96
P11	Potential Lot***	125		325	375	300
Subtotal Outside SWD		**331**	*50%*	**860**	**992**	**793**
Total Tahoe Donner		**659**	*100%*	**1,712**	**1,976**	**1,581**

**Ecosign estimate based on 140 cars per acre*

***Consider this area for staff parking*

****Potential lot near Coyote Moon*

Staff Parking

Parking capacities were analyzed for guests only and parking required for staff has not been allowed for. It is important to note that in order to satisfy the guest skier demand on busy periods all available parking is required and so efforts should be made to ensure staff do not fill up any guest parking stalls. A satellite staff parking lot will need to be found that can be used for staff and a shuttle provided to get them to the base area.

.8 Proposed Staging Concept

Table IV.16 illustrates that after the increased parking capacity is taken into consideration and combined with the guests arriving by the surrounding accommodation and being dropped off, the total amount of skiers staged according to our assumptions is approximatley 1,684. Therefore, while the skier service facilities and the lifts and trails will ultimatley support the target peak day of 1,900, according to our assumptions it will be hard to get the skiers to the base area with this shortfall of approximatley 70-80 stalls.

Possible Solutions Include:

- Increasing skiers arriving by charter bus from outside the Tahoe Donner area.
- Increasing shuttle service pickups throughout the Tahoe Donenr area so that skiers from Tahoe Donner residences do not get into their cars and fill up parking stalls.
- Securing more land for parking.
- Encourage a higher ratio of skiers per car (perhaps through paid parking).

TABLE IV.16
PREFERRED CONCEPT PARKING CAPACITY

Preferred Concept	**On Target Peak Day (1,900 skiers)**	
Tahoe Donner	**Number of Visitors**	**Number of Skiers**
Within SWD		
From Pillows (Walking)	50	40
From Parking (Walking)	984	788
Charter Bus, Private Drop Off from surrounding homes (8%)	79	63
Subtotal Within SWD	**1,113**	**891**
Outside SWD		
From Parking (Arrive by Shuttle)	992	793
Total Tahoe Donner	**2,105**	**1,684**

After all the improvements to the Lifts, Trails and Skier Service facilities, the Area Facilities Balance graph in Plate IV.1 illustrates that the target peak day is satisfies with the capacity of the planned lifts and trails as well as the indoor and outdoor seating. The base lodge building satisfies the target design day and there is a shortfall in parking and staging capacity as previously identified.

AREA FACILITIES BALANCE

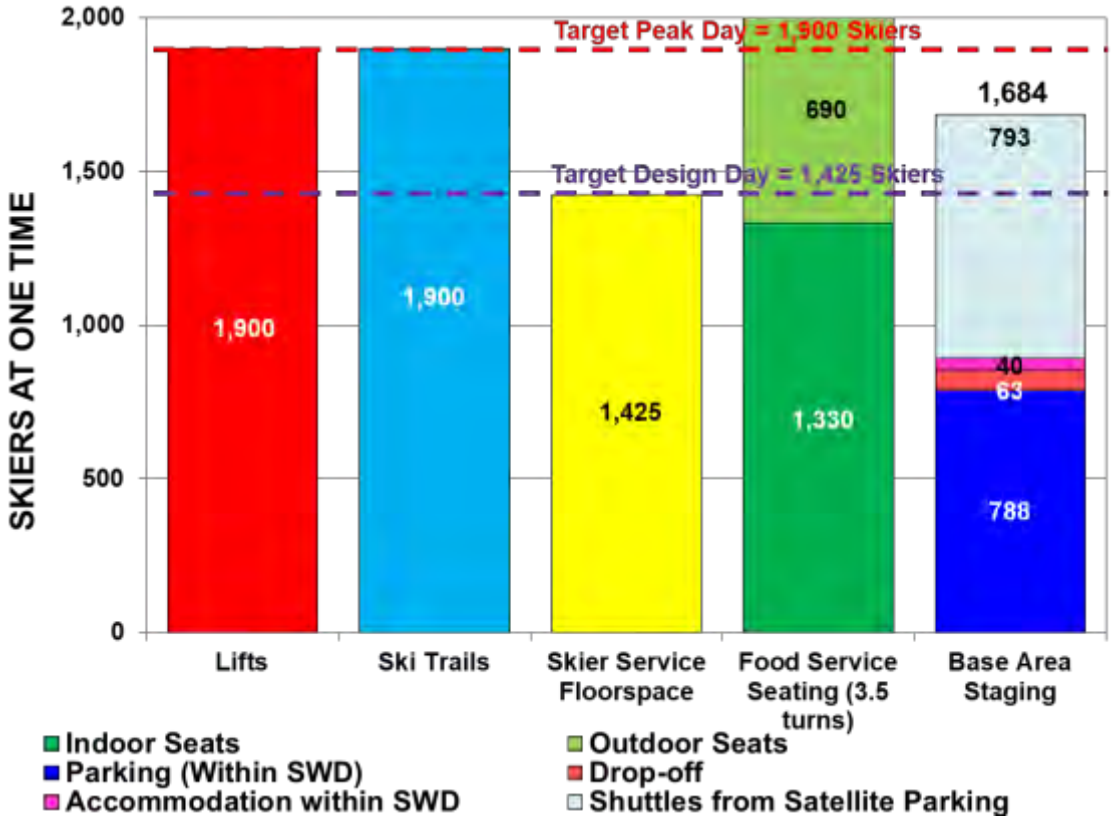


PLATE IV.1

.9 Summer and Winter Recreation

The following section consists of a general list of summer and winter recreational activities that may have some potential within the Tahoe Donner Downhill Ski Area site.

