

# Moving Differently: Exploring Neurodivergent Mobility through Scholarship, Lived Experience, and Urban Policy

Drafted by Jacob Fewer

April 2025

Master's Report Submitted to the School of Urban and Regional Planning in partial fulfillment of the requirements for the degree of Master of Urban and Regional Planning from the School of Urban and Regional Planning from Queen's University Kingston, Ontario, Canada.

## Executive Summary

This report, *Exploring the Neurodivergent Travel Experience*, investigates the lived urban travel experiences of students with attention deficit hyperactivity disorder (ADHD) at Queen’s University, while also examining the extent to which neurodiversity is represented in Canadian planning policy. Despite the growing interest in inclusive urban design and differentiated mobility experiences, the unique needs of neurodivergent travelers, particularly those with ADHD, remain underexplored in academic literature and policy frameworks.

To address this gap, this study employed a mixed-methods approach, consisting of (1) a comprehensive literature review, (2) an environmental scan of 28 transportation, accessibility, and equity policy documents from large Canadian cities, and (3) a qualitative analysis of semi-structured interviews with seven Queen’s students with ADHD.

## Key Findings

### Travel Planning as a Barrier

Interview Participants consistently identified trip planning as a significant source of stress. The cognitive demands of organizing transportation—checking bus schedules, managing time, packing necessary items—were described as overwhelming and sometimes discouraged travel altogether. This finding supports Baric et al.’s (2024) identification of the “whole journey chain” as a critical factor for neurodivergent travelers, especially the pre-trip phase. Among interview participants, walking and ridesharing services were often preferred for their simplicity and minimal planning requirements.

### Sensory and Social Overload

Many students reported experiences of overstimulation in crowded, noisy, or visually complex environments, particularly while using public transit or navigating dense pedestrian areas. Headphones, quiet zones, and avoidance strategies were frequently mentioned as coping mechanisms. These experiences suggest that sensory-friendly infrastructure and quieter, more flexible transportation environments may best support the travel needs of people with ADHD.

### Forgetfulness and Executive Dysfunction

Instances of forgetfulness, such as missing bus stops, leaving items behind, or failing to adhere to schedules, was a recurring challenge. These experiences often led to increased travel time and unplanned secondary trips, compounding stress. This finding suggests that transportation options that offer flexibility and quick recovery from errors, may be preferable for people with ADHD, and underscores the need for forgiving and user-friendly transit systems.

### Perceptions of Safety

Concerns about personal safety, particularly in relation to intoxicated individuals or heavy vehicle traffic, influenced travel experiences. Pedestrian-friendly environments and reliable ride-hailing options were viewed as safer and more comfortable alternatives to public transit, especially during evenings or winter months.

## Limited Integration of Neurodiversity in Canadian Policy

The environmental scan revealed a critical policy gap. Although some cities use broad definitions of disability that are implicitly inclusive of neurodivergent people, only five of the 28 documents analyzed in this report made any mention of neurodiversity, and just one, Vancouver’s Accessibility Strategy (City of Vancouver, 2022) offered a working definition. Where neurodivergence was mentioned, it was rarely accompanied by actionable planning measures.

Notably, many accessibility strategies and transportation master plans did not invoke a neurodiversity paradigm, which views neurological variation as a form of human diversity rather than deficit (Walker, 2014). While some features—like audio/visual stop announcements or flexible fare payment systems—incidentally support neurodivergent users, they were not intentionally designed with these populations in mind.

## Recommendations

### For Researchers

Expand demographic diversity, include additional forms of neurodivergence, employ mixed-method and longitudinal designs, and consider participatory action research to center neurodivergent voices.

### For Practitioners

Embed neurodiversity in policy frameworks, improve trip-planning tools, design sensory-friendly transit environments, and provide professional training in neuroinclusive planning.

## Conclusions

This study highlights the critical need for planning frameworks that go beyond conventional understandings of disability and embrace neurodiversity as a vital dimension of human variation. By integrating neurodivergent perspectives into transportation systems, cities can foster more inclusive, accessible, and equitable urban environments for all.

# Table of contents

## Contents

Executive Summary .....	iii
Key Findings .....	iii
Recommendations .....	iv
Conclusions .....	iv
Table of contents .....	v
List of Tables.....	vii
List of Figures .....	vii
Chapter 1: Introduction .....	1
The General Problem .....	1
The Research Questions .....	1
Report overview.....	1
Chapter 2: Literature Review .....	2
Overview of Scholarship on Travel Behavior .....	2
Choice and Related Models .....	2
Activity-Based Models .....	2
Cognitive and Affective Determinants of Behavior.....	3
Critiques of Normative Travel Behavior Research.....	3
Travel and the Built Environment .....	4
Life-Oriented Travel Behavior Research.....	4
Qualitative Travel Behavior Research .....	5
Scholarship on Differentiated Travelers.....	5
Neurodiversity.....	6
Travel Experiences of Neurodivergent People .....	7
Travel Experiences of People with ADHD .....	7
Summary and Knowledge Gaps.....	9
Chapter 3: Methods .....	10
Methodology and Study Design .....	10
Literature Review.....	10
Environmental Scan .....	10
Semi-Structured Interviews .....	11

Positionality .....	13
Limitations .....	13
Chapter 4: Environmental Scan .....	15
Environmental Scan Analysis .....	21
Key Insights .....	25
Chapter 5: Interview Results and Analysis .....	26
Key Theme 1: Travel Planning .....	26
Key Theme 2: Overstimulation.....	27
Key Theme 3: Forgetfulness .....	28
Key Theme 4: Safety.....	28
Key Theme 5: Routine .....	29
Key Theme 6: Winter .....	29
Key Theme 7: Mode Choice and Rationale .....	30
Key Insights .....	30
Chapter 6: Discussion & Recommendations .....	32
Key insights .....	32
Recommendations for Future Study .....	33
Recommendations for Professional Practice .....	33
Conclusions .....	34
Work Cited .....	35
Appendix .....	41
Appendix A: Semi-Structured Interview Guide.....	41
Appendix B: Letter of Information .....	43
Appendix C: Ethics Approval Letter .....	47

## List of Tables

Table 1. Silverman and Patterson’s Semi-Structured Interview Guide recommendations, and the steps taken in this study to implement them. ....	12
Table 2. Environmental Scan Data Extraction Table. ....	16
Table 3. List of Interview Participants. ....	26

## List of Figures

Figure 1: The Number of Articles Identified by Google Scholar Upon Searching the Term “Neurodiversity.” ....	7
Figure 2. Park and Chowdhury’s accessible journey chain. ....	8
Figure 3: Analysis of Consideration for Neurodiversity. ....	21

# Chapter 1: Introduction

## The General Problem

Understanding the factors that shape urban travel behavior is crucial for governing a dynamic urban transportation system and is of great importance for the sustainable development of cities (Nai et al. 2024). Perhaps due to this importance, the field is also very popular. The question of urban travel behavior has drawn scholars from a wide range of disciplines. Planning scholars have established causal relationships between the built environment and travel behavior (Ewing and Cervero, 2010), economists assert that income shapes travel behavior (Adkins et al., 2017), and sociologists claim that individual differences such as age, gender, sexuality, disability, and their intersections are central to travel behavior and experience (Jamal, 2020).

Despite voluminous scholarly literature on travel behaviour, research exploring the urban travel experiences of neurodivergent people is limited. Most of the scholarship focuses on people with autism, and few studies explore the travel experiences of other neurodiverse populations (Tola et al., 2021). There is, however, a growing body of literature concerning neurodiversity and the built environment. Tola et al. (2021) offer a comprehensive review of the topic, concluding that a nuanced understanding of the multiplicity of urban experiences (not just individual buildings or spaces) for those considered neurodivergent has yet to be captured and represents a significant knowledge gap.

This research report attempts to address this knowledge gap by investigating the urban travel experiences of Queen's University students with attention deficit hyperactivity disorder (ADHD), and by exploring neurodiversity in the Canadian planning policy landscape. This research takes a mixed methods approach to generate knowledge, featuring a literature review, an environmental scan, and qualitative interviews.

## The Research Questions

1. What is known about the travel and lived experiences of people with ADHD?
2. How, if at all, do municipal planning policies within Canada account for neurodiversity?
3. What are the travel behaviors and experiences of Queen's University Students with ADHD, and how, if at all, has ADHD shaped these behaviors and experiences?

## Report overview

Chapter 2: Literature Review provides a thorough review of travel behavior research to date. Additionally, this chapter provides context for the study of neurodiversity in travel behavior research. The methodological approach, study design, data scope, data collection methods and limitations are described in Chapter 3: Methodology. In Chapter 4: Environmental Scan, the results of an environmental scan are presented. In Chapter 5: Interview Analysis, the results from the qualitative interviews are presented, organized into key themes. Finally, in Chapter 6: Discussion and Recommendations, several insights gleaned from the research are discussed, and key recommendations for future research and practice are identified.

# Chapter 2: Literature Review

## Overview of Scholarship on Travel Behavior

Every day, billions of trips are taken by humans worldwide. Each trip is unique, motivated by a variety of factors, and facilitated by a variety of political, economic and physical landscapes. For example, a person's commute to work will be shaped by countless individual, geographical, political and economic factors that combine to create a unique travel experience. Urban planning plays a crucial role in understanding current travel behavior trends and the factors that influence them, in order to design cities that are inclusive and accessible to all.

Many different methods have been leveraged in the pursuit of a deeper understanding of urban travel behavior. Choice models, activity-based frameworks, environmental approaches, cognitive and affective models, and the life-oriented approach are just a few examples of popular methods within this space. The following chapter reviews the development of travel behavior research in North America and Europe since its emergence in the 1950s, along with a discussion of the ways in which neurodiversity has been considered in contemporary travel behavior research.

## Choice and Related Models

Large scale analysis of North American travel behavior began as early as the 1950s, during which the private automobile experienced a surge in popularity (Potoglou & Spinney, 2024). These very early studies aimed to describe the impacts of motorization and changes of land development on trip-making and, consequently, traffic flow on roadways and ridership on buses. Surveys conducted during this era of travel behaviour research focused on demographic variables such as age and gender composition in the household, car ownership, employment and industry type, driver's license holding, and income.

Much of this early research built upon a decision-making framework called the random utility model; A paradigm that is still the frame of reference for many contemporary research directions. This model, often referred to as rational decision making, is a label associated with human behavior that follows a strategy in identifying the best course of action (Potoglou & Spinney, 2024). For a more comprehensive breakdown of this framework, see Simon's (1983) paper on subjective expected utility.

## Activity-Based Models

Another popular framework for the analysis of travel behavior is the activity-based tradition. Activity analysis is a natural time-based method for investigating causal relationships as a person progresses through different life cycle stages. It allows one to incorporate historical time and major events that characterize specific periods in the analysis (Potoglou & Spinney, 2024).

Francis Chapin (1974) is credited with developing the foundations of activity-based travel-demand analysis. His work focused on linking patterns of individual's participation in activities and travel to urban planning. Subsequently, Becker (1976), Hägerstrand (1970), and Cullen & Godson (1975)

iterated on Chapin's original framework. Becker focused on time allocation from a household production viewpoint, while Hägerstrand developed a framework that analyzed movement in space and time under "external constraints". Finally, Cullen and Godson (1975) attempted to bridge the gap between Chapin's motivational approach to activity participation and Hägerstrand's constraints approach by creating a model depicting a routine and deliberate approach to activity analysis.

Much like the utility-based framework, this methodology considers the household to be the fundamental decision-making unit. What sets this system apart, however, is that interactions among household members are explicitly modeled to capture task allocation and roles within the household, relationships at a given point in time, sequences of relationships, and changes in these relationships as households move along their life-cycle stages and the individual's commitments and constraints change (Potoglou & Spinney, 2024).

## Cognitive and Affective Determinants of Behavior

In the pursuit of a more comprehensive understanding of human trip-making, travel behavior research has drawn on theoretical frameworks and models from the field of behavioural change in general (for example, Davis et al., 2015) and in the context of travel behaviour (De-Toledo et al., 2022). Some popular frameworks include Ajzen's (1991) Theory of Planned Behaviour (TPB), the Norm-Activation Theory (Schwartz, 1977), and the Transtheoretical Model or Stages of Change Model (Prochaska and DiClemente, 1983).

According to the TPB (and some related theories), the relative strengths of an individual's intentions to use alternative behaviours guide the choice between them, where the determinants of intended behaviour are a set of individual beliefs that include attitudes toward behaviour, subjective norms and perceived behavioural control (Ajzen, 1991). Common methodologies used in travel behaviour research include the human activity approach, econometric choice and simulation modelling.

