UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program
Student Research Report

Transportation Accessibility and Affordability in UBC's Residential Neighbourhoods

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Prepared for: UBC Campus + Community Planning

GEOG 371

The University of British Columbia

Themes: Transportation, Sustainability

Date: April 17, 2025

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Executive Summary

This report investigates transportation accessibility and affordability in the residential neighbourhoods of the University of British Columbia (UBC). In alignment with the university's ambitious sustainability objectives – as outlined in the Transportation Plan and Neighbourhood Climate Action Plan (NCAP) – this work contributes to ongoing efforts to understand and respond to the diverse needs and lived experiences of neighbourhood residents, including those not formally affiliated with the university. Recognizing that lived experiences are central to designing effective programming and policies, this report offers insights to help inform inclusive and responsive transportation strategies. These efforts are part of the university's commitment to identifying and addressing barriers to sustainable transportation to support successful implementation and advance shared climate and accessibility goals.

Using a mixed-methods framework, the research combines an online survey (55 respondents) and semi-structured interviews (with four interviewees) to explore barriers faced by residents in the UBC residential neighbourhoods of Wesbrook Place, Hampton Place, and Hawthorn Place. The neighbourhoods of Chancellor Place and East Campus were not represented in the study sample. The survey was distributed through official UBC newsletters, such as the Campus and Community Planning and University Neighbourhood Association Newsletters. Informal methods were also used, such as posting on various social media platforms and putting up posters at community centers. Interview participants were recruited through an optional interest question included at the end of the survey. Interviews were conducted online via Zoom and lasted approximately 20–30 minutes. Quantitative data revealed a high reliance on personal vehicles for trips beyond campus, highlighting potential limitations in regional transit accessibility or convenience. It also indicated that non-student residents often lacked access to transit subsidies, which may contribute to increased transportation costs for this group. While affordability was perceived as a moderate concern overall, the majority of respondents emphasized that transportation costs were generally manageable and not a significant barrier to mobility. Moreover, quantitative data revealed that there was a severe disparity in access to transportation subsidies outside of the student population, emphasizing a potential affordability barrier. Qualitative findings from the four interviews highlighted themes of timing and convenience, safety concerns (especially for women and children), and a lack of family-friendly mobility infrastructure.

Ethical considerations such as informed consent, confidentiality, and inclusion of underrepresented voices were prioritized throughout the study. Consent forms and an age limit of 18 were required for participation in the survey and interviews. Both the surveys and

interviews were ethically compliant, aligning with provincial and federal regulations regarding data storage and social science qualitative data collection respectively. Despite limitations in geographic and gender representation, the findings suggest that sustainable transportation access at UBC is shaped by social identity, household needs, and infrastructural gaps, not just by environmental targets.

Based on our data analysis, this report communicates a series of recommendations to UBC Campus + Community Planning (C+CP) and the University Neighbourhood Association (UNA) with the intent of informing the implementation of the Neighbourhood Climate Action Plan (NCAP) and future updates to the UBC Transportation Plan. Key recommendations include expanding access to transportation subsidies by advocating for programs that extend beyond the student U-Pass, particularly for faculty, staff, and unaffiliated residents. The recommendations also call for the integration of equity-based metrics, such as gender, age, income, and university affiliation into transportation monitoring, ensuring that system accessibility is assessed by both availability and actual usability across diverse resident groups. Another major priority identified was increasing transit frequency and service reach, particularly during peak hours and in the evenings, alongside a need for more accessible intra-campus options, such as improved shuttle routes.

Moreover, the recommendations emphasize the importance of inclusive, family-friendly mobility options, including the adaptation of car-share services and infrastructure to meet the needs of caregivers and residents with dependents. The recommendations in this report also discuss potential infrastructural improvements in collaboration with CCP and UNA to lighting, crosswalk design and transit stop visibility to address concerns around community safety, particularly for women, caregivers, and youth. It also advocates for embedding participatory practices into planning processes by introducing iterative engagement tools such as workshops, community forums, and feedback loops. Finally, the report proposes piloting on-demand and micro-transit services to address mobility gaps for underserved users, such as school-specific shuttles and family-accessible alternatives to conventional transit. Holistically, these recommendations emphasize the importance of grounding sustainability planning in the lived experiences of residents and ensuring that UBC's climate and mobility goals are pursued through inclusive, equitable, and community-responsive strategies.

Introduction & Problem Statement

Sustainable transportation is increasingly recognised as a complex and multifaceted challenge. Relevant to more than just carbon reduction, it intersects directly with social equity, access to opportunity, and spatial justice and thus plays a fundamental role in shaping neighbourhoods. Simply framing this concept in terms of decarbonisation would overlook its broader impact whereby accessibility – the capacity of people to reach a location from a different one, influenced by (but not excluded to) distance, relational interconnectivity, affordability, frequency and safety – is just as important in creating sustainable futures. Historically, mobility, in the form of travel patterns and habits, has defined transportation's role in place-shaping, but more recently this has shifted to view accessibility – referring to the potential for interactions and participation in activities – as the centre of transport-related social exclusion (Kenyon et al., 2002) and consequent inequitably-shaped neighbourhoods. To create a sustainable and equitable transportation future, therefore, it is crucial to understand the existing barriers, so that one might successfully and confidently integrate fair processes and outcomes to achieve this while simultaneously strengthening community resilience (Georgetown Climate Centre, 2021).

The University of British Columbia (UBC) residential neighbourhoods offer a valuable case study to explore some of these tensions. With a diverse evolving residential community, UBC has already committed to ambitious transportation and climate action goals, meeting community's needs and reducing emissions by building safe, resilient and expanded transportation networks as outlined in its Transportation Plan and NCAP. Central to these efforts is recognizing that equitable access to sustainable transportation modes depends on lived experience, which shapes how programs are designed and delivered. At present, despite the annual transportation survey, there is still a lack of baseline data regarding transportation habits, as well as accessibility and affordability concerns for UBC's neighbourhood residents, especially those who don't have a formal university affiliation or who are less likely to respond to conventional research tools like surveys. Indeed, these policies and programs can be limited by their understanding of how neighbourhood residents both currently access transportation and are impacted by structural and social barriers – raising important questions about how sustainability is defined and for whom it is really achieved. This makes it especially important to seek out and understand the diverse needs and experiences of residents in order to support effective implementation and to achieve UBC's sustainability goals. While the NCAP has directed attention toward engaging these communities more directly, there's still a need to critically engage with residents who are typically left out of planning conversations. Neighbourhood residents aren't a monolith, and it is often equity-deserving groups, such as caregivers or people with lower mobility access, whose voices are missing.

Transportation is determinative of many quality-of-life indicators (Wellman, 2012) that dictate empowerment, societal engagement and productivity, and so as UBC hopes “to create a sustainable and equitable transportation future” that is “resilient”, transportation must be holistically and sensitively integrated into planning approaches with community accessibility in mind.

To investigate the intersection of sustainable transportation and accessibility within UBC's campus neighbourhoods, we aim to answer:

What are the primary barriers preventing residents of UBC's campus neighbourhoods from accessing sustainable transportation, and what recommendations can be made to meet the equitability and sustainability goals of the Transportation Plan and NCAP?

But first, to effectively address this, three foundational definitions are important

1. Transportation sustainability: a system that balances environmental preservation, economic efficiency, and social equity to meet present and future mobility needs. It aims to minimise emissions and resource consumption, support economic vitality through cost-effective, efficient transportation options, and ensure equitable access while enhancing community well-being.
2. Social Equity: the fair, just and equitable management, distribution and implementation of public institutions, services and policy that must be informed by local planning history, the equity landscape and the input of diverse stakeholders (Pan et al., 2024, p. 86).
3. UBC neighbourhood resident: any individual (including faculty, staff, students and those with no affiliation to the university) that lives in the defined residential portions of UBC Vancouver campus (Hampton Pl, Hawthorn Pl, Wesbrook Pl, Chancellor Pls, East Campus & future Stadium & Acadia neighbourhoods).

Defining these and offering the following literature review that (1) conceptualizes accessibility, (2) explores social identities and how transport can exacerbate inequality, and (3) critiques sustainability strategies, should help us to better delineate the importance of holistic integrated planning for sustainable transportation strategies. Literature on accessibility and transportation justice is expanding, but there remains a notable gap in how these concepts are applied to university communities, particularly in hybrid institutional-residential settings like at UBC. Despite strong sustainability commitments, little research has addressed how its campus transportation policies impact neighbourhood residents who may experience a transportation landscape that is not designed with the holistic lived realities of undeserved groups being considered in policy. designed around university priorities rather than their lived realities. This research seeks to fill that gap by applying equity-centred accessibility frameworks to examine the structural and experiential barriers UBC neighbourhood residents face. Filling such a gap in this literature enables learning that can then be reapplied to UBC neighbourhoods as we put forward recommendations that can help build a "resilient and climate responsive transportation approach" (Choong, n.d).

Literature Review

Rethinking Access – From Movement to Opportunity

Kenyon (2002) poses that transportation increasingly should be viewed through a lens of accessibility rather than mobility. Historically defined purely through movement, more recently literature suggests its role is more nuanced and impactful. Consequently, it has become common-thought to place accessibility at the centre of transport-related social exclusion. Wellman (2012) corroborates this notion by emphasizing that transportation is not simply about getting from point A to B, but about the ability to participate fully in economic, social, and civic life. He argues that access to transportation is determinative of many quality-of-life indicators, including employment, education, healthcare, and social connection, and without it, individuals are effectively barred from empowerment, societal engagement, and productivity (Wellman, 2012). In other words, inadequate access to transportation not only limits physical movement, but also entrenches existing inequalities by disconnecting people from the resources and relationships they need to thrive. Evidence from past highway construction practices that displaced minority communities and compounded segregation (Helling, 1997) would certainly support this, with other transportation accessibility studies that will be explored further in the second part of this literature review delineating that a lack of accessible transportation exacerbates inequity. Evidence from past highway construction practices that displaced minority communities and compounded segregation (Helling, 1997) would certainly support this. These projects went beyond reshaping physical landscapes and simultaneously reconfigured access, often cutting off already marginalized populations from economic opportunity, education, and essential services (Helling, 1997). The physical removal of communities under the guise of progress represents the systemic failure to treat accessibility as a right rather than a privilege and commodity. As Wellman (2012) underscores, when transportation systems do not account for inclusivity, they actively produce exclusion. Other transportation accessibility studies, explored further in this literature review, continue to delineate how insufficient access reinforces cycles of poverty and spatial injustice. These studies suggest that transportation planning, when divorced from equity considerations, can reproduce structural disadvantages rather than alleviate them.

Pereira et al., (2017) explore this conceptually; applying Amartya Sen's Capabilities Approach – that looks beyond what people have, to a more opportunity-centric view that considers what they are actually able to do or be – to transportation context and positing that accessibility should be understood as a human capability. Through this he recognizes that the importance of transport infrastructure isn't necessarily whether a bus route exists, or a job is technically reachable but rather how feasible it is for a person to get there – considering costs, safety and other social and physical barriers. This framing continues that mobility alone is

insufficient, and that different social groups must be able to convert these transport options into equitable, meaningful participation in society for it to be effective.

