PILOT CITIES: PIERCING THROUGH THE GRIDLOCKS

AN ANALYSIS OF THE “GAP”: MOTIVATIONS AND STRATEGIES FOR TRANSPORTATION MODE SHIFTS

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REPORT SUMMARY

This report examined residents of the Reykjavík Capital Area who expressed a desire to change their primary mode of transportation for commuting to work or school. While current travel patterns remain dominated by private car use, respondents' desired travel modes closely align with the sustainable transportation targets outlined in the Reykjavík Master Plan. The largest share of respondents who wished to change modes indicated a preference for switching to public transportation, followed by biking and e-mobility.

A cluster analysis identified a large group of "Switchers" who were generally less satisfied with their current transportation mode, lived within distances suitable for sustainable travel, and reported relatively high levels of climate concern. The primary barriers preventing mode shift were not a lack of interest, but rather practical constraints related to travel time, reliability, route design, weather conditions, childcare responsibilities, and the need to complete daily errands.

Findings suggest that substantial opportunities exist to increase the use of sustainable transportation modes in the Capital Region. Improvements to public transportation service quality, active transportation infrastructure, winter maintenance, employer support, and integrated urban planning may help bridge the gap between residents' transportation preferences and their actual travel behavior.

INTRODUCTION

Cities are home to over half the world's population and urban areas are responsible for almost 70% of greenhouse gas (GHG) emissions [1]. The transport sector is a major contributor to emissions, and in the affluent Nordic countries, around one-third of the emissions from household carbon footprints can be attributed to mobility [2-4]. Among the Nordic countries, the residents of the Reykjavík Capital Area have some of the highest local travel footprints [5]. The Capital Area is highly car-oriented with private cars making up the majority of transport use and many residents see the car as a necessity for daily transport [6]. Around 70% of Capital Area residents use the car as their main mode of transport, whereas buses are used by around 8% of residents, and active transport modes are around 22% [7]. In the City of Reykjavík, 44% of total GHG emissions were attributed to road transportation in 2023 [8], so this is an area where substantial reductions could be seen by supporting residents in using public transportation or active modes transportation more frequently.

To address these issues, the City of Reykjavík has initiated a project entitled *Pilot Cities: Piercing through the Gridlocks*. This project, which is in line with the City of Reykjavík's goal of carbon neutrality by 2030, aims to find ways to reduce GHG emissions by learning about the habits and barriers that residents face concerning using sustainable transportation and reducing waste. The project began in September of 2024 and will be completed in August of 2026. It is a collaborative research and innovation project between the City of Reykjavík and the University of Iceland. The project is funded by Net Zero Cities program. This report is part of the Pilot Cities project and will address deliverable 2.6 of the project which aims to analyze the characteristics and motivations of citizens willing to shift their primary mode of transport.

METHODS

In order to analyze the characteristics and motivations of citizens willing to shift their primary mode of transport, data from a survey designed for the Pilot Cities project was used. The survey was open to residents of the Capital Region and was distributed online from February to April 2025. Around 1,800 responses were received. The survey contained detailed questions to determine the respondents' transportation and recycling habits and perceived barriers to more sustainable options as well as questions concerning their level of climate concern, life satisfaction, and sociodemographic information. The aim of the survey was to gather baseline information on current transport behaviors as well as insights from the public on transportation and recycling to identify targeted interventions.

Using the survey data, we focused on the respondents' reported current work travel modes and desired work travel modes. First, we did a bivariate analysis to see current and desired travel modes, current travel mode satisfaction, commuting distance, and level of climate concern to see how this may relate to transportation choices.

Then a two-step cluster analysis was then performed to identify naturally occurring subgroups in the sample. The variables tested in the analysis included transport mode preferences, sociodemographic variables, and climate concern levels. The analysis then went further into the group who desired to change work travel mode, which explored their stated barriers to change, thematic analysis of open-ended questions, and other data gathered from the survey which may help identify barriers, motivation, or strategies to facilitate those willing to switch their transportation modes. In the last section of the report all the findings are compiled and connected

to potential strategies that can be implemented in the areas of infrastructure and service, by the government, society, businesses, and the best practices that can be observed in other cities.

CURRENT TRAVEL MODES SHARES

This section will explore the survey respondents' current work travel modes, level satisfaction of their work travel mode satisfaction, commuting distance, and level of climate concern of the survey respondents across the travel mode groups.

CURRENT AND DESIRED TRAVEL MODES

Survey participants were asked which mode of transportation they currently used to commute to work or school. They were also asked what mode of transportation they would like to use if different from their current mode. Figure 1 shows the current and desired work travel modes of the survey respondents. The majority of respondents reported that their main mode of transportation to work was the car (60%) followed by walking (16%), bus (11%), e-mobility (electric bike % scooter) (7%) and biking (6%). When asked "If you could choose, what mode of transport would you use to get to this location," about 28% reported that they would like to switch from using the car to other modes, walking shares remained the same (16%), and there were increases in shares of bus (18%), e-mobility (13%) and biking modes (12%). Interestingly, the desired travel modes of the respondents were in-line with the goals of the Reykjavík Master Plan (car = 50%, bus = 15%, and active transport = 35%). The desire to use more sustainable methods of transportation is there amongst residents and further research is needed to see what may be preventing people from using these modes.

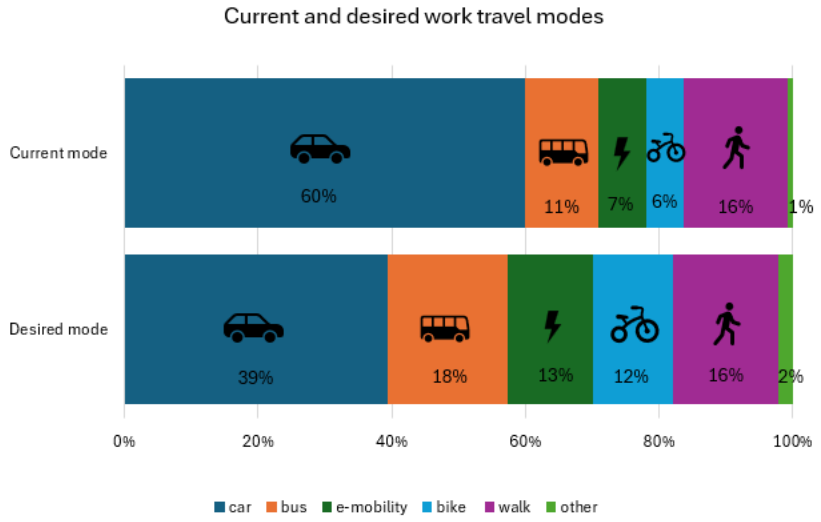

Figure 1. Percentages of current and desired travel modes of survey respondents.

KEY FINDING
DESIRED TRAVEL MODE SHARES ARE IN LINE WITH THE GOALS OF THE REYKJAVÍK MUNICIPAL PLAN.

CURRENT WORK TRAVEL MODE SATISFACTION

It is important to determine the baseline of satisfaction for different transportation modes to see where there is room for improvement or where people's level of satisfaction may be a factor in switching transportation modes. Respondents were asked to rank their satisfaction with their current work travel mode on a scale of 1 (very dissatisfied) to 5 (very satisfied). Figure 2 shows the level of satisfaction that the respondents had with their current work travel mode. Overall, satisfaction levels were quite high for all modes apart from those who currently commute by bus. The respondents who currently commute to work by modes of e-mobility were the most satisfied with 94% ranking their satisfaction as very or mostly satisfied followed by bikers (91%) and walkers (89%). Only 63% of bus riders reported high levels of satisfaction (mostly or very satisfied) with their current mode of transportation with around 20% reporting low satisfaction (very dissatisfied or rather dissatisfied).

