

# **Increase Business “Profitability” for Big Mountain Resort by Improving Visitor Distribution through Additional Chair Lift**

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## **BACKGROUND**

Big Mountain Resort locates in northwestern Montana. It offers spectacular views of Glacier National Park and Flathead National Forest. The resort originally opened in 1947 with an annual snowfall of 333 inches and 3,000 acres of skier and rider accessible terrain. It offers access to 105 named trails and vast bowl and tree skiing. All these are serviced by 11 lifts, 2 T-bars and 1 magic carpet for novice skiers. The longest run is named Hellfire and is 3.3 miles in length. The base elevation is 4,464 feet, and the summit is 6,817 feet with a vertical drop of 2,353 feet. With a terrain rating of 12% beginner, 38% intermediate, 44% advanced and 6% expert, this mountain can accommodate skiers and riders of all levels and abilities.

Big Mountain Resort has recently installed an additional chair lift to help increase the distribution of visitors across the mountain. This additional chair increases their operating costs by \$1,540,000 this season. Every year about 350,000 people ski or snowboard at Big Mountain. This business profit margin is 9.2% and the investors would like to keep it there. The business is eager to get your recommendations on recouping the increased operating costs from the new chair this season. Additionally, what can they expect this years' annual revenue to be if they make the changes you recommend? This project is used to evaluate the impact of the additional chair lift on the cost and propose a way to mitigate the issues by increasing the cost.

## RECOMMENDATION

Based on the analysis of data, we recommend adding additional chair lift based on the following reasons:

- The Big Mountain Resort has the largest snowfall area resort. However, the average area covered by per person per chair was lowered than other resorts. The additional chair lift could help to improve the visitor distribution and send people to more places.
- Since the average area covered by per person and per chair was high, all the chair lifts need run faster to distribute the visitors. The lifetime of the chair lifts would potential reduced. If this happens, the distribution of the visitors will be even worse. Additional chair lifts could extend the lifetime of current chair lifts by reduce the running speed.
- Based on the projection of statistical model, at least four more chairs lifts would be needed to get the 'standard' coverage area.
- The overall operating cost would increase 0.5% by installing the chair. However, this cost could be offset by attracting more people through improving distribution of people with additional chair lifting, or increase ticket price \$4.4 per person. The increasing tickets price was about 6.3%, which was still significantly lower than other resorts.

As a conclusion, we recommended to add additional chair lift. The increasing of operation cost will be offset by either increasing the ticket price or attract more people.

## DETAIL

During this project, we will compare the effectiveness of chair lifts with other resorts. If the Big Mountain Resort need additional chair lift, the effectiveness of chair lifts should be lower than other resorts.

After the additional chair lift was built, the operation cost would increase. To offset the increasing of operation cost, either more people would come, or increase the ticket price to a certain range. The comparison of ticket price in Big Mountain Resort with other resorts would be used to convince the shareholder about this activity.

In this project, python with Pandas, Numpy and Matlibplot.pyplot were used.

### I. Data Wrangling

Data Wrangling is the first step to import data. The data was provided by Springboard as "us resort data. csv". After data was imported, there were 24 columns and 303 rows. Further investigation found that there were 'null' present. After the 'null' value were dropped. There were 24 columns and 41 rows left for the data.

### II. Exploration of Data Analysis

There were four steps in this process.

- Exploration of each individual variable
- Assessment of the relationship between each variable and the target variable
- Assessment of the interaction between variables
- Exploration of data across many dimensions

The results were shown in Table 1:

Table 1. The Ranking of Big Mountain Resorts

Name	Ranking
Total skiable acres	1
Total area covered by snow making machine	1
Night skiing area	1
Adult weekdays ticket price	5
Adult weekdays ticket price	7

The results showed that Big Mountain resort has the largest resource for customer. However, the fee was not highest.

To evaluate the efficiency of current chair lift transportation, the average area covered by people through the chair lift would be calculated. Then these data were compared within different resorts to see whether additional of chair lifting would be needed. If average area covered by people in Big Mountain Resort is lower than the average resort, additional chair lift will be recommended. The results are shown below