This style of research has yielded several experimental successes, including the discovery of the travel time budget (TTB) (Tanner, 1979; Zahavi and Talvitie, 1980; Zahavi and Ryan, 1980; Marchetti, 1994; Newman and Kenworthy, 1999). TPB based research demonstrated that, although many features of aggregated travel behaviour do change over time (and therefore possibly can be changed), other features (such as TTB) seem largely 'fixed' or stable.

## Critiques of Normative Travel Behavior Research

Choice models, activity-based frameworks, and cognitive and affective methods have incurred significant criticism since their introduction. For example, choice models feature many implied behavioral assumptions, the most important being that of "collective optimization and homogeneity" (Potoglou & Spinney, 2024). To assume collective optimization is to assume that average travelers know all the paths, and that they select the path of minimum travel time. This is, of course, an oversimplification. Additionally, choice models assume that travelers know when a road will be congested, which leads them to select a different path. The homogeneity assumption implies that the amount of travel that an individual will engage in is a function of a few demographic characteristics and a small number of land-use types for each origin and destination. Challenging

these assumptions has been the aim of many subsequent behavioral studies up to the present (Potoglou & Spinney, 2024).

Much like choice-based frameworks, activity-based modeling relies on several assumptions. For example, many activity-based models assume that human interaction is limited to within-household interaction, and these interactions are incorporated by relating the day patterns of one person to the day patterns of other people within a household. Of course, activity participation and travel take place in many social fields (or networks), which involve many persons outside the household who exert social influence (Dugundji and Walker 2005; Carrasco and Miller, 2008; Farber and Páez, 2009).

Finally, although TPB has been widely used to analyse and predict behavioural change, and even to design behavioural change methods, researchers (mainly in health psychology) have published many concerns about its validity, including some calls to retire it. Sniehotta et al. (2014) argue that the “mediation” assumptions in the theory conflict with evidence. For example, beliefs are often found to predict behaviour over and above intentions (Araújo-Soares et al., 2013; Conner et al., 2013). Additionally, in many cases, TPB models and related theories are limited to cross-sectional data sets and thus neglect the temporal and longitudinal dimensions of decision-making (Müggenburg et al., 2015).

## Travel and the Built Environment

The potential to influence travel demand by changing the built environment is perhaps the most heavily researched subject in urban planning (Ewing and Cervero, 2010). Within this field, the built environment has often been described using words that begin with the letter “D”. The original “three Ds,” coined by Cervero and Kockelman (1997), are density, diversity, and design. Later, destination accessibility and distance to transit were added (Ewing & Cervero, 2001; Ewing et al., 2009). Demand management, including parking supply and cost, is a sixth D, included in a few studies

This “D’s” framework has since been used in numerous studies to provide economic and behavioral explanations of why built environments might be expected to influence travel choices as (e.g., Boarnet and Crane, 2001; Cervero, 2002; Cervero and Kockelman, 1997; Crane, 1996; Kockelman, 1997; Zhang, 2004). Drawing on these findings, Ewing & Cervero (2010) measured the magnitudes of such relationships and concluded that no individual built-environment factor (D’s) has a large effect on travel behavior but when combined, however, can have a significant impact on travel behavior.

## Life-Oriented Travel Behavior Research

Life-oriented travel behavior research accounts for the many criticisms leveled against historical travel behavior research. Zhang (2017) offers an overview of this recent trend and argues the importance of a paradigm shift to the life-oriented approach for a better understanding of travel behavior and for better supporting cross-sectoral transport policymaking.

Normative travel behavior research has long sought to identify causal (one-way) relationships between people, behaviors, and the environment. Conversely, the life-oriented approach was formally proposed in the early 2010s (Zhang, 2014, Zhang, 2017), and it posits that life choices (related to, e.g., residence, neighborhood, health, education, work, family life, leisure and

recreation, finance, and travel behavior) are interdependent, and that this interdependency may occur in the short term, the long term, and even over the life course. Zhang suggests that because a life-oriented approach needs to combine insights from multiple research fields (such as housing markets, labor markets, living conditions, health, etc.), it is expected that findings from life-oriented travel behavior research can support cross-sectional transport policymaking in a much better way than current normative approaches. In real terms, this approach captures the effects of policy interventions not only on outputs, such as modal share and trip frequency, but also on policy outcomes, such as the influence on other life choices and quality of life changes (Zhang, 2017).

## Qualitative Travel Behavior Research

Qualitative research methods are the obvious candidate for investigating subjective policy outcomes. However, within transportation planning and engineering domains, travel behavior studies that employ qualitative techniques to explore activity-travel decisions remain few and far between.

In their review, Mars et al. (2016) sought to provide an overview of the types of qualitative techniques available and explore how to correctly implement them. To this end, they conducted a literature review on the application of qualitative methods in 42 travel behavior studies published between 2001 and 2016, and observed a general increase in applying qualitative methodology in recent years, particularly since 2010. In terms of travel modes, Mars et al. (2016) found a higher number of articles referring to topics related to cars (19 up to 42 studies), followed by articles that focus on pedestrians ( $n = 7$ ), bicycles ( $n = 6$ ), various modes ( $n = 5$ ), general travel behavior ( $n = 4$ ), and public transport ( $n = 3$ ). Additionally, they note that in recent years, there are more studies focusing on bicycles and pedestrians, or evaluation of different transport modes. In-depth interviews were employed in nearly half of the articles reviewed, followed by focus groups as the next most common qualitative method.

## Scholarship on Differentiated Travelers

Within qualitative travel behavior research, a growing body of scholarship seeks to better understand travel behavior by exploring the subjective experiences of travelers as shaped by their identities. Individual differences such as age, gender, sexuality, disability, and their intersections are becoming central to our understanding of cities and have gathered considerable research attention over the last three decades (Kenna, 2023). Haustein (2013) offers a variety of methods for differentiating travelers when conducting behavior analysis, such as their travel behavior, socio-demographic characteristics, geographic location, life stages, lifestyles, and attitudes.

On this subject, Jamal (2020) offers a review that compares the travel behavior of millennials with that of older adults. Additionally, Jamal explores the factors which shaped these behaviors within each cohort. They found (A) that difference exists between generations in terms of travel behavior, (B) that the factors that influence each generation's travel characteristics vary, and (C) that the same factors can sometimes have opposite effects in different populations. Ultimately, Jamal suggests that future research should disaggregate different travelers as much as possible based on their unique features to better understand the factors that shape travel behavior.

Similarly, Park et al. (2022) offer a systematic review of peer-reviewed studies of the daily travel patterns of individuals across three categories of disabilities: mobility, cognitive, and sensory. They determined that people with disabilities make 10–30% fewer trips than those without disabilities, and that people with disabilities use public transit, taxi services and ride with others at increased rates. They concluded that persons with disabilities encounter many barriers in the built environment to their transportation access, and that environmental, social, and system barriers make specific modes unavailable to travellers with disabilities, increase travel time, and eventually decrease their trip frequency.

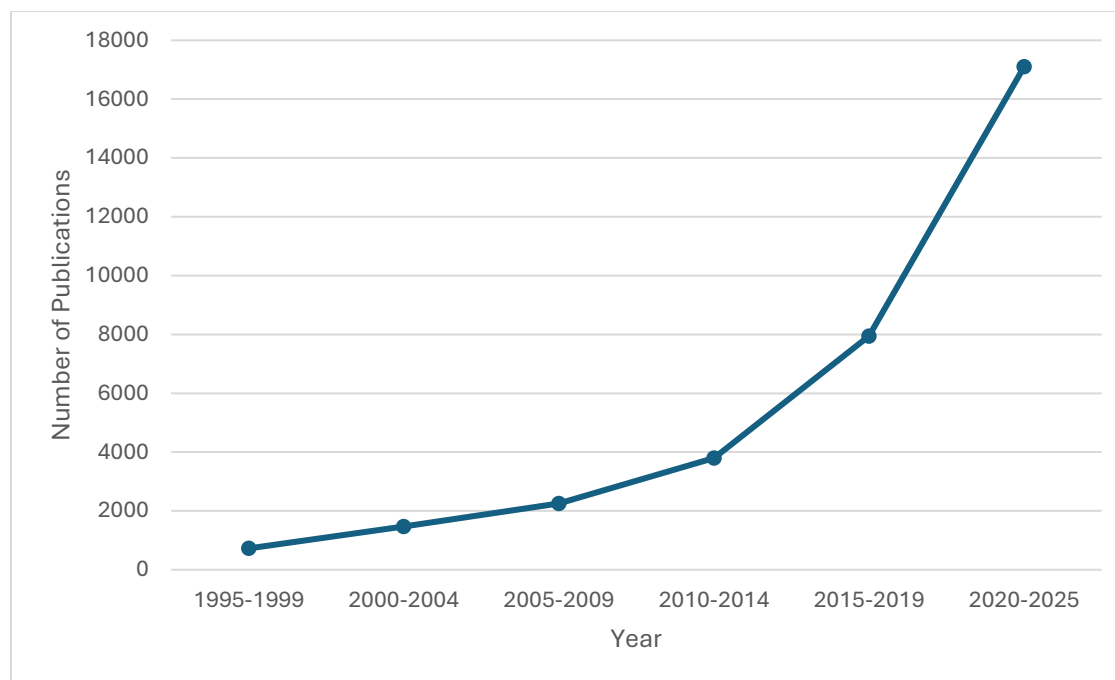
## Neurodiversity

Neurodiversity is a non-specific term used to refer to neurological differences. The term describes several neurodivergent conditions such as autism spectrum disorder (ASD), attention deficit and hyperactivity disorder (ADHD), sensory processing disorder (SPD), obsessive compulsive disorder, (OCD), borderline personality disorder (BPD), seasonally affected depression (SAD), dyslexia, dyspraxia, and Tourette's, among others (Botha, 2023). Neurodiversity describes differences in how the brain responds to, and manages, everyday life: tasks such as meeting deadlines, attending school or work, staying focused, and accessing public transport (Bradshaw et al., 2021). Singer, (n.d.) and Chapman (2020) insist, however, that the meaning of neurodiversity is evolving. The first descriptions of neurodiversity by Blume and by Singer in 1998 were vague. This has meant that people using the term “neurodiversity” have been able to make it their own and to change its meaning in the process (Arnold, 2017; Dekker, 2020; Singer, n.d.).

A separate but related concept is the “neurodivergent movement”. This specifically refers to a social justice movement that seeks civil rights, equality, respect, and full societal inclusion for neurodivergent people (Walker, 2014).

Finally, a “neurodiversity paradigm” as defined by Walker (2014) is a specific perspective on neurodiversity. The approach posits that neurodiversity is a natural and valuable form of human diversity, that a “normal” or “healthy” type of brain is a culturally constructed fiction, no more valid than the idea that there is one “normal” or “right” ethnicity, gender, or culture, and that the social dynamics that manifest in regard to neurodiversity are similar to the social dynamics that manifest in regard to other forms of human diversity. It should be noted that several definitions of the “neurodiversity paradigm” or “neurodiversity approach” have been offered. For more detail see Dwyer (2022).

Neurodiversity, and neurodiversity approaches have been gaining increasing attention from scholars in recent years. As evidence of this claim, the below figure was generated by searching Google Scholar for the term “neurodiversity”, limiting the search parameter to a 5-year period, and recording the number of articles identified.



*Figure 1: The Number of Articles Identified by Google Scholar Upon Searching the Term “Neurodiversity.”*

Despite this growing interest, literature exploring the lived experiences of people who identify as neurodivergent remains limited.

## Travel Experiences of Neurodivergent People

Research exploring the urban travel experiences of neurodivergent people is limited. Most scholarship focuses on people with autism, and few studies explore the travel experiences of other neurodiverse populations (Tola et al., 2021). There is, however, a growing body of literature concerning neurodiversity and the built environment. Tola et al. (2021) offer a comprehensive review of the topic. They assert that most research exploring the neurodivergent urban experience has focused on the design of autism-friendly built environments, and that there is limited consideration for other aspects of neurodiversity. They conclude that a nuanced understanding of the multiplicity of neurodivergent urban experiences (i.e., not just those which take place in individual buildings or spaces) has yet to be captured and represents a significant knowledge gap.

