BYU Traffic Study Follow-Up

Project ID: CEEn_CPST_010

by

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A Capstone Project Final Report

Submitted to

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Executive Summary

PROJECT TITLE: BYU Transportation survey
PROJECT ID: CEEn_CPST_010
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Preceding forthcoming revisions to the Brigham Young University (BYU) Housing Policy and Rideables Policy, a BYU Civil & Construction Engineering capstone team conducted a comprehensive analysis of student mobility patterns to, from, and within the campus premises situated in Provo, Utah. The initial survey, conducted in 2022 via Qualtrics, served to establish baseline data, with a subsequent plan for its reimplementation in 2024 to assess the impact of the revised policies on student travel behaviors.

During the follow-up survey conducted on Monday, March 11th, 2024, and Tuesday, March 12th, 2024, a total of 1,190 responses were acquired from BYU students. Survey administration took place from 9:00 AM to 11:00 AM and 1:00 PM to 3:00 PM on both days at the following strategically chosen sites around BYU campus: south of the Thomas L. Martin Building, east of the Joseph F. Smith Building, and inside the Wilkinson Center (north of the Cougareat). These parameters were established to ensure a diverse representation of students with varying schedules.

Through analysis, we saw a 3% increase in students living in Provo (from 2022 to 2024) and a decrease in students living in surrounding cities (0.9% decrease in students living in Orem from 2022 to 2024). Regarding chosen mode of transportation, there was an 8% increase in walking to and from campus and a 4.7% decrease in motorized vehicles utilized. Survey responses in 2024 highlight that 29% of students view distance to campus as the most influential factor in determining personal mode choice; only 17% of students viewed distance as the most influential factor in 2022. Survey responses in 2024 also highlight that 9% of students view parking as the most influential factor in determining personal mode choice; 19% of students viewed parking as the most influential factor in 2022. 2024 survey responses also highlight that 37.95% of students own a rideable. Of those students who own a rideable, 3.43% drive to campus then use their rideable when on campus, 34.93% use their rideable to get to campus, and 59.13% don't bring their rideable to campus at all. Additional results can be found in the 'Design, Analysis, & Results' section.

Despite the comprehensive nature of the study, challenges were encountered in effectively capturing the perspectives of rideable users due to their propensity to bypass survey stations while in transit. Additionally, while assumptions were made regarding the thoroughness and honesty of survey responses, there was no way to determine the validity of these assumptions.

It is recommended that supplementary survey initiatives be undertaken to enhance the representativeness of the data, considering the substantial student population at BYU. There are 34,000 recorded students at BYU [1], and only 1,190 survey responses were recorded. We recommend that this survey be performed in additional locations around BYU campus, and at additional times throughout the year. Student travel patterns are dependent on factors such as weather and time of year; a wider variety of survey dates would provide more representative analysis. We also recommend that this survey be distributed through methods additional to outdoor approaches to passersby. This way, results can represent rideables users who would otherwise pass by a physical survey booth on campus.

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Introduction

In the fall of 2021, Brigham Young University (BYU) announced significant changes to their housing policy, effective beginning in the 2022-2023 school year. The new policy states that first year BYU students must live in BYU On-Campus Housing, in BYU Off-Campus Contracted Housing, or with qualifying family members. The new policy also states that after the first year of BYU attendance, students are not required to live in BYU On-Campus or BYU Off-Campus Contracted Housing; they may choose to live anywhere. This increased freedom for BYU students left many reconsidering their options. Students reported that their concerns were more about quality of available housing, rather than the changes that previously required to live in BYU contracted housing [2].

In the summer of 2023, Brigham Young University made significant changes to their Rideables Policy. A rideable is a device used for the transportation of an individual such as bicycles, e-bicycles, scooters, e-scooters, skateboards, rollerblades, roller skates, hoverboards, and any similar device [3]. This policy change allows for a wider variety of rideables to be utilized around campus, with adherence to various rules that concern traffic, parking, and general operations. This policy change encourages students to use more than just a bicycle around BYU campus.

In the spring of 2022, before the BYU Housing Policy and Rideables Policy went into effect, a BYU Civil & Construction Engineering capstone team designed a survey and collected responses to assess student travel patterns to, from and around campus. It was intended that two years later, in 2024, another capstone team would repeat a similar study to assess the changes the policies caused in student travel patterns.

This survey collects student demographics including year in school and area of study. It asks participants to articulate where they live, how they chose to get to and from BYU campus that day, what factors influence their mode choice, and what rideables they use around campus, if applicable. All survey questions are included in Appendix A.

This technical report includes (1) assumptions and limitations regarding the survey and responses, (2) analysis of results and comparison with the 2022 baseline survey, (3) related issues, (4) lessons learned, (5) conclusions, and (6) recommendations.

Schedule

Date	Milestone
9/11/2023	Team formation and project initiation
10/4/2023	First meeting with Dr. Macfarlane
1/19/2024	Qualtrics survey edits completed
2/20/2024	Volunteers collected to distribute survey
2/28/2024	Meeting with Dr. Macfarlane and Bremen Leak
3/1/2024	Survey attained IRB certification
3/5/2024	Tents, tables, and other materials reserved for survey distribution days
3/11/2024	Day 1 of survey distribution
3/12/2024	Day 2 of survey distribution
4/3/2024	Poster completion
4/8/2024	Project rough draft completion and submission
4/17/2024	Project final draft completion and submission

Assumptions & Limitations

This project encountered several limitations during the data acquisition process that potentially impacted findings and results. Firstly, there were limitations regarding the geographic locations of the survey distribution. Data collection exclusively occurred within predefined areas south of the Thomas L. Martin Building, east of the Joseph F. Smith Building and inside the Wilkinson Center. We acknowledge that these locations may not have captured the entire BYU student population; individuals who do not routinely traverse these specific areas might have been underrepresented in the survey sample.

Weather conditions proved to be another limitation in the data acquisition process. The survey asked for information pertaining to students chosen modes of transportation to campus on the given day. Responses were potentially influenced by prevailing weather conditions. Tuesday, March 12th experienced markedly colder and rainier weather conditions than the preceding survey day, March 11th. Such inclement conditions might have prompted alterations to transportation choices among students, potentially skewing the data. Ideally, survey distribution would have occurred under climatic circumstances conducive to respondents preferred transportation modes, rather than necessitated choices driven by adverse weather conditions (e.g. favoring walking on a warm day over driving during inclement weather).

It is assumed that all survey participants conscientiously reviewed each question and provided responses truthfully and thoroughly. Additionally, the survey's reliability is presumed, implying consistent response patterns across repeated administrations.

Design, Analysis & Results

The following section of this report provides a detailed exposition of the project design, data analysis procedures, and the resultant findings. The 'Design' section navigates through a systematic breakdown of the survey design process. 'Analysis' proceeds to offer thorough examination of the outcomes of the survey and how analysis was done, and 'Results' presents each finding within the broader context of the project's objectives.

Design

Drawing from work done in the baseline capstone project conducted in 2022, the survey remained unchanged for direct comparability. However, in consultation with Bremen Leak, a faculty member at BYU involved in the Rideables Policy and sustainability, additional questions were added to the survey to assess the effects of the Rideables Policy on student travel patterns (see 'Appendix A' for all survey questions, original and added).

Similar to the baseline capstone project, approval to distribute the survey via email was denied; distribution via direct contact around BYU campus was approved. In the designated areas around campus aforementioned in this report, tents, tables, chairs, and signs with survey QR codes were set up for the duration of the survey time (March 11th, 2024, through March 12th, 2024). With the assistance of volunteers from the BYU American Society of Civil Engineers (Figure 2), we gathered 1,190 responses, surpassing the predetermined target of 1,000 responses. Student responses were categorized by year in school and compared to responses from 2022, displayed in Table 1. Responses were also categorized by college and compared to responses from 2022, displayed in Table 2.

Table 1: Student Responses Categorized by Year in School

Category	2022	2024
Freshman	207	273
Sophomore	240	281
Junior	228	237
Senior	174	239
Graduate student	20	32
Faculty/Staff	12	16
Didn't Specify	52	76
Total	933	1154

Table 2: Number of Responses Categorized by College

College	2022	2024	Difference
Business	118	98	-20
Education	52	43	-9
Engineering	132	195	63
Family, Home, and Social Sciences	82	98	16
Fine Arts and Communications	68	65	-3
Humanities	59	56	-3
International and Area Studies	13	20	7
Law	3	1	-2
Life Sciences	136	212	76
Nursing	16	32	16
Other/Undeclared	58	61	3
Physical and Mathematical Sciences	85	138	53
Religious Studies	2	2	0
Other	109	133	24

Figure 1: Survey Distribution Volunteers

Analysis

The primary analyses focused on the impacts of the newly implemented housing and rideables policies. It was hypothesized that significant changes in behavior attributable to the housing policy would be reflected in analysis. Specifically, attention was directed towards discerning alterations in residential living proximity to campus and the effects of transportation mode choice resulting from the policy revision.

While the introduction of rideables related questions limited direct comparison, their data provided various routes for exploration. The inquiry centered on the spectrum of rideable types used on campus, and their utility as commuting vehicles. The inquiry also covered the monetary valuation attached to rideables used by students, and the prevalence of rideable ownership relative to their use on campus. Additionally, analysis was done to ascertain whether rideable usage exhibited an increase due to policy alteration.

The statistical programming software, 'R', and it's varying functions and capabilities were utilized to analyze survey responses and results are included in the next section.

Results

Although the overall mode shares exhibited nominal variation from 2022 to 2024, discernable differences were observed. Notable, the proportion of students opting to walk surged by 8% from 2022 to 2024 (57.9% in 2022 and 65.9% in 2024). Table 3 displays this data, as well as other mode share information from 2022 and 2024.

A particular survey questions petitioned respondents to articulate what type of transportation they utilize, with more options than those displayed in Table 3. This includes modes such as the Ryde shuttle bus and UTA Transit. The results displayed in Figure 2 show that there was a decrease in the Ryde shuttle bus usage from 2022 to 2024. Figure 2 also shows that there was an increase in UTA transit usage from 2022 to 2024. This shift could be due to a greater student population near UTA transit pick up locations or a stronger preference to use UTA transit rather than the Ryde shuttle.