Summer

Zip Line

Resorts all around the world are now installing Zip Trek or Sky Line tours for both summer and winter use. Zip Trekking involves moving from treetop to treetop while attached to the cable via a full-body harness. The harness attaches to a zip pulley via two tethers (one main and one backup). The cable trail is connected to both a launch and landing platform. The series of cable zip lines and suspension bridges move riders over gaping gorges and ice framed rivers.

The Zip Trek has also evolved into a nature interpretive activity with zip line staff acting as guides who answer questions and provide relevant information about the area's ecology and the ancient forests. Riders can achieve speeds of up to 60 miles per hour over some of the spans.

Zip Line Eco Tours and Interpretive Programs

A second type of zip line consists of four parallel cables that run through the forest in one long span. This system is currently installed in Park City Resort, Utah.

Park City "ZipRider"

Beach/Grass Volleyball

Beach volleyball can be played either in the traditional way in sand with teams of two, or adapted to be played on grass with several courts and teams of six, as illustrated in the following photograph. The beach volleyball courts can be set up in front of the snow apron during the winter. The volleyball can take place on the grassed area, or sand can be placed on the courts for a true beach volleyball experience.

"Beach Volleyball" Grass Tournament

Climbing Wall

Climbing walls are very popular at ski /snowboard resorts. These walls are usually free standing structures that are modular and set up for the summer in the base area of the resort near the base lodge on the skier plaza.

Disc Golf

Disc golf is played in a similar manner as ball golf. The initial "drive" is taken from a designated tee area. Each subsequent throw is taken from just behind the spot where the disc came to rest. Each throw is added to a player's score. As with ball golf, each hole is given a par rating. A common strategy for a par-three hole, as in golf, would be to drive (long throw toward the basket), approach (mid-range throw to the "green") and then putt (short throw into the basket). The hole is scored when the disc has come to rest in the target basket, or when it hits the designated part of an object if there are no baskets and it is an object course.

The proposed trail system can be utilized for Disc Golf during the summer with “tee” zones and “holes” (a pole mounted metal basket about 3 feet in the air) placed in strategic parts of the ski trails.

Frisbee Golf

Mini Golf

A mini golf area can be set up in the base area adjacent to the moving carpet lifts and the beginner area. As is the case with many other ski areas, the mini golf course will be covered with snow during the ski season for skiing and snowboarding.

Conferences/Seminars/Weddings

A mountain top restaurant will be ideal for hosting conferences, seminars, retreats, family reunions, weddings and other group dinners associated with these gatherings. For example, the opportunity to meet and have a meal in a unique setting for one day of a multi-day conference will provide a unique attraction for groups coming to the resort.

Mountain Music Concerts and Festivals

The lower portion of the trail near the bottom of the fixed grip quadruple chairlift will be graded so that it forms a natural amphitheater slope for general seating. A stage could be set up on the new deck and face up toward the ski trail. The base lodge and village facilities can be used for ticket sales, refreshments and washroom functions.

Natural "Amphitheatre" setting for Music Concerts on the Mountain

Alpine Coaster

A full range of alpine slide devices are available. The “Toboggan Run” has small carts that are gravity powered and run in a stainless steel flume set into the ground. The track is made up of sharp curves, gradual bends and straight sections. The cart can accommodate up to two passengers. Track lengths vary between 800 and 6,500 feet. The bob-kart rides in a welded stainless steel track that is designed for flat sites. The bob-kart is gravity self-powered and can reach speeds up to 25 mph.

Alpine Coaster

The “Alpine Coaster” is a high-tech version of other gravity slides that runs on an elevated stainless steel tubular track. The track runs through the forest on a track that varies in height of between 3 and 20 feet above the ground. The coaster can be operated year round, as snow or rain does not affect the operation of the equipment. This type of coaster has its own uplift transportation system so that it is a self-contained attraction that can operate independently of the ski operation.

Mountain Biking

Mountain biking and summer hiking could utilize the ski trail and mountain road network. These mountain bike trails could include the use of the existing summer road system, as well as more advanced single track trails. The snowboard terrain park can be used as a mountain bike park during the summer.

Lift Accessed Sightseeing

It is possible that the main lift system up the mountain can be utilized to transport foot-passengers up the mountain for sightseeing, during both the winter and summer seasons. During the summer, foot-passengers will venture out from the top terminal location to hike around the different parts of mountain. Mountain top food outlets could be placed to allow guests to experience on-mountain dinning.

Winter

Terrain Park & Halfpipe

Terrain parks and halfpipes facilitate a unique aspect of snowboarding and skiing. While snowboarders use most terrain in a way familiar to alpine skiers, freestyle snowboarding comes straight from the street. The terrain park and halfpipe is where skate boarding's influence can be either confined or showcased, depending upon your point of view. Popular with both skiers and snowboarders, terrain parks are an excellent way to utilize a relatively small area of terrain.

Example of Terrain Park Layout

Example of Halfpipe Layout

Freestyle riding in the halfpipe is clearly a discipline that attracts the largest audience and media attention. Ski areas making the most of this activity take advantage of the sculptural aspects of snow, creating challenging areas that are the envy of their concrete and wood counterparts

A halfpipe is simply a channel constructed in the snow. The walls of the channel are contoured from horizontal to vertical, and the bottom of the channel is generally flat. The fall line runs directly through the channel. Snowboarders and freestyle skiers use the walls as both a launch and landing ramp, and perform tricks much like those observed in skateboarding. Halfpipe wall transitions are also used by snowboarders and skiers to absorb landing impacts. There are several different sizes of halfpipes ranging from the standard halfpipe up to the “Superpipe”.

