IDEAS FOR CREATING A SKI CONNECTION BETWEEN THE BIG BEAR MOUNTAIN AND SNOW SUMMIT RESORTS

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1. Content

2. Introduction

My name is Daniel Holoubek and I have lived in my home country, the Czech Republic, since being born 29 years ago. I have admired mountains, ski resorts, ropeway systems and skiing since my childhood and several beautiful mountain ranges in my country has been accompanying me until today. I have also spent several beautiful holidays in Austria, the neighboring country, where a completely different dimension of skiing opened up right in front my eyes. Although I studied the plastics technology and successfully completed the bachelor degree, I realized that my true passion related to the mountain environment and ski resorts is the key matter of my entire life. So I started creating my first proposals dedicated to the Czech ski area, but the possibilities for a more intense development are very limited. So I started addressing my next ideas and insights to the foreign ski resorts and this is how I finally got to researching the United States of American and Canada. If you asked me why I decided for the USA and Canada, my answer would be simple. The local ski resorts, from the large ones to the small ones, offer the most beautiful landscape and mountain atmosphere of all countries and continents. That is what I see in a large number of photos and videos all over the Internet. I also like the North American wildlife because my connection with nature has also been immensely strong throughout my life. As a life-time passionate skier and a great admirer of ski resorts and the strategy of developing them, and especially in terms of the lift construction and the renovation of aging devices, I would like to utilize all my knowledge and skills to contribute to the ski industry in some original and interesting way, which can happen through my creativity and ideas. If you were to ask me how I see the development of skiing in the future, I would answer that it would be important to establish an efficient, but also well-organized and environmentally friendly development, which could actually be called sustainable. However, I take concepts such as sustainability with great caution, because not everything that is considered dangerous now will eventually prove to be dangerous, just as not everything that is considered overall good in one era has to give the best results in the future. Experience based on reality is the starting point where I would personally start looking for the path of innovation.

As I already stated in the opening message, I noticed something very interesting during the process of creating the proposal for the complete reconstruction of the BBM Resort, and it was the immediate proximity of the neighboring slopes at Snow Summit. Although I was getting a clearer idea of what two possible ski links could look like, I considered the proposed investments within BBM Resort to be highly important and very expensive at the same time. Since I was not entirely sure whether all these matters could be combined together in any acceptable manner, I wrote my notes down, but subsequently postponed their completion until the near future, but an indefinite time period. I am pleased that the Alterra Mountain Company has decided to take such a step and I can add my insights with as much explanation and detail as possible at the moment.

3. Possible ways to achieve the planned connection

I have recently been reflecting more deeply on the upcoming connection. Finally I realized that there were two different ways to run the connecting lifts and expand the existing ski terrains in an amazing and maybe a little unexpected way. The individual options differ from each other in terms of the overall difficulty of implementation, which includes, among other things, the extent of the newly created ski terrains, or the economic and time requirements. Let me introduce them to you now.

3.1 Option 1 (the official plan)

The first option I originally thought of had a similar form to the official version. Although I never sketched it in a picture, I believe that I would lead the lifts in very similar tracks. My proposals always show a rough estimate while the resort operator and the professional project designers can adjust all the proposed lifts and trails to the final form so that the best possible result can be achieved. The main reason for this is that I only can study the online maps to search for some nice or reasonable lift and slope routing. So let me add several comments on your plan without any longer introduction.

First of all, I highly appreciate the planned Lift A, which will serve a few nice beginner slopes. I can imagine a fixed-grip triple or quad chairlift operating here which will offer a transport capacity in the range of 1,200 to 2,000 skiers/hour, but taking into account the possibility of a welcome upgrade which can executed at the chairlift No. 2 (i.e. the construction of a new device with a higher carrying capacity), I think that the ideal capacity may be found in the interval of 1,500 to 1,800 guests/hour at the design speed of 450 or 500 feet/minute. Otherwise, the traffic in the vicinity of Access Express could increase to the point where the quality of skiing experience may decrease. Therefore, I would recommend directing skiers using the Lift A preferentially to slopes 2, 3 and 4. My complementary idea then speaks about leading one more piste along the lower segment of slope 3 like the first figure suggests. And of course, the lower part of piste 3 could be realized wider too. Anyway, this remark is probably not so necessary, but I would consider Skytrac, Doppelmayr and Leitner-Poma to be the most suitable candidates for the supply of technology. A boarding belt can also become part of the equipment, but the speed of 450 feet/minute will probably not requite it. And if the adjacent slopes are wide enough, then in theory, in the case of replacing the existing Access Express with a more powerful device, the Chair 7 may be completely removed to make more room for descending skiers, or more precisely deputized by the new Lift A.

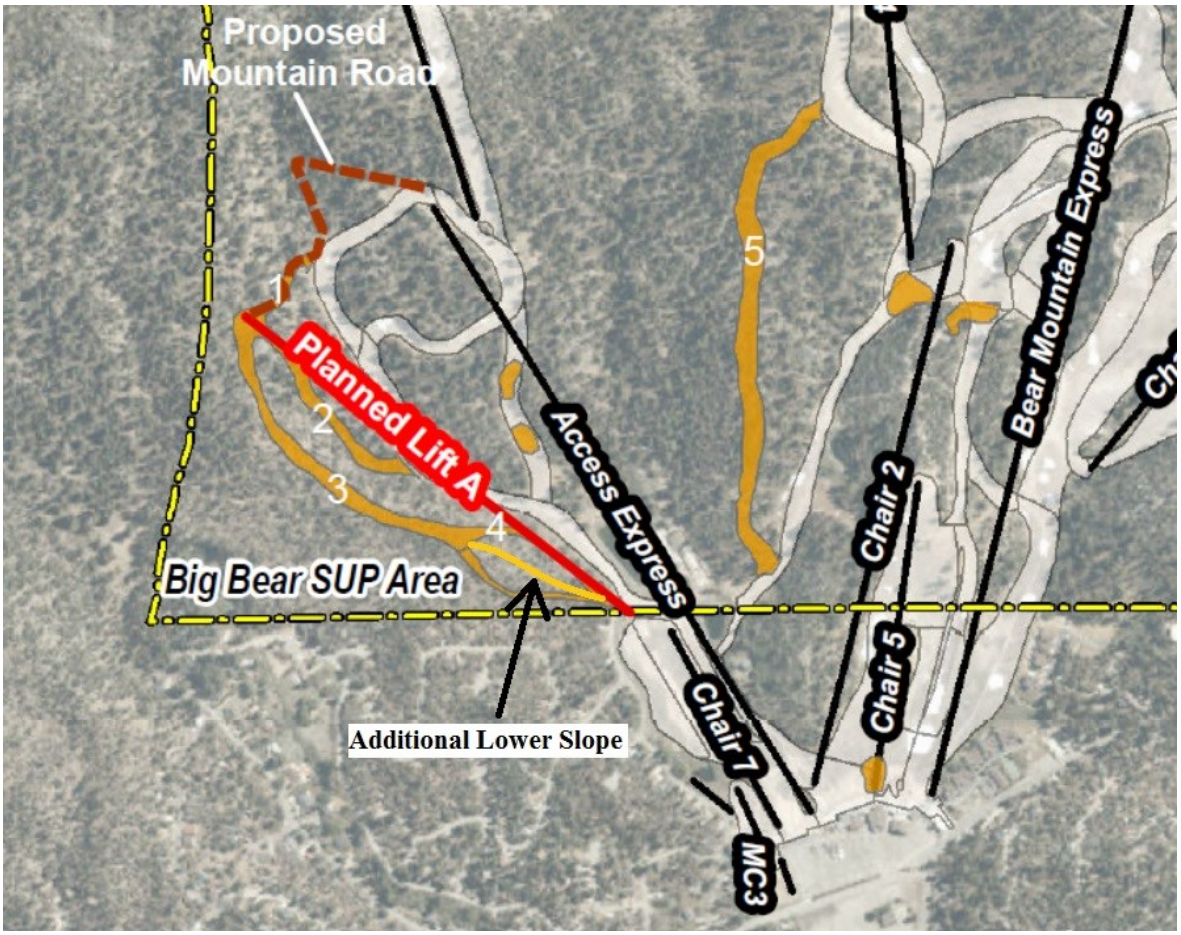

Fig. 1: Additional ski slope at the Lift A

I also praise the proposed mountain road, as well as the brand new slope 5, which will certainly attract a large number of skiers and further improve mobility at BBM Resort.