UBC's current transportation infrastructure is extensive (appendix part I) and through targeted policies in the NCAP and UBC Transportation Plan (2014) has expanded and continues to expand sustainable transit use and to reduce single-occupancy-vehicle (SOV). Beyond public transit, active transportation strategies that promote bike-share programs and cycle routes as well as improving pedestrian infrastructure help improve this infrastructure and contribute towards the NCAP 2035 goals of reducing UBC residential neighbourhood community emissions by 30% compared to 2022 levels and the NCAP 2050 goal of having net-zero community emissions by 2050 (UBC, 2024, p. 9). These efforts are not just limited to the enhancement of public transit services, such as the expansion of bus routes and integration with regional transit networks but also include a multi-modal strategy that prioritizes active transportation (UBC, 2024). Initiatives like the implementation of bike-share programs, the expansion of dedicated cycling routes, and improvements to pedestrian pathways have all contributed to a broader mobility ecosystem intended to meet the NCAP 2035 and 2050 targets (UBC, 2024). For example, current goals already achieved in NCAP are mandatory EV chargers and advanced bike storage require in new buildings (UBC, 2024, p. 23). Moreover, future goals consist of increasing the contribution of UBC's residential neighbourhoods to the university-wide target of having at least 66% of all trips to and from campus made by walking, cycling, rolling, or transit by 2035 and having 100% of trips be net-zero in carbon emissions by 2050 (UBC, 2024, p. 23). Importantly, this infrastructure is framed as a climate action imperative, positioning mobility not only as a matter of convenience or efficiency, but as a central mechanism through which UBC seeks to operationalize its residential neighbourhood sustainability commitments. However, while these efforts reflect clear environmental intent, they raise ongoing questions about who is most able to access, benefit from, or be burdened by such transitions—questions explored more fully in the second half of this review.

Understanding of the accessibility of these services, however, are somewhat limited. While affordability has been identified as a key co-benefit throughout NCAP and related planning, challenges remain – U-Pass benefits are unequally accessed and the transit system in certain parts is highly inconvenient, more expensive and at times inaccessible. Furthermore, these plans are limited by the scope of respondents that inform their census databases. About 25% of respondents in 2022 UBC Transportation Survey were residents in campus residential neighbourhoods, a meaningful share but still one that leaves gaps in understanding the full diversity of needs and experiences in these communities. This also reflects a broader issue within sustainability and transportation literature: a lack of focus on hybrid spaces like UBC that are simultaneously academic institutions and residential communities. Few studies have disaggregated data or conducted targeted investigations into how sustainability initiatives

function for UBC's neighbourhoods residents. Our study directly addresses this blind spot by focusing exclusively on neighbourhood residents, elevating their voices and needs in the sustainability discourse.

While this framing establishes accessibility as a fundamental condition for social inclusion, it remains necessary to interrogate who can access these services and how social identities, such as income, gender, and affiliation, shape individuals' experiences of transportation systems, reinforcing or mitigating existing inequalities. For our study, the reframing from mobility to accessibility is central. While earlier sustainability plans, such as CAP2030, primarily emphasized modal shift and infrastructure growth, the more recent NCAP (2024) demonstrates a growing recognition of the need to address barriers to access and ensure equitable transportation systems. Our work complements this direction by further highlighting how neighbourhood residents' diverse needs and lived experiences can inform implementation efforts that prioritize accessibility alongside decarbonization. By drawing on Pereira's capabilities framework, we assess not just whether transport options exist, but whether they are usable, affordable, and safe for all groups. Our work hopes to contribute new insight by applying these conceptual tools to a real-world, under-studied context – testing their practical relevance within UBC's unique planning environment.

Social Identities

Although accessibility has been widely recognized as central to equitable transportation, the ability to access sustainable mobility options is not distributed evenly; rather, it is deeply shaped by intersecting social identities such as income, gender, and institutional affiliation, which determine both the availability and usability of transport services. Efforts to advance transportation sustainability must prioritize accessibility to ensure that solutions do not inadvertently reinforce existing social and economic inequalities. Martens (2016) argues that sustainable transportation must be accessible to all income groups; otherwise, it risks becoming a privilege primarily for wealthier users. Investments in EV charging infrastructure, for instance, often prioritize high-income areas, restricting access for marginalized communities and exacerbating disparities in transportation sustainability. While many sustainability solutions focus on reducing emissions, they often fail to address affordability and accessibility, critical components of an inclusive and effective transportation system. Without accounting for these factors, transportation policies could contribute to a widening gap in mobility access, exacerbating existing disparities in economic and educational opportunities (ibid).

Kachelski et al., (2021) contribute further to this discussion stating that transportation barriers exacerbate education inequities by limiting both access to academic and professional opportunities (p.49) as well as students' ability to participate in activities (p.50). Accessible and sustainable transportation options, such as public transit, have been shown to enhance social

mobility and cohesion by connecting marginalized populations to employment, healthcare, and essential services (p. 55). Without a strong focus on equity, sustainability efforts risk deepening existing disparities rather than alleviating them. While Kachelski's research centres around students and their sense of belonging, learnings can be re-applied to our research that considers the 15,000 UBC campus neighbourhood residents subject to the same factors of belonging and access to opportunity, and how transportation consequently impacts the broader community

Nash and Mitra's (2019) Toronto-based study on the impact of neighbourhood characteristics, affordability and personal circumstances on university student transportation usage examines a different social identity impact, and highlights a gender divide in transportation usage, revealing that women were more likely to rely on less sustainable modes of transportation (p.210). Beyond this their study also highlighted that students residing in mixed-use neighbourhoods were more likely to use sustainable transportation than those in car-dependent regions.

Assessments of transportation are further complicated by the marginalization of qualitative and social aspects in scholarly transportation assessments. Karjalainen and Juhola (2021) argue that transportation sustainability evaluations prioritise quantitative metrics and often overlook the lived experiences of diverse local populations (p.677). This exclusion results from limited data collection methodology, limiting the integration of local voices in transportation decision-making processes. As a result, policies and sustainability initiatives may fail to address the specific needs of marginalized communities, exacerbating existing mobility inequities. Moreover, the literature highlights a significant gap in participatory approaches to transportation assessments. While multi-criteria decision analysis (MCDA) is frequently used to incorporate stakeholder perspectives, most studies reviewed by Karjalainen and Juhola (ibid) primarily engage experts from academia, planning, and policy-making sectors (p. 677). This lack of community involvement weakens the legitimacy and effectiveness of transportation policies, as public support is crucial for successful policy implementation and behavioural change (Banister, 2008, p. 189). As such, in our study, we aim to deliberatively challenge this, following a mixed-methods approach to data collection, valuing quantitative (survey) and qualitative (interview) data collection to provide a more real, personal perspective on transportation accessibility as it is experienced in UBC.

Recognizing that social identities shape transportation access and that current evaluation methods often obscure these realities, it becomes imperative to examine how planning frameworks and sustainability strategies themselves are structured — and whether they meaningfully incorporate the voices, needs, and lived experiences of the communities they intend to serve. These intersecting factors are especially relevant within UBC's neighbourhoods, where social identities vary widely and include both institutional affiliates and

unaffiliated residents. Yet planning documents and transportation assessments rarely differentiate between these groups. Our research therefore responds to a key omission in existing studies by exploring how these identities interact with access and sustainability within this specific university-residential setting – striving to offer a granular, community-informed analysis that is missing in current literature.

Planning for Integration – Sustainability through Collaboration

While sustainability has become a central tenet of transportation planning, its effectiveness depends not only on environmental targets, but on the inclusivity and responsiveness of the processes used to design and implement solutions and the extent to which they are collaboratively developed, contextually responsive and inclusive of all the communities they aim to support.

In the context of transport, this means recognizing that equitable outcomes cannot emerge from purely technocratic, top-down approaches that overlook the needs and experiences of the communities they intend to serve. Banister (2008) argues that for transportation strategies to be successful and enduring, they must be developed with the active involvement of communities, as public support is crucial for long-term behavioural change and policy legitimacy. Similarly, Marsden et al. (2010) emphasize that stakeholder engagement is not just beneficial but essential to the success of sustainable transport interventions, particularly in complex urban environments where diverse social groups interact with transportation systems in varied ways.

A clear articulation of what sustainable planning should entail can be found in the Climate Justice Charter for Vancouver (2022), which outlines that meaningful climate action must be anchored in justice, community voice, and shared responsibility. The Charter stresses the need for "communities advancing climate action… equity and social justice towards a shared future of healing and hope" as prerequisites to any sustainability strategy. It highlights that planning for sustainability must address power imbalances and historical injustices by embedding equity not just in outcomes but in the decision-making process itself. This vision of justice-led sustainability reframes transportation planning as a collaborative, iterative process where local knowledge and lived experience shape both the goals and the tools used to reach them.

At UBC, policy documents such as the Transportation Plan (2014) and the Neighbourhood Climate Action Plan (2024) articulate strong ambitions around decarbonization and explicitly recognize the importance of neighbourhood resident engagement. The NCAP includes actions aimed at improving inclusive participation and addressing local transportation needs. This report builds on those foundations by offering additional insight into how lived experiences can inform the implementation of equitable and responsive mobility strategies.

These strategies are largely driven by infrastructure expansion and modal shift targets, with little attention paid to the underlying social conditions that shape access. Choong's internal critique of UBC's planning framework (n.d.), directly addresses these shortcomings and calls for a "resilient and climate-responsive" transportation approach, rooted in equity and inclusivity, and argues that success depends on UBC's ability to move beyond numeric goals toward participatory, integrated planning. Choong identifies the gap between intention and lived experience, noting that "meaningful climate justice requires deep engagement with the people most affected by institutional decisions," a principle that while addressed in the NCAP, requires more of a baseline understanding of resident's transportation habits and requirements.

To move toward a truly inclusive and effective transportation strategy, Karner and Marcantonio (2018) propose a three-part equity-oriented framework: start with community-led design, ensure equitable revenue allocation, and implement consistent tracking of equity outcomes. This model aligns with the participatory ethos that underpins this research, which integrates both qualitative and quantitative methods to surface the nuanced lived experiences of UBC's campus neighbourhood residents. In particular, interviews and surveys offer a means to identify barriers that are often invisible in standard planning metrics, such as affordability, safety, or social stigma associated with certain modes of transit.

Ultimately, to align its sustainability goals with equity and justice, UBC must rethink the structures through which transportation decisions are made. This requires expanding the scope of its planning frameworks to include lived experience and social diversity as core components of sustainability—not as supplementary considerations. By embedding community voice at every stage of planning, and by treating accessibility and equity as foundational to climate action rather than externalities, UBC can begin to move from aspirational sustainability toward transformative, durable change.

While the literature reviewed offers conceptual frameworks and critiques of technocratic sustainability planning, there remains a significant absence of applied, localised research on sustainable transportation access in university-led residential environments. Our project aims to bridge this divide by integrating both conceptual insights and primary data to investigate UBC's unique context. Through qualitative and quantitative engagement with campus neighbourhood residents, we seek to generate findings that not only fill a scholarly gap but inform more equitable, community-responsive policy interventions at UBC.

Methodology

Area of Study

This study was conducted at the University of British Columbia (UBC), with a primary focus on its residential neighbourhoods: Wesbrook Place, Hawthorn Place, Hampton Place, Chancellor Place, and East Campus. While the Neighbourhood Climate Action Plan (NCAP) has made important strides in engaging neighbourhood residents, there remains a limited amount of baseline transportation data specific to these communities. This study contributes to addressing that gap by offering additional insights into the mobility needs and lived experiences of residents across UBC's residential neighbourhoods.

Data collection was conducted individually through surveys and interviews designed to capture personal transportation behaviours and lived experiences. Data collection also focused on gathering a diverse sample size, considering all factors such as gender, age range, and university affiliation.

Ethical Considerations

Several ethical considerations emerged throughout the research process that necessitated careful attention. First, the diversity of the study population required sensitivity to potential power imbalances or assumptions of institutional authority, particularly when engaging with non-student residents or, conversely, ensuring that student participants did not perceive us as positioned above them within the university hierarchy. All participants were provided with detailed information about the study's aims, and their responses were handled with strict confidentiality. Consent forms were used in both the survey and interviews. Survey participants were required to agree to the consent form before proceeding, ensuring that their participation and any identifying data were collected ethically. Participation in both methods was designed to minimize any risk of coercion or discomfort. Specific attention was given to including marginalized voices within UBC's neighbourhoods, recognizing the broader social justice implications of transportation equity.