The Snowbike

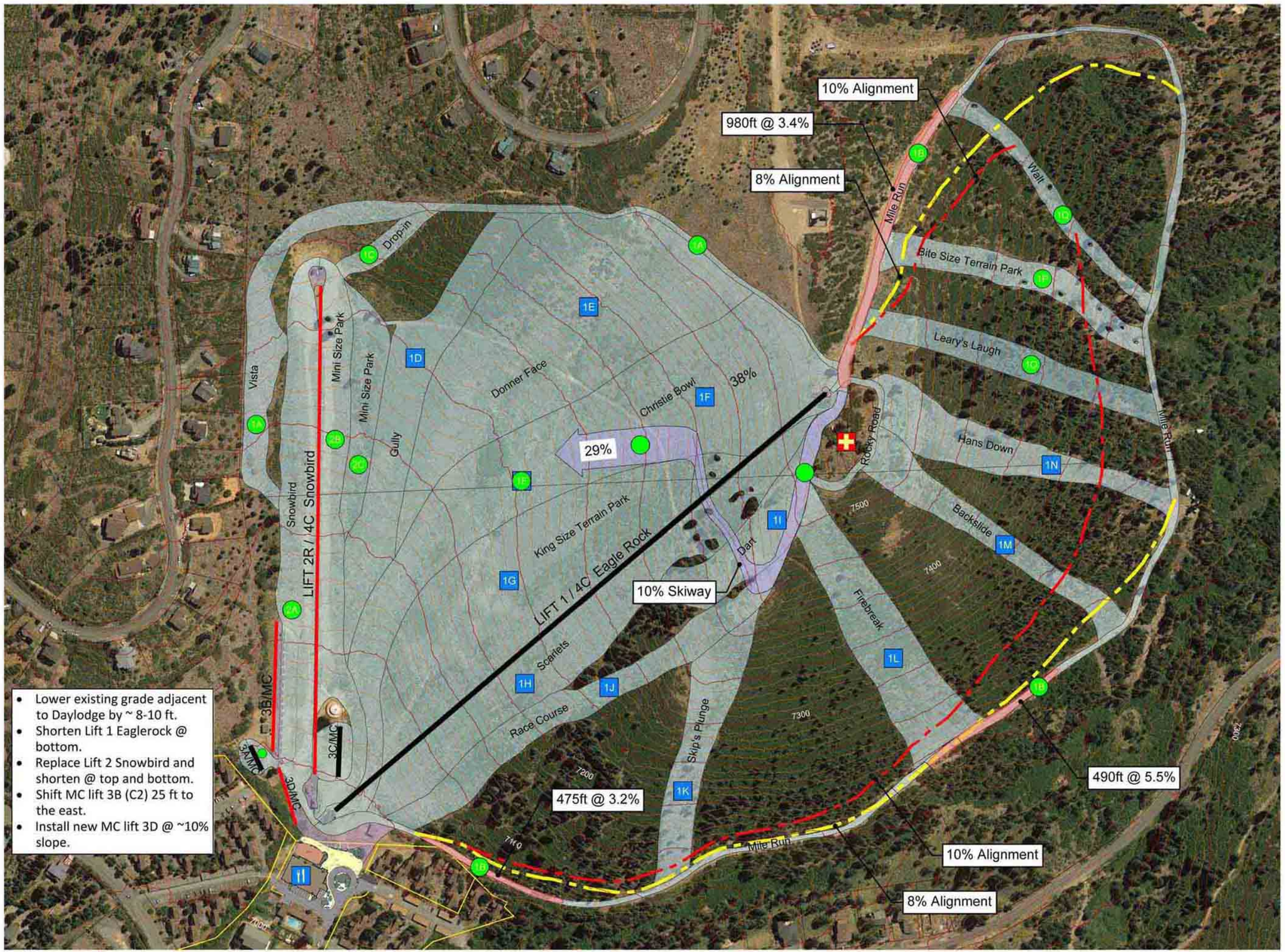
Originally called "skibobs," Snowbikes have been used for decades by seated gliders, mainly in Europe. Newest models are extremely light, efficient, and easy to maneuver. Some Snowbikes can even be immediately disassembled for transport on an aerial tram or gondola lift.

Snowbiking is as exhilarating as any other form of snow gliding, and experts on this toy are as impressive to watch as any world-class skier or snowboarder. What's more, snowbiking does not require quite the level of physical fitness and conditioning as other snowtoys. The seated position, and mini-skis on the rider's feet offer tremendous control and comfort. If you can ride a bicycle, you can quickly excel on a snowbike.

Mini Z and Ski-Doo Course

A small area approximately the size of 2 tennis courts can be utilized for mini Z snowmobiles. This area will require access to the snowmaking system so that a small, closed course can be created.

Mini Ski-Doo



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Contours: 10ft Date: 04/2018