And now, let me move on to the connecting lifts. Well, the slopes which will be served by the Lift C look great and I truly believe that the entire result will be able to bring a lot of fun and joy to skiers and snowboarders of all ages and skills. Nice and elegant, the depicted downhill runs, as well as the first connecting lift itself, appear to perfectly fit in the landscape. I assume that the slopes will be wide enough to handle some reasonable carrying capacity of the Lift C. In my previous design, I expressed the expectation that the future Bear Mountain Express (BME) could take form of a 6-seater or even 8-seater chairlift which would increase the capacity to 3,200 to 3,600 passengers/hour, or even up to 3,800 people/hour. With the knowledge of the planned connection, I can state that the pressure I put on the new BME can be slightly relieved, which actually does not mean I would step back completely from the eightpack. Depending on the carrying capacity of Lift C, the BME may one day still become a powerful device, but there is a chance that the sixpack option may be sufficient for the following years. I have no idea how wide the new downhill tracks will be, but the official picture give me the impression that slopes No. 6 and 9 may be slightly wider. I am aware that this will logically increase the costs for the implementation, and technical snowmaking and grooming, but in addition to higher safety during skiing, such a step will also affect the guest comfort and the transport capacity of the Lift C. If you allow me to express my opinion on the possible technology, I would suggest two options here. The basic variant is based on the

construction of a high-speed quad (or sixpack) with a transport capacity of 2,400 to 2,600 skiers/hour so that there is no danger of unpleasant and dangerous overcrowding of the slopes. Sufficiently wide pistes, however, will allow the choice of a sixpack with a maximum capacity of 2,800 to 3,000 people/hour, where such a more expensive solution would definitely ease the onslaught of skiers on the BME. In any case, a maximum speed of 1,000 ft/min should be sufficient for the lift route of about 4,000 feet. If the upper station will be located on the ridge, it may be good to install its technology on a larger building partially sunk into the ground, where its interior will serve as a depot for chairs. A step like this will help your projects designers to establish a parallel exit from the chairlift without any problem. In addition, the compact structure will be more stable than a compacted mound of dirt, which should guarantee that the exit zone will not need to be repaired practically at all even after many years. If for some reason a reduction to the garage size is required, a smaller part of chairs can be garaged directly in the station contour. If the upper station is hidden on the second floor, the building can be equipped with photovoltaic panels generating a part of the consumed electrical energy. I would leave the lower station free in the space, i.e. with a high cladding, so that the situation is not unnecessarily complicated. I would definitely vote for the bubble chairs, but mainly if a 4-seater device with a capacity of 2,400 people/hour or a sixpack conveying at least 2,600 people/hour will be selected. Perhaps the tenth slope could cross the lift track just above the upper station, as indicated by the strong yellow-orange line in the next sketch, so that it is possible to realize easy and comfortable boarding on the chairs perpendicular to the lift line, possibly supplemented by a boarding belt, while the traction branch of the Lift C should be the right one in such case.

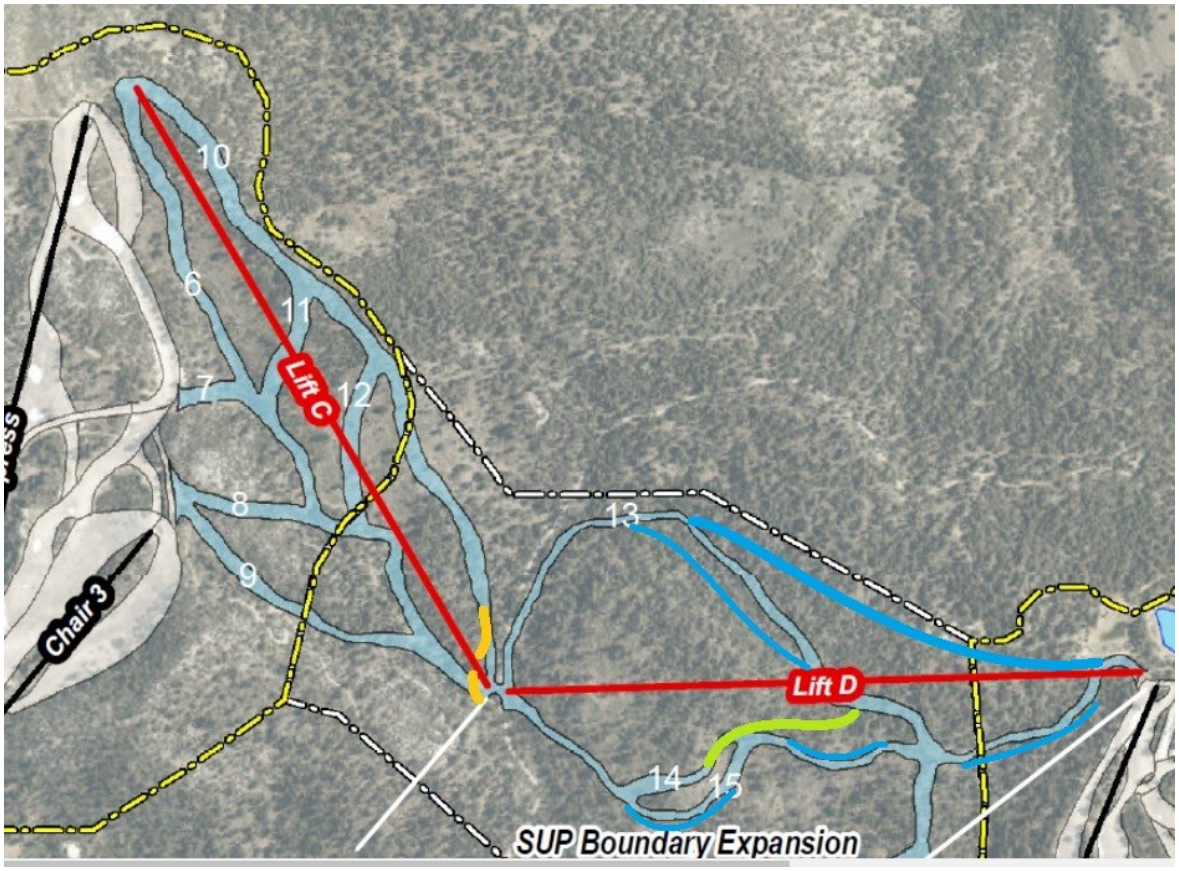

Fig. 2: Proposed additional changes in new ski terrains

By the way, on the official sketches, I see another option to get from BBM Resort to the Snow Summit slopes relatively easily, without having to take the Bear Mountain Express first. If skiers ride the more powerful chair 2, ride the BME track and then go to Chair 3, then they can be taken to the tracks No. 8 and 9, and finally be transported by Lift D directly to the top of the Snow Summit area. However, for this, it would be good to replace the existing Chair 3 with a new fixed-grip three-seater or four-seater, whose transport capacity in the range of 1,400 to 2,400 people/hour can improve the local traffic node to the highest skier satisfaction. But that is just the interval which I would personally look for the most suitable value in. More specifically, it is my impression that an uphill visitor flow of a theoretical hourly strength of 1,500 to 2,000 skiers/hour would be fully sufficient to satisfy both discussed purposes, i.e. ski recreation and approach function. As for the design speed, I am suggesting the value of 450 ft/min. Another thing is quite clear though. I don´t see much potential for any significant changes in the existing slopes at this point. So the upgrade can be only understood as a simple transformation of the old lift to the new and more efficient device. And I leave it up to the operator whether the name Showdown Chair (3) will be preserved or changed.