Mixed Methodology

A mixed-methods approach was used to collect both quantitative and qualitative data regarding the transportation barriers and behaviours of UBC residents. For qualitative data, an online survey was created using Qualtrics to gather insights into participants' lived experiences, perceptions of transportation accessibility, and suggestions for improvement. The survey began

with informed consent and confirmation that respondents were over the age of 18. It then included demographic questions, such as neighbourhood of residence, gender, age range, and university affiliation. Furthermore, closed- and open-ended questions were asked to collect data on travel modes, costs, and awareness of sustainability initiatives such as the NCAP. Open-ended questions allowed respondents to elaborate on personal challenges, experiences, preferences, and unmet mobility needs, offering a more nuanced and context-rich dataset. The survey also asked participants to rank proposed improvements to sustainable transportation infrastructure to serve as a baseline understanding of what community members prioritized in infrastructural improvements.

Survey Distribution

Survey distribution was facilitated through UNA and C+CP newsletters and email lists, as coordinated by SEEDS and C+CP project partners. Additional outreach was conducted via posters featuring a scannable QR code, placed in high-traffic areas such as the Wesbrook and Old Barn community centres. Informal methods, including posts in UBC neighbourhood Facebook groups, Reddit threads, and community group chats, were also used to broaden participation and reach individuals who may not engage with institutional communication channels. In total, the survey received 63 responses, of which 49 to 55 were deemed valid after data cleaning, depending on the question analyzed. The demographic and transportation questions, which appeared early in the survey, achieved the highest response rate at 55. Later questions, particularly those requiring open-ended or more detailed responses, saw a gradual decline in participation. This early placement allowed for the immediate identification of participant characteristics and mobility trends, setting the stage for interpreting subsequent responses.

Interview Facilitation

Four semi-structured interviews were conducted with UBC residents to gather qualitative data and contextualize survey results. Initially, a focus group was chosen as the qualitative method, however, timing constraints and lack of interest of participants sharing their insights in a group setting prevented the facilitation of this method. At the end of the survey, participants were invited to indicate whether they were interested in being interviewed to discuss their transportation barriers and habits. These interviews were held virtually via Zoom and were approximately 20–30 minutes in length. Permission to audio record the interviews was explicitly requested from each participant, with assurances that participation was entirely voluntary and that declining to be recorded would not influence the interview process or the nature of their contributions. Each participant asked 8 pre-determined questions, which were slightly adjusted to consider the participant's prior survey responses. For

example, a question asked was *"As an individual who primarily uses a personal vehicle to travel beyond UBC's neighbourhoods, are there any challenges you face in accessing sustainable modes of transportation?"* to identify the barriers and decision making patterns in a personal vehicle user that may disincentivize them from utilizing sustainable transportation modes. Holistically, these questions were intended to delve into the complexities behind transportation decision-making and to better understand the barriers to adopting more sustainable alternatives. Another example of a question asked was "In your experience, are there specific groups or demographics that face greater challenges in accessing transportation in your neighbourhood?", aiming to identify a significance in vulnerable populations that may face greater mobility challenges. Moreover, questions such as "Do weather or seasonal patterns alter your transportation habits?" were asked to address limitations in the initial survey design by capturing variables not originally considered, facilitating greater insight into individual's transportation habits and barriers. Follow-up questions were posed in cases where responses raised significant or novel insights not previously identified in the survey or previous interviews. Care was taken to ensure that interview participants reflected diverse age groups and affiliations with the university. However, gender diversity was limited due to a lack of interest from male participants.

There were multiple limitations and strengths associated with our data set. First, our data sample size was smaller than anticipated, averaging 52 valid responses across all questions of the survey. The smaller sample size may have prevented the identification of statistical significance between different variables such as gender and mode of transportation, as well as neighborhood and mode of transportation. Furthermore, our dataset lacks geographic representation from East Campus and Chancellor Place, limiting the extent to which our findings can be generalized across all UBC's residential neighbourhoods. Despite these limitations, our study offers several important strengths. First, it contributes valuable insights to a relatively underexplored area of research: the transportation needs and lived experiences of residents in UBC's residential neighbourhoods. While previous initiatives—such as those led by Campus + Community Planning (C+CP) and the SEEDS Sustainability Program—have engaged with UBC's neighbourhood residents, there remains limited baseline data specific to neighbourhood residents. This study helps to address that gap by centering their voices and highlighting mobility challenges that may not be captured through broader campus-wide planning efforts. By incorporating both university-affiliated and non-affiliated individuals, our research contributes a more nuanced and holistic comprehension of transportation behaviours and access across UBC's residential neighborhoods. The incorporation of a diverse array of residents enables the use of a mixed-methods approach – combining quantitative survey data with in-depth, semi-structured interviews – capturing both the breadth and depth of transportation experiences. While the survey allowed us to identify broader trends, the

interviews provided rich, contextual insights into the nuances of mobility decisions, such as how weather, cost, and infrastructure affect daily transportation choices. This methodological approach simultaneously enhanced the validity of our findings and allowed us to explore variables that may not have been initially accounted for in the survey design.

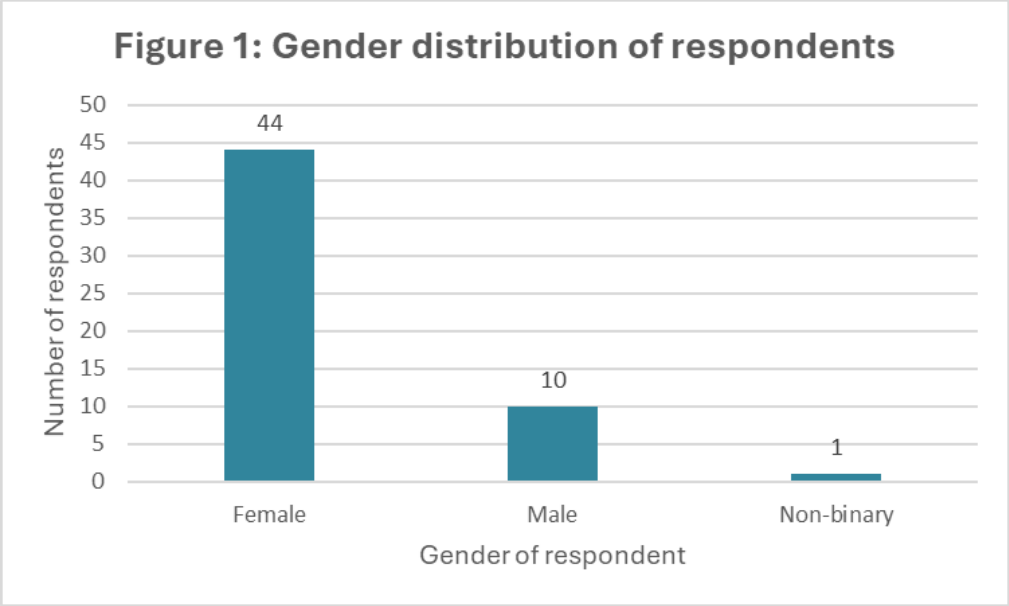
Analysis

Survey Results

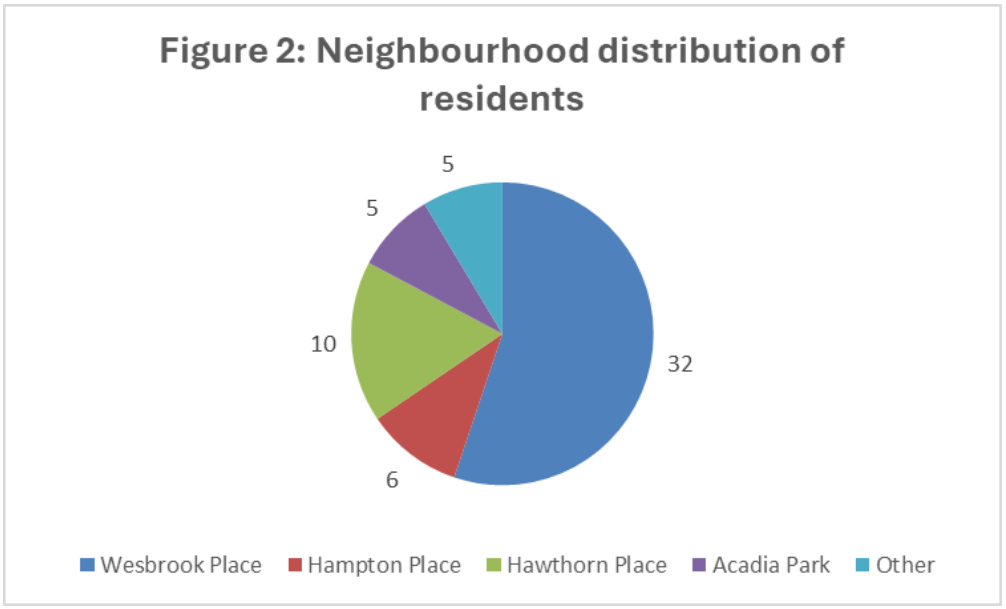
Our survey provided the foundation for understanding transportation behaviours, barriers, and perceptions among residents of UBC's residential neighbourhoods. By capturing both quantitative and qualitative responses, we examined patterns in mode choice, frequency of travel, and contextual factors such as cost, infrastructure, and seasonal variability.

1. Demographic Results

The survey revealed a noticeable gendered divide in who responded: 44 of 55 respondents identified as female, 10 as male, and 1 as non-binary. This demographic imbalance reflects gendered patterns observed in transportation accessibility literature, where concerns and priorities shaped by gender have influenced modal preferences and perceptions of safety, particularly within Canadian university contexts (Nash and Mitra, 2019, p. 210). The prominence of these dynamics in our dataset reinforces the continued relevance of gender as a structuring factor in mobility experiences, especially in settings where institutional planning often defaults to generalized user categories. Moreover, within a university context such as UBC, where mobility may be assumed to be broadly accessible, the overrepresentation of women and gender-diverse respondents may reflect a heightened awareness, of transportation barriers that are not evenly distributed. This suggests that sustainable transportation planning must move beyond one-size-fits-all models to account for the differentiated experiences shaped by gender, safety concerns, and caregiving responsibilities.

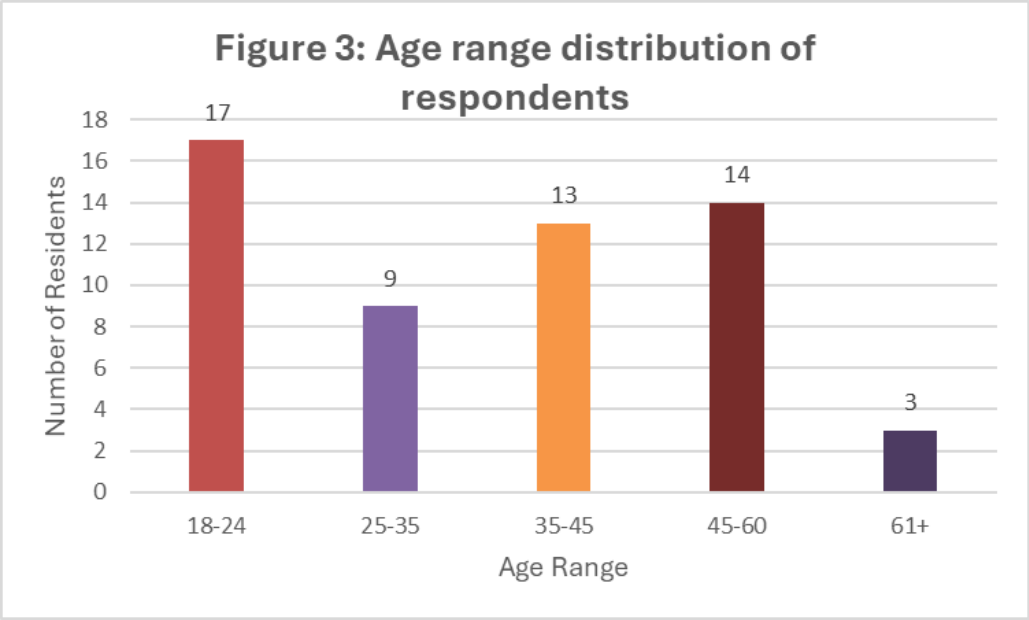


Neighbourhood distribution showed most respondents were from Wesbrook Place (32), with fewer from Hawthorn Place (10), Hampton Place (6), Acadia Park [future neighbourhood] (5), and five from other neighbourhoods. There were no responses from Chancellor Place or East Campus. While this reflects the larger population of Wesbrook, the absence of certain neighbourhoods limits our understanding of potentially unique transportation barriers. Thus, the study findings primarily reflect the experiences of Wesbrook residents.