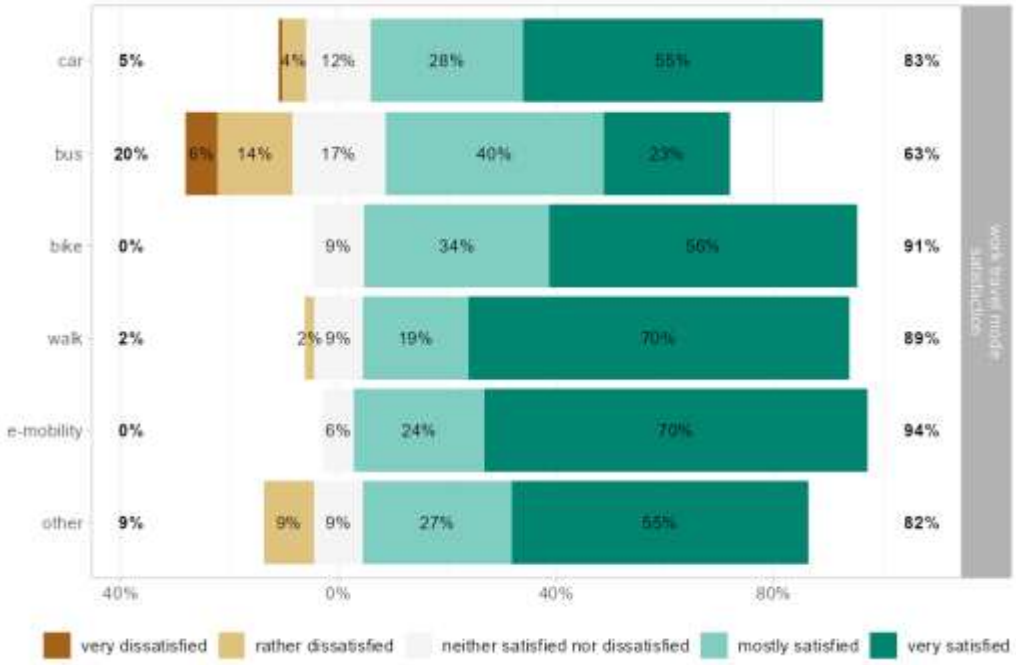

Figure 2. Likert plot of respondents' ranking of their satisfaction level with their current work travel mode.

COMMUTING DISTANCE

The distance between someone's home location and their workplace can be a factor that may determine what mode of transportation they use. For example, it has been suggested by the Norwegian Directorate of Health and Norwegian Roads Administration that 0 to 2 kilometers (km) is a feasible walking distance, 2 to 7 km can be traveled by bicycling, and 7 to 15 km can be done through multimodal trips (combining public transport with walking or biking) [9]. The survey respondents were asked to mark their home and work locations on a map to determine the distance that they travel to work or school. Figure 3 shows the percent of respondents who live within walkable, bikeable, multimodal or further distances from their workplace. 98% of the

respondents live close enough to take a sustainable transportation mode to work, so for most respondents there is great potential to use a sustainable mode of transportation to commute to work or school. Table 1 shows the average distances that people currently travel from home to work and their current travel. The mean and median distances fit within the ranges of what is considered feasible according to the distances described above [9].

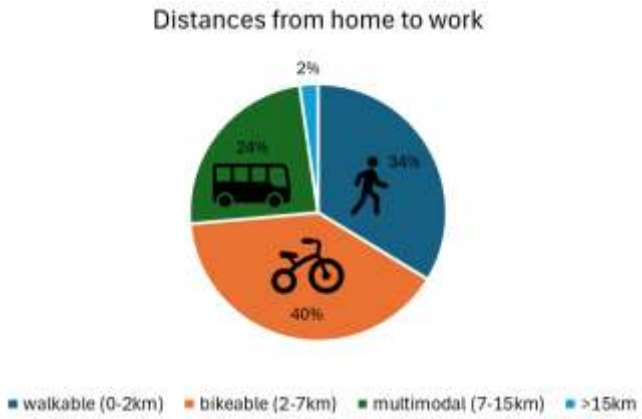

Figure 3. Percent of respondents living within walkable, bikeable, multimodal, or further distances from their home location to workplace.

Table 1. Mean and median distances traveled from home to work across current work travel mode groups.

	Current travel mode (km)	
	Mean	Median
Car	6.5	6
Bus	5.4	5
Bike	3.7	3
Walk	1.2	1
E-mobility	4.3	4
Other	4.4	2

KEY FINDING
98% OF THE SURVEY RESPONDENTS LIVE WITHIN WALKING, BIKING, OR PUBLIC TRANSPORT RANGE OF THEIR WORKPLACE

CLIMATE CONCERN & CURRENT TRAVEL MODE

Climate change concern has been linked to sustainable mobility and reduced car use [10], so it is important to assess the level of climate concern that individuals have in order to see where this could be a leverage point to increase sustainable transport modes. To determine the level of climate concern of the survey respondents, they were asked a series of questions based on the Six Americas Short Survey [11] on a 1(not at all) to 5 (completely) Likert scale. The responses were processed using Factor analysis techniques and the average value of the selected questions was used.

Figure 4 shows the level of climate concern across the current travel mode groups. Climate concern was generally high among the survey respondents (3.8 mean, 4.0 median). Although the level of climate concern among the different current work travel mode groups only differed slightly, the differences were statistically significant. Those who currently walk or take the bus to work had the highest average level of climate concern (4.2 mean, 4.4 median) and those who currently drive to work had the lowest (3.6 mean, 3.8 median). The average levels of climate concern of the other sustainable modes of transportation (biking and e-mobility modes) groups were also above the total average of the survey respondents, so many of the people already taking sustainable modes of transportation also had high climate concern.

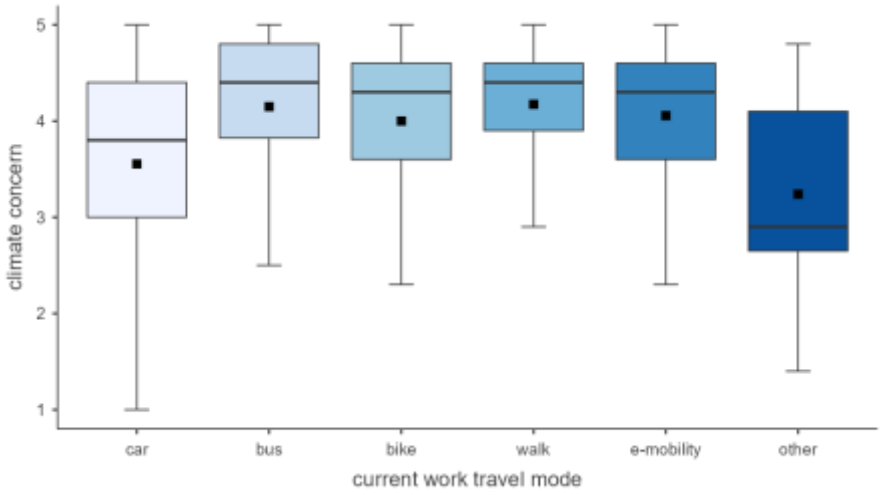

Figure 4. Box plot of reported levels climate concern from the current work travel mode groups. The box represents the middle 50% of responses and the horizontal line represents the median. The small black square indicates the mean. The whiskers that extend from the boxes show the highest and lowest reported values.

TRAVEL MODE GROUPS: CLUSTERING ANALYSIS

A two-step cluster analysis was conducted using SPSS software [12] to find naturally occurring sub-groups within the survey respondents. Variables related to sociodemographic characteristics (gender, citizenship, household type, education level, income group, disability status, LGBTQI membership, employment status, age), travel mode behaviors (current travel mode, desired travel mode, travel mode satisfaction, car ownership, car type, commuting distance), climate concern and responsibility, and life satisfaction levels were added to the model.

Sociodemographic variables	**Travel mode behaviors**	**Other**
Gender	****Current travel mode***	****Climate concern***
Citizenship	****Desired travel mode***	Climate responsibility
Household type	****Desire to switch***	Life satisfaction levels
Education level	****Travel mode satisfaction***	
Income group	Car ownership	
Disability status	Car type	
LGBTQI membership	****Commuting distance***	
Employment status		
Age		

The variables that ended up being the best predictors (statistically significant and predictive powers above 0.01) and led to an acceptable silhouette measure of cohesion (above 0.2) [13] were the current travel mode, desired travel mode, desire to switch, commuting distance, current mode satisfaction, and level of climate concern. From these six variables, the result was the four clusters shown in Table 2 (The Switchers, The Drivers, The Walkers, and Bus, Bikers & E-mobility).