Table 3: Mode Choice Percentages

Mode	2022	2024	Difference
Motorized	23.8%	19.1%	-4.7%
Rideable	4.8%	4.7%	-0.1%
Transit	13.4%	10.3%	-3.2%
Walk	57.9%	65.9%	8.0%

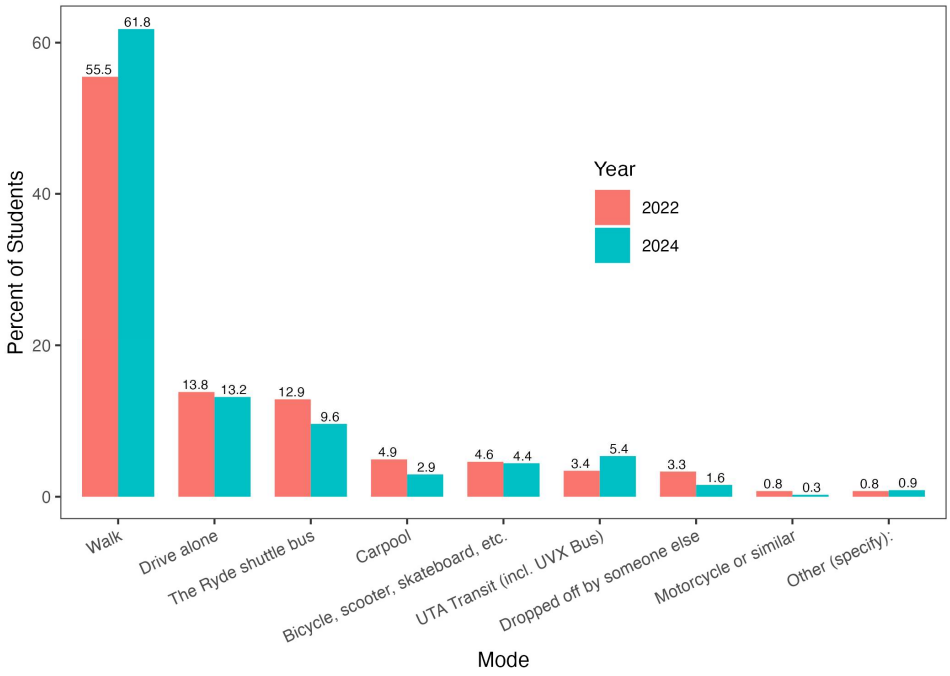


Figure 2: Mode Distribution Between 2022 and 2024

Figure 3 displays four major mode choices selected by students compared to year in school. There is a noticeable decline in walking and increase in motorized transportation as students progress through their academic career. To test the strength of this relationship, the walking share values were fit to a linear model, shown in Figure 4. A summary of the linear model is displayed in Table 4. Small p-values suggest that there is a relationship between year in school and mode choice.

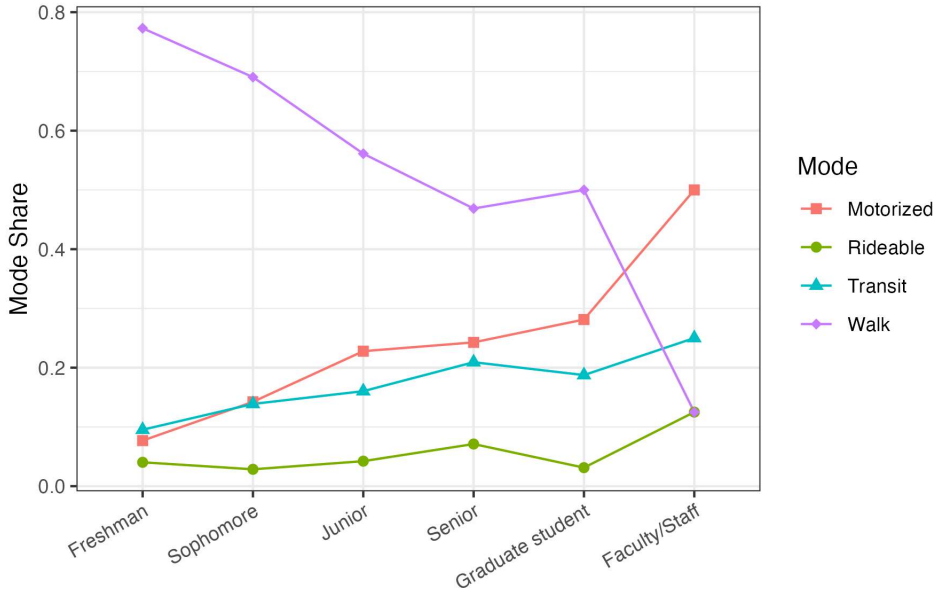


Figure 3: Mode Choice According to Year in School

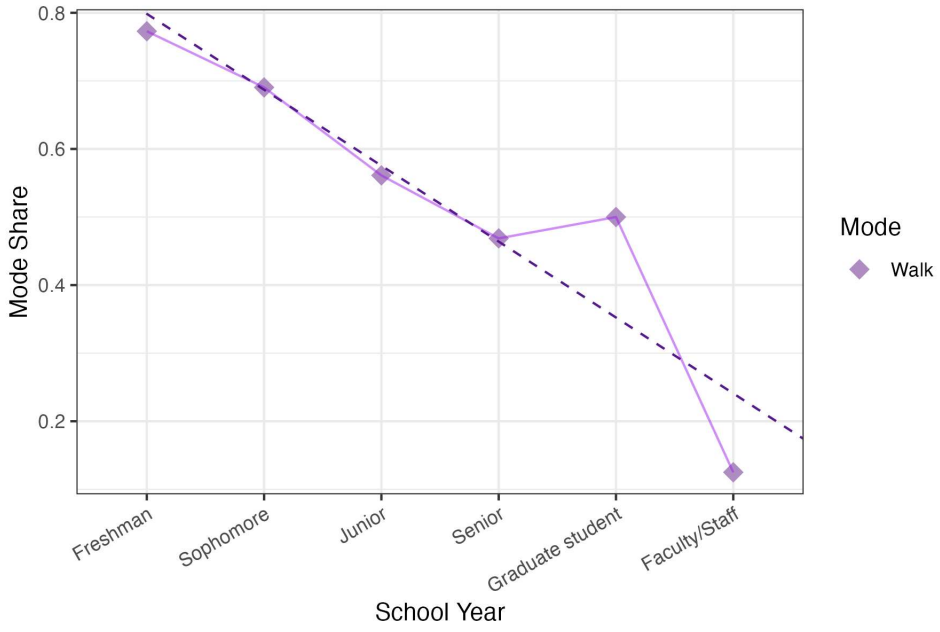


Figure 4: Walking According to Year in School

Table 4: Linear Model Summary: Walking and Year in School

Coefficients	Estimate	St. Error	t-value	p-value
Intercept	0.9100	0.0885	10.29	0.0005
Year In School	-0.1115	0.0227	-4.91	0.0080

Mode choice was sorted by gender, as displayed in Figure 5. Notably, women tend to walk to campus more than men, and men tend to drive to campus alone than women. Figure 5 also highlights that there is an overall decrease in the percentage of students utilizing the Ryde shuttle.

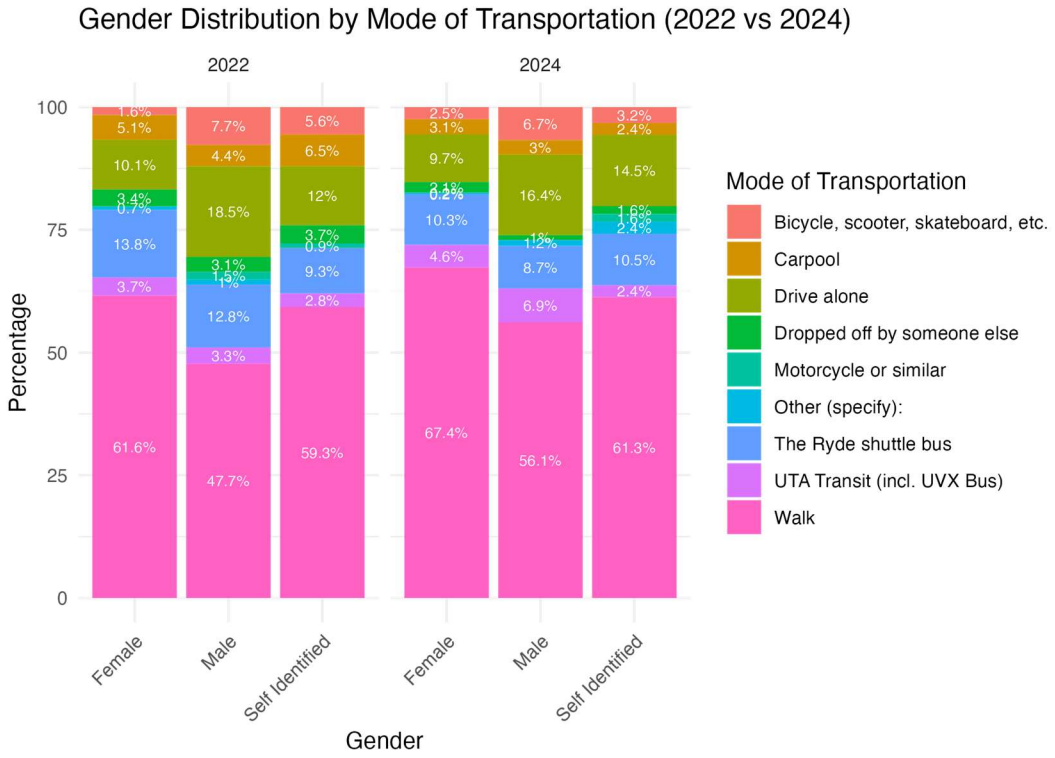


Figure 5: Distribution of Mode Choice Based on Gender

Mode choice was also sorted by major, shown in Figure 6a and 6b. As articulated in the 'Assumption and Limitations' section, there could be underrepresentation of some majors due to the survey booth locations around campus. Overall, it appears that each major tended to use similar modes of transportation in each year that the survey was administered.

