



# SITE SELECTOR SURVEY ANALYSIS

EDC Utah

## IS-6496 MSBA Capstone Project Report

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|---------------------|--|
| Project             | Site Selector Survey Analysis  |
| Client              | EDC Utah   |
| Sponsor             | Matt Hilburn<br>VP of Research & Marketing<br>(801) 971-3657<br><a href="mailto:mhilburn@edcutah.org">mhilburn@edcutah.org</a> |
| Faculty Advisor     | Dr. Jeff Webb<br><a href="mailto:jeff.webb@eccles.utah.edu">jeff.webb@eccles.utah.edu</a>                                      |
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### Team

|                        |  |
|------------------------|--|
| Kayden Maughan         | (801) 531-0401<br><a href="mailto:Kayden.maughan@hsc.utah.edu">Kayden.maughan@hsc.utah.edu</a> |
| Srinivasan Swaminathan | (510) 859-5688<br><a href="mailto:srakesh@gmail.com">srakesh@gmail.com</a>                     |
| Tim Lee                | (801) 755-6288<br><a href="mailto:tienshuk@gmail.com">tienshuk@gmail.com</a>                   |

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## Introduction

### About EDC Utah

Since 1987, EDC Utah has worked with Utah state and local government and private industry to attract and grow competitive, high-value companies and spur the expansion of local Utah businesses. EDC helps local companies find the public and private support they need to grow successfully in Utah. For companies exploring a new home in Utah, EDC's Business Development consultants provide free, expert consulting on all things Utah, right from initiation up until establishment.

### Business Problem

Attracting new companies to the state of Utah requires the understanding and persuasion of a few key players. Some of these key players are site selectors, or locational strategy consultants. These site selectors offer influential advice and practical counsel to companies looking to expand. Delving into the mind of the site selector and understanding what features are important in recommending a site are at the core of marketing the state of Utah as a prime site for companies and advancing economic development within the state as well.

### Project Goal

This project aims to provide analysis and solutions to the questions along the following broad themes:

1. What factors are the most important in site selection? What features are the site selectors looking for in sites?
2. What is Utah's position in the factors that are important to site selectors?
3. What does the competition look like? Which states do better than Utah and why?
4. Have site selector perceptions changed between 2016 and 2017 surveys? Is there a change in the magnitude of influence of the various factors that impact Net Promoter Score (NPS)?

This analysis is intended to be a more data-driven exploration leading to potential forming of future hypotheses regarding site selector perception. Perhaps future surveys could reflect hypotheses developed from the findings in this project in their questions and could extract further insight into the factors that make Utah and other states perceived as potential sites.

### Analytics Problem

Data from the 2016 and 2017 Site Selector Survey conducted by EDC Utah, will be the basis of this study. Along with numeric and categorical feature examination, free text analysis was used

to find common themes. The team build a shiny dashboard application which allows the user to slice and dice the results in an interactive manner.

## Analysis

### Summary of Data

The data consisted of two excel sheets which contained the results of surveys conducted in 2016 and 2017. The 2016 survey sheet had responses from 167 site selectors and the 2017 survey had responses from 140 site selectors. The 2017 survey had a wider set of questions that covered specifics on tax incentives. Along with the survey responses, a key to the questions asked in the survey was made available as well. Almost all of the responses were on a Likert scale except for a few text based comments.

### Assumptions

The dataset has only around 140 observations for survey sent out to about 600 site selectors. Since a substantial population of the site selectors didn't respond, inference from this data might not reflect the views of most of the population.

### Data Cleansing

While the data shared was mostly clean, there were slight differences in the questions asked between both surveys. The datasheet had question numbers and the corresponding responses with the questions described in a separate document. In order to allow for easier comparison and analysis, the question numbers were transformed to meaningful names as inferred from the key. All similar questions were tagged with the same prefix to allow for easier classification and grouping. While transforming the column names in the data matrix, similar naming conventions were used for both survey results to be consistent and to allow for easy comparison. The resulting datasheets were used for subsequent analysis.

### What factors are key influencers for site selectors?

In order to answer this question, the means of the responses to questions asking the site selectors to rate the importance of each factor was used. In the datasheet, these questions are annotated with the prefix "Importance\_". Missing values were excluded for the purpose of this analysis. The resultant numbers were ordered to determine the most important and least importance factors that influence site selector decisions.