Table 2. Cluster analysis summary by predictor variables.

	Switchers	Drivers	Bus, Bikers, & E-mobility	Walkers
Sample Size	510 (40%)	386 (30%)	216 (17%)	160 (13%)
Current travel mode	Car (70%) Bus (13%) Walk (11%) Bike (4%) E-mobility (2%) Other (1%)	Car (100%)	E-mobility (38%) Bus (36%) Bike (27%)	Walk (96%) Other (4%)
Desired travel mode	Bus (32%), Bike (21%), E-mobility (17%) Car (16%) Walk (10%) Other (4%)	Same as current	Same as current	Same as current
Commuting distance (mean)	Bikeable (5.2 km)	Bikeable (6.9 km)	Bikeable (4.4 km)	Walkable (1.1 km)
Current mode satisfaction (mean)	Satisfied (3.9)	Very satisfied (4.6)	Very Satisfied (4.4)	Very satisfied (4.7)
Climate concern (mean)	High (4.0)	Medium (3.1)	High (4.1)	High (4.2)

To dive deeper into these groups a crosstab analysis was done to see how these groups differed in their sociodemographic composition. No significant differences were found between the makeup of the clusters' citizenship type, income groups, or disability status.

The Driver cluster was the second largest cluster. This cluster currently drives to work and wishes to continue to drive as their main mode of transport, however, on average, they live within a bikeable distance from their workplace. They are very satisfied with their current travel mode and show slightly lower climate concerns than the other clusters. Not surprisingly, they had the highest levels of car ownership. The Drivers had a higher representation of families than the other clusters as well as a higher percentage of males. This cluster also had a slightly lower representation of high education levels.

The Bus, Bikers & E-mobility cluster was the third largest group. This cluster was made up of individuals who bus (36%), bike (27%) or use e-mobility (38%) modes to get to work and would like to continue doing so as they are highly satisfied with these modes of transportation. They also live within a bikeable distance to their workplaces and report a high level of climate concern. They have a slightly higher percentage of males represented in their cluster, higher education levels, and slightly higher percentage of group members who do not own a car; however the majority still own a car or have access to one. They tend to be a more mid-aged group (36-55).

The Walkers were the smallest cluster. This cluster consists of individuals who currently walk to work, and this is their preferred mode of transportation. The cluster also includes a small number of individuals who choose 'other' as their current and desired modes. The individuals in the Walker cluster predictably live within walking distance of their workplaces. The highest average level of climate concern was reported by this group. This cluster has more single households, more females, and higher education levels. There is a higher percentage of cluster members who do not own a car, however the majority still own a car or have access to one. This group tends to be younger and have more students represented in this group.

The Switcher group is the largest cluster and this is the cluster that will be analyzed further in this report since this is the group we wish to identify and understand more in order to build a profile of these residents so that tailored solutions can be designed to support their mode shift. This cluster consists of people who have a different desired travel mode than their current travel mode. Currently they are mainly car users (70%), but they would like to switch their work travel modes to the bus (32%), bike (21%), e-mobility (17%), car (16%), and walk (10%). The Switchers are less satisfied with their current travel mode as compared to the other clusters. They live within a bikeable commuting distance and report high climate concern. This group has a higher representation of females and higher education levels.

THE SWITCHERS

In this section we will dive deeper into the Switcher cluster in order to uncover what actions and strategies can be employed to help this group transition to their desired modes of transportation.

Table 3 shows some of the notable demographic differences between the desired travel mode groups (groups of those who wish to switch to the bus, biking, e-mobility, car, walking, or other) within the Switcher group. Compared to the groups identified in the cluster analysis who are currently using these methods, there are some similarities and notable differences.

Table 3. A comparison of demographic information and climate concern and responsibility for the desired travel mode groups.

Bus	Bike	e-mobility	Car	Walk	Other
↑ largest group ↑ couple households ↑ education levels* ↑ climate concern* ↑ belief in government and companies' responsibility* ↑ life satisfaction*	↑ education levels* ↑ climate concern* ↑ car ownership*	↑ Icelandic citizens* ↑ couples with children ↑ education levels* ↑ belief in individual responsibility & impact*	↑ foreign citizens* ↑ younger* ↑ students* ↓ education levels* ↓ climate concern* ↓ car ownership* ↓ income ↓ life satisfaction*	↑ female ↑ medium education levels* ↑ petrol cars* ↑ overtime workers	↓ Smallest group ↔ even gender ↑ 36–45-year-olds* ↑ EV owners*

*Significant, ↑ higher/more, ↓ lower/less, ↔ even

Those wishing to change their main transportation mode to the bus are the largest subgroup within the Switchers. They tended to come from couple-type households, have higher education levels, and higher life satisfaction compared to the other subgroups of the desired travel modes of the Switchers. Individuals in this group had higher climate concern and belief that the government and companies have the responsibility to facilitate pro-climate behavior.

The respondents who wished to switch to biking as their main mode of transportation to commute to work also had higher climate concern and education levels. They had slightly higher levels of car ownership than the other groups.

The group that wanted to switch to e-mobility modes differed from the other groups in that they had a higher representation of families (couples with children), Icelandic citizens, and a higher belief in personal responsibility when it comes to pro-climate actions.

Those who would like to use a car as their main mode of transportation had a slightly higher representation of foreign citizens, younger aged people, and students. This group also had lower income and education levels, but this may be related to higher number of students and young people in the group. This group also reported slightly lower life satisfaction levels than the other groups. Many in this group currently used the bus (43%) with low levels of active transport use.

The group that wanted to shift to walking as their commuting mode varied from the other groups in that there were proportionally more females, individuals with a medium level of education, and they tended to work more hours than the other groups.

The final group, who chose 'other' as their preferred transportation mode was quite small, so it is difficult to infer too much about this group, but a few notable differences was that this group had a more even representation of gender, were mostly mid-age, and a higher proportion of EV (electric vehicle) owners.

MODE SATISFACTION

Figure 5 shows the level of satisfaction that the different desired travel mode groups had with their current mode of transport to work. Overall, travel mode satisfaction was lower in the Switcher group as compared to the overall sample (Figure 2), where high satisfaction (mostly or very satisfied) was above 80% for all modes except for bus. Lower levels of satisfaction with current modes of transport could be a motivator in switching to more sustainable modes of transportation, especially since about 70% of the respondents in the Switcher group currently mainly drive.

KEY FINDING
70% OF THE RESPONDENTS IN THE **SWITCHER GROUP** CURRENTLY USE CAR AS MAIN MODE OF TRANSPORT

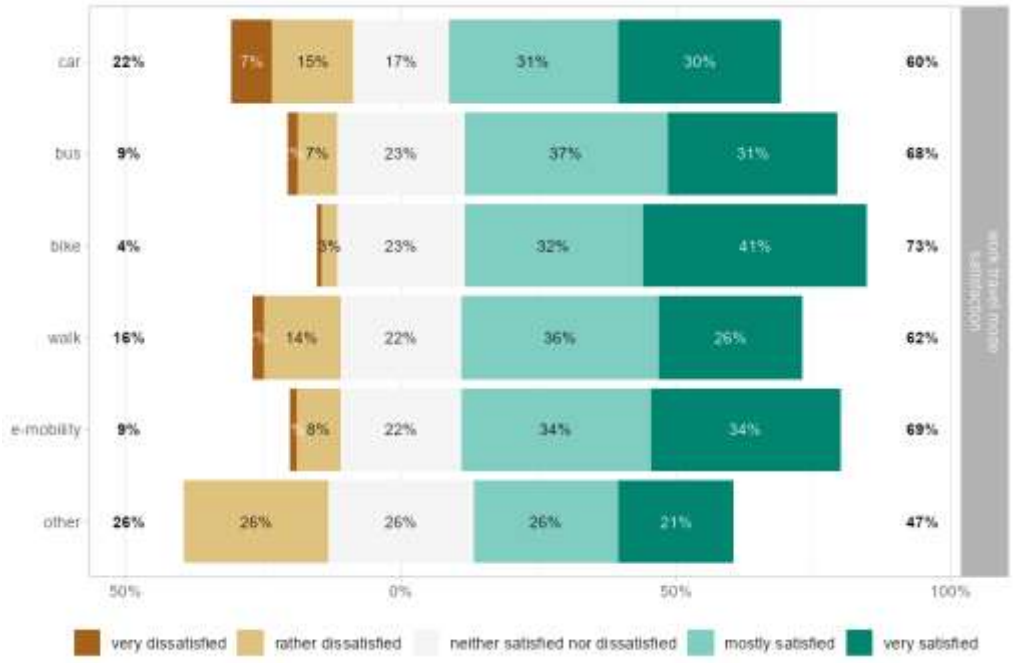

Figure 5. Likert plot of respondents' ranking of their satisfaction level with their current work travel mode across the desired work travel modes.