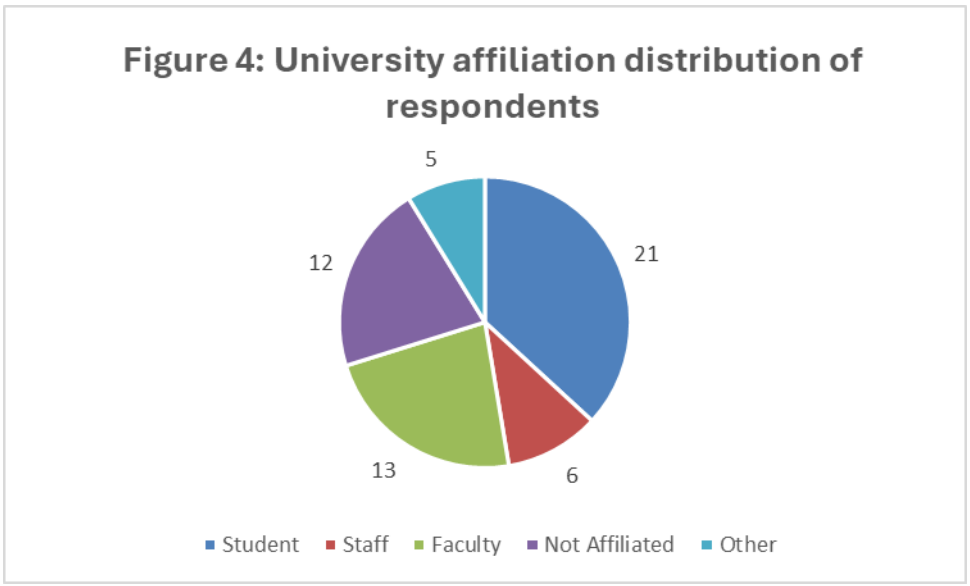


A diverse age range of respondents was recorded: 17 were 18–24, 8 were 25–35, 13 were 35–45, 14 were 45–60, and 3 were over 60. While younger adults were the largest single

group, over 30% of respondents were aged 45 or older, emphasizing the diverse age ranges that must be considered when addressing transportation accessibility and affordability issues.



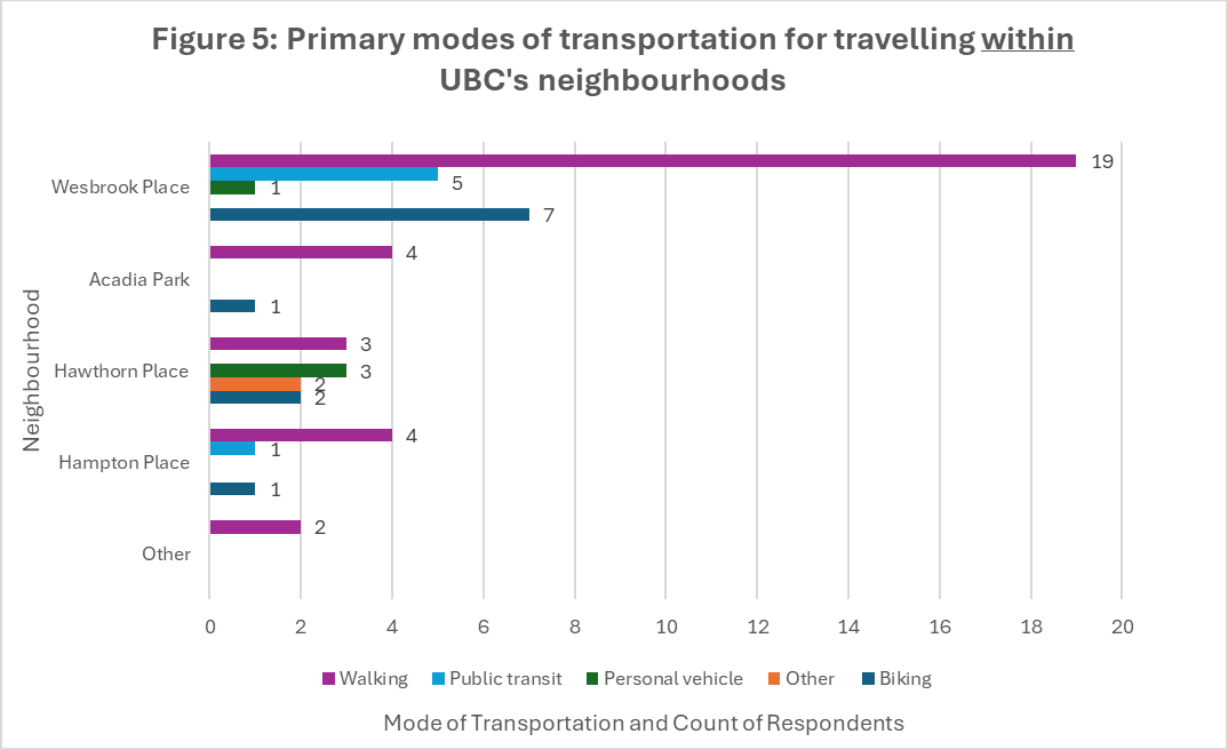
In terms of institutional affiliation, 21 of 55 respondents were UBC students, 6 were staff, 13 were faculty, 5 had other affiliations, and 12 were unaffiliated. This diversity in affiliation shows that UBC's neighbourhoods serve a broader community, not all of whom benefit equally from university support like the U-Pass.



2. Transportation Habits

To quantify transportation patterns within and beyond UBC's neighbourhoods, respondents were asked to identify their primary mode of transportation for both contexts, selecting from walking, biking, public transit, car-share, personal vehicle, or another self-specified option. While cross-tabulation was conducted to explore possible relationships between neighbourhood or gender and transportation mode, no statistically significant associations were found. This may suggest that our sample size was too limited to detect significance at scale, or simply that no strong association exists. Nonetheless, some general tendencies were observable across all neighbourhoods represented in the sample, such as a broad preference for walking and other active modes within campus boundaries. While not statistically significant, these trends align with the modal shift goals outlined in the NCAP, which prioritize reductions in single-occupancy vehicle use and increased adoption of low-emission travel. The prevalence of active transportation suggests that UBC's internal mobility strategies may be gaining traction, though further research is needed to assess whether this shift is equitable and sustained across different demographic groups.

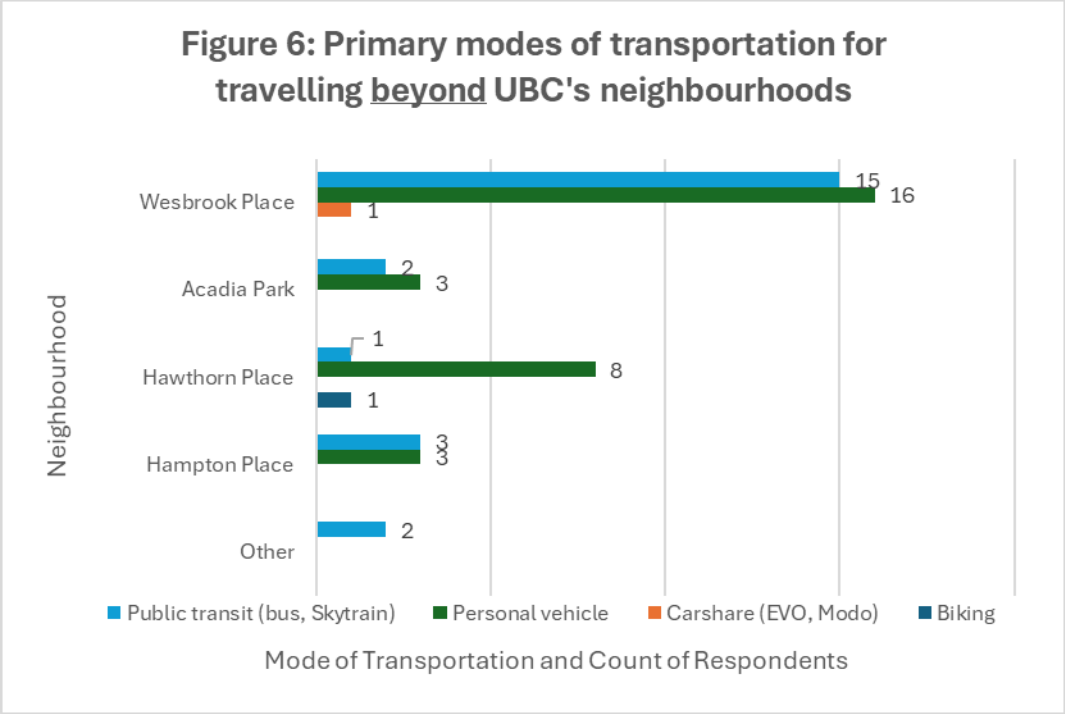
For trips within UBC, sustainable modes were dominant: 32 walked, 11 biked, 6 used transit, and 4 drove; none used car-share. For all neighbourhoods in the sample, walking was the most common mode across all neighbourhoods, followed by cycling. Walking as the dominant mode demonstrates the accessibility of UBC's pedestrian-oriented layout and the limited need for motorized transport over short distances. Furthermore, the lack of car-share usage suggests these services may be perceived as unnecessary for travel within UBC's neighbourhoods.



However, for travel beyond UBC, there was an opposite trend. Of the 55 participants, 30 relied on personal vehicles, 20 used public transit, 2 used car-share, and 1 biked. This shift toward car dependency emphasizes the geographical isolation of UBC and how geography coupled with current gaps in sustainable transportation accessibility may highly disincentivize sustainable transportation. In all neighbourhoods (excluding the other category), personal vehicles were the dominant mode of transportation for beyond UBC, followed by public transit. This pattern complicates a simplistic narrative of overwhelming car dependency and instead reveals a more nuanced transportation landscape. While personal vehicles were the most common mode overall, their dominance was concentrated in Hawthorn Place, the most car-oriented neighbourhood for travel within UBC's neighbourhoods. In contrast, residents of Hampton Place, and Wesbrook Place demonstrated a more balanced use of public transit and personal vehicles, suggesting that transit remains a viable, if not always preferable, option for many residents.

This suggests that barriers to sustainable transportation beyond UBC are not uniform but vary by neighbourhood context, infrastructure availability, and perhaps demographics. The relatively high transit usage in smaller neighbourhoods may reflect proximity to bus stops, differing household compositions, or varying degrees of institutional affiliation. These findings point to the need for targeted interventions, not a one-size-fits-all approach to improve UBC's neighbourhood residents' access to sustainable transportation. Enhancing service reliability, addressing transportation nee and tailoring transit access to each neighbourhood's needs could

help shift these ratios further toward sustainability. Resident car dependency also suggests that transit travel time, limited services and cost remain barriers to sustainable travel outside campus.