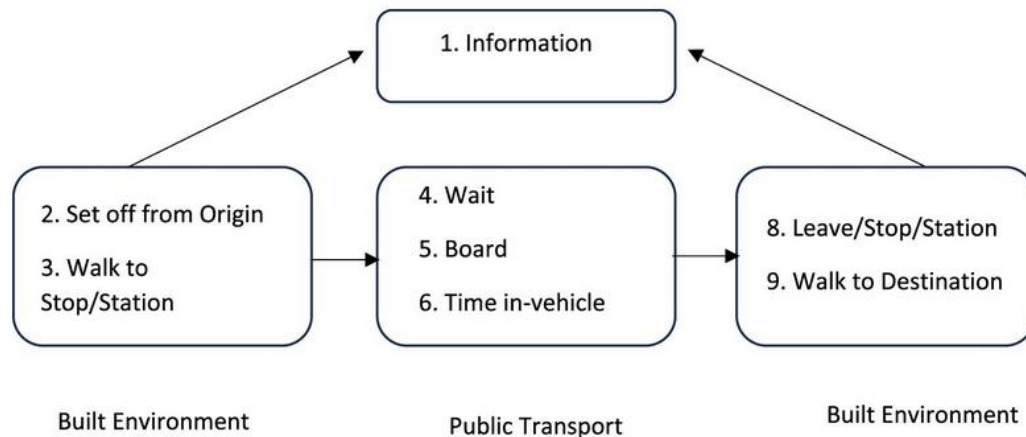
## Travel Experiences of People with ADHD

ADHD is a developmental disorder characterized by an ongoing pattern of one or more of the following types of symptoms: (1) Inattention, such as having difficulty paying attention, keeping on task, or staying organized; (2) Hyperactivity, such as often moving around (including during inappropriate times), feeling restless, or talking excessively; (3) Impulsivity, such as interrupting, intruding on others, or having trouble waiting one’s turn (NIMH, 2025). People with ADHD often encounter challenges when travelling by public transport due to these symptoms and behaviours

associated with their diagnoses (Berg & Ihlström, [2022](#); Davidson & Pfeiffer, [2024](#); Precin et al., [2012](#); Thériault & Morales, [2022](#)).

Berg and Ihlström ([2022](#)) discovered that individuals with neuropsychiatric disabilities (such as ADHD) rely more heavily on public transportation for daily commuting and frequently experience fatigue from travel. Somewhat paradoxically, people with ADHD also tend to avoid using public transport more frequently than those without these diagnoses, resulting in absences from work or school due to the difficulties they encounter during travel. People with ADHD tend to face issues related to executive functioning, such as planning and executing tasks, sustaining attention, and adhering to routes (Precin et al., [2012](#)). Executive functioning difficulties can lead to missing scheduled transport, boarding or alighting at incorrect stops, and difficulty reorienting to the correct route.

In a scoping review on the topic, Baric et. Al (2024) investigated current scholarship on the use of public transport among individuals with ASD or ADHD using the whole journey chain perspective. To this end, they drew on a framework developed by Park and Chowdhury (2018) which posits that to be able to travel independently, the entire chain of events needs to be comprehensible and functional (Park and Chowdhury 2018). This whole journey chain includes planning journeys, buying, and using tickets, moving around, and orienting oneself in the various places associated with public transport (e.g., waiting rooms, bus stops, etc.) in a safe and secure way, understanding information, boarding, finding somewhere to sit, knowing how to get off, and finding one’s way to the destination. See Figure 2. Below.



*Figure 2. Park and Chowdhury’s accessible journey chain.*

Using this framework, Baric et al. (2024) found that having “the confidence and economy” to travel was an important facilitator to independent travel for people with ADHD. Furthermore, they found that the need for support in transportation related issues tended to be higher among people with ADHD. Finally, people with ADHD were reported as being more likely to request support for transportation related issues such as community ride programmes and transit vouchers than neurotypical people.

## Summary and Knowledge Gaps

The study of travel behavior has evolved significantly since its early days of choice modeling in the 1950s, expanding into a rich and multidimensional field that now includes activity-based frameworks, behavioral psychology, and life-oriented approaches. While traditional models like the random utility model and TPB have provided foundational insights, they have also drawn valid critiques for their oversimplified assumptions about homogeneity, rationality, and linear causality. Emerging frameworks—such as life-oriented research and qualitative methodologies—offer more nuanced perspectives that recognize the complexity of human behavior and the interconnectedness of life domains.

Scholarship on differentiated travelers has highlighted the importance of identity and intersectionality in shaping urban mobility, revealing disparities in accessibility and experience across age, gender, disability, and neurodiversity. As the scholarly literature increasingly embraces these diverse perspectives, there is growing momentum toward developing inclusive, evidence-based transport policies that reflect the lived realities of all urban travelers.

Baric et al.'s (2024) review represents a significant step towards understanding the travel experiences of people with ADHD, however there is still much to be done. Baric et al. (2024) state that of the 11 studies considered in their review, only a single study focused on individuals with ADHD. This means that the travel experiences of people with ADHD have yet to be meaningfully reviewed and represent a significant knowledge gap. This research will help fill this gap by investigating the urban travel experiences of Queen's University students with attention deficit hyperactivity disorder (ADHD), and by exploring neurodiversity in the Canadian planning policy landscape.

## Chapter 3: Methods

### Methodology and Study Design

This research took a mixed methods approach informed by similar, existing travel behavior research (Naess, 2020; Fletcher, 2022) to generate data. Specifically, this study involved a literature review, an environmental scan, and semi-structured interviews. This approach was adopted to investigate (A) contemporary scholarship on the travel and lived experiences of people with ADHD, (B) how transportation, accessibility, or EDI policies within Canada consider neurodiversity, and (C) the travel behaviors and experiences of Queen's University Students with ADHD.

### Literature Review

An in-depth literature review was conducted to generate a thorough understanding of contemporary scholarship investigating the travel and lived experiences of people with ADHD. The review began with a preliminary search conducted to develop an understanding of the field. Some examples of search phrases used in this preliminary search include 'Factors that shape day-to-day travel behavior of people with ADHD', and 'Travel experiences of neurodivergent people'.

Once a preliminary understanding of the field was established, an iterative approach was adopted to conduct the broader literature review. The review was developed at a basic level before research began and then expanded when questions arose throughout the study's duration. The literature review examined peer-reviewed, scholarly journals accessed through Google Scholar and Scopus. Additionally, the review was limited to articles published in English, and articles published between and including the years 2000 and 2024. This was done to ensure only recent and relevant research was considered. Additionally, preference was given to studies which explored travel in the North American context, and to review articles.

### Environmental Scan

An environmental scan was conducted to generate knowledge on how current Canadian municipal policies interface with neurodiversity. Environmental scanning is a technique which can be used to gain an understanding of current practices and trends in the field. In recent years, environmental scanning has become a widely used tool in public health and planning (Jenkins, 2020; Rowel, 2005). Currently, there is no set standard regarding how to conduct a systematic environmental scan. Drawing on existing approaches, this environmental scan feature one primary avenue of investigation: a review of grey literature.

An initial Google search was devised using keywords relating to accessibility, equity, diversity, inclusion, or transportation. For example, "Ottawa Accessibility Plan" was one of the search phrases used for this purpose. The objective of this search was to help scope the environmental scan. From this initial search, the following inclusion criteria were identified:

### Inclusion Criteria

**Location:** Canada

**Document Type:** Transportation, equity/diversity/inclusion, or accessibility documents which originate from a Canadian City. These document types were selected because they were deemed to be the most likely to contain policies relevant to neurodiversity and travel.

**Size of Municipality:** Only cities with a population greater than five hundred thousand were considered. Large cities were selected to limit the scope of the analysis to a manageable scale. Additionally, it was assumed that larger cities have more resources and were therefore more likely to have published an increased volume and diversity of policy documents relevant to the study's topic.

**Date:** 2010 to 2025. These dates were selected to ensure that only recent and relevant policy documents were scanned.

## Grey Literature Data Extraction and Analysis

Once a final set of documents was assembled using inclusion criteria, a data extraction table was created to support content analysis. This table includes information such as the document name, the document's stated purpose, the length of the document, the document's publication date, and the document's status as statutory or non-statutory.

Following this, latent content analysis, loosely based off the Alberta Urban Municipalities Association (AUMA)'s "Measuring Inclusion Tool" (AUMA, 2017) was conducted. To assist with this content analysis, a series of questions were devised to "ask" of the plans and policies. These questions were drafted by the researcher, based on similar questions featured in the "Measuring Inclusion Tool" (AUMA, 2017) The questions used in this analysis were:

- 1) Does the document invoke a neurodiversity paradigm or approach in any capacity?
- 2) Is the document's definition of disability inclusive of neurodivergent people?
- 3) Is there any consideration for the transportation needs of neurodivergent people within this document?

These questions were developed to quickly identify the degree to which each document considered the travel behavior and experiences of neurodivergent people. The final stage of the analysis was identifying themes and trends in the data (AUMA, 2017). For this analysis, each question represented one theme.

## Semi-Structured Interviews

The method for conducting semi-structured interviews drew on the work of Naess (2020), and Silverman and Patterson (2022). For these interviews, I conducted purposeful sampling of students at Queen's University who identify as having ADHD. To achieve this, I recruited students who attended a "Students with ADHD" study group organized through Queen's Student Accessibility Services (QSAS). Additionally, I posted advertisements for my research in places that people with ADHD frequent, such as the Queen's Accommodation Services office. Finally, I recruited participants through social media using services such as Facebook and Instagram. These posts were made on my personal account, and I encouraged viewers to share the post with anyone they thought might be interested in participating.

A total of 7 people were interviewed for this study, and each interview lasted between 15-30 minutes. Participants were provided with a copy of an interview guide (see appendix A), which was developed based on the recommendations of Silverman (2022). The table below outlines the recommendations and details the steps taken in this study to implement them.

*Table 1. Silverman and Patterson’s Semi-Structured Interview Guide recommendations, and the steps taken in this study to implement them.*

<b>Element</b>	<b>Definition</b>	<b>Translation to Current Study</b>
Informed consent	A verbal or Written Statement about a study that identifies: It’s purpose, the risks and benefits of participating, steps taken to protect participants’ confidentiality, and the voluntary nature of participation.	Written consent was acquired via a letter of information. Verbal consent was acquired before each interview began.
Grand Tour Questions	Broad questions that ask an interviewee to provide an overview of major themes of interest to a researcher.	Themes discussed in this interview guide include an average day of travel, and preferred mode of travel.
Probes	Specific follow up questions used to flesh out details of a theme covered in a grand tour question.	Follow up questions explored rationales behind mode choice, and travel experiences when using different modes.
Demographic Questions	Questions asked to collect data on demographic characteristics of an interviewee and relevant dimensions of a research setting.	Demographics questions were limited to minimize burden and maintain rapport. Participants were asked to confirm their status as a Queen’s University student (Graduate, or Undergraduate), as a person with ADHD.
Closing Questions	A question which asks an interviewee if there are any other issues he or she would like to discuss or elaborate upon.	Participants were asked whether they felt ADHD had shaped their travel behaviors or experiences in any ways not yet mentioned. Additionally, participants were asked if there was anything else they wanted to talk about.

Once the interview guide was drafted, I reviewed it, drawing on my own lived experience as a person with ADHD, to ensure that each question was appropriate for participants with ADHD. I then conducted and recorded a pre-test of the interview guide with a mock participant. This pre-test simulated the conditions that were anticipated for the actual interview process. It also allowed me to assess the items included in the questioning route for clarity, and to gauge the amount of time required to complete an interview. After pre-testing, some necessary revisions to the interview

guide were applied. Specifically, two questions were removed from the interview guide in the interest of maintaining a 30-minute maximum interview duration.

The interviews were conducted either in-person or online via Microsoft Teams, at the interviewees' convenience to minimize burden. The interviews were recorded and transcribed, and short field notes were written immediately after each interview to document main impressions from the discussions.

Analysis of interview data drew from the constant comparative method (Silverman & Patterson, 2022). This method featured an open coding phase, in which the interview transcripts and notes were reviewed, and codes were assigned to discrete excerpts in the data. Next was the focused coding phase, in which broad, overarching categories for the data were constructed.

## Positionality

As a straight, white man from a middle-class background, studying in Southern Ontario, I recognize that my positionality affords me certain privileges. At the same time, I identify as neurodivergent and as a person with ADHD, which has shaped the way I move through different environments, interpersonal relationships, and broader societal structures. These experiences inform both my interest in and approach to this research.

My positionality has affected my methodology two ways. Primarily, my lived experience as a person with ADHD was useful in drafting a semi-structured interview guide. It allowed me to identify questions which might be challenging or unproductive for my target demographic and alter them to be more effective. Additionally, during the interview process, I was able to relate to many of the experiences and behaviors shared by participants, which was helpful in building rapport.

Furthermore, my positionality influences how I interpret data and analyze policy documents. Throughout my analysis process, I remained reflexive to the impacts that my positionality could have on my findings. For example, when I engaged in the open coding phase of interview data analysis, I was acutely aware of the potential to conflate experiences that I related to with experiences that were common among interview participants. Through this awareness, I was able to minimize the impact of my personal bias.