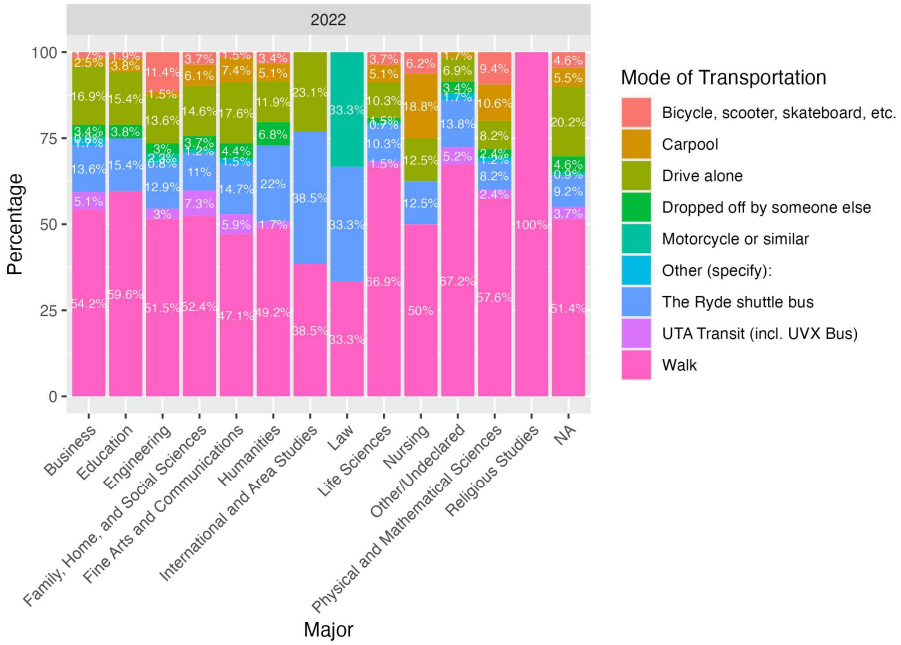


Figure 6a: 2022 Distribution of Mode Choice Based on Major

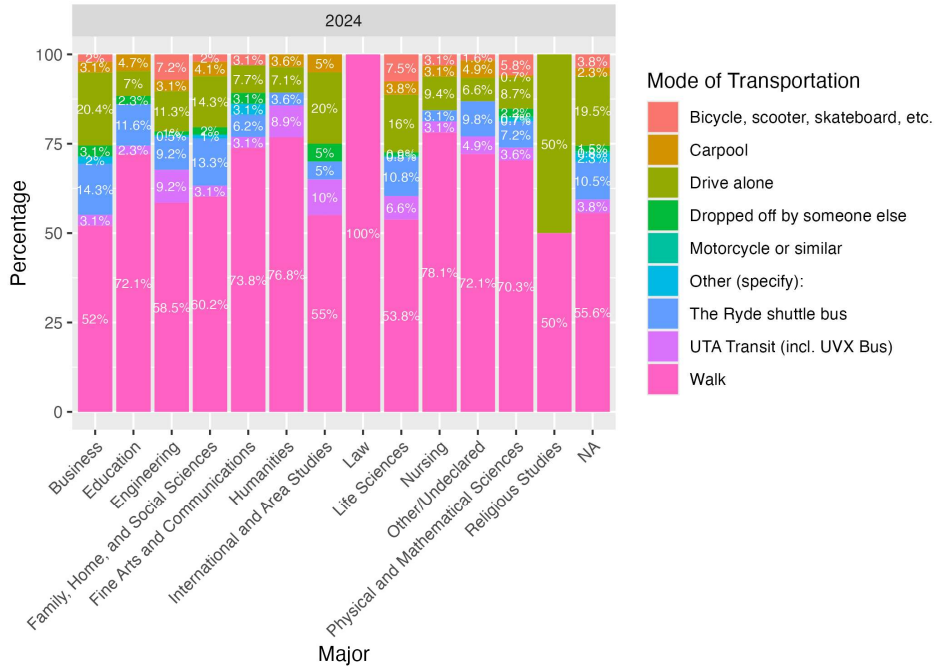


Figure 6b: 2024 Distribution of Mode Choice Based on Major

Given that the dataset provided only raw counts for each mode of transportation without corresponding averages, the most appropriate statistical approach was to conduct a proportion test, displayed in Table 5. Two modes exhibited statistically significant differences: “Walk” and “Dropped off by someone else”. A significance threshold of p=0.01 was used, chosen to adhere to a more conservative approach.

Table 5: Results of Probability Test

Mode	P-Value	2022 Distribution	2024 Distribution
Bicycle, scooter, skateboard, etc.	0.8357	4.6%	4.4%
Carpool	0.0189	4.9%	3.0%
Drive alone	0.6630	13.8%	13.2%
Dropped off by someone else	0.0082	3.3%	1.6%
Motorcycle or similar	0.1068	0.8%	0.3%
Other (specify)	0.7689	0.8%	0.9%
The Ryde shuttle bus	0.0189	12.9%	9.6%
UTA Transit (incl. UVX Bus)	0.0334	3.4%	5.4%
Walk	0.0038	55.5%	61.8%
Total	-	100.0%	100.0%

Mode Choice Factors

Survey respondents were able to select up to five factors that influence their mode choice and order them from most influential to least influential. Figure 7 displays factors that affected mode choice and percent of respondents that selected each factor for 2022 and 2024. Figure 8 breaks this down even further to display the difference for each factor between 2022 and 2024. In both years, the top 6 factors that student reported to have the greatest impact on mode choice were the following: convenience, parking availability, distance, cost, mode availability, and travel time. However, the level of importance varied between the two years. In 2022, 17% of respondents reported distance to be the most important factor in determining mode choice. However, in 2024, 29% of respondents reported distance to be the most important factor in determining mode choice. In 2022, 19% of respondents reported parking availability to be the most important factor in determining mode choice whereas in 2024, only 9% of respondents reported parking to be the most important factor in determining mode choice. Table 6 displays the six most important factors that affect mode choice as reported by students, with corresponding percentages of responses between 2022 and 2024.

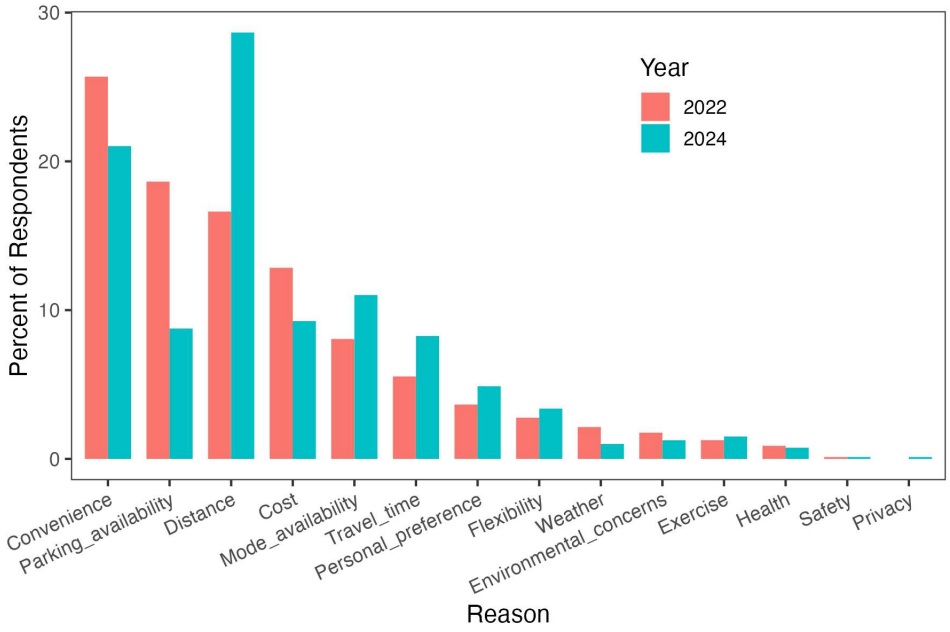


Figure 7: Reason for Mode Choice Selection

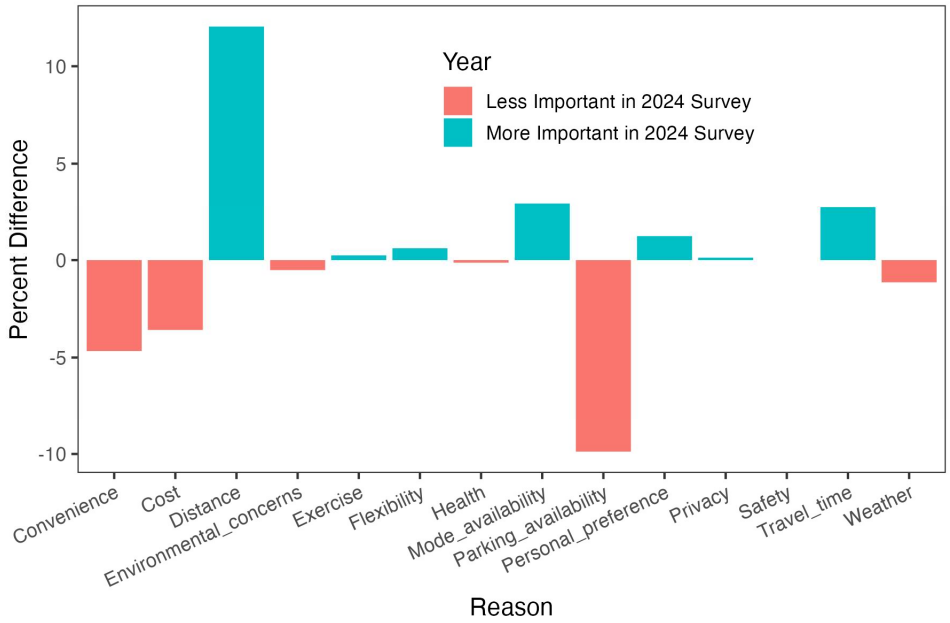


Figure 8: Percent Difference in Reasoning

Table 6: Top Six Reasons Ordered by Percent

2022	2024
Convenience 26%	Distance 29%
Parking 19%	Convenience 21%
Distance 17%	Mode Availability 11%
Cost 13%	Cost 9%
Mode Availability 8%	Parking 9%
Travel Time 4%	Travel Time 8%

Arrival and Departure

Density plots were constructed to visualize student arrive times to campus and departure times from campus; plots were also constructed to compare arrive and departure times between 2022 and 2024, as displayed in Figure 9 (arrivals are displayed in red and departures are displayed in blue). Figure 10 shows some variation in peaks between 2022 and 2024 but the information appears to be similar. As shown in the plots in Figure 9, students arrive to campus at a peak time of 9:00AM and students leave campus at a peak time of 4:00PM to 5:00PM. With classes generally beginning at the top of the hour, it's logical that most students would be arriving to campus at the top of the hour, or minutes before. Also, with most classes ending at 50 minutes after the hour, it's logical that peak departure times are around the top of the hour.