To be completely honest, I don't really believe that Lift D could achieve the same operational performance as the opposite Lift C. Even so, I would recommend widening some of the proposed downhill runs, perhaps the right ones, as well as adding one or two slopes on the left. The second picture indicates that, for example, the right-hand slope running under the marked intersection would not have to be divided into the two segments 14 and 15, which would then be connected again into one unit anyway, but that the 14th slope could possibly lead directly from the left wing, which refers to a similar situation to what I sketched with the light green curve. Doing this step, I am mainly aiming to ensure higher slope diversity, while all proposed modifications will lead to a slightly greater overall absorbency of the proposed pistes. The main goal here is to achieve a situation where the Lift D could be designed as a high-speed quad or sixpack offering a transport capacity from 2,000 to 2,400 people/hour, and of course without the risk of overcrowding the adjacent slopes. In the most optimistic case, the (terminal) value of 2,600 guests/hour may be considered, as again I assume that the user volume will consist of those who simply arrived to enjoy the slopes, and visitors who will only use the lifts only once to move to other parts of the entire ski area. The capacity of 2600 skiers/hour can be set immediately, or the chairlift can use some lower initial value in the first phase of operation, when the increase will then happen as a direct result of adding more chairs. But it is clear that the device would immediately have to be designed for the ultimate carrying capacity. Furthermore, the operator can also consider the application of bubble chairs, seat heating and either underground or above-ground chair garaging. As I stated many times in other proposals, I would highly recommend the option of chair garaging for better protection of the chairs from moisture, rain, snow, hail and wind, which can lead to their premature corrosion in long-term exposure, despite the staff taking a good care of them. The boarding belt may remain a question in this case, since I personally find it highly beneficial only if the chair interval is 8 seconds or less. As an enthusiastic skier, I would preferentially welcome bubbles on the Lift D, and especially if the chairlift will become a powerful device. Otherwise, it is just a great advantage as the 4,000 feet long line does not require bubbles so

much like, for example, it would be very pleasant to use the bubble chair at the future Bear Mountain Express, the backbone of the entire ski resort.

I am offering you the proposed changes leading to an acceptable expansion of the downhill tracks and the possibility to implement enough powerful lifts mainly because the overall rejuvenation of both resorts and implementation of their ski connection may one day exceed all current expectations, when a significant increase in the annual number of guests would be a reflection of huge success achieved with the executed projects, which may not be repeated in California for a long time. However, it may be very useful to build a new water reservoir intended for making snow on the slopes, but even such an act can be attributed to the ecological aspects of the planned project. Lakes and ponds can be found almost everywhere in the world, and among other things, they provide the supply of moisture to the air, which the necessary rainfall is then born from. But this does not mean that your area should have a problem with precipitation. However, if the total rainfall in some seasons is lower than it should actually be, this could also represent an argument in favor of building another water reservoir holding rainwater. As you can see, every coin has two sides and this coin would bring certain advantages to both the resort and nature, even if it was just able to support the harmonious character of precipitation.

For some reason, I don't see any Lift B marked in the sketch. According to the official report and picture, the ski connection should be created with a help of the two new chairlifts, i.e. Lifts C and D. The only idea I received here is that the possible Lift B could be hidden in the meaning of the replacement of one of either Bear Mountain Express or Chair 3 on the side of the BBM Resort, or one of the Chairs 7 or 6 at the Snow Summit Resort. Whatever the truth may be, the aim of this document is to express my opinion and comments on the official plan to connect the mentioned ski centers and at the same time familiarize you with the second option. The matter of the Snow Summit Resort reconstruction will be a topic of the next report.

3.2 Option 2 (the alternative draft)

When I was working on the design of extensive modernization of the ski infrastructure at BBM Resort, I had a certain awareness of the second possibility to create a very interesting connection with Snow Summit. Not all details were clear already, but I assumed that a ski connection like this should also include two lifts when speaking about the basic form. Although it is probably very bold to present to you the proposal of an alternative version when the official plan is already finished, but as you will learn below, it may have a great significance when bringing several benefits to the resort.

I have recently enriched my original proposal with one additional transport facility and one or two slopes dedicated to easy skiing in the highest part of the BBM Resort. As you may have guessed, the proposed ski terrains are spreading over the other side of both ski centers. Returning now to my formerly hazy vision, I found something remarkable. As a result, the lengths of outlined lifts and ski slopes would be even longer than I originally expected. There is no doubt that such ski terrains would certainly become the greatest winter attraction in California. Regardless of the number and width of the optimized slopes, the local ski terrains

would have several times the area compared to the officially planned interconnection. However, it is clear that the price for realizing such a project would be directly astronomical. That is why I am very pleased that the simpler option is already in the approval process. Who knows, maybe this version will finally come into existence at least in the distant future. But for now, let me introduce to you the three individual lifts which would be very costly in terms of both time and money. The approximate appearance of the new ski terrains is shown in the following picture.