The top 3 important factors as rated by site selectors were:

- Labor Quality
- Labor Availability and Costs
- Business Friendly Government

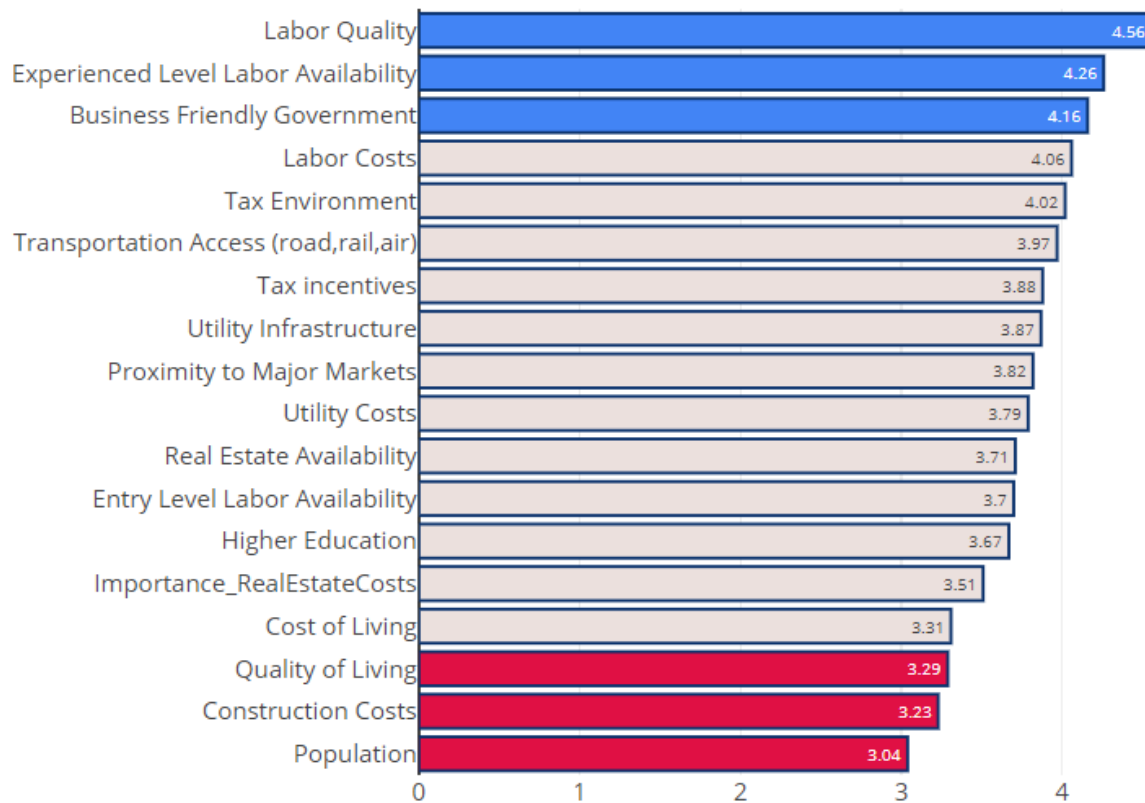
In contrast, site selectors were not too concerned about these factors:

- Quality of Living

- Construction Costs
- Population

The complete list of factors and their importance is listed in the graph below. The numbers show the mean rating of each factor on a Likert scale of 5 with 1 being the lowest and 5 representing the highest level of importance.

