3 Proposed Management Actions and Projected Use

3.1 Assessment of Public Need, Objectives, and Benefits of Proposed Action

The proposed management actions and projected uses set forth in this section of the UMP/DEIS include the following: installation of three (3) new ski lifts, replacement of two (2) existing ski lifts, addition of sixteen (16) new ski trails, construction of up to three (3) additional parking areas, expansion of the existing Discovery Lodge and Sunset Lodge, construction of the following new structures: the Tomahawk Lodge, an Information Booth, a salt storage building, an additional snowmaking pond, installation of snowmaking piping, a lower pumphouse, a compressor facility, and modification of existing pumphouses.

The environmental impacts and mitigation measures related to the actions proposed in this section are addressed in Section 4. Section 4 includes the SEQRA analysis of the ability of the area's natural resources to accommodate the full build alternative as well as the less build alternatives set forth in this UMP/DEIS.

This section also describes the most comprehensive plan for the expansion, modernization and improvement of the Belleayre Mountain Ski Center, the Full-Build Out alternative (Also see Section 6: Alternatives). This alternative proposes the completion of all of the actions proposed in this UMP/DEIS. The other alternatives presented in Section 6 provide for only a portion of the projects included in the Full-Build Out alternative, categorized by the locations proposed for these projects, namely the West Area, Core Area or East Area These alternatives provide for a subset of the actions described in this UMP, for instance, installing only select portions of the actions which are included in the Full-Build alternative which are proposed to be located in the western side of the facility. The Full-Build Out alternative may provide the Facility Operator with increased flexibility to implement these projects as needed or based upon the availability of funding.

Due to the extensive time period which has elapsed since the initiation of this planning process, some data represents historical measurements which were compiled after the initiation of this planning process in 2006. This UMP/DEIS relies on the data collected and also reflects the cyclical nature of the changing conditions, such as variations in weather conditions or the economy.

Public Need

Past public support for expansion, modernization and improvement of the Belleayre Mountain Ski Center was expressed in the public processes which resulted in the passage the 1986 amendment to the New York State Constitution (hereinafter "Constitution") and the 2008 Catskill Park State Land Master Plan.

The passage of the constitutional amendment was the first action which evidenced the public need and desire for the expansion of the facility. This amendment provided for the expansion of the ski trails by increasing the ski trail mileage cap up to a total of 25 miles in length. Article XIV, Section 1 of the Constitution authorizes these trails to be between 30 and 200 feet wide, provided that no more than two miles of such trails may exceed 120 feet wide.

The Catskill Park State Land Master Plan (2008) (CPSLMP) sets forth standards and criteria for the development and management of state-owned lands within the Catskill Park. The CPSLMP classifies the lands constituting Belleayre Mountain Ski Center as an Intensive Use Area, requires that the Ski Center comply with the Plan's applicable guidelines for Intensive Use Areas, and requires the Department to prepare a Unit Management Plan prior to initiating any new development, construction, or expansion of the facility. This UMP is a revision of the 1998 UMP for the Ski Center and covers the ensuing ten year management period. The proposed actions in this UMP are subject to adequate fiscal appropriations and subsequent changes to guidance, policy, rule or law that may affect management, design or construction.

The objective of this UMP/DEIS is to satisfy the public demand at the facility in a well balanced manner, to improve the enjoyment and safety of the public while at the facility and to meet the goals for the Belleayre Mountain Ski Center in compliance with the constitutional limits and as outlined in the CPSLMP which states "*Belleayre Ski Center should be modernized to the extent physical resources allow and within the constraints of the amendment to Article XIV, Section 1 of the State Constitution authorizing its establishment.*"

The purpose for the project is to provide the public with improved recreational opportunities on Forest Preserve land by constructing and maintaining additional mileage of ski trails at Belleayre, consistent with constitutional limits. The overall safety, attractiveness and viability of the ski center will be enhanced once this project is completed. The development of new trails will provide skiers with additional terrain on which to ski, making the skiing experience more diverse and enjoyable, and new appurtenances will heighten skier comfort and enjoyment. Attendance at the facility is expected to increase. The expanded facility will generate more interest and skiers are expected to visit more often, travel greater distances to use the ski center and are expected to spend a longer duration at the Ski Center each visit.

The improvements to the ski center will also generate incidental economic benefits, including:

- Construction expenditures will serve as a stimulus to the local and regional economy. Regional output would increase by $14.3 million, employee earnings would expand by $4.2 million, and regional employment levels would gain approximately 89 workers during the construction phase of the project.

- In response to the additional visitors, the Belleayre Mountain Ski Center and its concessionaires will offer additional employment opportunities (approximately 280 new jobs) and expand their payroll ($4.5 million). Local procurement activities ($440,000) at the ski center will also increase annually as well. Local, regional, and statewide tourism expenditures would expand as an average out-of-town visitor engaged in winter sports typically spends approximately $100/person/day in the regional economy. Annual local, regional, and statewide tourist expenditures are expected to increase by $32 million as a result of the proposed improvements to the Belleayre Mountain Ski Center. New York State's economy would benefit as the center would attract more visitors from out of state, gaining additional tourism expenditures.

- Tax receipts would experience an increase at the local, regional, and state levels during the construction and operational phases of this project. Sales tax receipts would expand as construction materials are purchased, goods are procured and as tourist expenditures are taxed. New York State income tax receipts would increase when tax is levied on the additional employee earnings generated by this project.

- The expansion and enhanced amenities at the ski center would make the Belleayre Mountain Ski Center more attractive and could make the local housing market more attractive. As the center improves its recreational amenities local housing, particularly the second-home market, could experience some increase in demand and thus some positive pressure on prices.

Discussion

From its inception in 1949, Belleayre Mountain Ski Center has continued to expand it facilities and attendance within constitutional limits. Belleayre has succeeded in increasing its attendance at a higher rate compared to the National and Regional trends. The following charts show U.S. Ski Industry Skier Visits, Northeast Region Skier Visits, and Belleayre Mountain Skier Visits from 1980-81 through the 2007-08 ski seasons.

Figure 3.1-1 U.S. National Annual Skier Visits[1]

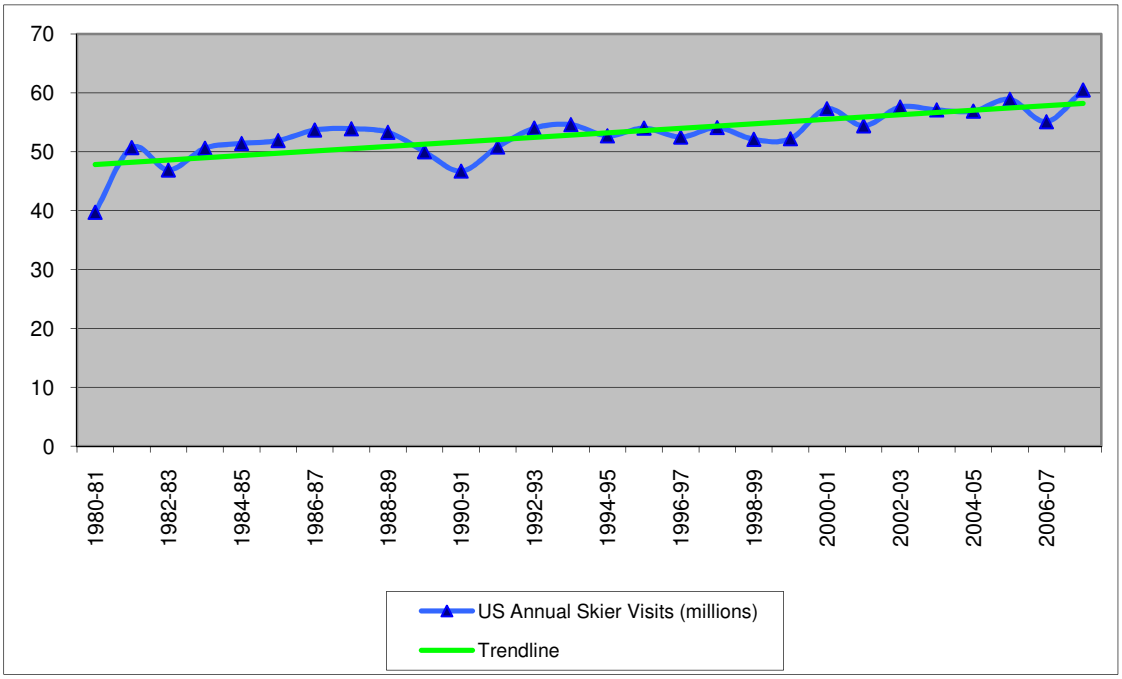
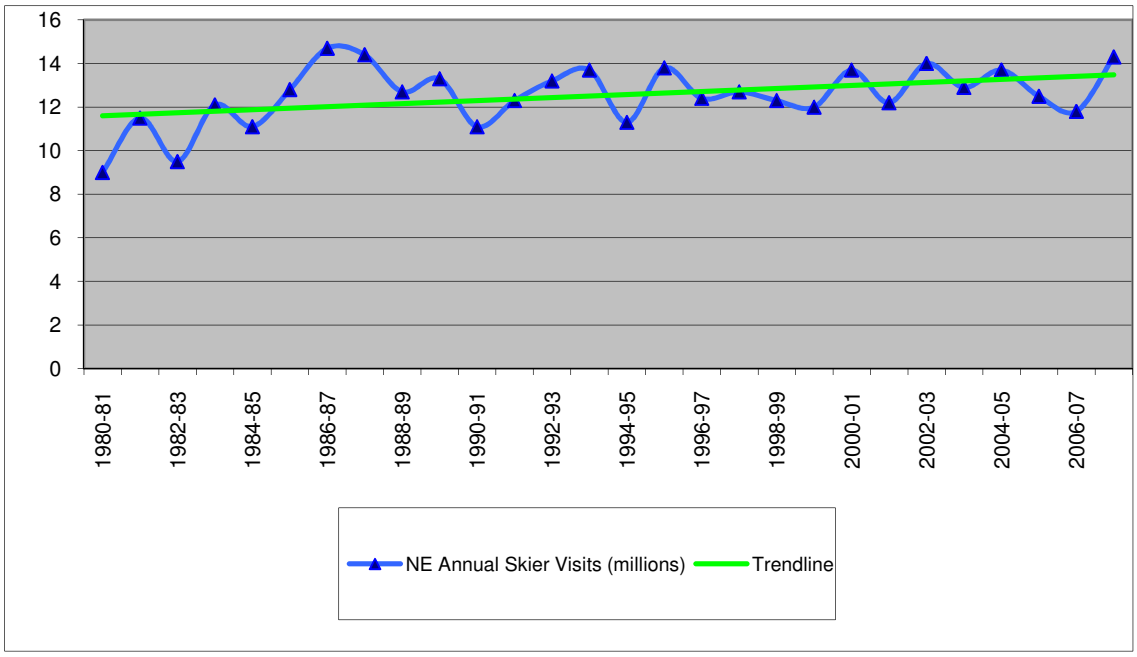


Figure 3.1-1 indicates an increasing trend of US National skier visits over the past 28 years of 20.8%, or an average increase of 0.74% per year.

Figure 3.1-2 Northeast Region Annual Skier Visits[2]



[1] NSAA - Kottke National End of Season Survey 2007/2008
[2] NSAA - Kottke National End of Season Survey 2007/2008

Figure 3.1-2 indicates an increasing trend of US Northeast Regional skier visits over the past 28 years of 15.4%, or an average increase of 0.55% per year.

Figure 3.1-3 Belleayre Annual Skier Visits

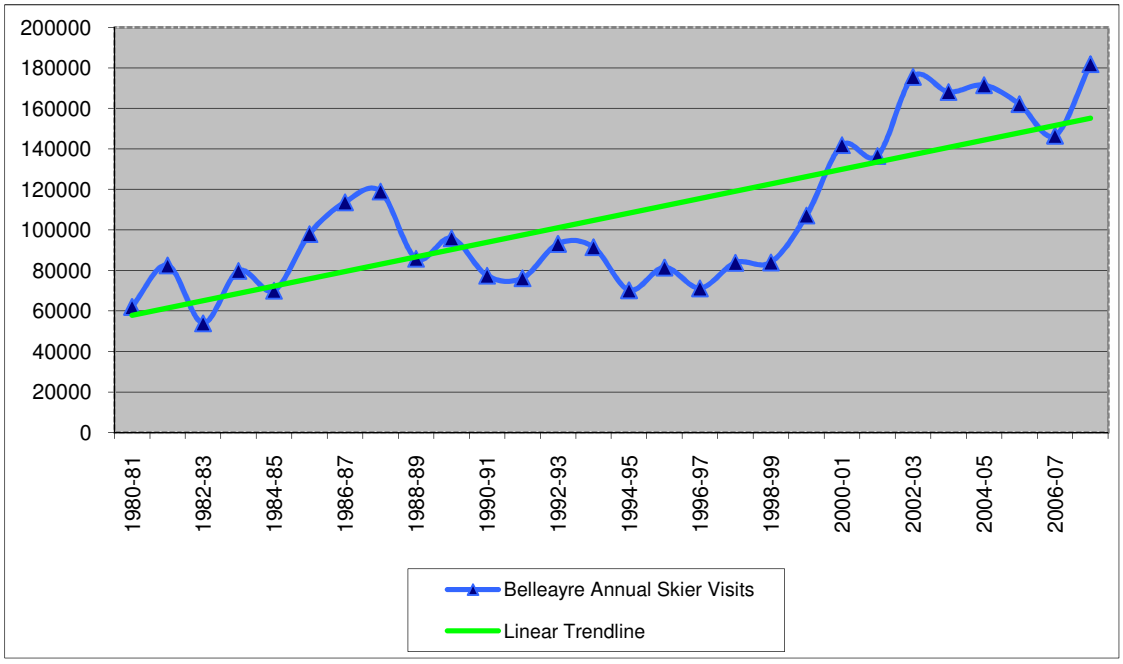


Figure 3.1-3 indicates an increasing trend of Belleayre Mountain skier visits over the past 28 years of 164%, or an average increase of 5.86% per year. The increase in attendance over the '97-'98 to '07-'08 seasons however was approximately 91 % or an average of 9.1% per year.

Dramatic rise in skier visits which started during 1999-2000 season can be correlated with the expansion of the ski area facilities, primarily the ski lifts and trails, which occurred that year. A more complete description of that expansion is given in section 1.3.1 Background and History. The public demand and support for this expansion was evidenced in 1986 when the public passed a constitutional amendment which authorized the expansion of Belleayre's trail system.

As the attendance has increased, it has become evident that the capacity of the facilities at Belleayre has become inadequate. The following photos were taken on February 24, 2003 during the Presidents Week holiday, a peak attendance day during one of the busiest weeks of the year. It should be noted that on this day the attendance was recorded at 5,188. These photos document the conditions on this peak attendance day and the over use of the facility. The largest daily attendance in one day during the 2010-11 season was greater – at 5,414 skiers in one day.