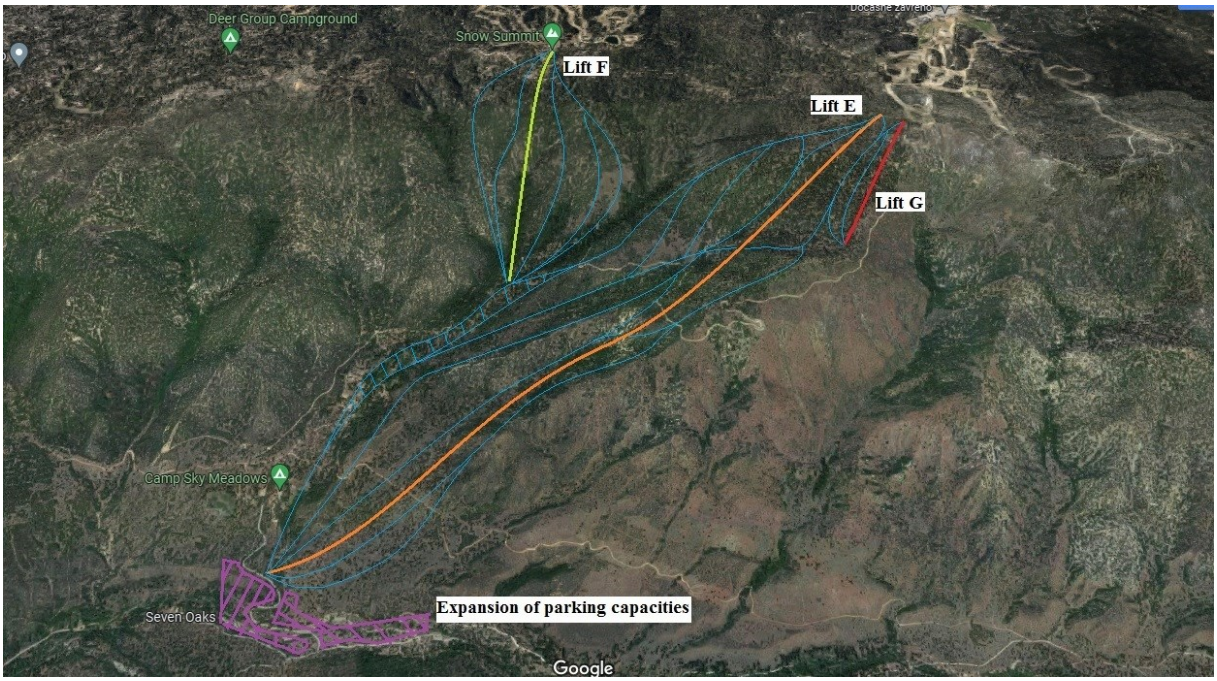

Fig. 3: New ski terrains above the Seven Oaks area

3.2.1 Lift E

According to the rough version of the second design indicated in the third image, the upper station of Lift E might be located very close to the upper station of Lift C, maybe in its immediate vicinity. With an estimated length of approximately 14,770 feet and an elevation of 2,660 feet, this would be the longest ropeway in the newly created ski area consisting of the BBM and Snow Summit resorts, and maybe all of California. The lift itself, which I propose in a form of a high-speed device with X-seater cabins due to its parameters, could run along Converse Creek to the area called Seven Oaks, where the lower station would be situated, if implemented in full version. You will learn later why I am suggesting so. Regarding my preliminary estimates, such a cable car could ideally serve 4 to 8 differently shaped ski slopes of a diverse profile. Although it would be possible to realize an intermediate station on the traction branch at some suitable place, where skiers preferring the upper slopes could board the cabins again, the lift should really lead all the way to the valley in order to implement some extensive and overall amazing downhill runs and establish an easy connection without the need of installing a short additional lift so that skiers can easily migrate between Lifts E and F. The exact positioning of the intermediate station would be a task worthy of professional project manager and their team. Among the most significant reasons for the construction of such a long lift may be the intention of making the whole area much more

attractive than it currently is, as well as large increase in the number of vacationers in winter or during the entire year, which may occur in the future and lead to the situation where the existing parking capacities at the BBM and Snow Summit resorts may not be enough. Such an unpleasant situation can be simply solved by addition of another sufficiently large parking lot by the lower station, when an outdoor parking area (or several smaller car parks) or a paid park house can solve the potential issue, when winter vacationers can get to Lift E almost immediately after leaving their cars. However, the price for parking should be considered carefully, because an excessively high price may encourage some visitors to choose a different resort, and especially if the price of the ski passes will increase too. The amount can also be included directly in the price of the ski passes, speaking about skiers using the paid parking area. In the best case, parking outdoors would be for free, but a proper calculation is needed for the final verdict. Investments in new ski terrains and ski link should certainly be reflected in the price of ski the passes. Anyway, it is clear that such long ski trails would be expensive and lengthy to make snow and groom. This is why I am suggesting considering the possibility of the intermediate station functioning only on the traction branch, when much more attention, effort and sources (i.e. water) could be directed to the upper slopes in terms of snowmaking and grooming, while the lower section would transport the winter vacationers to the upper slopes when the snow is lacking in the lower parts of the extended resort. In any case, both branches of the gondola should be adapted to some suitable and of course identical carrying capacity if the operator were to decide for summer operation as well. Downhill tracks should be laid out in the most interesting way so that they attract skiers of miscellaneous skill levels at first sight.

As for choosing the most suitable technology, I considered two basic options. The first of these leans towards a modern, reliable, swift and very comfortable monocable 10-seater gondola capable of providing a final transport capacity of around 3,200 passengers/hour, in a broader sense about 3,000 to 3,600 people/hour at the design speed of 6.5 or 7.0 m/s, i.e. about 1,280 to 1,480 ft/min. As you may have already guessed correctly, this means that some initial transport capacity accompanying the state of initially limited ski trail number could be found in the interval from 2,400 to 3,000 people/hour, when the increase can subsequently occur in the following years with the addition of cabins. It is also possible to have the gondola projected to some reasonable initial carrying capacity for the first phase of operation when using the (temporary) speed of 6.5 m/s, but with the fact that the entire technology will already be adapted to the future increase in both capacity and maximum speed of 7.0 m/s, the number of added cabins will be reduced. And if you find the initial parameters sufficient, the increase does not need to happen at all. Since the terrain may be a little more challenging in some of the track sections for guiding the adjacent slopes, the transport capacity would need to be considered very carefully with reference to the final (expected) result. The ride up at full speed should have taken between 12.5 and 14.5 minutes even with the existence of the intermediate station, and only 11.5 to 12.5 minutes if there is no mid station on the traction branch. In terms of overall comfort and reliability of the entire operation, the most luxurious result would be brought by the D-Line gondola from Doppelmayr equipped with spacious OMEGA V-10 SI, but negotiations can also take place with Leitner-Poma or MND Ropeways. I would personally consider the use of less than 40 towers to be a technologically

great result even with a middle station on the traction branch, which could be introduced as one of the conditions for bidders to supply the technology. Leather upholstery and heated seats would certainly become immensely pleasant and very welcome features in skiers´ eyes. As I am actually proposing the expansion of the entire infrastructure within the ski complex, in addition to other parking areas, the lower station of the long gondola could be located in a large building, which, besides the station technology and the garage hall for all the cabins, could also include ticket offices, a restaurant, a ski bar, toilet rooms, a rest room with Wi-Fi connection, and a locker room with lockers in which arriving visitors can leave their shoes, backpacks and luggage of all kinds, as well as other things they don't need while skiing. But the ski bar could with a great advantage be located at the top of BBM resort or Snow Summit, so that resting skiers can enjoy beautiful views of the surroundings from a higher altitude while having a drink and a snack. I didn't mark the existence of the ski bar anywhere, because it would depend purely on the operator where it would be best placed. After all, both BBM and Snow Summit resorts can enjoy their own high-altitude ski bar.

The upper station can be realized in an open space, equipped with a high cladding so that its structure won´t disturb the naturally harmonious appearance of the landscape. It is obvious that the top station of such an efficient gondola would require much more space than a chairlift. However, a part of the station terminal can protrude from a short station building, which will provide a great protection to skiers exiting the cabins from freezing and strong winds, snowfall, or spring rain. Thanks to this, snow and rain won´t be allowed to enter the cabins through their open door. At the same time, it would be good to adapt the lower station (or both the end stations) for the use of solar energy. I would expect a fairly high energy consumption at the new gondola, and therefore the operator can do something useful for meeting the energy requirements with the assistance of solar radiation, but only on the condition that the investment will really save finances in the end. Designing the possible intermediate station as a very simple object, I wouldn´t expect the photovoltaic panels here. The last place where solar panels can occur is the cabins. As you can see in the fifth figure, the solar units of limited size can be placed right on the roof of cabins, specifically next to their suspension. Such a technological sensation could help, for example, the process of heating the seats, if the procedure is well automated and regulated, and the collected energy is used in the lower station when skiers board. But such a remark is only a hypothesis at the moment.