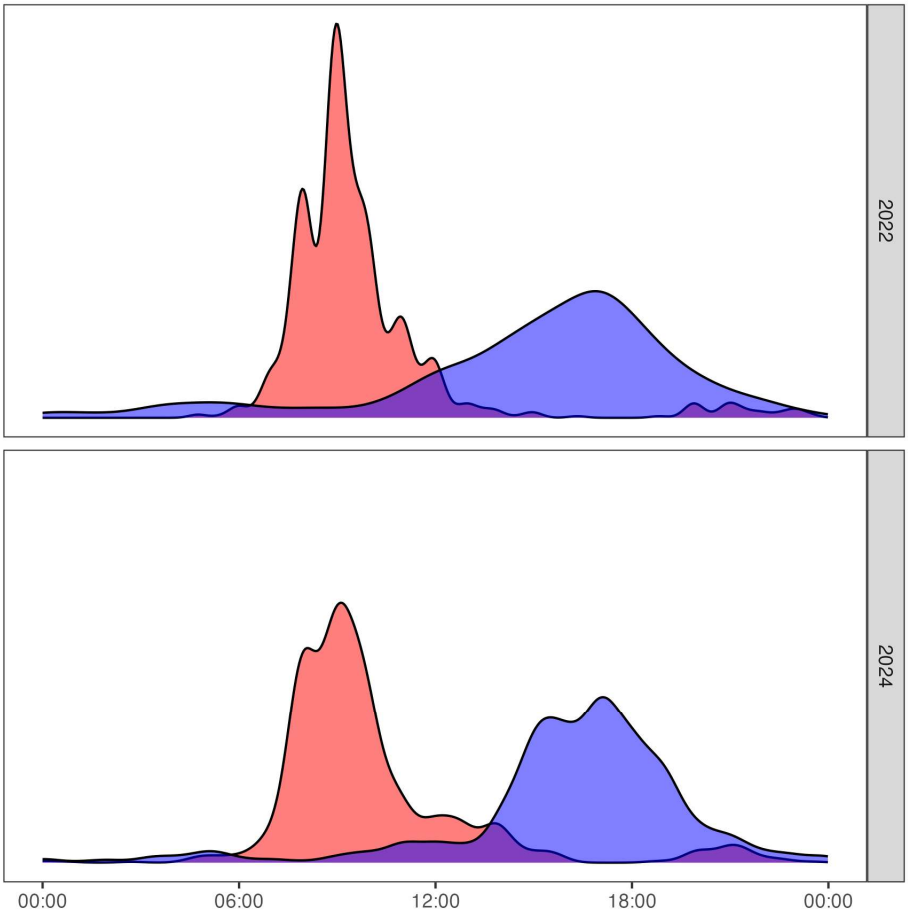


Figure 9 Arrival Time(red) vs Departure Time(blue)

Distance from BYU

A particular point of interest in this project was how the location of student residence had shifted due to the new housing policy. It was hypothesized that students would be living farther away from campus in 2024. Survey respondents were asked to select their current town of residence from the following locations: Provo, Orem, Springville, or other. Selection of 'Other' signified that the respondent lived in a city other than Provo, Orem, or Springville. These 3 cities are the closest to BYU campus; selection of 'other' lead to the assumption that the respondent commuted a reasonable distance to campus.

From analysis through Table 7, it can be concluded that there has been an increase of students living in Provo from 2022 to 2024. In 2022, 60.3% of students reported to live in Provo; in 2024, 63.3% of students reported to live in Provo. In 2022, 3.8% of respondents reported to live in 'other' (outside of the Provo, Orem, Springville area) and in 2024, 4.4% of students reported to

live in 'other'. Although there was a change in percentage from 2022 to 2024, the number of student responses collected was relatively low. A higher number of responses would give more representative information.

Table 6: Location Distribution

	Respondents		Percent		
City	2022	2024	2022	2024	Difference
Provo	563	731	60.3%	63.3%	3.0%
Orem	32	29	3.4%	2.5%	-0.9%
Springville	9	10	1.0%	0.9%	-0.1%
Other	35	51	3.8%	4.4%	0.7%
No Response	294	333	31.5%	28.9%	-2.7%

When asked to articulate city of residence, if respondents selected 'Provo', they were directed to an additional question with a map of Provo and a prompt to select where on the map they currently lived. Analysis was done to determine the exact distance from BYU campus to the selected map location for each survey response, displayed in Figure 10.

Not only did more respondents report to live in Provo in 2024 compared to 2022 as mentioned above, but more students reported to live closer to campus in 2024, than in 2022. There was a large concentration of respondents that reported to live less than three quarters of a mile away from campus in 2024; there was a smaller concentration of respondents who reported to live less than 2.5 miles away from campus in 2024.

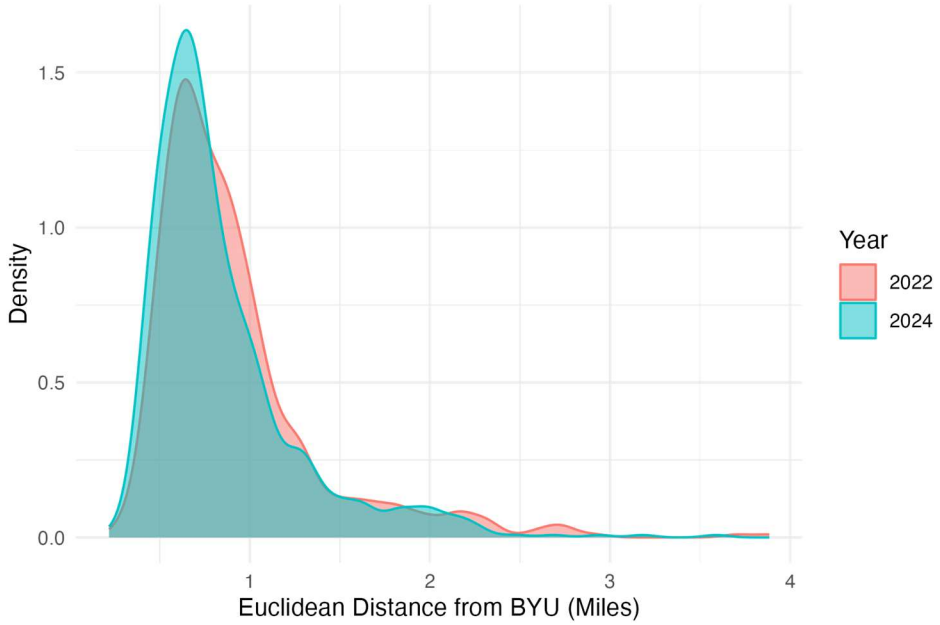


Figure 10: Distance Distribution

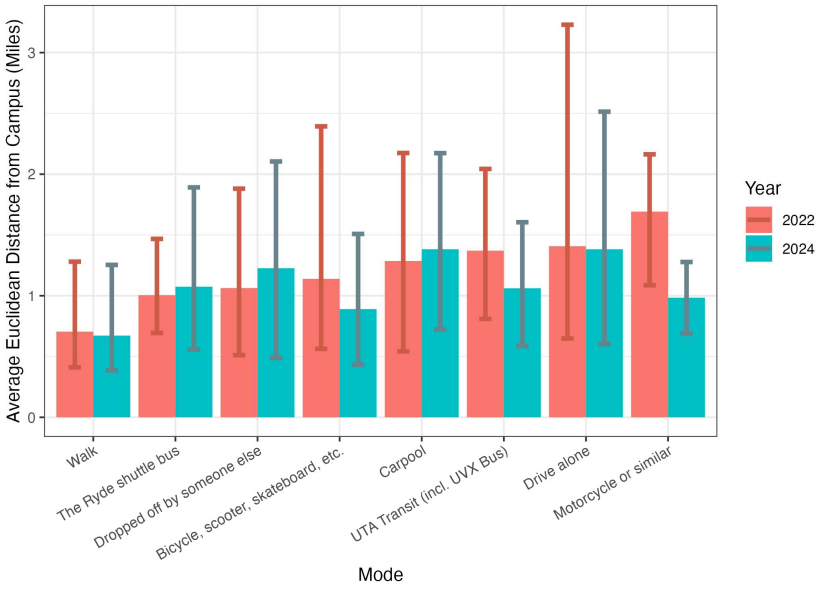


Figure 11: Average miles traveled per mode choice

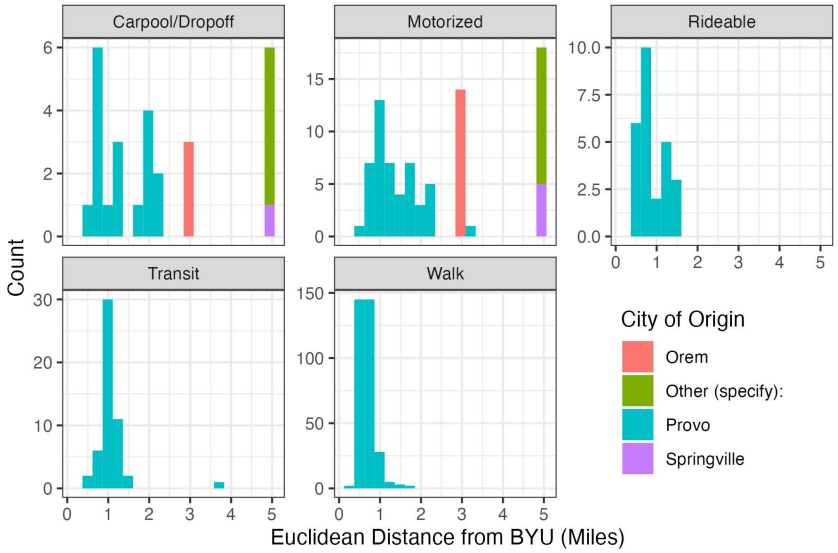


Figure 12: Distribution of mode choice based on distance from campus/city of origin