Discovery Lodge Sitting Space

Discovery Lodge Rental Shop

Overlook Parking

County Rte 49A Parking

Cross Country Area Parking
(Maintenance Garage currently in this location)

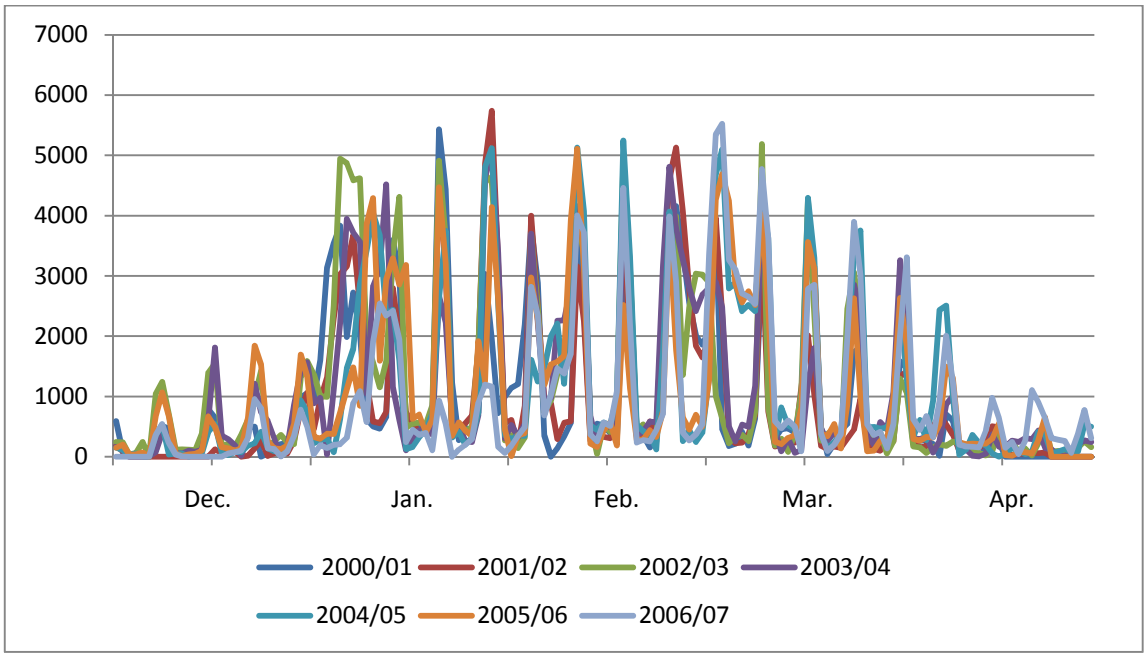


Figure 3.1-4 Daily Attendance

Figure 3.1-4 shows the daily attendance at Belleayre Mountain Ski Center for the 2000/01 through the 2007-08 ski seasons. The daily attendance data that this chart is derived from indicates an average of 4.6 days per year of attendance over the approximate existing Comfortable Carrying Capacity Comfortable Carrying Capacity of 4,500 that Belleayre currently provides.

The UMP/DEIS proposes to increase the Comfortable Carrying Capacity, over time, with the expectation that attendance will increase. This expectation is based on the average annual attendance growth of the last 28 years of 5.86% (Figure 3.1-3); it would take approximately 12 years for attendance to catch up to the increase in Comfortable Carrying Capacity from the current 4,500 to the proposed 9,000. Based on the attendance growth of 9.1% during the '97-'98 to '07-'08 period , it would take approximately 8 years for attendance to catch up, or 3 years after the scheduled completion of proposed expansion.

3.2 Trail and Lift Improvements

Discussion

The ski trail and lift system is the premiere attraction of any ski area. A regional/destination facility like Belleayre Mountain Ski Center needs to provide terrain which meets the demands of its market by providing a variety of trails for all ability levels.

Issues that need to be addressed in the design of the trail and lift improvements include the following:

* Trail expansion must stay within the mileage and width constraints contained in the State Constitution.
* The trail and lift system needs to accommodate the proposed Comfortable Carrying Capacity Comfortable Carrying Capacity for the facility.
* The trail system should provide trails with ability level distribution close to industry recommended standards.
* The trail and lift system needs to provide for efficient circulation of the skiers from the base facilities out onto the ski trails, and then eventually back to the base facilities.
* The trail system should minimize trail crossings, while including connections that link the lifts and trails together to allow circulation throughout the ski area.
* The trail system should minimize or avoid unnecessary convergences which could lead to skier congestion.
* Natural terrain should be utilized to the maximum extent practicable to minimize earthwork and its associated impacts, while adding pleasurable variety to the skiing experience.

In looking at the existing trail and lift system at Belleayre, it is helpful to look at its evolution. When the ski area was first opened, the Overlook (Main) lodge was the sole base lodge facility. The initial trails were on the upper part of the mountain only. The parking and entrance driveway was constructed to get people to this base lodge. Soon thereafter, the novice trails and Discovery (Lower) lodge were constructed. The upper driveway and parking physically separated the upper mountain from the lower mountain. One of the goals of the proposed lift and trail system is to improve the connection between the upper and lower mountain, and to centralize many of the skier services in the proposed expanded Discovery Lodge. Another goal of the proposed trail and lift system is to better balance the terrain available to meet the market demand for various ability levels. Finally, it is desired to provide more diversified terrain for the enjoyment of the skier.

To achieve these goals, the existing ski trail and lift inventory has been assembled, and the existing skier market breakdown has been established to determine where the greatest need in trail ability levels lie. Then existing lift Comfortable Carrying Capacity and Trail Density was tabulated. Proposed lift and trails were then planned to meet the goals, while considering the issues discussed above. Fi-

nally the proposed conditions were modeled to determine the proposed skier market breakdown, Comfortable Carrying Capacity, and Trail Density.

Design Criteria

The following design criteria were used in the determination of the ski area lift and trail Comfortable Carrying Capacity.

Skier Ability	Slope Gradient	
Beginner	8-12%	
Novice	13-25% avg.	30% max.
Low Intermediate	26-30% avg.	35% max.
Intermediate	31-40% avg.	40% max.
Advanced Intermediate	41-50% avg.	55% max.
Expert	>50% avg.	80% max.

Table 3.2-1 Acceptable Terrain Gradient

Mount Sunapee, 2009. Master Development Plan 2009-2014 by SE Group.

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

Table 3.2-2 Market Ability Level Breakdown

Mount Sunapee, 2009. Master Development Plan 2009-2014 by SE Group.

Table 3.2-3 shows the suggested skier density by ability level. This number represents the actual number of skiers on the trail per acre of trail area.

Skier Ability	Trail Density (skiers/acre)
Beginner	26
Novice	22
Low Intermediate	18
Intermediate	12
Advanced Intermediate	8
Expert	6

Table 3.2-3 Skier Density

Canadian Ministry of Environment, Lands and Parks, 1996. Guidelines To Alpine Ski Area Development In British Columbia. by: S.E. Canada.

Vertical Demand is the amount of vertical feet skiers can be expected to ski over the course of a day by skier ability (typically a six to seven hour period). The average vertical demand per skier by ability class is shown in Table 3.2-4

Skier Ability	Vertical Demand (ft)
Beginner	2300
Novice	4400
Low Intermediate	7000
Intermediate	8000
Advanced	11500
Expert	19000

Table 3.2-4 Skier Vertical Demand

Canadian Ministry of Environment, Lands and Parks, 1996. Guidelines To Alpine Ski Area Development In British Columbia. By: S.E. Canada.

Existing Lift and Trail System

Table 3.2-5 shows the existing lift specifications which will contribute to the existing lift and trail comfortable carrying capacity of the mountain. It should be noted the Little Creek Lift #3 was not included in this list as it is not currently operational.

Lift #	Lift Name	Vert Rise (ft)	Hor Length (ft)	Avg Grade (%)	Hourly Capacity (p/hr)	Rope Speed (fpm)	Carrier Spacing (ft)	Installed	vtf/h (000's)	Motor Size (hp)	People per Carrier
1	Novice Double Chair	479	3792	12.6	1100	440	47	1982	527	125	2
2	Novice Double Chair	479	3792	12.6	1100	440	47	1982	527	125	2
4	Ski Wee Carpet	15	100	15.0	540	270	31	1996	8	15	1
5	Novice Handle Tow	40	400	10.0	540	270	31	1992	22	15	1
6	Super Chief Detach Quad	1133	4866	23.3	2400	1000	94	2006	2719	600	4
7	Fixed Triple Chair	806	2861	28.2	1800	500	49	1986	1451	200	3
8	Tomahawk Fixed Quad	923	3412	27.1	2400	450	43	1999	2215	400	4

Table 3.2-5 Existing Ski Lift Specifications

Table 3.2-6 Existing Trail Conditions
Lower Mountain

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
Chinook	53	350	15.0	18.3	2	24648	1	70	1
Dakota	232	1714	13.5	28.3	2	120533	3	70	1
Discovery Way	245	2516	9.7	17.1	1	128736	3	51	1
Easy In Section A	40	187	21.4	38.0	2	19460	0	104	1
Easy In Section B	38	180	21.1	16.4	2	11986	0	67	1
Easy Out Section A	28	320	8.8	29.7	1	15540	0	49	1
Easy Out Section B	30	355	8.5	22.9	1	10874	0	31	1
Huron Section A	79	797	9.9	10.7	1	30575	1	38	1
Huron Section B	360	3100	11.6	15.4	2	182655	4	59	1
Iroquois	362	2400	15.1	22.8	2	215187	5	90	1
Little Creek	107	913	11.7	15.0	1	123156	3	135	1
Mohican	438	3982	11.0	20.9	2	241885	6	61	1
Oneida	130	1564	8.3	27.9	2	27636	1	18	1
Running Bear	72	583	12.3	17.4	2	59872	1	103	1
The Canyon Upper	73	362	20.1	20.1	2	34560	1	95	1
Ashokan Bottom Ext.	85	623	13.6	21.0	2	26730	1	43	2
Ashokan Section A	145	1081	13.4	14.1	2	74689	2	69	2
Ashokan Section B	257	1814	14.2	34.0	3	114596	3	63	2
The Canyon Lower A	173	1196	14.4	32.5	3	108905	3	91	2
The Canyon Lower B	68	400	16.9	25.6	2	32206	1	81	2
Eagle Falls	83	288	28.9	36.4	4	15165	0	53	2

Upper Mountain – Lower Section

Algonquin Lower	409	1503	27.2	35.0	4	106979	2	71	2
Area 51	480	1947	24.7	41.1	4	221623	5	114	2
Esopus	370	1809	20.5	31.8	3	94187	2	52	2
Expressway	206	1488	13.9	23.6	3	70496	2	47	2
Horseshoe Pass	221	1256	17.6	35.0	4	92600	2	74	2
Mohawk Lower	148	594	24.9	37.1	4	37335	1	63	2
Onondaga	305	1557	19.6	35.0	4	111550	3	72	2
Onteora Lower	396	1572	25.2	38.0	4	114474	3	73	2
Peekamoose Lower	367	1415	25.9	35.0	4	87779	2	62	2
Pepacton	474	1692	28.0	36.0	4	102339	2	60	2
Roaring Brook Section A	261	1545	16.9	26.4	3	113739	3	74	2
Roaring Brook Section B	505	3987	12.7	19.7	3	249356	6	63	2
Seneca Lower	486	1823	26.7	36.0	4	139026	3	76	2
Belleayre Run Lower	664	2721	24.4	35.0	4	287610	7	106	2
Cathedral Brook Lower	224	1965	11.4	30.0	3	85747	2	44	2
Deer Run	915	6768	13.5	31.2	3	433385	10	64	2
Dot Nebel Lower	553	2035	27.2	40.2	4	302953	7	149	2
Tomahawk Crossing	294	2036	14.5	27.1	3	119369	3	59	2
Tongora Lower	639	2626	24.3	35.0	4	157521	4	60	2
Tuscarora	200	652	30.6	53.2	5	54510	1	84	2
Wanatuska Lower	686	2866	23.9	31.3	3	240900	6	84	2
Winnisook Lower	578	2230	25.9	39.0	4	114240	3	51	2
Yahoo Lower	483	1862	26.0	38.0	4	197952	5	106	2

Table 3.2-6 Existing Trail Conditions (Cont.)

Upper Mountain – Upper Section

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
Algonquin Upper	339	1017	33.4	63.7	5	73416	2	72	3
Belleayre Run Upper	259	694	37.4	49.9	5	69066	2	100	3
Cathedral Brook Upper	335	1151	29.1	47.1	5	64015	1	56	3
Dot Nebel Upper	352	1454	24.2	44.2	5	130534	3	90	3
Mohawk Upper	287	726	39.6	50.8	5	50141	1	69	3
Peekamoose Upper	356	1074	33.1	49.9	5	85268	2	79	3
Wanatuska Upper	261	663	39.4	46.7	5	83890	2	127	3
Winnisook Upper	241	639	37.7	52.7	5	45968	1	72	3
Cathedral Brook Extreme	269	957	28.2	55.0	6	47770	1	50	4
Chippewa	250	618	40.5	56.0	6	10400	0	17	4
Onteora Upper	315	815	38.7	56.1	6	65362	2	80	4
Seneca Upper	328	1113	29.5	55.0	6	85160	2	77	4
Tongora Upper	253	625	40.5	55.0	6	45449	1	73	4
Utsayantha Upper	325	888	36.6	60.9	6	54027	1	61	4
Yahoo Upper	325	854	38.0	60.8	6	72058	2	84	4

Skiable Connectors *

Skiable Connector	Length (ft)	Area (sf)	Area (ac)	Avg. Width (ft)
1 - Ridge Lift 8 to Lift 7	1272	40168	0.9	32
2 -Ridge Lift 7 to Wanatuska	1087	21162	0.5	19
3 - Ridge Lift 6 to Roaring Brook	342	24198	0.6	71
4 - Lift 7 to Dot Nebel	1261	46300	1.1	37
5 - Mid Station Access Rd.	810	22680	0.5	28
6 - Dot Nebel to Seneca	1201	27612	0.6	23
7 - Winnisook to Wanatuska	482	14038	0.3	29
8 - Area 51 to Algonquin	210	7722	0.2	37
9 - Winnisook to Tongora	153	7310	0.2	48
10 - Belleayre Run to Onteora	172	4300	0.1	25
11 - Overlook Lodge to Top Novice Lifts	583	23860	0.5	41
12 - Discovery Lodge to Beginner Area	300	10883	0.2	36

Total Existing Trail & Skiable Connector Length = 17.8 mi.

*Note – Skiable Connectors are included when computing overall ski trail mileage as it applies to the constitutional mileage limit of 25 miles.

Existing Terrain Distribution vs. Market Demand

Table 3.2-7 and Figure 3.2-1 show the existing skier ability distribution at Belleayre Mountain vs. the desired market demand. As can be seen in the table, the ski area has a deficiency in the advanced and expert ability levels and an existing surplus in beginner and novice terrain. The 5.9 miles of trails proposed in this UMP would provide new intermediate and expert terrain, which is currently under represented at Belleayre, and increase the variety, diversity and the amount of terrain. This will result in a better balance for all abilities and stay within the 25 mile constitutional limit. The additional terrain being proposed will also improve skier distribution and convenience providing an overall improvement in skier safety and enjoyment.

Skier Ability	Market	Existing
Beginner	5	5
Novice	15	25
Low Intermediate	25	35
Intermediate	35	27
Advanced	15	6
Expert	5	2

Table 3.2-7 Existing Terrain Distribution vs. Market Demand

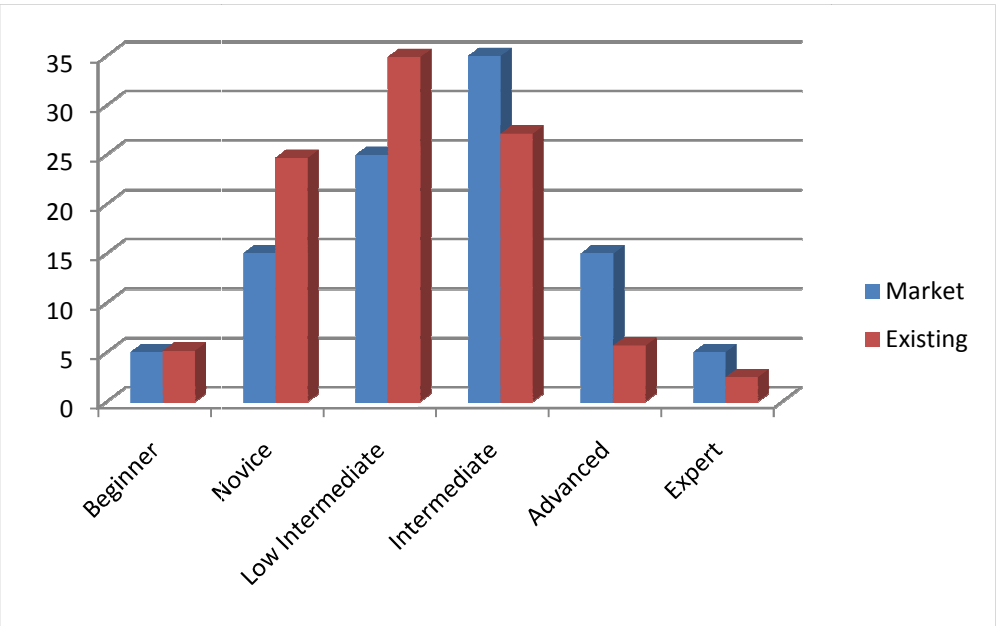


Figure 3.2-1 Existing Terrain Distribution vs. Market Demand

Existing Weighted Vertical Demand

Weighted vertical demand is calculated to determine the average skier vertical demand for all skiers using the trails of a particular lift and trail pod. The calculation takes into account the variety of terrain and different ability levels using the area. Table 3.2-8 shows how the weighted vertical demand was calculated for the Tomahawk lift and trail pod.