COMMUTING DISTANCE

The commuting distances of the different desired travel mode groups are shown in Table 4. Overall, the reported commuting distances generally aligned with what has been identified in previous research as feasible distances for cycling and multimodal travel, but the average distances that the walking group commute fall outside of the range. Although still a walkable distance, barriers such as time or weather may be an obstacle for this group as distances get longer.

Table 4. The mean and median commuting distances of the desired travel modes along with the feasible walking, biking and multimodal ranges.

Desired travel mode group	Current commuting distance (km)		Feasible distances (km)
	Mean	Median	Range
Car	5.4	5	
Bus	6.2	5	7-15
Bike	4.2	3	2- 7
Walk	3.4	2	0-2
E-mobility	4.7	3	7-15
Other	7.1	8	

CAR OWNERSHIP

Since the majority of the people in the Switcher cluster are car owners it is important to understand why they own a car. Figure 6 shows the percentage the car owners in this cluster who chose the

selected reasons as why they own a car. The top reasons were convenience, leisure (travel outside the city), reliability, and running errands. There were a few statistical differences between the desired travel groups (marked with an * in Figure 6). Reliability was a slightly more significant factor for those wishing to switch transportation modes to the bus. Having a car to transport children was modestly more significant for those wishing to switch to e-mobility or bike and having a car for care giving responsibilities was slightly more significant for the e-mobility group, which may be related to more families being represented in the e-mobility desired travel mode group.

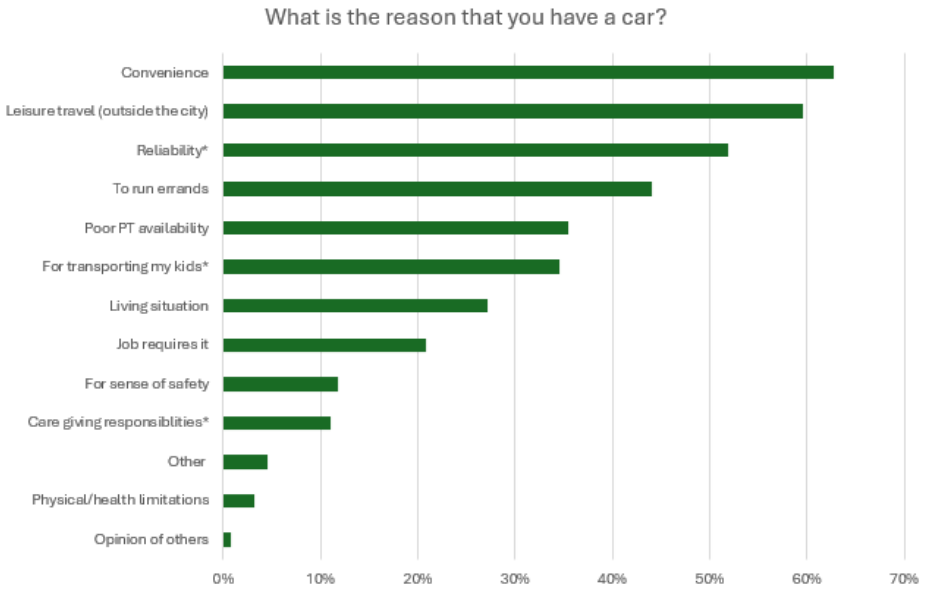

Figure 6. Percentage of car owners who choose selected reasons why they own a car. Statistical differences between the desired travel groups marked with an *.

Only about 11% of the Switchers did not own a car and they were asked why they did not own a car and given a selection of reasons to choose from, and they could pick as many as applied. Figure 7 below shows the percentage of respondents who selected each reason for not owning car. The main reason that people did not own cars was related to income or cost with 87% of respondents choosing this as a reason. The next most chosen reasons were that they preferred public (36%) or active (33%) modes of transportation.

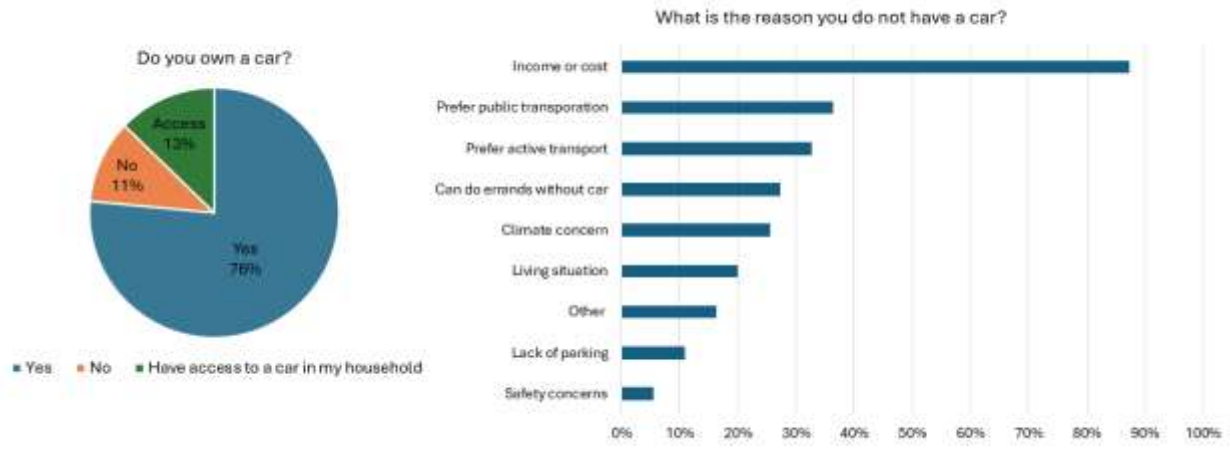

Figure 7. Pie chart of respondents who own a car, have access to a car in their household, or do not own car. Bar chart of percent of respondents who selected reasons for not owning a car.

CLIMATE CONCERN

The level of climate concern was generally high in all the groups. Although the differences in the level of climate concern between the groups only varied slightly, the differences were statistically significant. Figure 8 shows the reported levels of climate concern across the different desired travel mode groups of those wishing to switch modes. Those wishing to switch to bike (mean = 4.1, median = 4.3) or bus (mean = 4.1, median = 4.4) had the highest levels of climate concern, while those wishing to switch to cars reported lower levels (mean = 3.7, median = 3.9).

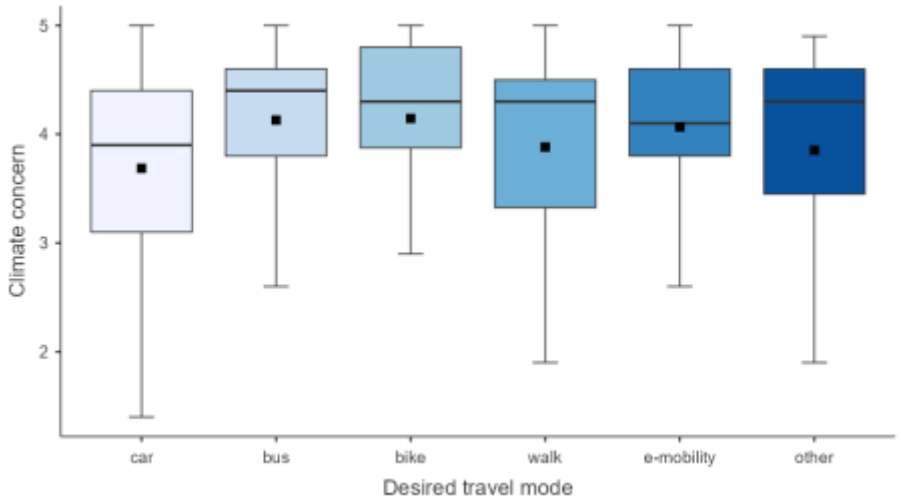

Figure 8. Box plot of reported levels climate concern from desired travel mode groups. The box represents the middle 50% of responses and the horizontal line represents the median. The small black square indicates the mean. The Whiskers that extend from the boxes show the highest and lowest reported values.

