Beyond the Work Trip: Teen Travel in the Greater Toronto Area (GTA) and Policy Implications

By

Reihane Marzoughi

A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy

Department of Civil Engineering
University of Toronto

© Copyright by Reihane Marzoughi, 2010
Beyond the Work Trip: Teen Travel in the Greater Toronto Area (GTA) and Policy Implications
Reihane Marzoughi
Doctor of Philosophy
Department of Civil Engineering
University of Toronto
2010

Abstract

Conventional transportation demand management approaches have had limited success in reducing automobile dependency. As a result, it has become increasingly important to understand the decision-making processes involved in determining travel behaviour. The purpose of this dissertation is to extend research on urban form and travel behaviour beyond adult travel by examining teen travelers aged 13-19 in the Greater Toronto Area. Data from the Transportation Tomorrow Survey (TTS) survey are used to study four main research questions: 1) How has teen mode choice changed from 1986 to 2006? 2) How do these choices vary as teens transition from the 13-15 age group to being of driving age (16-19)? 3) How do these choices vary across the different urban and suburban regions of the GTA? 4) What are some of the differences between teen travel and adult travel? The issue is further probed through the collection of quantitative and qualitative travel data from first year students at the University of Toronto, and a series of focus group sessions held in locations in the GTA. The first year survey explores attitudes towards different modes in relation to the locational attributes of the respondent’s hometown neighbourhood. The focus group sessions involve interviews with 26 teen and a take-home parental questionnaire. Results show that across the GTA, active transportation has decreased while auto passenger mode shares have increased. Younger teens walk more and older teens take transit more for both school and discretionary travel. Jurisdictions with better transit supply and orientation have higher transit mode shares for school trips, but discretionary trips have low transit mode shares. Walk mode shares for both school and discretionary travel are similar across all jurisdictions, regardless of whether they are urban or suburban. Additionally, the survey participants' narratives illustrate that the desire to travel actively and independently is strong. However, the reality of the final travel choice is determined by the presence of supportive infrastructure that facilitates active mode choices while shaping perceptions and attitudes formed as a result of daily travel experiences. Findings illustrate the relevance of qualitative work in advancing transportation research--particularly in understanding human travel decisions.
Acknowledgements

This research was funded by the Social Sciences and Humanities Research Council (SSHRC), as well as the Government of Ontario. Part of this research was made possible thanks to the support of the Toronto District School board. Thank you to Dr. Vanderburg, Dr. Miller, Dr. MacLean and Dr. Hess for their guidance and their very helpful and insightful comments that greatly strengthened this work. Thank you also to the administration and students of Harbord Collegiate Institute for their involvement, and Kamron Marzoughi for assisting in assembling the Westdale focus groups. Finally, thank you to my family and friends for their support, particularly my lovely, patient, and good-humoured husband.
# Table of Contents

Abstract............................................................................................................................................. ii

Acknowledgements............................................................................................................................ iii

Table of Contents................................................................................................................................... iv

List of Tables......................................................................................................................................... vii

List of Figures...................................................................................................................................... viii

List of Appendices............................................................................................................................... ix

Chapter 1: Introduction.......................................................................................................................... 1
  1.1 Contribution to the literature: Why study teen travel?................................................................. 2
  1.2 Research approach and organization......................................................................................... 2
  1.3 Structure of dissertation.............................................................................................................. 4

Chapter 2: A Precautionary Approach to City Building................................................................. 6
  2.1 Introduction.................................................................................................................................. 6
  2.2 Interpreting the relationship between urban form and mobility.............................................. 6
  2.3 Two approaches to urban form ................................................................................................... 8

Chapter 3: A review of urban form and mobility literature............................................................. 13
  3.1 Introduction.................................................................................................................................. 13
  3.2 A closer look at mobility.............................................................................................................. 13
  3.3 Quantitative research................................................................................................................... 14
    3.3.1 Regression, factor analysis and mode-choice models.......................................................... 15
    3.3.2 Social interactions and activity-based models...................................................................... 17
    3.3.3 Attitudes and preferences.................................................................................................... 19
    3.3.4 Descriptive studies............................................................................................................... 20
  3.4 Qualitative research.................................................................................................................... 21
    3.4.1 Attitudinal surveys............................................................................................................... 22
    3.4.2 Interviews and focus groups............................................................................................... 23

Chapter 4: Current literature on teenage travel behaviour............................................................ 25
  4.1 Current research on independent teen travel............................................................................ 25
  4.2 Active travel and transit use....................................................................................................... 25
  4.3 Trip to school............................................................................................................................. 27

Chapter 5: Teen travel in the Greater Toronto Area: A descriptive analysis of trends from 1986-2006 and the policy implications................................................................. 30
  5.1 Introduction.................................................................................................................................. 30
  5.2 The GTA: A description of the case study location................................................................... 30
  5.3 Transportation in the GTA......................................................................................................... 32
  5.4 Methodology and data................................................................................................................ 33
  5.5 Limitations.................................................................................................................................. 34
  5.6. Results - GTA trends (1996-2006)........................................................................................... 34
  5.7 Overall trip generation and modal shares from 1986-2006...................................................... 35
  5.8 Trip to school and discretionary travel 1986-2006................................................................. 37
  5.9 Teen travelers as compared to adult travelers in the GTA....................................................... 41
  5.10 Discussion and conclusion...................................................................................................... 45
List of Tables

Table 5.1 Population statistics for various regions.................................................................30
Table 5.2 Percentage of teens aged 16-19 with a license, by region........................................35
Table 5.3 Percentage of teens aged 13-19 with a transit pass, by region.................................35
Table 5.4 Total trip rates for teens aged in GTA region by year and age cohort.....................36
Table 5.5 Percentage change in mode shares from 1986-2006 for teens aged 13-15 by region..40
Table 5.6 Percentage change in mode shares from 1986-2006 for teens aged 16-19 by region..40
Table 6.1 Breakdown of where Toronto respondents live in relation to CBD.........................49
Table 6.2 Breakdown of when respondents obtained their license..........................................49
Table 6.3 Summary of modes most commonly used for trip to and from school....................50
Table 6.4 Most frequently used discretionary modes between ages of 13-15..........................51
Table 6.5 Most frequently used discretionary modes between ages of 16-19..........................51
Table 6.6 Frequency with which respondents require cars for discretionary travel................51
Table 6.7 Modes used for various discretionary activities, by location and age group.............52
Table 6.8 Parents attitude towards child traveling alone after dark.......................................53
Table 6.9 Parents attitude towards child taking transit alone................................................53
Table 6.10 Parents attitude towards child walking alone......................................................54
Table 6.11 Participants perception of transit systems in their city...........................................55
Table 6.12 Barriers influencing a teen’s decision to take transit............................................56
Table 7.1 Selected demographic statistics for focus group locations......................................62
Table 7.2 Participant characteristics by focus group.............................................................65
Table 7.3 Modes typically used for travel to and from school...............................................66
Table 7.4 Discretionary trip modes and destinations for Harbord focus groups.....................69
Table 7.5 Discretionary trip modes and destinations for Westdale focus groups.....................71
Table 7.6 Challenges faced by participants while trying to make discretionary trips..............74
Table 7.7 Frequency of transit use during temperate weather conditions..............................75
Table 7.8 Comments identifying advantages of transit..........................................................76
Table 7.9 Comments identifying disadvantages of transit....................................................77
Table 7.10 Frequency of automobile use amongst all groups...............................................81
Table 7.11 Comments identifying advantages of cars as a driver or a passenger.....................82
Table 7.12 Comments identifying disadvantages of cars as a driver or passenger..................83
Table 7.13 Frequency of walking for both focus groups......................................................85
Table 7.14 Comments identifying the advantages of walking................................................86
Table 7.15 Comments identifying the disadvantages of walking...........................................87
Table 7.16 Frequency of biking for both groups.................................................................90
Table 7.17 Comments identifying the advantages of biking..................................................91
Table 7.18 Comments identifying the disadvantages of biking.............................................92
Table 7.19 Number of vehicles by household type...............................................................98
Table 7.20 Maximum distance parents feel it is appropriate for their child to walk..................99
Table 7.21 Maximum distance parents feel it is appropriate for their child to bike...................99
Table 7.22 Factors influencing a parent’s decision to allow their child to walk or bike without accompaniment.................................................................100
**Table of Figures**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Conceptual map of factors influencing teen travel outcomes</td>
<td>4</td>
</tr>
<tr>
<td>5.1</td>
<td>Map of the GTA</td>
<td>31</td>
</tr>
<tr>
<td>5.2</td>
<td>Map of the most commonly used highways in the GTA</td>
<td>33</td>
</tr>
<tr>
<td>5.3</td>
<td>Daily trip rates for whole GTA region by type and year</td>
<td>36</td>
</tr>
<tr>
<td>5.4</td>
<td>Total mode shares for teens in GTA region</td>
<td>36</td>
</tr>
<tr>
<td>5.5</td>
<td>School travel mode shares by municipality and year in the GTA</td>
<td>38</td>
</tr>
<tr>
<td>5.6</td>
<td>Discretionary travel mode shares by municipality and year in the GTA</td>
<td>39</td>
</tr>
<tr>
<td>5.7</td>
<td>Modes shares by trip type for teen and adult travelers in Toronto for 2006</td>
<td>41</td>
</tr>
<tr>
<td>5.8</td>
<td>Modes shares by trip type for adult travelers in Hamilton for 2006</td>
<td>42</td>
</tr>
<tr>
<td>5.9</td>
<td>Modes shares by trip type for teen and adult travelers in Halton for 2006</td>
<td>42</td>
</tr>
<tr>
<td>5.10</td>
<td>Modes shares by trip length for teen and adult travelers in Toronto for 2006</td>
<td>44</td>
</tr>
<tr>
<td>5.11</td>
<td>Mode shares by trip length for teens and adults in Hamilton in 2006</td>
<td>44</td>
</tr>
<tr>
<td>5.12</td>
<td>Modes shares by trip length for teen and adult travelers in Halton for 2006</td>
<td>45</td>
</tr>
<tr>
<td>7.1</td>
<td>Map of Westdale catchment area</td>
<td>137</td>
</tr>
<tr>
<td>7.2</td>
<td>Map of Westdale neighbourhood</td>
<td>138</td>
</tr>
<tr>
<td>7.3</td>
<td>Map of Harbord catchment area</td>
<td>139</td>
</tr>
<tr>
<td>7.4</td>
<td>Map of Harbord neighbourhood</td>
<td>140</td>
</tr>
</tbody>
</table>
List of Appendices

Appendix A: First year travel survey.................................................................122
Appendix B: Interview guide........................................................................130
Appendix C: Parental questionnaire...............................................................132
Appendix D: Sample of map used for Harbord mapping exercise..................135
Appendix E: Maps of Focus Group Areas......................................................137
Chapter 1: Introduction

1. Introduction

Urban researchers and practitioners generally agree that current land development patterns are problematic. The discussion is focused on altering current growth regimes to yield genuine changes in the way people travel. Over the past several decades, various policies based on transportation-land-use interactions have been developed and enacted to address problems of auto-ownership and use. Some policies have been more effective than others. Badoe and Miller (2000) review literature on empirical studies of these interactions and identify significant discrepancies in findings. Some studies show that urban densities, traditional neighbourhood design and land-use mix have a strong impact on auto-ownership and use, while others find the impact to be marginal at best. Even when empirical evidence suggests that auto dependence is lower in traditional style neighbourhoods, it provides little insight as to whether altering non-traditional style urban form will actually lead to a genuine change in travel patterns (Handy, 1996).

The lack of clarity in the findings has been linked to several key issues in the literature. These include: the difficulty of translating built form elements into their meaning for the kinds of choices available to residents; and incorporating attitudes and preferences into models in order to address the idea of self-selection (Kitamura et al., 1997; Bagley and Mokhtarian, 2002; Krizek, 2003; Schwanen and Mokhtarian, 2005). Both involve going beyond the work-trip to assess discretionary travel choices.

Additionally, most of this research focuses on the “average” traveler, that is, adults with standard work schedules. There is still a need for further research that examines the ways in which different groups of travelers negotiate their urban environment. Commuting adults are but just one group of travelers within any given metropolitan area. Cities are filled with people who do not work regular hours, who may have income constraints, and who may be too old, or not old enough, to access certain modes. Studying groups with limited mobility enriches the literature on urban travel by helping to shed light on some of the different barriers faced by a wider demographic of travelers.

This dissertation looks at the travel behaviour of teenagers, and particularly the ways in which they meet their discretionary travel needs. There is a focus on the ability for teens to travel independently, and the factors that ultimately influence their mode choice. A goal of this work was to shed light on the ways in which this age group negotiates the barriers to their travel, whether these are related to built form, parental influences, or social attitudes. It attempts to determine the role all these various factors play, individually or in combination, in determining travel outcomes. The work does not attempt to quantify the relative “influence” various aspects of built form have on teen mode and route choice, and is mostly a qualitative exploration of the ways in which teens use their built environment and the reasons behind their choices.
1.1 Contribution to the literature: Why study teen travel?

While the automobile dependence of adult travelers is a widely researched topic, when it comes to independent mobility, teenagers are an understudied demographic. Teens do not have the same needs, demand patterns or freedom of choice as working adults. What are the key decision-making factors that impact their travel patterns? To what extent does urban design influence their mode-choice? What is the relationship between built form variables and real or perceived neighbourhood safety, parental attitudes, household transportation options, etc.? How much of an influence do parents have on when and where teens travel, and how does this change by age cohort?

Focusing on teens extends the research beyond the work trip emphasis, while somewhat avoiding the methodological issue of self-selection. Teens do not choose where they live and generally, are still developing attitudes and preferences toward travel. As a mobility-limited group, they are a prime transit user market and more likely to use active modes if given the opportunity. When children enter their teenaged years they are no longer entirely bound to a supervising adult’s schedule, habits and preferences, and as a result, begin to make independent travel decisions. In what ways does this independence change his or her mobility patterns, if at all? Studying teens could reveal the potential of particular urban forms to allow people to become less auto-oriented in ways that are not obvious when studying adult travelers. Understanding more about the way this group travels, even if this understanding cannot be generalized to encompass the behaviour of the entire demographic, may provide insight into how policy can better respond to overall mobility needs.

1.2 Research approach and organization

This research seeks to determine of how teenagers in the Greater Toronto Area (GTA) currently meet their school travel and discretionary travel needs, and the barriers they face while trying to do so independently. The goal is to develop an understanding of the transportation strategies used by teens as they balance their mobility constraints, the perceptions of their parents, and their own opinions about modes in order to negotiate their autonomous travel throughout their neighbourhood and city. The aim is to gain a clearer picture of the barriers to independent teen travel and some of the ways they can be overcome through policy initiatives. Specifically, the following questions provide guidance for this work:

- What are the key decision-making factors that impact teen travel patterns?
- To what extent does urban design influence their mode-choice?
- Is urban form a direct influence, or does it indirectly influence travel choices by informing variables such as real and perceived neighbourhood safety, parental attitudes, household transportation options, etc.?
- What kinds of discretionary trips are being made?
- How independently do teens travel?
  - How does this independence vary by gender or age cohort?
  - How does it vary in relation to urban form?
  - How much influence do parental worries have on travel decisions?
• What are their perceptions of different modes?
  o How safe do they feel walking and biking around their neighbourhood?
  o Are their perceptions accurate?
  o How do they feel about riding transit?
  o Does image play a role in travel decisions?
• What do teens identify as barriers to their mobility?
  o Do they overcome these barriers, and if so, how?

In order to explore these questions, the research design uses three different approaches. First, an extensive regional travel data set is analyzed to explore teen travel trends in different GTA regions, how the behaviour varies throughout urban and suburban jurisdictions, and how the behaviour has changed over the past decade. This analysis confirms that within the GTA, teens and adults exhibit significantly different travel behaviour. Unlike adult mode shares, teen walk mode shares for both school and discretionary travel are similar across all jurisdictions, regardless of whether they are urban or suburban. Results show that in general, active transportation has decreased, while auto passenger mode shares have increased across the region over time. Jurisdictions with better transit supply and orientation have higher transit mode shares for school trips, but discretionary trips have very low transit mode shares. While this dataset does provide some interesting results, it is focused mostly on the adult work trip and thus can only provide a limited analysis of the way teenagers travel. It stops short of offering explanations regarding the degree of independent teen travel in the region, as well as the mobility barriers faced by teens. For this reason, additional data was needed

The second research approach was based on the development of an online teen travel survey that was distributed to first year university students at the University of Toronto. This survey was designed to build on the information found from the regional dataset. Questions focused on gathering more specific information regarding discretionary trips, as well as mobility barriers identified by respondents. The analysis expands the understanding of the kinds of discretionary trips GTA teens make, as well as the ways in which Toronto teens differ from the rest of the region. The results of this analysis confirm those drawn from the analysis of the regional data, but provide more detail with regards to discretionary trips and modes, as well as barriers to independent travel.

The third and final research approach was a series of semi-structured focus group interviews conducted with 26 teens from two different GTA neighbourhoods. Participants were asked directly about their travel decisions, their independence, and the mobility barriers they identify. These personal accounts provide a much more nuanced picture of teen travel in the GTA, and yielded some of the most interesting information. Overall, results indicate that the ways in which teens experience their urban environment has a significant impact on their mode perceptions, and in turn, on their mobility behaviour. For example, teens living in areas with a low density of destinations and infrequent transit feel trapped by their environment, and tend to view automobile travel in a more favourable light.
These experiences, in combination with parental constraints and household transportation options, ultimately shape their travel outcomes (see Figure 1.1)

**Figure 1.1 Conceptual map of factors influencing teen travel outcomes**

The application of these three complementary research approaches enabled a fairly comprehensive exploration of teen mobility needs. The qualitative findings provide rich details that cannot be gathered through conventional travel surveys. The individual situations of each participant were conveyed, including their household constraints, their attitudes and perceptions towards modes, their preferences, their fears and the degree of involvement their parents have in their travel decisions. In combination with the broader regional data, and the data collected from the University students, this analysis strikes a unique balance between breadth and depth.

### 1.3 Structure of dissertation

The idea for this project was born from a general concern for the way we have been developing and building our cities since the Second World War. Chapter 2 presents the conceptual framework for this dissertation\(^1\). Chapter 3 presents a brief review of the literature on urban form and mobility behaviour, and sets out an argument for the use of qualitative methods in this type of research. Chapter 4 continues with a review of the existing literature related to youth travel behaviour. Much of this literature focuses on the trip to school, but a small portion does address the issue of independent travel and its importance. There is also a small body of literature outlining the influence of parents or guardians on travel behaviour.

Chapter 5 provides a description of the study location, the GTA, and provides demographic and transportation information. The rest of this chapter presents the analysis of the regional travel data set, and a description of teen travel behavioural trends throughout the GTA over the past decade. This work has been

---

1. This chapter was written in collaboration with my supervisor, Professor Vanderburg and a version of it has been published in the April 2010 issue of *The Bulletin of Science, Technology & Society* (Volume 30, no. 2, p. 86-95).
submitted to the *Transport Policy* journal and is currently being reworked to include some minor reviewer comments. It is expected that the work will be published within the next year.

The results of the first year university student survey are presented in Chapter 6. This analysis builds on the findings of presented in Chapter 5, and sets the stage for the focus group study, which is presented in Chapter 7. Finally, the research findings are summarized and the policy implications are discussed in Chapter 8. Several policy alternatives are explored and evaluated in light of the finding. Study limitations and suggestions for future work are also discussed.

Chapter 2: A Precautionary Approach to City Building

2.1 Introduction
The literature on the impact of urban design on travel behaviour reveals mixed results. Instead of interpreting this finding as an insufficient basis for warranting action, this paper suggests that a precautionary approach be introduced. This approach should be based on two interdependent modes of knowing and doing in order to establish and evolve design exemplars in conjunction with discipline-based analytical exemplars. Even if trends, including the digitization of human life and society, peak oil and climate change turn out to have smaller negative effects than is currently anticipated, we will be ahead with more livable and sustainable urban forms.

The concept of urban form may be defined as the spatial configuration of fixed elements within a metropolitan region, which includes the spatial pattern of land uses, their densities, as well as the spatial design of transportation and communication infrastructure (Anderson et al, 1996). As established by Bourne (1982), urban form has a significant influence on the interactions within a city, but does not determine them completely. A wide variety of organizing principles work simultaneously to determine the overall spatial structure of an area.