Fig. 4: A protruding station terminal

Fig. 5: The way of installing photovoltaic panels on the cabin roof

I have to admit that I also reflected on a very luxurious system, which is the TRI-Line technology from Doppelmayr (see the sixth picture). The company officially presented this

product on September 7, 2022, which most of the components from the detachable D-Line devices were used for. The D-Line chairlifts, gondolas and combined lifts were introduced to the world market in 2015. Actually, it can be stated that TRI-Line systems were developed to combine the qualities and advantages of both three-rope (3S) gondolas with D-Line products, while offering an enormous carrying capacity, but with a smaller footprint and lower costs than 3S lifts. The cabins themselves are meant to bring all elements of the most modern gondolas using the OMEGA V cabins with those of the Atria 3S cabins together. The suspension uses two detachable D-Line grips and eight running wheels. The customer can order the cabins equipped with electronic sliding doors on both sides, which can be advantageously used especially in the urban transport requiring a very high transport capacity. The cabins can accommodate up to 20 passengers, where 12 of them can take a seat and 8 has to stand. The TRI-Line technology keeps on utilizing the D-Line stations, but they are adapted to accommodate track ropes and larger cabins. Unlike the 3S gondolas, the new system works great with tubular towers reducing the footprint, which brings some great advantages in the construction phase, such as the suitability of the components for air transport, or the ability to place the towers in places where the terrain would be extremely difficult to create a concrete foundation for a lattice tower of the 3S gondola. I also hope that the choice of such a technology will be reflected in the need to set up fewer towers than with the monocable gondola. The Direct Drive gearless technology, Doppelmayr Connect controls and AURO autonomous operation are all compatible with TRI-Line devices to make the operation best managed, absolutely safe and as smooth as external circumstances allow for. The properties of D-Line devices can be simply summarized as follows:

- **High throughput:** The theoretical capacity of a TRI-Line gondola can reach up to 8,000 passengers per hour and per direction at the maximum speed of 7.0 m/s. This is what makes the lift unique in the field of the ski industry.
- **Great compatibility:** TRI-Line devices are based on the D-Line product line. Their compact stations and other components allow for low impact on the ground.
- **Enhanced fluidity:** Both processes of boarding and exiting from the cabins can be very fluid and effective due to having electric doors on both sides. This opens up completely new possibilities for managing passenger flows.
- **High degree of digitalization:** TRI-Line systems are connected cable car systems. All cabin functions can be integrated and controlled directly with the Doppelmayr Connect control system.
- **Advanced autonomy:** If the customer wishes for reducing the number of operators on duty, it is a very easy task due to the AURO concept. Detectors are meant to control the entire operation and put the lift out of order immediately after detecting a deviation from the usual state of operation. The deviation means, for example, the situation when a skier (or a passenger in general) struggles to get on the chair, board the cabin, or exit the lift. The whole operation is managed from the ROC (i.e. Rope Operation Center), where the operator notices the problem and decides to continue the operation as soon as the matter is solved.

Fig. 6: The TRI-Line gondola system from Doppelmayr

I have just briefly presented all the proposed options and elements. If you are interested in more detailed information, you can read the source articles, websites and videos.

Source 1: *TRI-Line – The best of two worlds; from the Doppelmayr official website, cited on September 25, 2023*

https://www.doppelmayr.com/en/systems/tri-line/

Source 2: *Doppelmayr Introduces TRI-Line Three Cable System; from the www.lift-blog.com website, pub. on September 7, 2022, Peter Landsmann, cited on 25 September, 2023*

https://liftblog.com/2022/09/07/doppelmayr-introduces-tri-line-three-cable-system/

Source 3: *TRI-Line by Doppelmayr; from the www.remontees-mecaniques.net website, pub. on September 8, 2023; Rodo_Af, cited on 25 September, 2023*

https://www.remontees-mecaniques.net/accueil/actu-nouveaute-tri-line-by-doppelmayr-214.html#

Source 4: *Doppelmayr/Garaventa - TRI-Line - English (2023); from the official Doppelmayr YouTube Channel, pub. on April 19, 2023, the link added on September 25, 2023*

https://www.youtube.com/watch?v=0kW3sVEILlQ

When I started gathering all my ideas for the second option of connecting the BBM and Snow Summit ski resorts, I noticed the area of Seven Oaks Trail and Camp Sky Meadows. The whole area seemed so interesting for all year round visitors that I immediately decided to research some more information to get a better picture of activities which the guests can decide for outside the winter season. Let me quote some of the most interesting information

from the official Camp Sky Meadows website that sparked my vision for an overall improvement to year-round tourism.

"Sixty miles of trails and fire roads provide excellent opportunities for viewing wildlife and native plants. One can walk through valleys and along ridge tops, through woodlands, sage scrub and grasslands. Camp Sky Meadows is located on 25 acres in the Barton Flats area of the beautiful San Bernardino Mountains (5,800 foot elevation) and is a place where people of all ages can escape the pressures of urban life, find peace, and experience solitude in natural surroundings. Camp Sky Meadows has picnic areas, a large swimming pool, an outdoor BBQ, children's playground, horseshoe pit, softball field, volleyball court, and a hillside amphitheater that provides a perfect location for campfires and worship services. Our camp offers a perfect overnight retreat for groups of up to 122 people (more if camping in tents). The facilities consist of a main meeting/dining hall that can seat up to 140 for meals and 225 people for day-use meetings. For overnight stays, there are two lodges and four dormitory-style cabins."

This was exactly the case when the introduction alone managed to get me very interested in the area and the entire matter. Therefore, I looked at the photos published on the mentioned websites, but since I am naturally a little distrustful of advertisements and their credibility, and also because of past experiences, I also found some photos on Google. I also looked at the facilities at some of the lodges and cabins, such as Manzanita Lodge and Whispering Pines, and ended up realizing that the facilities were very advanced. Unlike many camps in my country, there are practically no restrictions on food preparation or hygiene. There is even a swimming pool available for summer visitors. This is amazing. And when it comes to the Seven Oaks Trail, in addition to being an avid skier, I am also an equally avid hiker. Therefore, I will definitely like the trail if I visit it one day. So I came to a currently very general conclusion. I am of the opinion that both Seven Oaks Trail and Camp Sky Meadows should be further supported, as they can potentially play an important role in improving year-round tourism in the area if the Lifts E, F and G are built one day. Since I don´t intend to disturb the rural tranquility prevailing in the camp, the whole plan of a ski connection in such a generous form would have to be prepared and brought into existence very carefully and respectfully to the entire area and the local landscape. This would be a very delicate matter for sure. Winter and summer guests preferring more luxurious accommodation including the full board or half board, and holiday rush would have to be directed to mountain hotels and guesthouses, so if necessary, other investments could bring an expansion of modern and large-capacity accommodation facilities, but definitely outside the Seven Oaks area. The new hotel or guesthouse could be located on the existing busy side of either Big Bear Mountain or Snow Summit ski resort. However, some of the winter guests are willing to take care about their meals on their own. As the lodges offer the possibility to use a fridge and a kitchen, there is no problem for them to do so. So if such skiers and snowboarders are allowed to stay at Camp Sky Meadows, then one ski slope should pass right around it so that they can get from their calm accommodation directly to the bottom station of Lift E.