Ability Level	Trail Area (acres)	Trail Capacity	% Use	Vertical Demand	Weighted Vertical Demand (ft)
Beginner - 1	0.0	0	0%	2300	0
Novice - 2	0.0	0	0%	4400	0
Low Intermediate - 3	9.9	179	43%	7000	3024
Intermediate - 4	14.5	174	42%	8000	3360
Advanced - 5	6.2	50	12%	11500	1377
Expert - 6	2.0	12	3%	19000	538
Total	32.6	415	100%		**8298**

Table 3.2-8 Tomahawk Lift & Trail Pod Weighted Vertical Demand Calculation (Typical)

The Weighted Vertical Demand for each lift and trail Pod is displayed in Table 3.2-9 using the same calculation method shown in the Table above. This data is used in the calculation of Comfortable Carrying Capacity.

Lift #	Lift & Trail Pod	Weighed Vertical Demand (ft)
1&2	Novice Chairs	4508
5	Novice Handle Tow	2300
6	Super Chief Detach Quad	7848
7	Fixed Triple Chair	9168
8	Tomahawk Fixed Quad	8298

Table 3.2-9 Summary Existing Lift & Trail Pods Weighted Vertical Demand

Existing Comfortable Carrying Capacity

As defined in Section 1.5, Comfortable Carrying Capacity (also referred to herein a "CCC") is an optimal level of utilization for the ski area (the number of visitors that can be accommodated at any given time) that guarantees a pleasant recreational experience, without overburdening the resort infrastructure. This is the key figure in all subsequent planning, acting as the baseline to all development within the ski area.

Comfortable Carrying Capacity (CCC) for each lift and trail pod is calculated as per the following:

$$CCC = \frac{\text{Vertical Foot Rise Of the Lift} \times \text{Hourly Capacity Lift} \times \text{Hours of Operation of the Lift} \times \text{Lift Loading Efficiency}}{\text{The Weighted Vertical Demand of the Ski trails associated with the ski lift}^{3}}$$

The ski area Comfortable Carrying Capacity is the sum of the CCC calculation of each lift and trail pod.

Lift #	Lift Name	Vert Rise (ft)	Hor. Length (ft)	Hourly Capacity (p/hr)	Opera. (hr/day)	Lift Load-ing Eff. (%)	Adjusted Hourly Capacity (p/hr)	Vertical Feet/Day (000's)	Vertical Weighted Demand (ft/day)	CCC
1&2	Novice Double Chairs	479	3792	2200	7.0	75	1650	5532	4508	1227
5	Novice Surface Lift	40	400	540	7.0	75	405	113	2300	49
6	Super Chief Det. Quad	1133	4866	2400	7.0	80	1920	15228	7848	1940
7	Fixed Triple Chair	806	2861	1800	7.0	80	1440	8124	9168	886
8	Tomahawk Fixed Quad	923	3412	2400	7.0	80	1920	12405	8298	1495
TOTAL			**15331**	**9340**			**7335**	**41403**		**5598**

Table 3.2-10 Existing Lift & Trail Comfortable Carrying Capacity

Table 3.2-10 shows the existing Lift & Trail Comfortable Carrying Capacity calculated for each lift and trail Pod at Belleayre Mountain and the total existing Lift

[3] Guidelines to Alpine Ski Area Development – British Columbia Ministry of Environment, Lands and Parks 1996

and Trail Comfortable Carrying Capacity. The total existing Lift and Trail Comfortable Carrying Capacity is calculated to be 5627.

* Lift loading efficiency is another variable in the calculation of Comfortable Carrying Capacity . It is measured as the ratio of the number of skiers loaded on the lift as a percentage of the total uphill capacity of the lift. If every chair was full and the lift never needed to slow down or stop you would be achieving 100% loading efficiency. Several factors can influence the efficiency of loading and unloading of ski lifts. Detachable lifts with a slower rope speed at the loading and unloading points tends to be easier for skiers to handle and will result in a higher lift loading efficiency. The steepness of ramps, skiers per carrier, average skier ability and lift speed also have an influence. The lift attendants, signage and methods of corralling skiers in the loading areas will also influence efficiency.

Existing Ski Trail Density

Ideally, the uphill capacity of a lift will be designed to be in balance with the downhill trail capacity of the trails in each lift and trail Pod. If there is inadequate uphill capacity, lift lines will tend to be long and the trails will be underutilized. If the uphill capacity is over designed, the lift will be underutilized or the trails will tend to be too crowded for the comfort level of most skiers. At most ski areas, it is estimated that about 70% of the skiers will be active on the slopes while the other 30% will be in the lodge or at other skier services off the slopes. The design of the lift and trail system can determine to a large degree whether the active skiers will be skiing, riding the lift or waiting in the lift line. While lift lines are an expected part of the ski experience, lift lines should be kept short on days where the Comfortable Carrying Capacity is not exceeded. Table 3.2-11 estimates the resulting trail densities for each lift & trail pod based on its Comfortable Carrying Capacity. This calculation is performed to estimate how well the ski trail system is balanced with the lift capacity.

The formulas below are used in estimating how the skiers will be distributed.

People Not Skiing = 30% of the total CCC of each Lift and Trail POD.

$$\text{Skiers on the Lift} = \frac{\text{Length of Lift (ft)}}{\text{Carrier Spacing (ft)}} \times \text{Skiers/ Carrier}$$

$$\text{Skier in the Lift Line} = \text{Adjusted } \frac{\text{Hourly Capacity of Lift}}{} \times \frac{\text{Lift Line Wait(min)}}{60}$$

Skiers on Slopes = CCC – People Not Skiing – Skiers on Lift – Skiers in Lift Line

Lift #	Lift Name	CCC	% People not Skiing	People not Skiing	Lift Line Wait Time (min)	People in Lift Lines	People on Lift	People on Slopes	Trail Area (acres)	Trail Density (people/ac)	Desired Density (people/ac)	Diff. %
1 & 2	Novice Double Chairs	1227	33	405	5	138	323	362	19.1	19	22	87%
5	Novice Handle Tow	49	33	16	1	7	13	13	1.4	10	26	37%
6	Super Chief Det. Quad	1940	33	640	10	320	207	773	55.1	14	14	101%
7	Fixed Triple Chair	886	33	292	10	240	175	179	23.0	8	11	70%
8	Tomahawk Fixed Quad	1495	33	493	10	320	317	364	32.6	11	13	88%
TOTAL		**5598**	**33**	**1847**		**1024**	**1035**	**1691**	**131.1**	**13**	**15**	**88%**

Table 3.2-11 Existing Trail Density

Table 3.2-11 shows that overall, the existing lift and trail system is well balanced. The Novice Handle tow does have some extra trail area for its lift capacity, but this overall area is very small in the context of the overall ski area. The Superchief lift calculation indicates that the trail area is slightly undersized for its lift capacity, while the fixed triple chair has a slight excess in trail area. Since these two lifts overlap in the skiable terrain that is accessible from them, they will tend to balance each other out so that the overall lift capacity and trail capacity between the two are well balanced. The Tomahawk Quad calculation shows that the lift and trails there are well balanced.

Proposed Lift and Trail System

This UMP/DEIS details several alternatives to a Full Build-Out alternative as set forth in Section 6 herein. Additionally, the impact analysis associated with the construction and installation of new or improved lifts and trails described in this section can be found in Section 4 herein.

As indicated in the analysis of the Existing Terrain Distribution vs. Market Demand shown in Tables 3.2-7 and Figure 3.2-1, Belleayre Mountain Ski Center has a deficiency in amount of terrain for the advanced and expert ability levels. The site of the former Highmount Ski area to the west of the existing Belleayre ski center has advanced and expert terrain that could fill this deficiency. The existing ski runs at Highmount are mostly advanced and expert terrain which is significantly different than that of the existing upper mountain at Belleayre. The distinct steeper ridge which exists on Belleayre proper becomes less defined as you go west toward Highmount. The trails at Highmount offer a more consistent steeper pitch from top to bottom than at the existing Belleayre upper ridge. Also the topography at Highmount has longitudinal ridges as you look down the fall line that offers some very unique and challenging skiing terrain. There are several locations along these ridges that offer spectacular views as well. Many skiers with knowledge of the Highmount terrain venture out of bounds off of the Deer Run trail and ski the Highmount terrain when natural snow conditions permit.

As part of the overall plan, the Discovery Lodge is planned to be expanded and become the more centralized lodge facility containing the bulk of the skier services, and administration. More skiers will inevitably arrive at the ski center at the proposed expanded Discovery Lodge. To aid in the disbursement of the skiers, the new Discovery Lift is proposed from the Discovery Lodge all the way to the ultimate summit of Belleayre on the western side of the ridge. Skiers of intermediate and advanced ability levels will be able to enjoy the terrain on the popular western side of the mountain such as the famous “Dot Nebel” trail or the newly proposed Belleayre West, or Highmount trails, with just one lift ride, while being able to take advantage of the updated facilities at the Discovery Lodge. In order to better connect the mountain, and get skiers back to the Discovery Lodge from the western slopes without having to cross over several trails, circum-navigate the Overlook Lodge, then continue down to the Discovery Lodge, the Tomahawk skier bridge is proposed to cross over the existing entrance road, and allow the existing extremely popular Deer Run trail to be extended down to the Discovery Lodge. This ever popular lower intermediate run will then become one of the longest such in the region.

The proposed Lift and Trail plan is shown on UMP Drawing TR1.

The following series of tables model the proposed trail and lift system to determine the proposed skier distribution, Comfortable Carrying Capacity, and trail density.

Lift #	Lift Name	Vert Rise (ft)	Hor Length (ft)	Avg Grade (%)	Hourly Capacity (p/hr)	Rope Speed (fpm)	Carrier Spacing (ft)	Installed	vtf/h (000's)	Motor Size (hp)	People per Carrier
1	Discovery Detach Quad	1360	6510	20.9	2400	1000	94	Prop.	3264	700	4
2	Novice Quad Chair	430	3555	12.1	2000	400	47	Prop.	860	200	4
3	Little Creek Beg. Triple Chair	100	900	11.1	1200	250	37	Prop.	120	30	3
4	Ski Wee Handle Tow	15	100	15.0	540	270	31	1996	8	15	1
5	Novice Surface Lift	40	400	10.0	540	270	31	1992	22	15	1
6	Super Chief Detach Quad	1133	4866	23.3	2400	1000	94	2006	2719	600	4
7	Fixed Triple Chair	810	2800	28.9	1800	500	49	1986	1458	250	3
8	Tomahawk Fixed Quad	923	3412	27.1	2400	450	43	1999	2215	400	4
9	Belleayre West	1020	4230	24.1	2400	1000	49	Prop.	2448	600	4
10	Highmount	850	2525	33.7	2400	500	49	Prop.	2040	300	4

Table 3.2-12 Proposed Ski Lift Specification

Table 3.2-12 shows the proposed lift specifications. It should be noted the proposed Discovery Lift was included in this list, but will not be included in the Comfortable Carrying Capacity calculation as it will primarily function as a transport lift to get skiers into the trail system.

Table 3.2-13 Proposed Trail Conditions

Existing Lower Mountain

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
Chinook	53	350	15.0	18.3	2	24648	1	70	1
Dakota	232	1714	13.5	28.3	2	120533	3	70	1
Discovery Way	245	2516	9.7	17.1	2	128736	3	51	1
Easy In Section A	40	187	21.4	38.0	2	19460	0	104	1
Easy In Section B	38	180	21.1	16.4	2	11986	0	67	1
Easy Out Section A	28	320	8.8	29.7	2	15540	0	49	1
Easy Out Section B	30	355	8.5	22.9	2	10874	0	31	1
Huron Section A	79	797	9.9	10.7	2	30575	1	38	1
Huron Section B	360	3100	11.6	15.4	2	182655	4	59	1
Iroquois	362	2400	15.1	22.8	2	215187	5	90	1
Little Creek	107	913	11.7	15.0	1	123156	3	135	1
Mohican	438	3982	11.0	20.9	2	241885	6	61	1
Oneida	130	1564	8.3	27.9	3	27636	1	18	1
Running Bear	72	583	12.3	17.4	1	59872	1	103	1
The Canyon Upper	73	362	20.1	20.1	2	34560	1	95	1
Ashokan Bottom Ext.	85	623	13.6	21.0	3	26730	1	43	2
Ashokan Section A	145	1081	13.4	14.1	3	74689	2	69	2
Ashokan Section B	257	1814	14.2	34.0	3	114596	3	63	2
The Canyon Lower Sect A	173	1196	14.4	32.5	3	108905	3	91	2
The Canyon Lower Sect B	68	400	16.9	25.6	3	32206	1	81	2
Eagle Falls	83	288	28.9	36.4	4	15165	0	53	2

Table 3.2-13 Proposed Trail Conditions (cont.)

Existing Upper Mountain – Lower Section

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
Algonquin Lower	409	1503	27.2	35.0	4	106979	2	71	2
Area 51	480	1947	24.7	41.1	4	221623	5	114	2
Esopus	370	1809	20.5	31.8	3	94187	2	52	2
Expressway	206	1488	13.9	23.6	3	70496	2	47	2
Horseshoe Pass	221	1256	17.6	32.8	4	92600	2	74	2
Mohawk Lower	148	594	24.9	37.1	4	37335	1	63	2
Onondaga	305	1557	19.6	35.0	4	111550	3	72	2
Onteora Lower	396	1572	25.2	38.0	4	114474	3	73	2
Peekamoose Lower	367	1415	25.9	35.0	4	87779	2	62	2
Pepacton	474	1692	28.0	36.0	4	102339	2	60	2
Roaring Brook Section A	261	1545	16.9	26.4	3	113739	3	74	2
Roaring Brook Section B	505	3987	12.7	19.7	3	249356	6	63	2
Seneca Lower	486	1823	26.7	36.0	4	139026	3	76	2
Belleayre Run Lower	664	2721	24.4	35.0	4	287610	7	106	2
Cathedral Brook Lower	224	1965	11.4	26.9	3	85747	2	44	2
Deer Run	915	6768	13.5	31.2	3	433385	10	64	2
Dot Nebel Lower	553	2035	27.2	40.2	4	302953	7	149	2
Tomahawk Crossing	294	2036	14.5	27.1	3	119369	3	59	2
Tongora Lower	639	2626	24.3	35.0	4	157521	4	60	2
Tuscarora	200	652	30.6	53.2	5	54510	1	84	2
Wanatuska Lower	686	2866	23.9	31.3	3	240900	6	84	2
Winnisook Lower	578	2230	25.9	39.0	4	114240	3	51	2
Yahoo Lower	483	1862	26.0	38.0	4	197952	5	106	2

Table 3.2-13 Proposed Trail Conditions (Cont.)

Existing Upper Mountain – Upper Section

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
Algonquin Upper	339	1017	33.4	63.7	5	73416	2	72	3
Belleayre Run Upper	259	694	37.4	49.9	5	69066	2	100	3
Cathedral Brook Upper	335	1151	29.1	47.1	5	64015	1	56	3
Dot Nebel Upper	352	1454	24.2	44.2	5	130534	3	90	3
Mohawk Upper	287	726	39.6	50.8	5	50141	1	69	3
Peekamoose Upper	356	1074	33.1	49.9	5	85268	2	79	3
Wanatuska Upper	261	663	39.4	46.7	5	83890	2	127	3
Winnisook Upper	241	639	37.7	52.7	5	45968	1	72	3
Cathedral Brook Extreme	269	957	28.2	55.0	6	47770	1	50	4
Chippewa	250	618	40.5	56.0	6	10400	0	17	4
Onteora Upper	315	815	38.7	56.1	6	65362	2	80	4
Seneca Upper	328	1113	29.5	55.0	6	85160	2	77	4
Tongora Upper	253	625	40.5	55.0	6	45449	1	73	4
Utsayantha Upper	325	888	36.6	60.9	6	54027	1	61	4
Yahoo Upper	325	854	38.0	60.8	6	72058	2	84	4

Existing Skiable Connectors *

Skiable Connector	Length (ft)	Area (sf)	Area (ac)	Avg. Width (ft)
1 - Ridge Lift 8 to Lift 7	1272	40168	0.9	32
2 -Ridge Lift 7 to Wanatuska	1087	21162	0.5	19
3 - Ridge Lift 6 to Roaring Brook	342	24198	0.6	71
4 - Lift 7 to Dot Nebel	1261	46300	1.1	37
5 - Mid Station Access Rd.	810	22680	0.5	28
6 - Dot Nebel to Seneca	1201	27612	0.6	23
7 - Winnisook to Wanatuska	482	14038	0.3	29
8 - Area 51 to Algonquin	210	7722	0.2	37
9 - Winnisook to Tongora	153	7310	0.2	48
10 - Belleayre Run to Onteora	172	4300	0.1	25
11 - Overlook Lodge to Top Novice Lifts	583	23860	0.5	41
12 - Discovery Lodge to Beginner Area	300	10883	0.2	36

Table 3.2-13 Proposed Trail Conditions (Cont.)