## Limitations

This study has several limitations that should be considered when interpreting the findings. The primary limitation lies in the small and specific sample size, as only seven Queen's University students with ADHD were interviewed. This limited participant pool restricts the generalizability of the results and may not reflect the broader experiences of individuals with ADHD across different demographics, institutions, or regions. Furthermore, this study only includes people with ADHD, meaning it captures only a small portion of the neurodivergent travel experience. Additionally, participants' perspectives may have been shaped by the unique context of Queen's University and the surrounding Kingston area, further limiting broader applicability. Additionally, quantitative data on the travel behaviours of the interviewees was not collected, and this would have provided a richer understanding of their travel patterns. Finally, limited demographic information was collected during the semi-structured interviews. This was done to maintain rapport, and to keep interview duration below 30 minutes, thus minimizing burden. The negative consequence of this

decision is that limited demographic information reduces one's ability to identify bias within the sample.

While the environmental scan component was useful in identifying trends and gaps in transportation, accessibility, and equity, diversity, and inclusion (EDI) policy documents across major Canadian cities, it was restricted to publicly available documents. This meant that many cities with smaller populations were excluded from the scan. Key informant interviews with planning and transportation professionals could have shed light on these internal or unpublished practices, but given the scant state of Canadian policy which addresses neurodiversity, it is likely that interviews would have yielded little meaningful data. Finally, only a small volume of data which pertained to neurodiversity was identified by the scan. This finding is useful in that it indicates limited consideration for neurodiversity within Canadian planning policy, but it also limits the amount of meaningful analysis able to be conducted.

## Chapter 4: Environmental Scan

An environmental scan was conducted to answer the second research question: “How, if at all, do planning policies within Canada account for neurodiversity?” It was found that most of the accessibility, EDI, and transportation policies originating from large Canadian cities do not adopt a neurodiversity framework in any capacity. Conversely, many accessibility documents offer a definition of disability that is somewhat inclusive of neurodivergent people. Finally, transportation policies with Canadian cities were found to lack meaningful consideration for people who identify as neurodivergent.

The table below is a comprehensive list of the 28 documents reviewed by this environmental scan. The table features each document’s title, purpose, length of document, date of publication, and qualifies whether the document is statutory, or non-statutory.

Table 2. Environmental Scan Data Extraction Table.

<b>Title</b>	<b>Purpose of Document</b>	<b>Publication Date</b>	<b>Length of Document (pages)</b>	<b>Statutory vs. Non-statutory</b>
City of Ottawa – Equity, Diversity and Inclusion	To explore how the City of Ottawa’s new draft zoning by-law might affect housing affordability and choice, social fragmentation, mobility and access to services, environmental health equity and the climate emergency	2022	19	Non-statutory
City of Ottawa OC Transpo Accessibility Plan	To fulfil obligations under the <i>Accessible Canada Act</i> (ACA, 2019).	2024	40	Non-statutory
City of Ottawa Accessibility Plan	To outline the City’s strategy to prevent and remove barriers for people with disabilities.	2025	29	Non-statutory
City of Ottawa Transportation Master Plan	To provide a blueprint for planning, developing, and operating its walking, cycling, transit and vehicular networks in the decades to come, and to identify transportation policies, facilities and services that will meet the needs of residents and businesses from now to 2046.	2023	159	Non-statutory
City of Toronto – Multi-Year Accessibility Plan	To outline goals and initiatives relating to the City’s of Toronto’s commitment to creating an accessible city and advancing efforts in building an equitable and inclusive society that values the contributions of people with disabilities.	2020	41	Non-statutory

City of Toronto 2015-2018 Strategic Plan (Equity, Diversity and Human Rights)	To provide a four-year Divisional plan (2015-2018) that guides the work of the Equity, Diversity and Human Rights Division. Also, to offer corporate direction to City divisions.	2015	18	Non-statutory
Winnipeg Transportation Master Plan	To present a long-term strategy to guide the planning, development, renewal and maintenance of a multi-modal transportation system.	2011	107	Non-statutory
Winnipeg Accessibility Design Standards	To support the implementation of the City's Universal Design Policy within built environments.	2018	202	Statutory
City of Winnipeg Accessibility Plan	To provide an overview of the City's policies, procedures efforts, and a plan of action intended to ensure inclusive access and participation within facilities, services, and programs.	2024	65	Non-statutory
Brampton Multi- Year Accessibility Plan	To illustrate how the City will continue to recognize, remove, reduce, and prevent accessibility barriers and enhance the Accessibility Program.	2022	14	Non-statutory

City of Brampton Equity Diversity and Inclusion Review Report	To conduct a privileged and confidential independent review into the experiences of Black employees at the City, including an assessment of processes, policies and procedures, to assess the existence and/or scope of discriminatory experiences or practices.	2021	65	Non-statutory
City of Brampton Transportation Master Plan	To update the City of Brampton's Transportation Master Plan (TMP) And to provide the City with creative and realistic solutions to transportation problems.	2015	119	Non-statutory
City of Calgary Gender Equity Diversity and Inclusion Strategy	To propose new and enhanced strategic actions that build on The City's current diversity and inclusion initiatives, with a primary focus is ensuring gender equity in planning and decision making	2020	18	Non-statutory
City of Calgary Access Design Standards	To increase awareness of the needs of people with disabilities within the built environment, and to promote accessibility throughout City of Calgary facilities.	2016	56	Non-statutory
City of Surrey Accessibility Action Plan	To identify, remove, and prevent barriers for individuals working for or interacting with the City of Surrey.	2024	27	Non-statutory

City of Vancouver Accessibility Strategy (Part 1/2)	To outline the City of Vancouver's commitment to supporting the full participation of persons with disabilities by establishing and maintaining inclusive services, programs and infrastructure and by identifying, removing and preventing barriers.	2022	115	Non-statutory
City of Vancouver Equity Framework	To address injustices and inequities experienced by a broader cross-section of our society – including Black and other racialized people, women and gender-diverse people, and people with disabilities.	2021	24	Non-statutory
City of Vancouver Transportation Master Plan	To provide a long-term strategic vision for the city that will help guide transportation and land use decisions and public investments for the years ahead	2012	99	Non-statutory
Mississauga Equity Diversity and Inclusion Progress Report	To establish various accessibility baselines from which to measure progress in the future.	2023	21	Non-statutory

Mississauga Transportation Master Plan	To further the aims of the Mississauga Strategic Plan, supporting and strengthening the City's strategic pillars: move, belong, connect, prosper, and green.	2019	147	Non-statutory
Mississauga Multi-Year Accessibility Plan	To provide a roadmap to creating a better city, and to outlines key actions to meet and go beyond legislative obligations to support the City's commitment to an inclusive community.	2023	11	Non-statutory
City of Edmonton Equity Diversity and Inclusion Framework	To outline the City's aspirational view of an inclusive workplace and the path that they will take to get there.	2019	40	Non-statutory
City of Hamilton Multi-year Accessibility Plan	To demonstrate the City's commitment to fulfilling the requirements of the Integrated Accessibility Standards Regulation.	2020	9	Non-statutory
City of Hamilton Transportation Master Plan	To plan and build for the 2031 transportation planning horizon and beyond.	2018	159	Non-statutory

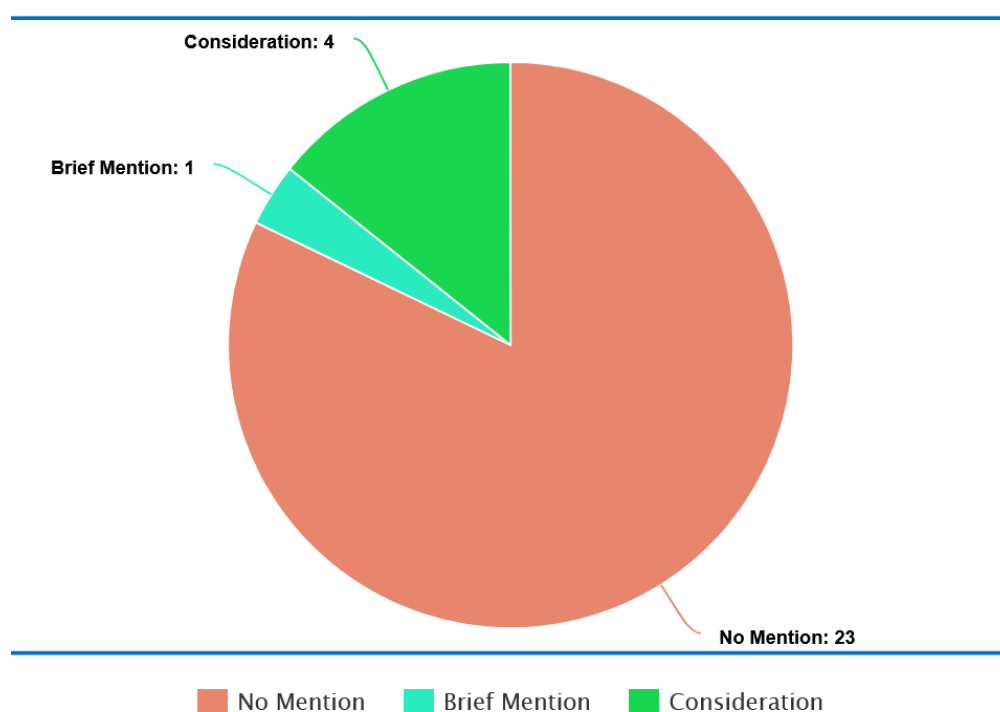
## Environmental Scan Analysis

Three key questions were developed to aid in the analysis of these 28 documents. These questions were (1) Does the document invoke a neurodiversity paradigm or approach in any capacity? (2) Is the document’s definition of disability inclusive of neurodivergent people? And (3) Is there any consideration for the transportation needs of neurodivergent people within this document? From each of these questions, a theme arose: neurodiversity paradigm, definition of disability, and neurodivergent transportation.

### Question 1: Neurodiversity Paradigm

The key question from which this theme emerged was “do the documents in question invoke a neurodiversity paradigm or approach in any capacity?”

Of the twenty-eight documents identified during the data collection phase, only five documents touch on the topic of neurodiversity.



*Figure 3: Analysis of Consideration for Neurodiversity.*

The documents that considered neurodiversity were:

1. The City of Vancouver Accessibility Strategy Phase 1 (City of Vancouver, 2022)
2. The City of Vancouver Accessibility Strategy Phase 2 (City of Vancouver, 2022)
3. The City of Vancouver Equity Framework (City of Vancouver, 2021)
4. The City of Surrey Accessibility Action Plan (City of Surrey, 2024)
5. The City of Winnipeg Accessibility Plan (City of Winnipeg, 2024)

Of these documents, the City of Vancouver Accessibility Strategy Phase 1 (City of Vancouver, 2022) offered the most comprehensive consideration of the topic. They define neurodivergence as “the term for when someone’s brain processes, learns, and/or behaves differently from what is considered ‘typical.’” This document was the only item in the environmental scan to offer a definition.

Furthermore, under the section titled “Built Environment & Public Spaces”, Vancouver survey participants describe how “neurodivergence and intersectional considerations must also be included in accessibility planning and implementation.” Despite this, the section does not outline any tangible steps that the City will make towards implementing a neurodivergence paradigm into their planning process.

The City of Vancouver Equity Framework (City of Vancouver, 2021) touches on neurodiversity less directly. In a section describing the plan’s “system orientation”, the document uses attention-deficit/hyperactivity disorder (ADHD) as an example to illustrate that “inequities are created by the systems themselves – sometimes unintentionally, often by design.” This excerpt illustrates that the City of Vancouver has at least considered neurodiversity when drafting their approach to equity. Much like Vancouver’s Accessibility Strategy, this document does not list any tangible steps towards a more inclusive future for neurodivergent people.

The City of Surrey Accessibility Action Plan (City of Surrey, 2024) does not offer a definition for neurodiversity. However, in a section titled “Accessible Communication and Engagement”, a goal to “create an internal SharePoint accessibility directory site for staff that includes neurodiversity terms and definitions”, among other items, has been identified. This suggests that the City is in the process of integrating a neurodiversity paradigm into their policy framework.

The City of Winnipeg Accessibility Plan (City of Winnipeg, 2024) offers the least comprehensive consideration of the topic. The document offers no definition of neurodiversity, but mentions on one occasion that in Kern Park, an old structure was replaced with a new accessible structure with accessible path connection to the play structure and, and that play equipment geared towards children with autism was added. They further specify that this equipment was chosen after consultation with a local community member with an autistic child. This excerpt suggests that citizens in Winnipeg have voiced an interest in planning for neurodiversity, but that the City has yet to develop meaningful policy on the topic.

Twenty-three of the twenty-eight documents analyzed do not adopt a neurodiversity approach to transportation, accessibility, equity, diversity or inclusion planning. This is perhaps to be expected: the concept of neurodiversity has gained popularity only recently, and it takes time for an innovation to be communicated throughout society’s various channels (Rogers, 2003). Each document identified by this scan to interface with the concept of neurodiversity was published within the last 4 years, with The City of Vancouver Equity Framework (2021) representing the oldest document. It therefore stands to reason that moving forward, more and more municipal planning policy documents may adopt a neurodiversity paradigm as the innovation reaches decision makers.