On the other hand, there are also plans to establish a bike park. Although I previously proposed to implement it directly on the territory of the BBM Resort, which I still consider very beneficial, I can also imagine a very long track for MTB descents along the suggested

gondola, regardless of what technology would be chosen for the Lift E. I believe that mountain bike descents are mainly sought after by young adventurers looking for an adrenaline rush. However, the younger generation, at least from what I observe, is not necessarily looking for the highest level of comfort equivalent to a four or five star hotel. A vacation at Camp Sky Meadows including the use of the gondola for adrenaline MTB descents and reaching the top of the BBM Resort, as well as swimming, BBQ parties and hiking could be just what they are looking for. Hikers and other tourists could take the gondola to reach the peaks and execute some nice walks and hikes at the high altitude if they are allowed to. In the future, I would therefore suggest a slight expansion of Camp Sky Meadows and, in case of choosing a monocable 10-seater D-Line gondola from Doppelmayr, the operator will be given the opportunity to use the Bike Cabs, the special vehicles as one of them is depicted in the next figure. The principle of using Bike Cabs is captured in the video from the link attached right below the image. Simply described, a central rack rotates as the cabin passes through the boarding zone so that bikers are enabled to hang their bikes on it and board the following cabin. One Bike Cab on a 10-seater gondola can accommodate eight bikes. I am not really sure now, but there is a chance that Bike Cabs could also be used for TRI-Line devices with 10-seater cabins. In any case, what lovers of adrenaline downhills wouldn´t appreciate the opportunity to enjoy a very long track of an interesting profile, with the possibility of nearby accommodation? But that is already a question for the operator, and partly also for the future.

Fig. 7: The Bike Cab designed by Doppelmayr

Source 1: *Transport of all kinds of sports equipment – Bike Cab; from the Doppelmayr official website, cited on September 25, 2023*

https://www.doppelmayr.com/en/technology/bike-and-sports-equipment-transport/

Source 2: *Doppelmayr/Garaventa - Bike Cab - English (2021); from the official Doppelmayr YouTube Channel, pub. on May 5, 2021, the link added on September 25, 2023*

https://www.youtube.com/watch?v=Xl7N8-xGoVo

As you can sense from the previous paragraphs, there are actually many possible ways to improve year-round tourism and MTB downhills. In addition, horse rides may also take place in the vicinity of Seven Oaks or the two existing ski resorts, if it isn´t possible now. However, the proposal is very fresh and I cannot add any further details at this time.

3.2.2 Lift F

Point B refers to the proposal that would definitely please all fans of more demanding ski terrains. Its essence is the construction of an approximately 5,380-foot-long Lift F on the side of Snow Summit, where the elevation gain should be approximately 1,860 feet. The adjacent downhill runs can be shaped very differently compared to each other, so that they are suitable for a larger range of skiers, i.e. from the experienced ones to the skiers with average skills. Therefore, at least one of the new ski slopes should lead in a bigger circle to offer a gentler slope, as well as the longest length. Such a step can be considered a fairly easy profile correction. Since I see the possibility of establishing three to five slopes here, the carrying capacity of the Lift F could be found in the range of 2,400 to 3,000 people/hour, and I am thinking of the design speed of 1,000 to 1,196 feet/minute. In any case, I consider the number and width of pistes to be a very important factor since the slopes should be wider due to the generally more demanding profile, and for the maximum safety of skiers. When it comes to choosing the most suitable technology, there are three different options for further consideration.

The first option speaks about the construction of a high-speed quad or sixpack, which should actually be the least expensive, yet still a great option. The driving comfort can easily be increased by including bubbles and heated seats in the equipment of the suggested device. The velocity interval should not differ from the expectation given. Regarding the estimated route length and the considered capacity of 2,400 skiers/hour and more, I would definitely prefer a sixpack. In order to save space in the area of the lower station, perpendicular boarding lanes can be implemented, but an alternative to this would be the choice of a curved station, as the eighth image outlines. And if the lower station would be, by any chance, located in the station building, the number of first compression towers can be simply reduced due to pulley batteries attached directly to the frame of the station building. The solution shown in the next picture will be helpful whenever the terrain is way too difficult for the implementation of a compression tower or a larger number of them, or on the contrary very flat when the existence of the first compression tower can be conveniently avoided.

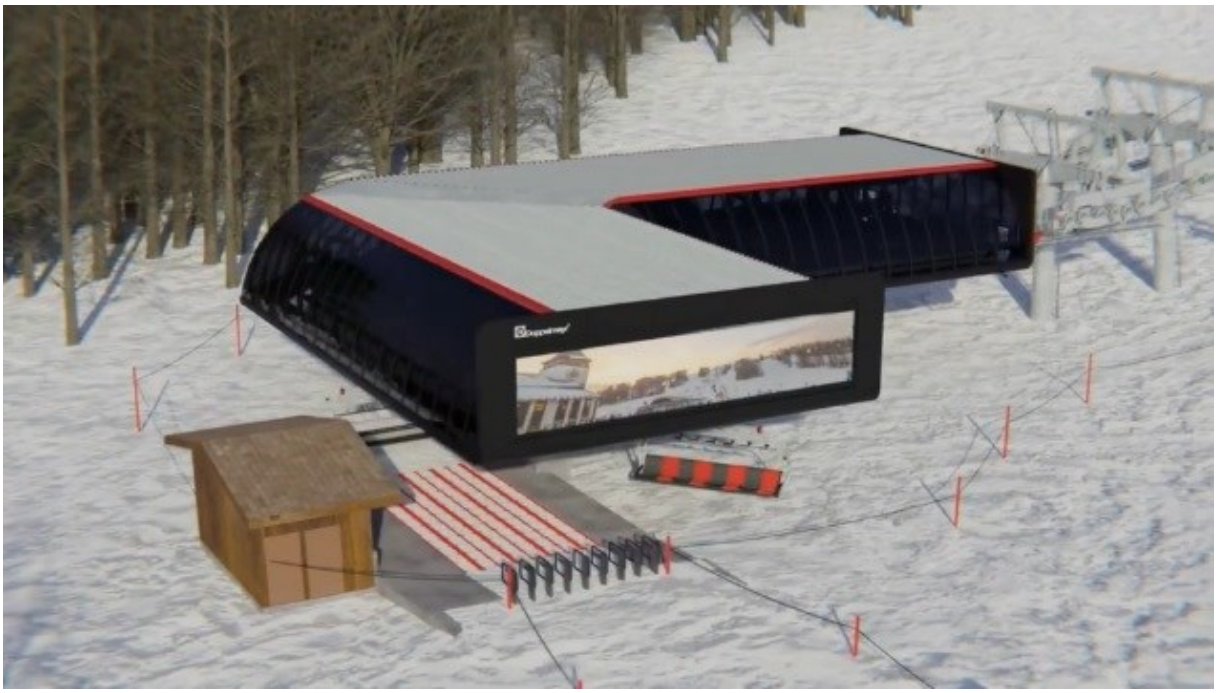

Fig. 8: The curved lower station at a D-Line chairlift

Fig. 9: A lower station complex realized without the first compression tower

The second option consists in choosing an 8-seater or 10-seater gondola with a design speed of 1,100 or 1,200 feet/minute. Although the production of its technology would be more expensive, gondola systems in general are perfectly adapted to almost any of challenging or highly difficult terrains and, moreover, can easily transport visitors in both directions even when there is a lack of snow on the adjacent slopes. However, settling a longer station technology into a potentially spatially limited valley may become very tricky. I have to emphasize that a very important traffic node should be created directly in the valley, ensuring easy migration of skiers within the entire area. Simply written, besides the slopes served by the Lift F itself, skiers should be allowed to get from the top station of Lift E to the lower station of Lift F, as well as from the lower station of Lift F to the valley station of Lift E while

passing through the valley. By the way, the valley itself may be suitable for the implementation of one very wide slope indicated by the blue hatched segment, which can easily absorb the entire volume of skiers. I would also expect higher resistance to harsh weather conditions from the gondola, and especially higher wind stability. Although I usually recommend the vehicle garaging for any detachable lift, I always put an exceptional emphasis on the gondola systems. Both gondolas and combined lifts often have similar options.