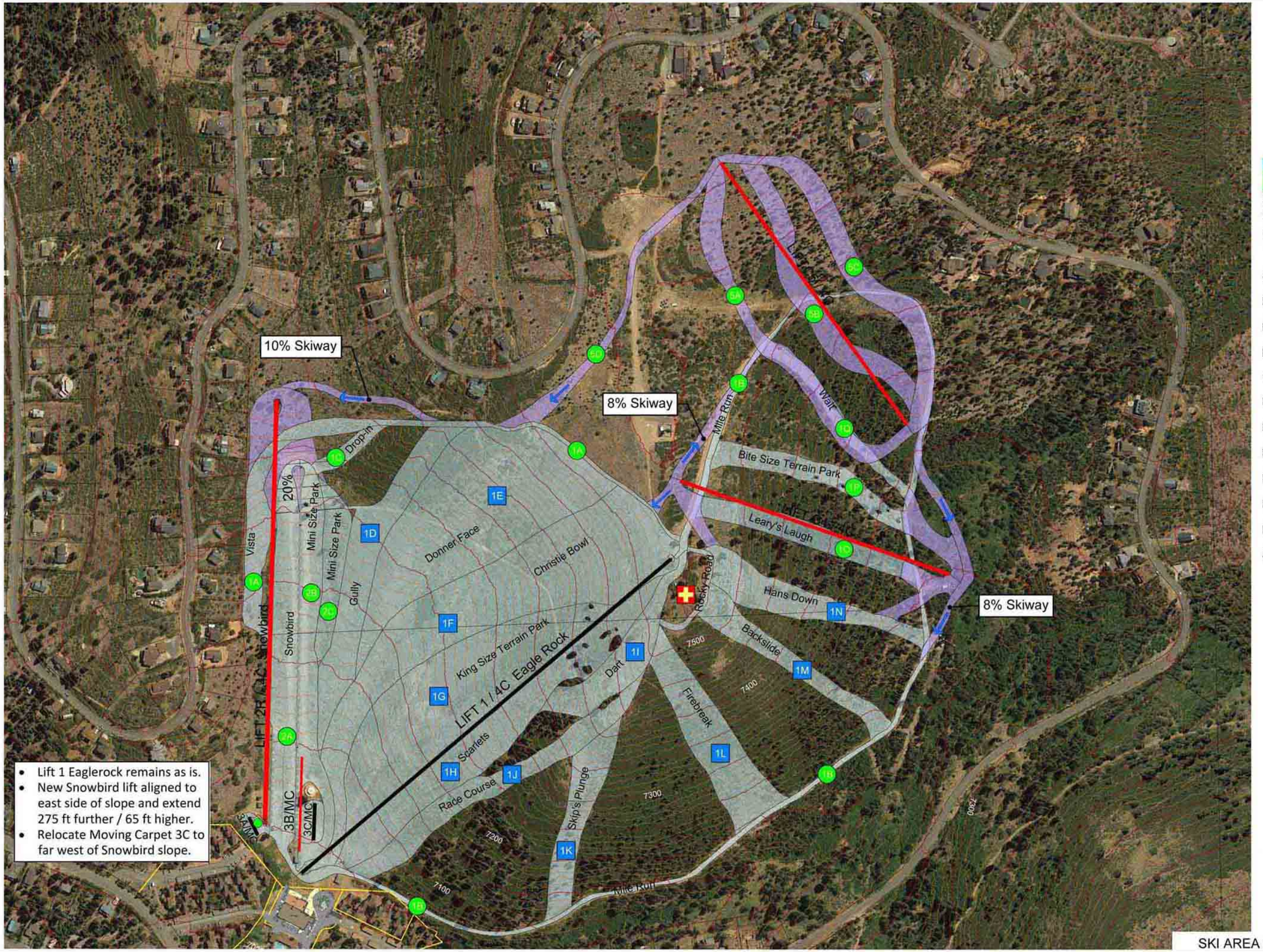
0ft 150 300 450 600

SKI TRAIL ABILITY LEVEL

- Easiest
- More Difficult
- Most Difficult

*see text for lift and trail details

- Existing Lift
- Lift to be Removed
- Proposed Lift
- Existing Trail
- Proposed Trail
- 8% Skiway
- 10% Skiway
- Areas too Flat for Downhill Skiing and Snowboarding
- Restaurant
- Ski Patrol



- Lift 1 Eaglerock remains as is.
- New Snowbird lift aligned to east side of slope and extend 275 ft further / 65 ft higher.
- Relocate Moving Carpet 3C to far west of Snowbird slope.

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Contours: 10ft

Date:04/2018

0ft 200 400 600 800

SKI TRAIL ABILITY LEVEL

Easiest

More Difficult

Most Difficult

*see text for lift and trail details

Existing Lift

Lift to be Removed

Proposed Lift

Existing Trail

Proposed Trail

Restaurant

Ski Patrol

SKI AREA MASTER PLAN CONCEPT C 8b

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Contours: 10ft

Date:04/2018

0ft 200 400 600 800

SKI TRAIL ABILITY LEVEL

- Easiest
- More Difficult
- Most Difficult

*see text for lift and trail details

- Existing Lift
- Lift to be Removed
- Proposed Lift
- Existing Trail
- Proposed Trail
- Restaurant
- Ski Patrol

- Lift 1 Eagle rock remains as is.
- Replace and Shorten Lift 2 Snowbird per Concept A/B except use existing grade in base area.
- Shift MC Lift 3B (C2) 25ft to the east using existing grade
- Install new MC Lift 3D @ 7% with minor earthworks.