## Question 2: Definition of Disability

The key question from which this theme emerged was “are the documents’ definitions of disability inclusive of neurodivergent people?” This question was primarily applicable to the “accessibility” focused documents.

It was found that the definition of disability provided by these documents was generally inclusive of neurodivergent people. Many of the documents draw on provincial frameworks, such as Section 2 of the Accessibility for Ontarians with Disabilities Act (Government of Ontario, 2005), or the Ontario Human Rights Code (Government of Ontario, 1990). For example, the City of Ottawa offers the following definition of disability:

- A) Any degree of physical disability, infirmity, malformation or disfigurement (...).
- B) A condition of mental impairment or a developmental disability,
- C) A learning disability, or a dysfunction in one or more of the processes involved in understanding or using symbols or spoken language,
- D) A mental disorder, or
- E) An injury or disability for which benefits were claimed or received under the insurance plan established under the Workplace Safety and Insurance Act, 1997 (City of Ottawa, 2025).

Furthermore, the City of Ottawa extends their definition to be inclusive of intersectional identities and social factors (e.g., gender, age, language, sexuality, race, and culture) that may intersect with disability and affect a person’s experiences with City programs, services and facilities.

Similarly, the City of Vancouver draws on the WHO’s definition of disability and offers the following statement: The City defines “persons with disabilities” to include “people who experience physical, mental health, cognitive, communication, intellectual, sensory, or age-related impairments, inclusive of seniors and people with lived experience of mental health challenges or substance use- related disabilities.” (City of Vancouver, 2022)

While these definitions of disability are generally inclusive of neurodivergent people, the accessibility documents showed very little evidence of adopting a “neurodiversity paradigm”: a framework which posits that neurodiversity is a natural and valuable form of human diversity, that a “normal” or “healthy” type of brain or mind is a culturally constructed fiction, no more valid than the idea that there is one “normal” or “right” ethnicity, gender, or culture, and that the social dynamics that manifest in regard to neurodiversity are similar to the social dynamics that manifest in regard to other forms of human diversity (Walker, 2014).

The City of Ottawa’s approach to accessibility is especially interesting when viewed through a neurodiversity paradigm lens, as it extends definition of disability to be inclusive of disability caused by intersectional identities such as race, gender or age. Simultaneously, the city restricts their understanding of differences in neurotype to a binary of “disabled” and “normal”. This contrast reveals a tension in the City’s approach: they embrace the broad, intersectional nature of disability in some areas (i.e. gender, race and age) yet fail to recognize neurodivergence as a natural variation in human experience, instead describing as a deficit, (or disability) to be managed.

### Question 3: Neurodiversity in Transportation Planning

The key question from which this theme emerged was “Is there any consideration for the transportation needs of neurodivergent people within this document?” This question primarily targeted transportation documents, and documents which feature a transportation section.

The analysis revealed that few transportation planning documents demonstrate any level of consideration for neurodivergent people. Generally, these documents adopt a disability-based framework, and often cite provincial, or supporting documents for details regarding improved accessibility, or accommodations for disabled people. A good example of this is the City of Hamilton’s Transportation Plan, which states:

“The Accessibility for Ontarians with Disabilities Act (AODA) defines accessibility as the design of products, devices, services, or environments for people who experience disabilities. Access is more broadly defined as the degree to which individuals have the ability to reach desired goods, services, activities and destinations, and includes the accommodation of users of all ages, ability and income. Both accessibility and access are very important considerations for the transportation system.” (City of Hamilton, 2022)

Despite not adopting a neurodiversity paradigm, some of the initiatives presented by these plans will likely support the travel of neurodivergent populations. For example, the City of Hamilton is implementing audio and visual stop announcements for all transit stops. This suggests that a disability framework may be an effective, if imperfect substitution for a true neurodiversity paradigm.

Similarly, The City of Mississauga’s Transportation Master Plan (City of Mississauga, 2019) declared an objective to ensure transit stops, stations, and terminals can be navigated by people with disabilities or mobility restrictions, a goal that suggests some level of consideration for people who identify as neurodivergent. However, the plan offers few key actions which will address challenges that neurodivergent people face relating to transportation.

As a final example, the City of Ottawa’s transportation plan (City of Ottawa, 2023) offers perhaps the most comprehensive policy relating to accessibility. The Plan’s “Policy 8-4 Deliver Convenience, Comfort and Accessibility” promises to deliver convenient, comfortable and accessible transit service. This policy lists a “system-wide rollout of digital payment alternatives which will make it easier for residents and visitors to use transit without advance planning” as an actionable step to improve accessibility. This action is very much aligned with Park and Chowdhury’s (2018) whole journey chain perspective which posits that to be able to travel independently, the entire chain of events needs to be comprehensible and functional, including the planning phase. This is further evidence that a disability framework is a useful, if imperfect tool for accommodating neurodivergent travelers.

## Key Insights

Across the 28 municipal documents reviewed, very few implement a true neurodiversity paradigm, only five documents make any mention of the topic, and just one provided a definition of neurodivergence. While a few cities (e.g., Vancouver, Surrey, Winnipeg) have begun to engage with the concept of neurodiversity in their accessibility or equity frameworks, these references are generally surface-level and rarely paired with actionable policies or planning strategies.

Simultaneously, many of the documents reviewed offer broad and inclusive definitions of disability that implicitly include neurodivergent people, often drawing from provincial legislation. However, these definitions alone do not indicate a deeper commitment to the values of the neurodiversity paradigm, which views neurological differences as natural forms of human diversity rather than deficits to be accommodated.

Transportation planning documents further reflect this gap, with most municipalities defaulting to general disability frameworks without explicitly considering the unique needs of neurodivergent people. While features such as audio/visual transit stop announcements or simplified digital fare systems may incidentally benefit neurodivergent users, these initiatives are never designed with neurodiversity in mind. The lack of neurodiversity-specific goals, language, and implementation strategies across both accessibility and transportation planning documents suggests that most cities remain in the early stages of integrating neurodivergent perspectives into public policy. Where progress exists, it tends to be fragmented and dependent on individual community input or limited to broader interpretations of disability, rather than grounded in the affirming and inclusive lens promoted by the neurodiversity paradigm.

## Chapter 5: Interview Results and Analysis

This chapter presents the qualitative analysis of seven semi-structured interviews conducted with students who identify as having ADHD who attend Queen’s University. The primary aim of this analysis was to explore the travel behaviors and experiences of these students. The interviews were transcribed, coded, and analyzed using thematic analysis (Silverman, 2022) to identify key patterns and insights that emerged from the data.

The findings are organized into overarching themes that emerged from the interviews. Each theme reflects a common aspect of the participants’ experiences and perspectives, providing a deeper understanding of the travel experiences of people with ADHD. In this analysis, participant confidentiality is maintained using pseudonyms and removal of any identifying information from direct quotes.

Themes 1-6 were identified inductively, during interview analysis. Theme 7 was established by the interview guide, and is therefore a deductive, theory driven theme.

*Table 3. List of Interview Participants.*

<b>Pseudonym</b>	<b>Format</b>	<b>Student’s Current Degree</b>
Edith	In person semi-structured interview	Undergraduate
Alex	In person semi-structured interview	Graduate
Ellianna	Online semi-structured interview	Undergraduate
Adrian	Online semi-structured interview	Graduate
Diana	Email Conversation	Undergraduate
Loretta	In person semi-structured interview	Undergraduate
Daxton	Online semi-structured interview	Undergraduate

### Key Theme 1: Travel Planning

The first prominent theme identified from the interviews was planning as a barrier to travel. This theme emerged during several interviews and suggested that difficulties associated with trip planning may shape the travel experiences and behaviors of people with ADHD.

For example, when asked about her travel experiences in Kingston, Edith noted that “The biggest [challenge] is all the steps behind [travel]. For example, looking at the [bus] times and getting ready and heading out the door and [everything else] outside of that.” This sentiment was echoed by another participant, Alex, who emphasized the lack of planning involved in walking: “... Walking is just the easiest. I can pick up and go. I don't have to worry about bringing stuff along with me. (...) There's no planning involved, no scope, I'll pick up and leave.”

Planning associated with bus schedules was mentioned often. Edith described a state they called “bus limbo” stating that “there's just always a kind of limbo where I could technically do something for these next 20 minutes, [but] I feel like I can't do anything except get ready to go there, and then I'm just kind of sitting there. I'm just kind of sitting there in the space, but I don't know how to fill it.”

Similarly, Ellianna stated “I have issues taking the bus to go rock climbing. For example, if I miss a bus, which I often do, I have to decide whether I’ll turn around and do that walk of shame, or if I should stay, in limbo, waiting for the next one. I can’t start anything new, because I might become distracted, and miss the next bus.”

This idea of trip planning as a barrier is supportive of the “whole journey chain” framework (Park & Chowdhury, 2018), which emphasizes the importance of a preliminary “planning phase” of travel to populations with ADHD and autism. Furthermore, these findings suggest that bus frequency, meaning the frequency at which public transportation vehicles arrive at any given bus stop, might be especially important to travelers with ADHD.

Additionally, challenges related to trip planning suggests that modes of transportation that have low planning requirements may be preferred by people with ADHD. This final idea is further supported by participants’ perspectives on ridesharing services. Edith suggested that they use ride hailing services in instances where they have made an error in planning their travel: “More recently, because I’m still figuring out the correct bus timings, due to the snow, which makes walking take longer, I have taken Ubers a to get to class on time. Similarly, Diana stated that “Ubers [are nice] because you don’t have to wait in the cold for public transit. [Also], it’s even nicer to have a quicker more direct route, and a private space.” This idea of private space is an excellent segue to the second theme identified during interview analysis: overstimulation.

## Key Theme 2: Overstimulation

Another key theme that emerged was overstimulation, which focuses on feelings of sensory or social distress experienced by travelers with ADHD. Ellianna highlighted the difficulties they encountered riding the bus, “I don’t really listen to music: most of the time it’s just noise cancelling headphones. I feel like it’s too loud and just too much and I sometimes get sensory overload from all of it.”

Many participants also stated they go out of their way to avoid a busy sidewalk, or crowds more generally. Edith stated, “It’s almost claustrophobic sometimes when you’re on the sidewalk and there’s a giant group of people also going the same place.” Similarly, Loretta notes “Every day, I go on the path of least resistance. [I go] wherever I would have the least number of things.

On the topic of sensory overload, Alex had this to say about their public transportation experience: “I feel like there’s so many things going on. There’s a baby crying, there’s people talking with their friends, there’s my bus stop that I don’t want to miss. I feel like I’m taking in so many things, and it’s making like my travel experience a lot more stressful. Even though I have my headphones on, even though I’m listening to music, I’m still distracted by all these things and overstimulated.”

However, not all participants shared this struggle. For example, Adrian stated “I don’t mind taking it, it’s pretty good. I’ve had no major issues. I’ve taken it at all times of day, especially when I work and yeah, I’ve had really no issues. It’s been a mostly pleasant experience.” This variation suggests that overstimulation during travel is not an experience that is necessarily universal to people with ADHD.

These experiences shared by Ellianna, Edith and Alex suggest that sensory discomfort might significantly shape the travel behavior and experiences of Queen’s University students with ADHD, and crowds are a major source of this discomfort. This finding suggests that interventions which

aim to minimize sensory discomfort (e.g., improved soundproofing in public transportation, a switch to electric vehicles, smaller public transportation vehicles, expansion of walking/cycling networks to reduce overcrowding, etc.) may be effective for improving the travel experiences of people with ADHD.

### Key Theme 3: Forgetfulness

The third theme to emerge was forgetfulness, focusing on the travel behaviors and experiences of people with ADHD associated with poor memory. On the topic of forgetfulness, Daxton described: "I'm very forgetful. I forget things. I can't remember the last time I brought an item to an event and remembered to bring it home. Because of that I've spent a lot of money on long-distance bus tickets. I often have to [travel] back to people's places after forgetting key things like my laptop charger."

Similarly, when asked if they have a travel routine, Alex replied "I want to do that, I actually I aspire to do that, but then it just it never works out because [unless I have class] I forget to go to school and forget to get ready."

Finally, several participants suggested that getting off at the correct bus stop is a challenge. Edith said "I find I'm not aware, I get quite distracted. If I'm on the bus sometimes I'll miss a stop or I'll get off on the wrong stop." And another noted "If I know that there's only four stops for example and I'm listening to music, I will get too into the music and I'll forget that I need to need to get off, the bus goes fast." Similarly, Daxton said "I find I'm not aware as I could be, I get quite distracted. If I'm on the bus sometimes I'll miss a stop, or I'll get off on the wrong stop. I've found myself taking the wrong [bus] line many, many times."