The third alternative represents a compromise between the two previous options. Its essence is now a system called a chondola, where several chairs are followed by one cabin. In this case, I would suggest choosing 6-seater chairs and 8-seater or 10-seater cabins. If the spacing of cabins alone ensures a capacity of at least 800 people/hour, then during any time period when all adjacent slopes are closed due to the lack of snow, the Lift F can be operated purely as a gondola, where the chairs remain in the garage while nothing prevents the cabins from circulating and transporting the guests in both direction in the same hourly amount. Such an opportunity would certainly depend on several indisputable factors such as the full carrying capacity, the design speed, and the ratio of chairs and cabins, where all of this determines the exact cabin distance (interval), the key aspect. However, the end stations of the chondola could again be relatively large. However, if the maximum velocity is limited to 1,000 ft/min, I would also expect a reduction in the length of the station terminals which could really help the entire planning process. In my personal and honest opinion, the best case scenario is the situation where the Doppelmayr technology (ideally the D-Line device) is selected, because the operator can choose a double access to chairs and cabins, which means the existence of two separate boarding zones. While the first group of skiers gradually gets on the chairs in the inner station arch, i.e. perpendicularly to the track and with the assistance of a boarding belt, other passengers enter the cabins on the outer contour. The situation is documented in the tenth attached photo. The exit zone can easily be left uniform, which means parallel to the lift axis where the exit belt won´t be required.

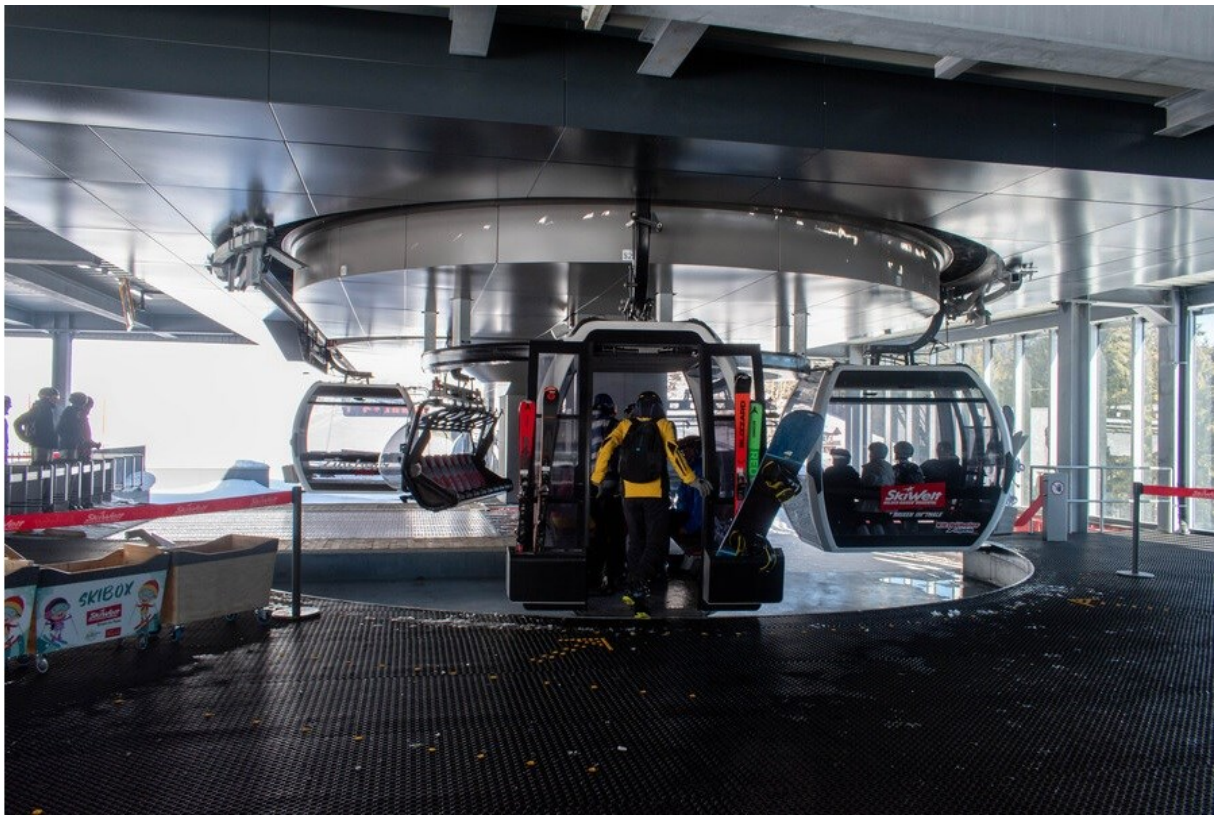

Fig. 10: Double boarding at a D-Line chondola

And now, I would like to add some additional considerations. If the operator desires to have chairs, cabins or both garaged at the lower station, despite the fact that the area needed for the establishment of the complex and all projected slopes may be limited, an alternative solution would be to move the lower station to the sloping terrain where it will sit on the garage hall partially sunk in the ground. The hall should be large enough to accommodate all the vehicles. In this situation, it would mean that while skiers using the Lift F would arrive comfortably from its slopes directly to the elevated boarding platform, skiers coming from BBM Resort would have to ascend to get there. That would be a bit complicated, but if solved somehow, even this kind of vehicle garaging can be very useful. For those who would like to go down the local slopes and continue all the way down to the lower station of Lift E, the elevated boarding platform would make no difference to them as they would simply go past the structure while missing it. On the other hand, the vehicles may also be parked on the elevated rails right above the bottom station technology, which can be hidden in a building standing on the strong concrete foundations. Otherwise, if the circumstances require the chairs and cabins to be garaged in the upper station, it may be advantageous to do so with the help of a hall partially sunk in the ground like I mentioned for the lower station, which the top station technology will be installed on. The elevated surface will allow the professionals to adjust the exit zone to the smallest details, and most importantly without the need to use a large amount of compacted dirt to ensure that the upper station can finally stand on a sufficiently elevated surface together with its comfortable exit zone. The main goal here would to avoid a situation where another compression or support-compression tower has to stand directly in the arrival to the upper station, which I have also seen before and I don't consider it to be the smartest and most elegant solution. This sometimes happens where the area around the top station is

too flat. I believe that it might have occurred in Italy and Austria, but I am not really sure now where it exactly was. All other details can be adapted to the overall possibilities and budget set for the project.