SKI AREA MASTER PLAN CONCEPT D 8c

Cut: 2,517
Fill: 2,339
Net: 178 cu.yd. (cut)

980ft @ 3.4%

Cut: 1,212
Fill: 1,198
Net: 14 cu.yd. (cut)

490ft @ 5.5%

Cut: 1,794
Fill: 1,586
Net: 208 cu.yd. (cut)

475ft @ 3.2%

Vista
Mini Size Park
Mini Size Park
Drop-in
Donner Face
Christie Bowl
Gully
Snowbird
LIFT 2R / 4C Snowbird
King Size Terrain Park
LIFT 1 / 4C Eagle Rock
Scarlets
Race Course
Dart
Firebreak
Skip's Plunge
Rocky Road
Mile Run
Walk
Bite Size Terrain Park
Leary's Laugh
Hans Down
Backslide
3A/MC
3B/MC
3C/MC
8.1%
8.2%
8.3%
8.2%
5.5%
8.0%
8.0%
7.1%
8.0%
5.9%
5.4%

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Contours: 10ft
Date:04/2018

0ft 150 300 450 600

SKI TRAIL ABILITY LEVEL

- Easiest
- More Difficult
- Most Difficult

*see text for lift and trail details

- Existing Lift
- Lift to be Removed
- Proposed Lift
- Existing Trail
- Proposed Trail
- Removed Trail
- Areas too Flat for Downhill Skiing and Snowboarding
- Existing Contours
- Proposed Contours
- Restaurant
- Ski Patrol

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Contours: 2ft

Date: 04/2018

0ft 25 50 75 100

3B/MC

3A/MC

LIFT 2R / 4C Snowbird

3C/MC

3D/MC

LIFT 1 / 4C Eagle Rock

Eaglerock Lift Moved along alignment approx. 55ft

Relocate Maintenance Building

PATIO

DAYLODGE

F3 - 82.0
F2 - 70.0
F1 - 58.0

Shuttle Drop-off / Pick-up

Delivery Drop-off

BASE LODGE & SNOW FRONT ILLUSTRATIVE SITE PLAN - CONCEPT A 9a

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Contours: 2ft

Date: 04/2018

0ft 25 50 75 100

3B/MC

3A/MC

LIFT 2R / 4C Snowbird

3C/MC

3D/MC

LIFT 1 / 4C Eagle Rock

Eaglerock Lift Moved along alignment approx. 55ft

Relocate Maintenance Building

PATIO

DAYLODGE

F3 - 82.0
F2 - 70.0
F1 - 58.0

Shuttle Drop-off / Pick-up

Delivery Drop-off

BASE LODGE & SNOW FRONT ILLUSTRATIVE SITE PLAN - CONCEPT B 9b

Mountain Top "Tea House"
Grab and Go food & seating
Patrol & Ops Space
±4,000sqft