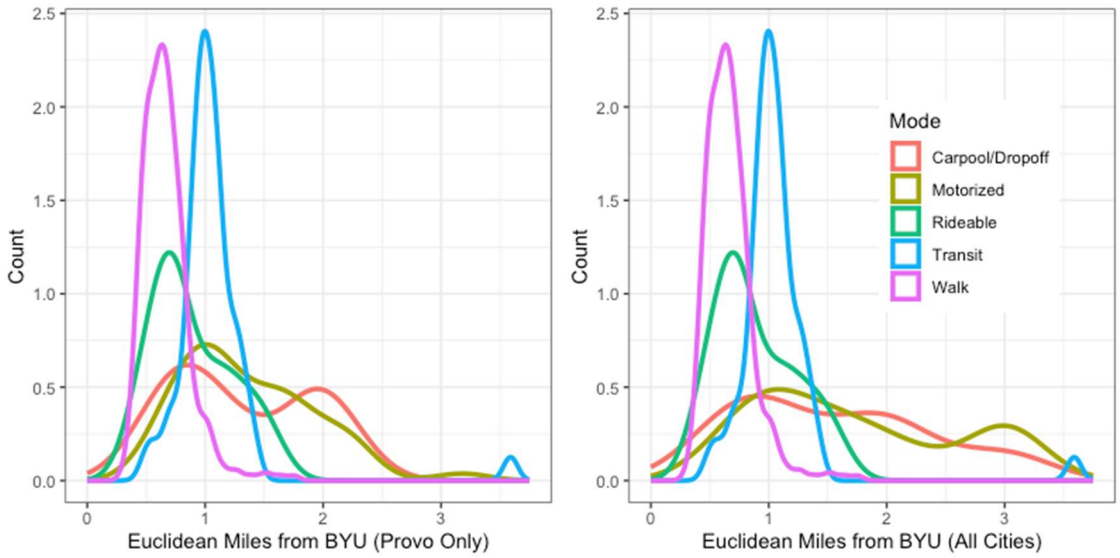


Figure 13: Miles traveled versus mode choice used

Multinomial Logit Model

To test which factors had the greatest effect on mode choice, we created several multinomial logit models comparing different combinations of variables. The variables used were distance from campus (Distance), year in school (Class), and mode choice factor (Reason). A list of all these models and their coefficients can be found in Appendix B, and the four most significant models are discussed below. Table 7 shows the intercept values for the four models with the highest r squared and lowest Aaike Information Criterion (AIC) with asterisks marking the lower p-values. Distance seems to play the biggest factor in individual mode choice since the model containing only the distance variable had a much higher r squared value than the other models with individual variables. Adding the mode choice factors to the model significantly increased the r squared value and decreased the AIC value which shows that mode choice is also influenced by factors people think are important in traveling to campus. After adding class, the models r squared values rose by an insignificant amount but created large intercepts which could be a sign of overfitting the model. Because of this, the model comparing distance and mode choice factors to mode selection is recommended.

Table 7: Intercepts and Statistical Analysis of Multinomial Logit Models

	Distance	**Distance and Class**	**Distance and Reason**	**Distance, Class, and Reason**
(Intercept) × Motorized	0.795	15.78	0.83	16.832
(Intercept) × Rideable	3.003***	20.669	2.504*	23.234
(Intercept) × Transit	2.336**	17.404	2.624**	19.634
(Intercept) × Walk	8.613***	24.564	8.596***	27.278
Num.Obs.	2370	2370	2370	2370
AIC	759.4	777	737.2	754.6
RMSE	0.49	0.49	0.46	0.45
mcfadden's r2	0.223	0.247	0.347	0.371

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 8 shows the coefficients for the model comparing distance to mode choice. With statistically significant distance coefficients of -2.484 for rideables and -6.511, we can conclude that distance plays a major role in people's decision to walk to campus and take a rideable to campus. It is harder to tell if distance plays as big of a role for motorized vehicles because the coefficient is relatively small and has a higher p-value.

Table 8: Multinomial Logit Model Testing Distance Influence on Mode

	Distance
(Intercept) × Motorized	0.795
(Intercept) × Rideable	3.003***
(Intercept) × Transit	2.336**
(Intercept) × Walk	8.613***
miles_from_byu × Motorized	0.139
miles_from_byu × Rideable	-2.484**
miles_from_byu × Transit	-1.082+
miles_from_byu × Walk	-6.511***
Num.Obs.	2370
AIC	759.4
RMSE	0.49
mcfadden's r2	0.223

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Rideables

The 2022 survey questions did not have as strong a focus on Rideables; it is clear that rideable use was less of a focus in that survey. This made it difficult to draw any conclusions about the change in rideable use around campus. There was, however, some general data on those who arrived and left school on a rideable which allowed for the comparison of people who used rideables to get to campus in 2024 versus 2022. That percent was, however, almost the same for each year. One recommendation for future use of the survey is to keep the questions added this year to get an idea of how people are using rideables on campus during the 2024 survey year versus future years.

Table 9 shows the percentage of people who stated they owned a rideable and Table 10 shows how respondents use their rideables with respect to commuting. About 38% percent of the respondents own a rideable, and, of those 38%, almost 60% of them stated they never use their rideable to get to campus. A little over three percent of those that own a rideable bring their rideable in the car and use it to get around campus. Unfortunately, there is no good way of seeing if this is due to the change in rideable policy because of the lack of questions on rideable use in the year 2022. Assuming every student followed the policy before it was changed and that all who used

bikes before still use bikes now, all Rideables used besides bikes could potentially be due to the change in policy.

Table 9: Rideable Ownership

Owns Rideable	Count	Percent
Yes	438	37.95%
No	625	54.16%
No Response	91	7.89%

Table 10: Rideable Transportation

Campus Use	Count	Percent
I don't ever bring a rideable to campus	259	59.13%
I use a rideable to get to campus	153	34.93%
I drive to campus and then use a rideable to get around campus	15	3.42%
No Response	11	2.51%

This survey also investigated how much people were willing to pay for their rideable. Figure 14 shows a density plot of the prices that people stated they paid for their rideable. It appears hardly anyone who responded was willing to pay over $1000 for a bicycle, electric scooter, or a skateboard, but the rest of the rideables had some people willing to spend over $1000. A few of the Rideables listed on the survey are not included in the figure because those respondents didn't state how much they spent on their rideable.

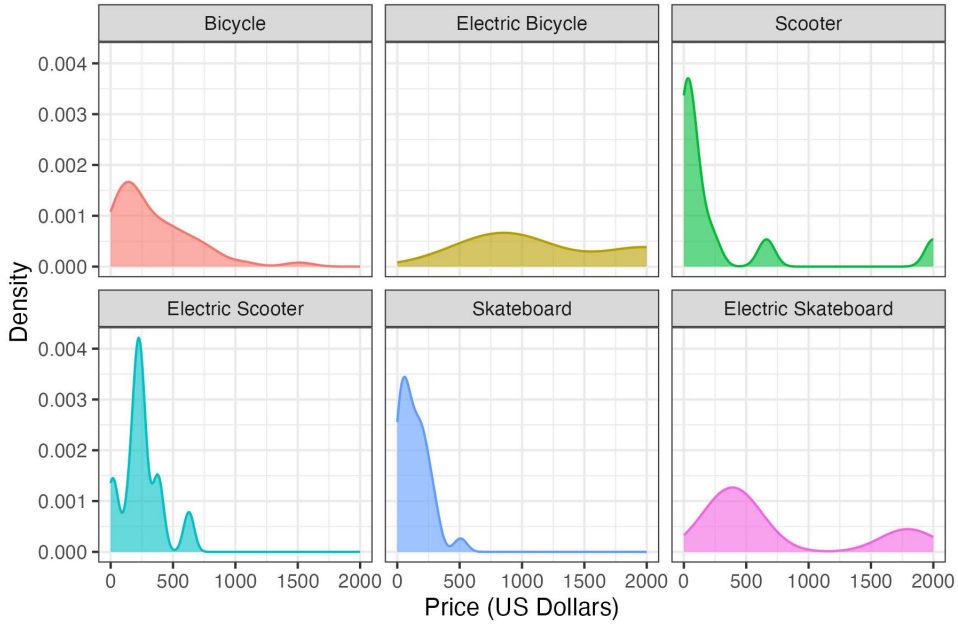


Figure 14: Cost of Rideables

Related Issues

The survey conducted by the BYU Office of Sustainability provided valuable insights into transportation's impacts on safety, environmental factors, economic considerations, and public health within the campus vicinity. These findings illuminate potential areas for improvement and strategic interventions to enhance sustainability and well-being.

Safety Considerations:

One of the most notable impacts identified pertains to safety concerns surrounding transportation to and from campus. By analyzing the data collected, BYU can identify patterns of commuting behavior among students and faculty. For instance, if a significant portion of the campus community utilizes bicycles for commuting, there is an opportunity for BYU to enhance safety by implementing dedicated bike lanes and safer routes around campus. Such proactive measures would contribute to mitigating risks associated with bicycle commuting and fostering a safer environment for all. Since so many students walk to school, BYU, that would be one of the main safety considerations. BYU might look at lighting the sidewalks around campus better or providing safer, clearer crosswalks.

Environmental Impacts:

The survey findings also shed light on the environmental implications of transportation choices. While promoting sustainable transportation options like biking and walking can reduce carbon emissions and congestion, decisions such as increasing parking capacity may inadvertently lead to higher vehicular traffic and environmental degradation. For instance, expanding parking facilities could encourage more students to drive to campus, resulting in increased air pollution and energy consumption. Conversely, if the data indicates a shift towards public or self-sustaining transportation methods, BYU may opt to reduce parking infrastructure, thereby positively impacting the environment by curbing vehicle emissions and promoting cleaner air quality.