These responses suggest that forgetfulness may shape both the travel behavior and experiences of Queen's University students with ADHD. Forgetfulness creates unplanned travel, which compounds the issues that arise related to travel planning. Because of this, forgetfulness may further reinforce the value of flexible modes of transportation, which require little to no planning, such as walking, driving, or rideshare services.

### Key Theme 4: Safety

Another key theme that appeared focused on participants' perceptions of safety when traveling. On the topic of public transportation, multiple participants noted that intoxicated people make them feel unsafe at bus stops. Alex stated that "It's very rare that I have a good [public transit] experience. If I [take the bus to get home] after I hang out [with my friends], I sometimes run into people who are drunk [or otherwise intoxicated], and then my friends and I are uncomfortable and silent while this person's having their moment." Daxton shared a similar anecdote, this time about walking: "Sometimes [intoxicated] people make me feel like slightly unsafe on the street."

Additionally, several participants stated that cars make them feel unsafe while they're traveling. When asked about their experience cycling in Kingston, Edith replied "Stressful. Yeah, definitely. Because of the automobiles." Another participant, Loretta, described their walking experience in Kingston as pleasant, specifically because there were few cars: "As a pedestrian, [my experience is] normally pretty good. There aren't many cars around here, so I don't need to focus on avoiding

them, and I'll just cross the road wherever. [In instances where] there are more cars, I'm a lot more aware of my surroundings, and stressed.”

This data suggests that for Queens students with ADHD, feeling safe is an important factor to consider when making travel related decisions. Furthermore, it suggests that proximity to automobiles is a common source of discomfort this population. This theme is a reminder that many diverse factors shape travel behavior and experiences, some related to neurotype, and others perhaps not.

## Key Theme 5: Routine

Another key theme that appeared focused on participant’s relationship with routine. Several participants stated that they do not have a day-to-day travel routine and instead choose to travel based on their feelings and their commitments. For example, Daxton stated: “As scuffed as it sounds, I just came in [to work] based off the vibe. I was living in Kingston, so I would periodically book Megabus dates, and then I would travel to Toronto to work. I would stay in Toronto for however long [felt appropriate], and then whenever I was feeling done with it, I would come back to Kingston. Similarly, when asked if she had a daily travel routine, Alex stated “No, I typically program [my travel] around classes and I do not come to school if I don’t have to go to class.

This disregard for routine was not unanimous, however. Adrian described how walking home a different route from usual with a friend caused some discomfort: “So yeah, it's one of those things. It doesn't bother me, but it does a little bit.... I think I take comfort in the predictability of my travel perhaps.” Adrian re-iterated this idea when describing her route to school: “To Union and then through the side of the building, that same route every time.”

The absence of a travel routine is significant, because it increases the planning requirements of travel. A travel routine must be planned only once and then adhered to every day. Non-routine travel must be planned each time a trip is made. Non-routine travel via public transportation especially must be planned meticulously to minimize wait times and walking. The key theme of non-routine travel again suggests that flexible modes of transportation which have minimal planning requirements may be preferred by people with ADHD.

## Key Theme 6: Winter

Another theme that appeared during interview analysis was winter. Many interview participants stated that the cold, wet, and slippery conditions of Kingston’s winter shaped both their travel behaviors and experiences. Adrian described how “[In] the wintertime, I dislike being super cold. --- The cold is a discouraging factor.” Similarly, Ellianna stated “I forget about the snow. I can't move as fast as though it. I'm pretty much always late, but it's worse in the winter.” Finally, when asked about ridesharing services, Diana stated that “Ubers are costly over the long run but it’s nice to not have to wait in the cold for public transit.

Winter serves as a reminder that travel experiences are influenced by many factors: some specific to students with ADHD, others more broadly shared. In Kingston, winter is unavoidable, and while everyone faces its effects, the season’s obstacles intersect uniquely with the difficulties encountered by neurodivergent individuals.

## Key Theme 7: Mode Choice and Rationale

Walking was overwhelmingly the most popular mode of travel, with five of the seven participants identifying it as their main mode of transportation.

Participants offered a variety of rationales as to why they preferred walking, and a common explanation was distance. “It would be a further walk for me to go to my car than it would for me to go to my classes, so I don't really see the point in that.” Said Loretta, when asked why walking was their main mode of transportation. Similarly, Darwin said “My typical mode of transportation is walking because everything is close together, and I don't need to have a quicker mode of transportation.” Finally, when asked why walking was her main mode of transportation, Lorretta said “I mean, everything's within walking distance.” Interestingly, Adrian described the simplicity of walking as a rationale: “Walking is just the easiest. I can pick up and go. I don't have to worry about bringing stuff along with me, there's no planning involved, I'll pick up and leave.”

Conversely, Alex stated that public transportation was her main mode of transportation. When asked why, she described how distance and comfort were motivating factors: “I'm so far from school. I do have a little scooter, but Kingston roads are not scooter friendly. I don't want to be close to cars or bikes or pedestrians.”

These answers suggest that for these interview participants, the built environment plays a significant role in shaping travel behavior, especially distance variables. The answers from Adrian and Alex, however, suggest that a desire for comfort and simplicity might also significantly shape the travel behaviors of Queens Students with ADHD.

## Key Insights

The semi structured interview analysis suggests that the travel behaviors of Queen's University students with ADHD are shaped by a strong preference for flexibility, simplicity, and sensory comfort. A major barrier identified is the mental load associated with trip planning—tasks like checking bus schedules, preparing for delays, or organizing belongings can be overwhelming and sometimes deter travel altogether. Many students preferred walking or using rideshare services, perhaps because these modes require little planning and offer more control, especially when executive dysfunction or forgetfulness is at play. Participants also described “bus limbo”: the unproductive time spent waiting for transit, which further complicates travel. Forgetfulness, including missing stops or leaving behind items, often leads to unplanned travel experiences, again reinforcing the preference for forgiving, low-stakes transportation options.

Sensory overload was another prominent theme, with participants citing discomfort in loud, crowded environments like buses or busy sidewalks. While not universal, overstimulation shaped mode choices and travel experiences for many participants. Safety also emerged as a concern—particularly around intoxicated individuals and proximity to cars—prompting a preference for quieter, pedestrian-friendly environments. Winter added another layer of complexity, with cold and snow worsening punctuality and reducing mobility, making costly but convenient options like rideshare more attractive. Most participants lacked a consistent travel routine, opting instead to move based on their daily energy, commitments, or “vibes.” This absence of routine, while

sometimes intentional, increases the cognitive burden of each trip. Overall, these insights suggest that simplicity, sensory comfort, and flexibility significantly affect the transportation behaviors and experiences of Queen's students with ADHD.

## Chapter 6: Discussion & Recommendations

This report set out to explore the neurodivergent travel experience, using a combination of literature review, an environmental scan of contemporary Canadian planning, and qualitative interviews with Queen's University students with ADHD. These three methods have each offered unique insights into the true nature of neurodivergent travel.

### Key insights

#### Travel Behaviors of Students with ADHD Align with Prior Research, Particularly in Relation to Trip Planning Challenges

The experiences of Queen's students with ADHD identified by this study are largely in line those detailed in Baric et al.'s (2024) review, especially around trip planning, a major barrier for many neurodivergent travelers. Participants in this study frequently described the cognitive load associated with organizing a trip as a deterrent to travel. Tasks such as checking schedules, anticipating delays, or simply remembering necessary items were often cited as overwhelming, potentially leading to a preference for more spontaneous, low-planning modes such as walking or rideshare services. These findings reinforce the need for transportation systems to consider the executive functioning challenges that can shape travel decisions for individuals with ADHD.

In particular, the concept of “bus limbo”: the unproductive, sometimes anxiety-inducing experience of waiting for public transit, further illustrates the importance of flexible and forgiving transit systems. This qualitative insight highlights the ways that executive dysfunction can turn seemingly small logistical issues into significant mobility barriers.

#### Time and Money Remain Key Drivers of Travel Behavior

Though the influence of time and financial cost on transportation choices is well-established in broader travel behavior literature, data from this study suggests that these factors intersect uniquely with the neurodivergent travel experience. Participants repeatedly cited the efficiency and flexibility of rideshare options, despite their cost, as justification for choosing them over public transit, particularly when they needed to correct errors in travel planning. Walking, a mode that is free, accessible, and demands little executive planning, was also a preferred option.

This preference for modes which limit friction demonstrates how the predictors of time and money are functional but limited in the depth of understanding they provide. For neurodivergent travelers, including but not limited to those with ADHD, considerations like comfort and flexibility are significant for determining if a trip is viable or not. Thus, the conventional metrics used to evaluate transportation systems such as cost-efficiency or travel time may fail to fully capture critical dimensions of accessibility for this group.

#### Canadian City's Limited Adoption of a Neurodiversity Framework Represents an Exciting Opportunity for Inclusion and Innovation

The policy analysis conducted in this research reveals that while some Canadian municipalities are beginning to reference neurodiversity in accessibility or equity documents, these efforts remain

surface-level and lack meaningful integration into transportation planning. Most documents reviewed offer broad definitions of disability that technically include neurodivergence, but few adopt a true neurodiversity paradigm when planning for accessibility. This absence represents both a shortcoming and an opportunity.

Adopting a neurodiversity-informed approach could unlock a wave of low-cost, high-impact interventions. Simple design choices such as clear signage, predictable schedules, or soundproofing measures could dramatically improve the travel experience for neurodivergent people, while also benefitting the general population. This phenomenon, often described as the "curb-cut effect," underscores how policies designed with marginalized groups in mind often yield widespread benefits.

Moreover, meaningful engagement with neurodivergent communities can help shift the planning paradigm from one of accommodation to one of inclusion—recognizing neurodivergence as a natural variation in human experience, rather than a deficit to be managed. Doing so would place Canadian cities at the forefront of inclusive urban mobility and contribute to a more just, accessible, and efficient transportation system.

## Recommendations for Future Study

This report provides an initial exploration into the neurodivergent travel experience, but there is significant opportunity for further research that can deepen and broaden these findings.

1. **Expand Demographic Diversity:** Future studies should include neurodivergent individuals beyond ADHD and outside the university context to capture a wider range of travel behaviors and experiences. This could include people with autism, dyslexia, dyspraxia, and other forms of neurodivergence, across various age groups, cultural backgrounds, and socioeconomic strata.
2. **Longitudinal and Seasonal Studies:** Travel behavior studies that span multiple seasons would help determine how neurodivergent individuals experience travel in different environments over time. Capturing data during winter months, for instance, could validate the sensory and logistical challenges expressed in this study.
3. **Mixed-Methods Approaches:** Qualitative interviews provide depth, but the use of travel diaries for the collection of quantitative data could provide a richer understanding of the travel behavior of neurodivergent people.
4. **Participatory Action Research (PAR):** Future research should involve neurodivergent individuals as co-researchers rather than subjects. This not only empowers participants but can produce more relevant and applicable knowledge for policy and planning.

## Recommendations for Professional Practice

The findings of this study have clear implications for urban planners, transportation officials, and policy makers seeking to create inclusive cities. While current planning approaches may include disability broadly, more specific, actionable strategies are required to support neurodivergent travelers.

1. **Embed Neurodiversity in Policy Frameworks:** Cities should revise transportation master plans and accessibility strategies to explicitly address the needs of neurodivergent populations. This includes moving beyond definitions and into action, for example, incorporating neurodiversity in modal analysis, level of service standards, and infrastructure design.
2. **Improve Trip Planning Tools:** Recognizing the challenge many participants reported in planning travel, digital tools (such as transit apps and journey planners) should incorporate features like customizable reminders, and simplified route options. To achieve this, planners can work with user-interface designers trained in accessibility and neurodiversity-informed design.
3. **Create Sensory-Friendly Transit Environments:** Transit agencies should assess the sensory profile of stations, vehicles, and pedestrian environments. Considerations might include minimizing harsh lighting, reducing unnecessary audio announcements, and creating quiet or low-stimulation zones.
4. **Incorporate Lived Experience into Planning Processes:** Planners must adopt inclusive engagement strategies that actively involve neurodivergent people. This may mean rethinking consultation methods — such as moving away from open houses toward one-on-one interviews or creative workshops — to ensure neurodivergent voices are not excluded.
5. **Professional Training and Education:** Urban planning and transportation professionals should receive ongoing training on neurodiversity, executive functioning, and inclusive design. This would help foster empathy, build capacity, and create a shared language for addressing cognitive accessibility in practice.

## Conclusions

This research highlights the disconnect between neurodivergent travel experiences and current transportation planning approaches in Canada. While cities may gesture toward inclusivity, neurodivergent individuals remain underrepresented in both policy and infrastructure. Through more inclusive research methods, updated planning tools, and genuine engagement with neurodivergent communities, the field can move toward a more equitable, cognitively accessible future. Planners must take seriously the lived expertise of neurodivergent people — not as an afterthought, but as central to the design of inclusive urban mobility systems.