TEA HOUSE

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Contours: 2ft

Date: 04/2018

0ft 25 50 75 100

LIFT 1 / 4C Eagle Rock

Eagle Rock

Relocate Maintenance Building

Service Vehicle Access to snowfront

PATIO

DAYLODGE

F3 - 90.0
F2 - 76.0
F1 - 64.0

Shuttle Drop-off / Pick-up

Short Term Stalls

Delivery Drop-off

BASE LODGE & SNOW FRONT ILLUSTRATIVE SITE PLAN - CONCEPT C 9c

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Contours: 2ft

Date: 04/2018

0ft 50 100 150 200

Ski-In Access to Parking

Ski-Out Access to Trails

Ski-Out Access to Trails

Day Skier Parking +/- 800 Stalls

Existing Cellular Tower

Main Drop-off

Children's Building:
- Ski School
- Employees
- Facilities
- Patrol

Main Day Lodge:
- Rentals
- Tickets
- Restaurant

Proposed Lift

Existing Lift

7260

7250

7240

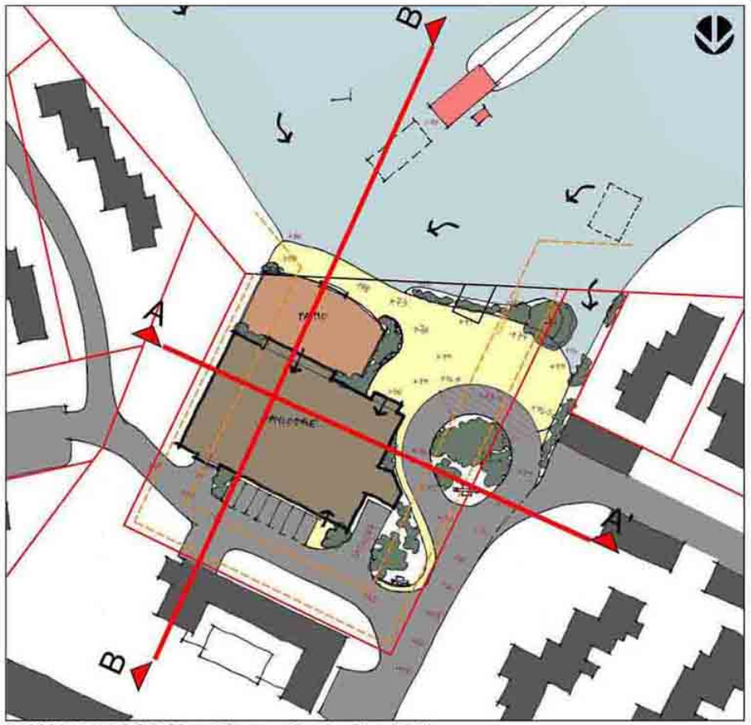
7230

7220

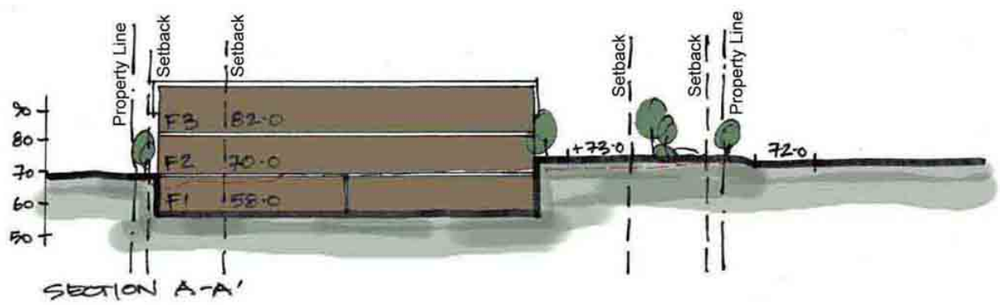
7210

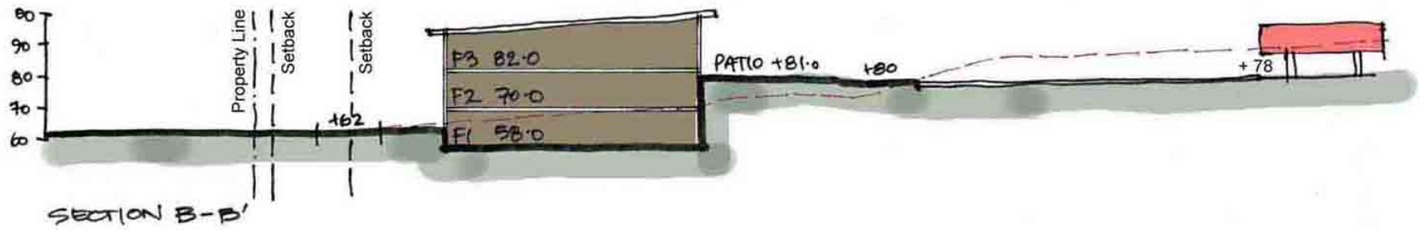
7200

BASE LODGE & SNOW FRONT ILLUSTRATIVE SITE PLAN - CONCEPT D 9d



CONCEPT A&B Key Plan - Scale 1" : 100"





CONCEPT A&B Scale 1" : 50'

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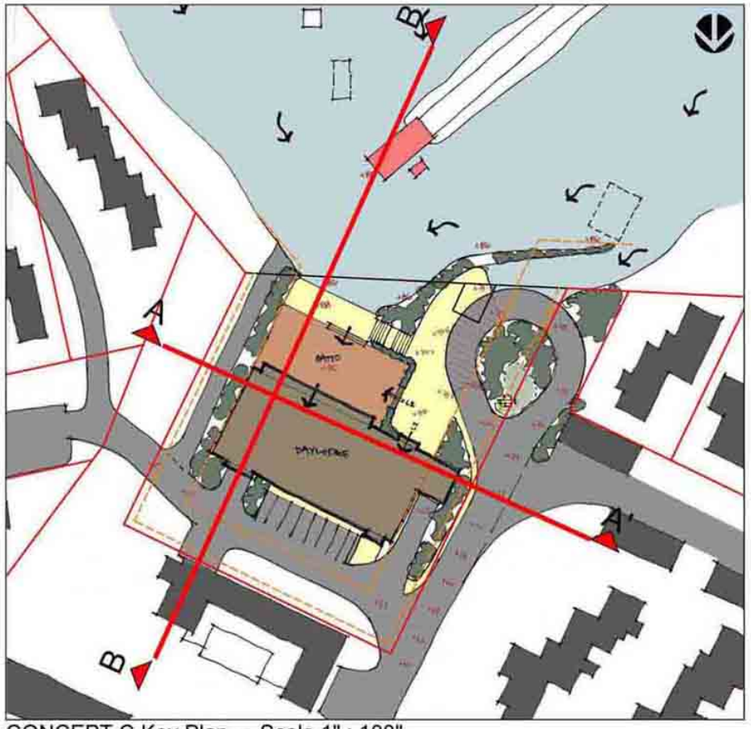
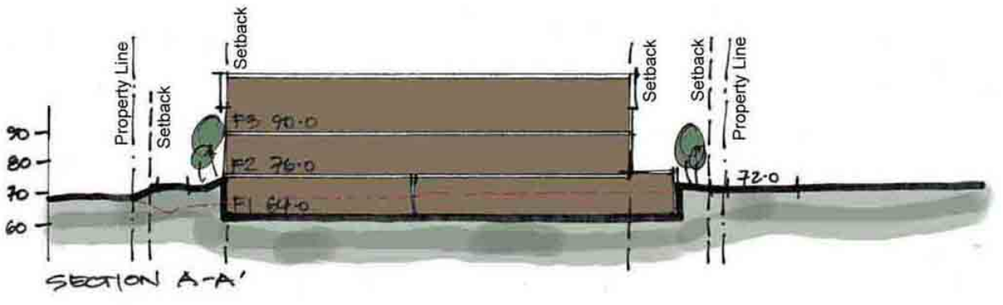
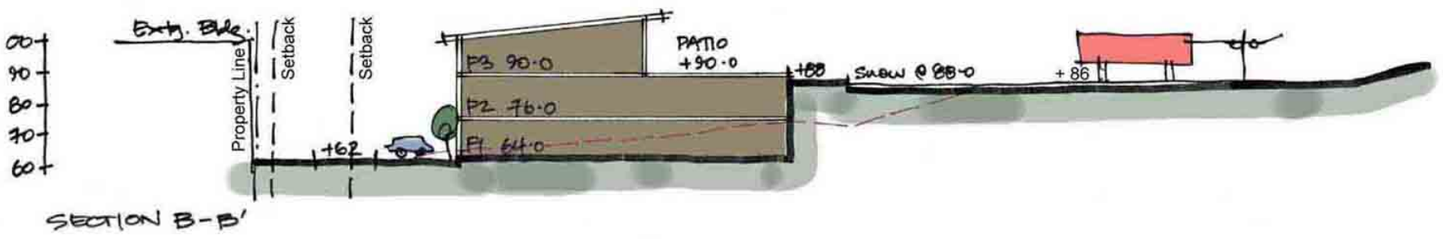
Date: 04/2018