To explore climate concern more deeply, participants were asked to rank the statements below on a scale of 1 (not at all) to 5 (completely):

1. Pro-climate behavior is my responsibility.
2. The state/municipality has a responsibility to facilitate my pro-climate behavior.
3. Companies have a responsibility to facilitate my pro-climate behavior.

Figure 9 below shows how the respondents in each desired travel mode group responded to these statements. Overall, personal responsibility was ranked lower than government and companies' responsibility in facilitating pro-climate actions the groups. The e-mobility group ranked individual responsibility the highest with 70% stating that they believe that pro-climate behavior is their responsibility (to a great extent or completely) followed by those who wished to switch to bus (62%). The group that desired to switch to walking showed the lowest belief in personal responsibility for pro-climate behavior with 22% ranking it as not at all or slightly their responsibility and only about 50% believing that it was to a great extent to completely. Turning to government and companies' responsibilities to facilitate pro-climate behaviors, respondents felt more strongly that pro-climate behavior should be facilitated by these sectors (above ~70% ranked as to a great extent or completely). Those wishing to switch the bus ranked government responsibility as the highest (86%) and those wishing to switch to car ranked this the lowest with 15% ranking it as not at all or slightly and 69% as to a great extent or completely. Those who wished to switch to bike had the highest percent who ranked companies' responsibility as to a great extent or completely (86%) and those who wished to switch to car or other had the highest percentages of not at all or slightly (16%). Interestingly, these perceptions of responsibility align closely with the sectors that have the greatest ability to influence the desired mode shifts. Those wishing to switch to the bus expressed the strongest belief in government responsibility, which is consistent with the government's central role in public transportation planning, funding, and service provision. Similarly, those wishing to switch to biking reported the strongest belief in companies' responsibility, suggesting that workplace measures such as secure bicycle parking, changing facilities, showers, and cycling incentives may be particularly effective in supporting this transition.

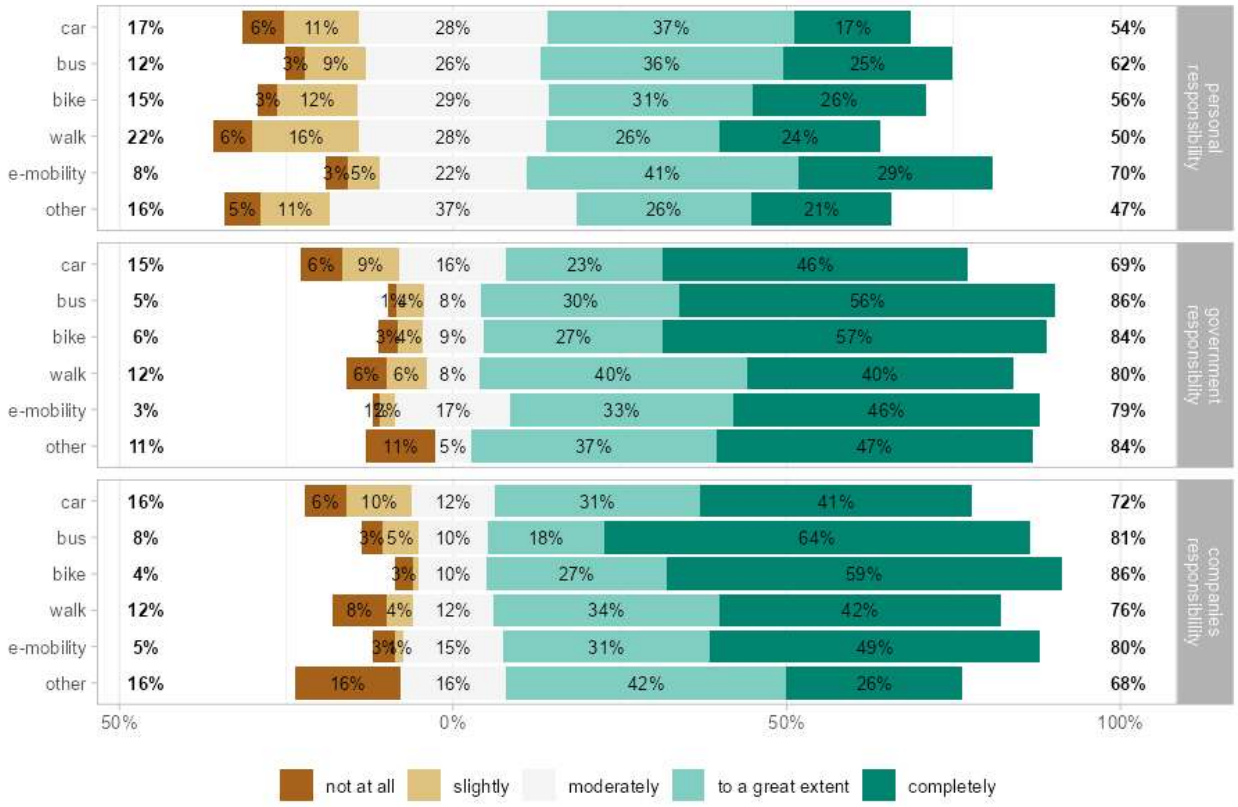

Figure 9. Likert plot of respondents' ranking of to what extent the responsibility of the facilitation of pro-climate behavior is that of the individual, the government (state or municipality) or companies.

SELECTED BARRIERS TO SWITCHING MODES

Participants were asked to choose from a list of barriers that might prevent them from changing their main mode of transport. They could choose all that applied. For those who stated that they would like to switch to using the bus, Figure 10 below shows the percentage of those respondents who selected each barrier. More than half selected the barriers that the bus takes too much time (79%), does not go where they need to go (61%), makes it difficult to run errands (58%), and it is not reliable (53%).

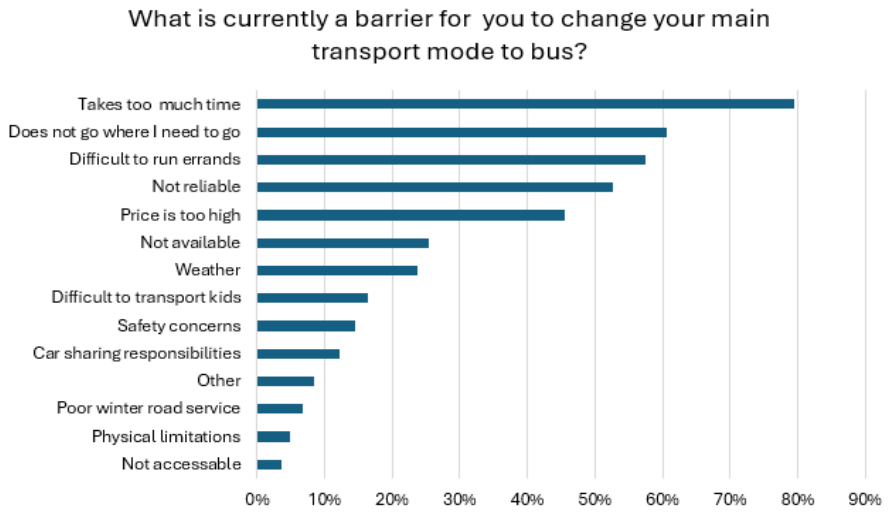

Figure 10. Percentage of those who wish to switch their transport mode to bus who chose selected barriers to change their current mode of transportation to bus.