Proposed Core Area

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
DEER RUN EXT	288	2160	13.3	31.0	3	119954	3	56	2

Proposed West Area

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
WEST-1	131	1225	14.0	25.0	3	43544	1	47	2
WEST-2	553	2191	25.2	46.8	5	197574	5	90	3
WEST-3	380	1643	23.1	55.0	5	158920	4	97	3
WEST-4	361	1153	31.3	55.0	5	134444	3	117	3
WEST-5	507	2380	21.3	47.7	4	248123	6	104	2
WEST-6		2228			2	118840	3	53	2

Proposed Highmount Area

Trail Name	Vertical (ft)	Length (ft)	Avg. Grade (%)	Max. Grade (%)	Ability	Area (sf)	Area (ac)	Avg Width	Posted Ability
HMT-1	385	1204	32.0	55.0	6	102375	2	85	4
HMT-2	425	1437	29.6	50.2	5	128553	3	89	3
HMT-3	228	1595	14.3	25.0	3	75216	2	47	2
HMT-4	285	838	34.0	51.8	5	90639	2	108	3
HMT-5	509	1390	36.6	51.0	5	146978	3	106	3
HMT-6	265	784	33.8	55.5	6	62423	1	80	4
HMT-7	502	1358	37.0	70.0	6	125895	3	93	4
HMT-8	642	3411	18.8	31.0	3	129454	3	38	2
HMT-9	445	3200	13.9	25.2	3	144120	3	45	2

Total Trail & Skiable Connector Length = 23.1 miles.

Proposed Terrain Distribution vs. Market Demand

Table 3.2-14 and Figure 3.2-2 below show that the proposed trail expansion has successfully narrowed the gap in desired skier distribution for the advanced intermediate and expert terrain increasing from 7.9% and 2.8% existing respectively to 15.9% and 4.3% proposed. Distribution of terrain for the beginner, novice and low-intermediate ability levels is also closer to the desired market distribution.

Skier Ability	Market	Proposed
Beginner	5	4
Novice	15	20
Low Intermediate	25	37
Intermediate	35	25
Advanced	15	11
Expert	5	4

Table 3.2-14 Proposed Terrain Distribution vs. Market Demand

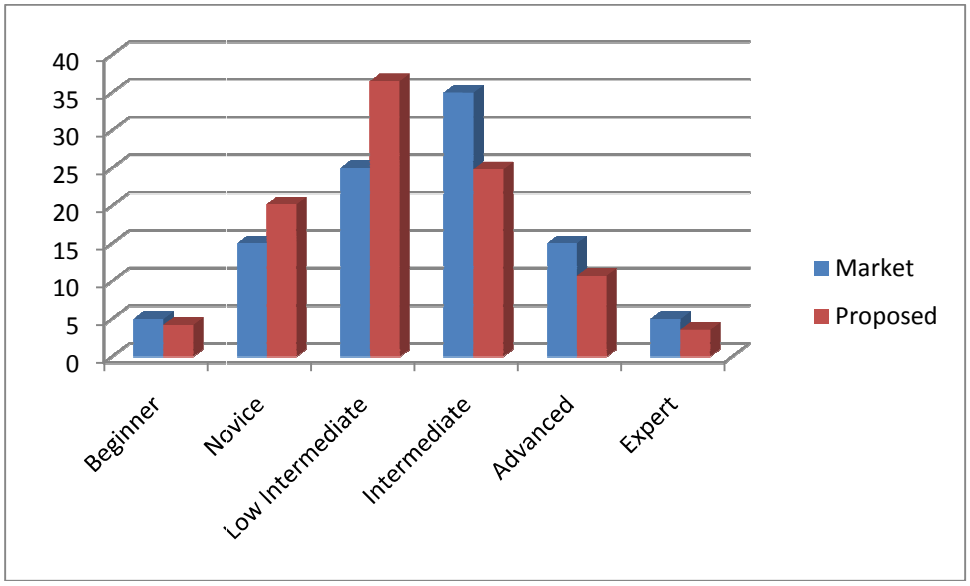


Figure 3.2-2 Proposed Terrain Distribution vs. Market Demand

Weighted Vertical Demand

The Weighted Vertical Demand for each lift and trail pod in the proposed condition is displayed in Table 3.2-15. These numbers were calculated in the same manner as shown in Table 3.2-8 for the existing Tomahawk Lift & Trail pod. This data will be used in calculating the Comfortable Carrying Capacity of the proposed conditions.

Lift #	Lift & Trail Pod	Weighted Vertical Demand (ft)
2	Novice Chair	4508
3	Beginner Chair	2300
5	Novice Surface Lift	2300
6	Superchief Detach Quad	7848
7	Fixed Triple Chair	9168
8	Tomahawk Fixed Quad	8298
9	West Fixed Quad	9991
10	Highmount Fixed Quad	11082

Table 3.2-15 Summary Proposed Lift & Trail Pods Weighted Vertical Demand

Proposed Comfortable Carrying Capacity

The proposed condition Comfortable Carrying Capacity is calculated in the same manner as in the existing conditions. Table 3.2-16 below shows the calculation of the individual Lift & Trail Pod, as well as the overall total Comfortable Carrying Capacity.

Lift #	Lift Name	Vert Rise (ft)	Hor. Length (ft)	Hourly Capacity (p/hr)	Oper. (hr/day)	Lift Loading Eff. (%)	Adjusted Hourly Capacity (p/hr)	Vertical Feet/Day (000's)	Vertical Weighted Demand (ft/day)	CCC
2	Novice Quad Chair	452	3555	2000	7.0	75	1500	4746	4508	1053
3	Little Creek Beginner Chair	105	900	1200	7.0	75	900	662	2300	288
5	Novice Surface Lift	40	400	540	7.0	80	432	121	2300	53
6	Super Chief Det. Quad	1133	4866	2400	7.0	90	2160	17131	7848	2183
7	Fixed Triple Chair	806	2861	1800	7.0	85	1530	8632	9168	942
8	Tomahawk Fixed Quad	923	3412	2400	7.0	85	2040	13180	8298	1588
9	Belleayre West	1027	4230	2400	7.0	85	2040	14666	9991	1468
10	Highmount	867	2525	2400	7.0	85	2040	12381	11082	1117
TOTAL		**5353**	**22749**	**15140**			**12642**	**71518**	**55495**	**8691**

Table 3.2-16 Proposed Lift Comfortable Carrying Capacity

Table 3.2-16 shows the calculation of total Comfortable Carrying Capacity to be 8,691 and has been rounded to 9000 for the purposes of this UMP, and for design of other ski area facilities.

Proposed Ski Trail Density

The proposed ski trail density is calculated in the same manner as done in the Existing Ski Trail Density. The calculations are shown in Table 3.2-17 below.

Lift #	Lift Name	CCC	% People not Skiing	People not Skiing	Lift Line Wait Time (min)	People in Lift Lines	People on Lift	People on Slopes	Trail Area (acres)	Trail Density (people/ac)	Desired Density (people/ac)	Diff. %
2	Novice Quad Chair	1053	33	347	10.0	250	303	153	19	8	22	37%
3	Little Creek Beginner Chair	288	33	95	5.0	75	73	45	3	16	26	61%
5	Novice Surface Lift	53	33	17	2.0	14	13	8	1	6	26	22%
6	Super Chief Det. Quad	2183	33	720	10.0	360	207	895	55	16	14	117%
7	Fixed Triple Chair	942	33	311	10.0	255	171	204	23	9	11	80%
8	Tomahawk Fixed Quad	1588	33	524	10.0	340	317	407	33	12	13	98%
9	Belleayre West	1468	33	484	10.0	340	345	298	17	18	9	188%
10	Highmount	1117	33	369	10.0	340	206	202	20	10	10	106%
TOTAL		**8691**	**33**	**2868**		**1974**	**1636**	**2213**	**171**	**13**	**14**	**96%**

Table 3.2-17 Proposed Trail Density

Table 3.2-17 shows that the lifts and trail systems will operate in a well balanced manner. Some exceptions to be noted include the Little Creek Lift #3, which is a Beginner teaching area so the desired trail density is not of great concern. There may be larger numbers of beginners clustered together in lessons or at the sides of the trail. The Belleayre West lift has greater capacity than the trail capacity, which will allow for the possibility of adding trails there in the future. The Highmount lift also has a slightly greater capacity that its trail capacity, also allowing for the possibility of adding trails there in the future.

Proposed Expansion of Winter Recreational Opportunities at the Ski Center

This Unit Management Plan proposes to add additional winter recreational opportunities for the public while visiting the Ski Center. Providing options for the public to experience additional winter recreational opportunities at Belleayre which are similar to the recreational opportunities on other Forest Preserve lands, such as Nordic, or cross country skiing, will create several alternative recreational opportunities for the public when visiting the Ski Center.

Expansion of Cross Country Skiing Opportunities

This Unit Management Plan proposes to improve the existing Nordic, or cross country skiing opportunities for the public within the Belleayre Mountain Ski Center's intensive use area. This winter recreational sport is fun, easy to learn, healthy, accessible, affordable, and offers great variety for all members of the public. The existing trails and the location of proposed trails are shown on the UMP Drawing TR2 in Appendix A.

The Nordic Trails within the Ski Center will be enhanced and modernized. These trails are utilized by many demographics and are acceptable for recreational activities including snow shoeing, cross country skiing, and back country skiing. The experience is desired by participants and provides a secure and controlled wilderness experience**.**

Cross country skiing uses natural movements and is a winter recreational activity which promotes good health and the opportunity for the public to enjoy the beauty of the Forest Preserve during the winter. Each member of the public can ski at each person's own pace and according to each individual's fitness level, from smooth gliding on gentle trails to bounding up, over, and down varied terrain.

Cross country skiing is also a family-friendly activity. Infants and toddlers can ride in a backpack or on a sled, while it's also gentle for grandparents and great-grandparents. Teenagers who want to go fast can skate ski, a technique that combines the leg motion of ice skating and the arm push of cross country skiing.

The Facility Manager may provide for the maintenance and expansion of the existing cross country ski trails in a manner consistent with other cross country ski trails within the Ski Center located with the Forest Preserve. The tread or travel width of these trails is proposed to average 12 feet in width; the maintained width shall be no more than 16 feet wide as needed to relocate the trails to avoid hazards or to groom for cross country skiing purposes. The trails will be maintained to reflect the natural wild forest setting consistent with Forest Preserve.

Proposed Tubing Hill

This Unit Management Plan revision proposes to develop, as an alternative to an existing ski trail, asnow tubing hill which will be located in an area about 100' wide with a 400' long slope which has a gradient not more than 20%, provided the length of the snow tubing hill will be counted against the 25 mile ski trail cap authorized by the Constitution. For safety purposes, the run out is near flat and up to 800 feet long. No additional tree cutting is proposed for the development of a snow tubing hill since it will replace an established ski trail. See UMP Drawing G4.1 for the conceptual location of the snow tubing hill.

This proposed snow tubing hill will also include a surface lift. Prior to construction, the Facility Manger will be required to obtain a more accurate design to incorporate all necessary safety measures. This design shall be subject to approval by the Department.

3.3 Parking and Vehicular Circulation

This UMP proposes to expand the available parking areas located within the Ski Center to accommodate the safety and needs of the public during high-attendance days. The impacts associated with this proposal to construct parking areas, and an explanation of mitigation measures are explained in Section 4 herein. The parking needs assessment process consists of the following steps

- Assess the capacity of the existing designated parking areas at the ski center. This is presented in Section 1.5.6
- Evaluate existing data to develop a ratio for the existing visitors arriving by Bus and by Passenger Vehicles (PVs)
- Determine the ability of the existing parking areas to serve the Existing Comfortable Carrying Capacity day and also the 2008 Historic Peak day.
- Review potential mitigation measures to increase the capacity of existing parking areas to meet existing and proposed Comfortable Carrying Capacity demands. These measures can include some Parking Management methods that are more readily achievable.
- Determine the capacity of proposed additional parking areas needed to further mitigate the need for additional parking to serve the proposed Comfortable Carrying Capacity.
- Determine additional mitigation measures if needed to serve the proposed Comfortable Carrying Capacity. These may include both Parking Management methods and methods to promote alternate transportation modes.

Existing Visitor Data and Bus/PV Analysis

General

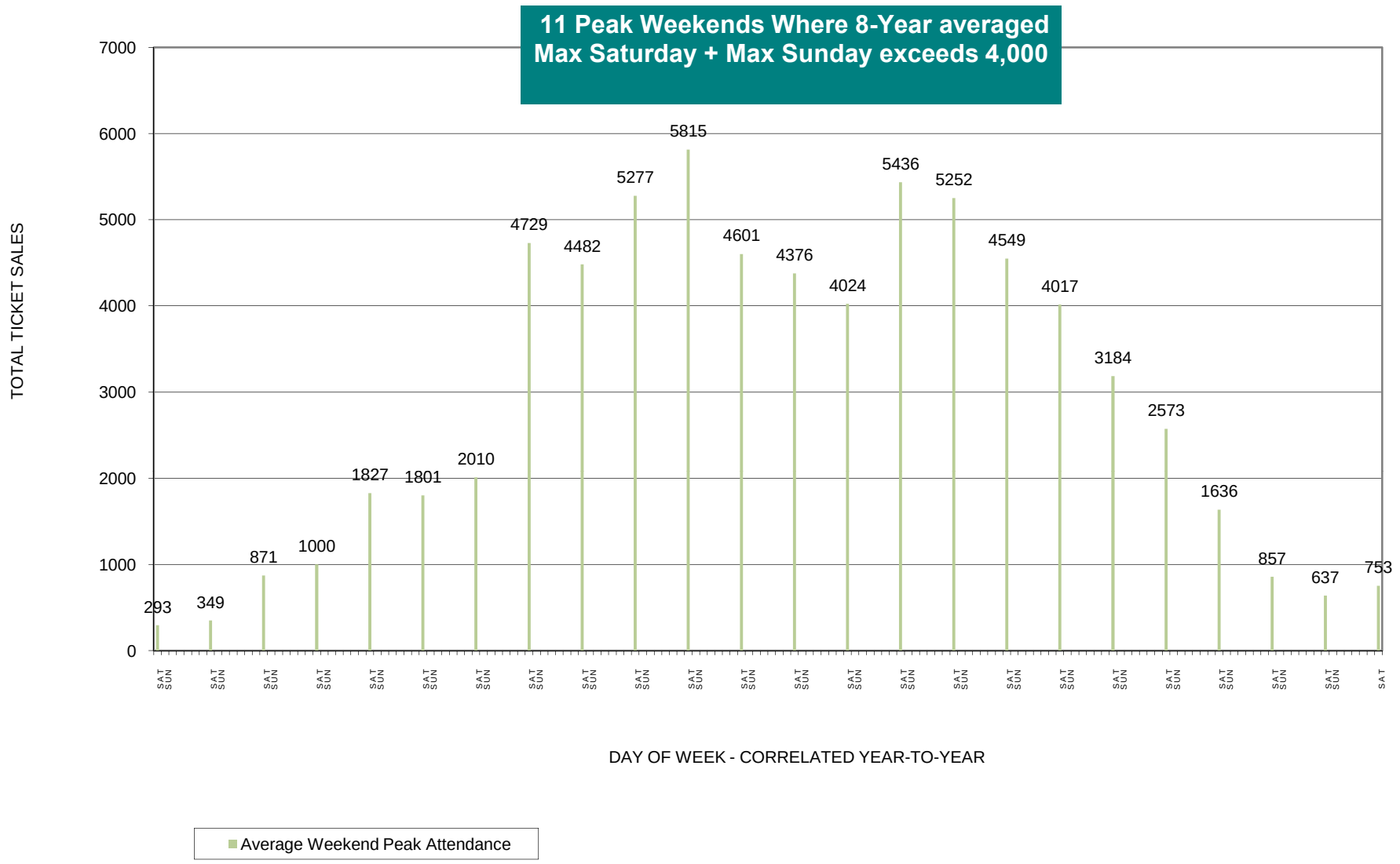
Existing visitor data were obtained from several sources. Ticket sales data collected by Belleayre Mountain Ski Center were reviewed in addition to data provided by bus transit services to the Mountain. Data were generally collected for ski seasons up to the 2007/2008 season, some going back to the 2000/2001 season. Belleayre Mountain collects ticket sales data for both Upper (Overlook), Lower (Discovery Lodge) and Bus Sales Admissions.