## Work Cited

- Abou-Zeid, M., Witter, R., Bierlaire, M., Kaufmann, V., & Ben-Akiva, M. (2012). Happiness and travel mode switching: Findings from a Swiss public transportation experiment. *Transport Policy*, 19(1), 93-104.
- Ajzen, I., (1991). The theory of planned behavior, *Organizational Behavior and Human Decision Processes*, Volume 50, Issue 2, Pages 179-211, [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T).
- Alberta urban municipalities association. (2017). Measuring Inclusion Tool. [https://www.abmunis.ca/sites/default/files/Advocacy/Programs\\_Initiatives/WIC/measuring\\_inclusion\\_tool\\_-\\_electronic\\_user\\_0.pdf](https://www.abmunis.ca/sites/default/files/Advocacy/Programs_Initiatives/WIC/measuring_inclusion_tool_-_electronic_user_0.pdf)
- Araújo-Soares, V., Rodrigues, A., Pesseau, J., & Sniehotta, F. F. (2013). Adolescent sunscreen use in springtime: a prospective predictive study informed by a belief elicitation investigation. *Journal of behavioral Medicine*, 36, 109-123.
- Bolic Baric, V., Larsson Ranada, Å., & Berg, J. (2024). The whole journey chain with public transport for people with autism spectrum disorder and attention deficit hyperactivity disorder—a scoping review. *Transport reviews*, 44(6), 1136-1160.
- Becker, G. S., (1965). A theory of the allocation of time. *Economic Journal*, 75,299, 493–517.
- Ben-Akiva, M., McFadden, D., Train, K., Walker, J., Bhat, C., Bierlaire, M., Munizaga, M. A. (2002). Hybrid choice models: Progress and challenges. *Marketing Letters*, 13, 163-175.
- Berg, J., & Ihlström, J. (2022). *Experiences of public transport among people with neuropsychiatric disabilities* [Sw: Erfarenheter och upplevda hinder i kollektivtrafiken hos personer med neuropsykiatriska funktionsnedsättningar]. Statens väg-och transportforskningsinstitut.
- Boarnet, M. G. and Crane, R. 2001. The influence of land use on travel behavior: specification and estimation strategies. *Transportation Research A*, 35 (9) : 823 – 845 .
- Bolic Baric, V., Larsson Ranada, Å., & Berg, J. (2024). The whole journey chain with public transport for people with autism spectrum disorder and attention deficit hyperactivity disorder – a scoping review. *Transport Reviews*, 44(6), 1136–1160. <https://doi.org/10.1080/01441647.2024.2372495>
- Botha, M., Chapman, R., Giwa Onaiwu, M., Kapp, S. K., Stannard Ashley, A., & Walker, N. (2024). The neurodiversity concept was developed collectively: An overdue correction on the origins of neurodiversity theory. *Autism*, 28(6), 1591-1594. <https://doi.org/10.1177/13623613241237871>
- Bradshaw, P., Pickett, C., van Driel, M.L., Brooker, K. & Urbanowicz, A. (2021) Recognising, supporting and understanding autistic adults in general practice settings. *AJGP*, 50(3), 126–130. Available from: <https://doi.org/10.31128/AJGP-11-20-5722>

- Carrasco, Juan & Miller, Eric & Wellman, Barry. (2008). How Far and with Whom Do People Socialize? Empirical Evidence About Distance Between Social Network Members. *Transportation Research Record*. 2076. 10.3141/2076-13.
- Cervero , R. (2002). Built environments and mode choice: Toward a normative framework . *Transportation Research D* , 7 ( 4 ) : 265 – 284
- Chapin, F. S. (1974). *Human Activity Patterns in the City: Things People Do in Time and in Space*. Wiley.
- City of Hamilton. (2002). City of Hamilton Transportation Master Plan Review and Update. <https://www.hamilton.ca/city-council/plans-strategies/master-plans-studies/transportation-master-plan>
- City of Mississauga. (2019). Mississauga Transportation Master Plan. [https://www.mississauga.ca/wp-content/uploads/2020/09/17085056/Mississauga\\_Transportation\\_Master\\_Plan\\_May\\_2019.pdf](https://www.mississauga.ca/wp-content/uploads/2020/09/17085056/Mississauga_Transportation_Master_Plan_May_2019.pdf)
- City of Ottawa. (2023). Transportation Master Plan. [https://documents.ottawa.ca/sites/default/files/tmp\\_policies\\_en.pdf](https://documents.ottawa.ca/sites/default/files/tmp_policies_en.pdf)
- City of Ottawa. (2025). Municipal Accessibility Plan. <https://pub-ottawa.escribemeetings.com/filestream.ashx?DocumentId=211337>
- City of Surrey. (2024). City of Surrey's Accessibility Action Plan. <https://www.surrey.ca/sites/default/files/media/documents/Accessibility-Action-Plan-2024.pdf>
- City of Vancouver. (2021). Equity Framework Getting our House in Order. <https://vancouver.ca/files/cov/equity-framework.pdf>
- City of Vancouver. (2022). Transforming Attitudes, Embedding Change: The City of Vancouver's Accessibility Strategy. <https://vancouver.ca/files/cov/accessibility-strategy-phase-1-full-strategy.pdf>
- City of Winnipeg. (2024). Strategic Plan 2024 Accessibility Plan. <https://www.winnipeg.ca/city-governance/documents-reports/2024-accessibility-plan>
- Crane , R. 1996 . On form versus function: Will the new urbanism reduce traffic, or increase it? . *Journal of Planning Education and Research* , 15 ( 2 ) : 117 – 126 .
- Cervero R., Kockelman K. (1997) Travel demand and the 3Ds: Density, diversity, and design *Transportation Research Part D: Transport and Environment*, Volume 2, Issue 3, Pages 199-219, [https://doi.org/10.1016/S1361-9209\(97\)00009-6](https://doi.org/10.1016/S1361-9209(97)00009-6).
- Connors, M. H., & Halligan, P. W. (2015). A cognitive account of belief: a tentative road map. *Frontiers in psychology*, 5, 1588.
- Cullen, I., and Godson, V., 1975. Urban networks: the structure of activity patterns. *Progress in Planning*, 4, 1-96.

- Davidson, J., & Henderson, V. L. (2010). 'Travel in parallel with us for a while': sensory geographies of autism. *The Canadian Geographer/Le Geographe Canadien*, 54(4), 462-475.
- Davidson, A., & Pfeiffer, B. (2024). Community participation challenges for young adults with autism spectrum disorders during COVID-19 A photovoice study. *Community Mental Health Journal*, 60(1), 60–71. <https://doi.org/10.1007/s10597-023-01199-7>
- Davis R, Campbell R, Hildon Z, Hobbs L, Michie S. Theories of behaviour and behaviour change across the social and behavioural sciences: a scoping review. *Health Psychol Rev*. 2015;9(3):323-44. doi: 10.1080/17437199.2014.941722. Epub 2014 Aug 8. PMID: 25104107; PMCID: PMC4566873.
- De-Toledo K., P., O'Hern, S., Koppel, S. (2022). Travel behaviour change research: A scientometric review and content analysis, *Travel Behaviour and Society*, Volume 28, Pages 141-154, <https://doi.org/10.1016/j.tbs.2022.03.004>.
- Rogers, M. Everett. (1983). *Diffusion of Innovation*. 5th edition. The Free Press. A Division of Macmillan Publishing Co., Inc; New York.
- Dugundji, E. R., & Walker, J. L. (2005). Discrete Choice with Social and Spatial Network Interdependencies: An Empirical Example Using Mixed Generalized Extreme Value Models with Field and Panel Effects. *Transportation Research Record*, 1921(1), 70-78. <https://doi.org/10.1177/0361198105192100109>
- Dwyer, P. (2022) The Neurodiversity Approach(es): What Are They and What Do They Mean for Researchers?. *Human Development* 17 May 2022; 66 (2): 73–92. <https://doi.org/10.1159/000523723>
- Egard, H., Hansson, K., & Wästerfors, D. (Eds.). (2022). *Accessibility denied: Understanding inaccessibility and everyday resistance to inclusion for persons with disabilities* (p. 232). Taylor & Francis.
- Ewing, R. and Cervero, R. 2001. Travel and the built environment. *Transportation Research Record*, 1780: 87–114
- Ewing, R., Greenwald, M. J., Zhang, M., Walters, J., Feldman, M., Cervero, R. and Thomas, J. 2009. *Measuring the impact of urban form and transit access on mixed use site trip generation rates—Portland pilot study*, Washington, DC: U.S. Environmental Protection Agency. DeAnna, M.
- Ewing, R., & Cervero, R. (2010). Travel and the Built Environment: A Meta-Analysis. *Journal of the American Planning Association*, 76(3), 265–294. <https://doi.org/10.1080/01944361003766766>
- Farber, Steven & Páez, Antonio. (2009). My car, my friends, and me: a preliminary analysis of automobility and social activity participation. *Journal of Transport Geography*, Elsevier, vol. 17(3), pages 216-225.
- Fletcher, T. S., Chen, A., Pizarro, E. O., Norris, A., Tripp, M., & Tran, J. (2022). Sensory spaces on wheels: Meeting neurodiverse community members where they are. *OT Practice Magazine*.

- Government of Ontario. (1990). Human Rights Code, R.S.O. 1990, c. H.19.  
<https://www.ontario.ca/laws/statute/90h19>
- Government of Ontario. (2005). Accessibility for Ontarians with Disabilities Act, 2005, S.O. 2005, c. 11. <https://www.ontario.ca/laws/statute/05a11>Hagerstrand, T. (1970). What about people in regional science? *Papers of the Regional Science Association*, 24, 7–21.
- Hansen, N., & Philo, C. (2007). The normality of doing things differently: bodies, spaces and disability geography. *Tijdschrift voor economische en sociale geografie*, 98(4), 493-506.
- Haustein, S., & Hunecke, M. (2013). Identifying target groups for environmentally sustainable transport: Assessment of different segmentation approaches. *Current Opinion in Environmental Sustainability*, 5(2), 197–204. <https://doi.org/10.1016/j.cosust.2013.04.009>
- Jamal, S., & Newbold, K. B. (2020). Factors Associated with Travel Behavior of Millennials and Older Adults: A Scoping Review. *Sustainability*, 12(19), Article 19. <https://doi.org/10.3390/su12198236>
- Jenkins, E., McGuinness, L., Haines-Saah, R., Andres, C., Ziemann, M. J., Morris, J., & Waddell, C. (2020). Equipping youth for meaningful policy engagement: an environmental scan. *Health promotion international*. 35(4), 852-865.
- Kenna, T. (2023). Neurodiversity in the city: Exploring the complex geographies of belonging and exclusion in urban space. *The Geographical Journal*, 189(2), 370-382.
- Manaugh, K., & El-Geneidy, A. M. (2012). What makes travel “local”: Defining and understanding local travel behavior. *Journal of Transport and Land Use*, 5(3), 15–27.
- Marchetti, C. (1994) ‘Anthropological invariants in travel behavior’, *Technological Forecasting and Social Change*, 47(1), p75–88.
- Mars, L., Arroyo, R., & Ruiz, T. (2016). Qualitative research in travel behavior studies. *Transportation research procedia*, 18, 434-445.
- Müggenburg, H., Busch-Geertsema, A., & Lanzendorf, M. (2015). Mobility biographies: A review of achievements and challenges of the mobility biographies approach and a framework for further research. *Journal of Transport Geography*, 46, 151-163.
- Naess, P. (2020). Validating explanatory qualitative research: Enhancing the interpretation of interviews in urban planning and transportation research. *Applied Mobilities*, 5(2), 286-305. <https://doi.org/10.1080/23800127.2018.1464814>
- National Institute of Mental Health. (2025, February 20). *Attention-Deficit/Hyperactivity Disorder (ADHD)*. Mental Health Information. <https://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd>
- Newman, P. and Kenworthy, J. (1999) ‘Costs of automobile dependence: Global survey of cities’, *Transportation Research Record*, 1670, p17–26.
- Park, J., & Chowdhury, S. (2018). Investigating the barriers in a typical journey by public transport users with disabilities. *Journal of transport & health*, 10, 361-368.