#### 1. Coverage Area by People in Big Mountain vs. Other Resorts

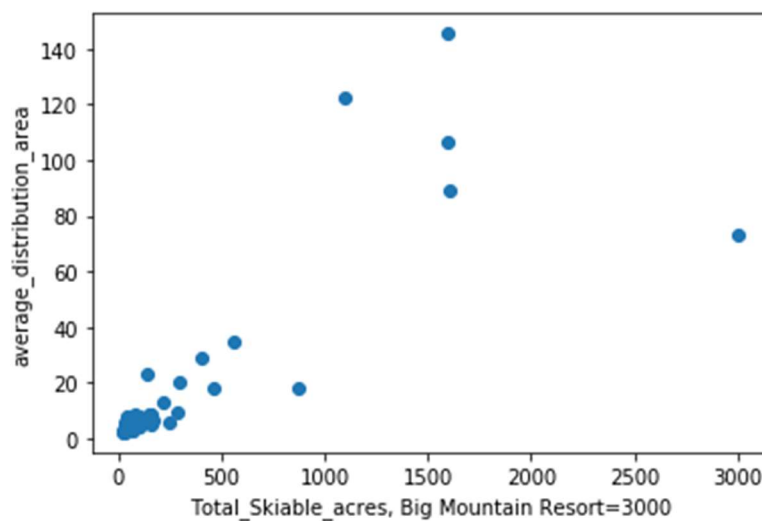


Fig.1 Total\_Skiable\_Acres Covered by People in Different Resorts

Results showed that Big Mountain Resort had a much higher number (3000 acres) than any other resorts. This indicated that chair lift could not effectively distribute customer. Therefore, additional chair lift will be recommended because it could help to increase the distribution by decreasing total\_skiable\_acres. The improving of distribution customer could help to attract more people.

## 2. Chair Lift Runs in Big Mountain Resort vs. Other Resorts

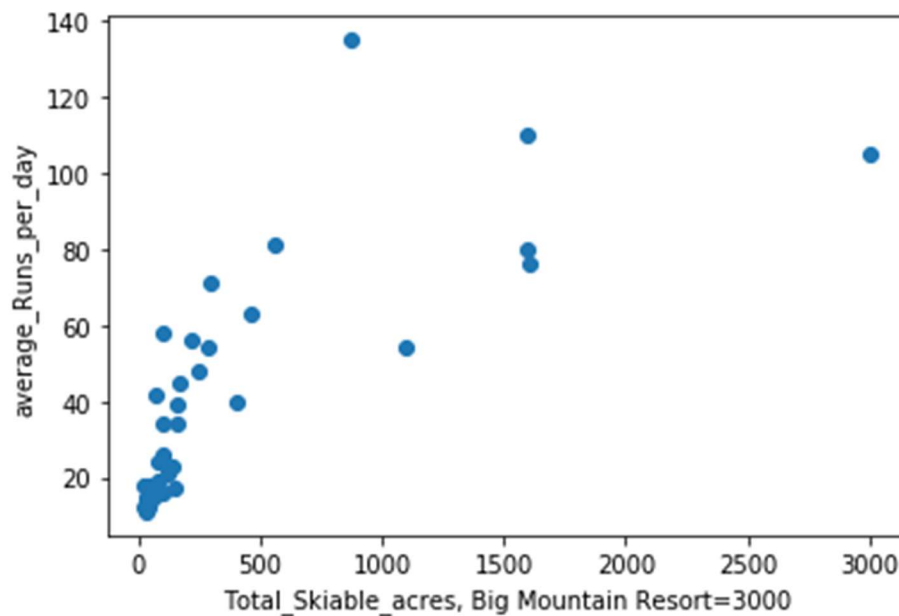


Fig. 2. Chair Liftss Runs Comparison

As expected, the chair lifts in Big Mountain Resort runs faster than other resorts. This would potentially decrease the lifetime of chair lifts. Additional chair lifts could help to extend the lifetime of current chair lifts by decreasing runs.

### III. Modeling - Projected Chair Lifts

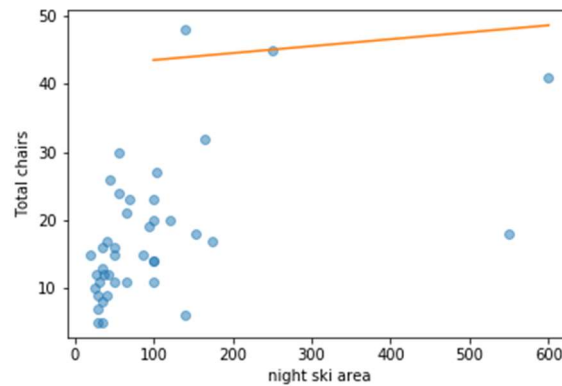


Fig. 3. Statistical Model Prediction

Statistical model was used to predict the number of additional chair lifts needed. The results showed that at least 45 chair lifts will be needed. Currently Big Mountain Resort has 41 chairs lifts. Therefore at least four more chairs would be needed. This could be a quad chair lifts or two double chairs lifts.

### IV. Offset Operation Cost

The addition of chair lifts will increase the operation cost \$ 1450000. Since share holder would like to current revenue level as 9.2%, some method will be needed to offset increasing of operation cost. There will be two ways.

#### 1. Potential to Attract More Customers

Currently there were 350000 visitors. If the spending is \$70 per customer, the total revenue would be \$245000. After the additional chair lift is installed, potentially more people would like to visit Big Mountain Resort. If there were additional 21000 visitors, it will cover offset the operation cost. This would be a 6% increasing.

#### 2. Increase the ticket price

The current ticket price for visitor is \$ 81 per day. However, other resorts put a different price tag on the ticket during weekdays and weekends. So Big Mountain Resort could

also consider to use the similar strategic approach and increase both weekdays ticket price and weekend ticket price by \$4.00. This will also offset the operation cost increasing.