The average attendance varies over a typical season, initially ramping up, and then tailing off late in the season. Because of the variation and that some transportation mode data were not provided for the full ski season, a charted distribution was used to determine the attendance data used, as discussed below.

Daily Ticket Sales Data

A season-long chart was created by plotting daily ticket sales data for eight seasons, from 2000/2001 through 2007/2008 (Belleayre 2009-1). Ten peak weekends are readily discernable from the plotted data. The average visitor numbers on these weekends are not all over the current comfortable carrying capacity of 4,500. However, using the averaged weekend, Saturday plus Sunday, ticket sales over the eight seasons, shows 11 weekends where the averaged peak ticket sales are over 4,000. This covers the ten peak-week span and adds an additional weekend at the tail end, as the charted ticket sales begin to step down each subsequent weekend. The ticket sales data is shown and the 11 weekend span is labeled on Figure 3.3-1. For the purposes of this document, the timeframe for the Saturdays and Sundays data of the 11 week span will be referred to as the "11 peaks". This forms the timeframe for looking at some of the average visitor parking data. It can also be noted that the $10^{th,}$ $11^{th,}$ 15th and 16th weekends have historic average peaks exceeding 5,000. See Figure 3.3-1 for a graphic representation of this 2000/2001 season through 2007/2008 weekend ticket sales data.

Figure 3.3-1 BASED ON WEEKEND TICKET SALES BETWEEN 2000/2001 TO 2007/2008



UCAT Bus Services Passenger Data

UCAT provides regularly scheduled bus transportation from the City of Kingston to Belleayre Mountain. During the 2007/2008 ski season, UCAT provided weekday and Saturday transportation of visitors to the mountain. The UCAT delivery numbers for the 2008 calendar year portion of the 2007/2008 season were provided by Ulster County (UCAT 2009). The data spanned Saturdays on 10 of the 11 peaks. The visitors utilizing UCAT accounted for an average of 84 tickets each Saturday day for the period analyzed; this equals 2.21 percent of the daily ticket sales for those dates.

Adirondack Trailways passenger data

As of Friday, November 28, 2008, Adirondack Trailways was operating a single bus on Fridays, Saturdays, Sundays & Mondays. Their season total ticket purchases for the 2002/03 through 2007/08 seasons were provided in Period Sales Reports from Belleayre and Summarized (Adirondack Trailways 2009) The number of tickets sold, averaging approximated tickets per day, is a small percentage of the total daily ticket sales.

Estimating Visitors per PV and Visitors per bus

DEC group sales reservations data collected between January 20, 2000 and March 21, 2009 (Belleayre 2009-2) show an average of 41 passengers per bus and 2.5 passengers per passenger vehicle. These data are based on advance reservations and were not necessarily realized at the ticket window. They indicate an intended mass transit use on a particular day. The passenger vehicle data can include a mix of cars and vans. Ticket window bus sales data were recorded during the period between 11/04/02 and 06/05/08. For days when group reservations were made for a number of busses and no group reservations were made specifying passenger vehicles, the average number of visitors per bus was calculated to be 41. This value used the actual ticket sales and the number of busses anticipated in the group reservation since actual bus counts were not made. For days when group reservations were made for passenger vehicles and no group reservations specified bus transportation, the average number of visitors per passenger vehicle was calculated to be 5.7. Calculations in the Whiteface Mountain FEIS (Whiteface 2004-1) used average values for the number of visitors per busload and visitors per passenger vehicle, of 44 and 3 respectively. It is conceivable that the 5.1 and 5.7 passengers per vehicle number are influenced by the use of larger passenger vans. Data collected on February 14, 2010 showed average vehicle occupancy of 2.49 PPV for cars and light trucks counted. Other data collected on the same day showed that the estimated number of visitors was approximately 5% greater than the ticket sales for the day, attributable to non-skiers.

Visitors arriving by bus as a percentage of total ticket sales

The number of visitors arriving by bus as a percentage of the total number of visitors was calculated using the weekend bus ticket sales and total ticket sales during the 11 peak period for the 02/03 through 06/07 seasons. The average of 14% is used in Table 3.3-1 and 3.3-2 for calculations involving the estimated existing total number of visitors arriving by bus. Bus ticket numbers come from the sale of the bus/group tickets. If a group or bus arrives (reserved or not) and buys a ticket in that category, the number counts towards bus/group sales. If a group or bus arrives (reserved or not) and buys a ticket in another category such as racing then it does not count towards group sales. On some weekends, Bus usage is lower than average because of schools being out of session, such as during Presidents' Week.

Existing Parking Needs

Existing Available Parking

See Section 1.5.6 for discussion of the existing potential parking capacity of 51 busses in the Upper Discovery Bus Lot and 1,231 passenger vehicles distributed throughout the other existing designated parking areas.

Current overflow allows additional non-designated areas to be used. Additional overflow parking in the grassed Cross Country Skiing parking area can accommodate approximately 100 passenger vehicles. The service drive area spanning between the Discovery Lot 1 and Lot 2 can accommodate approximately 100 passenger vehicles on grass and gravel.

On days when group reservations do not fill the lot, the Discovery Bus lot can be used for passenger vehicles. The Discovery Bus Parking area can accommodate approximately 220 passenger vehicles in a hypothetical parking arrangement, with room also available for four buses to park, as shown on Drawing EX13.

Meeting parking needs for Current Comfortable Carrying Capacity and Historic Peak Day

Available data were used to calculate the ability to provide parking on days when the number of visitors reaches the current (Existing) Comfortable Carrying Capacity and when the number of visitors reached the historic peak attendance. The tabulated results show the ability of the existing parking areas to accommodate the current Comfortable Carrying Capacity of 4,500 and the 2008 historic peak attendance day of 5,890 visitors, which are discussed below as Condition 1 and Condition 2 respectively. Currently, the number of visitors arriving by foot is considered to be negligible.

See Table 3.3-1 for the summarized analysis.

Table 3.3-1 Existing Parking Capacity Summary Table

#	Description	Existing CCC Day(1)	Historic Peak (1/19/08)	Notes regarding proposed improvements
		1	2	:Condition
1	Total Number of anticipated Visitors or Historic Ticket Sales	4500	5890	
2	Total Number of Visitors Arriving by Passenger Vehicle (2)	3,870	5,096	100%-14% = 86% of the ticket sales are bus for Existing CCC for Peak use ticket sales (=5890-678-116)
Passenger Vehicles				
3	Average number of visitors per vehicle	2.49	2.49	based on field count (2.49) 2/14/10
4	Total No. of Stalls needed for Passenger Vehicles	1,554	2,047	
5	Total No. of Stalls needed for Employee Parking	209	209	(Per BMSC, 284/day), use 1.36 per car (2/14/10) , WHI used 8% of Total
6	Total Passenger Vehicle Parking Stall needs (Visitors&Employees)	1,763	2,256	
7	Passenger Vehicles per Acre	103	103	from Table 1.5-5 data, overall average
8	Total Acres needed to accomodate Passenger Vehicles	17.1	21.9	from Table 1.5-5 data, 12 ac available
Bus/Mass Transit Vehicles				
9	Total Number of Skiers arriving by Bus	630	794	Use 14% for Existing CCC, Use actual Bus +UCAT Ticket sales for Historic Peak Day tckt (=678+116)
10	Number of Skiers Per Bus (3)	41	41	
11	Total number of Buses needed (if less than 51, shows addtl potential)	15	19	
12	Buses per Acre	24	24	from Table 1.5-5 data
13	Total Acres required for Buses	0.6	0.8	
14	Total Acres required for Passenger Vehicles and Buses.	17.7	22.7	
15	Total Acres available (incl Overlook Rd area and Discovery Bus)	14.2	14.2	from Table 1.5-5 data
16	Parking Acreage Imbalance	3.5	8.5	
17	Number of potential passenger vehicles, spillover	415	995	Using a 117 PV per acre average parking density.

Notes: ver:022310

1. Existing and Proposed CCC values by DEC
2. 14% is avg obtained by taking the bus/total sales % for 11 peak weekend period Sat-Sun for 02/03 through 07/08 seasons where bus ticket data is readily available
3. Calculated from Group Reservation and Bus Sales Data, SE Group, Whiteface Table II-7, used 44

Condition 1 - Parking on Existing Comfortable Carrying Capacity Day (4,500 visitors)

The existing designated parking areas are insufficient to accommodate the existing Comfortable Carrying Capacity of 4,500, with 3.5 acres deficit of parking area as shown in Table 3.3-1. The percentage of visitors arriving by bus compared to passenger vehicles was based on average values.

Condition 2 – Parking on Historic Peak Day (5,890 visitors)

The existing parking areas were insufficient to accommodate the parking demand on the historic peak day. Parking spillover occurred and calculations also show this condition with an 8.5 acre deficit of parking area as shown in Table 3.3-1.
Notes on these calculations:

Equation #2: The percentage of visitors arriving by bus compared to passenger vehicles was based on the ticket sales on the particular day as opposed to an average The total ticket window sales (5,890) minus bus ticket sales (678) minus the number of UCAT passengers (116) provides the non-bus visitor total of 5,096

Equation #9: Equals Bus ticket sales plus UCAT for visitors transported by bus: 794=678+116

Equation #11: The number of busses is theoretical and based on the ticket sales. It will be far less than the 51 bus Discovery Bus Lot capacity.

Mitigation by Parking Management Methods

Parking Management Methods consider some of the relatively low cost and low tech methods to promote more efficient use of existing parking areas.

Increase Density - Reducing vehicle stall size

Existing Conditions

The existing parking lots generally do not have painted lines to delineate parking stalls. The potential impact of this condition on the average parking density is evaluated below. An approximately ten percent increase in available parking can be realized by reducing PV spacing along rows from the existing 10 ft average, down to 9 ft. Part of this increase may also be realized over time if the average vehicle size is reduced.

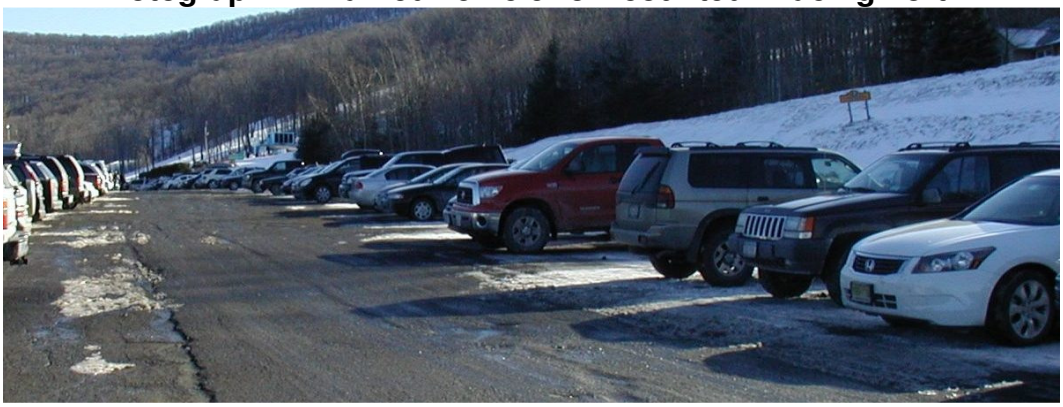
The existing 10 ft spacing was determined as follows:

In section 1.5.6, hypothetical parking lot arrangements used 10-ft wide vehicle parking stalls in order to estimate the existing capacity of the un-striped parking

lots. Using a stall width based on field observations of parking patterns in the unstriped lots should both help to determine a more accurate existing parking capacity, and provide data for possible capacity improvements by parking management to better utilize the existing areas.

The average width of area taken up per vehicle measured in a long row of parked vehicles was 10.22-ft. On February 13, 2009, parking measurements were taken for a group of vehicles parked in the Overlook Lodge Upper Parking Lot, shown on UMP Drawing EX16. No striped stall lines or staff is used in the lot to guide parking and the resulting spacing between vehicles is based on driver preference. A relatively long row of cars parked parallel to each other was measured using a rolling wheel measure. The row had 79 vehicles parked in a length of approximately 807-ft (see Photographs 1 and 2 below). Where vehicle spacing showed that cars had left prior to the count, they were added to the total.

Photograph 1 - Parked vehicle row counted – facing north



Photograph 2 - Parked vehicle row counted – facing south

This mitigation measure can be implemented using a combination of painted lines, using structures to guide PVs to park and using staff teams to direct arriving vehicles.

Proposed Mitigation - Increase parking density by reducing stall widths from 10-ft to 9-ft

Increasing the stall widths to 10-ft reduces the total number of stalls by 34, from 320 at 9-ft wide, down to 286-ft. This 10.6 percent difference shows the increases parking that could be realized, in a relatively efficient parking lot layout, by causing cars to park closer.

Section 1.5.6 presents the results of the effort made to determine the hypothetical vehicle capacity of the existing parking areas at Belleayre,. Hypothetical parking patterns for the designated parking areas are shown on UMP Drawings EX12 through EX16. For the purposes of estimating the capacity of the existing parking areas, a parking stall width of 10-ft was typically used.

A comparison ski resort in the northeast was visited on February 5, 2009 to obtain a comparison density of ski-area vehicle parking. The parking lots had exposed pavement in the travel aisles and an ice/snow layer over an inch thick in the stall areas. No lines or other controls were visible for use to guide parking. Two linear areas were measured by paced distances and the number of vehicles which were parallel parked was counted. One area had 17 vehicles parked in a length of approximately 143-ft (see Photograph 3 and a second area had 15 vehicles parked in a length of 138-ft as shown in Photograph 4. The stall widths calculate to 8.4-ft and 9.2-ft respectively or an average of 8.8-ft. Although a parking lot attendant was noted at the facility, it was not confirmed whether the drivers were guided to park.

Photograph 3 - Comparison Parking Area - Row 1

Photograph 4 - Comparison Parking Area – Row 2

Increase Density - Improving Parking Arrangement in Lots

Existing Conditions

Improving the parking distribution in the lots will result in more efficient use of the lots and a capacity increase above the existing.

On February 15, 2008, Photograph 5 was taken of Discovery Lodge Lower Parking 1, adjacent to the Discovery Lodge Service Drive (see EX12). The parking arrangement was the result of driver preference. There are no painted lines on the asphalt surface. Most of the vehicles in the center of the lot are parked in a back-to-back row arrangement; however, the single row shown behind the pedestrian points to inefficiency in the arrangement. Although not accurately quantified, improvement of the arrangement by establishing row spacing could have allowed for an additional row of 20+ PVs, an increase of approximately 13%.

Photograph 5 - Discovery Lodge Lower Parking

On February 7, 2009, photographs were taken by Department staff showing passenger vehicles parked in Discovery Lodge Lower Parking 1 and the Tomahawk Parking Lot (middle lot of the three tiered lots shown on EX15)

The parking of vehicles in the Discovery Lot as shown in Photographs 5 and 6 is an example of the relatively efficient parking currently. Vehicles were guided into the lot but the parking arrangement in the unmarked lot is based on driver preference.

Photograph 6 - Lower Discovery Lodge Parking Lot - facing North

Photograph 7 - Lower Discovery Lodge Parking Lot - facing East

The estimated number of passenger vehicles parked in the Discovery Lodge Lower Parking 1 is 209. The unguided parking arrangement follows a pattern similar to the hypothetical layout. At least 172 vehicles are discernable in the photographs, within the rectangular footprint of the lot. Both counts exceed the 152 vehicle hypothetical capacity of the lot. This can be in part attributed to the narrower travel aisles allowing for an additional single row of cars shown along the left edge of Photograph 6 above.