Economic Considerations:

The survey results underscore the economic ramifications of transportation-related initiatives. Any modifications to the transportation infrastructure, such as the expansion of shuttle services or the implementation of new routes, entail financial investments for BYU. While these endeavors may initially impose a burden on the institution's budget through the acquisition of new vehicles and training of personnel, they also present opportunities for economic stimulation within the local community. Not to mention, in many ways the budget could be greatly influenced by knowing what the students currently or could potentially value. By creating employment

opportunities and supporting local businesses through procurement activities, BYU's transportation initiatives can foster economic growth and vitality in the surrounding area.

Public Health Implications:

Furthermore, the survey findings have implications for public health outcomes. Encouraging sustainable transportation modes such as walking and biking can promote physical activity among students and faculty, thereby contributing to improved overall health and well-being. Additionally, by reducing reliance on fossil fuel-powered vehicles, BYU can mitigate air pollution and enhance air quality, thereby safeguarding the respiratory health of the campus community.

This survey provides a comprehensive understanding of the multifaceted impacts of transportation on safety, environmental sustainability, economic dynamics, and public health. By leveraging these insights, BYU can formulate evidence-based strategies to optimize transportation systems, prioritize sustainability goals, and promote the well-being of its campus community and the surrounding environment.

Lessons Learned

One significant challenge encountered during the project was how to better the original survey from 2022 and add additional questions about rideables while keeping the survey similar enough to the original 2022 survey. We wanted the new survey to be similar to the 2022 survey so that the results would be comparable. The original 2022 survey was altered only slightly by including better wording and clearer options for survey takers while still maintaining the same overall questions.

With new rideables policy in place, our related questions needed to be easily understood by survey takers as well as measure the desired topics given to us by the Office of Sustainability. We created questions carefully and ran them by Bremen Leak from the Sustainability Office and Dr. Macfarlane, our mentor, for their comments. After their approval, we incorporated all rideables related questions into the survey.

Another challenge we encountered and overcame was deciding where, when, and how to distribute the survey to produce the least amount of bias. It was decided to distribute the survey in three different locations on campus: the west side of the JFSB, south of the MARB, and inside the Wilkinson Center. This way, data was collected from a variety of different students with various majors, taking different paths through campus. The survey was also distributed over two days at various times of the day. This allowed the survey to be taken by people who arrive to and leave from campus at various times.

We were also challenged to collect a similar number of responses from the 2022 survey or more. This way, we could be more confident in comparing the data and that we were seeing an accurate representation of the BYU student population. We incentivized all passersby with a treat to bring in more people. This effort was successful; we surpassed the number of survey responses from 2022.

Conclusions

The project, in its entirety, has achieved significant success. The methodology involved redistributing and modifying the original survey from two years ago to better align with the project's objectives. This strategic revision facilitated a comprehensive analysis, which enabled a comparison and contrast with the survey outcomes from 2022 with those obtained this year effectively.

The findings from this capstone highlight a critical insight: the necessity for further research to definitively ascertain the impact of recent housing policy changes. Our initial hypothesis assumed that there would be a noticeable shift in the transportation choices of students and faculty, specifically an increase in the number of individuals opting to drive alone or utilize public transport. This assumption was predicated on the premise that the alteration in housing policy by Brigham Young University (BYU) would broaden the range of housing choices available to students, including apartment communities situated further from the campus. Contrary to our expectations, the survey revealed a pronounced increase in the number of students walking to campus, a trend that noticeably diverges from our hypothesis and suggests no direct correlation with the housing policy modifications.

Another noteworthy aspect of our data collection process was the challenge in soliciting participation from students using rideables. Given the volunteer nature of the survey, the predominant demographic of respondents comprised individuals who were on foot at the time of the survey. This limitation has potentially skewed our results, as we were unable to secure a representative sample that accurately reflects the transportation modalities of the entire student body. The implications of this sampling bias suggest that our findings may not fully capture the varied transportation preferences of the BYU student population, necessitating a cautious interpretation of the data.

In summary, while the project has yielded valuable insights, the discrepancies observed, coupled with the challenges encountered in data collection, highlight the need for ongoing research to fully understand the implications of housing policy changes on student transportation choices.

As next steps, it is essential to refine data collection methods to encompass a broader and more diverse segment of the student population, particularly targeting those utilizing various forms of transportation. This could involve deploying targeted outreach strategies or leveraging digital platforms to ensure a more representative sample. Finally, a study spanning multiple years could provide valuable insights into long-term shifts in transportation choices among students, potentially correlating these trends with specific policy changes or other external factors.

Recommendations

We recommend that the results of this study be used by the BYU Office of Sustainability and other BYU agencies as they plan and make decisions for BYU. It would be especially useful to administer the survey in coordination with a new campus policy like this study. It would be beneficial to conduct this survey in the future with a larger and more accurate sample. This could be achieved if the survey became a campuswide survey.

The only way this would be approved as a campuswide survey is if it helped further the strategic objectives of BYU. This may become possible by working with BYU's assessment and planning office to update the survey in a way that will help them with gathering data to meet their objectives. With that said, it is recommended that the survey stay as true to the original as possible allowing an easier comparison between survey administration years.

Further, it is recommended that a more in-depth analysis of rideable use be made in future years. Since this was the first year with the added questions involving rideable use, it wasn't possible to compare the results to past years. With future surveys containing these same questions, more comparative analysis can be made.

Since the analysis suggested distance has the biggest effect on mode choice, those interested in changing travel behavior for campus commuting should consider changes that affect the distance people live to BYU campus. This information should be used to aid in housing acquisition decisions, virtual learning plans, and other policies that would affect the distance from campus. It would also be interesting to create a multinomial logit model with past data and compare the coefficients.

Appendix A

Included below are snapshots of the survey distributed in 2024.

BYU Civil & Construction Engineering
IRA A. FULTON COLLEGE OF ENGINEERING

Implied Consent
BYU Commuter Survey 2024
IRB#: IRB2022-040

We are researchers at BYU working under Dr. Gregory Macfarlane of the Department of Civil and Construction Engineering. You are being invited to participate in this reseach study about commuting to campus. Your participation in this study is optional.

If you choose to be in the study, you will be asked to complete a survey that should take approximately 5 minutes. You may stop the survey at any time. The survey is anonymous, and no one will be able to link your answers back to you. Please do not include your name in the survey responses. You will not be paid for being in this study. The information will be used to understand travel modes and distances to campus.

Questions? Please contact us at transport-surveys@byu.edu. If you have questions or concerns about your rights as a research participant, you can contact the BYU Human Research Protections Program at 801-422-1461 or BYU.HRPP@byu.edu. If you want to participate in this study, click the [Next] button to start the survey.

The next several questions ask about your journey to BYU's campus today. If you did not or will not travel to campus today, please respond with information on your most recent trip.

How did you get to campus today?

- ○ Drive alone
- ○ Motorcycle or similar
- ○ Carpool
- ○ Dropped off by someone else
- ○ UTA Transit (incl. UVX Bus)
- ○ The Ryde shuttle bus
- ○ Bicycle, scooter, skateboard, etc.
- ○ Walk
- ○ Other (specify):

What time did you arrive on campus today? Include AM/PM

What time will you leave campus today? Include AM/PM

What influenced your decision to use the transportation mode you chose (Bicycle, scooter, skateboard, etc.)? Select up to 5 that apply:

- ☐ Parking availability
- ☐ Cost
- ☐ Convenience
- ☐ Safety
- ☐ Privacy
- ☐ Weather
- ☐ Flexibility
- ☐ Distance
- ☐ Health
- ☐ Exercise
- ☐ Personal preference
- ☐ Mode availability
- ☐ Travel time
- ☐ Environmental concerns
- ☐ None of the above

Rank the reasons you chose from most influential to least influential (drag and drop):

Do you own a car?

- ◯ Yes
- ◯ No

Select which rideable(s) you own.

- ☐ Bicycle
- ☐ Electric Bicycle
- ☐ Skateboard
- ☐ Electric Skateboard
- ☐ Scooter
- ☐ Electric Scooter
- ☐ Hoverboard/Segway/Electric Unicycle
- ☐ I don't own any of these
- ☐ Other (please explain)

Some people use a rideable(bicycle, skateboard, etc.) to get to campus, and some drive to campus with their rideable stored in their vehicle to use on campus. If you ever bring a rideable to campus, which option best describes you?

- ◯ I use a rideable to get to campus
- ◯ I drive to campus and then use a rideable to get around campus
- ◯ I don't ever bring a rideable to campus

Which rideable do you use most often to get to/get around campus?

Where do you store your Bicycle on campus?

- ☐ Campus bike racks
- ☐ Parked outside campus
- ☐ Backpack
- ☐ In a lab or classroom
- ☐ Somewhere else (Please Specify)

About how much did your Bicycle cost? ($0 - $2000+)

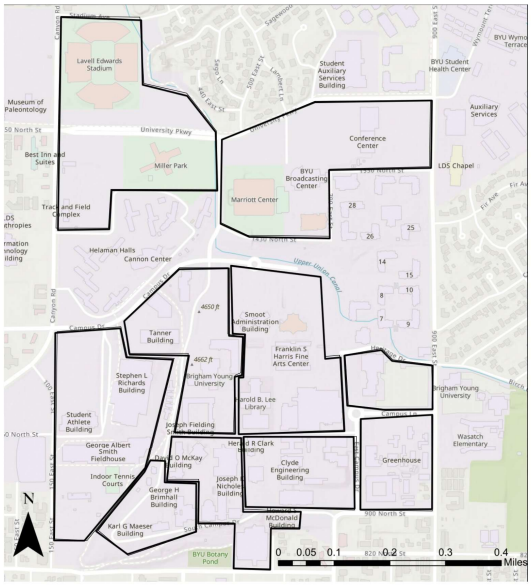
0 500 1000 1500 2000

Dollars

What year are you in school?

- ◯ Freshman
- ◯ Sophomore
- ◯ Junior
- ◯ Senior
- ◯ Graduate student
- ◯ Faculty/Staff

Select where your first on-campus activity was located today:



Select where your last on-campus activity is located today:

Where do you currently live?

- ◯ On-campus housing
- ◯ Off-campus BYU-contracted housing
- ◯ Non-BYU-contracted housing (including with family)

Which complex do you currently live in?