It is important to distinguish between micro and macro level urban form concepts. Micro urban form variables are generally at the neighbourhood level, shaping the nature of the streets and public spaces that inform the urban context people experience throughout their daily-life. Macro urban form extends upward to the scale of the city, or even the region, and deals with the overall structure of transportation infrastructure, employment patterns, and general land-use. Both levels of urban form are important when discussing mobility options for urban dwellers; micro factors interact with, and are in part informed by, macro factors. Throughout this dissertation, both micro and macro level urban concepts are referenced.

2.2 Interpreting the relationship between urban form and mobility

Since industrialization began, the proportion of humanity living in urban habitats has steadily grown, and this trend shows no sign of diminishing. In 2007, the United Nations revealed that at least 50 percent of the world’s population is living in cities (Griffith, 2009). By 2030, that number will increase to 60 percent, with nearly 2 billion new city residents, many migrating from rural areas (Griffith, 2009). According to the report, we are building the equivalent of a city the size of Vancouver every week. The urbanization trend is accompanied by a transformation of the surrounding countryside as a result of the ongoing industrialization of agriculture, displacing diverse ecosystems with urban habitats and vast monocultures (Pawlick, 2009). At the same time, greater demands are put on that diminishing nature by the borrowing of ever-larger quantities of matter and energy from the biosphere. These interdependent developments present us with many challenges: resource depletion, peak oil, climate change, social equity and cohesion, sustainable and healthy cities, and the ability of the biosphere to sustain all life. Given the

---

2 A version of this chapter has been published in the Bulletin of Science, Technology & Society (Vol. 30, no.2, p.86-95), and was written in collaboration with Dr. W.H. Vanderburg.
steady transformation of our planet and the enormous risks we face, a precautionary approach to the building of cities and the evolution of the surrounding countryside is urgently required.

The precautionary principle states that if an action or policy is likely to cause severe or irreversible harm to the biosphere, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. Therefore, the proponent of the activity should examine the full range of alternatives to a potentially harmful action, including the option of abandoning the action altogether.

The precautionary principle may be extended with regard to harm done to human life and society. Every traditional pre-industrial society regarded its way of life as a proven design for making sense of living in the world, passed down and evolved by generations. It approached anything new with a great deal of caution, ensuring that the viability of this way of life would not be negatively affected. All this changed with industrialization. As people changed technology, technology also changed people (Vanderburg, 2005). This led to the development of new metaconscious knowledge. Its deepest forms included the myths of progress, work and happiness, and capital as the first secular sacred (Ellul, 1967). At this point, any new technology was regarded as a step on the road to progress, and it was taken for granted that material progress would lead to social and spiritual betterment. An entirely new kind of technological growth was born, based on attaining maximum desired outputs from the required inputs, and increasingly driven by performance ratios (such as efficiency, productivity and profitability) as opposed to the values of a community. It strengthened the technology-based connectedness of human life and society at the expense of their culture-based connectedness (Vanderburg, 2005). The technology-based connectedness of a society results from the inability of human activities to create or destroy the matter and energy on which they depend. They must borrow both from the biosphere, usually via long chains of other activities. It is the interdependence between all these activities that constitutes a technology-based connectedness. The culture-based connectedness of a society results from the fact that we are symbolic species (Deacon, 1998; Vanderburg, 1985). Symbolization seeks to establish the meaning and value of human experiences by relating them to each other, and consequently to individual and collective human life in the world. All this is rooted in an ultimately unknowable reality by what, in cultural anthropology, are referred to as a sacred and myths (Vanderburg, 2005).

In pre-industrial societies, the technology-based connectedness evolved as a dimension of the culture-based connectedness. The creation of the myths of progress, work and happiness as a consequence of industrialization assured the communities of the 19th century that all earlier societies had taken the wrong approach. They believed that the best way to ensure a good life was to strengthen its material foundation, and that everything else people valued and desired would follow. The 20th century unmasked these myths but put others in their place (Ellul, 1975). In the meantime, the technology-based connectedness (evolved through the use of input-output measures rather than cultural values) became increasingly inappropriate with respect to human life and society and unsustainable by the biosphere. Hence, the precautionary principle ought to have a much broader applicability. Along with terms such as appropriate technology and sustainable development, the precautionary principle had to be invented in response to
industrialization because these values were no longer built into ways of life (Vanderburg, 2005). This change also affected the way cities were built and evolved.

Given this broad context, it is essential to carefully examine the forms our urban habitats take and their resulting effects on their physical and social surroundings. Two reciprocal interactions stand out. The first is the effect urban form has on the increasing need to borrow matter and energy from the biosphere. These activities strain biosphere resources, while biosphere limitations determine the kinds of urban forms that can be sustained. The second interaction is also reciprocal in character: as people change cities, cities also change people (Vanderburg, 2000). This happens because as people live in an urban habitat, they symbolize their experiences, which results in neural and synaptic changes in the organization of their brain-minds (Vanderburg, 2005). It confirms what we have known all along. When human beings lived in nature as their primary life-milieu by means of food-gathering and hunting, the symbolization of their experiences led to cultures unique to that epoch. When societies began to form as a result of people living in settled communities, the symbolization of their experiences led to cultures characteristic of traditional societies. Today, the symbolization of our experiences in a very different life-milieu is leading to unique new cultures characteristic of mass societies (Vanderburg, 2005). Thus, the reciprocal interaction between people and their urban habitat raises the issue of human sustainability. To what extent can we freely impose our values and aspirations on this life-milieu, and to what extent does it alienate us? To what extent does this life-milieu affect our health on the physical, social and spiritual levels, and to what extent does it impose unsustainable demands on our resources? To what extent does it facilitate community life, and to what extent does it make living together more difficult?

We will begin by exploring which kinds of urban forms sustain human life and which kinds undermine it. This focus on their livability will reveal a convergence between urban forms that sustain human life and those that can be sustained by the biosphere.

2.3 Two approaches to urban form

In her influential book, The Death and Life of Great American Cities (1961), Jane Jacobs points out that the current urban forms in North America have their roots in the concepts of a “garden city” and “towers in the park”. The reasons are not difficult to understand. The conglomeration of factories and housing for workers that sprung up in Western Europe during the course of industrialization had little in common with traditional cities. The latter were shaped by traditions of city building integral to tradition-based ways of life and cultures. Symbolizing the experiences of urban life in relation to all other experiences led to the development of cities that were culturally appropriate and sustainable. Under the pressures of industrialization, traditional ways of life were swamped with

---

3 The symbolization of human experience from birth to death has been examined in The Growth of Minds and Cultures (Vanderburg, 1985). An updated summary was subsequently published as chapter 2 in Living in the Labyrinth of Technology (Vanderburg, 2005). This work also contains the beginning of an examination of why the cultures of contemporary mass societies are highly desymbolized, but this subject will be further examined in a forthcoming work.
new situations for which no precedents existed, which meant that they had to be thought out. Reason began to replace tradition, which gradually led to the phenomenon of rationality first observed by Max Weber. Confronted with industrial slums, concepts like the “garden city” and “towers in the park” proved to be appealing. However, these were utopian ideas whose livability and sustainability had not been established.

In North America, these two utopian concepts of urban form were combined into the “radiant city” and “city beautiful” (Mumford, 1961; Jacobs, 1961). Urban centres became increasingly dominated by towers surrounded first by older city neighborhoods and then by suburban “garden cities”. With the emergence of discipline-based knowing and doing, this kind of urban form was endlessly refined and optimized by urban planners, architects, civil engineers, geographers and urban sociologists. Despite these refinements, Jacobs observed that in a great many instances, these ideas paved the way for suburban sprawl and the development of auto-oriented cities that are neither particularly livable, nor environmentally sustainable.

Jacobs’ findings implicitly relied on two parallel approaches to knowing and doing: one based on the symbolization of experience and the other based on disciplines. The former seeks knowledge by trading depth for breadth while the latter does the opposite. Although such parallel approaches are potentially complementary, our current culture devalues the approach based on experience to the benefit of those based on disciplines and specialization. The result is a vacuum created by the disappearance of traditional approaches to building and evolving cities.

On the level of daily-life experience, symbolization determines the meaning and value of every element of an urban form in relation to everything else in human life and society. For example, in the case of a building, it helps us make sense of our experiences as we approach the building, enter it, do our business within it, and leave. The discipline-based approach to a building is very different. No discipline is fully capable of explaining how a person experiences the building. The building must be broken down into various categories within which individual phenomena, modeled as a continuum, contribute to its functioning (Vanderburg, 2009a). For example, the foundation distributes the weight of the building over a sufficiently large area of soil to create an equilibrium. Its structure supports the floors and the additional loads imposed by their usage. The heating, cooling and ventilation system regulates the indoor temperature to ensure the comfort of the occupants. The building skin exchanges energy and light with the surroundings. In other words, discipline-based knowledge cannot be applied to the building as a

---

4 Jacobs used the term "Radiant Garden City Beautiful" to describe these early 20th century attempts at enhanced urban design, which she did not feel were successful. Mumford was also a critic of many attempts to “beautify” cities, but he also believed that planned public space was preferable to Jacobs’ idea of “organized complexity”. He took issue with Jacob's treatment of the Garden City ideas of Ebenezer Howard, which she saw as the precursor of suburban sprawl. For Mumford the Garden City was not without flaws, but part of an answer to the congestion and misery in industrial cities.
whole but only to its constituent domains where one category of phenomena makes a contribution to the overall functioning of the building. This form of knowing and doing is entirely separated from experience and culture. We all remember that in high school we learned physics in an abstract domain populated by masses, forces and frictionless planes which could be entered only by our mathematical imagination. The idea that eventually this mathematical domain approximates the real world overlooks the obvious fact that, unlike the real world, this domain relegates all non-physical phenomena to other disciplines. In the same way, a continuum or a fluid constitutes a mathematical domain within which only one category of phenomena are admitted.

All the disciplines directly and indirectly involved in the building of cities exhibit this tension between the two knowledge approaches. Unfortunately, the approach based on experience and culture has been all but banished from engineering education. Most engineering design textbooks muddle the two approaches, but generally subsume everything under the discipline-based one. As a result, students have little choice but to reduce engineering design to the kinds of problems they solved during their undergraduate or graduate education (Vanderburg, 2009a). The situation can be summarized by introducing the distinction between design exemplars and analytical exemplars. A design exemplar is a concept for any product or system based on how it would be encountered and used in a daily-life setting. It deals with entities as a whole, as well as any features that affect our experience or use of it. However, it excludes any analysis of the details and subfunctions of the design or concept. This analysis is carried out by the specialists in technical disciplines who examine individual categories of phenomena in scientific domains. They are not examined in the real world where they would mingle with many other phenomena. Thus, the technical disciplines generally do not use design exemplars but focus on what are called analytical exemplars. Analytical exemplars cannot be used until the product or system has been divided into a set of distinct but interacting domains in which one category of phenomena contributes a subfunction to the whole. A design exemplar must be established first because it governs the boundary conditions of the mathematical equations used by the disciplines. It is impossible, therefore, to move from an analytical exemplar to a design exemplar. Even so, engineering students are not taught how to arrive at an appropriate design exemplar.

The situation is similar in the other disciplines involved in the building and evolving of cities. For example, by means of surveys, a complex reality is replaced by mathematical representations of the interdependence of a set of variables as a basis for determining an optimal configuration in relation to a real situation. Each social science and its applications examine one category of phenomena by delegating the study of all others to their respective disciplines. What they study is distinct from the mingling of all these phenomena in human life and society. In other words, there is a distinction analogous to the one between design exemplars and analytical exemplars with the latter dominating.

The work of Jane Jacobs may therefore be interpreted as an approach to creating appropriate design exemplars for urban form. It was motivated by the proliferation of urban forms that are disconnected from human experience and based on utopian concepts refined and optimized by discipline-based approaches. By walking the
streets and observing how they worked for people, Jacobs built up a great deal of experience-based knowledge. After grouping streets and neighbourhoods according to their livability, discipline-based analyses could then be used to determine what the “good” and “bad” streets had in common. In this way, she was able to establish her well-known four principles for livable urban forms, namely: city blocks offering a diversity of functions, short blocks to bring these functions within easy reach, a diversity of buildings offering a variety of uses, and a sufficient density of dwellings to ensure lively, safe streets. In one way or another, these four design principles formed the backbone of New Urbanist design, pedestrian pockets, transit-oriented development, urban villages and Smart Growth.

The considerable influence Jane Jacobs has had on the urban research almost certainly stems from her use of two approaches to knowing and doing in a synergistic manner. She advocates using experiential knowledge to determine the types of urban designs that lead to livable cities, and discipline-based knowledge to arrive at the details of how such designs should be carried out.

Apart from the methodological implications, Jacobs’ work stands out in drawing attention to the link that exists between urban forms and mobility. This mobility goes beyond simply moving goods, people and information throughout a region. It is the kind of mobility that facilitates livable, safe streets and neighbourhoods. For example, urban forms that leave people little choice but to use their cars does not lead to this type of mobility. If everyone is whizzing around in their cocoons made of metal and plastic, there will be a lack of sidewalk activity, and in turn people may not feel safe walking around. The order of street traffic is mostly in conflict with the order of human life on the sidewalk. Safe and livable urban forms contribute to a reasonable balance between these two orders, but the order of sidewalks is paramount. Mobility is thus divided into the component that contributes to the order of sidewalks and the one related to the order of street traffic.

A great deal has changed since Jane Jacobs’ study of streets and neighbourhoods. A full-blown mass society has emerged with a different social fabric than the one prevalent in the 1950s and 1960s. The other-directed personality is now dominant, statistical morality competes with traditional morality, and public opinion has replaced private opinion (Vanderburg, 2005). On these developments are superimposed many others, including internet-based social interactions facilitated by mobile devices. The transformation of economies into anti-economies is changing many socio-economic strata with the well-known shrinking of the middle class, the increase in the number of working poor and homelessness (Vanderburg, 2009b). On the environmental front, there is growing concern about climate change and the need to reduce greenhouse gas emissions. Our growing reliance on “big box” stores is draining local business from our streets. It also creates a very energy intensive distribution system since we now have to drive miles to satisfy our needs. All these developments are symptoms of a deeper underlying pattern.

---

5 It should be noted that Jacobs was observing the operation of old ethnic, mostly working-class social formations based on strong community interactions, which were slowly disappearing at the time. Currently, many of the older neighbourhoods in urban settings have undergone or are undergoing gentrification, which results in a very different social formation.
6 Statistical morality is often based on numerical data held to be indicative of social pathology. These would include, for example, statistics on suicide, divorce, mental health, and abortion.
The 20th century transformed the technology-based connectedness into a technique-based connectedness. Our contemporary knowledge infrastructures are oriented toward strengthening technique-based connectedness, resulting in a further desymbolization of human cultures. In light of these developments, experiential explorations of human life on neighbourhood sidewalks must be revisited and the findings re-examined through the lenses of relevant disciplines. Some of the above developments may undermine the order of sidewalks, while others may strengthen it. In terms of biosphere impacts, by enabling more sidewalk use, the energy intensity of overall mobility will drop; and there is no question that the infrastructure requirements will also be reduced. The question remains as to whether these shifts are sufficient to make livable urban forms sustainable by the biosphere.

We may conclude from this overview that methodologies for the establishment and refinement of designs for livable and sustainable urban forms are of great strategic importance. It is from this broad context that we will seek to reinterpret what we know about the relationships between urban design and walkable streets. Furthermore, this broader context must be kept in mind as a reminder that our success or failure to create design exemplars for livable streets and neighbourhoods has profound consequences for an increasingly urbanized humanity. Hence, a precautionary principle should be introduced to the implementation of research findings.

Chapter 3: A review of urban form and mobility literature

3.1 Introduction

---

7 The technique-based connectedness of human life and society evolved out of technology-based connectedness. It represents a network of flows of matter and a network of flows of energy resulting from exchanges between all the activities of the way of life of a society. The emergence of the phenomenon of rationality, as examined by Max Weber, and its mutation into the phenomenon of technique, as examined by Jacques Ellul, transformed this technology-based connectedness into the technique-based connectedness of so-called industrially advanced societies. This transformation has been examined in detail in Living in the Labyrinth of Technology (Vanderburg, 2005).
There is a large body of literature exploring the relationship between different urban design approaches, the impacts on mobility, and ultimately, the link between urban form and the creation of more walkable cities that are not heavily auto-oriented. The following chapter explores some current literature with the following broad questions in mind: Can urban form influence travel behaviour? How do different aspects of urban design contribute to making more walkable communities? And ultimately, how should we move forward in our urban development? The aim is also to provide an argument for the use of qualitative analysis in developing a nuanced understanding of the issues involved in determining mobility patterns and mode-choice, as well as informing more robust quantitative models.

3.2 A closer look at mobility

The city can be viewed as a beautifully complex creation. It can also be seen as something that is poisonous, full of despair and inequality. Throughout history, it has been both and continues to motivate research aimed at improving its livability. Much of the urban growth since World War II has been shaped by auto dependence. With its congestion, smog, noise and air pollution, the auto city can induce high stress levels and alienation among its inhabitants, while heavily straining the biosphere. The unsustainable nature of current urban growth, transportation and land use patterns is widely recognized; what is less clear is how to move forward given the complexity of urban systems.

The body of research addressing this topic varies greatly in its scale, its implications and its conclusions. The ongoing debate regarding which urban form designs are more sustainable has been discussed by many scholars (Gordon and Richardson, 1989; Gordon and Richardson, 1997; Ewing, 1997; Handy, 1996; Newman and Kenworthy, 1999; Anderson et al., 1996; Crane, 2000; Badoe and Miller, 2000). The literature is indicative of the charged, ideological, and value-laden nature of the issues. Researchers continually work to find verifiable evidence that supports or dismisses the contention that particular built form variables will affect travel choices. For many, an efficiently planned transportation and land use scheme is seen as both a key part of environmental initiatives but also as part of a larger effort to restore a better quality of life amongst neighbourhoods and communities (Crane, 2000).

A well-functioning transportation system requires cooperation between urban design, land-use policies and public transit supply. To face issues of resource depletion, climate change and overall livability, it is clear to most urban scholars that we cannot continue to build heavily auto-oriented cities. There are two general approaches toward transportation network design: supply-side solutions and demand-side solutions. Supply-side solutions include building more roads, increasing the number of lanes in a main urban artery, optimizing traffic signals to decrease congestion, creating more commuter train lines, etc. All of these solutions strive to make it easier for people to manage their mobility while keeping our travel patterns relatively stable. Conversely, demand-side solutions strive to reduce our need for mobility. They examine the way all elements of urban form work together to shape the way we travel, and find ways to reduce our travel distances, increase active travel and lessen the burden of the automobile on the environment and on our quality of life. To do this it is necessary to assess the locations of
origins and destinations, the types of land-uses in a particular area, the integration of public transit into communities, the residential densities that are meant to support public transit, and much more.

3.3 Quantitative research

A variety of quantitative approaches are used to explore the issue of travel behaviour and its relationship with built form. These include multivariate statistical studies, probability mode-choice models, household activity-based models, and more. The studies fall under two general categories: macro-level work, which examines overall development density and urban structure, and micro-level work, which examines local neighbourhood design. Both types of studies can be revealing in terms of both the descriptive analyses that emerge, as well as the links identified between certain built form variables and travel outcomes. However, it is apparent from the literature that findings are not always consistent across different studies, resulting in a lack of clarity with regards to policy implications. One issue that emerges from some of the macro-level studies stems from over-aggregation of data. One of the most well-known macro-level studies of residential density and its relationship to automobile use, conducted by Newman and Kenworthy (1989, 1999), has been criticized for over-aggregation of variables into gross spatial units that are not homogenous with respect to design characteristics, land use, and socio-economic characteristics. As a result of ignoring this variability, the effects of specified characteristics are unclear.