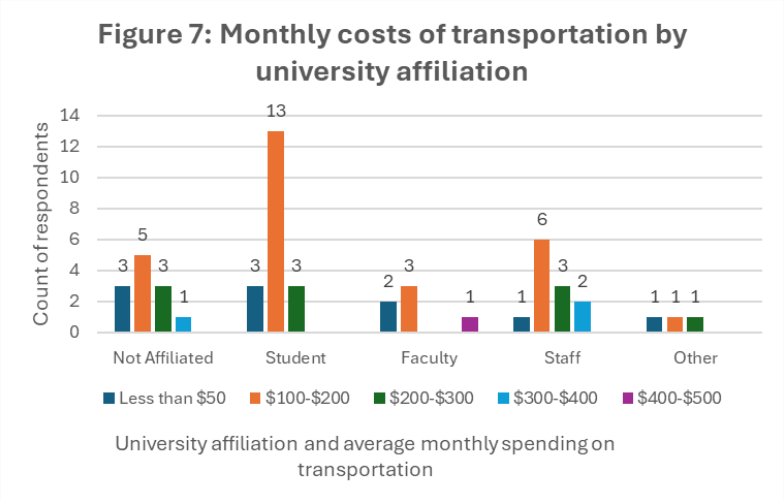


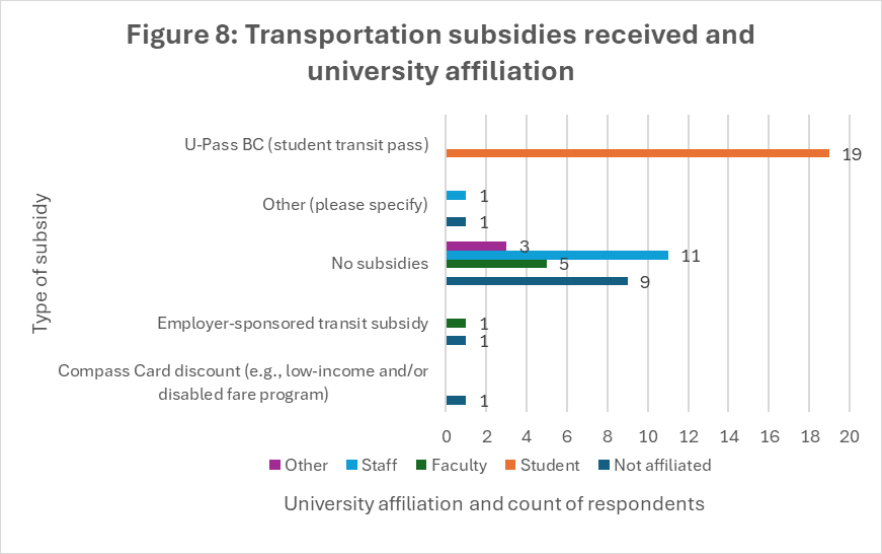
3. Transportation Costs and Barriers

Respondents were asked about monthly transportation costs. Of 52 responses, 10 spent under $50 monthly, 28 spent $100–200, 10 spent $200–300, 3 spent $300–400, and 1 spent over $400. Respondents also rated how affordable they perceived their current primary mode of transportation, averaging 3.56 out of 5—suggesting a moderate level of affordability, neither especially accessible nor entirely unaffordable.

As shown in Figure 7, transportation costs varied by university affiliation. Students were more likely to report spending less than $100 per month—likely reflecting access to the U-Pass program—while non-student groups (faculty, staff, and unaffiliated residents) showed a more even distribution across higher spending brackets. When asked about transportation subsidies, 28 respondents indicated they received none, while 19 reported receiving student-related benefits like the U-Pass (Figure 8). Although this points to an uneven distribution of subsidies, it is important to consider that staff and faculty—often assumed to be full-time earners—may not be targeted for the same forms of support.

However, this disparity in subsidy access does not necessarily translate into clearly different perceptions of affordability. Across affiliations, the average affordability rating remained moderate, with no pronounced divide between students and non-students. This raises important questions about how affordability is subjectively experienced and whether it is shaped more by structural support or by expectations tied to income and role. While students may benefit from subsidized transit, other groups may have different thresholds or coping mechanisms for managing costs, complicating simple assumptions about financial burden.





In an open-ended question inquiring about specific sustainable , participants expressed the need for improved public transit. One stated, "*All elementary school students who live in Wesbrook Village walk 1 to 2 km to go to Norma Rose Point School each day. Many parents drive because it is a long walk with little kids, especially when raining. There is currently no bus that links Wesbrook Village with Norma Rose Point School. Some option for public transportation would greatly reduce the car traffic during rush hour along Wesbrook Mall.*" Another noted, "*Bus service to/from campus is far too crowded, and even within UNA area it's not adequate. My kids have to take two buses to get from Wesbrook to U Hill elementary.*" These open-ended responses underscore a recurring theme: public transit within and around UBC's neighbourhoods remains insufficient for meeting the daily needs of families, particularly those with young children.

Moreover, these responses reflect the transportation habits results from earlier in the survey, where many respondents indicated a preference for walking or driving for short, intra-neighbourhood trips due to gaps in transit coverage. While active transportation modes like walking are often encouraged within sustainability frameworks, these accounts reveal how such modes may be impractical or exclusionary for certain groups—particularly caregivers navigating long distances with young children or inclement weather. In this context, the absence of localized, reliable public transit options not only discourages sustainable travel but also reinforces car dependency among families who may otherwise prefer alternatives.

The second response points to both overcrowding and indirect routing, which complicate transit use for intra-neighbourhood trips. While UBC's broader transportation strategies emphasize reducing single-occupancy vehicle use and promoting sustainable modes, these accounts suggest that current infrastructure does not adequately support short, local

trips, particularly for those with caregiving responsibilities. The gaps in transit accessibility disproportionately affect parents and caregivers, many of whom may not have flexible schedules or alternative transport options, thereby reinforcing structural barriers to sustainable mobility.

Taken together, these qualitative insights reveal that public transit planning in UBC's residential neighbourhoods must move beyond a narrow focus on campus–city commutes to also address the full range of localized and everyday mobility needs. While commuting is a key focus of CAP2030, the NCAP (2024) explicitly emphasizes all trips made by residents. Without careful attention to these diverse travel patterns, there is a risk that sustainability efforts may overlook the lived realities of those whose mobility needs fall outside traditional transit planning assumptions.

Interview Results

Thematic analysis of our four semi-structured interviews revealed three overlapping barriers to sustainable transportation in UBC's residential neighbourhoods: timing and convenience, safety, and accessibility. While each of these emerged as distinct themes, they often intersected, particularly for caregivers, women, and unaffiliated resident, shaping participants' transportation decisions in layered and often limiting ways. All four interview participants identified with one or more of these roles, offering perspectives shaped by caregiving responsibilities, gendered safety concerns, and limited access to institutional support. Their experiences highlight how transportation challenges are as much about who systems are designed for as they are about the systems themselves.

1. Timing and Convenience

All interviewees pointed to a persistent misalignment between transit schedules and their daily routines. One participant explained, *"Times of the bus doesn't work well... distance to the bus station takes 15 minutes — it's too long,"* highlighting how poor first-mile connectivity deters even short local trips. Another shared, "It takes me like an hour to get [downtown], whereas if I was driving... could take 20 minutes," suggesting that, for some residents, the time cost of sustainable travel, particularly for longer trips, may present a significant barrier. This consistent feedback points to a broader issue: sustainable transportation options at UBC often fail to align with the rhythms and practical constraints of daily life. Whether due to infrequent service, indirect routing, or long distances to transit stops, the time and effort required to use

transit—especially for those balancing work, caregiving, or irregular schedules—can outweigh its intended environmental or financial benefits. As these interviews show, when sustainable modes become inconvenient or inefficient, they are less likely to be adopted, regardless of users' intentions or values.

This practical inconvenience was not just about speed but shaped by specific trip contexts. *"My willingness to go and stand in a lineup at the bus loop... is greatly incentivized me to drive instead of... waiting four or five buses,"* said one participant, reinforcing our survey findings that showed car use dominates for off-campus travel. These reflections echo Martens (2016), who argues that transport equity is compromised when people must choose between affordability and efficiency (Martens, 2016). Despite the availability of transit and car-share infrastructure, participants frequently defaulted to driving, often reluctantly, because transit options did not adequately accommodate caregiving responsibilities, irregular schedules, or weather-dependent needs. This suggests that sustainable transportation at UBC is not inaccessible in a literal sense, but becomes functionally inaccessible when convenience is compromised.

2. Safety

Safety was a recurring concern—particularly at night or in off-campus settings. Participants generally felt safe on campus during the day, but noted contextual risks. One stated, *"Yeah, I think on campus it's pretty safe,"* but then qualified: *"If I were, you know, my teenage daughter, I probably wouldn't want her... to go and catch a bus at 10 o'clock at night by herself on campus."* While the campus is often perceived as secure, gendered risk and caregiving responsibilities complicate that sense of safety after dark. This reflects what Nash and Mitra (2019) describe as "gendered geographies of mobility," where women and caregivers disproportionately bear the burden of managing risk and adjusting travel behavior to ensure safety (Nash and Mitra, 2019).

Lighting and visibility were also mentioned as critical factors shaping perceptions of safety. One participant described off-campus areas as *"not very well lit or safe,"* while another recalled a specific incident involving her child: *"We had a negative experience... so I don't take that route anymore."* These accounts reveal how even isolated negative events can fundamentally alter transportation habits, especially for caregivers. Moreover, the lack of lighting in off-campus areas is echoed in the dominance of personal vehicle usage to travel beyond UBC's neighbourhoods revealed through a quantitative demographic question in the first part of the survey. However, these interview findings also contextualize and consider the

lived experiences of residents that may face more safety-related barriers to accessing sustainable transportation. Safety, in this sense, is both a physical and deeply affective one, shaping mobility through emotion and memory. It also reflects broader gendered and familial dimensions of travel dimensions, that are often underrepresented in transit planning but crucial to equitable accessibility.

3. Accessibility

Participants also raised critical points about accessibility—ranging from infrastructure gaps and information clarity to affordability and inclusion. Car-share systems like Evo and Modo were not seen as family-friendly due to their lack of car seats. One participant explained, *"Even if you booked sometime, somebody might not bring in [a car seat]... that could create a problem within our family."* This signals how certain sustainable options—while available—are not inclusive of families or users with specific needs.

Others noted how confusing signage or unclear information systems hindered spontaneous travel: *"There's no like visual maps at the stations... you might be like, where am I going?"* Another participant suggested, *"If there's an on-demand kind of thing where the information is voluntarily shared... that would be helpful."* This points to a gap not in infrastructure, but in wayfinding and digital access—something that can disproportionately affect newcomers, seniors, or those unfamiliar with the system.

A more systemic concern raised by participants related to affordability and institutional affiliation. One participant noted, *"Some universities you get it completely for free; that would be a greater incentive,"* while another reflected on the discontinued UBC employer U-Pass: *"That was a great program... I would like that to be restarted."* These reflections were mirrored in our survey results, which indicated that students receive the most consistent transit subsidies, while unaffiliated residents and some staff face higher cost burdens. This pattern suggests an opportunity for more inclusive transportation policy where access to affordable, sustainable transit is less contingent on institutional status and more aligned with UBC's broader equity and sustainability commitments.

Still, some participants expressed appreciation for existing services. One said, *"I like Evo; it's right there,"* while another remarked, *"Compared to where I used to live, this system is great."* However, even these positive assessments were conditional—often shaped by weather, distance, or specific trip purposes. This reinforces the idea that sustainable transportation at

UBC is shaped less by personal preference than by contextual factors, including cost, timing, safety, and available infrastructure.

Significance

This study emphasizes the necessity for UBC Campus + Community Planning (C+CP) to adopt a more equity-oriented and opportunity-driven approach to transportation planning for UBC's residents in the university's residential neighbourhoods. Drawing on Pereira et al.'s (2017) application of the capabilities framework, we argue that accessibility must be understood not merely as proximity to transit services, but as the ability to convert transportation options into real, equitable access to opportunities. The presence of a bus route is insufficient if individuals cannot safely, affordably, and reliably use it to meet their daily needs.