- ◯ Heritage Halls
- ◯ Helaman Halls
- ◯ Foreign Language Student Residence (FLSR)
- ◯ Wyview Park
- ◯ Wymount Terrace
- ◯ Other (specify):

Thank you! Please answer a few additional questions about your background:

Where did you grow up? (City, State, Country)

What mode(s) of transportation did you primarily use to get to high school? (select all that apply)

- [ ] Drive alone or with siblings
- [ ] Motorcycle or similar
- [ ] Carpool with peers
- [ ] Dropped off by parent or guardian
- [ ] School bus
- [ ] Public transportation
- [ ] Bicycle, scooter, skateboard, etc.
- [ ] Walk
- [ ] Other (specify):

How do you describe yourself?

- ○ Male
- ○ Female
- ○ Non-binary / third gender
- ○ Prefer to self-describe
- ○ Prefer not to say

Are you married?

- ○ Yes
- ○ No

Do you have children?

- ○ Yes, 1
- ○ Yes, more than 1
- ○ No

What is your area of study?

- ○ Business
- ○ Education
- ○ Engineering
- ○ Family, Home, and Social Sciences
- ○ Fine Arts and Communications
- ○ Humanities
- ○ International and Area Studies
- ○ Law
- ○ Life Sciences
- ○ Nursing
- ○ Physical and Mathematical Sciences
- ○ Religious Studies
- ○ Other/Undeclared

Do you currently work?

- ○ Yes, on campus
- ○ Yes, off campus
- ○ Yes, both on and off campus
- ○ No

What is the highest level of education obtained by one of your parents?

- ○ No college/post-secondary education
- ○ Trade school
- ○ Some college
- ○ Associate's degree
- ○ Bachelor's degree
- ○ Master's degree
- ○ Doctorate or professional degree
- ○ Other:

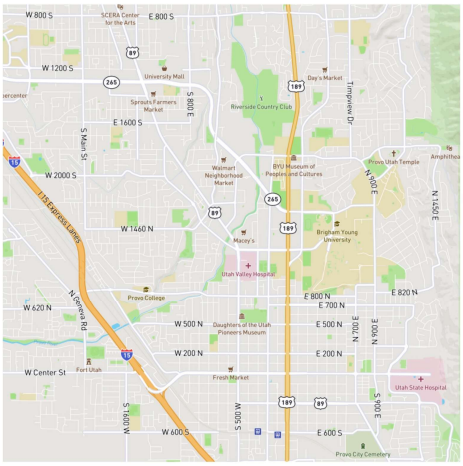
What type of housing do you live in?

- ○ Owned, Single Family
- ○ Owned, Multi-family (e.g. condos)
- ○ Renting, Single Family
- ○ Renting, Multi-family (e.g. apartments)

What city do you currently live in?

- ○ Provo
- ○ Orem
- ○ Springville
- ○ Other (specify):

Please click/tap roughly where you live (or live closest to):



Included below are snapshots of the BYU Student Housing Policy from 2022 as well as the BYU Rideables Policy from 2023.

Student Housing Policy

Brigham Young University seeks to promote a living environment for students that is consistent with the moral principles of The Church of Jesus Christ of Latter-day Saints and conducive to study and learning. Accordingly, the university has established this Student Housing Policy to assist single students in adhering to the high ideals and principles of behavior expected at BYU.

Two-Semester Housing Requirement

For their first two semesters as a BYU student, all single undergraduate students must live (1) in BYU on-campus housing, (2) in BYU off-campus contracted housing, or (3) with qualifying family members. This applies to all single BYU undergraduate students, including transfer students, who are matriculated, meaning they have been admitted to a degree-seeking program.

Completion of both spring and summer academic terms qualifies as one semester.

Qualifying family members are parent(s), stepparent(s), grandparent(s), married uncle or aunt, and married sibling.

Any exception must be approved in writing by the BYU Off-Campus Housing Office.

Single, matriculated students who have completed two semesters at BYU are eligible but are not required to live on-campus or in BYU off-campus contracted housing.

Sex-Separated Housing Requirement

All single students not living with qualifying family members are required to live in dwelling units only with persons who are the same sex as the student. BYU's Off-Campus Housing Office may grant exceptions in certain circumstances, such as for siblings of the same family living together in the same dwelling unit provided there are no other single persons in the dwelling unit.

Single BYU students who choose to live in non-BYU-contracted off-campus housing (community housing) are still required to abide by the requirement to live only with persons who are the same sex as the student. Single BYU students who find themselves in individual dwelling units where sex-separation is not maintained, that is, where a roommate (or apartment-mate or housemate) who is a member of the opposite sex has moved in, are required to find other housing arrangements, at the student's cost.

Single BYU students who live in community housing are encouraged to choose roommates who abide by and respect the principles contained in this policy. BYU's Off-Campus Housing Office is a resource to single BYU students who live in community housing and experience difficulties

with roommates who are not following this policy's sex-separated housing requirement or this policy.

Conduct

BYU students are required to abide by the Church Educational System Honor Code (CES Honor Code) "at all times and in all things, and in all places" (Mosiah 18:9). BYU students must refrain from acting inconsistently with the CES Honor Code or any other applicable university policies.

The CES Honor Code commitment to "encourage others in their commitment to comply with the Honor Code" applies in the context of on-campus housing, BYU contracted off-campus housing, and in community housing. Though the university is unable to require non-BYU students to abide by the CES Honor Code, BYU students should encourage their guests to abide by the CES Honor Code and this policy while visiting BYU students in their dwelling units.

It is a privilege to live in on-campus housing and in BYU-contracted off-campus housing. Violating the CES Honor Code or this policy may result in an eviction from, and a loss of eligibility to live in, on-campus housing and BYU-contracted off-campus housing.

Visitors

Opposite sex visitors of single BYU students in on-campus housing, BYU contracted off-campus housing, and in community housing are permitted to visit in living rooms and kitchens and are not permitted in bedrooms or private hallways, except when visiting Helaman Halls as outlined on the housing website. The use of bathroom areas by members of the opposite sex is not appropriate unless emergency or civility dictate otherwise and then only if the safety and privacy of other residents are not jeopardized.

Visiting hours for individuals visiting single BYU students in on-campus housing, BYU contracted off-campus housing, and in community housing begin after 9:00 a.m. and extend until 12:00 midnight. Friday night visiting hours extend until 1:30 a.m. BYU contracted off-campus landlords may establish a shorter visiting period if written notice is given to students.

Because Helaman Halls does not have common living rooms, visitors of the opposite sex are permitted to visit in bedrooms during certain days and times as approved by Residence Life.

Current Address

All students must provide the current street address of their local residence (not a post office box). Students must verify their address each semester or term using the Change Residential Address link. Single students living with a qualifying family member must submit a family declaration at the time they begin living with the qualifying family member.

APPROVED: 29 Aug 2022 [Revised 6 Sep 2022]

PRIOR VERSION: 29 Jun 2020

APPLICABILITY: This policy applies to all students.

POLICY OWNER: Student Life Vice President

RESPONSIBLE OFFICE: Residence Life

RELATED POLICIES:

- Animals on Campus Policy
- Banning Policy
- Church Educational System Honor Code
- Dress and Grooming Standards

Traffic, Parking, and Rideables Policy

Brigham Young University prioritizes pedestrian access on campus. Motor vehicles and rideables are allowed on university property only as described in this policy. Members of the BYU community and visitors to campus should exercise prudence and caution while operating and parking motor vehicles and rideables on university property and in the surrounding communities.

Definitions

For purposes of this policy, key terms are defined as follows:

Disability Mobility Device means a mobility device used by an individual with a mobility disability, as defined by federal law.

Main Campus means BYU's academic, administrative, and residential buildings and the surrounding property owned and controlled by the university in Provo, Utah.

Motor Vehicle means a self-propelled vehicle intended primarily for use on roads. This definition includes, but is not limited to, trucks, buses, vans, cars, gas or electric carts (e.g., GEM carts, golf carts, utility vehicles), ATVs, UTVs, motorcycles, snowplows, and gas-powered scooters and mopeds.

Rideable means a device used primarily for the transportation of an individual. This definition includes bicycles, e-bicycles, scooters, e-scooters, skateboards, rollerblades, roller skates, hoverboards, and any similar device approved by the university for use on the Main Campus. Rideable does not mean a Disability Mobility Device used by an individual with mobility disabilities. Motor Vehicles and any gas-powered devices are not Rideables.

University Property means the Main Campus and all other buildings and property owned, operated, or controlled by the university (e.g., BYU Salt Lake Center, Jerusalem Center, Aspen Grove).

Authority and Responsibility

BYU retains the right to control traffic and to enforce parking regulations on University Property and may grant, revoke, or refuse parking privileges at its discretion. Within its jurisdiction, BYU Police enforces relevant Utah state law, including the Utah Traffic Code, and Provo City ordinances. BYU Security oversees parking on the Main Campus in accordance with the procedures posted on the BYU Security website.

The university assumes no responsibility for the care or protection of, or damage to, any personal Disability Mobility Device, Motor Vehicle, or Rideable, or its contents, at any time it is operated on, parked on, or removed from University Property. The university reserves the right to cite, fine, impound, or immobilize at the owner's or operator's expense any Motor Vehicle or Rideable in violation of parking regulations or this policy.

Traffic

The university allows Motor Vehicles to be operated on the Main Campus on designated roads, in parking lots, and in accordance with traffic laws and posted signage. The only Motor Vehicles allowed to be operated on sidewalks on the Main Campus are certain pre-approved Motor Vehicles and only at the times and under the circumstances prescribed by the administration vice president and CFO.

Parking

BYU provides designated parking areas for current BYU students, employees, and visitors. Motor Vehicle operators must obey parking regulations, as found on the BYU Security website, and posted parking signs.

Parking oversized Motor Vehicles, such as recreational vehicles and motorhomes, and overnight parking of any Motor Vehicle are prohibited; however, limited exceptions may be made by the Parking Services Office.

Electric Motor Vehicles may be charged on the Main Campus only in designated areas.