Figure 11 shows the barriers selected by the respondents who reported that they would like to change to biking, walking, or e-mobility travel modes. The top barriers for these groups included weather, that it was difficult to run errands, distances were too far, and it took too much time. A higher percentage of the group that wished to switch to walking chose these top barriers as compared to those who wish to switch to e-mobility or biking. Taking too much time and making it difficult to run errands were top barriers in both this group and the bus group.

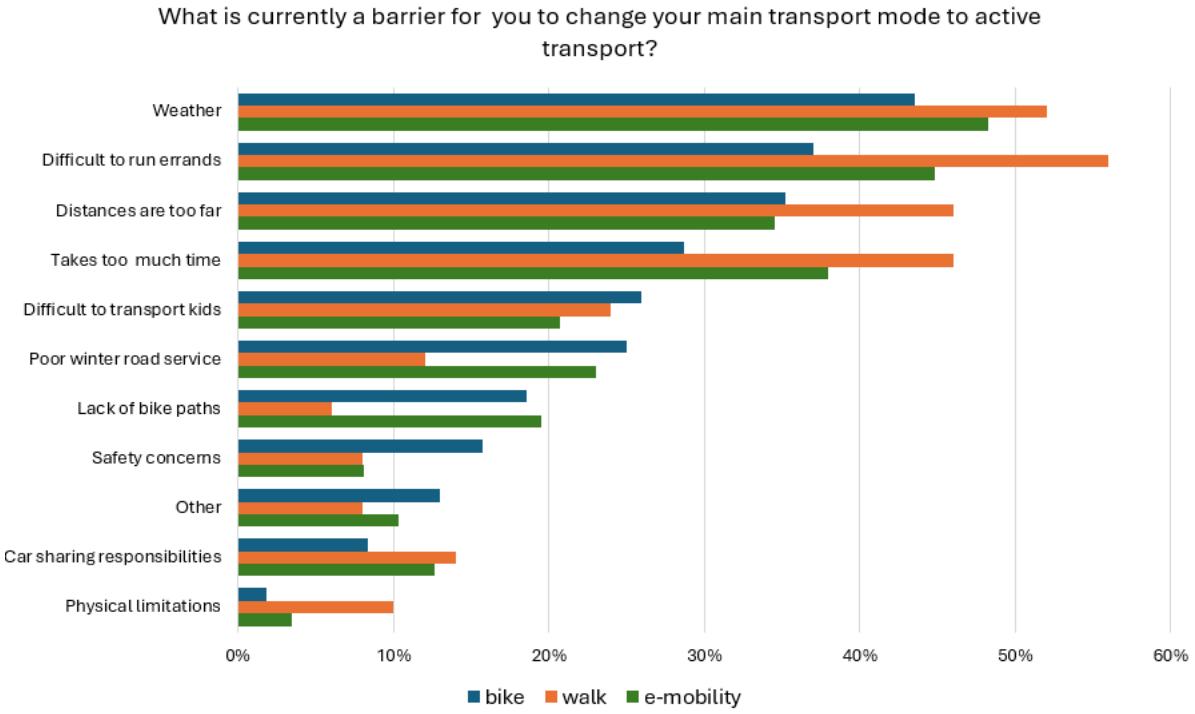

Figure 11. Percentage of those who wish to switch their transport mode to biking, walking, or e-mobility who chose selected barriers to change their current mode of transportation.

OPEN ENDED QUESTION THEMES

To dive further into what may be preventing individuals from using their ideal mode of transportation, the survey respondents were asked "What needs to happen for you to change your transportation habits?" They could respond to this question in an open-ended manner. To better identify solutions to support residents who would like to change their transportation modes, we analyzed the answers given by the Switcher group from the clustering analysis by their desired mode of transportation (bus, bike, walk, e-mobility, car, or other). Several interesting themes emerged and by far the most comments were about how to improve the public transportation system, whether that was their desired travel mode or not. Suggestions to improve the bus system that were mentioned most frequently are summarized in Table 5. The Appendix (pages 30-31) includes a list of comments from the survey respondents which mention specific areas (neighborhoods or streets) where bus routes or walking and biking paths could be improved.

Table 5. Suggestions for improvement to public transportation related to scheduling, service and quality, routes, and infrastructure from the Switcher cluster (N=510).

Schedule	Increase bus frequency Extend hours of service (buses start earlier and run later)
Service and quality	Lower price for the current service quality or better subsidies Faster trips More reliable (buses show and show up on time) Enhance efficiency Meet the standard of public transportation systems abroad Transportation by bus must be more competitive with the private car
Routes	Improve routes (go where people need to go) Better or less bus connections/transfers (having to switch buses) More bus stops (some areas have no or little access)
Infrastructure	Better quality bus shelters Add dedicated bus lanes Borgarlína Make public transportation a priority in planning

This quote sums up many of the issues that respondents described in their answers regarding public transportation:

> *"It requires more convenient (e.g. timetable, stations, etc.) and cheaper public transportation. Generally, it requires more thinking towards real-life practices regarding physical conditions of individuals (e.g. for families with small kids, different working schedules, running errands between towns, etc.)."*

The weather was another barrier that was brought up frequently by all groups. It was often stated that the weather would need to get better for them to be able to switch transportation modes, but many respondents also offered practical solutions that could improve the situation such as better winter service for roads and paths, improving bus service to decrease waiting times in the cold, better bus shelters, and getting better clothing to be outside in all types of weather. Interestingly,

some participants framed weather adaptation as both an individual and systemic responsibility, emphasizing the importance of supportive infrastructure alongside personal preparedness.

Time emerged as one of the most important barriers to changing transportation habits. Respondents frequently described sustainable transportation options as requiring too much time compared to driving. This included longer travel times, waiting for buses, making transfers, and coordinating transportation with childcare and work schedules. Many participants indicated that they would be more willing to bike, walk, or use public transportation if they had greater flexibility in their daily schedules or shorter working hours. The findings suggest that transportation choices are strongly influenced by broader societal structures and time pressures.

Having young kids and the kindergarten situation in Reykjavík was brought up as an obstacle, especially for those who wished to switch to bike, e-mobility, or walking, but less so for those who wished to ride the bus. People often stated that once their kids were older or able to independently transport themselves, then they could potentially switch modes. The location of the kindergarten, workplace, and children's activities were often located too far apart or would take too much time. The quote below highlights the difficulty that residents have with the way preschool has been organized in Reykjavík.

> *"I wish I could make better use of public transportation, but the frequency of trips and travel schedule don't allow me to do so. At two preschools in separate neighborhoods in Reykjavík. If preschool issues were better managed, I could make better use of active transportation and public transportation."*

Transporting kids was a reason that individuals stated as why they owned a car (Figure 6), particularly for people who want to switch to e-mobility or biking, so this is an area where interventions can be made to ease this pain point.

A small but notable group of respondents emphasized the role of attitudes, social norms, and lifestyle choices. Some suggested that reducing car dependency may require broader cultural changes, including placing greater value on active transportation or changes to working life such as less working hours. Systemic changes such as better land-use planning and prioritizing public and active transport were also noted.

KEY THEMES
PUBLIC TRANSPORTATION AS A CENTRAL ISSUE THE WEATHER WAS A KEY FACTOR TIME IS A CRITICAL RESOURCE CHALLENGES SURROUNDING THE TRANSPORTATION OF CHILDREN LIFESTYLE AND SYSTEMIC CHANGES ARE NECESSARY

The following sections will highlight the comments and themes from each desired travel mode group.

SWITCH TO BUS

Turning to the open-ended responses of those who wished to switch to the bus, a clear theme emerged: public transportation needs to become a more competitive alternative to the private car. Many comments focused on the need for more frequent service, faster travel times, lower costs, improved reliability, and better route design. Others highlighted broader issues related to land-use planning, noting that workplaces, services, schools, and childcare facilities are often located too far from residential areas or are not efficiently connected by public transportation. Several respondents also compared the local bus system to the higher standards of service they had experienced abroad and expressed a desire for a system that is more convenient, dependable, and integrated into everyday life.