- Potoglou, D., & Spinney, J. (Eds.). (2024). *Handbook of Travel Behaviour*. Edward Elgar Publishing. <https://doi.org/10.4337/9781839105746>
- Park, Keunhyun & Nasr Esfahani, Hossein & Novack, Valerie & Sheen, Jefferson & Hadayeghi, Hooman & Song, Ziqi & Christensen, Keith. (2022). Impacts of disability on daily travel behaviour: A systematic review. *Transport Reviews*. 43. 1-26. 10.1080/01441647.2022.2060371.
- Precin, P., Otto, M., Popalzai, K., & Samuel, M. (2012). The role for occupational therapists in community mobility training for people with autism spectrum disorders. *Occupational Therapy in Mental Health*, 28(2), 129–146. <https://doi.org/10.1080/0164212X.2012.679533>
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of consulting and clinical psychology*, 51(3), 390.
- Rowel, R., Moore, N. D., Nowrojee, S., Memiah, P., & Bronner, Y. (2005). The utility of the environmental scan for public health practice: lessons from an urban program to increase cancer screening. *Journal of the National Medical Association*, 97(4), 527-534.
- Schwartz, S. H. (1977). Normative influences on altruism. In *Advances in experimental social psychology* (Vol. 10, pp. 221-279). Academic Press.
- Simon, H.A. (1956). Rational choice and the structure of the environment, *Psychological Review*, 63(2), pp. 129–138.
- Sniehotta, F. F., Presseau, J., & Araújo-Soares, V. (2014). Time to retire the theory of planned behaviour. *Health psychology review*, 8(1), 1-7.
- Tanner, J.C. (1979) 'Expenditure of time and money on travel', *Transport Road Research Laboratory Report*, SR-466: Crowthorne, UK.
- Thériault, W., & Morales, E. (2022). Accessibility and social participation in urban settings for people with autism spectrum disorder (ASD) or an intellectual disability (ID). *Journal of Accessibility and Design for All*, 12(1), 155–179. <https://doi.org/10.17411/jaccess.v12i1.352>
- Tola, G., Talu, V., Congiu, T., Bain, P., & Lindert, J. (2021). Built environment design and people with autism spectrum disorder (ASD): A scoping review. *International journal of environmental research and public health*, 18(6), 3203.
- Walker, N.(2014). Neurodiversity: Some basic terms and definitions. *Neurocosmopolitanism*: Dr. Nick Walker's Notes on neurodiversity, autism, and cognitive liberty. Neurocosmopolitanism. <https://neurocosmopolitanism.com/neurodiversity-some-basic-terms-definitions/>.
- Zahavi, Y. and Ryan, J.M. (1980) 'Stability of travel components over time', *Transportation Research Record*, 750, p19–26.
- Zahavi, Y. and Talvitie, A. (1980) 'Regularities in travel time and money expenditures', *Transportation Research Record*, 750, p13–19.

- Zhang , M. 2004 . The role of land use in travel mode choice: Evidence from Boston and Hong Kong .  
*Journal of the American Planning Association* , 70 ( 3 ) : 344 – 361 .
- Zhang, Y., & Peng, Y. (2014). Understanding travel motivations of Chinese tourists visiting Cairns, Australia. *Journal of Hospitality and Tourism management*, 21, 44-53.
- Zhang, J., & Van Acker, V. (2017). Life-oriented travel behavior research: An overview. *Transportation Research Part A: Policy and Practice*, 104, 167–178.  
<https://doi.org/10.1016/j.tra.2017.06.004>

# Appendix

## Appendix A: Semi-Structured Interview Guide

Version 2.0; 9-Apr-2024



# Student Semi-Structured Interview Script

## Study title: Exploring the Neurodivergent Travel Experience from the Perspective of Queen's University Students

Principal Investigator: Jacob Fewer, Department of Geography and Planning, 17jojf@queensu.ca

### Introduction

- The individual conducting the semi-structured interview is myself, Jacob Fewer from the Department of Geography and Planning at Queen's University.
- The semi-structured interview's purpose is to gather opinions about your day-to-day travel habits because we want to know about the travel behaviors and experiences of people with ADHD.

### 1 Focus group/Semi-structured interview questions

- Can you describe a typical day in your life as a Queen's University student in terms of travel?
  - If it helps, you can describe your travel yesterday, or on a day in recent history.
- What is your typical mode of transportation for day-to-day travel in Kingston?
  - Why is this your typical mode of transportation for day-to-day travel?
- How would you describe your experience as a pedestrian in Kingston?
- Do you have a driver's license?
  - Have you ever driven in Kingston? If so, how would you describe your experience?
- Have you ever taken public transportation in Kingston? If so, how would you describe your experience?

Version Date: 2024/08/22



- Have you ever ridden a bike in Kingston? If so, how would you describe your experience?
- Have you ever used ride-hailing services such as Uber or Lyft in Kingston? If so, how would you describe your experience using these services?
- Can you confirm that you are a Queen's University Student?
  - Do you identify as having ADHD?
  - Are you a graduate student or an undergraduate student?
- Do you think that your ADHD has shaped or influenced your travel behaviors in any way?
  - In what way has ADHD shaped or influenced your travel behaviors?
- Do you think that your ADHD has shaped or influenced your travel experiences in any way?
  - In what way has ADHD shaped or influenced your travel experiences?

## 2 Recording audio

- During the semi-structured interview we will record audio using Microsoft Teams/a digital audio recorder. The audio files will be kept for analysis. All tapes will be kept under lock and key by myself.

## 3 Transcribing audio

- Names will be removed from transcripts. Participants will have coded numbers attached to their names, which only I will know.
- The semi-structured interview discussion will be transcribed through Microsoft Teams.
- The original audio files and transcripts for this session will be stored on the encrypted Queen's OneDrive server. I will analyze these transcripts for my report, and then transfer them to my supervisor Dr. Patricia Collins, who will store them for the required 5 years before deleting them.
- Only myself and Dr. Patricia Collins will have access to the semi-structured interview transcripts (with your name removed).

## Appendix B: Letter of Information



# Implied Informed Consent Form (ICF)/Letter of Information (LOI) for Prospective Research with Human Participants-HSREB and GREB

**Study title:** Exploring the Neurodivergent Travel Experience from the Perspective of Queen's University Students

Short title: [Day to Day Travel and ADHD](#)

**Principal Investigator:** Jacob Fewer, Department of Geography and Planning, [17jojf@queensu.ca](mailto:17jojf@queensu.ca)

Co-Investigator(s)/Supervisor: Dr. Patricia Collins

## 1. Purpose of Study

You are invited to participate in a research study because you [have self-](#)identified as a student with ADHD. This study is looking to understand the travel behaviors and experiences of Queen's University Students who identify as neurodivergent. This consent form provides information to help you make an informed choice. This study has received ethical approval by the Queen's University General Research Ethics Board (GREB).

Participation is voluntary, and you can decline to participate at any time. Your participation in this research project will include completing a one-time interview. This interview will be completed via email, in person, or online via Microsoft Teams and will take at most 30 minutes to complete.

The interview is not anonymous, your responses will be linked to your name and your email. You can decline to answer any question you don't want to. You can choose to withdraw from this study at any time without providing a reason. To withdraw your participation from this study please contact Jacob Fewer at [17jojf@queensu.ca](mailto:17jojf@queensu.ca). You can withdraw your data [until](#) April 1st by contacting Jacob Fewer. Past this date, the findings of the study will have been published.

## 2. Risks and benefits

There are no known risks to this study. Furthermore, there are no direct benefits to you for taking part in this study.

Version Date: Oct 2nd, 2024



We hope that the results of this study may benefit the broader scholarly community, by generating novel insights into the travel experiences of people with ADHD and the opportunities to plan for neurodivergent people in transportation systems.

### 3. Confidentiality

All the information collected during the research study will remain strictly confidential to the extent permitted by the applicable laws. If you decide to participate in this study, the research team will only collect the information needed.

To protect your privacy, you will only be identified in the study documents by a participant ID. The master log linking your name and email address to your participant ID will be stored separately from other study data and will only be accessed by Jacob Fewer, the primary investigator for this study. This master log will not leave the local site.

The study data will be stored electronically on the encrypted Queen's University OneDrive Server.

The study data will be stored for 5 years. After this storage period, the study data will be destroyed by Dr. Patricia Collins.

During the study, for data collection, data analysis, monitoring, control, safety, and security your study file may be accessed by the following organizations:

Members of the study team as delegated by the principal investigator.

Authorized Representatives of Queen's University and/or Queen's University General Research Ethics Board (GREB).

The results of this research study data may be published or shared during scientific meetings however you will/will not be identified during the dissemination of study results or publication. All efforts will be made to protect your privacy and the likelihood that someone may identify you is small, however it cannot be eliminated.

### 4. Compensation

If you choose to participate in this study, your name will be entered into a draw to win a \$50 Amazon gift card.

After your interview, you will have the opportunity to provide your contact information to be entered into a draw for a chance to win a \$50 Amazon gift card. Your odds of winning are based on the number of individuals who participate in the interview.



Your name and email will be stored securely and separately from your survey responses and permanently erased once the draw is complete. The survey will close on February 10th.

Entry into the draw will close on February 10th.

The draw will take place one day after the survey closes and be conducted a random number generator.

The winner will be contacted using the contact information provided upon entry into the draw. If a winner has not responded within 1 week, the winner will forfeit the prize, and another draw will be held to determine a winner. The prize must be accepted as awarded or forfeited and cannot be redeemed for cash.

Participation is not required for entry into the draw; to enter without participating in the study, you must submit a 3x5 index card with your name and contact information, along with the study title, printed by hand to 68 University Avenue, Kingston Ontario. Entries must be received by the closing date above to be eligible. We are not responsible for lost, late, incomplete, illegible, damaged, destroyed, postage due, or misdirected entries. No bulk mailings will be accepted. All entries will become the property of the study team and will not be returned."

If you have any questions, please contact GREB at or [chair.greb@queensu.ca](mailto:chair.greb@queensu.ca).

## 5. Contact Information

If you have questions about this study, you can contact:

Jacob Fewer at [17jojf@queensu.ca](mailto:17jojf@queensu.ca) or Dr. Patricia Collins at [Patricia.Collins@queensu.ca](mailto:Patricia.Collins@queensu.ca)

For ethics concerns, please contact the General Research Ethics Board (GREB) at 1-844-535- 2988 (Toll free in North America) or email [chair.GREB@queensu.ca](mailto:chair.GREB@queensu.ca). Use 1-613-533-2988 if outside North America. Please note that GREB communicates in English only.

## 6. Consent

I agree that:

- I have read the Letter of Information/Consent Form.
- By consenting, I have not waived any legal rights in the event of research-related harm.



I consent to Participating in the Main Study. Selecting "Yes" and proceeding to completion of the survey/questionnaire implies your consent to the study as outlined above.

Yes  No

## Appendix C: Ethics Approval Letter



### Queen's University General Research Ethics Board (GREB)

#### RE: GREB Initial Ethics Approval

October 15, 2024

Mr. Fewer  
Faculty of Arts and Science\Geography and Planning  
Queen's University

TRAQ #: 6042362

Study Title: "Exploring the Neurodivergent Travel Experience from the Perspective of Queen's University Students"

Supervisor: Dr. Patricia Collins

Review Type: Delegated

Date of Full Board Meeting: N/A

Date Ethics Approval Issued: October 15, 2024

Date of Expiry of Ethics Approval: October 15, 2025

Dear Mr. Fewer

Thank you for submitting the above referenced study to The Queen's University General Research Ethics Board (GREB). GREB has reviewed the study and granted initial ethics approval for this study as of the date noted above.

#### Documents Approved:

Document Name	Comments	Version Date
Letter of Information/Consent Form (combined document)	This is my LOI for my Student Semi-Structured Interviews	2024/10/02
Letter of Information/Consent Form (combined document)	This is my letter of information for my key informant interviews	2024/10/01
Other document	This is my Verbal Consent Log	2024/10/01
Other document	This is my Master Linking Log.	2024/10/01
Recruitment Letter/Email/Notice/Poster	This is the Recruitment Email for my Key Informant Interviews.	2024/10/01
Poster	Instagram Story/Post	2024/10/01
Interview Guide	Key Informant Interview Guide	2024/09/18
Interview Guide	Student Interview Guide	2024/09/18

No deviations from, or changes to, the protocol should be initiated without prior written approval from GREB, except when necessary to eliminate immediate hazard(s) to study participants.

On behalf of the GREB, I wish you success in your research.

Sincerely,



Jacob Brower  
Chair, General Research Ethics Board (GREB)  
Associate Professor and Distinguished Faculty Fellow of Marketing,  
Academic Co-Director (Business), Master of Digital Product Management  
Smith School of Business  
chair.greb@queensu.ca  
Queen's University  
Kingston, ON K7L 3N6

GREB operates in compliance with, and is constituted in accordance with, the requirements of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2); the International Conference on Harmonisation Good Clinical Practice Consolidated Guideline (ICH GCP); Part C, Division 5 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations and the provisions of the Ontario Personal Health Information Protection Act (PHIPA 2004) and its applicable regulations. Federalwide Assurance Number: FWA#: 00004184, IRB#: IRB00003062. GREB members involved in the research project do not participate in the review, discussion, or decision.