0ft 25 50 75 100



CONCEPT C Key Plan - Scale 1" : 100"





CONCEPT C Scale 1" : 50'

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Contours: 2ft Date:04/2018

0ft 25 50 75 100

Children's Yurt Building

Existing Snowmaking Pump Station

LIFT 2R / 4C Snowbird

3A/MC

3B/MC

3C/MC

LIFT 1 / 4C Eagle Rock

Dirt Road

Edge of Gravel

Building Utility

Sign

Existing Condominiums

Flat Staging Zone

Relocate Maintenance Building to under new deck

Ski route to waiting zone / Summer vehicle access

Shuttle Waiting Zone

Shuttle Drop-off / Pick-up

5,000ft² Patio

Ski Trail connection (approx. 13 % - 16%)

Access to Patrol / First Aid

Ski Trail connection to Parking

Entrance into F2

Entrance into F1

5 Angled Stalls

Guest Route to/from Parking

4 Parallel Stalls

Garage Existing

Existing Building

Pool

BASE LODGE & SNOW FRONT SITE PLAN - PREFERRED CONCEPT 11

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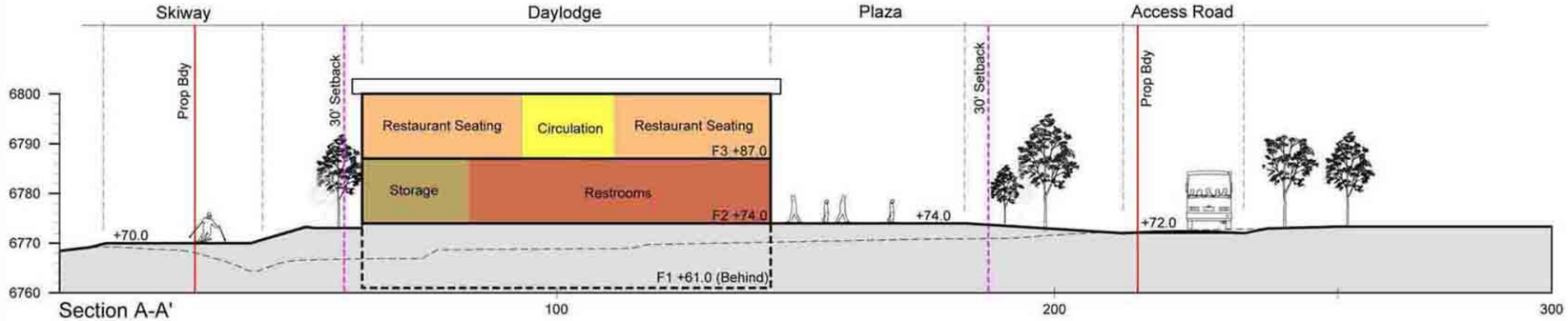
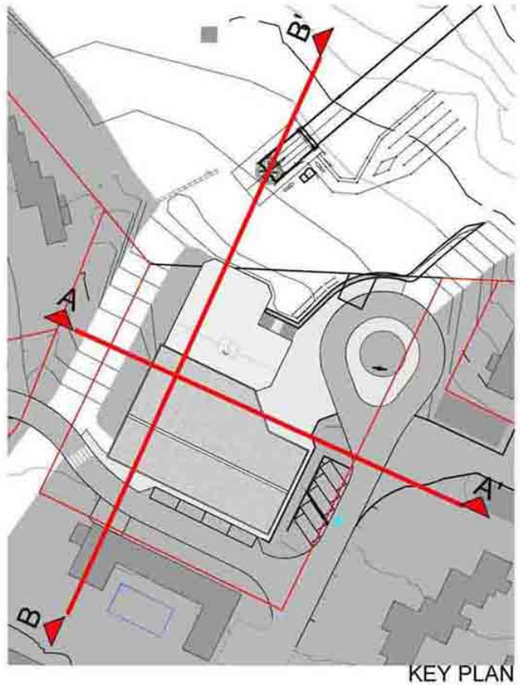
Date: 04/2018

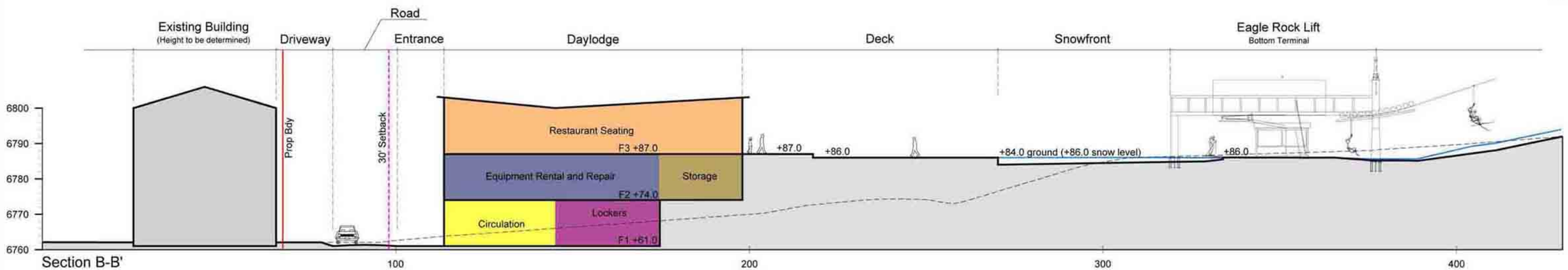
0ft 15 30 45 60



Section A-A'



KEY PLAN



Section B-B'