The early research dealing with micro-level questions regarding the role of different neighbourhood designs in shaping travel behaviour is based on using aggregate statistics. This research has led to several general results: people drive less in areas with higher residential density, superior accessibility to public transit, more pedestrian amenities, traditional design (as opposed to suburban design), and mixed-use centres (Holtzclaw, 1994; McNally and Kulkarni, 1997; Cervero and Gorham, 1995; Ewing et al., 1994; Hess et al. 1999). Later works use more disaggregate approaches, analyzing the behaviour of individual households through an analysis of variance, regression models or probability models (Kitamura et al., 1997; Cervero and Kockelman, 1997; Handy, 1996, Zhang, 2006). Currently, the most commonly discussed principles for sustainable neighbourhood design are embodied in the ideas of New Urbanism, traditional neighbourhood design (TND) and transit-oriented development (TOD): walkable urban villages with a variety of housing, mixed land-use, and street design that is conducive to effective public transit. These design philosophies are aimed at reducing the number of motorized trips, increasing the share of non-motorized trips, reducing travel distances, and increasing vehicle occupancy levels (Cervero and Kockelman, 1996). All three approaches are linked through their focus on density, diversity and design.

Overall, the later research suggests that pedestrian orientation, higher land use mix and higher density lead to reduced automobile trip rates. However, the disaggregated empirical models tend to yield mixed results in terms of the statistical significance of various built form variables. Badoe and Miller (2000) conclude that the reason for discrepancies in findings stems from weaknesses either in data quality or methodology. Many such studies analyze individual trips independently, which does not allow for a clear picture of sequential, multi-destination travel. For example, someone may choose to drive to the bakery, not because a car is required for this trip but because it is on
the way to the grocery store (a trip that may require a car). Later, more sophisticated, tour-based or activity-based models were developed in order to help deal with this methodological issue.

### 3.3.1 Regression, factor analysis and mode-choice models

Regression analysis can be used to determine the statistical significance of certain independent variables on a variable of interest. Often these models are used when assessing the impact of urban form on travel behaviour. They are often used alongside mode-choice probability models, such as logit, nested-logit or joint models. When applying regression, it is important that the independent variables do not exhibit significant correlation. Because this is often not the case when examining explanatory variables related to urban form, some researchers use factor analysis. Factor analysis is used to describe variability among observed variables in terms of a potentially lower number of unobserved variables called factors (Cervero and Kockelman, 1997). Thus, variables are combined to represent an overarching factor, helping to avoid the effects of multicollinearity. For example, side-walk width, street width and lighting distance could be combined to represent a “walking-quality” factor.

In a well-known study, Cervero and Kockelman (1997) examine the transportation objectives of smart growth and New Urbanist policy using travel and socio-economic data from the 1990/91 Bay Area Travel Survey (BATS). They test the idea that automobile use can be reduced through changing the 3Ds — the density, diversity and design dimensions — of a built environment. The paper examines the relative influence of these dimensions on three common transportation objectives: reducing the number of motorized trips; increasing the modal share of non-motorized trips; reducing travel distances and increasing vehicle occupancy levels for motorized trips.

Multiple regression is used to predict the impact of the built environment on vehicle miles traveled (VMT), and a binomial logit analysis is used to predict the probability of a person traveling by non-personal-vehicle or non-single-occupancy-vehicle (SOV) mode. The underlying assumption is that travel is a derived demand, and therefore bringing origins and destinations closer together will lead to changes in travel behaviour. The researchers use factor analysis, testing variables that collectively or individually capture the 3Ds for the 50 neighbourhoods studied while controlling for demographics, household characteristics, transportation supply, and Euclidean trip distances. These models led to the conclusions that density, land-use diversity and pedestrian orientated designs generally do reduce trip-rates and encourage non-automobile travel in statistically significant ways. However, it appears that their influence is modest at best. The authors conclude that the 3Ds must coexist if meaningful transportation benefits are to accrue. For example, pedestrian amenities in a low-density, residential-only neighbourhood are unlikely to prompt walking.

The Cervero and Kockelman paper has had a significant impact on research addressing the relationship between built form and travel behaviour. A concern with the study is the mode-choice grouping. Lumping walk, bicycle and transit trips as “non-personal-vehicle” hurts the precision of the mode-choice and dilutes the impact of

---

8 For a detailed description of logit models, see Ben-Akiva M., Lerman S., 1985.
certain built form characteristics. For example, the presence of convenience stores would be expected to induce some walking trips but would have little impact on transit trips. Also, while the use of factor analysis avoids problems of colinearity between variables, it does not allow the measurement of the travel effects associated with individual elements of the built environment. Finally, when reviewing the results of the study, it should be noted that the researchers primarily focused on residential areas and non-work trips, and the households used were not randomly sampled and were generally wealthy with smaller than average household sizes. Thus, the results do not reflect the experiences of lower-income households.

Cervero and Duncan (2003) take the above study further by assessing the links between urban environment and non-motorized travel, giving particular attention to walking and cycling. Because these trips are generally shorter than auto trips, a finer analytic resolution is required for assessment. Also, barriers to walking or bicycling, such as steep slopes, unlit areas, safety level in the neighbourhood, and curvilinear/cul-de-sac street layouts must be considered. In this study, the influence of urban design, land-use diversity and density patterns on the choice to walk or bike, vis-à-vis other factors, are examined using San Francisco Bay Area data from the year 2000. The analysis was limited to include trips that were potentially walkable or bikeable, such as social visits, meals, personal services, recreation, volunteer/civic/religious activities and shopping. Also, trip records of less than 5 miles were selected, assuming that this is a walkable distance range. Discrete logit-modeling was used to determine the probability of a person choosing walk, bike or motorized modes depending on the choice set available for particular origins and destinations. The hypothesis is that the built environment surrounding the origins and destinations are significant explainers of the decision to walk or bike, after controlling for impedance factors such as distance, slope and time, as well as personal and household characteristics of the trip maker. Once again, factor analysis was used to represent the 3Ds.

The analysis reveals that urban landscapes in the Bay Area have a modest and sometimes statistically insignificant effect on walking and bicycling. While connectivity, small blocks and mixed land uses did induce non-motorized transport, exogenous factors such as topography, darkness and rainfall had far stronger influences. Demographic characteristics of trip makers were also strong predictors. The results also suggest that built environments exert bigger impacts on walking and biking around origins (i.e. a person’s neighbourhood of residence) than destinations.

Again, the results show a weak link between built form and travel behaviour, which is in accordance with much of the literature on this topic. It seems unintuitive that urban design would only exert modest impacts on the way people travel; it is possible that the absence of strong statistical relationships reflect the use of imperfect variables to capture the many features of the built environment. Due to data limitations, it is not always possible to represent urban design adequately. Cervero and Duncan (2003) use factors such as connectivity, block size and land mix; it is not surprising that such variables would not have as strong an effect on walking as perhaps transit use (as long as the transit supply exists). Conceivably, a different set of variables would have provided different results.
Furthermore, the authors recognize that statistical analyses should be supplemented by micro-level qualitative case studies and surveys to account for possible influences that probability and regression models cannot capture.

The above issues highlight the importance of adequate model specification and meaningful variable characterization. It is not always easy to translate the reality of a built form into quantifiable variables that can be used in models. For example, one would intuitively expect that road structure would have an effect on automobile usage, walkability and transit-orientation. However, in several studies it appears that road structure variables are not statistically significant in mode-choice models (Cervero and Kockelman, 1996; Parsons Brinkerhoff, Quade and Douglas Inc., 1996; Messenger and Ewing, 1996). The same is true for land-use mix and other built form characteristics. Such results raise questions with regards to the characterization of these variables. It is likely that they are being defined and quantified in ways that are inadequate. In their study of pedestrian trips for shopping and strolling purposes in Austin, Texas neighbourhoods, Handy, Clifton and Fisher (1998) emphasized the importance of qualitative analysis of their survey data in developing their statistical model.

Recently, several researchers have published review articles that summarize some of the issues, results and conclusions regarding the impact of built form on travel behaviour (Handy, 2005; Saelens and Handy, 2008; Cervero and Ewing, 2010). Cervero and Ewing (2010) conducted a meta-analysis of the built environment-travel literature up to 2009 in order to draw some generalizable conclusions for practitioners. The purpose was to quantify the magnitude of effects, update some earlier reviews on the subject and also address the methodological issue of self-selection. To do this, they computed elasticities for individual studies and pooled them to produce weighted averages. Results show that travel variables are generally inelastic with respect to changes in built environment measures. Individual variables characterizing built form had weighted average travel elasticities of less than 0.39. However, in combination, the effect of several such variables on travel could be quite large. This finding is very interesting because it suggests that no one particular built form variable can necessarily be attributed to a certain behavioural outcome. It is perhaps the overall experience of several variables in combination that ultimately determines the choices people make. In other words, one reason why some of the findings in the literature show a weak connection between built form and travel behaviour could stem from an over-emphasis on the influence of particular variables. The authors also stress the importance of recognizing that very few studies control for residential preferences and attitudes, and as a result, the elasticities derived in their work contain unknown error and have unknown confidence intervals. The issue of self-selection is still not well understood in the literature, as will be explained in section 3.3.3.

3.3.2 Social interactions and activity-based models

Another approach toward understanding the role of urban form in shaping travel behaviour is the use of travel demand modeling. Over the past several decades, the state of best practice in this area has steadily progressed
from the conventional four-step, trip-based models toward nested multi-level tour-based models. These models are often labeled as “activity-based” because they model a set of connected trip chains rather than a set of unconnected individual trips. This results in much more sophisticated models that are based closely on an understanding of the ways in which individuals experience daily-life travel in their urban environment.

Activity-based approaches are beginning to enter practice in many jurisdictions across North America (Roorda et al., 2008; Davidson et al., 2007). Travel behaviour modelers increasingly agree that activity-based approaches are superior to conventional approaches; early examples of such models have been described by Kitamura (1988), Jones et al. (1990) and Pas (1990). Kitamura has had an enormous impact on these approaches, particularly in operationalizing the concept of time-space constraints into models that determine travel behaviour. This has helped in the understanding of how travel choices are constrained by the context within which decision-makers find themselves (Miller, 2009). Activity-based modeling approaches recognize that travel arises out of the need to participate in out-of-home activities. As such, to understand trip-making and travel behaviour, we must also understand how individuals organize their responsibilities, social activities, provisionary obligations, etc. Ultimately, the need and desire to participate in activities, coupled with the mobility and accessibility options available, will determine overall travel behaviour. These models also consider that travel decisions are made within the context of household interactions, constraints and needs.

In order to implement dynamic, disaggregate activity-based models, microsimulation frameworks can be used. In this way, the travel behaviours of individual, disaggregate agents are modeled using base-year data. The system is evolved toward an end state through the dynamic decision-making of the modeled agents. One example is the Travel/Activity Scheduler for Household Agents (TASHA), a model of activity scheduling and mode choice that is designed to improve upon current four-stage modeling systems used in the Greater Toronto Area (GTA) (Roorda et al., 2008). TASHA represents behavioural decision-making through the inclusion of spatial and temporal constraints, which allows for better sensitivity toward demand-oriented policies. It is an agent-based microsimulation model that represents persons and households as “intelligent objects” who are capable of perceiving their contextual environment and making decisions. Currently, the microsimulation is run for a 5% sample of households in the GTA.

The TASHA model can operate on its own, or be embedded within the Integrated Land Use Transportation Environment (ILUTE) modeling framework for forecasting long-term and short-terms decisions of households and firms that lead to the evolution of urban areas (Salvini and Miller, 2005). ILUTE simulates the activities of persons (within households), transportation networks (road and transit, but also pedestrian and cycling infrastructure), houses and commercial buildings, the economy (interest rates and inflation), and the job market. As such, it enables researchers to capture some of the complex interactions that occur within an urban environment, and gain a sense of

---

9 For an explanation of these concepts, see Michael D. Meyer and Eric J. Miller (2001).
how higher-level decisions (e.g. where people chose to live) influence lower-level decisions (e.g. daily travel behaviour) (Salvani and Miller, 2005).

The development of such activity-based microsimulation models is incredibly challenging and complex. The power of these models depends largely on the ability of the individual sub-parts to credibly capture the behaviour of real-life entities (Salvini and Miller, 2005). Much work remains in improving these kinds of modeling frameworks to help them better capture the evolving, dynamic nature of urban development and the travel behaviour of city residents. Doing this will require further optimization of these modeling frameworks, but can also be helped through data collection that is directed by exploratory, qualitative research.

3.3.3 Attitudes and preferences

One of the most difficult issues to resolve in this area of research stems from the sheer number of different ways urban form can influence travel behaviour (Krizek, 2003). In some cases, urban form directly influences the range of travel possibilities available to a household (i.e. no public transit available). In other cases, urban form is what determines the relative attractiveness of each travel choice (i.e. public transit is available, but stops are too far from homes and service is infrequent). Another layer of complexity stems from questioning the direction of the causal relationship between urban form and travel. This methodological problem of “self-selection” is of increasing interest to researchers. It is difficult to untangle to what extent travel patterns can be attributed to urban form, and to what extent they can be attributed to the preferences of those who choose to live in the study area. People may locate in neighbourhoods that facilitate their travel preferences. There are many studies in the literature that identify the importance of incorporating attitudes and preferences into models in order to address the methodological issue of self-selection (Kitamura et al., 1997; Bagley and Mokhtarian, 2002; Krizek, 2003; Schwanen and Mokhtarian, 2005; Cao et al., 2009). These studies suggest that attitudes toward travel and land use underlie the association between travel behaviour and urban form. In other words, households with an affinity for walking or transit may choose to reside in neighbourhoods with an urban form that supports these modes. Thus, differences observed in travel behaviour between households in different neighbourhoods may not be attributed to urban form alone.

Krizek (2003) conducted a study that analyzed the travel behaviour of the same households in a longitudinal manner in concert with detailed built form measures. Urban form was captured using a unique strategy specific to each residential location. The study attempts to assess whether or not travel behaviour changes between two consecutive years, and to what extent any change in behaviour can be attributed to different urban form settings as opposed to changes in preferences. Results suggest that when households relocate, their travel behaviour changes as well, all else being equal. Regression models show that increases in neighbourhood accessibility results in reduced automobile use. The author recognizes that the study does not fully resolve the self-selection issue because the choice of neighbourhood and travel preferences are tightly woven together and difficult to characterize as dependent variables. Other studies, which have attempted to include attitudinal and lifestyle explanatory variables into their models have found similar limitations in their variable choices (Bagley and Mocktarian, 2002).
More recently, Cao et al. (2009) provide a thorough review of the empirical findings related to residential self-selection. The work reviews 38 empirical studies and identifies nine methodological categories for addressing self-selection: direct questioning, statistical control, instrumental variables, sample selection, propensity score, joint discrete choice models, structural equations models, mutually dependent discrete choice models and longitudinal designs. Almost all of the studies reviewed found a statistically significant influence of the built environment remaining after self-selection was accounted for. Thus, the influence of built form cannot be denied; however, it is difficult to assess the strength of the autonomous influence of the built form relative to the influence of self-selection. It is also difficult to determine whether that autonomous influence is “large enough to matter” on its own terms.

3.3.4 Descriptive studies

Descriptive studies can provide a picture of the travel outcomes within a particular country, region, or case study area. They represent an important step toward understanding the travel behaviour of various groups of people by revealing mobility patterns in different settings. While they do not always attempt to explain the travel behaviour, they provide an understanding of general trends over a set period of time. These kinds of studies can be either qualitative or quantitative in nature, depending on the methodologies used and the goals of the research.

An example of such a study is Miller and Shalaby’s (2003) work looking at personal travel in the Greater Toronto Area (GTA) and the policy implications. The study examines travel trends throughout the GTA over the past 35 years within the context of the region’s evolving urban form. The trends they identify suggest that Toronto may have fallen behind in terms of progressive transportation and land-use planning. Traditionally, the Toronto central area has provided a strong, viable transit service and relatively high density, transit-oriented development. However, the analysis indicates that, as a whole, the GTA is becoming more and more similar to other North American cities. The authors identify trends of increasing auto-ownership, increasing single-occupant vehicles, increasing suburbanization of population and employment into areas poorly served by transit, increasingly complex travel patterns, and transit maintaining (at best) a constant number of trips per capita but losing modal share. In revealing such trends, the study provides a very useful assessment of the current conditions in the GTA and many insightful policy implications.

The combination of all these trends points to an increase in auto dependency in the GTA; however, the study points out some important ways in which the City of Toronto in particular deviates from North American norms, possessing qualities that are conducive to sustainable transportation and land-use. For example, the TTC and GO-Transit both provide a very strong base for improved transportation systems. The continuing vitality of Toronto’s central area supports such transit systems as well. The GTA is at a crossroads with respect to the development of sustainable transportation and land-use linkages. There is tension and incompatibility between the auto-dominated suburban expansion occurring outside of the city of Toronto and the strong transit-oriented urban form within the city. The decisions made over the next few years will likely have a great influence on the future
shape of this region. In making such decisions, Toronto can learn from itself; the city has clearly demonstrated that coordinated land-use and transportation planning designed to promote transit does in fact work.\(^\text{10}\)

### 3.4 Qualitative research

One key difference between quantitative and qualitative methods is in their flexibility. While quantitative methods are generally inflexible and fixed, qualitative methods allow for greater spontaneity and adaptation, particularly between the researcher and the study participants. Such methods enable the use of open-ended questions and probing, which gives participants the chance to respond in their own words, rather than choosing a fixed response to sum up their experiences. As a result, qualitative work can provide a more thorough understanding of what the important questions are, the best way to ask them, and the range of possible answers. This information can be later applied to the development of more robust quantitative instruments.

A brief overview of the quantitative literature reveals certain limitations with respect to understanding the magnitude and direction of urban design impacts on travel behaviour. Intuitively, it is expected that built form factors would influence mode-choice and travel activities. From experience, it is clear that certain neighbourhoods tend to have a greater variety of choices available, and thereby exhibit different related travel behaviour than those that are primarily auto-oriented. Yet, the findings in this area are ambiguous, with many studies concluding that the relationship between built form and travel is modest and often statistically insignificant. Using empirical models to quantify these relationships have benefits; however, they also have limitations in that they cannot always capture the nuances and complexity of the way people travel.

There are difficulties involved in the quantification of the many aspects of urban form; finding the right set of indicators and the related data is not an easy task. For example, a common way of quantifying the degree of land-use mix is through the use of the entropy index. The mean entropy ranges between 0 (homogeneity, wherein all land uses are of a single type) and 1 (heterogeneity, wherein developed area is evenly distributed among all land-use categories). The problem with this indicator is that no distinction is made with regards to the type of land-use. Thus, an entropy value of 0.75 could represent a tract that has both residential, commercial and employment zoning; however, it could also represent a tract that has industrial, employment and commercial zoning. The outcome of these land mixes would be different and not represented by a simple indicator. Also, it is important not to infer direct causal relationships between the effects determined through particular set of indicators and a particular policy. The relationships may be associative; however, the policy under investigation is usually only one of many factors that determine the outcomes revealed through indicators.

In general, empirical models have limitations in their ability to reveal a complex and nuanced picture of policy impacts. For this reason, it is important to support such quantitative work with qualitative analysis when possible. What makes these analyses complementary is in part due to the varying ability to generalize findings to

---

\(^{10}\) Other examples of descriptive studies include Friedman et al. (1992) and Rutherford et al. (1996)
wider groups and circumstances. Quantitative research tends to fragment and delimit phenomena into measurable, “common” categories that can be applied to wider subjects and circumstances. As a result, through the establishment of elements that, by definition or distortion, are common to all, it attempts to deal with both external and internal validity. However, because of this focus on generalizable statistical relationships, it is possible that some accuracy is being sacrificed for generalizability. One way of dealing with this problem is to use qualitative methods alongside quantitative methods in a complementary way. Qualitative methods can establish internal validity within studies because of the way they deal with the meanings and experiences of the 'whole' person, or localized culture (Winter, 2000). In other words, the associations established through this kind of work have the potential for strong internal validity. In this way, qualitative methods provide a context for the generalizable relationships found through quantitative work, and vice versa.

It should be noted that the distinctions between quantitative and qualitative methods and the data derived from them are not always clear. Travel surveys increasingly incorporate questions about qualitative factors that may influence travel behaviour – attitudes about the environment or orientation to leisure (Clifton and Handy, 2001; Lund, 2003). As a result, it is important to look at attitudinal surveys because of their role in clarifying the importance of qualitative factors in travel behaviour research. It should also be noted that data gathered using qualitative methods such as interviews and focus groups can also be quantified (although rarely are the samples large enough to yield statistically-significant results).

3.4.1 Attitudinal surveys

As mentioned, although not generally considered to be qualitative, attitudinal surveys provide a means for measuring qualitative variables. These surveys usually ask a series of attitudinal questions in the form of statements with which respondents are asked whether they agree or disagree on a 5-point or 7-point scale, called a Likert scale (Clifton and Handy, 2001). Such surveys tend to show the importance of attitudinal factors, and their relative significance amongst traditional demographic variables in relation to travel behaviour.