The estimated number of passenger vehicles parked in the Tomahawk Middle Parking lot, shown in Photograph 8 below is 56, based on a count of by Department staff. The hypothetical number of vehicles that could fit in the lot using 10-ft wide stalls in the arrangement shown on UMP Drawing EX15 is 77. The parking arrangement in the lot is based on driver preference and varies significantly from that shown on EX16.

Photograph 8 - Tomahawk Parking Lot

On February 7, 2009, photographs were taken by Department staff showing busses and passenger vehicles parked in the Discovery Lodge Bus Parking Lot.

Photograph 9 - Buses in Discovery Lodge Bus Parking Lot

Nineteen buses in a single row are discernable in the background of Photograph 9 with what appears to be sufficient room for one additional, next to the school bus on the left edge of the photograph.

Angled parking for up to 12 buses is shown in this area of the hypothetical parking lot on UMP Drawing EX14. The 90 degree parking observed allows more buses in one individual row than in the hypothetical layout, but does not necessarily increase the overall lot capacity. Dividing the approximate length of the row, scaled from drawings at 320-ft, by the 19 buses results in a spacing of 16.8-ft for each bus which is the result of driver tendency in the un-striped lot. The hypothetical stall spacing of 15-ft is relatively close to this value.

Proposed Mitigation - Increasing parking density by organizing parking in each lot

The number of vehicles parking in each lot can generally be increased by improving the parking row and travel aisle structure in the un-striped and often snow covered lots. This can be accomplished by using staff attendant teams to guide the drivers, and by using rope and pipe "sawhorse" systems to better designate the parking rows. A similar approach is used at Gore Mountain as shown in the Photograph 10.

Photograph 10 - Parking lot using pipe sawhorses and plastic balusters to establish row locations

Mitigation by increasing the passengers per vehicle

Numerous methods can be used to encourage more efficient use of motor vehicle transportation to the ski center. Some consideration when determining which methods to implement include:

- Ease for visitors to understand the program and see the benefit of the action.
- Ease to implement at the Parking lots, first point of interaction with visitors, or other "reward" point.
- Metrics to determine the quantitative level of success
- Cost to implement versus savings in various ways
- Prefer approaches that reward carpoolers over approaches that penalize less efficient vehicle occupancy.

Allowing preferential parking areas for carpool vehicles would encourage more efficient use of passenger vehicles. A relatively easy to implement approach would be to cordon off access to parking lots within walking distance of the lodges and only allow vehicles with a certain high occupancy to park. This would also reduce the number of shuttle bus trips with larger groups/numbers walking in.

Promoting drop-off of groups/families and allowing nearby parking, within walking distance, for groups/families could reduce the number of shuttle trips.

Offer other incentives for carpooling. Some examples of incentives other resorts are offering include:

- ❄ Anticipating a very busy Presidents Day/Valentine's day weekend, Colorado's Steamboat Ski and Resort Corp recently offered coupons good for a free beverage (hot chocolate, coffee or 20-ounce dispenser soft drink at mountain venues) to each adult arriving in a vehicle occupied by two or more this past… (Steamboat Pilot &Today, 02/13/09).

- ❄ Locally, Jiminy Peak, in nearby Hancock Mass, has offered a program for carpoolers with four or more people in a vehicle being rewarded with a single free lift ticket.

Incentives for carpooling would increase the passenger vehicle efficiency. Using an increase goal of 3.0 PPV from the current approximately 2.49 PPV would result in a 20.5 percent increase in PPV.

Expanding Available on-site Parking

The proposed approach to meet the future parking needs includes management controls of existing and proposed lots and the construction of three proposed parking lots. Table 3.3-2 summarizes the analysis of the combined existing and proposed parking areas ability to accommodate the future proposed Comfortable Carrying Capacity of 9,000 visitors per day. Alternatives to the construction of these parking areas are outlined in Section 6 herein as alternatives. Additionally, the Facility Operator shall have the discretion to limit the construction of any future parking area due to actual demand.

Up to 705 parking stalls are shown in the plans for the three additional parking areas at the ski center. These are referred to as the Upper Discovery, North Parking and East Parking Areas shown on UMP Drawings PK1, PK6, and PK10 respectively. Some of the 705 stalls are replacements for parking reduction in existing areas caused by proposed design features (91 lost and 75 gained) netting 689 additional stalls.

Some existing parking areas loose stalls/capacity

The Discovery Lodge site modifications will result in a loss of approximately 30 passenger vehicles stalls from Discovery Lodge Lot 1 by providing a service drive to the lodge through the area. The hypothetical change to the lot is shown on UMP Drawing EX12. The existing approximately 11 employee parking stalls will be removed from the area adjacent to the existing lodge.

The construction of the skier bridge over overlook road will result in the removal of the paved service drive and paved existing parking for 22 passenger vehicles. The available parking in the adjacent Tomahawk parking lot will be reduced. The

existing capacity of 55 vehicles based on 10-ft stalls will be reduced to 33 vehicles using similarly sized stalls. A proposed stall layout for the lot is shown on UMP Drawing BS13.

The Construction of the proposed Compressor Building could reduce the hypothetical stall capacity of the uppermost Tomahawk lot by 28 stalls, from the existing 77 stalls, down to 49 stalls as shown on UMP Drawing BS14.

Some existing parking areas gain stalls

The former maintenance garage area can provide parking for up to 55 additional passenger vehicles.

Phasing of parking improvements

Sequencing the construction of the proposed parking lots affords the ability to improve their design as technologies change over the full UMP period. It also allows for development of the other transportation modes that may reduce the on-site parking needs.

Meeting Future Comfortable Carrying Capacity with above mitigation measures

Table 3.3-2 sets forth a chart of the Proposed Parking Capacity Summary Table under Condition 3 scenario, as explained below, which summarizes one analysis of the existing parking areas ability to accommodate the proposed Comfortable Carrying Capacity of 9,000 visitors with the above mitigation measures applied. The calculations are discussed below. The table shows that even with the above mitigation measures applied, additional visitor parking or transportation accommodations will be needed to meet the future Comfortable Carrying Capacity.

Table 3.3-2 Proposed Parking Capacity Summary Table

#	Description	Future CCC Day(1)	Notes Regarding Proposed Improvements
	Mitig Proposed Parking Management and Added Areas	3	:Condition #
1	Total Number of anticipated Visitors	9000	
2	Total Number of Visitors Arriving by Passenger Vehicle (PV)	7,740	(use 86% with 14% of visitors arriving by bus)
	Existing Passenger Vehicle Areas		
3	Number of visitors per vehicle	3.0	Increased usng carpooling incentives
4	Total No. of Stalls needed for Passenger Vehicles	2,580	
5	Total No. of Stalls needed for Employee Parking	284	=(9,000/4,500 x current 284 emp) / 2employees/PV projected
6	Total Passenger Vehicle Parking Stall needs (Visitors&Employees)	**2,864**	stalls
7	Available PV parking in existing areas without Parking Management Controls	1,231	from existing capacity summary table
8	Proposed PV parking in existing areas with Parking Management Controls	1,354	includes added 10% for 9-ft wide versus 10-ft parking stalls
	Proposed Passenger Vehicle Areas		
9	Proposed Additional PV Parking Stalls	705	Three on-site parking areas, UD, North and East
10	Existing Stalls removed for new improvements	-30	Discovery Lodge Lot 1 Parking
		-11	Discovery Employee Parking
		-22	Lower Tomahawk -Skier Bridge area
		-28	Uppermost Tomahawk Parking Compressor Bldg area loss
11	Additional PV Stalls added to existing parking areas	20	Discovery Lodge Looping Service Drive
		55	Overlook Lower Lot in Maint Gar area
12	Net Parking Available in PV areas	**2,043**	stalls
13	PV Parking Stall Imbalance	**821**	(+) for additionally PV parking stalls needed #6 - #12
	Bus Travel		
11	Total Number of Visitors by Bus	1,260	using 14%
12	Number of Visitors Per Bus	44	
13	Total number of Buses needed for above # visitors	29	
14	Total Parking Available For buses	51	max utilization of existing Upper Discovery bus parking lot
15	No. of additional buses that can be accommodated in UD Bus lot	22	#14 - #13
16	No. of additional visitors that can be accommodated in UD Bus lot	968	using 44 passengers per bus from #12
17	Equivalent number of PV stalls that could be reduced	323	using 3 passengers per vehicle
18	PV stall imbalance with UD Bus lot filled to 51 bus capacity	498	equals 1494 visitors at 3 per PV (also equals 34 buses at 44 visitors per bus)
19	Potential PV off-site parking at Pine Hill Lake, up to 96 PVs	96	
20	Resulting PV stall imbalance	402	equals 1206 visitors at 3 per PV
21	Resulting PV stall imbalance	**422**	adding 5% for non skiers equals 1266 visitors at 3 per PV

Notes:
1. Future CCC values provided by DEC

ver: 03 2011

Condition 3 - Parking on Future Comfortable Carrying Capacity Day (9,000 visitors)

The existing designated parking areas are insufficient to accommodate the future CCC of 9,000 as shown in the condition 1 and 2 analysis.

Since the CCC is considered to occur on only a finite number of days per year, it is worthwhile to consider spillover of vehicles into adjacent parking locations that have been traditionally used or available. UMP Drawings PK17 shows the locations that can be utilized for parking to accommodate the CCC. Table 3.3-3 below shows the distribution of the PVs by area and the total stalls needed to accommodate the CCC.

Table 3.3-3 Proposed Parking Capacity Summary Table

#	Description	Future CCC Day(1)	Notes Regarding Proposed Improvements
Proposed Passenger Vehicle Areas			
	Overlook Upper	353	
	Overlook Lower	266	
	Overlook Roadside	288	
	Tomahawk	265	
	Discovery	424	
	Cross Country	100	
	New Discovery	336	
	New North	184	
	New East	185	
	Town Road	120	
	Proposed total PV Parking Spaces (See PK17)	2,521	
	Average number of visitors per vehicle	3.0	Increased using carpooling incentives
	Number of visitors accomodated in PV areas	**7,563**	
Bus Travel			
	Total Parking Available For buses	35	
	Average number of visitors per bus	41.0	
	Total Number of Visitors by Bus	**1,435**	
	Total Number of Visitors Accomodated	**8,998**	approximately equals CCC of 9000

Notes:
1. Future CCC values provided by DEC

ver: 03 2011

Additional potential Mitigation Methods

Increasing Mass Transit

During the 2008/2009 ski season, Ulster County Area Transit ("UCAT") provided 3 daily roundtrip bus rides from Kingston to Belleayre on weekdays and 2 each on Saturday and Sunday, increasing their service. Utilizing more UCAT transportation is a potential mitigation measure.

Rail to Trail along Ulster and Delaware

There is a potential for the Ulster County Rails to Trail Program to provide mass transit to the mountain. Plans developed by Ulster County show the mountain as a destination; however the operation of any future rail system would most likely be dependent on the weather.

Reduction of Parking Lot Footprints

The existing passenger vehicle parking areas provide for a hypothetical average of 117 vehicles per acre of parking lot. The linear parking lot modules for the three proposed parking areas provide a density of approximately 132 vehicles per acre.

Some of the proposed design features to reduce the parking lot footprints include the following:

- Use of 9-ft wide parking stalls angled at 45 degrees
- Use of a parking "module" with an 18-ft wide center travel aisle and 17-ft angled parking on each side, (52-ft total module width)
- Linear parking strips which can be oriented in terraces, paralleling the existing topography and reducing overall depth of soil excavation, cut and fill.

Design features that help to minimize Parking lot Surface Areas

Some of the proposed design features implemented to minimize parking surface areas include the following:

- The proposed Service Drives use a 12-ft single paved lane width, with 2% cross slope to drain rainwater to be treated for stormwater quality, and a 22-ft paved width in areas of two directional traffic.

- For low-volume, low speed local rural roads in mountainous terrain, road grades slopes up to 14% are allowable. This is presented in (CLRP1) Table 2 on page 8. Due in part to these slopes, Service Drives will have paved surfaces since they will have increased erosion resistance over gra-

vel. In some proposed parking areas, steep drives more closely match the existing grades and reduce the excavation necessary for construction.

- Minimizing parking area surface slopes to between 1 and 2% longitudinal and 2% cross slope provides a 2.8% or less diagonal pitch with a relatively low runoff velocity and short travel path towards the localized stormwater quality treatment systems. Combining the short sheet flow path with pre-treatment filter strips reduces the volume needed for pretreatment in the Dry Swale stormwater treatment systems. In some areas, the longitudinal slopes were reduced to 1% to better fit the existing topography.

- The alignments in the proposed parking lot areas use sweeping horizontal curves to follow the contours in the longitudinal direction. In the locations of the proposed dry detention stormwater treatment and weir-over areas, tangent sections of over 60 ft are used.

Design features that help to improve visual impacts

Some of the proposed design features implemented to improve visual impacts associated with the proposed and existing parking areas include the following:

- The proposed parking lots provide screening plantings to provide a visual barrier from the adjacent roadways. The terraced arrangement of the parking lots also breaks up the expanse of parked vehicles. A landscaping plan showing the location of proposed screening plantings for the parking lot areas is included as UMP Drawing LA2.

3.4 Skier Services Buildings

Discussion

In general, the skier services functions at a ski area need to be sized based on the Comfortable Carrying Capacity of the Lift and Trail system. The current Comfortable Carrying Capacity at Belleayre is approximately 4500 skiers, and the plan is to expand to a Comfortable Carrying Capacity of 9000.

Currently at Belleayre Mountain Ski Center, skier services are provided Discovery Lodge, Overlook Lodge, Longhouse Lodge, Summit Lodge, and the Nursery building.

The intent of this project is to reconfigure and refurbish existing space, and construct additional space at the ski center to accommodate current needs, future needs, be ADA compliant and address other deficiencies. Planned growth or the projection of the design day (when the visitors experience is comfortable despite a large crowd) should stay proportional to all facility sizes, such as future parking, trail acreage, utilities, and building square footage.

The intention of the various buildings design is that they be rustic in nature and blend with character of the Forest Preserve in which the ski center is located. The designs should generally reflect the Adirondack Great Camp architectural style in an effort to integrate the existing and new buildings into one fully functional unit. Further, the designs shall make use of readily available materials, standard construction techniques, and low maintenance features that when combined result in a highly energy efficient building and grounds.

A Building Space analysis was done for the ski center in order to determine the required space for the various skier service functions including Sitting Space, Food Preparation, Bar/Lounge area, Retails Sales, Rental/Repair Shop, Day Care/ Nursery, Restrooms, Ticket Sales, Public Lockers, Employee Lockers, First Aid/Ski Patrol, Administration, Indoor Circulation, and Storage/Mechanical. Industry standard multipliers (See Table 3.4-1) were used to project the recommended space requirements for the functions, at a Comfortable Carrying Capacity of 4500 and compared to existing conditions at the ski center (see Table 3.4-2). Recommended space requirements at a Comfortable Carrying Capacity of 9000 (design) were computed and compared to the proposed building conditions (see Table 3.4-3).