#### What factors are most important to site selectors' clients?

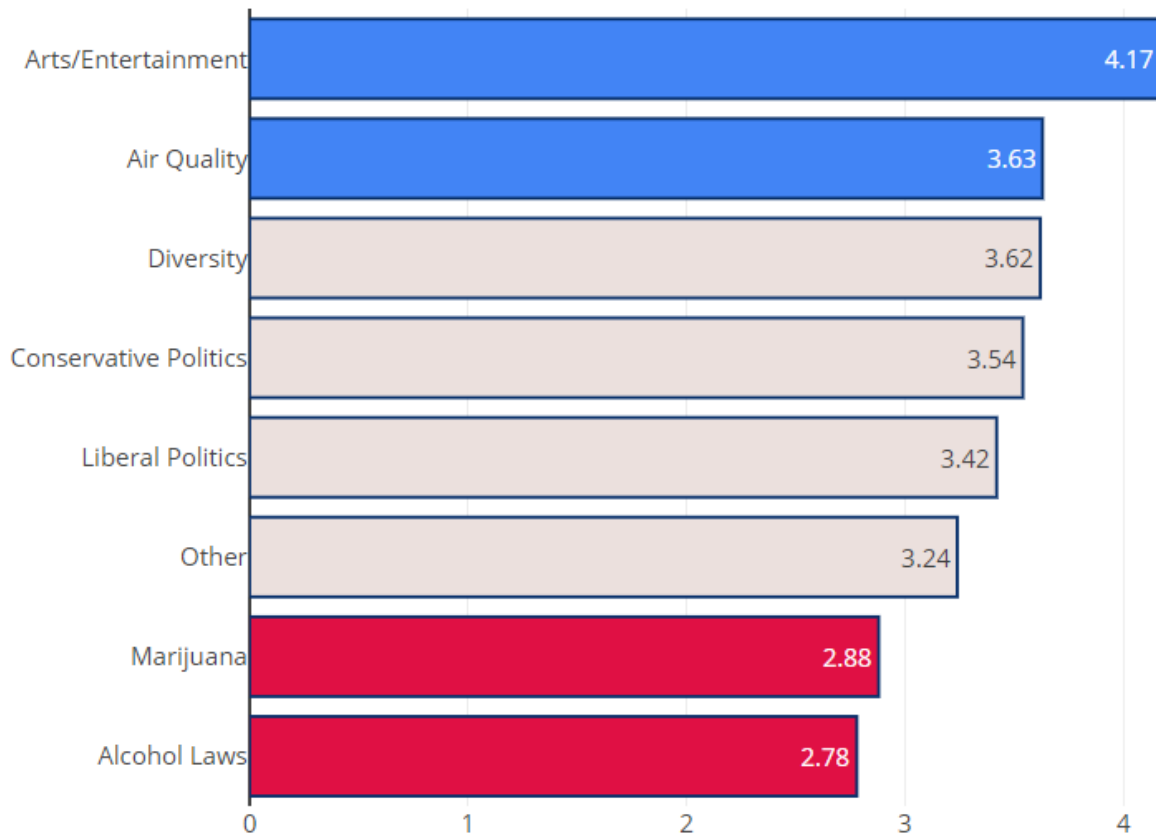


It is important to note that these are the ratings of what the site selectors thought were important. In our regression analysis presented later in the report, we found a different set of factors to have a stronger influence on the likelihood of recommendation.

#### What are the rankings of the other soft factors?

In addition to the list of key business influencers, the site selectors were also asked about the importance of some “soft” factors that could have an impact on the perception of Utah as a viable business destination. A similar analytical approach as used for influencers was used to answer this question as well. From the responses, the **top two important soft factors were Arts & Entertainment and Air Quality**. In contrast, site selectors were not too concerned about the Marijuana and Alcohol laws of Utah.

## What other factors have had a significant impact on the clients' relocation?



## What industries are associated with Utah?

In order to answer this question, we did an analysis of the responses to questions about what industries do site selectors associate Utah with. These questions are labelled with prefix "IndustryAssociation\_" in the cleaned dataset. Site selectors were asked to choose the industries given the options and the analysis was performed by taking an overall split of the various industries across the available options.

From the analysis, Utah looks to be strongly associated with the following industries:

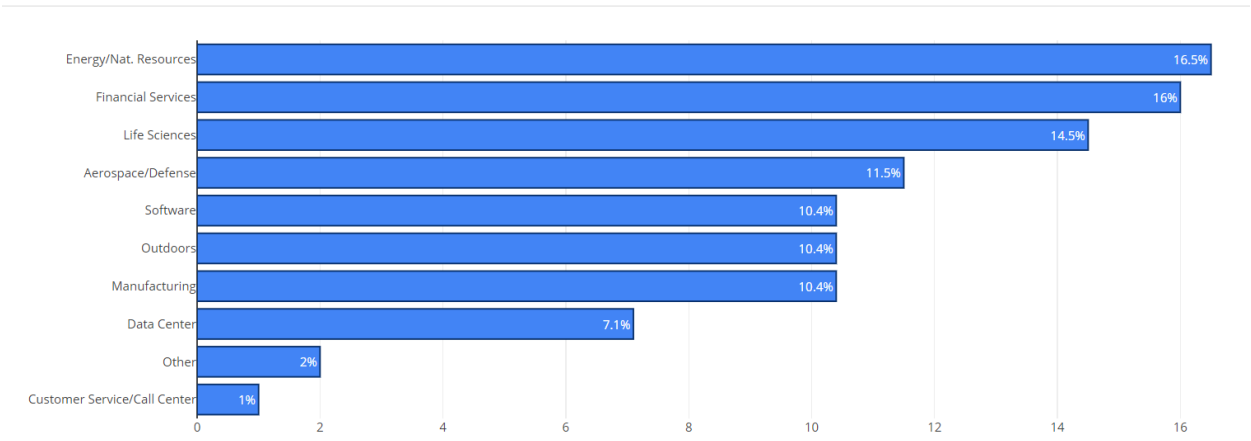
- Financial Services
- Energy and Natural Resources
- Life Sciences