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Contours: 2ft

Date: 04/2018

0ft 20 40 60 80

LIFT 2R / 4C Snowbird

3A/MC

3B/MC

3C/MC

LIFT 1 / 4C Eagle Rock

2ft Snow Pillow

16%

13%

Daylodge
Floor Levels
F3 - 87.0
F2 - 74.0
F1 - 61.0

Potential 30' setback

Existing 5' setback

ELEC. VAULT

Existing Road
Average 11.2%
Grade

BASE LODGE & SNOW FRONT GRADING PLAN - PREFERRED CONCEPT 13

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Contours: 2ft

Date:04/2018

0ft 20 40 60 80

Potential 30' setback

Existing 5' setback

Stairs to upper level and snowfront

Maintenance Storage under deck

Storage

Restrooms

Ticket Windows

Accessory Retail

Tickets

Equipment Rental and Repair

Guest Services

F2 at 74.0

Shuttle Drop-off / Pick-up

Lockers

Storage / Mechanical

Patrol / First Aid

Employee Facilities

Administration

Short term / ADA parking stalls

F1 at 61.0

BASE LODGE CONCEPTUAL FLOOR PLANS - PREFERRED CONCEPT 14a

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Contours: 2ft

Date:04/2018

0ft 20 40 60 80

Ski Racks

2ft snow pillow

Potential 30' setback

Existing 5' setback

Roof Plan

Welcome Signage

Small Ramp

Shuttle Drop-off / Pick-up

Guest Circulation

Restaurant Seating

Restaurant Seating

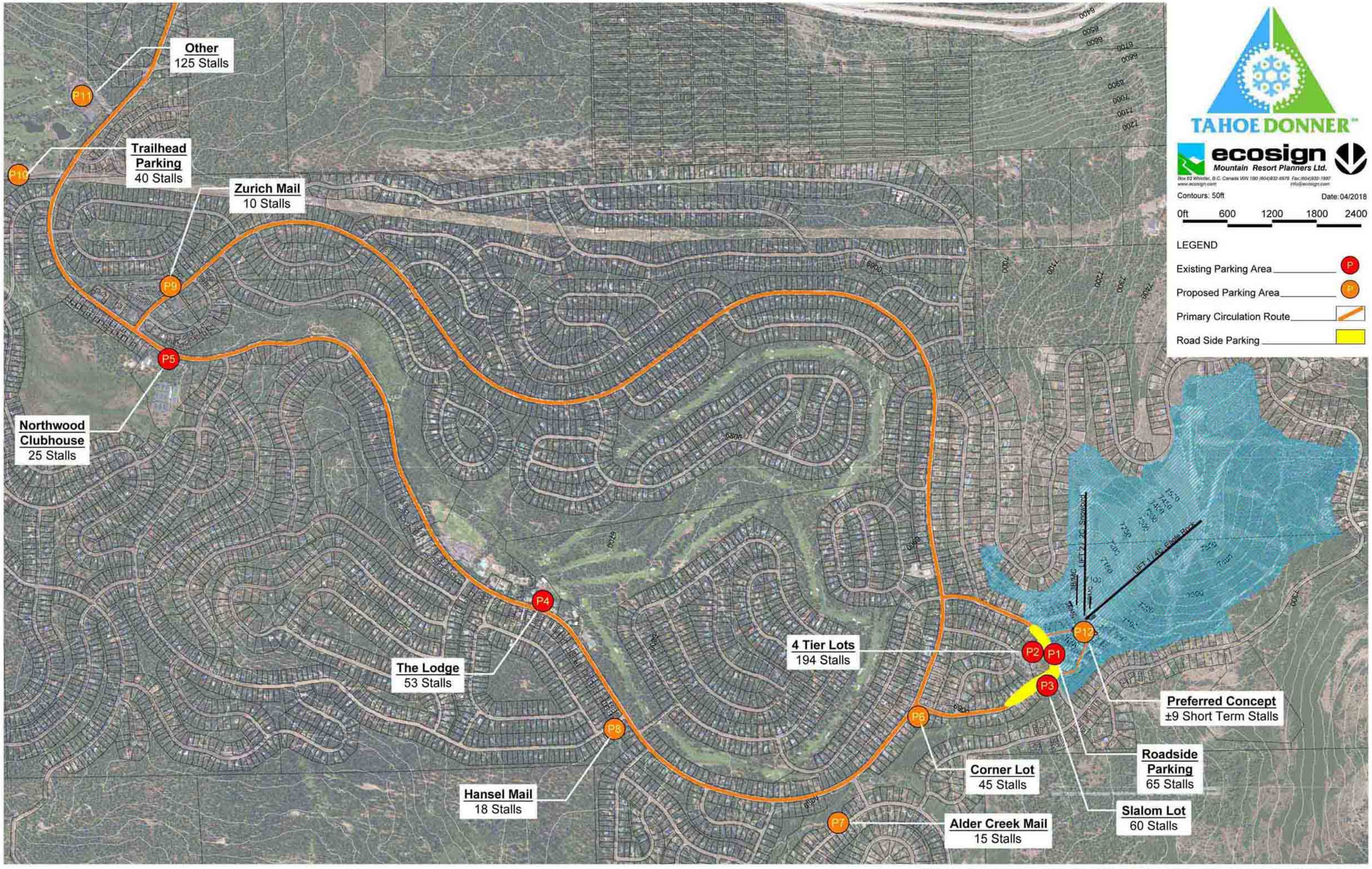
Kitchen and Scramble

Bar / Lounge

Guest Services

F3 at 87.0

BASE LODGE CONCEPTUAL FLOOR PLANS - PREFERRED CONCEPT 14b



SKI AREA PARKING AND CIRCULATION PLAN - PREFERRED CONCEPT 15