FUNCTION	Alpentech 1 (sf/p)	SE Low 2 (sf/p)	SE High 2 (sf/p)
Sitting Space	2.4	3.78	4.62
Food Preparation	0.5	1.13	1.39
Bar/ Lounge	0.7	0.69	0.84
Retail	0.3	0.55	0.67
Rentals/ Repair	0.4	0.81	1.08
Day Care/ Nursery	0.35	0.72	0.88
Restrooms	0.35	0.85	1.04
Ticket Sales	0.2	0.4	0.5
Public Lockers	0.5	0.67	0.83
Employee Lockers	0.15	0.23	0.28
First Aid/ Patrol	0.5	0.43	0.43
Administration	0.3	0.46	0.56
Ski School	0.4	0.36	0.44
Indoor Circulation	0.4	1.2	1.8
Storage/ Mechanical	0.2	0.8	1.1

Table 3.4-1 Industry Recommended Building Function Multipliers

FUNCTION	EXISTING (sf)	Alpentech (sf)	SE Low (sf)	SE High (sf)
Sitting Space	13137	10800	17010	20790
Food Preparation	4763	2250	5085	6255
Bar/ Lounge	1488	3150	3105	3780
Retail	2691	1350	2475	3015
Rentals/ Repair	4142	1800	3645	4860
Day Care/ Nursery	3325	1575	3240	3960
Restrooms	2719	1575	3825	4680
Ticket Sales	782	900	1800	2250
Public Lockers	1159	2250	3015	3735
Employee Lockers	1880	675	1035	1260
First Aid/ Patrol	1409	2250	1935	1935
Administration	2652	1350	2070	2520
Ski School	2424	1800	1620	1980
Indoor Circulation	7881	1800	5400	8100
Storage/ Mechanical	2506	900	3600	4950
TOTAL	52958	34425	58860	74070

Table 3.4-2 Existing Space vs. Recommended Space (CCC=4500)

1 – Spreadsheet - Space Analysis: Square Foot Projections by Alpentech, Inc. 2003

2 – Mount Sunapee – Master Development Plan 2009-2014 June 1, 2009 by SE Group

FUNCTION	PROPOSED (sf)	Alpentech (sf)	SE Low (sf)	SE High (sf)
Sitting Space	20621	21600	34020	41580
Food Preparation	7954	4500	10170	12510
Bar/ Lounge	5970	6300	6210	7560
Retail	3206	2700	4950	6030
Rentals/ Repair	6500	3600	7290	9720
Day Care/ Nursery	5870	3150	6480	7920
Restrooms	4057	3150	7650	9360
Ticket Sales	1265	1800	3600	4500
Public Lockers	5168	4500	6030	7470
Employee Lockers	2037	1350	2070	2520
First Aid/ Patrol	2492	4500	3870	3870
Administration	3454	2700	4140	5040
Ski School	3362	3600	3240	3960
Indoor Circulation	12288	3600	10800	16200
Storage/ Mechanical	5149	1800	7200	9900
TOTAL	89393	68850	117720	148140

Table 3.4-3 Proposed Space vs. Recommended Space (CCC=9000)

In general the proposed function square footages are within the values recommended by Alpentech and the SE Low numbers, indicating that the proposed building plan is reasonable when compared to industry standards, while not being extravagant or wasteful.

Discovery Lodge Expansion

The Discovery Lodge Expansion project is the centerpiece of the Belleayre Mountain Ski Center's improvements to the skier services buildings. It will make the Discovery Lodge the primary arrival point, and central area, for skier services and administration. This building expansion will allow the centralization of several major functions which are currently separated between the Discovery Lodge and the Overlook Lodge, such as Rental/Repair Shop and Administration, which will result in a more efficient operation.

The existing Discovery Lodge is 23,100 square feet in size and the proposed expansion will increase its square footage to 51,800 square foot. The expansion will include: increased seating areas, a larger kitchen, a larger public locker area, an expanded ski patrol area, an expanded central administration area, an expanded central rental/repair shop, an expanded outside ticket sales area, an expanded retail sales area, a larger day care area, additional restrooms and improved accessibility. The building is designed to be LEED Gold certifiable. See Appendix O -

Discovery Lodge LEED Checklist for a listing of the projects proposed LEED credits. See UMP Drawings BA-13 for a schematic of the Existing Discovery Lodge, and UMP Drawings BA-14 through BA-17 for details and schematics of the Proposed Expansion of the Discovery Lodge.

Overlook Lodge Modifications

The Overlook Lodge remains a key lodge on the mountain. The proposed rehabilitation and modification of this structure will include grading and landscaping of the surrounding hillside to increase skier safety in the winter. The grading of the hillside may also accommodate lawn seating for incidental summer gatherings, such as concerts. A temporary fabric type canopy is proposed to be erected for such gatherings. The existing bar area is proposed to be expanded and reconfigured to provide additional space, improve the efficiency of the space, and improve views of the mountain. See UMP Drawings BA-2 for details of the Existing Overlook Lodge, and UMP Drawings BA-3 and BA-4 for details and schematics of the Proposed Overlook Lodge Public Assembly Area and Sections.

Information Building

An Information Building is proposed on the road entrance off State Route 28. The approximate dimensions are 24 foot x 44 foot with the square footage being 1056. The building will have a main sitting and information kiosk area to provide persons year round information of the opportunities of Belleayre Mountain and the two counties surrounding the area. It will have a small mechanical room and an accessible restroom. There will be a small administrative room with a sliding window. The building will keep the rustic look of the mountains buildings by using wood waney- edge siding with manufactured stone on the lower section of walls. There shall be an architectural shingle roof. A small propane fired boiler shall provide heat and hot water with small a/c units for cooling. The building shall be built to surpass NYS Energy Building Codes. See UMP Drawing BA-27 for proposed conditions.

Sunset Lodge Expansion

The existing Sunset Lodge is used to capacity and in need of expansion. There is also a need for better site views from the top of the mountain as there are fantastic south/southeast views of the adjoining valley. In the summer time, this is the drop off of customers for mountain touring. The existing lodge is 1930 square foot with a sitting capacity of 70 people. The restrooms are small and are not accessible. The kitchen/cafeteria needs more storage space for food stuffs. The proposed expansion will increase the square footage to 4825. The sitting capacity will increase to 164 persons. There is a large increase in restroom areas to meet health code standards and make the rooms accessible. There will be a 400 square foot vestibule to welcome skiers and create viewing towards the lift drop off area and back down the mountain. The new seating area will have fantastic views towards

the valley. There is an existing deck area for the customers to relax and this will be updated and include area adjacent to the new sitting area. Currently, electric baseboard is used as the heating system. The new mechanical area shall incorporate a high efficiency heating system. The expansion area construction will surpass NYS Energy Building Code requirements. The expansion will use similar wood "waney" edge siding used thru out the mountain and on the existing lodge. An architectural shingle roof will be used. See UMP Drawings BA-10 through BA-11 for existing and proposed conditions.

Tomahawk Lodge

The proposed Tomahawk Lodge will be built to increase the utilization of the parking lots located at the Tomahawk Lift base area, to provide sitting space and restroom facilities as a rest stop for skiers using the western side of the mountain, and to provide a changing area for skiers using the Tomahawk parking areas. There is currently a small ticket booth at this location, and the new Lodge will better suit this purpose. The new Tomahawk Lodge will be similar to the Longhouse Lodge in keeping with the architectural rustic look of the mountain's buildings. It will have wood board and batten siding with an architectural shingle roof. A manufactured stone siding will be applied to the bottom of the wall in keeping with stone fireplace facades in the Overlook Lodge and stone partial siding on the Maintenance garage. The lodge will employ 3451 square foot of usage which includes 2336 square foot of sitting space with an area for food and beverage vending. There shall be men's and women's accessible restrooms and a covered deck off the rear of the building utilizing views down the mountain. The lodge exterior dimensions shall be 80 ft. by 44 ft. The building shall be built to exceed the requirements of NYS Energy Building Code and shall employ a propane fired boiler heat system. See UMP Drawing BA-12 for proposed conditions.

3.5 Miscellaneous Appurtenances

3.5.1 Snowmaking

The essential product that a ski area offers is a beautiful ski trail covered in snow. In the Northeast US, successful operation of a ski area necessitates snowmaking. Snowmaking enables the area to open earlier and close later in the season, taking greater advantage of the large investment in infrastructure. It also allows the ski area to guarantee more consistent trail coverage when Mother Nature doesn't provide enough natural snow cover. Quicker recovery from dangerous icy conditions resulting from winter thaws, or rain storms is another advantage. Snowmaking allows the customer to have more confidence to schedule ski vacations since the conditions are more reliable. The majority of the snowmaking occurs from the end of November to get ready to open for the Thanksgiving holiday, and continues through mid March as weather conditions permit.

The existing snowmaking system at Belleayre Mountain Ski Center currently makes snow on approximately 150 of 155 acres or 97% of the skiable area. The system is proposed to be expanded to cover new trails, bringing the total amount of acres on which snowmaking occurs to 200 acres. The existing snowmaking system at the ski center is described in detail in section 1.5.4, as well as in Appendix B "Snowmaking Engineer's Report" and is shown in plan on UMP Drawing EX10. See UMP Drawings BA18 and BA24, respectively, for the Existing Upper Pumphouse, and Existing Pine Hill Pumphouse drawings.

The attached Appendix B "Snowmaking Engineer's Report" located in this UMP document also describes the proposed improvements to the snowmaking system at Belleayre. This report includes sections on;

Existing Snowmaking Water Supply System
Existing Snowmaking Compressed Air System
Inventory of existing Snowmaking Guns & Accessories
Existing Energy Consumption
Proposed Trail Expansion
Weather Data
Proposed Trail Opening Phases
Equipment Selection
Modeling of Proposed System Expansion
Proposed Water Supply System
Proposed Compressed Air System
Energy Management/ System Control

As described in the report, upgrades to meet the increased demand include adding a new water storage/stormwater pond, new lower pumphouse, upgraded upper pumphouse, elimination of existing diesel powered rental compressor system, installation of new high efficiency electric powered compressor facility, new fan gun units on new trails, and associated trail piping/utility lines. Performance spe-

cifications are included for the proposed Energy Management/ System Controls which will allow more efficient operation of the system, and recording of operational data.
Also included in this UMP is Appendix F which is the NYPA "Energy Efficiency Feasibility Study - Belleayre Ski Mountain" This study documents the feasibility of replacing the existing diesel powered rental compressed air system with a new high efficiency electric powered central air system. This project which is part of the UMP would be accomplished through the NYPA Energy Service Program.

See UMP Drawings SM1 through SM22, for details of improvements to the Snowmaking System. For specific details, see UMP Drawings BA18 for Existing Upper Pumphouse, BA19 for Proposed Upper Pumphouse Floor Plan Modifications, BA20 and BA 21 for the Proposed Main Compressor Building Plan and Elevations, respectively, and BA22 for Proposed Lower Pumphouse.

3.5.2 Primary Electric Upgrades

The state currently owns and operates its own underground primary electric distribution system at the Belleayre Mountain Ski Center which has to service lifts, pumphouses, compressor houses, and buildings throughout the facility. New York State Electric and Gas (NYSEG) is the regional service provider. The existing on-site primary electric lines are shown on UMP Drawing EX3.

The existing state owned primary electric system on site is aging and inadequate to handle the proposed electrical loads which include additional pump loads at the new lower pumphouse, modified upper pumphouse, new electric compressor facility, new fan gun units and low energy guns on trails, new ski lifts, and expanded lodge facilities. It is planned to upgrade the underground primary electric feeders on-site at Belleayre to modernize existing infrastructure and to provide suitable power for the expansion. The general layout of the proposed new on-site primary electric feeders is shown on UMP Drawing UT-1.

The primary electric service coming into the facility is provided by NYSEG, and the size of this service will need to be upgraded. An engineering study of the work that will be required to upgrade the primary service is to be performed by NYSEG. It is anticipated that the design peak demand load will be approximately 14,730 kW.

The distribution system will be a combination of electric lines originating from switchgear and terminating at transformers. The distribution lines will be a combination of overhead and underground lines. Both these have advantages and disadvantages and the conditions at each location will ultimately determine which type of distribution line is better utilized at each location. The facility operator

will determine, at the time of installation, whether an overhead line or underground line shall be installed after consideration of the advantages and disadvantages of each option.

Various construction methods will be utilized to minimize environmental impacts such as: i) Underground mitigation techniques include the typical trenching protections to minimize erosion, or ii) Overhead mitigation techniques include using black insulation and installing the lines on the sides of trails in order to better blend with the trees.

3.5.3 Sand/Salt Storage

A proposed Sand/Salt Shed will be constructed near the new Maintenance Center at the novice area. There is currently an open faced small shelter near the old Garage that is inadequate for the Mountain's need. The staff currently receives eight or so shipments of material during the winter season. The proposed design will have the capacity of storing 600-700 tons of sand/salt mixture which will require possible two deliveries of material, greatly reducing the amount of trucking needed. The proposed design is 60 foot x 40 foot. A concrete floor and approach will create an impervious base. Treated lumber will be used as framing with a trussed roof. The roof and walls will have a metal panel skin to match the design of the Maintenance Garage. It will be accessible from the garage parking area. See UMP Drawing BA24 for proposed conditions.

Alternatives to Sand/Salt for winter de-icing were evaluated and are discussed in Appendix E – SWPPP.

3.5.4 Potable Water Supply

The state currently owns and operates its own Public Water Supply at Belleayre Mountain Ski Center. The system was substantially modified in 2004. A copy of the Engineer's Report and existing well logs for that work is included in this UMP as Appendix D. Ulster County Department of Health enforces compliance with the NYS Department of Health requirements for the public water supply at the ski center.

As part of this UMP it is proposed to discontinue use of and properly close existing Well #3 due to turbidity issues, and to operate the system entirely on Well's #1, #2, and #4. Also proposed is to abandon the existing Summit Well (Sunset Lodge), and install a booster pump at the upper 50,000 gallon reservoir to pump potable water to the Summit (Sunset Lodge). The proposed changes to the on-site water distribution system will need to comply with the requirements of NYSDOH Subpart 5.1 Public Water Systems. The proposed changes must be approved by the Ulster County Department of Health.

As a result of the proposed expansion of the ski center facilities the maximum daily water demand will increase to 60,000 gpd. This figure is obtained from the "Wastewater Engineers Report" which is included in this UMP as Appendix C.

Existing Well Yields from pump tests are:

Well #1 – 18gpm
Well #2 – 60 gpm
Well #4 - 24 gpm

At the desired pumping rate of 67% of well yield capacity, the maximum daily capacity of the existing well sources is 0.67 x (18 + 60 + 24) x 1440 = 146,880 gpd. This indicates that the existing supply capacity is well in excess of the projected maximum daily demand of 60,000 gpd.

While it is not anticipated that any additional wells will be required as a result of this project, if new wells were ever to be required, they would need to comply with the requirements of NYSDOH Appendix 5-B ("Standards for Water Wells") and NYSDOH Appendix 5-D ("Special Requirements for Wells Serving Public Water Systems") of the NYS Sanitary Code, 10 NYCRR Parts 1 to 24, eff. Nov. 23, 2005.

It will also be necessary to reroute the existing transmission lines from existing Wells #1 and #2 to the existing Chlorine Building, due to construction of the proposed Snowmaking/Stormwater Pond.

Proposed layout and details of proposed potable water system modifications are shown on UMP Drawings UT-2 through UT-6.

3.5.5 Wastewater

As discussed in Section 1.5.9 the existing sanitary sewage wastewater is collected at Belleayre Mountain Ski Center and is eventually treated and discharged at the NYCDEP Pine Hill WWTP. Presently, the ski center's sewage collection system accommodates a carrying capacity of approximately 4,500 skiers per day, with peak attendance of 6,000 skiers per day. The proposed expansion would accommodate a carrying capacity of 9,000 skiers per day, with a peak attendance of 10,500 and would result in a maximum daily flow of 60,000 gpd for the expanded facility. A Wastewater Collection/Treatment Analysis Engineer's Report was prepared and is included in this UMP as Appendix C. This Engineers Report documents the maximum daily flows from the proposed project, and analyzes the capacity of the existing collection system to handle the increased flows.

As part of the proposed project there would be several sources of sanitary sewage wastewater that would be connected in the existing wastewater collection system which are not currently connected. The expanded Sunset Lodge, the proposed

Tomahawk Lodge, and the proposed Information Booth would be connected. Proposed layout and details of proposed sanitary sewer wastewater system modifications are shown on UMP Drawings UT-2 through UT-6.

The Engineers Report concludes that the existing wastewater collection system is adequate to accommodate the proposed expansion with the inclusion of recommended maintenance repairs.

3.5.6 Lighting, Landscaping, and Signage

Lighting

The Discovery Lodge Expansion project is designed to be a LEED Gold Certifiable Building. The building is designed to get credit for Light Pollution Reduction under the Sustainable Sites section of the LEED checklist (See Appendix O – Discovery Lodge LEED checklist). Exterior lighting will only be provided in areas required for safety and comfort. The design does not exceed 80% of the maximum lighting power densities for exterior areas and 50% for building facades and landscape features as defined in ASHRAE/IESNA Standard 90.1-2004, Exterior Lighting Section.

The project is classified as a LZ1 — Dark (Park and Rural Settings) zone as defined in IESNA RP-33, and the exterior lighting is designed so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.01 horizontal and vertical foot-candles at the site boundary and beyond.