Findings from this study affirm critiques by Martens (2016), Nash and Mitra (2019), and Karjalainen and Juhola (2021), who collectively warn that technocratic transportation strategies often reinforce social inequities by prioritizing modal targets and environmental metrics while neglecting social identity, lived experience, and affordability. Our research confirms that institutional affiliation plays a determining role in transport accessibility at UBC, with students receiving extensive benefits through the U-Pass program, while staff, faculty, and unaffiliated residents are often excluded from comparable support. This reflects a broader gap between sustainability ambitions and equity outcomes that must be addressed in future planning efforts.

As NCAP and the Transportation Plan move forward, our findings underscore the importance of embedding equity and lived experience into its transportation objectives. The NCAP, while ambitious in its climate mitigation goals, can be strengthened by incorporating a capabilities-based understanding of accessibility and ensuring that residents are supported in meaningful, inclusive, and participatory ways. More specifically, the recommendations below aim to inform the NCAP's implementation strategies—moving it beyond infrastructural metrics and modal targets toward a transportation justice framework that ensures all UBC residents can equitably access and benefit from sustainable mobility systems.

C+CP should advocate for an expanded subsidy framework to UBC that extends beyond the current student-focused U-Pass. This could include revisiting the Employer U-Pass program and developing targeted subsidies for faculty, staff, and unaffiliated residents. Doing so would reflect Martens' (2016) call for affordability as a central pillar of sustainable transportation and ensure equitable access across all social groups

Recommendations

1. Expand Access to Transportation Subsidies

C+CP should advocate for an expanded subsidy framework to UBC that extends beyond the current student-focused U-Pass. This could include revisiting the Employer U-Pass program and developing targeted subsidies for faculty, staff, and unaffiliated residents. Doing so would reflect Martens' (2016) call for affordability as a central pillar of sustainable transportation and ensure equitable access across all social groups.

2. Integrate Equity Metrics into Transportation Monitoring

While the NCAP outlines strong goals around modal shift and emissions reduction, it currently lacks social equity indicators. We recommend incorporating disaggregated metrics that assess accessibility across gender, age, income, and affiliation. This would operationalize Pereira's capabilities approach, shifting the focus from availability to usability and inclusion.

3. Enhance Transit Frequency and Service Reach

Respondents identified limited-service frequency and long travel times as key deterrents to using transit for off-campus trips. To achieve NCAP's modal shift goals, C+CP should collaborate with TransLink to increase peak-hour frequency, extend evening service, and introduce direct express routes to major destinations beyond UBC. This increase in service should also reflect intra-campus shuttles, such as the 68 bus to increase accessibility for underserved individuals on their campus-wide travels. These changes would significantly reduce car dependency, improve the practicality of sustainable travel and increase equity for vulnerable community members.

4. Develop Family-Friendly and Inclusive Mobility Options

Participants have expressed that car-share services, while having a prominent presence at UBC, are not currently designed with families or caregivers in mind. This design flaw has prevented accessibility for a diverse array of community members. This should be reflected in the NCAP and UBC's dealings with car-share companies (EVO and Modo) and should include provisions for "family-ready" car-share vehicles, more accessible pickup points near schools and housing, and safe infrastructure for users with dependents. This aligns with Nash and Mitra's (2019) findings on gendered mobility needs and supports a more inclusive transportation system.

5. Embed Participatory Planning Practices into NCAP Implementation

A recurring critique in the literature (Karjalainen & Juhola, 2021; Banister, 2008) is the exclusion of community voices in sustainability planning. Our study confirms that UBC neighbourhood residents are underrepresented in institutional data and decision-making processes. NCAP needs to fill this void by creating iterative feedback mechanisms to encourage resident

participation, such as collaborative design workshops, community hearings, and public forums, both online and in-person.

6. Enhance Safety Framework and Views on Security

Safety became a primary issue discussed in interviews, especially in relation to nighttime travel and transit use by caregivers, women, and young people. Numerous respondents mentioned inadequate lighting, hazardous crosswalks, and the anxiety of waiting at secluded bus stops. The UNA ought to collaborate with TransLink and campus services to upgrade lighting, refine bus stop design, and ensure improved visibility and monitoring in at-risk areas.

7. Pilot Micro-Transit and On-Demand Services for Underserved Users

Interview participants expressed a desire for accessible, on-demand mobility options, particularly for families with young children, caregivers and unaffiliated UBC residents. As NCAP explores alternative transportation strategies, piloting micro-transit services could provide valuable insights into addressing mobility gaps. An example of these alternative transportation strategies may be school-specific bus services, which are buses specifically designed to operate before and after school hours to meet the demands of residents with children. These services would not only reduce reliance on personal vehicles but also directly support those most excluded from conventional transit networks and fill a large accessibility gap for UBC neighbourhood families.

Future Directions

Building on the findings of this study, future research should include a larger and more diverse sample, particularly targeting underrepresented demographic groups such as international families, seniors, and individuals with mobility challenges. For a larger sample size, statistical significance as a method should be applied to determine a correlation between specific neighbourhoods, gender and primary modes of transportation. If gender-based disparities continue to persist, it will be critical to investigate their root causes, particularly those related to safety concerns, affordability, and modal preferences, to ensure equitable transportation planning and policy development. Identifying the statistical significance and root causes allow for a more gender-nuanced approach in making recommendations to C+CP and informing NCAP. Statistical significance should also be identified for average costs of transportation and affiliation with university to better inform relief methods for those facing financial hardships or may lack support from UBC. Moreover, studies should specifically focus on vulnerable populations in the future instead of the broader population of residents. This will allow for more equitability-focused transportation solutions and recommendations for C+CP, NCAP and UBC. Finally, due to the persistent challenges of engaging with UBC's neighbourhood

residents, particularly equity-deserving groups who may not respond to conventional tools like online surveys, further investigation is needed into how to promote more meaningful, inclusive, and sustained engagement. Future research could incorporate a broader range of participatory and community-led methods, such as in-person focus groups, community mapping, photovoice, or pop-up dialogues held in public or semi-public neighbourhood spaces. These determined community engagement methods will facilitate easier and more effective data collection on future studies across a wide variety of social science disciplines in UBC's residential neighbourhoods.

Additionally, assessing the mobility experiences of marginalized groups not directly addressed in this project, such as the LGBTQ+ community, people with disabilities, and newcomers, would broaden the equity lens of UBC's transportation strategy. Future research should also examine how intersecting social identities, specifically race, ethnicity, and immigration status, may shape transportation access and experiences within UBC's residential neighbourhoods. Collecting and analyzing data in this way may identify accessibility and affordability gaps not explored in this study, further enhancing the contribution to existing literature. Also, expanding the geographic scope to include adjacent residential areas, such as those living on university endowment lands, and incorporating spatial analysis tools like GIS could help identify micro-level inequities. Lastly, future studies could explore interdisciplinary collaborations: linking urban planning, public health, and sustainability fields, to assess how transportation access intersects with broader wellbeing outcomes. Establishing partnerships with Campus and Community Plannings and TransLink may also facilitate more policy-relevant research, ensuring findings contribute meaningfully to future infrastructure planning and sustainability goals.

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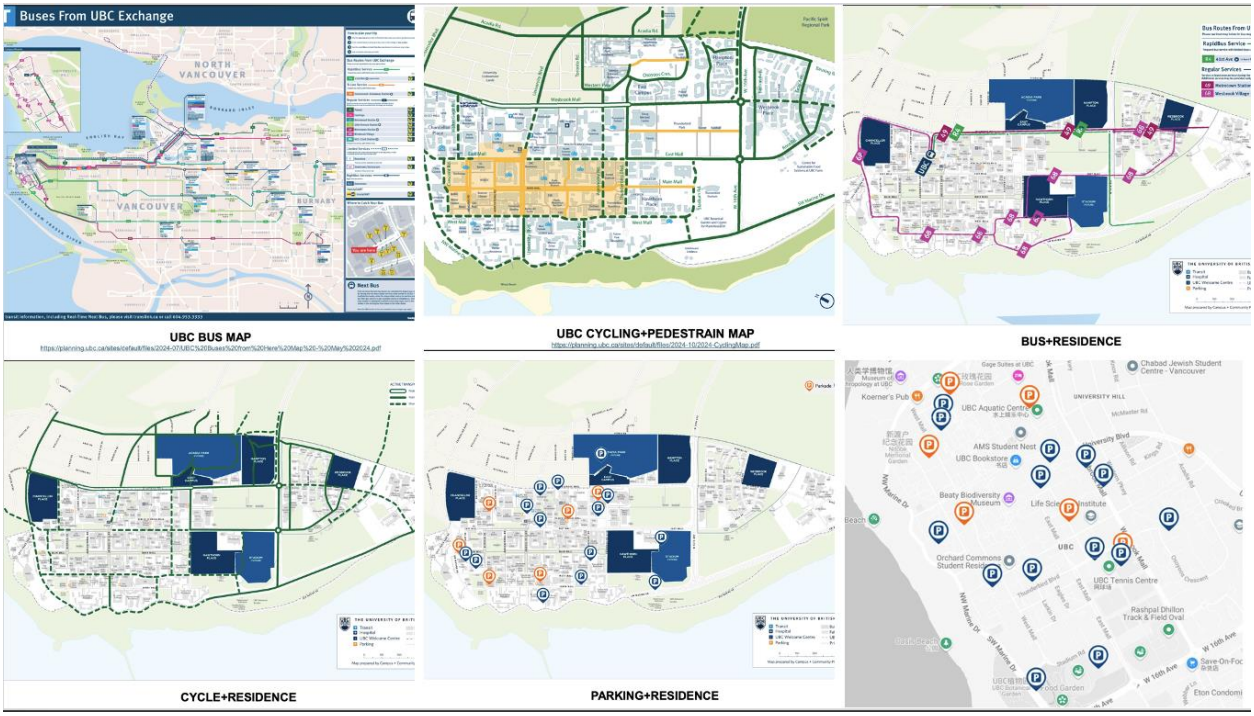
Appendix

a) Maps, Survey Invitations & Posters

1. *Extensive transport infrastructure at UBC*

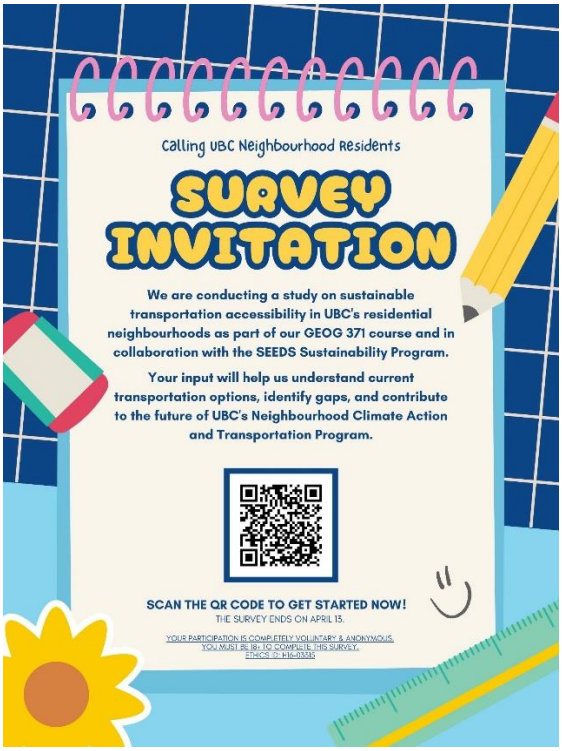


https://planning.ubc.ca/sites/default/files/2024-10/2024-CyclingMap.pdf

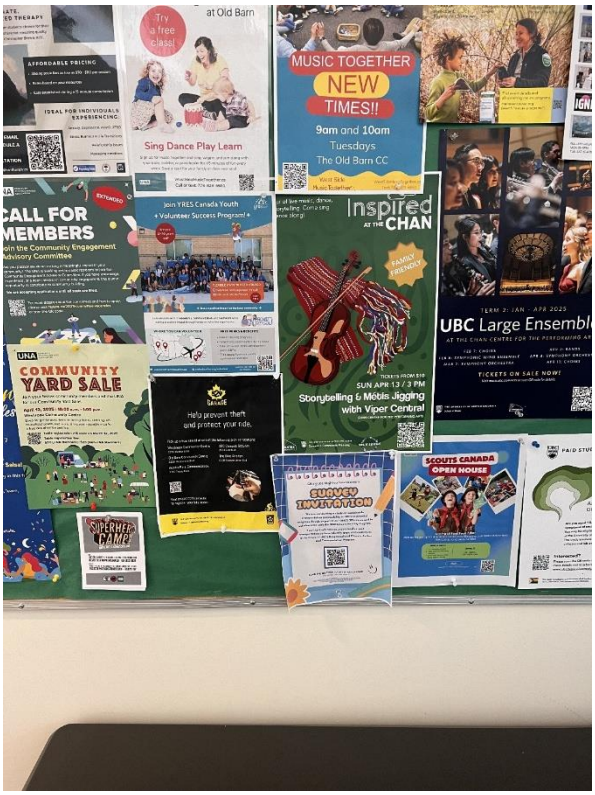
https://planning.ubc.ca/sites/default/files/2024-07/UBC%20Buses%20from%20Here%20Map%20-%20May%202024.pdf