Interestingly, Utah seems to be least associated with the following industries:

- Manufacturing
- Data Centers
- Customer Service / Call Centers

These are potential areas of opportunities which Utah can focus in order to attract new business.

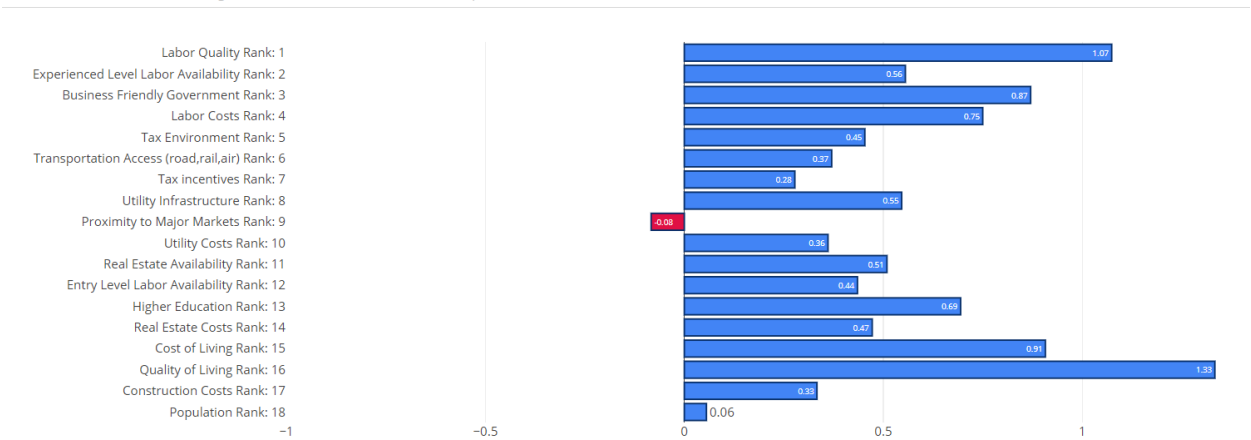
What industries generally are associated with Utah?



How does Utah rank in the categories that are important to site selectors?

In order to visualize this data, we summarized the responses on a normalized scale with a centered mean of 0. Any positive value above the centered mean indicates that Utah is doing better than average in those areas and a negative value indicates scope for improvement. The analysis indicates that Utah is doing well on almost all categories that site selectors find to be important. Utah's best rating is for Quality of Living, but that doesn't figure on the top list of factors for site selectors. The only area where Utah ranked below average was its proximity to major markets, which unfortunately is a factor that cannot be controlled.

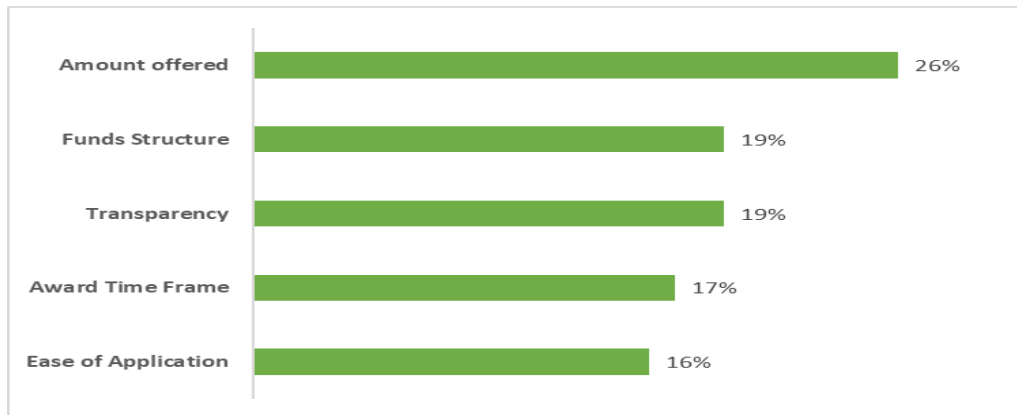
How is Utah ranked in the categories that site selectors find most important?