3.2.3 Lift G

Like I mentioned at the very beginning of this chapter, I decided to include the Lift G after my deeper reflections. I was convinced of its utility by the assumption that there were a relatively large number of ski trails intended for intermediate to advanced skiers in both ski areas. According to the maps, the upper part of the currently unused slope should be of a gentle nature, and therefore I came up with the idea of establishing one or two additional slopes served by an about 3,350 feet long device running almost parallel to the long gondola. The elevation gain is estimated by the map at 560 feet, which promises very pleasant, almost beginner pistes. However, if two slopes are prepared for winter sport seekers, it is realistically necessary to expect a situation where these two neighboring facilities would share the majority of one of their slopes. The choice of the most suitable technology would therefore be highly influenced by the number of skiers that a medium-length chairlift can theoretically transport. I would then estimate the useful capacity at 1,400 to 2,000 people/hour, and in one breath I must emphasize that the hourly flow of skiers should definitely not exceed 2,200 skiers. Otherwise, the risk of having to establish a greater distance between these two lifts may arise, which could make the whole situation more difficult, and in the worst case scenario, it could threaten to disrupt the compact nature of the entire ski trail system. With regard to the selected capacity, you can consider the options of a fixed-grip chairlift with three- or four-seater chairs, or a high-speed quad. If the operator is willing to choose the option of a detachable system, then I have to point out that I consider the lift to embody more of an additional device, which would be a reason for me to suggest the simplest option in the form of bubble-free chairs with the absence of seat heating and the boarding belt. On the other hand, the loading belt would certainly ensure a great boarding experience at the fixed-grip chairlift capable of working at the velocity of 500 ft/min. If the operator explicitly requires a chair parking of some sort, the alternative of having the chairs parked in both lower and upper stations, possibly accompanied by a parking rail for the remaining chairs, should be an elegant and fully sufficient solution, regardless of the selected technology producer.

In association with the detachable technology, I am also thinking of the possibility of reinstalling some well-preserved used detachable quad, which can be relocated from BBM or Snow Summit due to the construction of new lifts, or another ski resort anywhere in the United States of America or Canada, just after receiving at least a basic renovation. What I would really intend under the term of basic renovation is the replacement of electrical wiring, thorough treatment of rusty parts, better adaptation of old control/command units to the current demands and trends, and finally the replacement of old seats and uncomfortable steel straps representing the back rest for the new fully upholstered seats. As you can see in the penultimate picture of the document, even a detachable CTEC device can look and work great after a major upgrade. The operator has therefore quite a large variety of options to choose from in case of their interest.

Fig. 11: A detachable CTEC quad after renovation

Rough estimates of the parameters of the proposed connecting lifts from the second option are recorded in the summary table added separately, where all the sketches are also included, so that you can see all these images in a large format and further zoom in if necessary. At the same time, I would like to point out that the given data are only indicative and may differ in reality, as well as the sketched lifts and slopes can lead on (slightly) modified tracks if necessary. All pistes are drawn in blue because the black lines at Lift F were not well visible. So I chose the blue color purely for the quality of the representation, but without any reference to the actual inclination or the overall difficulty of the outlined slopes. The individual blue curves can be understood as the possibilities for the realization of new slopes, while their shapes themselves represent more of the axis of the intended slopes without taking their exact width in account. The opinion of professional project designers would be needed to determine all further details. Among other important parameters, I also included the average slope of the route [°], which I determined based on the calculation from the mathematical relationship for expressing the trigonometric function sin α. I hope the values obtained are correct.

4. Conclusion

As anyone can imagine, there are two possible ways to improve Big Bear Mountain and Snow Summit Ski Resorts. The first of them means the replacement of the aging lift infrastructure, while the second one is based on the creation of a direct ski connection. Thanks to the second mentioned step, completely new ski terrains can be introduced into the area to expand the

range of ski trails. I am very pleased that there is already an official plan for the implementation of the second step, possibly even the modernization of the existing lifts, and that the wide public is being given the opportunity to comment on the outlined plan. Therefore, let me now summarize my ideas and insights.

The first option of reaching the connection, i.e. the officially discussed way of developing ski potential of the area, is very simple and much easier to achieve in terms of time and money, at least in its basic nature. Thanks to it, two connecting detachable chairlifts C and D will be added, serving quite a lot of new downhill runs. Since these lifts will be in a direct contact with the Bear Mountain Express on the side of Big Bear Mountain and Chairs 6 and 7 belonging to Snow Summit, these lifts would also deserve to be replaced with modern and more powerful devices. I like the idea of implementing the beginner Lift A, and if I am not mistaken, Lift 1 is supposed to be removed in order to allow for a welcome upgrade and at the same time release the pressure exerted on the local slopes. However, I also consider the presence of Lift 7 to be slightly negative, because the width of the actual slope may become dangerously limited in the case of a possible replacement of Access Express with a more powerful system. However, if the Lift A offers a sufficient carrying capacity and serves sufficiently wide downhill runs, the situation can probably be solved relatively easily. Moreover, the operator can consider the replacement of Chair 7 by a button lift or a T-bar moved to the left, where the slopes end and forests begin. The matter of Lift B remains a bit of mystery to me, but maybe I am just overlooking something at the moment. The only thing which comes to my mind now is the idea of replacement of one of the existing lifts, maybe in a modified route. If you could give me a little hint, I would be grateful to you. As you read in the chapter dedicated to the official plan, apart from minor adjustments in the downhill tracks, there is nothing more I would suggest changing. And as I indicated, I will release my ideas for rejuvenating the Snow Summit area as soon as I have a clear idea.

I also described an alternative option which would bring a much more significant expansion of possibilities for skiing directly on the opposite side of the mountains. However, the indisputably higher costs of implementation and operation should be balanced by even greater enthusiasm of the clients of both connected ski resorts, leading to a significantly higher and stable all year round guest number. Not only that the local terrains appear to be great for skiing, they may also be used for summer operation. In addition to hikers reaching the nearest peaks and hiking along some informative trails equipped with information boards providing them with the most interesting information on the local ecosystem and wildlife, the new gondola could be highly appreciated by MTB riders, for whom an exceptionally long track full of turns and opportunities to execute bold but save jumps may be prepared. Camp Sky Meadows might also benefit from the expanded sports center as seeing an increase in the number of guests. However, if the alternative plan is eventually selected, I would really like to preserve the peaceful rural atmosphere here. Modern sports centers are being built almost everywhere in the world, and that is why it is extremely important to protect quieter, almost traditional leisure time and resting places. There are quite many options for optimizing the specific plan, so I emphasize that it will be good to look for the most effective, but acceptably invasive solution. On the other hand, my statement doesn´t exclude the realization of the more demanding ski connection. If the construction of the two connecting Lifts C and D is

considered to be an overall better option, perhaps also through the economic side of the project, nothing prevents Alterra from seeking all the necessary permits and approvals. However, I have to note that mainly because of the possibility of expanding parking capacities at Seven Oaks, the second option can be kept in reserve since it can help the operator cope with the increasing all year attendance and ski traffic on the existing slopes at Big Bear Mountain and Snow Summit. This would be the greatest reason for me to consider the construction of the three incredible Lifts E, F and G (and their downhill runs) the most convenient step leading to the stabilization of the whole situation, as well as a great opportunity for the entire ski area to further expand, and an amazing and unexpected gift for visitors of all age groups throughout the entire year. Perhaps the bike park may be relocated here one day. Then I would no longer talk about the establishment of a ski connection, but rather about an expansion with the pleasant side effect of another ski connection. But I can definitely imagine the second option coming into existence too. That is all for me, and now it is entirely up to you whether Alterra will re-evaluate the existing plans or keep the more challenging version for further expansion of the ski terrain.

5. Figure list

6. Acknowledgement

I want to thank both the Alterra Team and the US Forest Service Members for devoting their time and attention to my designs. If any questions concerning the ideas given arise, please do not hesitate to contact me. I wish the members of both Alterra and the Forest Service the best of luck and success in their mission fields, and a pleasant negotiation leading to the full satisfaction of both parties, as well as the general public. Likewise, I wish all of you great autumn months.