Kitamura, et al. (1994) included attitudinal questions in their three-day travel diary survey of residents of five neighbourhoods in the San Francisco Bay Area. The questionnaire included questions about the respondent’s neighbourhood preferences and feelings about his current neighbourhood. Factor analysis was then used to transform the 39 attitudinal questions into 8 factors, which were then modeled. The analysis showed that the attitude factors were strongly associated with the travel demand measures used. In fact, these factors proved to have more explanatory power than the demographic and socioeconomic variables.

---

\[1^{1}\] Internal validity addresses the "true" causes of the outcomes observed in a study. Strong internal validity suggests reliable measures of independent and dependent variables, and a strong justification that causally links independent variables to dependent variables. External validity addresses the ability to generalize study outcomes to other people and other situations. To have strong external validity generally a probability sample of subjects or respondents drawn using "chance methods" from a clearly defined population is needed.
One challenge associated with attitudinal surveys is the difficulty in formulating questions that do not have significant wording biases. Even the order of the questions can result in contextual effects that call the findings into question (Clifton and Handy, 2001). Other methods such as focus groups or one-on-one interviews can help further explore the information gained from attitudinal surveys in order to expand our understanding about how these preferences are formed and how they influence travel decisions.

3.4.2 Interviews and focus groups

Two common qualitative methodologies used in the study of travel behaviour and urban form are in-depth personal interviews and focus group style interviews. When using these approaches, a group of travelers is identified and a sample is selected. Often, this sample is not statistically representative of the particular population under study; this is because such analyses are usually exploratory. In other words, interviews and focus groups are often held in order to identify the context within which the population travels. This understanding can then be applied to the development of more statistically representative quantitative studies.

Both focus groups and personal interviews can provide rich, situational responses. One-on-one interviews have the benefit of avoiding confidentiality issues and normative pressures that can be a problem with focus groups. When very detailed, personal information regarding household circumstances is required, one-on-one interviews could prove to be more useful than focus group discussions. On the other hand, conducting personal interviews can be very time-consuming and require the interviewer to have significant education and training. Also, the benefit of group discussion is lost – a successful focus group can turn into animated discussions requiring little interference from the facilitator.

A study conducted by Lovejoy and Handy (2008), which looks at the travel behaviour of recent Mexican immigrants living in California, describes an effective use of focus group methodology. The work explores the ways in which recent immigrants, with varying language-skills, income levels, and accessibility to public transit or personal vehicles, secure transportation for their daily-life activities. Particularly, the researchers were interested in determining the role the automobile plays in the lives of those who are not car-owners. To conduct this analysis, focus groups were assembled in six different California cities, which were selected to reflect a range of different city sizes, regions and types of immigrant communities. A total of 102 participants were recruited, with 49 and 53 in the car-owning and car-less groups, respectively. Based on the interviews, the researchers found that auto-ownership is not always the best measure of vehicle access. Participants reported extensively sharing cars, borrowing cars and car-pooling in order to obtain vehicle access. Seven “dimensions of access” were identified as specific factors that influence levels of vehicle accessibility. These include reliability, immediacy, flexibility, directness, punctuality, independence and trip realization. In future work, these dimensions can be quantified to assess individual mobility.

---

12 For this work focus groups were used, despite the risk of peer pressure affecting the answers given by the teenagers. This method was chosen because of the difficulty involved in recruiting teenage participants for a one-on-one interview. It was much easier to attract teenagers to a group discussion involving pizza and pop, likely because of the social aspect.
either by auto or by other modes, and can be compared against traditional measures of vehicle availability (such as auto-ownership).

Another study conducted by Beirao and Sarsfield Cabral (2007) looks at attitudes and perceptions of toward public transportation versus the use of a private automobile. The work presents data from a qualitative study involving in-depth interviews with 24 participants in Porto, Portugal. The study attempts to understand the main influences affecting mode-choice, with an emphasis on exploring the attitudes participants have toward public transportation. Findings indicate that in order to increase the popularity of public transit, the service must better accommodate varying needs of a range of different kinds of travelers. Many travelers feel that the current service is inadequate and inconvenient and as such, feel more reliant on private vehicle travel.

In the same vein, Lucas (2009) conducted a more extensive study examining the nature of car ownership and use within British society. The work draws on National Travel Survey data, a review of international literature and British attitude surveys, and findings from exploratory focus groups. The study finds that the car is the most dominant mode of travel in most people’s daily lives, and is viewed as a major asset by most households. Participants regularly refer to work or home location as a main reason for needing a car, and many identify grocery shopping as the trip that is most unmanageable without a vehicle. Those from non-car-owning households rely heavily on friends and families to drive them around, and mention feeling like a burden on those around them. These participants also mention feeling trapped and isolated without a vehicle. Car-owning participants identify cost as a major downside to auto-ownership, and some said that they would prefer not to drive, but felt they had no choice.

A particularly interesting use for qualitative analysis is in conjunction with activity-based models for the assessment of individual and household travel behaviour on a disaggregate level. Work done by Kusumastuti et al. (2010) reveals the power of qualitative approaches in capturing aspects of travel behaviour, such as detailed decision-making process information, which can then deepen insight into travel behaviour from an agent-based perspective. To do this, they apply a semi-structured interview method called the Causal Network Elicitation Technique (CNET). This method elicits individuals' thoughts regarding fun-shopping related travel decisions, i.e. timing, shopping location and transport mode choices, by encouraging participants to think aloud about their considerations when making decisions. The protocol was tested in Hasselt, Belgium, using 26 young adults as respondents. Results highlight different interrelated contexts, instruments and values considered when planning a trip. These findings can give feedback to current activity-based models to raise their behavioral realism and to improve modeling accuracy.
Chapter 4: Current literature on teenage travel behaviour

4.1 Current research on independent teen travel

There is a limited body of research exploring the specific transportation needs of teens, and a slightly larger body of research focused on child travel in general. Most of this literature focuses on the trip to school. Within the teen literature, a general lack of access to independent means of travel has been identified, causing teens to rely on adults for much of their travel. A study by McDonald (2006), using data from the 2001 National Household Travel Survey (NHTS), shows that, in general, youth travel is automobile dominated with nearly 75% of trips being made in private vehicles. This focus on the automobile has major health and environmental implications, but also represents a constraint on the caregivers of teens without a driver’s license. In fact, children have been included as a variable in transportation studies to determine the extent of their influence and constraint on the scheduling of activities and trips (Bhat, 1998; Damm and Lerman, 1981).

The findings also have equity implications; children are five times more likely to travel with their mothers as with their fathers (McDonald, 2006). Several other studies have also shown that women bear most of the responsibility for chauffeuring children and make more trips to serve passengers than men (McDonald, 2008a; Blumenberg, 2004; England, 1993; Kwan, 1999). Once youth reach driving age, their behaviour dramatically favours the automobile, with 40% of American teens aged 16-18 reporting to be the primary driver of a household vehicle. Research conducted in various communities in the United States shows that teens gain greater independence as they age; however, this independence comes with a greater reliance on the automobile. Younger teens use a wider variety of modes (Clifton, 2003). By late adolescence, the automobile is a well established part of the lives of American teens. Relatively little is known about the degree of automobile dependence amongst teenagers in the Canadian context.

4.2 Active travel and transit use

The degree of auto-dependency and lack of independent travel amongst American teens can partially be attributed to a general lack of transit use. There are over 28 million teenagers in the United States, making up approximately 9 to 21 percent of U.S. transit ridership depending on urban area size (Cain, 2006). Transit accounts for approximately 1 to 3 percent of teenagers’ aggregate person trips. This can be attributed to lack of transit supply, reliability issues, safety concerns, cost and general negative perceptions associated with public transit travel (Cain 2006).

Lack of transit infrastructure and the issue of independent travel often lead to questions regarding the driving behaviour of teenagers. Particularly, when they choose to get their license, how often they drive, and the possible role the built environment has in determining these outcomes. Trowbridge and McDonald (2008) examined the link between urban sprawl and vehicle miles driven daily by teenagers. The work was motivated by a concern for teen driver fatality rates per mile driven, which are significantly higher than adults, making the identification of
environmental influences on travel behavior particularly important in this age group. Driving and demographic data for 4528 teens aged 16-19 years were obtained from the 2001 National Household Transportation Survey (NHTS). Using logistic regression, the association between daily miles driven by teens and sprawl, controlling for demographic characteristics, was modeled and the probability of driving more than 20 miles in counties with varying degrees of sprawl was calculated. Overall, teens in sprawling counties were more than twice as likely to drive over 20 miles/day as teens in compact counties, a trend most prominent among the youngest drivers. Given the relationship between driving exposure and fatality risk among teens, the study pleads for increased efforts to understand and modify the effects of sprawl on adolescent driving behavior.

The authors followed up with another study (McDonald and Trowbridge, 2009) that examines the role of the built environment in determining when American teens become drivers. Data from the 2001 National Household Travel Survey were used to estimate the effect of residential density on the driver status of teens aged 16 to 19 years after controlling for demographic characteristics. Results show 16 and 17 year old teens in high density neighborhoods had driver rates 15 percentage points below teens living in less dense areas. The effect for 18 and 19 year olds was a 9 percentage point decrease. In other words, teens living in less dense and more sprawling communities initiate driving at a younger age than comparable teens in compact areas. As such, the authors emphasize the importance of considering the role of factors such as neighborhood walkability and provision of transit, when attempting to curb automobile use and dependence amongst young people.

In relation to automobile usage amongst teens, another growing concern is the reduction in active travel mode-use for both discretionary and school travel. Studies show that the issue of active travel can be linked to variables that are not always directly linked to urban form. Kerr et al. (2007) look at pedestrian travel in Atlanta by youths aged 5-18 years. The results show a more significant relationship between urban form variables and the travel choices of people in high-income households. Among low-income and non-white youth, environmental variables generally exhibited weak associations with the choice to walk. This suggests that lack of vehicle access creates a necessity to walk that would exist regardless of whether a neighbourhood is walkable or not. McDonald’s (2008b) study of walking and biking rates among low-income and minority youth in the U.S when traveling to school reveals similar results. 2001 National Household Travel Survey show that low-income and minority groups, particularly blacks and Hispanics, use active travel modes to get to school at much higher rates than whites or higher-income students. However, racial variation in travel patterns is removed by controlling for household income, vehicle access, distance between home and school, and residential density.

Tal and Handy (2008) examine children’s biking for non-school purposes, specifically exploring the factors associated with biking to Saturday morning youth soccer games in Davis, California. The findings show that over three-quarters of players and their parents drove to the game, with fewer than 20% biking. While the distance from home to the game is a significant deterrent to using non-motorized modes, players who bike to school and whose parents bike regularly are much more likely to bike to the games. Although this study focuses on a very specific
case, it points to the need for more research exploring the influence of physical, attitudinal and logistical factors on a child’s mode choice.

Hjorthol and Fyhri (2009) also study mode-use for children’s organized leisure activities, and ask whether such activities actually encourage car use. They hypothesize that organized leisure activities are often not located in the child’s residential neighbourhood, and explore the impacts of this through an examination of a nationwide survey in Norway that focuses on child mobility. Results suggest that a large proportion of children participate in leisure activities such as sports and music lessons, and that the car is the main mode of transportation to such activities. In fact, car mode shares are higher for these trips than for the trip to school. The analysis indicates that although distance to activities is a major influence on car-use, parents travel habits also have an impact on mode choice for these purposes.

Waygood and Kitamura (2009) examine levels of active, independent travel amongst children in the Osaka metropolitan areas of Japan. This area is particularly interesting because of its transit-oriented development patterns. Neighbourhoods have grown around train stations surrounded by mixed-used development. Adult travelers in this region often use non-motorized modes. To examine youth travel behaviour, the study considers measures of social cohesion, independent travel mode splits and average travel times. The findings show that children tend to travel independent by foot in areas with a higher population density and a greater level of social cohesion.

4.3 Trip to school

Recently, there has been attention placed on the trip to school, focusing on the shift from children walking to school to be predominantly driven there by a parent (Grize et al., 2010; Buliung et al., 2009; Ewing et al., 2004; Fulton et al., 2005; McMillan, 2005, 2006). Panter et al. (2010) examine the potential associations between active school travel and urban form. The study aims to assess whether objectively measured characteristics of the neighborhood, route, and school environments are associated with active commuting to school among children, and whether distance acts as a moderator in this relationship. A cross-sectional study was conducted of 2012 children aged 9-10 years attending 92 schools in the county of Norfolk, United Kingdom. Questionnaires were completed by children and parents during and attributes around the home and children's route to school were assessed using a GIS. Findings indicate that almost half of the children usually walked or cycled to school. Children with higher density of roads in their neighborhood were more likely to walk. Distance did not moderate the observed associations.

McMillan (2007) examines the influence of urban form on the trip to school, as well as the magnitude of influence urban form and non-urban form factors have on children’s travel behaviour. The study focuses on 16 elementary schools in California in order to assess ways in which the Safe Routes to School (SR2S) policies can be made more effective. Odds ratios indicate that perceptions of neighbourhood and traffic safety, transportation options, and social/cultural norms have a greater magnitude of influence on travel behaviour than that of urban form. However, it was found that the urban form variables contributed significantly to the model fit.
McDonald et al. (2010) also look at parental perceptions of the social environment in relation to active travel to school. To do this, they conducted surveys with 432 parents of 10-14-year-olds in the San Francisco Bay Area during 2006 and 2007. Unadjusted and adjusted differences in rates of active travel to school were compared between families reporting high levels of social control in their neighborhood and those reporting low or neutral levels of social control. Results show that of children whose parents reported high levels of social control, 37% walked or biked to school, compared with 24% of children whose parents reported low or neutral levels. The association was strongest for girls and non-Hispanic whites. The authors conclude that higher levels of parent-perceived child-centered social control are associated with more walking and biking to school. Increasing physical activity through active travel to school may require intervention programs to address the social environment.

Mathews et al. (2010) look at the policies involved in promoting active travel to school by conducting a travel survey for principals and district officials in South Carolina. Results show that 65% of district officials reported having a clear position about students walking to school, 80.0% of which were supportive. Seventy-two percent of principals reported having a clear position about walking to school, 67% of which were supportive. They note, however that these positions were most commonly communicated either orally or through memos or other written documentation, as opposed to official, written policies or directives. Respondents who personally supported walking to school were more likely to believe that walking to school benefited students' health and academic performance. The authors suggest that those who support active travel encourage schools and districts to develop official, written directives or policies.

Pooley et al. (2010) use innovative methods to examine the complexity of the school journey, and to relate it to exposure to air pollution and engagement with the environments children engage with. To explore these issues, the study engaged 30 high school students and had them use mobile-phone devices deployed with global positioning system technology to record their routes to and from school. Participants were asked to take photographs and write text messages relating to their route, and these data were then linked to modeled air pollution on the routes travelled. Results demonstrate that children who travelled independently (on foot, by bicycle, or by bus) were most likely to engage with their immediate environment. Furthermore, small variations in route choice had significant effects on their cumulative exposure to air pollution.

Again, there is relatively little work done in the Canadian context. Buliung et al. (2009) studied the spatial trends in active transportation of children aged 11-15 for school trips in the Greater Toronto Area. Similar to other studies, they found that between 1986 and 2006, walking mode share for trips to school declined significantly. Children aged 11-13 walked more in urban regions that in the suburban regions; however, children aged 14-15 walked more in the suburbs and took transit more in the urban regions. The results point to a general need for more active transportation policies and programs.
Larsen et al. (2009) build on the above study by conducting a more detailed examination of the relationship between certain social and physical built form characteristics and their influence on a child's mode of travel between home and school. To do this, travel surveys were administered to students aged 11 to 13 years from 21 schools throughout London, Ontario. A geographic information system linked survey responses for 614 students who lived within 1 mile of school to data on social and physical characteristics of environments around the home and school. Logistic regression analysis was used to test the influence of environmental factors on mode choice (motorized vs "active") to and from school. Results show that over 62% of students walked or biked to school, and 72% walked or biked home from school. The likelihood of walking or biking to school was positively associated with shorter trips, male gender, higher land use mix, and presence of street trees. Active travel from school to home was also associated with lower residential densities and lower neighborhood incomes. Overall, findings suggest that active travel is associated with environmental characteristics. Authors encourage school planners to consider these factors when siting schools in order to promote increased physical activity among students.
Chapter 5: Teen travel in the Greater Toronto Area: A descriptive analysis of trends from 1986-2006 and the policy implications

5.1 Introduction

This paper extends research on urban form and travel behaviour beyond adult travel by examining teen travelers aged 13-19 in the Greater Toronto Area. Data from the Transportation Tomorrow Survey (TTS) survey are used to study four main research questions: 1) How has teen mode choice changed from 1986 to 2006? 2) How do these choices vary as teens transition from the 13-15 age group to being of driving age (16-19)? 3) How do these choices vary across the different urban and suburban regions of the GTA? 4) What are some of the differences between teen travel and adult travel? Results show that in general, active transportation has decreased, while auto passenger mode shares have increased across the region. The younger group walks more and the older group takes transit more for both school and discretionary travel. Jurisdictions with better transit supply and orientation have higher transit mode shares for school trips, but discretionary trips have very low transit mode shares. Walk mode shares for both school and discretionary travel are similar across all jurisdictions, regardless of whether they are urban or suburban. In contrast to adult travel in the GTA, built form characteristics and transit supply do not appear to have a direct relationship with teen mode-choice. Urban form appears to exert an indirect influence on teen travel.

As mentioned, this a version of this paper is currently being reworked for the Transport Policy journal in order to include suggestions provided by reviewers. It is expected that the work will be published in the journal within the next year.

5.2 The GTA: A Description of the Case Study Location

The Greater Toronto Area (GTA)\textsuperscript{13} is Canada’s largest and fastest growing urban region. It currently has a population of 6.1 million people and is forecasted to be home to 8.6 million people by the year 2031 (Stats Can, 2006). Approximately 9\% of the current population is made up of teenagers aged 13-19 (see Table 5.1)

<table>
<thead>
<tr>
<th>Table 5.1 Population statistics for various regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>Ontario</td>
</tr>
<tr>
<td>GTA</td>
</tr>
</tbody>
</table>


The GTA is comprised of two single-tier municipalities\textsuperscript{14} (Hamilton and Toronto) and four regional municipalities\textsuperscript{15} (Durham, Halton, Peel and York) as seen in Figure 5.1.

\textsuperscript{13} The City of Hamilton is included as part of the GTA. This region is sometimes called the GTHA, but is referred to as the GTA in this work.
The GTA is the third largest commercial, distribution and financial centre in North America, currently producing nearly 20% of Canada’s GDP. It is also home to 40% of Canadian business headquarters. Most financial and government offices are located in downtown Toronto, including the operational headquarters of the Toronto Stock Exchange and Canada’s five largest banks (City of Toronto, 2010). Markham (in York region), has a high concentration of technology companies (Town of Markham, 2010). Hamilton has been dubbed the Steel Capital of Canada, producing 60% of Canada’s steel at Stelco and Dofasco (Arnold, 2010).

The economies of the municipalities in GTA are largely intertwined with one another. In 2006, the number of people commuting to work in the municipalities of Toronto, Mississauga, Vaughan and Markham was higher than

---

14 A "single tier" municipality is a municipality where there is only one level of municipal government.
15 A “regional municipality”, also referred to as an “upper-tiered” municipality, is similar to and at the same municipal government level as a county (but generally provide more services than counties).
the number of workers living in these municipalities (+232,300 in Toronto, +68,700 in Mississauga, +25,800 in Vaughan and +6,900 in Markham) (City of Toronto, 2010). In contrast, the number of people working in the Municipality of Brampton was lower than the number of workers living there (net loss of 58,900 workers).