## Utah's Tax Program

Site selectors were asked how Utah compared to its competitors when it comes to its Tax program. Almost, half the site selectors expressed a neutral opinion. ~30% of the selectors felt Utah was doing better than its peers while ~20% felt that Utah's tax program ranked lower than its peers. Selectors were asked about what the features they would prefer in a tax program and these were the top 5 asks:



Formulating tax programs around these features would help in attracting site selectors and their clients to Utah.

## The competition's tax incentives

Site Selectors were asked to rate the tax incentive programs of rest of the states in the US. Three states emerged as clear winners – **Texas, Georgia and South Carolina**. We further analyzed the reasons for the high ratings for **Texas** and the following reasons were found to be instrumental:

- Amount offered
- Funds Structure
- Transparency
- Award Time Frame
- Ease of Application

Factoring in these features while making future tax program decisions will help attractor potential investors to Utah.

## Comparison of Business Climate and Likelihood of Recommendation

Utah was rated the best in terms of Business Climate when compared to states in the South West and West regions. The only state that ranked above Utah for business climate was Texas.

Of the 8 states compared, **Texas** had the most recommendation of site selectors, way ahead of rest of the states. Amongst the western states, Arizona had a higher likelihood of recommendation than Utah.

We analyzed the text responses of Arizona to understand what made it a better choice of recommendation, but we couldn't find any specific pattern in the data.

### Text Analysis

Topic modeling was performed on the responses to the reasons while site selectors considered Utah as an investment destination. Latent Dirichlet Allocation (LDA) method was used for this analysis. It is a particularly popular method for fitting a topic model where in it treats each document as a mixture of topics, and each topic as a mixture of words. This allows documents to “overlap” each other in terms of content, rather than being separated into discrete groups, in a way that mirrors typical use of natural language. These were three major themes that came out of this analysis:

- Labor and workforce
- Tax programs



### NPS changes between 2016 and 2017

One of the key factors of comparison between the 2016 and 2017 results was to check if there was any significant change in the NPS score of the same site selector. This would indicate a strong change in perception and in a way indicate the effectiveness of any interventions performed. The study is also critical to determine if Utah slipped behind on any of the areas and if a corrective action is required.

Definition of NPS category:

| Likelihood of Recommendation | NPS category |
|------------------------------|--------------|
| <b>&lt;= 6</b>               | Detractor    |
| <b>7/8</b>                   | Passive      |
| <b>9/10</b>                  | Promoter     |

Since there were no site selector ids to compare and given that not all site selectors responded to both surveys, **IP addresses** of the selectors were used to identify the same set of respondents across surveys. On comparing the IP addresses, there were 38 site selectors found to be common to both surveys. Of these 16 retained their recommendations, while 22 of them changed their recommendation ratings across the surveys.

The overall change was positive with 15 site selectors improving their recommendation ratings while 7 downgraded their ratings. A further study of reasons for the score didn't yield any specific outcomes or patterns. We checked to see if their visits to Utah had an influence on the outcome and that was found to be not the case.

The overall distribution of NPS across the population remained fairly the same. 50% were passive and the remaining were split across the detractor and promoter buckets.

#### Influence of Predictors – 2016 v 2017

A linear regression was performed with NPS as the outcome variable and the various influencers as predictors. The coefficients of the regressions with 2016 and 2017 data were compared to check for any major changes. Amongst the key predictors, Cost of Living, Construction Costs and Quality of Life didn't have a significant change between the surveys. **Interestingly, while site selectors didn't rate Quality of Life as a significant influencer of their decision, the variable was found to have a strong influence on the NPS outcome.**

Amongst the major changes in weights, Real Estate Availability, Tax Incentives and Transport had a stronger influence on NPS outcome in 2017 than they did in 2016. In contrast, experienced labor availability and business friendly government showed a reduced influence.