Landscaping

The Discovery Lodge Expansion project includes a detailed landscaping/planting plan. See UMP Drawing LA1 for details of the Discovery Lodge planting.

Landscape plantings are proposed to screen selective areas of parking lots from County Rte 49A, see UMP Drawing LA2 Parking Screening Planting and Appendix M – Parking Lot Screen Conceptual Planting Plan Memo.

Signage

There are several different types of signs at Belleayre Mountain, and each type of sign is necessary and associated with specific requirements.

The first type of signage is required by Code Rule 54. Belleayre Mountain is required to have indoor as well as outdoor signage specifically relating to the skiers responsibility code. Signage with regards to Code Rule 54 is located at all entry areas, ticket locations, lifts, and any other area of public assembly. Outdoor trail maps are provided as required by Code Rule 54.

Another type of signage, located throughout the interior of the lodges, is related to advertising and marketing. These signs promote events, programming, and the general product line. Other important signage on the mountain is used to identify trails, their arrangement, and ability level. This signage is extremely important to help people to properly navigate around the Mountain and to safely select ski

trails that are appropriate to their ability. In addition to skiable trails and terrain, Belleayre Mountain has 11 parking lots with 7.5 miles of roads. Appropriate signs are necessary to identify parking locations, speed limits, and other traffic and travel information. Highway markers and other directional signs are also important to direct visitors to their destinations. These directional signs are located on Route 28, the entrance to the cross country area, the entrance to the Discovery lodge area, and the entrance road to the Nursery, Overlook and Longhouse Lodge areas.

The Belleayre Mountain Interpretive Trail is perhaps the only downhill ski and snowboard environmental education initiative in the country. The Interpretive Trail is a series of kiosks with information about the Forest Preserve and environment helping to enhance the skiers and riders experience.

Code Compliance requires many other signs throughout the mountain. Signage for maximum building occupancy, confined spaces, fire safety requirements such as lighted exit signs, as well as a number of other signs such as directional signs for the purpose of directing people to the restrooms, cafeteria, administration offices, ski school, and first aid rooms.

Section 9-0305 of the Environmental Conservation Law addresses the erection of signs and other advertising in the Adirondack and Catskill Parks. 6 New York Codes, Rules and Regulations (NYCRR) Part 195 further defines the parameters for the issuance of Department permits for the erection and maintenance of signs, advertising structures and devices in the Adirondack and Catskill Parks. While these requirements were principally developed to guide signage on privately-owned lands, the Department also uses many elements of this guidance in designing, erecting and maintaining its own signs. At Belleayre Mountain, the Department will strive to employ the guidance provided by this statue and regulation insofar as doing so does not compromise other requirements established to preserve public safety and comply with industry standards. Specifically, the Department will employ the guidelines provided under 6 NYCRR §195.4 in selecting materials, design, colors and text of signs at Belleayre Mountain. Applicable provisions include the following;

- Facility signs shall be of a rustic or other design which will be attractive and suitable for its proposed location;

- Facility signs shall be painted or stained in one of the following color combinations;

    - yellow lettering on brown background; (*this combination is preferred*)
    - black lettering on white background
- Highway signs leading to the facility shall comply with the Cooperative Agreement dated April, 2011 between Federal Highway Administration, NYSDOT and NYSDEC.

The objective in designing, erecting and maintaining any signs at Belleayre Mountain will be to define a sense of "place", reinforcing the notion that the facility is in the New York State Catskill Forest Preserve. Ensuring Belleayre signage is consistent with the aesthetic character of the Catskill Park will further maintain consistency with direction in the Catskill Forest Preserve Public Access Plan and the Catskill Park State Land Master Plan.

3.5.7 Energy and Materials Management

An Energy Audit was performed at Belleayre Mountain Ski Center and is included as Appendix G (Energy Audit Report). The audit identified that the majority of the energy consumed at the Ski Center is used in the production of snow. The proposed project includes significant upgrades to the snowmaking system to make it as energy efficient as possible. A Facility Energy Management System is proposed to be installed as part of the improvements to the snowmaking system. See Appendix B "Snowmaking Engineer's Report" for the performance criteria of the proposed Energy Management and System Control.

All work related to the Discovery Lodge expansion project exceed current building energy code requirements by a minimum of 25%. The project complies with Executive Order 111 and is designed to incorporate Green Building design concepts and meet LEED Gold Certification requirements.

Other building work must comply with the latest NYS Energy Building Code requirements.

3.6 NSAA Sustainability Slopes

The NSAA Sustainable Slopes ENVIRONMENTAL CHARTER FOR SKI AREAS 2005 is a framework for sustainable operations at ski areas. The principles outlined in the charter provide guidance in the planning and operation of ski area facilities aimed at improving sustainability and environmental performance. Many of the principles were considered and utilized to the extent practical in the development of the Full Build-Out plan detailed in this UMP/DEIS.

Some of the NSAA Sustainable Slopes principles (goals) that were considered include:

PLANNING DESIGN & CONSTRUCTION

"Engage Local Communities, Environmental Groups, government agencies, and other stakeholders in up front and continuing dialogue on development plans and their implementation"

The Department held public scoping meetings where public input was received on initial conceptual plans. The input was considered in the preparation of the UMP/DEIS. The UMP/DEIS will also undergo a formal public comment period before final approval in the SEQR process.

"Assess environmental concerns and potential restoration opportunities at local and regional levels"

Concerns related to the impacts to classified trout streams and tributaries near the project site were expressed during the scoping process for this UMP/DEIS. Much attention was paid to the design of parking stormwater management facilities to mitigate the potential impacts to the streams. Initial stormwater runoff from new parking lots will be treated by filtering, then flow underground before discharge into the stream to help lower the temperature of the discharge water. The existing Pine Hill Lake discharge is proposed to be retrofitted with a cold water discharge to reduce potential thermal impacts to the stream at that location. Also the minimum stream bypass flow at the Pine Hill Lake diversion is planned to be increased from 5 cfs to 8 cfs to improve stream habitat at that location.

"Plan, site and design trails, on-mountain facilities and base area development in a manner that respects the natural setting and avoids, to the extent practical, outstanding natural resources"

Ski trails were planned to maximize the use of fall line ski trails, and minimize the use of constructed (cut/fill) ski trails. The proposed ski trails will utilize the natural terrain as much as possible. In some of the tree cutting areas, the trees will be cut flush to grade, and the stumps will remain to minimize ground disturbance.

"Make water efficiency, energy efficiency and clean energy use and materials efficiency priorities in the design of new facilities and upgrades to existing facilities"

Substantial effort was made to audit the existing energy use at the facility, and target the highest uses of energy for improved efficiency in the new design. The highest use of energy by far was the compressed air for the snowmaking system. New high efficiency electrically driven snowmaking equipment will use significantly less energy compared to the existing diesel driven rental air compressors. The proposed expansion of the Discovery Lodge is designed to be LEED Gold Certifiable.

"Use high-density development or clustering to reduce sprawl, provide a sense of place, reduce the need for cars and enhance the pedestrian environment"

The proposed expansion of lodge facilities consolidates the rental shop, retails space, and most of the cafeteria concessions into one space all located at the expanded Discovery Lodge.

"Meet or exceed requirements to minimize impacts associated with ski area construction"

The proposed ski trails are designed so that the facility will be within the constitutional limits set for Belleayre Mountain Ski Center on ski trail mileage and width. Also, many of the proposed ski trails are planned to be located on currently cleared areas of abandoned ski trails at the former Highmount Ski Area, minimizing the amount of tree cutting required for the project.

OPERATIONS

"Optimize efficiency and effectiveness of water use in snowmaking operations"

During the Energy Audit it was discovered that the existing water supply system pressure was regulated by a pressure relief valve to allow excess pressure to be relief by re-circulating water from the system. The proposed system will be operated by a variable speed drive to eliminate the wasted energy in the existing system.

"Conduct snowmaking operations in a manner that protects minimum stream flows and is sensitive to fish and wildlife resources"

The UMP proposes to increase reservoir storage volume which will allow additional attenuation of stormwater flows, and allow the minimum stream by pass

flow at the Pine Hill Lake diversion to be increased from 5 cfs to 8 cfs during the critical trout spawning season.

"Conserve water and optimize efficiency of water use in ski area facilities."

The proposed plan includes the complete replacement of plumbing fixtures in the Discovery Lodge expansion project to utilize water conserving fixtures.

"Maximize efficiency in water use for landscaping and summer activities"

There are no plans for extensive landscaping watering or summer activity water use.

"Strive to exceed water quality-related requirements governing ski area operations"

The project Stormwater Pollution Prevention Plan (SWPPP) is a state of the art plan which incorporates several measures to mitigate the potential impacts of stormwater runoff including requirements for erosion and sediment control during construction, provision of vegetative buffers adjacent to streams, use of dry swale and sand filters for quality treatment of parking lot runoff, as well as detention ponds for flow attenuation. Also modifications to the outlet of the existing Pine Hill Lake reservoir to make the outlet a "cold water outlet" are proposed in the plan to improve the downstream habitat.

"Manage wastewater in a responsible manner"

The existing wastewater collection system for the entire facility is connected to a municipal wastewater treatment plant. An engineering evaluation of the collection system was conducted and several measures were identified and implemented to eliminate stormwater infiltration, and improve system maintenance.

ENERGY CONSERVATION AND CLEAN ENERGY

"Reduce overall energy use in ski area facilities"

As indicated in the Energy Audit, the most energy used at the facility is in the snowmaking system. The proposed system will in the neighborhood of 40% more energy efficient that the existing system. The proposed Discovery Lodge expansion project will be a LEED Gold Certifiable building. A facility energy man-

agement system will allow real time monitoring and recording of energy use data, as well as aid in the control of critical energy using systems.

"Use cleaner or renewable energy in ski area facilities"

The existing snowmaking compressed air system uses inefficient diesel driven rental air compressors. The proposed energy for the facilities is electricity from the power grid. Direct emissions of Green House Gases will be reduced substantially by the conversion of the systems from diesel to electric. Indirect emissions will be reduced as well. Use of electricity from the grid will allow the possibility purchase of Renewable Energy Credits from providers of renewable energy such as wind.

"Reduce Energy Use in lift operations"

The proposed new or replacement lifts will utilize modern high efficiency motors.

"Reduce fuel use in ski area vehicles"

More efficient parking, with guests shuttled to the drop off point will result in an overall reduction in fuel use. The ski area is also purchasing two hybrid diesel shuttle buses that will be used to shuttle visitors from the parking areas. Incentives to promote carpooling by guests would also reduce fuel consumption. The use of improved low energy snow-guns and fan-guns for snowmaking will reduce the amount of snow moving required by snow groomers, resulting in a reduction in fuel use.

FISH AND WILDLIFE

"Minimize impacts to fish and wildlife and their habitat and maintain or improve habitat where possible"

Extensive field studies were performed to identify the fish and wildlife resources that could possibly be impacted by the project. Of particular concern are the trout streams near the project site. Design considerations were taken into account to minimize the impact to these streams, and to improve stream habitat. Additional snowmaking water storage capacity will allow the increase in minimum stream bypass flows. Implementation of a cold water outlet on the existing Pine Hill Lake will improve downstream habitat. Implementation of a state of the art Stormwater Pollution Prevention Plan will minimize potential stream impacts during construction. Design of stormwater treatment practices that include filtering of the stormwater prior to discharge into streams will minimize potential thermal impacts to streams. The design also provides for the maintenance of adequate natural buffers from proposed disturbed areas to streams to minimize potential impacts.

Additionally, two existing culvert stream crossings will be replaced with much larger arch culverts with a natural bottom in order to improve stream habitat.

WETLANDS & RIPARIAN AREAS

"Avoid or minimize impacts to wetlands and riparian areas, and offset unavoidable impacts with restoration, creation or other mitigation techniques.

In the initial project development, existing wetland boundaries were delineated and mapped. Aerial survey mapping was used in conjunction with field verification to locate surface water resources. The project was then designed to avoid any permanent disturbance to wetlands and to maintain adequate buffers to riparian areas.

AIR QUALITY

"Minimize negative impacts to air quality"

"Reduce operations-related air pollution and greenhouse gas emissions as feasible"

The project will eliminate the use of rented diesel powered compressors for snowmaking drastically reducing the direct emissions of greenhouse gasses as well as other pollutants.

VISUAL QUALITY

"Create built environments that complement the natural surroundings"

"Explore partnerships with land conservation organizations and other stakeholders that can help protect open lands and local view-sheds"

Architectural requirements for new or expanded buildings were established prior to design that they be rustic in nature and blend with natural character of the Forest Preserve in which the ski center is located. The designs reflect the Adirondack Great Camp architectural style in an effort to integrate the existing and new buildings into one fully functional unit. Further, the designs make use of readily available materials, standard construction techniques, and low maintenance features that when combined result in a highly energy efficient building and grounds.

A comprehensive visual impact assessment was prepared for the proposed project. The visual impact assessment characterizes the visual and aesthetic resources of the area surrounding the Belleayre Mountain Ski Center and the visibility and visual character of the proposed project, identifies the individuals and groups that may be affected by the project, evaluates the impact of the project on those resources and recommends mitigations if necessary. The Project has been designed to mitigate visual impact and improve the aesthetic quality of Belleayre Mountain. New ski lifts are streamlined to be lower in profile than the existing ski lifts, and will be painted colors that blend into the wooded landscape. Parking lots will be terraced and tree cover will be preserved to block views of the lots. External finishes of the new buildings will also be chosen to blend into the landscape, using earth tone colors and non-reflective glass. To prevent light pollution, outdoor lighting is designed to meet the standards of the International Dark Sky Association. Cut off light fixtures will be used in new applications, and the facility will not be equipped with lighting for night skiing.

TRANSPORTATION

"Ease congestion and transportation concerns"

Proposed parking facilities will be serviced with shuttle busses to reduce congestion at the ski area. Incentives are proposed to encourage car pooling in order to reduce traffic volume to the ski center. Park and Ride services from Kingston will continue to be promoted to reduce car traffic to the mountain.

EDUCATION AND OUTREACH

"Use the natural surroundings as a forum for promoting environmental education and increasing environmental sensitivity and awareness"

"Develop outreach that enhances the relationship between the ski area and stakeholders to ultimately benefit the environment"

The Belleayre Mountain Interactive Nature Center located in the Longhouse Lodge, is a seasonal, hands-on learning experience. The Nature Center invites everyone from local community, to area visitors, to school group and more to come, see and feel for themselves how fun and informative nature can be.

Environmental Education programs are regularly conducted at ski area facilities.

3.7 Phasing and Scheduling

Below is a chart identified as Table 3.7-1 which details a five (5) year plan for the phasing of the construction and implementation of the improvements, modernization and expansion of the Belleayre Mountain Ski Center as proposed in the most comprehensive alternative identified in Section 6 of this UMP, the Full Build-Out alternative. These proposed phases may be impacted from unexpected delays in funding, approvals, weather conditions, land acquisition, management decisions, construction/design issues, availability of materials or other unexpected delays. The completion of the construction and expansion of the projects set forth in the Full Build-Out alterative under this 5 year plan would result in the most site disturbance or impact at any one time. The adoption of a final UMP with one of the other alternatives identified in Section 6 herein would affect the project scope and scheduling.

Task	Year 1	Year 2	Year 3	Year 4	Year 5
Deer Run Extension Trail			x		
Tomahawk Ski Bridge			x		
Discovery Lift			x		
Replace Novice Lift #2				x	
Beginner Lift #3					x
West Trails and Snowmaking		x			
Belleayre West Lift		x			
Highmount Trails and Snowmaking			x		
Highmount Lift			x		
Replace Primary Electric	x	x	x	x	
Potable Water System Mods.	x				x
Parking Lot Upper Discovery		x			
Parking Lot North			x		
Parking Lot East				x	
Stormwater Collection & Treatment		x	x		
Stormwater / Storage Reservoir		x			
Pine Hill Pumphouse Mods.				x	
Upper Pumphouse Mods.				x	
Cathedral Glen Pumphouse Mods.				x	
New Lower Pumphouse				x	
Energy Management System	x	x	x	x	x
Compressed Air Facility	x				
New Transmission Lines	x	x	x	x	x
Discovery Lodge Expansion	x	x			
Summit Lodge Expansion					x
Tomahawk Lodge					x
Information Booth					x
Overlook Lodge Modifications				x	

Table 3.7-1 UMP Project Schedule