5.3 Transportation in the GTA

The GTA is served by a network of nine separately-governed local transit agencies and one regional transit provider. Regional rapid transit is limited to the GO Rail network and the Toronto Transit Commission (TTC) subway system. Much of these rail corridors radiate outward from downtown Toronto. Unfortunately, higher-order transit services connecting destinations outside of central Toronto to one another are almost entirely lacking. The various municipal bus lines are poorly integrated, making travel across different municipalities frustrating and costly. Furthermore, the system has seen very minimal expansion since the late 1980s.16

Regional travel is accommodated primarily by expressways, including the Queen Elizabeth Way, the Gardiner Expressway, Highway 401, Highway 403, and Highway 407 (see Figure 5.2). As such, the GTA has become increasingly dependent on private automobiles for mobility. Between 1986 and 2006, the number of trips made by automobile in the GTA grew 56% (Metrolinx, 2010). This auto-dependence is in part due to an increase in lower density, dispersed development and a general lack of coordination between transportation and land-use planning. The low-density development is not transit-supportive and also discourages the use of active travel modes such as walking and cycling. As a result of these development patterns, the GTA suffers from worsening traffic congestion. Currently, more than two million car trips are made during the peak travel period each morning in the GTA, with that number forecast to approach three million trips by 2031 (Metrolinx, 2010). The resulting congestion increases the costs of road repairs, degrades the environment and negatively impacts the quality of life of the travelers in this region. According to a study commissioned by Metrolinx on the economic costs of congestion in the GTA, in 2006 the annual cost of congestion to commuters was $3.3 billion and the annual cost to the economy was $2.7 billion.

16 The construction of rapid transit averaged approximately 135 kilometers per decade from the 1960s to the 1980s (Transit Toronto, 2010).
As a whole, the GTA is similar to other North American cities, exhibiting unfavorable trends such as increasing individual auto-ownership and auto-driver trip rates, as well as increasing suburbanization of the population and employment into areas poorly served by transit (Miller and Shalaby, 2003). At the same time, the GTA (particularly the City of Toronto) deviates from some of these patterns. The continuing strength of the Toronto central area has allowed for the provision of strong, viable transit service and orientation. Furthermore, there is high-density development throughout even the inner suburban portions of the city. Thus, while current trends are headed in an unsustainable direction, the region possesses the potential required to facilitate an efficient transportation system for all travelers.

5.4 Methodology and Data

This paper presents a descriptive analysis of the evolution of teen travel in the GTA from 1986 to 2006, with a focus on current trends. The reason for this analysis is to gain a general understanding of how teenagers in the GTA travel and the kinds of choices they make in relation to their region of residence. Four research questions are examined: 1) How has teen mode choice varied over time? 2) How do these choices vary as teens transition from the 13-15 age group to being of driving age (16-19)? 3) How do these choices vary across the different urban and suburban regions of the GTA? 4) What are some of the differences between teen travel and adult travel?
The data analyzed are drawn from the Transportation Tomorrow Survey (TTS), a large-scale personal travel behaviour survey undertaken in the GTA. The TTS is an on-going survey program that consists of a 1-day telephone interview of GTA residents every 5 years, using consistent survey instruments and procedures. The latest version was conducted on behalf of twenty-one local and provincial agencies.

The 1986 TTS includes completed interviews for a 4.2% random sample of all households in the GTA (171,086 persons). The 1991 TTS data are not used because the sample was limited to specific areas exhibiting large population growth. The 1996 (312,781 persons), 2001 (374,182 persons), and 2006 (401,653 persons) data were analyzed, each one using a sample size of 5%. Travel behaviour for randomly selected households (including children 11 years or older) was proxy reported by an adult household member (Data Management Group, 2008; Data Management Group, 2001).

5.5 Limitations

One limitation of the TTS data set is its treatment of discretionary travel. Discretionary travel is defined as all trips other than home-based work and home-based school. The TTS survey divides these trips into three subcategories: home-based shopping, home-based other and non home-based. Unfortunately, due to the use of third-party respondents to report trips made by other household members, discretionary travel is under reported in this survey. The under reporting is significant with respect to public transit, auto driver and cycling trips; however, the TTS provides correction factors. Due to this limitation, it is difficult to get a rich picture of teen discretionary travel patterns. The survey data is more reliable in terms of the trip to and from school.

Further to this issue, total trip-making is underestimated because walk trips are recorded for work and school trips only in the TTS survey. Bicycle trips are recorded for all trip purposes in the 1996, 2001 and 2006 surveys, but only for school and work trips for the 1986 survey (Data Management Group, 1999). Thus, the TTS data provides an adequate preliminary trend assessment of overall teen travel, but supplementary data are needed in order to fill in the details.

5.6 Results - GTA trends (1996-2006)

In order to understand teen mobility in the GTA, there are a few key points regarding the public transportation system that must be mentioned. Downtown Toronto and its inner suburban ring are served by the highly coordinated Toronto Transit Commission (TTC). The TTC consists of a grid network of surface routes (buses and streetcars) covering the city and feeding into a radial subway system. The rest of the GTA is served by buses with varying levels of frequency and reliability. Many neighbourhoods in the downtown core are considered to be pedestrian friendly. They exhibit principles that promote livability as highlighted by Jane Jacobs, such as short blocks, a mix of uses, a mix of old and new buildings and sufficient density to support transit (Jacobs, 1961).
The presence of viable public transportation is a likely influence on a teen’s decision to obtain a driver’s license or a transit pass. Table 5.2 shows that in the City of Toronto, there has been a 10% decrease in the percentage of teens aged 16-19 with a license over the past two decades. Conversely, in the suburban municipalities the numbers have not dropped significantly, and have even increased slightly (York, Halton). In 2001, all municipalities exhibit an upward spike in the percentage of teens (16-19) with a license, and a drop in the percentage of teens (13-19) with a transit pass (Table 2). Table 2 also shows that Toronto exhibits the largest growth in the number of teens with a transit pass (4%), followed by Hamilton (2%). This is not surprising in light of the superior transit supply available in these municipalities.

Another possible influence on a teen’s decision to obtain a driver’s license could be linked to perceptions of driving. Downtown residents who must contend with more congestion, aggressive drivers, narrow roads, streetcars, cyclists, taxis and more might feel more apprehensive about driving. Parental influence could be a factor here as well.

| Table 5.2 Percentage of teens aged 16-19 with a license, by region |
|------------------------|--------|--------|--------|--------|
| Toronto    | 47.4  | 39.2  | 44.2  | 37.5  |
| Durham     | 59.8  | 52.3  | 57.1  | 54.4  |
| York       | 55.1  | 56.7  | 65.0  | 56.7  |
| Peel       | 56.2  | 50.2  | 58.3  | 50.4  |
| Halton     | 58.0  | 57.5  | 62.1  | 59.1  |
| Hamilton   | 48.5  | 50.4  | 55.2  | 46.9  |

| Table 5.3 Percentage of teens aged 13-19 with a transit pass, by region |
|------------------------|--------|--------|--------|--------|
| Toronto    | n/a   | 13.9  | 11.6  | 17.9  |
| Durham     | n/a   | 12.0  | 8.7   | 12.4  |
| York       | n/a   | 7.2   | 4.2   | 8.1   |
| Peel       | n/a   | 6.2   | 4.1   | 5.4   |
| Halton     | n/a   | 4.2   | 2.6   | 6.2   |
| Hamilton   | n/a   | 14.4  | 9.3   | 16.4  |

5.7 Overall trip generation and modal shares from 1986-2006

Throughout the GTA, teens aged 13-19 average a daily trip rate of 2.5 trips per day. Daily trip rates are generally higher in the suburban municipalities than in the urban municipalities. If the trip rates are disaggregated by type, it is clear that teens aged 16-19 are making a wider variety of trips than the 13-15 year olds, with more discretionary, non home-based and work trips being made. Overall, trip rates have not changed appreciably over the past two decades.
Table 5.4 Total trip rates for teens aged in GTA region by year and age cohort

<table>
<thead>
<tr>
<th>Year</th>
<th>13-19</th>
<th>13-15</th>
<th>16-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>2.34</td>
<td>2.18</td>
<td>2.44</td>
</tr>
<tr>
<td>1996</td>
<td>2.48</td>
<td>2.39</td>
<td>2.56</td>
</tr>
<tr>
<td>2001</td>
<td>2.54</td>
<td>2.45</td>
<td>2.61</td>
</tr>
<tr>
<td>2006</td>
<td>2.47</td>
<td>2.45</td>
<td>2.49</td>
</tr>
</tbody>
</table>

Figure 5.3 Daily trip rates for whole GTA region by type and year.

Figure 5.4 Total mode shares for teens in GTA region.

Between 1986 and 2006, there has been an increase in personal automobile travel for all teens, particularly in terms of auto passenger travel (see Figure 5.4). This increase is evident in both age groups. Passenger mode shares have increased significantly for the younger group (13-15), from 22.1% to 39.7%. This increase is met with an 8.6% drop in active travel mode shares (walking and biking), and an 8.3% drop in transit shares. Parents and caregivers are likely facilitating this modal shift by driving teens to their various destinations. The 16-19 year olds are also exhibiting a shift toward auto passenger mode, showing an increase of 11.1% over the past two decades. It is interesting to note, however, that auto driver mode shares have decreased from 22.8% to 14.8%. This could suggest a drop in independent travel for this age group. Unfortunately, at this time the TTS survey does not collect...
information on whether a trip is made alone or with a companion (parent, caregiver, friend, sibling, etc.). For the older age group, the active travel modal shares have not changed appreciably over the past 20 years, while the transit share has seen a 3.9% drop.

5.8 Trip to school and discretionary travel 1986-2006

In order to better understand the differences in mode choice between the two age cohorts across the GTA region, school and discretionary travel are examined more closely. As expected, there has been a slight decline in overall walk mode shares for both age groups, as well as a notable increase in auto passenger mode shares. The younger teens tend to walk to and from school more than the older teens (8-12% larger walk mode shares). The older group uses public transit more, while the younger group uses the schoolbus more, particularly in suburban regions. The auto driver mode shares for the trip to school (16-19 age group) have decreased across all jurisdictions over the past two decades. In Toronto and Hamilton the car trips are seemingly replaced with more transit trips. In the suburban municipalities, they are replaced by an increase in auto passenger trips. This may indicate that the urban areas with better transit supply provide more of an opportunity for older teens to travel independently.

Another interesting result is that from 1986 to 2006, there is little variation in walk mode shares across the GTA jurisdictions. It could be expected that the suburban-style built form would be less conducive to walking than the urban-style one. However, the results show that in 2006, for teens aged 16-19, the suburban municipalities of Durham, Peel and Halton even have a slightly larger walk mode share than Toronto and Hamilton.

Although York, the fastest growing suburban jurisdiction, has the smallest walk mode share, it is the only municipality that shows an increase in walk mode shares for both age groups over the past two decades (4.2% for teens aged 16-19). This suggests that regardless of urban form, the desire to walk, bike and take transit to school exists amongst this age group.
Figure 5.5 School travel mode shares by municipality and year in the GTA.
When examining the discretionary travel mode shares, it becomes immediately apparent that the private automobile dominates. For teens aged 13-15, the passenger mode share has increased by 12.1% in Toronto (urban), 12.9% in Hamilton (semi-urban), 4.6% in York (suburban) and 3.12% in Peel (suburban). For teens aged 16-19, the increase has been very dramatic, from an 8.5% increase in Halton (suburban) to a 22.1% increase in Peel. Equally
dramatic is the decrease in auto driver mode shares for this age group. Driver shares have dropped anywhere from 13.3% in Halton to 25.4% in Peel. These fluctuations do not seem to be significantly tied to the urban form, as changes have similar magnitude and direction across the board. It appears that 16-19 year olds are increasingly being driven around by others (parents, friends, siblings) as opposed to driving themselves.

Transit mode shares have also decreased for both age groups in all jurisdictions. The drop is particularly signification for the 13-15 year olds, from a 2.6% drop in Halton to a 19.8% drop in Hamilton. In Toronto, there has been a 15.1% drop in discretionary transit mode shares despite the superior transit supply in this jurisdiction. In contrast, walk mode shares have increased across all jurisdictions for both age groups. For the 13-15 age group, Durham and Hamilton have had the greatest increase in walk mode shares (4.4% and 6.8% respectively). York region, a typical suburban municipality, has seen a 3.1% growth in walk mode shares, which is higher than the 2.2% growth in Toronto. For the older age group, Halton (another suburban jurisdiction) exhibits the largest growth in walk shares (5.3%). These results are surprising given the assumption that teens are more likely to walk and take transit for discretionary travel in Toronto than in the suburban areas.

<table>
<thead>
<tr>
<th>Region</th>
<th>Walk</th>
<th>Transit</th>
<th>Auto Driver</th>
<th>Auto Passenger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toronto</td>
<td>2.2</td>
<td>-15.1</td>
<td>12.1</td>
<td></td>
</tr>
<tr>
<td>Durham</td>
<td>4.4</td>
<td>-4.7</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>York</td>
<td>3.1</td>
<td>-8.5</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>Peel</td>
<td>2.3</td>
<td>-6.0</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Halton</td>
<td>1.4</td>
<td>-2.6</td>
<td>-0.4</td>
<td></td>
</tr>
<tr>
<td>Hamilton</td>
<td>6.8</td>
<td>-19.8</td>
<td>12.9</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.6 Percentage change in mode shares from 1986-2006 for teens aged 16-19 by region

<table>
<thead>
<tr>
<th>Region</th>
<th>Walk</th>
<th>Transit</th>
<th>Auto Driver</th>
<th>Auto Passenger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toronto</td>
<td>2.1</td>
<td>-0.9</td>
<td>-16.1</td>
<td>13.9</td>
</tr>
<tr>
<td>Durham</td>
<td>2.8</td>
<td>-1.5</td>
<td>-17.9</td>
<td>15.5</td>
</tr>
<tr>
<td>York</td>
<td>2.2</td>
<td>-0.1</td>
<td>-16.5</td>
<td>13.7</td>
</tr>
<tr>
<td>Peel</td>
<td>2.4</td>
<td>0.8</td>
<td>-25.4</td>
<td>22.1</td>
</tr>
<tr>
<td>Halton</td>
<td>5.3</td>
<td>-1.9</td>
<td>-13.3</td>
<td>8.5</td>
</tr>
<tr>
<td>Hamilton</td>
<td>1.7</td>
<td>-2.6</td>
<td>-14.8</td>
<td>14.0</td>
</tr>
</tbody>
</table>
5.9 Teen travelers as compared to adult travelers in the GTA

In order to assess some of the ways in which teen and adult travel patterns differ, mode choice by trip type and trip length is examined for three age groups: 13-15, 16-19 and 20-70\textsuperscript{17}. Data from 2006 for Toronto (urban), Hamilton (semi-urban) and Halton (suburban) are examined. Considering Figures 6, 7 and 8, it is clear that regardless of trip type, auto driver is by far the dominant mode for adult travelers in all three jurisdictions. Unlike teen travelers, adult mode choice follows a more predictable pattern in terms of urban form. In Halton, where there is poor transit supply, low residential density (approximately 20 dwellings/hectare), and mostly single-use development, auto driver mode shares are very high (71% to 90%). In Toronto where there is strong, viable transit supply, higher residential density (approximately 150 dwellings/hectare), grid-pattern street networks with mixed-use development and other pedestrian amenities, walk and transit shares are higher. Adult home-based work and school trips have a walk mode share of 6.5% and 14.7% respectively, both lower than the walk mode shares for both teen age groups. Hamilton has comparable walk mode shares of 4.2% for home-based work trips and 18.3% for home-based school trips. Halton has very small walk and transit mode shares of less that 2% for all trip types except home-based school. Adult transit shares are highest in Toronto, representing 32.0% of home-based work trips and 60.8% of home-based school trips. Furthermore, when comparing adult travelers to teen travelers, auto passenger mode appears to be much less dominant for all trip types and jurisdictions.

\textsuperscript{17} It should be noted that this age group is not homogenous in terms of travel needs and patterns.
Figure 5.8 Modes shares by trip type for adult travelers in Hamilton for 2006.

Figure 5.9 Modes shares by trip type for teen and adult travelers in Halton for 2006.
Looking at the trip lengths, the data show that 80% of the trips to school for teens 13-19 are less than 5 km, which is ideal for using modes such as walking, biking or public transportation. Non home-based trips exhibit a similar trip length profile; however, the discretionary trip profile shows the tendency toward longer trip lengths. It will be interesting to collect more detailed data in order to determine what kinds of discretionary trips teens in the GTA are making and why they are perhaps longer than their trips to school.

Modal split by trip length (2006 data) for teens and adults in Toronto, Hamilton and Halton are shown in Figures 5.10, 5.11 and 5.12. Again, it can be seen that regardless of urban form, teens in both age groups walk for approximately half of their trips that are less that 2 km (1.2 miles) in length. Conversely, urban form does seem to have a relationship with adult walk shares. In Toronto, for trips less than 2 km (1.2 miles), the walk mode share is 14.5% but drops to 8.4% in Hamilton and 2.9% in Halton.

For trips over 2 km (1.2 miles), urban form and transit supply impact mode shares for all three age groups in different ways. For teens in Toronto, as the trip length increases, so do auto passenger shares (especially for the 13-15 year olds) and transit shares (especially for the 16-19 year olds). Although the driver mode is dominant for adults in Toronto, transit does exhibit a strong presence. In Hamilton and even more so in Halton, teen transit shares are low for trips over 5 km (3 miles). Adult transit shares are even lower than those of teens, particularly in Halton, where they are almost non-existent. The lack of transit supply likely contributes to the increase in auto driver mode shares for longer distances in both these jurisdictions. Finally, whereas teens all three municipalities walk for about half of their trips under 2 km (1.2 miles) and around 5% of their trips that are 3 to 5 km in length, adults almost never walk for any trip over 2 km (1.2 miles). Again, the differences in built form seem to only impact adult walk shares, while teen walk shares remain steady.
Figure 5.10 Modes shares by trip length for teen and adult travelers in Toronto for 2006.

Figure 5.11 Mode shares by trip length for teens and adults in Hamilton in 2006.
Figure 5.12 Modes shares by trip length for teen and adult travelers in Halton for 2006.

If the data are examined further, it is clear that adult trip lengths are predominantly longer than those taken by teens aged 13-19. The portion of trips that are over 2 km (1.2 miles) drops by 14% as soon as the trip-maker region of residence moves from the downtown core to the inner urban core. This portion drops another 3-5% as the trip-maker’s region of residence moves from the inner urban core to the inner ring (Etobicoke, North Toronto, Scarborough) and outer ring suburbs (York and Halton regions). This is due primarily to employment destinations, but also to discretionary travel destinations. It could also be a result of differing attitudes, preferences and personal freedom. Overall, the results are interesting and suggest that teens and adults travel in significantly distinct ways. It is important to make genuine attempts at understanding the differences in order to have a chance at meeting the needs of various groups of travelers who clearly use the transportation system in different ways.

5.10 Discussion and conclusion

The examination of teen travel between 1986 and 2006 in the GTA using TTS data is revealing in several ways. Overall, there has been an increase in personal automobile travel for both age groups, particularly in terms of auto passenger travel. For teens aged 13-15, the increase in auto passenger mode has been met with a decrease in active travel mode shares and transit shares. For the older group, the auto passenger mode has increasingly dominated the auto driver mode, suggesting a drop in independent travel.

It appears that, currently, teens in this region mostly walk or take transit to school, but are driven around by others for most of their discretionary trips. From 1986 to 2006, there is little variation in school trip walk mode
shares across the GTA jurisdictions. Regardless of urban form, teens in the GTA choose to make a reasonable amount of walk trips. Nevertheless, there has been a slight decline over the years in active travel to school throughout the region for both age groups, and a sharper decline in auto driver trips to school for the older group. In urban jurisdictions, these trips are replaced with transit and in suburban jurisdictions they are replaced with auto passenger trips. This is an indication that transit supply and transit-oriented land-use provide more choice for teens and possibly induce a more autonomous mobility profile. In the same vein, the data show that areas with better transit supply exhibit larger growth in the number of teens with transit passes and a significant decrease in the percentage of teens aged 16-19 with a license over the past two decades. This suggests that the driver’s license as a symbol of adulthood and freedom may not be as entrenched in the GTA as it was in Clifton’s (2003) study of American teens.

As mentioned, the examination of discretionary travel reveals the prevalence of the private automobile in teen travel. Auto passenger mode shares have increased dramatically for both age groups, with the older group increasingly being driven around by others (parents, friends, siblings). Surprisingly, walk mode shares have also increased across all jurisdictions for both age groups. Suburban areas with minimal pedestrian amenities exhibit a greater growth in walk shares than Toronto. In contrast to the trip to school, transit use for discretionary travel has decreased in all jurisdictions, regardless of transit supply or urban form.