*It must be noted that the analysis is made on a small sample set of site selectors and with varying list of responders. It is likely that the differences observed are merely due to the varying nature of the clients of the site selectors. In addition, Tax incentives are strongly correlated to Business Climate and it is possible that the increase in weightage of Tax incentives attributed to the decrease in weightage of Business Climate influence.*

## Conclusion

### Inferences

- Utah is doing great in terms of Labor Availability, Business Climate and Quality of Life
- Industries most associated with Utah are Energy and Natural resources, Life Sciences and Financial Services.
- Texas is the biggest competitor and Arizona is the closest major competitor.

### Recommendations

- Utah must look at improving its perception when it comes to Tax incentives and transport. While Utah ranked low in terms of its proximity to major markets, this is not a factor that can be controlled.
- Future tax incentives should consider the features that site selectors look for in such programs. The reasons for the high ratings for Texas' tax program can also serve as a good benchmark for comparison.
- Utah is surprisingly not strongly associated with Data Centers and Call centers. This could be more of a perception issue that needs to be addressed.
- The details of the site selectors who changed opinions have been shared in the appendix. Further analysis or follow-up of this subset is recommended to understand what made the selectors change their ratings.

## Survey Dashboard

The report submits a single dimension of analysis of the data across all responses. Further insights can be derived by viewing the results for a subset of the population based on NPS scores or industry groups of selectors. In order to facilitate this view, a dynamic web-based dashboard has been developed using Shiny applications in R. The dashboard is hosted on a cloud server, the details of which have been shared separately. The code used to develop the dashboard with detailed documentation is on GitHub for review and future enhancements.

GitHub code repository: <https://github.com/edcutah/SiteSelectorSurvey>

## Appendix

### NPS Rating Changes

| IP              | NPS_2016  | NPS_2017  | RatingChange |
|-----------------|-----------|-----------|--------------|
| 205.178.86.90   | Promoter  | Passive   | Downgraded   |
| 12.217.123.2    | Passive   | Detractor | Downgraded   |
| 12.217.123.2    | Passive   | Detractor | Downgraded   |
| 198.134.52.71   | Promoter  | Detractor | Downgraded   |
| 66.162.170.174  | Promoter  | Passive   | Downgraded   |
| 209.194.200.254 | Promoter  | Passive   | Downgraded   |
| 209.194.200.254 | Promoter  | Passive   | Downgraded   |
| 74.219.120.102  | Detractor | Promoter  | Improved     |
| 4.35.222.2      | Detractor | Passive   | Improved     |
| 208.68.247.151  | Detractor | Passive   | Improved     |
| 209.194.200.254 | Passive   | Promoter  | Improved     |
| 209.194.200.254 | Passive   | Promoter  | Improved     |
| 162.118.16.5    | Passive   | Promoter  | Improved     |
| 209.194.200.254 | Detractor | Passive   | Improved     |
| 209.194.200.254 | Detractor | Promoter  | Improved     |
| 66.64.15.194    | Passive   | Promoter  | Improved     |
| 66.64.15.194    | Passive   | Promoter  | Improved     |
| 199.52.13.132   | Detractor | Promoter  | Improved     |
| 72.54.86.205    | Detractor | Passive   | Improved     |
| 72.54.86.205    | Detractor | Passive   | Improved     |
| 74.219.120.102  | Passive   | Promoter  | Improved     |
| 209.194.200.254 | Detractor | Passive   | Improved     |

### Linear Regression Coefficients

| Component                               | 2016Coeff | 2017Coeff | change |
|---|-----------|-----------|--------|
| Importance_BusinessFriendlyGovt         | 0.707     | -0.064    | 0.771  |
| Importance_LaborAvailabilityExperienced | 0.488     | -0.207    | 0.696  |
| Importance_CostOfLiving                 | 0.357     | 0.289     | 0.067  |
| Importance_RealEstateAvailability       | 0.171     | 0.687     | 0.516  |
| Importance_QualityOfLife                | 0.093     | 0.052     | 0.041  |
| Importance_ConstructionCosts            | 0.046     | 0.118     | 0.072  |
| Importance_TaxIncentives                | -0.063    | 0.596     | 0.660  |
| Importance_LaborCosts                   | -0.182    | -0.519    | 0.337  |
| Importance_TaxEnvironment               | -0.260    | -0.683    | 0.423  |
| Importance_Transport                    | -0.438    | 0.249     | 0.687  |