Rideables

BYU allows the use of Rideables on the Main Campus subject to the following conditions:

General Operations

- Rideables must be operated in a safe and prudent manner, prioritizing pedestrian safety and movement.
- Rideables must be operated only on established sidewalks, walking areas, or roads.
- Rideables must not be operated on accessibility ramps.
- Rideable operators must maintain a clearance of three feet from pedestrians, Disability Mobility Devices, Motor Vehicles, and other Rideables.
- Rideables must be privately owned or owned by the university and may not be commercial ride-share devices.
- Rideables must not be used for stunts, jumps, or tricks, or on railings, stairs, or similar features.

Specific Circumstances

Sidewalks and Walking Areas

- Rideables must travel at speeds no greater than a fast-walking speed (5 mph or less).
- Rideable operators must obey pedestrian rules.
- See the Crowded Times subsection below for further restrictions.

Main Campus Roads

- Rideables may be operated on Main Campus roads.
- Rideables must comply with all traffic rules, including speed limits and stopping for pedestrians at crosswalks, and must not impede Motor Vehicle traffic.

Marriott Center Bridges

- Rideable use is not allowed.

Inside Buildings

- Rideables must not be operated, ridden, or stored in buildings.
- Rideables may be brought into buildings only if they are completely stowed inside a standard backpack-sized bag. Rideables must remain with the owner or operator and out of any aisles or walking paths.

Charging

- Rideables and batteries for Rideables must not be charged on the Main Campus, except in designated areas in on-campus housing for residents of on-campus housing only.

Security and Storage

- When not in use, Rideables must be secured outside to bike racks or in other designated areas.
- Rideables must not be secured to railings, light poles, or any other structure not designed for Rideable storage.
- If left unattended and unsecured, or secured in an unapproved location, a Rideable may be moved or impounded by BYU Security or BYU Police at the owner or operator's expense.

Crowded Times

- Rideables must not be operated inside Campus Drive (including the sidewalk along the interior perimeter of Campus Drive) during class breaks and in any crowded areas.

Inclement Weather or Dangerous Conditions

- Rideables should be used with heightened caution.

Exceptions or Variances

Posted signage may restrict or prohibit the use of Rideables in ways that vary from the above conditions.

The University Accessibility Center (UAC) may recommend individual exceptions to the above-listed conditions to provide reasonable accommodations for persons with disabilities. The managing director of BYU Security has the authority to grant UAC-recommended exceptions. These exceptions are not required to operate a Disability Mobility Device on University Property.

Additional Rideable Notices

Violations of these conditions may result in citations by law enforcement, fines, and the loss of Rideable-use privileges.

BYU assumes no liability for those who use Rideables on University Property. Any individual operating or riding on a Rideable on University Property is operating or riding at that individual's own risk. The university makes no guarantee that University Property is safe for Rideable use.

Rideable users are responsible for any damage, injury, or loss caused by their personal Rideable use on University Property.

APPROVED: 26 Jun 2023

PRIOR VERSION: 4 Jun 2012

APPLICABILITY: This policy applies to all individuals on University Property.

POLICY OWNER: Administration Vice President and CFO

RESPONSIBLE OFFICE: BYU Security, BYU Police

RESOURCES: Parking Services

RELATED POLICIES:

- Accommodation of Persons with Disabilities at BYU Procedures

Appendix B

Below are the coefficients of every multinomial logit model that was run.

	Distance	Reason	Class	Distance and Class	Distance and Reason	Class and Reason	All Three
(Intercept) × Motorized	0.795	1.099*	17.138	15.780	0.830	19.172	16.832
(Intercept) × Rideable	3.003***	-0.154	16.445	20.669	2.504*	18.603	23.234
(Intercept) × Transit	2.336**	1.350**	15.751	17.404	2.624**	18.793	19.634
(Intercept) × Walk	8.613***	2.659***	16.445	24.564	8.596***	18.445	27.278
miles_from_byu × Motorized	0.139			0.173	0.320		0.341
miles_from_byu × Rideable	-2.484**			-3.043***	-3.070**		-3.801***
miles_from_byu × Transit	-1.082+			-1.037+	-0.773		-0.815
miles_from_byu × Walk	-6.511***			-6.630***	-6.765***		-7.091***
reasonCost × Motorized		-1.099			-1.048	-1.055	-0.952
reasonCost × Rideable		2.100+			20.117	2.134+	20.641
reasonCost × Transit		0.442			17.034	0.293	17.108
reasonCost × Walk		1.169			19.124	1.023	19.458
reasonDistance × Motorized		-0.038			-0.454	-0.101	-0.196
reasonDistance × Rideable		-2.043+			-0.864	-2.153+	-0.468
reasonDistance × Transit		-0.982			-0.880	-1.099+	-0.770
reasonDistance × Walk		0.291			0.204	0.134	0.391
reasonEnvironmental_concerns × Motorized		-1.099			-1.089	-1.078	-0.846
reasonEnvironmental_concerns × Rideable		19.894			20.963	19.986	21.166
reasonEnvironmental_concerns × Transit		-1.350			-1.563	-1.404	-1.540
reasonEnvironmental_concerns × Walk		17.774			19.421	17.953	19.572
reasonExercise × Motorized		-1.099			-1.073	-1.030	-0.888
reasonExercise × Rideable		20.813			20.896	20.348	20.860
reasonExercise × Transit		-1.350			-1.777	-1.361	-1.788
reasonExercise × Walk		20.398			19.822	19.838	19.680
reasonFlexibility × Motorized		18.878			18.924	18.809	19.040

	Distance	Reason	Class	Distance and Class	Distance and Reason	Class and Reason	All Three
reasonFlexibility × Rideable		0.154			0.613	-0.211	0.207
reasonFlexibility × Transit		16.612			16.836	16.462	16.665
reasonFlexibility × Walk		16.689			16.694	16.343	16.727
reasonHealth × Motorized		18.641			18.860	18.618	19.090
reasonHealth × Rideable		0.154			-0.219	0.215	-0.074
reasonHealth × Transit		-1.350			-2.001	-1.331	-1.757
reasonHealth × Walk		17.774			17.234	17.733	17.340
reasonMode_availability × Motorized		-0.693			16.472	-0.676	16.613
reasonMode_availability × Rideable		-0.539			17.864	-0.667	18.169
reasonMode_availability × Transit		0.154			17.664	0.044	17.581
reasonMode_availability × Walk		0.910			18.227	0.652	18.330
reasonParking_availability × Motorized		-1.609+			-1.545	-1.577+	-1.350
reasonParking_availability × Rideable		-0.357			0.159	-0.350	0.445
reasonParking_availability × Transit		-0.474			-1.435	-0.589	-1.518
reasonParking_availability × Walk		-0.658			-0.229	-0.737	-0.049
reasonPersonal_preference × Motorized		-1.099			-0.535	-1.371	-0.274
reasonPersonal_preference × Rideable		0.560			1.815	0.039	1.297
reasonPersonal_preference × Transit		-19.893			-19.433	-19.677	-19.091
reasonPersonal_preference × Walk		0.049			0.661	-0.018	0.421
reasonPrivacy × Motorized		20.944			20.499	21.038	20.483
reasonPrivacy × Rideable		0.154			4.336	0.426	5.773
reasonPrivacy × Transit		-1.350			-0.902	-1.004	-0.150
reasonPrivacy × Walk		-2.659			6.472	-2.409	7.162
reasonSafety × Motorized		20.944				20.875	
reasonSafety × Rideable		0.154				0.179	
reasonSafety × Transit		-1.350				-1.643	

	Distance	Reason	Class	Distance and Class	Distance and Reason	Class and Reason	All Three
reasonSafety × Walk		-2.659				-2.369	
reasonTravel_time × Motorized		-0.405			-0.915	-0.482	-0.663
reasonTravel_time × Rideable		0.773			0.916	0.735	1.315
reasonTravel_time × Transit		-0.993			-1.495+	-1.168+	-1.520+
reasonTravel_time × Walk		-1.772**			-2.201*	-1.978**	-1.962*
reasonWeather × Motorized		17.433			17.589	17.515	17.690
reasonWeather × Rideable		17.992			18.679	18.219	19.034
reasonWeather × Transit		17.181			16.271	17.288	16.674
reasonWeather × Walk		15.872			16.552	16.064	16.785
classFreshman × Motorized			-15.959	-14.738		-17.966	-15.823
classFreshman × Rideable			-15.634	-17.001		-17.837	-20.196
classFreshman × Transit			-14.430	-14.559		-16.943	-16.359
classFreshman × Walk			-12.827	-15.984		-14.816	-18.672
classGraduate student × Motorized			-15.346	1.174		-17.315	1.979
classGraduate student × Rideable			-16.445	-17.869		-18.710	-20.061
classGraduate student × Transit			-15.058	0.446		-17.541	0.278
classGraduate student × Walk			-13.880	-0.869		-15.757	-1.580
classJunior × Motorized			-16.199	-14.622		-18.168	-16.033
classJunior × Rideable			-16.696	-17.382		-19.029	-20.542
classJunior × Transit			-15.241	-15.495		-17.789	-17.668
classJunior × Walk			-13.988	-15.805		-16.035	-18.645
classSenior × Motorized			-16.182	-15.268		-18.005	-16.321
classSenior × Rideable			-16.182	-16.699		-18.782	-19.891
classSenior × Transit			-14.722	-15.163		-17.151	-16.836
classSenior × Walk			-14.214	-15.745		-16.076	-18.328
classSophomore × Motorized			-16.509	-15.709		-18.336	-16.841
classSophomore × Rideable			-16.578	-18.100		-19.118	-21.231
classSophomore × Transit			-14.886	-15.328		-17.360	-17.164
classSophomore × Walk			-13.634	-16.095		-15.537	-18.713
Num.Obs.	2370	3740	3665	2370	2370	3665	2370

	Distance	Reason	Class	Distance and Class	Distance and Reason	Class and Reason	All Three
AIC	759.4	1490.7	1544.7	777.0	737.2	1456.0	754.6
RMSE	0.49	0.55	0.57	0.49	0.46	0.54	0.45
mcfadden's r2	0.223486348754736	0.126203214236066	0.030069281104905 6	0.246926678076622	0.346991906572281	0.154981342403555	0.370602580454534

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

References

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[2] M. Gudmundson, "Students share thoughts on BYU housing policy change," The Daily Universe, Mar, 2024.

[3] Traffic, Parking, and Rideables Policy, BYU Security, BYU Police, Provo, Utah, Jun. 2023.