As expected, teens choose to walk for short trips and seldom walk for trips that are over 5 km (3 miles). Usually, transit or auto passenger modes are used for longer trips. Generally, the trips taken by teens in these areas are less than 10 km (6 miles). It appears that the trip to school is often short and that discretionary trips are longer. This corresponds to the finding that teens generally do not walk for their discretionary travel. Nevertheless, regardless of their region of residence, approximately 50% of their trips are short (under 2 km/1.2 miles), a sharp contrast to the trip length profile of adults in the same regions. This is possibly due to schools generally being located within a child’s neighbourhood, whereas employment can be scattered all over the GTA. The discrepancy could also be a result of different attitudes toward discretionary travel.

An important finding from this study is the significant difference between teen and adult travel behaviour, particularly in terms of their correspondence with conventional travel behaviour associated with certain urban forms. Years of research has shown that adult travelers are more likely to walk or take transit in areas with strong, viable transit supply, higher residential density (approximately 150 dwellings/hectare), grid-pattern street networks with mixed-use development and other pedestrian amenities. Conversely, in suburban areas with single-use development, spread out amenities and lower residential density, adults are more likely to drive. The analysis of the TTS data for adults in the GTA generally conforms to these ideas. On the other hand, the analysis of the same data for teens aged 13-19 is much less predictable. As mentioned, in some cases transit supply and urban form seem to have an impact on the decision to walk or take transit, and in other cases, teens choose to walk or take transit despite built form differences.
The results of the analysis support the hypothesis that urban form is an important factor, but perhaps not directly linked to a teen’s decision about school or discretionary travel. If this is the case, other factors, such as real or perceived neighbourhood safety, traffic, household transportation options or scheduling, caregiver attitudes and socio-demographics, may be equally or even more important. These results are similar to those of McMillan (2007), which suggested that programs focusing on modifications to urban form to increase walking or biking may see little change in modal splits. Both sets of research findings suggest that planning decisions should be based on understanding the needs of all travelers, especially those who are dependent users of the transportation system.

From a transportation planning and policy perspective, the overall findings offer hope for increasing the use of alternative modes. Contrary to American teens (Clifton, 2003), teens in downtown Toronto are not abandoning walking and transit as soon as the automobile becomes an option. Thus, there is a desire to walk or take transit, as long as use of these modes is an option. Further work should be done to take a closer look at the kinds of discretionary trips teens in the GTA are making. Are they usually driven to these activities as is suggested by the TTS data? Are these trips generally longer than their trip to school? Do these trips differ for various age cohorts? And finally, who ultimately makes the mode choice — is it the teen’s decision or the parents’ decision to use the auto-passenger mode? Are these teens being driven around because they lack adequate means of transit; or are other personal or parental concerns such as the dangers of traffic or fear of crime driving this decision? Determining the constraints on discretionary travel, and whether these constraints are influencing the “choice” to be driven around, will help inform transit policy that can effectively meet the needs of this demographic. The results presented confirm urban form is one of many factors that shape teen travel; however, planning decisions should be sensitive to how a particular built form is used, as well as the needs of the population it is meant to serve.
6.1 Introduction

After examining the TTS data, many questions remained unanswered. Although it is a very rich dataset, the survey is does not target teenagers in particular, nor is it designed to gather information regarding attitudes and concerns with respect to traveling in the GTA. For the purpose of this dissertation, more specific information was needed, particularly with respect to discretionary travel. Furthermore, because the TTS dataset has many weaknesses with respect to information on teenage travelers, the results of this analysis needed to be further corroborated. To do this, additional data was collected through an online travel survey administered to groups of first year students at the University of Toronto.

The survey had two different goals. The first was to gather locational information about where each respondent went to high school, the modes they used for various discretionary activities, and the degree of independent travel undertaken. The second was to gather information regarding each respondent's attitude toward public transportation, walking and biking, and to explore what they identify as barriers to their mobility. The survey asks participants a number of questions regarding their trip to school, their discretionary travel, their use of transit, and the barriers they face when trying to travel on their own. This survey was tested in the spring of 2008 with 50 responses (a 5% response rate) and reworked in order to improve response rates. A copy of the survey instrument can be found in Appendix A.

6.2 Data and methods

As mentioned, the survey was e-mailed out to first year engineering students at the University of Toronto. First year engineers may represent certain types of student, with particular educational backgrounds, study habits, family traits, etc. Although the resulting data analysis appears to represent a variety of backgrounds, attitudes and experiences, it should be noted that there could be some sampling bias at play.

The reworked survey was sent out in September 2009, with a response rate of 40% (481 responses from a sample of 1208 students). Of these responses, 417 were complete and useful; 64 responses were discarded, making the useful response rate 35%. The sample is not a perfect representation of the total teen population in the GTA. Despite this, it is possible to draw some externally valid conclusions based on the selected sample.

Once the data was collected, it had to be cleaned up and tabulated. All data were entered in to an Excel spreadsheet and filters were used in order to analyze different combinations of variables. Only some of the collected data was used and included in this analysis.

---

The survey was also sent to a few first year geography classes, but the bulk of the sample was engineering students.
6.3 Analysis of respondents

There were a total of 417 useful responses collected, with 57% male respondents and 43% female. Of these responses, 62% (n=257) were from students who grew up in the GTA, with 56% of them being male and 44% being female. Within the GTA group, 49% lived in the City of Toronto (n=125). This group was asked to indicated the distance between their home and the Toronto central business district (CBD), and the results are shown in Table 6.1. About 36% of respondents live within 5km of the downtown core, while 44% live more than 10km from downtown.

Table 6.1 Breakdown of where Toronto respondents live in relation to CBD.

<table>
<thead>
<tr>
<th>Distance from CBD</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1km</td>
<td>16</td>
<td>13%</td>
</tr>
<tr>
<td>1-5 km</td>
<td>29</td>
<td>23%</td>
</tr>
<tr>
<td>6-10km</td>
<td>25</td>
<td>20%</td>
</tr>
<tr>
<td>&gt; 10km</td>
<td>55</td>
<td>44%</td>
</tr>
<tr>
<td>Totals</td>
<td>125</td>
<td>100%</td>
</tr>
</tbody>
</table>

Students were asked to indicate whether or not they had their driver’s license, and if so, how old they were when they got it. Results indicate that 56% of the sample have their license, but only 16% of that group grew up in Toronto. Looking at the Toronto sample, 32% have their license, while 80% of the GTA (not including Toronto) have their license. This result is consistent with the 2006 TTS findings, which showed that about 38% of Toronto teens between the ages of 16 and 19 had their license, in contrast to about 54% to 60% for most other GTA regions. Table 6.2 shows a breakdown of when each respondent obtained their license.

Table 6.2 Breakdown of when respondents obtained their license

<table>
<thead>
<tr>
<th>Age obtained</th>
<th>Toronto n=125</th>
<th>GTA n=132</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>30.0%</td>
<td>50.5%</td>
</tr>
<tr>
<td>17</td>
<td>17.5%</td>
<td>40.0%</td>
</tr>
<tr>
<td>18</td>
<td>40%</td>
<td>9.5%</td>
</tr>
<tr>
<td>19</td>
<td>7.5%</td>
<td>-</td>
</tr>
<tr>
<td>&gt;19</td>
<td>5.0%</td>
<td>-</td>
</tr>
</tbody>
</table>

The data show that Toronto respondents tend to get their license later than the rest of the GTA. Whereas 90.5% of the GTA respondents with a license obtained it by the time they were 17 years old, this percentage was only 47.5% for the Toronto respondents. Furthermore, 12.5% of the licensed Toronto respondents obtained their license after graduating from high school. This difference in attitude towards learning to drive is reflected in the rest of the results as well.

6.4 Trip to school

Table 6.3 summarizes the modes used most commonly by respondents for their trips to and from high school. The results echo TTS findings: the dominant overall mode for school transportation in the GTA is walking,
followed by auto passenger and transit. Looking more closely at Toronto versus the rest of the GTA, walking and transit dominate over all other modes, followed by auto passenger (with a parent driver) and cycling. In fact, 49% of Toronto respondents report that they either walked or biked to school. In contrast to the TTS findings, cycling does appear to have a significant mode share within this sample. The GTA mode shares (excluding Toronto) are slightly different. School bus travel plays a role in the trip to and from high school for the GTA respondents, whereas none of the Toronto respondents mention using this mode. This is because in the City of Toronto, when a child attending middle school (grades 6-8) or high school (grades 9-12) lives more than 4.8km from their school, they can request to receive TTC tickets from the TDSB as opposed to school bus transportation. This would explain perhaps why the Toronto respondent transit mode share is 23.2% higher than that of the GTA. The GTA respondents walk mode share is almost equal to the auto passenger (with a parent driver) mode share. However, about 42% of the GTA respondents report using the automobile to get to school, versus 18.4% of Toronto respondents. The GTA respondents were also more likely to be driven to and from school by a friend than were the Toronto respondents. This is not surprising given the fact that the Toronto respondents had a smaller portion of licensed drivers.

Table 6.3 Summary of modes most commonly used for trip to and from school

<table>
<thead>
<tr>
<th>Mode</th>
<th>Walk</th>
<th>Bike</th>
<th>Drive</th>
<th>Driven by parent</th>
<th>Driven by friend</th>
<th>Transit</th>
<th>School bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>31.4%</td>
<td>8.1%</td>
<td>6.6%</td>
<td>20.3%</td>
<td>4.4%</td>
<td>20.3%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Toronto</td>
<td>36.8%</td>
<td>12.0%</td>
<td>3.2%</td>
<td>13.6%</td>
<td>1.6%</td>
<td>32.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>GTA</td>
<td>26.7%</td>
<td>4.8%</td>
<td>9.6%</td>
<td>26.0%</td>
<td>6.8%</td>
<td>9.6%</td>
<td>16.4%</td>
</tr>
</tbody>
</table>

6.5 Discretionary travel

Students were also asked to answer questions regarding the modes they use for their discretionary travel. The questions asked respondents to record the modes used most frequently for discretionary travel during the first and second half of high school (see Tables 6.4 and 6.5). As expected, 42.3% of respondents say that they were driven around for most of their discretionary trips. For Toronto respondents, transit dominates but only slightly over walking and auto passenger mode. The GTA respondents have a stronger tendency to be driven around for these trips, but also have a larger cycling mode share than Toronto. These figures change when examining discretionary mode shares between the ages of 16-19. For the older group, transit becomes a more significant mode. Also, the “driven by adult” mode share decreases while the “driven by friend” mode share increases for this group, suggesting increased levels of independent travel. For GTA respondents, driving themselves around becomes just as common as getting a ride from their parents. Once they get their license, they are likely struggling to obtain vehicle access and make independent driver trips.
Table 6.4 Most frequently used discretionary modes between ages of 13-15

<table>
<thead>
<tr>
<th></th>
<th>Walk</th>
<th>Bike</th>
<th>Driven by adult</th>
<th>Driven by friend</th>
<th>Transit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>19.7%</td>
<td>12.2%</td>
<td>42.3%</td>
<td>3.2%</td>
<td>22.6%</td>
</tr>
<tr>
<td>Toronto</td>
<td>28.0%</td>
<td>10.3%</td>
<td>27.4%</td>
<td>2.9%</td>
<td>31.4%</td>
</tr>
<tr>
<td>GTA</td>
<td>13.2%</td>
<td>13.7%</td>
<td>53.7%</td>
<td>3.5%</td>
<td>15.9%</td>
</tr>
</tbody>
</table>

Table 6.5 Most frequently used discretionary modes between ages of 16-19

<table>
<thead>
<tr>
<th></th>
<th>Walk</th>
<th>Bike</th>
<th>Driven by adult</th>
<th>Driven by friend</th>
<th>Transit</th>
<th>Drive Self</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>15.8%</td>
<td>9.8%</td>
<td>22.9%</td>
<td>7.1%</td>
<td>26.8%</td>
<td>17.6%</td>
</tr>
<tr>
<td>Toronto</td>
<td>22.2%</td>
<td>9.4%</td>
<td>19.2%</td>
<td>6.9%</td>
<td>36.5%</td>
<td>5.9%</td>
</tr>
<tr>
<td>GTA</td>
<td>10.3%</td>
<td>10.3%</td>
<td>26.1%</td>
<td>7.3%</td>
<td>18.4%</td>
<td>27.8%</td>
</tr>
</tbody>
</table>

To get a sense of how important the role of the automobile is for discretionary travel, respondents were asked to indicate the frequency with which they require a vehicle to make such trips. The idea was to assess how bound respondents are to automobile travel, and to cross-check their response with some of the built form characteristics of the neighbourhood they grew up in.

Table 6.6 Frequency with which respondents require a vehicle for discretionary travel

<table>
<thead>
<tr>
<th></th>
<th>Rarely</th>
<th>Less than 1/2 trips</th>
<th>About 1/2 trips</th>
<th>Almost all trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>15.6%</td>
<td>10.9%</td>
<td>14.8%</td>
<td>58.8%</td>
</tr>
<tr>
<td>Toronto</td>
<td>26.4%</td>
<td>16.8%</td>
<td>18.4%</td>
<td>38.4%</td>
</tr>
<tr>
<td>GTA</td>
<td>4.5%</td>
<td>5.3%</td>
<td>11.4%</td>
<td>78.8%</td>
</tr>
</tbody>
</table>

Looking at Table 6.6, about 59% of respondents indicate needing an automobile for almost all their discretionary trips. This figure decreases to about 38% when looking at just Toronto respondents, but shoots up to almost 79% for the rest of the GTA. Of those who indicated needing a car for almost all their trips, 68% also indicated that their neighbourhood is poorly served by transit, and about 70% indicated living in single-family homes in areas with mostly curvilinear street patterns. All of these factors suggest that those respondents relying on automobile trips likely reside in more dispersed, suburban areas with lack of adequate transit.

Another goal of the survey was to gain a better sense of the modes used and how these modes may change depending on who the respondent is traveling with and where they are going. Thus, respondents were asked to indicate which modes they use for particular kinds of trips. The results can be seen in Table 6.7
Table 6.7 Modes used for various discretionary activities, by location and age group.

<table>
<thead>
<tr>
<th>Location</th>
<th>Mode</th>
<th>Part-time job</th>
<th>Shopping with friends</th>
<th>Shopping with parents</th>
<th>Social activities</th>
<th>Spectator sports</th>
<th>Participatory sports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>Walk</td>
<td>23%</td>
<td>18%</td>
<td>14%</td>
<td>12%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Bike</td>
<td>10%</td>
<td>10%</td>
<td>3%</td>
<td>4%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Ride</td>
<td>40%</td>
<td>30%</td>
<td>39%</td>
<td>25%</td>
<td>82%</td>
<td>69%</td>
</tr>
<tr>
<td></td>
<td>Transit</td>
<td>27%</td>
<td>26%</td>
<td>44%</td>
<td>26%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Drive</td>
<td>-</td>
<td>16%</td>
<td>-</td>
<td>9%</td>
<td>-</td>
<td>11%</td>
</tr>
<tr>
<td>Toronto</td>
<td>Walk</td>
<td>24%</td>
<td>17%</td>
<td>16%</td>
<td>27%</td>
<td>11%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Bike</td>
<td>11%</td>
<td>11%</td>
<td>3%</td>
<td>9%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Ride</td>
<td>25%</td>
<td>23%</td>
<td>20%</td>
<td>53%</td>
<td>72%</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>Transit</td>
<td>40%</td>
<td>41%</td>
<td>61%</td>
<td>84%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>Drive</td>
<td>-</td>
<td>8%</td>
<td>-</td>
<td>3%</td>
<td>-</td>
<td>5%</td>
</tr>
<tr>
<td>GTA</td>
<td>Walk</td>
<td>22%</td>
<td>19%</td>
<td>13%</td>
<td>10%</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Bike</td>
<td>9%</td>
<td>9%</td>
<td>3%</td>
<td>3%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Ride</td>
<td>51%</td>
<td>35%</td>
<td>56%</td>
<td>32%</td>
<td>90%</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Transit</td>
<td>17%</td>
<td>14%</td>
<td>29%</td>
<td>23%</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>Drive</td>
<td>-</td>
<td>23%</td>
<td>-</td>
<td>43%</td>
<td>-</td>
<td>17%</td>
</tr>
</tbody>
</table>

*Note: Percentages do not necessarily add up to 100 because respondents were allowed to check off more than one mode.

Several observations can be made from these results. Firstly, getting rides seems to be a common way of getting to many discretionary destinations, regardless of age. Again, this confirms the results of the TTS analysis. This data does, however, allow for a more nuanced picture of how mode shares shift depending on destination and adult accompaniment. For example, respondents note that they are more likely to take transit when shopping with friends than with parents. This is particularly true for the Toronto group. Thus, it can be assumed that parental involvement in discretionary trip-making has an impact on mode-choice. Very few respondents living outside of Toronto took any mode other than the automobile when traveling with their parents to shop. In fact 90% of the 13-15 age group and 75% of the 16-19 said they would get a ride with their parents. Even when traveling alone, most GTA respondents within the 16-19 year old age group often drive to their discretionary destinations. In contrast, driver mode shares were relatively low for the Toronto group.

When looking just at the Toronto respondents, transit emerges as a very important mode for both age groups. Although auto passenger represents a significant mode share, transit tends to dominate, particularly for the older group and for trips made without parental accompaniment. Walk mode shares are slightly higher for the Toronto group than for the rest of the GTA; however, this mode is not as significant for discretionary trips as it was for school trips. Again, this confirms the TTS data.

One surprising result is that cycling mode shares for Toronto and for the rest of the GTA are higher than expected (as compared to the TTS data). Lack of adequate cycling data is a well-known limitation of the TTS
dataset. These results could mean that cycling plays more of a role in discretionary teen travel than is suggested by the TTS data.

6.6 Parental influence

As mentioned, results indicated that automobile use tends to increase for trips that involve parental accompaniment. To further probe the issue of parental influence on mode choice and independent travel, respondents were asked a series of questions regarding parental input on mode choice and safety. To begin with, students were asked whether their parents allowed them to travel alone after dark once they turned 16 (see Table 6.8). The majority of respondents (75%) said that they were allowed to travel alone after dark (71% of Toronto respondents and 79% of GTA respondents). Looking at the gender breakdown, it was found that of those not allowed out after dark, 80% of the total, 74% of Toronto and 88% of GTA respondents were female. Toronto had a higher percentage of respondents who were not allowed to travel alone after dark. This is likely due to the different perceptions of safety associated with suburban and urban areas.

<table>
<thead>
<tr>
<th>Allowed</th>
<th>Not allowed</th>
<th>Expressed no opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>n=257</td>
<td>75% 20% 5%</td>
</tr>
<tr>
<td>Toronto</td>
<td>n=125</td>
<td>71% 23% 6%</td>
</tr>
<tr>
<td>GTA</td>
<td>n=132</td>
<td>79% 17% 4%</td>
</tr>
</tbody>
</table>

Respondents were also asked to comment on whether their parents encouraged or discouraged them to take transit on their own (Table 6.9). Many indicated that their parents encouraged them to take transit independently. This percentage was higher for Toronto respondents (58%) than for GTA respondents (42%). Of those discouraged to take transit alone, 72% were female respondents (56% of Toronto group and 81% of GTA group). Respondents who were discouraged to use transit on their own were asked to comment on what they thought were the reasons behind this sentiment. About 80% said that their parents felt riding transit was unsafe, 51% felt transit is too expensive, 27% were afraid their child would get lost and 22% discouraged transit use in favour of their child using active modes such as walking and biking.