https://parking.ubc.ca/map

2. Survey Invitation



3. Survey posters on noticeboards in community spaces



b) Survey Questions

GEOG 371 - Transportation Affordability at UBC

Start of Block: Block 1

Survey Consent Form Welcome to our survey! Our study is understanding sustainable transportation accessibility for residents in UBC's neighbourhoods and is for both our Geography class at UBC (GEOG371) and to aid the SEEDS Sustainability Program in their investigation of transportation affordability in UBC's neighbourhoods. In particular we hope to first establish a baseline understanding of the existing services of sustainable transportation in UBC residential neighbourhoods and residents' current use and access to these services. The data and results will then inform recommendations for UBC's Neighbourhood Climate Action Plan implementation and future updates to UBC's Transportation Plan later this year. We are collecting surveys until April 13th. The survey will take approximately 10 minutes. By answering our survey, you are consenting to participate in this research and acknowledge that you are at least 18 years of age. Please know that your participation is entirely voluntary and that your responses are anonymous. The Co-principal Investigators for this project are Geraldine Pratt and Bonnie Kaserman, our instructor, who can be reached at bonnie.kaserman@ubc.ca if you have any questions about this study. Additionally, our group is supported by SEEDS and co-ordinated by Cindy Cheng, Research and Program Developer. If you have any further questions specific to SEEDS please email her at zhaohua.cheng@ubc.ca. If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study (ethics ID H16-03315) , contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598.

Do you consent to having your data used for the study? If you do not consent to having your data used for this study, the survey will end.

- o Yes
- o No

End of Block: Block 1

Start of Block: Section 1A: Demographics and Affiliation

Are you a UBC neighbourhoods resident?

- o Yes
- o No

Which neighbourhood do you live in? (Please refer to the map below if necessary)

- o Hawthorn Place
- o Hampton Place
- o Wesbrook Place
- o Chancellor Place
- o East Campus
- o Acadia Park Student Housing
- o Other (please specify) _____

End of Block: Section 1A: Demographics and Affiliation

Start of Block: Section 1B: Demographics and Affiliation

What age range are you in?

- o 18-24
- o 25-35
- o 35-45
- o 45-60
- o 61+
- o Prefer not to say

What gender do you identify as?

- o Male
- o Female
- o Non-binary
- o Prefer to self-describe _____
- o Prefer not to say

End of Block: Section 1B: Demographics and Affiliation

Start of Block: Section 1C: Demographics and Affiliation

Are you affiliated or associated with the university as a UBC neighbourhood's resident?

- o Yes, I am a student
- o Yes, I am faculty
- o Yes, I am staff
- o I am a UBC resident but otherwise not affiliated or associated with the university.
- o Yes, other (please specify) _____

What is your primary mode of transportation for daily activities **within** UBC's neighbourhoods (e.g., groceries, social activities, etc.)?

- o Public transit
- o Walking
- o Biking
- o Personal vehicle
- o Carshare (EVO, Modo)
- o Other (please specify) _____

What is your primary mode of transportation for travelling **beyond** UBC's neighbourhoods (commuting to and from the university)?

- o Public transit (bus, Skytrain)
- o Walking
- o Biking
- o Personal vehicle
- o Carshare (EVO, Modo)
- o Other (please specify) _____

End of Block: Section 1C: Demographics and Affiliation

Start of Block: Section 2: Awareness of UBC'S Transportation and Climate Action Plan

UBC's Neighbourhood Climate Action Plan (NCAP) sets a pathway to a net-zero and climate resilient community for the residential neighbourhoods on the University of British Columbia's Vancouver campus. The plan prioritizes active and sustainable modes of transportation.

Before taking this survey, were you aware of the NCAP and its goals for sustainable transportation in UBC neighbourhoods?

- o Yes, I am familiar with its transportation and sustainability goals
- o I have heard of the NCAP but don't know much about the sustainable transportation goals
- o No, I was not aware of the NCAP

Do you think UBC is currently doing enough to support sustainable and affordable transportation in its neighbourhoods?

- o Yes
- o No
- o Unsure

Skip To: End of Block If Do you think UBC is currently doing enough to support sustainable and affordable transportation i... = Yes

Skip To: End of Block If Do you think UBC is currently doing enough to support sustainable and affordable transportation i... = Unsure

---

If not, which specific improvements would you like to see?

_____

_____

_____

_____

_____

End of Block: Section 2: Awareness of UBC'S Transportation and Climate Action Plan

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Start of Block: Section 3: Transportation Costs & Affordability

On average, how much do you spend per month on transportation (including public transit, U-Pass fee [$46 per month, $184 per term], fuel, vehicle costs, bike maintenance, etc.)

- o Less than $50
- o $100-$200
- o $200-$300

- o $300-$400
- o $400-$500
- o Over 500 dollars

Do you receive any subsidies or discounts on your transportation costs? (Select all that apply)

- ▢ U-Pass BC (student transit pass)
- ▢ Compass Card discount (e.g., low-income and/or disabled fare program)
- ▢ Employer-sponsored transit subsidy
- ▢ Bike share or car share discount
- ▢ Other (please specify) _____
- ▢ No, I do not receive any discounts or subsidies

How affordable do you find your current transportation options? (Scale: 1 = Not affordable at all, 5 = Very affordable)

	1	2	3	4	5
1					

Have transportation costs impacted your ability to access essential services (e.g., work, school, healthcare, groceries)?

- o Yes, significantly
- o Yes, somewhat
- o No

If yes, in what way have transportation costs impacted you?

_____

_____

_____

_____

_____

End of Block: Section 3: Transportation Costs & Affordability

Start of Block: Section 4: Accessibility and Barriers to Sustainable Transportation

Do you feel you have adequate access to the following transportation options in your neighbourhood? (Rate each on a scale of 1 = No access, 5 = Excellent access)

	1	2	3	4	5
Public transit					
Bike lanes and infrastructure					
Pedestrian-friendly pathways					
Carshare services (EVO, Modo)					

What are the biggest barriers preventing you from using sustainable transportation options more frequently? (Select all that apply)

- ▢ Cost
- ▢ Limited transit routes or schedule
- ▢ Safety concerns (traffic, lighting, etc.)
- ▢ Lack of infrastructure (e.g., bike lanes, sidewalks)
- ▢ Lack of car share services/infrastructure
- ▢ Other (please specify) _____

If you primarily use a personal vehicle, what would encourage you to switch to more sustainable transportation? (Select all that apply)

- ▢ More frequent and reliable transit service
- ▢ Lower transit costs (subsidies or discounts)
- ▢ Better biking and walking infrastructure

- ▢ More carshare availability
- ▢ Incentives for sustainable transportation
- ▢ Nothing - I need to drive
- ▢ Other (please specify) _____
- ▢ I don't use a personal vehicle

End of Block: Section 4: Accessibility and Barriers to Sustainable Transportation

---

Start of Block: Section 5: Future Transportation Improvements and Conclusion

What transportation improvements would make sustainable options more accessible and affordable for you?

_____

_____

_____

_____

_____

How would you rank the following improvements to be most helpful in making transportation more affordable and/or accessible in UBC neighbourhoods? (Drag and drop to rank order)

_____ Lower transit fares
_____ Increased public transit subsidies/discounts
_____ Expanded transit routes and schedules
_____ Improved biking infrastructure
_____ More pedestrian-friendly infrastructure
_____ More accessible carshare services
_____ Financial incentives for sustainable transportation
_____ More affordable parking options for residents who need a car

---

Would you support policies that discourage private car use in UBC neighbourhoods in exchange for improved public transit, biking, and walking infrastructure?

o Yes

- o No
- o Maybe/Unsure

End of Block: Section 5: Future Transportation Improvements and Conclusion

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Start of Block:

Thank you for taking part in our survey. Would you be interested in taking part in an individual 20-30 minutes long interview?

- o Yes, I am interested
- o No, I am not interested

End of Block:

Start of Block: Block 9

Thank you for your interest! Please give us your email so that we can contact you. Be aware that by giving us your email we will be able to connect your email with your responses. We, the researchers will know your survey responses, but your responses will remain confidential.

_____

_____

_____

_____

_____

End of Block: Block 9

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c) Fieldnotes from Interviews

Fieldnote 1 – 2025.03.28, 9:00 AM
Antony – Discussion Leader
Bjorn – Fieldnote Taker
Participant 1

Antony began by professionally confirming consent for recording and participation, ensuring ethical clarity. He thanked the participant and proceeded with a structured set of interview questions.

When asked about **challenges preventing the use of sustainable transportation**, the participant identified timing and accessibility as key barriers:

“Times of the bus doesn’t work well... distance to the bus station takes 15 minutes — it’s too long.”

Regarding **affordable transfer options**, the participant acknowledged financial constraints affecting some community members:

“Some people can’t afford (transit), opt to cycle or walk or ride share.”

Weather conditions also played a major role in shaping her transportation choices. She stated clearly:

“Absolutely. Probably if it's rainy, I'll be more apt to drive rather than walk or cycle.”
She expanded by sharing a personal experience:
“I've been pregnant on a really hot bus before in the summer and that's not pleasant or safe actually for a lot of people.”

On **safety**, she distinguished between experiences on campus and in the city:

“Yeah, I think on campus it's pretty safe.”
“I feel fairly safe as an adult accessing transit or going to the bus stop in the morning or late at night.”
However, she noted the situation differs downtown or in other parts of the city:
“If I were, you know, my teenage daughter, I probably wouldn't want her... to go and catch a bus at 10 o'clock at night by herself on campus.”
“It's just not very well lit or safe, I would say.”

Antony also inquired about **shared mobility services** like Evo and bike share. The participant said:

“I live very close by to an Evo lot. So there's always a car available.”
But she added:
“I don't really use the bike share at all.”

In response to questions about **barriers related to transportation infrastructure**, the participant described long-standing issues with poor connectivity:

“Living on campus, it's really hard to get um transit outside of Vancouver within a reasonable time frame.”
She pointed to the discontinuation of key commuter routes over time:
“We’ve seen the reduction of, you know, direct buses, commuter buses, they just don’t exist anymore.”

Her reflections on **campus infrastructure** revealed frustration over the removal of helpful shuttle services:

“There used to be a small shuttle that would connect main campus with a lot of the daycares… and they got rid of that. So that was a big hardship.”
“It was just easy to hop on the shuttle and get there.”