Table 6 summarizes the most frequently mentioned improvements. Reliability emerged as a particularly important issue. This finding is consistent with the quantitative results, where reliability was identified as a more important reason for car ownership among those wishing to switch to the bus.

Table 6. Frequency of comments by the group who would like to switch to bus and what would need to be changed for them to do so.

What needs to happen for you to change your transport habits?	Times mentioned
Increased frequency of buses	43
Lower price, increased subsidies, free	36
Faster trips, takes too long now	35
More reliable (shows up on time)	28
Better routes (bus goes where they need to go more efficiently)	23
Better connections (too many connections or difficulty with connections	20

This quote emphasizes the aspects of time and lifestyle changes that could enable individuals to change but also illuminates the current issues with the bus service and planning.

> *"It would also be nice if work would allow me to work 1 hour less every day if I took the bus or bike, it's miserable to lose almost 1 hour and 20 minutes of your day just to be able to take the bus"*

> *"It is incredibly frustrating to have to plan your day and week based on bus routes and timetables, as some routes are very time-consuming and trips are not frequent enough. I would rather it were the other way around, that you use the bus that fits your daily schedule because it is likely to be available."*

Some people also said they gave up on other transportation such as the bus and just got a car.

> *"I bought a car because I didn't have time to use the bus anymore"*

SWITCH TO BIKE

In this group, many noted various improvements to the public transportation system with time being one of the most important factors. People wanted more time to bike and did not want to waste time waiting for a bus running late. Weather was also a concern, and many respondents noted the struggle with kindergartens as well as other services not being located nearby. Families talked both about the kids getting older and transporting themselves, which would allow them to bike more, but many also wanted to bike with their kids, but faced challenges in doing this. Better infrastructure, safety, and employer support were also crucial aspects that were noted as needed improvement. Table 7 shows the comments most frequently mentioned by this group.

Table 7. Frequency of comments by the group who would like to switch to biking on what would need to be changed for them to do so.

What needs to happen for you to change your transport habits?	Times mentioned
Comments related to improving public transportation (included in Table 5)	38
Weather	11
Location of services, work, kindergarten/kids' activities	11
Safety	9
More employer support (changing facilities)	8
Better bike storage (home, work, city center, bike racks)	7
Better bike path routes	7

Some other topics mentioned included better winter service for bike paths, the importance of prioritizing infrastructure for active transport, lifestyle and societal changes to make more time for biking (less work hours), and several noted seasonally dependent travel mode preferences.

This quote highlights several aspects that participants noted as barriers to using active or public transport including lack of time, how society is organized (work and school schedules), and the economic system.

> *"If the cost of living was not so high, both myself and my partner could work less than 100%+. I could then take the extra time to bike. I cannot bike my kids to school, then bike to work then back without adding hours to my commute. I used to commute by bike and I loved it! I do sometimes when my partner can pick up and drop off the kids."*

SWITCH TO WALKING

This group also made many mentions of improving public transportation, followed by the challenges related to transporting children, weather issues, and the location of services being inconvenient to work or home locations. This group also made some interesting comments related to changes to personal mindsets and societal norms and attitudes, which are illustrated by the following quotes:

“A lot of this is attitude and deciding that you don't have to do everything - that is, be everywhere.”

“Better public transport and less car culture”

SWITCH TO E-MOBILITY

The participants that said that their desired mode of transportation for commuting to work would be an electric bike or scooter mostly commented on public transportation improvements, followed by comments about having to transport children around, weather issues, increasing the amount of bike paths, better winter service, safety, improving paths, and the location of services and workplaces from their homes causing difficulties. Many of the themes that emerged were similar to the themes of those who wanted to switch to biking, but the cost of the bikes or scooters became more of a concern and a comparison to the cost of a good electric bike to cheap small electric cars was noted as being quiet similar by a few respondents. The struggle with kindergarten situation and transporting kids around to school and other activities is captured well in the quote below:

“But due to the lack of service, heavy closures and "mess" at the preschool and school, the household now has to have two cars in operation, despite the fact that I moved to work in the neighborhood and my wife moved to work on the outskirts of the neighborhood.”

SWITCH TO CAR

The most common comments from this group were about public transport improvements, the weather as an issue, and the need for higher income to buy a car. This matches with the reason that people said they did not own a car (Figure 7) due to cost or lack of income. One respondent made an interesting remark related to social norms as a leverage point for increasing public transportation use:

“It would also be encouraging if more people around me were using the bus (if it were the norm).”

SWITCH TO OTHER

Most respondents in this group mentioned trains/trams/metro/subway/light rail, truly the “other” group, but this group also saw weather and noted improvements for the bus system as well as walking and cycling paths. The quotes below sum up the opinions of this group:

“TRAINS everywhere, at free or near-free costs.”

“Train/tram on common routes in the capital. A subway would revolutionize access to public transportation in Iceland, not least because of the weather.”

STRATEGIES & BEST PRACTICES

This section will expand upon the themes highlighted in the sections above and connect them to strategies that can be implemented in the areas of infrastructure and service, by the government, by businesses and employers, related to weather, and connected with society and individual mindsets.

INFRASTRUCTURE AND SERVICE

By far the most comments were made about improving the bus service. To make the public transport more competitive with the car, aspects that must be considered include public transport service quality, car restrictions, and land use – shift from considering public transportation as needing to provide minimal service to a direct competitor to the car [14]. A review of Nordic studies on travel behavior and public transport revealed that reliability and frequency can increase the attractiveness of public transport, but there is limited evidence on if this increases or changes behaviors [15]. Capitalizing on climate concern could be an important strategy for the Switchers in this report who wanted to switch to cycling, e-mobility or the bus, but this can only go so far. Physical improvements need to be made, and the high level of car ownership and car-centric design of the city continue to be a major challenge.

Having the public transportation in the Capital region reach the standard of systems abroad was mentioned by some and much can be learned from the successes of other public transportation systems. For example, a couple of respondents noted that the transportation system in Gothenburg, Sweden was a desirable system and a recent study by Sharma et al. [16] identifies what aspects of the system were important to the users as well as what they there were satisfied with and where there were areas of improvement, which could be a useful resource for improving the Capital Region bus system. They also found that user characteristics significantly influenced satisfaction levels.

SPATIAL PLANNING AND GOVERNMENT ACTION

Spatial planning plays an important role in shaping transportation choices. Respondents frequently highlighted the challenges associated with the locations of workplaces, schools, childcare facilities, and services. Better spatial planning can promote more sustainable transport by integrating and connecting locations of business and residences [17]. Public transport needs to be located near housing and workplaces in order for people to use it [18] and include other places that people might also frequently go to on their way to and from work (shopping, the gym, picking up kids) [19].

For kids, strengthening cycle and walking networks between schools, leisure activities and social spaces is especially important at distances are between 3-5 km [20], which may alleviate some of the time stress and car dependency that respondents noted about having to transport their children. Green infrastructure for weather and blocking noise and pollution from walking and biking paths may make these routes more appealing for users and if designed correctly could help with storm water runoff, for example.

The government taking steps to facilitate active and public transport for pro-climate reasons may be an effective strategy for those wishing to switch to taking the bus or biking to work and may have

less of an impact on those wishing to switch to other modes (Figure 9). Here are some other ways that The City could incentivize more sustainable transport use:

- Recognize and reward employers or other initiatives that are facilitating sustainable transportation use.
- Encourage and support business development from companies that sell or provide:
    - Bikes (including, for example, cargo bikes that make transporting kids or running errands possible with a bike)
    - Gear for walking and biking in inclement weather
    - Repair shops
    - Build bike sheds or other quality bike parking solutions
    - Mobility as a service- bike, scooter, and car sharing
- Education campaigns
    - Teach the skills necessary to use various modes
    - Highlight the benefits to using these modes (health, climate, etc.)
    - Working to improve the perception of public and active transportation modes and shifting these modes to the norm
- Make public and active transport a priority in planning
- Improve kindergarten situation to make it easier for families to use sustainable modes of transport
- Support family friendly transport

BUSINESSES AND EMPLOYERS

Employers can play an important role in facilitating sustainable commuting. Respondents frequently mentioned workplace-related barriers, including limited flexibility and insufficient facilities for active transportation users. Table 8 has a summary of strategies that employers could use to promote sustainable transportation use to their employees.