<table>
<thead>
<tr>
<th>Encouraged</th>
<th>Discouraged</th>
<th>Expressed no opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>n=257</td>
<td>42% 18% 40%</td>
</tr>
<tr>
<td>Toronto</td>
<td>n=125</td>
<td>58% 10% 32%</td>
</tr>
<tr>
<td>GTA</td>
<td>n=132</td>
<td>42% 16% 42%</td>
</tr>
</tbody>
</table>
Respondents were also asked to comment on how their parents felt about them walking around their city by themselves (Table 6.10). In this case, 56% of total respondents indicated that their parents encouraged them to walk to their destinations without adult accompaniment, 19% were discouraged and 25% felt that their parents did not express an opinion of the matter. The percentage of encouraging parents was slightly higher for the Toronto respondents (58%) and lower for the GTA respondents (49%). In total 19% of respondents indicated that they were discouraged from walking alone (27% of GTA respondents and 18% of Toronto respondents). Of this group, 44% of respondents were female (37% for Toronto group and 54% for GTA group). Again, respondents were asked to comment on why they thought their parents discouraged them to walk alone to their destinations. About 80% said that their parents felt it would be unsafe and 62% said that their parents worried about them getting lost. Several respondents commented that their parents felt that walking would be far too time consuming and unreasonable due to the distance between their home and their discretionary destinations.

| Table 6.10 Parents attitude towards child walking alone. |
|----------------|----------------|----------------|
|                | Encouraged      | Discouraged    | Expressed no opinion |
| Total          | 56%             | 19%            | 25%                  |
| Toronto        | 58%             | 18%            | 23%                  |
| GTA            | 49%             | 27%            | 24%                  |

6.7 Attitudes, perceptions and concerns

The last part of the survey was designed to gather some information regarding the attitudes and perceptions teenagers have towards taking transit, walking and biking. Participants were also asked to identify barriers to their independent travel. In of light the TTS data results, most of the questions in this section were focused on transit. The TTS analysis shows that discretionary transit mode shares have been decreasing over the past decade for this age group. This survey attempted to probe the issue to determine some possible reasons for this decrease.

6.8 Transit concerns

Participants were asked to rate the transit system in the city they went to high school in (see Table 6.11). Overall, 36% of respondents feel that the transit system was good, while 38% felt it was fair. Looking at Toronto respondents, 64% feel that the transit system is either very good or good, as compared to 36% of the GTA respondents. It is not surprising that Toronto respondents have a more positive perception of transit, in light of the superior transit accessibility and supply in the Toronto region.
Table 6.11 Participants perception of transit systems in their city.

<table>
<thead>
<tr>
<th></th>
<th>Very good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n=257</td>
<td>12%</td>
<td>36%</td>
<td><strong>38%</strong></td>
<td>14%</td>
</tr>
<tr>
<td><strong>Toronto</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n=125</td>
<td>21%</td>
<td><strong>43%</strong></td>
<td>32%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>GTA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n=132</td>
<td>5%</td>
<td>31%</td>
<td><strong>43%</strong></td>
<td>21%</td>
</tr>
</tbody>
</table>

For a clearer understanding of the attitudes participants have toward transit, they were asked whether they had ever had a particularly unpleasant experience on transit, and to indicate the nature of this experience. About 53% of respondents reported having had an unpleasant experience on public transit (n=136). Of this group, 38% said they had to deal with a long wait or delayed bus/subway service, 23% said they were treated unkindly by an employee, 18% said they got lost in the transit system, 18% said they were treated unkindly by another passenger, and 4% said they were assaulted. Several respondents left comments detailing some other kinds of unpleasant experiences:

- “Illegal substance abuse in bus” (Male, Oakville)
- “Mugged while waiting for the bus” (Male, Etobicoke)
- “Public transit employee did not help when I was assaulted” (Female, Toronto)
- “Bus driver misses my stop” (Female, Whitby)
- “Weirded out by other passengers” (Male, Mississauga)

6.9 Barriers to transit use

Participants were also asked to consider a list of various possible transit barriers, and to rank them in terms of their importance. The most highly rated concern is infrequent service, followed by expensive fares, lengthy trips and irregular service (see Table 6.12). Participants seem to think that transit service is too infrequent and that this impedes their ability to use this mode. Only about 35% of these respondents grew up in Toronto, the rest grew up in other GTA areas, with more dispersed development patterns and infrequent transit service. Respondents comment that infrequent service is particularly an issue during non-peak travel times. Teenagers often travel outside of peak times and, as a result, run into service problems.
Table 6.12 Barriers influencing a teen’s decision to take transit.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Frequency distribution</th>
<th>% response¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Too expensive</td>
<td>45%</td>
<td>26%</td>
</tr>
<tr>
<td>Too infrequent</td>
<td>51%</td>
<td>22%</td>
</tr>
<tr>
<td>Trips take too long</td>
<td>40%</td>
<td>39%</td>
</tr>
<tr>
<td>Service is irregular</td>
<td>38%</td>
<td>30%</td>
</tr>
<tr>
<td>Does not take you where you need to go</td>
<td>14%</td>
<td>26%</td>
</tr>
<tr>
<td>Too many transfers</td>
<td>11%</td>
<td>30%</td>
</tr>
<tr>
<td>Uncomfortable</td>
<td>6%</td>
<td>19%</td>
</tr>
<tr>
<td>Hard to get information</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Unpleasant employees</td>
<td>20%</td>
<td>16%</td>
</tr>
</tbody>
</table>

¹ Where (1) represents “Major concern” and (5) represents “Minor concern”

Similarly, about 37% of those who ranked the long length of transit trips as being a major concern grew up in Toronto. Respondents mentioned that long transit trips are often a result of multiple transfers. Others mentioned long wait times for buses and streetcars, again, particularly during off-peak times.

In terms of service irregularities, Toronto respondents made up 71% of those who ranked this concern highly. An explanation for this could be that suburban regions have less extensive transit systems with a lower chance of being thrown off schedule as a result of traffic congestion and other complications. Furthermore, infrequent service in more suburban regions leads to less spontaneous trip-making, and more of a reliance on schedules, whereas in Toronto, travelers assume frequent service. Thus, it is possible that because Toronto travelers have certain expectations regarding frequency, they plan less in terms of factoring in transit schedules and are irritated when unexpected delays do occur. Concerns that did not rank highly include unpleasant public transit employees, a lack of transit information, and uncomfortable seats.

Participants were also given the opportunity to comment on additional barriers not provided in the list. They were particularly vocal with regards to funding issues, fare hikes and lack of new infrastructure. Many respondents complained that there has not been enough subway expansion in the GTA, and that “there could be more bus and streetcar lines”. They feel that the cost of transit in the GTA does not reflect the level of service throughout the region, particularly outside of the downtown core. There were comments expounding on the failure of the TTC to modernize and that the organization is mismanaged, spending funds inefficiently and “gouging riders” for fares. These concerns are obviously not specific to this age group, but clearly, teens have an opinion on the level of transit service they are getting. At the same time, several participants mentioned that a major cause of these problems is lack of adequate funding.

Participants also had a lot to say about transit accessibility, or lack thereof, in the suburbs. Many mentioned lack of service in neighbourhoods outside of the downtown core to be a serious, frustrating barrier to their independent mobility. They felt that bus stops in the suburbs are “poorly placed” and that the distances they have to
walk in order to get to a transit stop are unacceptable. Some participants felt that poor land use planning and lack of population density was the culprit: “good public transit depends on population density, the denser the population the better the public transit. There are not enough people using transit in the suburbs, which means there is not enough reason to increase the number of bus routes”.

Another barrier is the lack of coordination between regional transit agencies and the TTC. A few participants mentioned having trouble using transit because they found trip planning from their neighbourhood to a downtown neighbourhood to be confusing and time consuming. They felt that transit agencies were not doing enough to make this process easier, and as a result, some suburban teens abandon the idea of taking transit all together.

A major concern for transit users is that fact that most buses and streetcars share the road with cars, and as such, get stuck in traffic during rush hour. Participants feel that this slows down their transit trips, particularly in the downtown core and during the summer when there is construction on many routes. Some suggested that “designated lanes” for transit could alleviate this issue. Overcrowding on buses and subways during rush hour is another barrier, mentioned primarily by those who lived in the Toronto area. A few participants said that not only does rush hour make riding transit uncomfortable, but during winter months, results in exposure to many people who may be carrying flu or cold viruses. Some also complained that buses, subways and streetcars are too dirty.

Safety is another concern. Several participants said they felt unsafe waiting at bus stops, especially if the area is not well-lit. Waiting can also be a problem in cold weather, or if it is raining and there is no bus shelter at the stop. A few people mentioned feeling unsafe on transit, but this was not a very common complaint.

6.10 Barriers to walking

Participants were also asked to identify barriers to walking to their destinations. The most commonly cited barrier was the distance between origins and destinations within their neighbourhoods. Many said that walking simply takes too long and is not a convenient, viable mode of transportation. They would rather get a ride, sacrificing some of their freedom to travel independently, than have to walk very long distances. Several respondents expressed “feeling stuck” because of this barrier. When walking distances are long, weather becomes a more pronounced barrier. Teens do not want to commit to walking what they deem to be long distances, especially if it is raining, very cold and snowy, or very hot and humid.

Another built form barrier is the lack of pedestrian friendly infrastructure in certain areas. Participants mention that it is unpleasant walking in areas that do not have trees, or in areas that have “sidewalks on one side of the road” or lack sidewalks all together. One respondent complained that in her town of Ajax, there are “no good bike paths or walkways; travel destinations are too far apart (>10km); sidewalks disappear, forcing pedestrian to walk on major road”. They do not like having to cross “large, busy intersections” or highway ramps because they
find it dangerous. Some of these intersections have “poorly timed traffic lights that favour drivers over pedestrians”. Many mention that within suburban areas, there are many careless, distracted drivers that do not expect to see pedestrians: “Drivers tend to neglect to signal and have very little regard for cyclists and pedestrians” (Female, Oakville).

Respondents also mention feeling unsafe walking at night in certain areas of the city due to the presence of “weird people”. One participant mentions living in a housing project and not feeling safe traveling around it at night due to the presence of “dangerous people”. A few mentioned that poorly placed fences and blocked off areas are a barrier for them, resulting in having to take alternative, lengthier routes. Finally, there were a few participants who cite sheer laziness as a barrier to walking to their destinations.

6.11 Barriers to biking

Lastly, participants were asked to identify barriers to utilitarian cycling. Not surprisingly, most comments were centered on safety and bike theft issues. Almost all participants identify a lack of bike lanes and other cycling infrastructure as a problematic barrier to cycling in the GTA. Sharing the road with cars, trucks, buses and streetcars causes some serious safety concerns for this age group. This problem is made worse in the downtown core when construction projects take place on the already crowded, sometimes narrow roads. Another issue affecting Toronto cyclists is the presence of streetcar tracks, which can be a hazard to those biking with thin road bike tires. Such tires can get caught in the tracks, causing the cyclist to be thrown off of their bike. Participants feel that only very experienced cyclists stand a chance against these obstacles, as well as “aggressive, non-accommodating Toronto drivers”. The animosity between cyclists and drivers within the city was addressed in several comments.

“A major barrier is crazy/arrogant cyclists who make drivers angry at all other cyclists. Also, street car tracks + bike wheel = fail. I think cyclists should be required to earn a license and have as strict rules as cars on the road!” (Male, Toronto)

“As for bicycling, the trucks can be brutal at times. Once, I was inches from being hit by a truck as it passed by me.” (Female, Toronto)

Another barrier identified is inadequate bike security. Many worry about their bike getting stolen and feel that the bike parking available in the GTA is not secure enough. A few mention that in the winter, it is even harder to find bike parking due to inadequate snow removal. Riding in the winter can also be dangerous for this same reason. In general, poor weather conditions are a barrier to utilitarian cycling.

The last major barrier identified by participants relates to finding good information on biking routes in the GTA. A few respondents mention that they often do not know where to find bike paths and lanes, or how to find information on the best ways of getting around the region by bike. They feel that there is a lack of information on this topic readily available to people in their age group.
6.12 Conclusions

The analysis of the online travel survey yielded some very interesting results regarding teenage mobility in the GTA. The results echo many of the general trends suggested by the TTS analysis. However, many of the points raised by the participants of the survey would have been impossible to extract from the TTS dataset. In general, it appears that respondents can articulate the reasons behind choosing or not choosing certain modes, and indicate a certain awareness of the role land use and transportation planning play in facilitating or impeding their travel. Many of the concerns expressed by the participants can directly inform policy that would not only benefit this age group, but all GTA travelers as a whole. The policy implications of this analysis are presented along with those determined through the focus group study, and can be found in Chapter 8.

Despite the detail that this data adds to the TTS analysis, there are still questions that remain unanswered. For example, the data showed that Toronto travelers have some habits that are different from the rest of the GTA; however, the reasons behind these habits are still somewhat of a mystery. Furthermore, while the online survey provides a sense of the barriers to independent teen travel, it does not provide any information regarding how these barriers are overcome. It is difficult to ask complicated questions in a survey format, and even harder to assess the accuracy and truthfulness of the responses. Many participants skip open ended questions that are designed to gather more descriptive information. In short, for an in-depth assessment of the teen mobility barriers, still more research was needed.
Chapter 7: High school focus group project

7.1 Introduction

Chapters 5 and 6 revealed certain trends in active travel amongst teens, as well as differences between teen and adult travel in the GTA. The TTS data raised many questions as to the kinds of trips made by teens and the degree of independent travel amongst this age group. While the online survey data shed some light on these issues, it too could only provide a general sense of travel habits of teens from different parts of the GTA. Despite the richness of both datasets, there are limits to what large scale surveys can reveal regarding travel decisions. As mentioned, it is difficult to attain descriptive responses through survey tools.

For these reasons, alternative approaches must be applied to go deeper than the survey data in exploring the attitudes and perceptions of teenagers toward their mobility. This chapter describes the methodology and results of a focus group project conducted in two different GTA neighbourhoods. Using both surveys and focus groups enables an exploration of some of the creative mode combinations used by teens, and the degrees of access they have to each mode.

7.2 Research Questions

Several interesting issues emerged from the analysis of the TTS and online survey data leading to the formation of research questions to guide the rest of the dissertation. These questions are concerned with the ways in which teenagers in the GTA make use of their urban environment to facilitate daily-life travel. The work mostly explores the ways in which teens actually use the built environment and the reasons behind their choices. The following research questions guide this inquiry:

- Is urban form a direct influence, or does it indirectly influence travel choices by informing variables such as real and perceived neighbourhood safety, parental attitudes, household transportation options, etc.?
- What kinds of discretionary trips are being made? If teens are mostly being driven around for these trips (as suggested by the TTS analysis and online survey analysis), why is this the case?
  - Are these discretionary destinations further away than schools?
  - Do the distance between origin and destination vary depending on whether the location is urban or suburban?
- How independently do teens travel?
  - How does this independence vary by gender or age cohort?
  - How does it vary in relation to urban form?
  - How much influence do parental worries have on travel decisions?
- What are their perceptions of different modes?
  - How safe do they feel walking and biking around their neighbourhood?
  - Are their perceptions accurate?
  - How do they feel about riding transit?
  - Does image play a role in travel decisions?
• What do teens identify as barriers to their mobility?
  o How do they overcome these barriers?

7.3 Research approach

To address the above questions and enrich the findings from the TTS and online survey data, a series of focus groups were conducted between June 2009 and March 2010. The purpose of these focus groups was to obtain an in-depth qualitative understanding of the views of teenagers toward traveling. Although the participants of the study do not comprise a statistically representative sample, an exploration of their experiences will be a useful starting point for formulating theories to be tested in future research. As mentioned, existing transportation data sets do not contain the information needed for this study. Even with adequate data, exploratory, qualitative work is necessary to understand the basic issues involved before conducting a large-scale representative survey. The overall goal of this work is to develop a more nuanced picture of teen travel, revealing the ways in which barriers to mobility are dealt with or overcome, to inform transportation policy that better meets the needs of this group.

7.3.1 Geographic Focus within the GTHA

Two different schools within the GTHA were selected in which to conduct the focus groups: Westdale Secondary School (Hamilton, Ontario) and Harbord Collegiate (Toronto, Ontario). Each school is located within what would be considered a “walkable” neighbourhood. The neighbourhoods were selected to represent different built form variables and levels of transit supply. Census data for each location is shown in Table 7.1.

• Westdale (Westdale Village), Hamilton Ontario: This area was chosen to represent a low-density suburban-style neighbourhood, with fairly good public transportation and pedestrian amenities (see Figures 7.1 and 7.2 in Appendix E).
• Harbord (Palmerston-Little Italy), Toronto, Ontario: This area represents a medium-density urban neighbourhood, with excellent public transportation supply and pedestrian amenities (see Figures 7.3 and 7.4 in Appendix E)

Westdale Village and Palmerston-Little Italy both have boundaries that are within 1.6km of the high schools. It is important to note that some of the youth participating in this study do not reside within the immediate neighbourhood of the school. Many students travel from further locations within and outside the catchment areas of each school.

---

19 Using the walkability score tool, Westdale scores 77/100 and Harbord scores 89/100 (http://www.walkscore.com/).
20 In general, low residential density is considered to be less than 20 dwellings/hectare, medium density is considered to be between 20 and 50 dwellings/hectare, and high-density is anything over 50 dwellings/hectare (Hall, 2002).
### Table 7.1. Selected demographic statistics for focus group locations

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Population</th>
<th>Teen Population</th>
<th>Area (km²)</th>
<th>Residential Density (dwellings/hectare)</th>
<th>Median household Income (2006 CAN$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westdale Catchment</td>
<td>23475</td>
<td>1915</td>
<td>12.42</td>
<td>8.45</td>
<td>54,213</td>
</tr>
<tr>
<td>Westdale Village</td>
<td>12809</td>
<td>1190</td>
<td>8.54</td>
<td>6.23</td>
<td>67,185</td>
</tr>
<tr>
<td>Harbord Catchment</td>
<td>71760</td>
<td>3525</td>
<td>8.12</td>
<td>41.72</td>
<td>50,372</td>
</tr>
<tr>
<td>Harbord (Palmerston-Little Italy)</td>
<td>18940</td>
<td>970</td>
<td>1.98</td>
<td>40.15</td>
<td>52,412</td>
</tr>
</tbody>
</table>


It is important to distinguish between the transit systems available in each city and neighbourhood. The Toronto Transit Commission (TTC) is comprised of three subway lines, 11 streetcar routes and 140 bus routes. Within Harbord’s catchment area, the average distance between subway, streetcar and bus stops is 475, 245 and 210 metres, respectively. The subway runs from 6am to 2am, with wait times of 2-5 minutes between trains all day. Several streetcar lines run 24 hours a day, as do certain buses. Average wait times for streetcars and buses range from 4 to 6 minutes during peak times, and 10 to 15 minutes during off peak periods.

The Hamilton Street Railway (HSR) is a considerably less extensive transit system that the TTC. The HSR has 58 regular bus lines and no subways or streetcars. Within Westdale’s catchment area, the average distance between bus stops is approximately 300 metres. Buses run from 5am to 2am on weekdays, however weekend schedules vary by line (several lines do not even run on weekends). In terms of wait times, each bus line varies significantly. The most commonly used lines travelling along east/west corridors throughout the cities come about every 7-8 minutes between 8am and 7pm. After 7pm, buses become more and more infrequent, with service decreasing to once every 20 minutes by 10pm, every 30 minutes by 11pm and every 40 minutes after midnight. Less popular lines run once every 30 minutes, even during peak periods.

#### 7.3.2 Recruitment process

As mentioned, participants were recruited from two different communities in the GTA to reflect a range of urban form variables and transit supply. A total of four focus group sessions were conducted: two sessions in Hamilton, Ontario with students from Westdale Secondary School, and two in Toronto, Ontario with students from Harbord Collegiate Institute. Some effort was made to recruit an equal number of male and female students from a variety of grade levels ranging from 9 to 12. Also, the groups were made up of teens living within the catchment area of the school, as well as teens traveling far distances to participate in special programs such as French Immersion and orchestra. No effort was made to recruit a statistically representative sample due to the small sample size, and because the study was designed as a qualitative exploration as opposed to a quantitative investigation.

---

21 The TTC considers peak periods to be between 6am – 9am, and between 3pm – 7pm. However, many streetcar and bus lines have frequent service until 11pm.

22 The HSR does not clearly define peak travel periods.
In order to recruit participants from the high schools, approval had to be obtained from the Hamilton-Wentworth District School Board (HDSB) and the Toronto District School Board (TDSB). This process was very labour-intensive and lengthy. Approval was not obtained from the HDSB; hence, the participants from Westdale Secondary School were recruited through a snowball sampling process, starting with several local contacts. A total of 12 participants were recruited and interviewed in two sessions. These sessions, held in June 2009 in Hamilton, Ontario, were used as a pilot study to test out the interview questions and a mapping exercise. This exercise asked the teens to map out some of their common routes in the area of their high school, identifying modes used for each destination. The teens were asked to give feedback regarding the length of the sessions and the ease of the mapping activity.