She emphasized that **timing and convenience** are crucial in transit decisions:

“It’s challenging to get routes that are um like going where I need to go.”
This lack of convenience often pushed her to drive:
“My willingness to go and stand in a lineup at the bus loop... is greatly incentivized me to drive instead of... waiting four or five buses.”

When asked about potential **incentives for taking transit**, she suggested improved east-west shuttle connectors and funding support:

“Definitely having more shuttles throughout the campus, like, you know, east-west connectors.”
“Well, I would say probably funding to TransLink.”

In summary, her **transportation choices** were shaped by a complex mix of personal needs, safety concerns, infrastructure gaps, and weather conditions. Antony closed by thanking her for participating and acknowledged her input as invaluable to the project.

Fieldnote 2 – 2025.03.28, 10:00 AM
Antony – Discussion Leader
Max – Fieldnote Taker
Participant 2

Live notes taken.

Personal vehicle to go beyond; biggest challenge for going beyond: times that don't align with schedule shares a car with sister (parents in Whis).

Car is for groceries or to go to whis. Calculated bus is same as car gas to go the longer distances. Bring more stuff with you.

Parking easily we take car faster. If going out we take bus; drinking etc. Recognises her privilege in having a car.

Depends where we are going, convenience of the transit.

Comfortable home; flowers, good setting. Seemed interest in the subject.

- What are the main challenges you face in accessing sustainable transportation options (e.g., transit, cycling, shared mobility)?
- How do transportation costs impact your mobility choices?

No. Parents paying for school; campus card etc. free mobility with transit. Car not used that often; insurance, repairs etc. split in half (with sister). Laughed nervously recognizing she is perhaps luckier than others. 10am Eating her breakfast at same time; but certainly comfortable talking.

- Would you say there are specific groups or demographics (e.g., students, seniors, families, low-income residents) who face greater challenges in accessing affordable transportation?

Not sure. Buses are delayed or are too full main thing that friends & she bring up. The "Classic". People that live nearby to her.

- Do weather or seasonal patterns influence your transportation decisions significantly? (hot weather, rain or snow in winter)?

"Whistler escapades" weather driven; sea-to-sky is something but used to driving in the snow. Quite a charismatic participant. Storms etc. will drive decision making.

On campus, when it is nice uses a bike. When it's raining "I will not take my bike". On the fence about if it going to rain later… come back and you're soaked. Weather doesn't incentivise decision making – sustainable transportation; funny girl "have you looked at parking on campus wooheh" and pulled a face with wide eyes, and laughed.

- How easy is it for you to access and use shared mobility services (e.g., car share, bike share, e-scooters)?

Never tried shared access, but have a lot of friends who have some must be accessible.

Never needed it… Car share – already have my own so irrelevant. Won't plan an acitibty that needs car if I don't have access. Bike share – have my own bike. Used to montreal bike share system – lock it in; a confusing harder system leave the bikes wherever & too complex to work

out. System & how it works is unclear – “I’m ambiogus as to how it works idk even know how toi start”… but I haven’t thought much to it ratehr than the occasional thought. Haven’t actively looked at it.

- Have you experienced any barriers related to transportation infrastructure (e.g., lack of bike lanes, poor transit connectivity)?

No.

· Have you used any transportation-related programs or incentives provided by UBC (e.g., UPass, cycling infrastructure, bikeshare programs, car-sharing options)? If so, how effective do you think they are?

Upass… Yes. Some universities you get it completely for free; that would be a greater incentive. Raised eyebrows. Shrugs shoulders and suggests general not knowing re. sharing schemes.

- What policies or improvements would make sustainable transportation more accessible and affordable for you?

Thought about this fairly deeply. Whis needs permanent stop with UBC Campus; for groceries idk (kinda looked to the side). “yeh” difficult with the bus – amount to carry is just complex; taking space feel bad… raised hands and threw up “it’s a lot”.

Organised into themes

Transportation Choices & Modal Use

- **Primary transport modes**: Uses both personal car and public transit. Car is shared with sister and used mainly for groceries or trips to Whistler.
- **Decision factors**: Choices depend on convenience, distance, weather, and activity type (e.g., takes the bus if going out drinking).
- **Cost comparison**: Found that the cost of driving (gas) is roughly equal to bus fare for longer distances—prefers the car due to ability to carry more and save time.

Cost & Financial Accessibility

- **Perceived privilege**: Acknowledges her privilege in having access to a personal vehicle.
- **No strong cost barriers**: Parents cover school and transit (UPass) costs. She splits car-related expenses with her sister.
- Not especially concerned with transportation affordability, but laughed nervously when noting this.

Weather & Seasonal Factors

- Weather strongly influences biking behaviour: avoids biking in rain or when it might rain later due to discomfort.

- Uses a bike when the weather is good.
- Describes winter trips to Whistler as weather-driven but feels confident driving in snow and adjusts accordingly.

Shared Mobility & Infrastructure

- **Limited use**: Hasn't used UBC's bikeshare or car share—has personal access to a car and bike.
- **Perception of shared systems**: Finds them confusing or unclear (e.g., Montreal's system vs. local options). No strong incentive to learn about or use them due to lack of personal need.
- **Barriers**: No major concerns expressed regarding infrastructure like bike lanes or transit connectivity.

Transit Reliability & Access

- Notes frequent bus delays and overcrowding as common complaints among peers: "the Classic."
- Personally hasn't faced major issues with transportation infrastructure.
- Finds UBC's UPass useful but mentions that some universities offer it for free, which she sees as a better incentive.

Policy Suggestions & Needs

- Recommends establishing a permanent bus stop between Whistler and UBC.
- Describes grocery trips via transit as challenging due to the amount of stuff and space taken up—expressed with a sense of frustration.
- Did not elaborate deeply on systemic policy changes but acknowledged areas for improvement.

Fieldnote 3 – 2025.04.03, 9:30 AM
Antony – Discussion Leader
Bjorn – Fieldnote Taker
Participant 3

Antony began by confirming consent for recording and participation. The participant acknowledged receiving the consent form and confirmed understanding of its content. Antony expressed appreciation and moved into the interview, thanking the participant for their time and involvement in both the survey and interview.

When asked about **transportation challenges**, the participant identified UBC's geographic isolation and transit connectivity as primary issues:

"UBC is far out. So now I have to go downtown. It takes me like an hour to get there, whereas if I was driving... could take 20 minutes."

The participant noted that while buses run frequently, the **indirect connections** (e.g., getting to the SkyTrain) **add time and complexity**. Though hesitant to be critical, she acknowledged that getting downtown is a "pain," and welcomed the idea of a future SkyTrain extension.

Cost did not seem to be a major barrier:

"It's just like $2.60... I think it's **affordable**."

However, she recalled feeling it was expensive initially, before adjusting to Canadian currency and pricing norms.

On-campus transit was perceived as **inconvenient and expensive** for short distances:

"Feels too expensive to spend like two and a half dollars to get to the UBC exchange... I'd rather walk or take my bike."

She also shared a negative experience involving a minor accident on a campus bus, which discouraged her from using certain routes:

"I had an accident in one... I was with my daughter. We were fine, but I was just like, oh, never taking that bus again."

The participant observed that campus signage and navigation support were lacking:

"There's no like **visual maps at the stations**... you might be like, where am I going?"

When prompted about **demographics**, she did not identify specific groups facing major challenges but remarked on visible changes in demographics depending on bus routes.

Seasonal weather, especially rain, posed minor inconvenience but was **manageable**:

"We were fine. And I have two small kids... hassle in the rain... but it was fine."

Compared to her country of origin (implied to be Johannesburg), she found **Vancouver's public transit impressive and efficient**:

"Where I'm from it doesn't work... maybe a bus arrives one every hour. So I'm like actually super impressed."

Regarding **shared mobility**, the participant **praised Evo**:

"Used Evo for the first time... it's amazing... super impressive system."

However, she noted that **cost** was a factor, especially for routine trips:

"If I'm going somewhere, I don't jump in an Evo. I take the bus."

She had not yet used the bike share or explored bike routes extensively. When asked about **infrastructure barriers**, she mentioned **limited bike lanes and unclear routing**, particularly on campus.

“Some of the busier roads are not super bike friendly.”

On **incentives or discounts** (e.g., U-Pass), she was **unaware** of any and noted that her husband (a faculty member) likely did not receive one.

In reflecting on policies to promote **sustainable transportation**, she supported disincentives for personal vehicle use:

“Yes. 100%... There are things like how you don’t pay for parking with an Evo... That’s a great policy.”

The participant concluded by expressing interest in reading the final report, and Antony closed the session with thanks and confirmation of follow-up.

Summary:
The participant's transportation choices were influenced by a combination of UBC’s geographic location, cost considerations, personal safety experiences, infrastructure clarity, and past transit conditions in her home country. Her feedback suggests room for improvement in campus transit clarity, visual aids, and infrastructure design, as well as support for continued investment in sustainable mobility incentives.

Fieldnote 4 – 2025.04.09, 2:00 PM
Antony – Discussion Leader
Bjorn – Fieldnote Taker
Participant 4

Antony opened the session by reviewing the participant’s survey responses and asking about their transportation habits. The participant confirmed that their **primary mode of transportation outside UBC is a personal vehicle**. This decision is influenced by **family responsibilities** and the need to travel off-campus for **essential services** like groceries.

“Grocery here is expensive... I'm like a family of four... so we go outside... also no recreational purpose.”

The participant explained that **shared mobility options** like **Evo or Modo** were preferred in the past, but became less practical after having children. The **need for car seats** and the **potential unavailability of vehicles** complicate the use of such services:

“Even if you booked sometime, somebody might not bring in [a car seat]... that could create a problem within our family.”

He stated a clear preference for **shared mobility services** but emphasized that they are **not always family-friendly**. The **absence of kid-friendly infrastructure**, like car seats in shared vehicles, was a notable barrier.

The discussion shifted to **seasonal influences**. The participant noted that bad weather—especially rain—led them to choose **driving over walking or biking**:

"Because if it's raining all of a sudden, you take the car."

On **affordability**, the participant stated that **transportation costs had not personally impacted** their decisions, though acknowledged this might differ for others.

"Yeah, it has gone up for sure... but not at this point for me."

He also addressed **demographic-specific barriers** and said that **current transit programs** (e.g., **concessions for students, seniors, low-income individuals**) were working well from his perspective.

"I know there is also a provision for low income as well... I would say we're pretty well covered."

Accessibility of shared mobility services was **not an issue** due to **proximity to campus**:

"I'm living on campus right now... so it is easy to access."

However, he emphasized that **better real-time data** and **communication** would improve the system:

"If there's an on-demand kind of thing where the information is voluntarily shared... That would be helpful."

He praised recent **improvements in live tracking** via Google Maps and other platforms, but added that **information on bus capacity** (e.g., whether a bus is full) would further enhance decision-making.

The participant also reflected positively on previous experiences with **employer transit passes** like the **U-Pass**, which have since been **discontinued**:

"That was a great program... I would like that to be restarted."

When asked about improvements that could help the **wider community**, he recommended a **sustainable school shuttle** to reduce **traffic during peak drop-off/pick-up times**:

"If we have some kind of sustainable transportation [for] schools... that will help immensely."

The session closed with a discussion of **North Vancouver's school bus model** as a **successful example**. The participant expressed appreciation for the project and interest in receiving the final report.

"Keep up the good work... I'd like to see the impact of your project."

Summary:
The participant's experience reflects the tension between sustainable mobility and family needs. While supportive of shared and sustainable options, practicality and child-related logistics often necessitate personal vehicle use. Key suggestions included enhancing family-friendly shared mobility, reinstating transit subsidies, and improving real-time transit data. Their feedback underscores the need for flexible, inclusive transport planning that supports both individual and family mobility needs.