Table 8. Summary of strategies for employers to facilitate the use of sustainable modes of transport to commute to work among employees.

Lower financial barriers	Free or subsidized bus passes Bike subsidies or reimbursement Allowance for clothing or other gear to walk or bike to work
Reduce time stress	Flexible work schedules to reduce stress around commuting
Quality facilities to support biking	Showers and changing rooms Drying areas for gear Secure and covered bike parking Charging for e-mobility
Support & champion	Incentive programs that reward sustainable commuting Education campaigns about sustainable transportation

Businesses can also provide good bike parking, clear pathways in winter, advocate for good public transportation and other incentives to encourage customers to use sustainable modes of transport.

WEATHER

The weather can create challenges for active and public transportation modes. Even though we cannot control or change the weather, there are ways to make active and public transportation more comfortable in bad weather through changes to the built environment, better service, and individual actions. Winter maintenance of pedestrian and biking infrastructure is crucial to participation in active transport [21]. A study in Sweden showed that the summer levels of cycling can be sustained through winter and that the quality of cycling infrastructure is vital to this happening. The study also found that electric bikes can help enable winter biking and people were generally more likely to bike to work than for leisure [22]. Drawing upon the comments from the survey respondents, here are some suggestions to reduce the weather as a barrier to public and active transport modes:

- Improved snow and ice removal on walking and cycling routes
- Secure covered bicycle parking
- More protected walkways and bus shelters (indoor, underground, enclosed bus shelters, connections between buildings)
- Public information campaigns about clothing and equipment for year-round active travel

SOCIETY AND INDIVIDUAL MINDSETS

While the majority of comments were about physical and service improvements to the current system, it was interesting that a few individuals brought up that much of the way society is organized creates the barriers to switching to sustainable transportation modes as well as people's individual mindsets and social norms.

There have been challenges related to the kindergarten system, which the City can address to alleviate parents having to travel outside of their neighborhood for taking their children to school. However, it is important to understand the motivation behind why parents are driving kids to school. For example, a study in Sweden found that parents chose to drive kids to school not just for the convenience, but to spend time with their kids and accompany them to school [23]. The car is often the preferred method of transport of families with young children and will increase when other modes have low accessibility and the cost of public transport can be seen as obstacle when traveling as a family, the number of children, and level of income can also impact car usage, with higher income families using the car more often [24]. So, there are opportunities here to promote more sustainable transport by providing more flexibility in daily life (work, school, kids' leisure activities), which could reduce the time constraint that families have and allow them to use other modes.

FURTHER RESEARCH & LIMITATIONS

This study has provided a deeper insight into the characteristics and motivation of the residents of the Capital Region who are willing to shift their primary mode of transport. However, there are several limitations to this study which should be considered when interpreting the findings. First, the results just demonstrate correlations of certain characteristics, attitudes, and behaviors and

therefore cannot establish causal relationships between sociodemographic characteristics, climate concern, and transportation preferences. While significant associations were identified, further research is needed to better understand the underlying motivations that drive transportation mode choice. Second, the survey relied on self-reported data, which may be influenced by recall bias or social desirability bias. Reported desired transportation modes may not necessarily translate into actual behavioral change. Third, the survey respondents may not be fully representative of all residents of the Capital Region. Individuals with stronger interests in sustainability or transportation issues may have been more likely to participate.

It is important to understand the motivations behind why people choose certain transportation modes and as studies have shown more research needs to be done [15]. Future research could explore transportation decisions through interviews, focus groups, and longitudinal studies that follow individuals over time. More spatial analysis different areas to determine which barriers exist related to active or public transportation modes would reveal which targeted interventions are needed. Additional research on families with young children, childcare-related travel, and the role of workplace flexibility may be particularly valuable, as these emerged as important themes throughout the analysis. Further investigation into the specific factors that enable successful transportation mode shifts would also help inform future policy and intervention design.

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APPENDIX

List of specific areas mentioned where bus, bike, and walking transport could be improved:

Related to bus routes and stops

1. If the 6 would run to Miklabraut/Ringbraut all the way to HÍ, like it did before.
2. I take the 1,2, and 4 regularly and the 2 is incredibly unreliable, for example, while having a completely nonsensical pathway on the kopavogur/garðabæ side
3. Even though I'm downtown I still have to walk to Skúlagata or Laugavegur to catch one to work
4. Buses that run between Àrbaer and Grafavogur for instance. Not all buses or people need to go downtown.
5. I'm in the hills and often go to Laugardalur and there are no good connections between there. It only makes sense to take the bus if I'm going downtown... which I almost never do.
6. More safe environment in Mjódd.
7. My child can't take a direct bus to the next neighborhood (Hlíðar-Laugardalur) for practice, which means a shuttle
8. Faster connection of Breiðholt to the central area -
9. Why can't I take the bus from Grafarholt to Mjóddina without changing buses on Miklubraut? When I moved to Grafarholtið it just became too difficult and I gave up at the end of last year and bought a car.
10. bus stop in Jöjursbás
11. Helgafellsland straight up to the University
12. If a bus ran from Seltjarnarnes directly east-west, reliability and speed would increase much more.
13. No. 1 has more convenient bus routes and more stops
14. use small cars that go often within the neighborhood (for example, Borgarhverfi - Víkurskóli - Egilshöll which significantly reduces the number of shuttles for children and teenagers and reduces stress for parents.
15. There would need to be a bus that goes across the suburbs, for example from Grafarvogur in Árbæ and up to Breiðholt/Kópavogur. My children play sports in Grafarvogur and Grafarholt but have no access to a bus that goes to those places - most of them go straight down to town.
16. A bus that runs to Strandvegur, it would be faster and more comfortable than the 6 that runs to Langurima and Fjallkonuveg.
17. facilitate bus access to Kársnes, directly in the center of Reykjavik. For example, with the City Line and a bridge over the strait.
18. bus stop were placed outside Möðrufell
19. Ártúnsbrekkan is a disgusting interchange in terms of air quality and safety.
20. Increase the frequency of 23 and 24 and even better if it was just the same route. These cars share a terminus in Ásgard but very often intersect badly
21. we're all pretty unlucky with bus routes - from the old west town in Kársnes (near Skylagoon), Vatnagardi and MK (which is the most diagonal route though)
22. A bus would need to go from Sæbraut to Reykjanesbraut and have stops on Reykjanesbraut.

Related to bike and walking paths

1. Better cycling conditions especially at Miklabraut, it would make cycling to HÍ more comfortable.
2. better crossing over Miklabraut, more sense of safety.

3. I can cycle for 30 minutes from Norðlingaholt to Landspítlan without stopping if I go down Elliðaárdalinn and then Fossvogsdalinn and past HR which is great but I've started cycling Bústaðarveginn more because there is so much traffic of all kinds of people crossing the paths in Fossvoginn, but all the stops at the lights when you go Bústaðarveginn are quite annoying.
4. A bike path from Úlfarsárdalur down to the city center, which is properly serviced in winter
5. there are no bike paths from Kollafjörður to Mosfellsbær. I would really like to have a safe bike storage area on the outskirts, for example at Korputorg and park the car there and take the bike.
6. Skeifan and it is a very dangerous area for all modes of transport. The cycle and walking paths need to be improved there
7. More bushes planted as windshield along the route I walk/bike to work (specifically from the N1 gas station at Fossvogur up to the airport, it is often very windy). This is number 1, 2, and 3.
8. I have to go through the area around smáralind and it is a nightmare for bikers.
9. Bike paths in the city center of Rvík need to be improved, for example, Lækjargatan is impossible for cyclists.
10. That bike paths are the shortest route between A and B, but not designed as if for a leisurely Sunday ride in the sunshine. I want a bike path, for example, along Vesturlandsvegur, down Ártúnsbrekka and all the way out to Grandi
11. It's very common in Árbæn that it's barely possible to walk anywhere. It cleared up this winter though. This could be improved, my elderly parents hardly leave the house in the winter for fear of falling.