After obtaining approval from the TDSB, identifying a school willing to participate on a volunteer basis was challenging. After considerable searching, Harbord Collegiate Institute agreed to participate. The participants were recruited with help from the Principal Rodrigo Fuentes. Again, this process was lengthy and difficult due to a limited budget that did not allow for the provision of individual financial incentives. Eventually, 14 participants were recruited and interviewed in two sessions; they also conducted a mapping exercise, detailing the modes and routes taken when traveling in the Harbord neighbourhood. Participants were offered a pizza dinner and the opportunity to win gift certificates from the local mall. These sessions were held after school in March 2010 at Harbord CI. Parents of the participants were asked to complete a questionnaire detailed below.

7.4 Methods and Tools

Three different research instruments were developed and used for this project. Each one is described below.

7.4.1 Group Interviews

All focus group sessions involved a group interview during which the teens were asked several detailed questions regarding the trips they make, the modes they use, their degree of independent travel, and the attitudes and perceptions that inform these decisions. The discussions encouraged a free-flowing dialogue between the researcher and the teens with regards to their travel patterns, as well as their concerns and ideas regarding their urban mobility experience. An interview guide was developed in order to achieve consistency across groups while still leaving participants room to express themselves freely. A copy of the interview guide can be found in Appendix B. Each interview session lasted approximately 60 minutes and was recorded digitally. Textual transcriptions of the recordings were later generated and used.

7.4.2 Mapping exercise

A mapping exercise was undertaken with the participating teens at Harbord Collegiate. As mentioned, a test run of this exercise was completed by the Westdale focus group to determine the appropriate size and scale of the map, and the amount of time the activity would likely take. During this exercise, each teen was given a map of the neighbourhood surrounding the school (defined as the area within a 1.6 kilometer radius of the school). Participants were asked to identify the intersection closest to where they live, map their walk and bike trips in
different colour markers, and use various stickers to identify places they travel to by car or transit. Throughout the exercise, participants were also asked to identify areas they deemed safe for walking and biking. They were given approximately 30 minutes to complete this activity.

This exercise was designed to determine the degree of familiarity the participants have with the area surrounding their school. Also, the hope was to identify interesting or creative routes taken by teens when traveling around the school. A sample map can be found in Appendix C.

7.4.3 Parental questionnaire

The parental questionnaire was given to the parents or guardians of the teens participating in the Harbord focus groups. It was designed to determine the patterns of parental accompaniment, as well as general concerns or observations parents have with respect to teen travel. There are three sections in this questionnaire: the first section collects demographic data necessary for the interpretation of the questionnaire results; the second section asks questions regarding the child’s travel habits; the final section consists of a four-point likert-scale rating whereby parents can indicate the factors that influence their decision to allow their child to travel independently. A copy of this questionnaire can be found in Appendix D.

7.5 Analysis Process

7.5.1 Group interviews

Once the focus groups were completed, the content was analyzed and synthesized in order to present the results. To do this, qualitative summaries were written based on a subjective assessment of the content. Additionally, comments made by participants were counted systematically and arranged into themes.

The first step in this analysis was to transcribe digital interview files and compose an initial summary of the discussion. This led to the identification of certain themes and a tentative list of topics to explore more systematically. The topic list was constantly updated and revised throughout the course of the analysis process.

Once a list of topics was identified, the transcripts were read through again and comments deemed relevant to each topic were tagged. The result was an Excel spreadsheet with topics labelled horizontally across the top, and individual comments listed in each column. At this point, the comments under each topic heading were organized in terms of the points they convey. Each topic was then summarized and rough counts of the frequency of certain points were taken.
7.5.2 Mapping exercise

Each map was analyzed individually in terms of the routes marked, modes used and landmarks identified. These various elements were examined in relation to the where the individual conducting the exercise lived. Each map was then compared to the others in order to identify similarities and differences. The results of this exercise are not easily analyzed due to many discrepancies between the ways people used the maps. Very few participants followed the instructions correctly, and as a result, not very much useful information was gathered from the maps. Students seem to be most familiar with the landmarks directly around the school. Their familiarity with routes and locations diminished as they moved away from the school on their maps. The resulting maps were used mostly to support the commentary giving by the students regarding places they travel and the modes they use to get there.

7.5.3 Parental questionnaire

The results of the parental questionnaire were tabulated and analyzed using a spreadsheet. Demographic data was cross-checked against some of the travel behaviour to look for possible relationships, and likert-scale responses were tabulated to determine the urban form factors that most influence a parent’s decision to allow their child to travel independently. Parents also provided written commentary regarding their answers to the questions. These comments were organized into categories depending on the mode and concern they related to.

7.6 Results

7.6.1 Focus Group Characteristics

The intention was to put together a group of youth, with a roughly equal number of males and females, representing a range of ages (13-19) and experiences. Little effort was made to control the sample because the number of participants was too small to be considered statistically significant. In other words, the only screening done was to ensure that the participants fit the age group criteria and attended the high school participating in the study.

<table>
<thead>
<tr>
<th>Group</th>
<th>Total participants</th>
<th>Aged 13-15</th>
<th>Aged 16-19</th>
<th>Male</th>
<th>Female</th>
<th>Able to drive</th>
<th>Reside outside school catchment</th>
<th>Reside in 0 car household</th>
<th>Reside in 1 car household</th>
<th>Reside in 2 car household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westdale 1</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Westdale 2</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Harbord 1</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Harbord 2</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>10</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

A total of 26 teens participated, with 46% of the group being female, and 62% being of legal driving age. Although, as mentioned, the recruitment process was not intended to generate a statistically significant, representative sample of the target population, some differences between the two groups can be observed. Within
the Westdale group, seven of the eight participants old enough to have a license had either obtained one or had started the process of obtaining one. In sharp contract, not one of the eight Harbord teens who were of driving age could drive or had even started the process of obtaining their license. Much of the discussion surrounding driving sheds light on this result. Another interesting point is that while there were two Harbord participants from zero car households, and five from one car households, nearly all Westdale participants came from 2 car households. This is not surprising given some of the differences in urban form within the two neighbourhoods.

7.6.2 Trip to school

Participants were asked how they generally travel to and from school during normal weather conditions. Overall, 50% walk, 30.8% use public transit, 11.5% cycle and 7.7% get rides.

Table 7.3 Modes typically used for travel to and from school.

<table>
<thead>
<tr>
<th>Group</th>
<th>Walk</th>
<th>Bike</th>
<th>Transit</th>
<th>Auto Passenger</th>
<th>Auto Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westdale 1</td>
<td>7</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Harbord 1</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

If we look at the mode profile by location, the results become more interesting. Within the Westdale group, 58% of participants walk to and from school. According to the school statistics, most of the students who walk to Westdale live in one of two areas:

1. Westdale Village: Students walking to school within this area walk a maximum of 1km to school.
2. Aberdeen/Dundurn: Students walking from this area walk 1.5 to 2 km to school.

The first group walks through residential, tree-lined streets lined with a variety of single-family homes of various styles and ages. The walk from this direction is fairly picturesque, with little exposure to busy, arterial roads. The second group, however, generally walk further, with about half of the route taking place on a four-lane road surrounded by land that was formerly occupied by a warehouse (along Longwood). In other words, the walk for this group is less picturesque. When participants were asked to comment on this, they all provided similar reasons for this choice:

“I would rather walk along Longwood for 20 minutes than waste time and money waiting for the bus. Plus, pretty much everyone I know walks to school that way, so you’ll always have people to walk with.“
- Male 17, Westdale

“Yeah, Longwood is a really boring stretch but it goes by fast when you walk with people. There are always like 20 kids walking up and down that stretch before and after school.”
- Female 15, Westdale

“Plus, it’s the fastest way of getting there. I mean, you’re not going to take a crazy long route to get to school just because it’s prettier.”
- Female 18, Westdale

About 25% of Westdale participants said they use transit regularly to get to and from school. According to the participants and the school, students living outside of the two areas identified above generally take transit to school.
Those who do not take transit tend to instead receive rides (about 17% of participants). These travelers usually live outside the Westdale catchment area and attend the school in order to participate in French Immersion or in the special orchestral music program. Two of the focus group participants fell in this category and explained why they felt they could not rely on transit.

“I live in a very suburban area. I have to walk 1.5 km just to get to the bus stop. Even then, the bus only comes once every 40 minutes, so if I don’t time it perfectly, I’ll miss it and be really late for school. I used to get a ride to school, hang out in the area till about 5 or 6pm and then get a ride back with my mom after work. When I got to grade 12, I started taking the bus home a lot just because it’s easier to do that than to schedule my time around getting rides. But even then, I would get a ride to school either with my mom or my neighbour’s parents [neighbour also attends Westdale]. It’s just so inconvenient to take the bus to school – way too much of a time commitment”.
- Male 18, Westdale

“One good thing about taking the bus is that you can buy student tickets from the [school] office for a dollar less than they sell them at stores. So for me, this is really good.”
- Female 15, Westdale

It is interesting to note that none of the Westdale participants drive or bike to and from school. In terms of driving, they noted that it is rare for a Westdale student to have frequent access to a vehicle. Even if they do, they would rarely drive it to school due to lack of parking – most of the school parking lot is reserved for staff and off limits to students. In terms of biking, participants identify lack of biking infrastructure as the number one reason for not using a bike as a mode of transportation.

The Harbord participants had very different experiences. About 43% of participants walk to school; however, most of the very frequent walkers live 1km from the school. Those living within a 1-2km radius tend to alternate between walking and transit depending on the weather, how late they are and how lazy they feel. Due to the frequency and accessibility of transit, particularly during peak periods, many Harbord students find this option to be very attractive. As a result it is not surprising that 36% of the participant use transit to get to and from school. In contrast to the Westdale group, students who live more than 1km from the school do not walk there and back unless they feel like it. The transit users do identify crowding during peak periods as being problematic for them, especially when they are carrying heavy school bags and sports equipment.

“I hate riding the TTC with a big backpack on during rush hour. There’s way to many people, it gets really uncomfortable. Sometimes you can’t get off at your stop on time if you’re stuck at the back of the streetcar.”
- Female 16, Harbord

Another notable difference is that while none of the Westdale participants cycled to and from school, 21% of the Harbord group regularly bike as a mode of travel. According to the school, many students bike to and from

---

23 Student bus tickets cost $1.65 in Hamilton, but students can purchase them for 65 cents each at their school office. Student fares in Toronto are $2 if paying cash, and $1.65 if using tokens.
school, making bike parking difficult to find during the spring and fall. None of the Harbord participants regularly receive rides to and from school, unless they are carrying large amounts of sports equipment. Even those who live far from the school find that transit is a better option than getting a ride.

“I’ll usually take the TTC to school unless I have to carry a lot of stuff. That makes it harder to get around without a car – so at that point my parents will drive me”
- Male 17, Harbord

“My mom doesn’t work regular 9 to 5 hours and refuses to give me a ride so I always take TTC. I don’t mind because it’s pretty easy to take TTC to and from school.”
- Female 15, Harbord

7.6.3 Discretionary travel

The discussion regarding discretionary travel – destinations and modes – was particularly illuminating, especially with respect to creative travel solutions. In general, the TTC allows for easier independent travel around the city, especially to destinations located downtown. As a result, much of this group’s discretionary travel needs are met by transit, walking and biking. Those living in more suburban areas of Toronto must rely on other modes such as rides from parents, and combinations of walking, biking, transit and taxis. The Westdale group faces greater challenges when it comes to discretionary travel, also having to rely on various mode combinations to travel independently. After asking each group to list discretionary travel destinations and identify when these trips would be made, each participant was asked how they generally travel to these places. Age was definitely a factor in relation to independent travel and the modes used. Tables 7.4 and 7.5 show the types of discretionary trips made and the modes used when traveling alone, with parents and with friends.

The Harbord participants mostly walk and take transit for their discretionary travel needs, particularly when traveling independently. This result is also reflected in the maps they created. Participants agreed that Toronto’s public transit system allows them to meet many of their discretionary travel needs without the use of a car. In fact, they prefer not to travel by automobile unless they are leaving the city or they absolutely have to. Most (13 out of 14) participants agreed that their preferred modes are walking, biking and transit. Biking is a mode that only 4 teens in the group feel completely comfortable with. Those that do feel comfortable tend to use it frequently for independent travel.


### Table 7.4 Discretionary trip modes and destinations for Harbord focus groups.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor/Dentist</td>
<td>Day/Evening</td>
<td>Transit/Walk, Bike</td>
<td>Ride</td>
<td>Ride, Transit</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>appointments</td>
<td></td>
<td>Walk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music Lessons</td>
<td>Day/Evening</td>
<td>Transit/Walk, Bike</td>
<td>Ride</td>
<td>Ride</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Sports practices/games</td>
<td>Day/Evening</td>
<td>Transit</td>
<td></td>
<td>Ride, Transit</td>
<td>Transit,Walk</td>
<td>Transit, Walk</td>
<td></td>
</tr>
<tr>
<td>Shopping/Mall</td>
<td>Day/Evening</td>
<td>Transit,Walk</td>
<td>Ride,Transit</td>
<td>Transit,Walk</td>
<td>Walk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gym</td>
<td>Day/Evening</td>
<td>n/a</td>
<td></td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Part-time job</td>
<td>Day/Evening</td>
<td>Transit/Bike</td>
<td>Ride</td>
<td>n/a</td>
<td>Walk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Going out for Coffee</td>
<td>Day/Evening</td>
<td>Walk</td>
<td></td>
<td>n/a</td>
<td>n/a</td>
<td>Walk</td>
<td></td>
</tr>
<tr>
<td>Large parties</td>
<td>Evening/Night</td>
<td>Walk,Transit, Bike, Taxi</td>
<td>Ride</td>
<td>Ride, Walk</td>
<td>Transit</td>
<td>Transit, Walk</td>
<td></td>
</tr>
<tr>
<td>Hanging out at friend's house</td>
<td>Evening/Night</td>
<td>Transit,Walk</td>
<td>Ride</td>
<td>Ride, Walk</td>
<td>Transit</td>
<td>Transit, Bike</td>
<td></td>
</tr>
<tr>
<td>Movies</td>
<td>Day/Evening/Night</td>
<td>n/a</td>
<td></td>
<td>Ride, Transit</td>
<td>Walk, Transi</td>
<td>Transit</td>
<td></td>
</tr>
<tr>
<td>Shows/Concerts</td>
<td>Night</td>
<td>n/a</td>
<td>Transit, Walk</td>
<td>n/a</td>
<td>Walk, Transit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bars/Pubs/Clubs</td>
<td>Night</td>
<td>n/a</td>
<td>Walk,Transit, Taxi</td>
<td>n/a</td>
<td>Walk, Transit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is interesting to note that, as noticed in the results of the online survey, the only time Harbord participants make car trips is when they travel with their parents. Only three participants mention riding transit with their parents, two of which live in car-free households. Since none of the participants drive, they never use cars to make independent trips. Participants were asked to describe situations that would necessitate getting a ride from a parent or a friend’s parent rather than taking TTC, biking or walking. All of them mention distance as a primary factor – the further the destination, the less likely they are to get to it using transit, walking or biking.

“If it’s going to be a 2 hour ride on the TTC, I’d rather get a ride”
- Male 16, Harbord

“When I’m hanging out with friends, I always use TTC, walk or bike. I never get rides unless it’s super far”
- Male 17, Harbord

Many participants also mentioned that traveling to sports games and practices without the use of an automobile is challenging and rarely done unless no equipment is needed.

“I’ll usually walk or take TTC but not if I’m carrying a hockey bag full of equipment. That makes it harder to get around without a car”
- Female 17, Harbord
This finding echoes the results of Tal and Handy’s (2008) study examining children’s biking for non-school purposes, specifically exploring the factors associated with biking to Saturday morning youth soccer games in Davis, California. The findings show that over three-quarters of players and their parents drove to the game, with fewer than 20% biking. While the distance from home to the game is a significant deterrent to using non-motorized modes, carrying equipment was also a factor.

Another reason sited for opting to get a ride somewhere instead of walking was parental and child safety concerns, which have a significant influence on independent travel. If we take a closer look at the trips made and modes used, it becomes apparent that the 13-15 year olds make less of their discretionary trips on their own. When questioned about this, they explained that they tend to make some daytime trips on their own, but mostly travel with their parents and friends in the evenings and at night. This is a result of parental concerns, as well as individual concerns. The younger group generally felt that walking or taking transit on their own at night is not advisable. The older group felt more comfortable traveling alone at night, but agreed that traveling in a group of friends or getting picked up by a parent is safer.

“I play a bunch of sports in the evening. One of them is pretty close my house, but my mom wants to drive me there when it’s dark even though it’s not too far. During the day I would walk”.  
- Male 17, Harbord

“I don’t really like to walk home by myself when it’s dark outside. Even taking the TTC at night can be sketchy sometimes. My parents don’t like me taking it late at night so they would rather come pick me up.”  
- Female 16, Harbord

When the Harbord participants were asked how they feel about asking their parents for rides, most said that doing this is a last resort. They would prefer to be able to get around without having to ask for rides, but sometimes feel that they have to out of necessity. For example, when they cannot reach their destination easily using transit, walking or biking, or when they feel it is not safe to travel unaccompanied by an adult.

Table 7.5 shows that although Westdale teens walk or take transit when they can, the automobile plays a larger role in their discretionary travel. This is not surprising in light of built form factors in this area, as well as the results of the TTS data analysis. For Westdale teens, the car is an important mode of transportation that cuts down on travel time considerably. As a result, amongst the older group, many prefer to drive for their discretionary trips if they have vehicle access. Within this focus group, none of the participants have consistent vehicle access and therefore must often find alternative ways of getting to discretionary destinations. This involves a lot of transit use, as well as walking. Even when distances are longer than they would like to walk, participants note that they would rather walk 2km than wait 40 minutes for a bus they just missed. When asked to rank their preferred modes, they consistently ranked driving at the top, then walking (depending on the distance), transit and biking. Biking is used very casually and not usually as a mode of transportation – this is primarily due to a lack of cycling infrastructure. Most said that prefer getting rides to places like the doctor or dentist’s office, music lessons, part-time jobs, sports games and practices, but would rather avoid getting rides to their friend’s house or to and from parties.
Table 7.5 Discretionary trip modes and destinations for Westdale focus groups.

<table>
<thead>
<tr>
<th>Destination/Activity</th>
<th>Time of day</th>
<th>Modes used</th>
<th>13-15 n=4</th>
<th>16-19 n=8</th>
<th>13-15</th>
<th>16-19</th>
<th>13-15</th>
<th>16-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor/Dentist appointments</td>
<td>Day/Evening</td>
<td>Transit,Walk,</td>
<td>Ride</td>
<td>Ride</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Music Lessons</td>
<td>Day/Evening</td>
<td>Transit,Walk</td>
<td>Ride</td>
<td>Ride</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Sports practices/games</td>
<td>Day/Evening</td>
<td>Walk,Transit</td>
<td>Drive,Transit</td>
<td>Ride</td>
<td>Ride</td>
<td>Walk,Ride,Transit</td>
<td>Drive, Ride,Transit</td>
<td>Drive, Ride,Transit</td>
</tr>
<tr>
<td>Shopping/Mall</td>
<td>Day/Evening</td>
<td>Transit</td>
<td>Drive,Transit</td>
<td>Ride</td>
<td>Ride</td>
<td>Transit, Ride</td>
<td>Drive</td>
<td>Drive</td>
</tr>
<tr>
<td>Gym</td>
<td>Day/Evening</td>
<td>n/a</td>
<td>Drive,Transit</td>
<td>n/a</td>
<td>Ride</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Part-time job</td>
<td>Day/Evening</td>
<td>Walk</td>
<td>Walk</td>
<td>n/a</td>
<td>n/a</td>
<td>Walk</td>
<td>Walk</td>
<td>Walk</td>
</tr>
<tr>
<td>Large parties</td>
<td>Evening/Night</td>
<td>Walk,Transit</td>
<td>Walk,Transit, Drive</td>
<td>Ride</td>
<td>Ride</td>
<td>Walk,Transit, Drive</td>
<td>Walk,Transit, Drive</td>
<td>Walk,Transit, Drive</td>
</tr>
<tr>
<td>Hanging out at friend’s house</td>
<td>Evening/Night</td>
<td>Tran sit</td>
<td>Transit,Drive</td>
<td>Ride</td>
<td>Ride</td>
<td>Transit, Ride</td>
<td>Drive, Drive</td>
<td>Drive</td>
</tr>
<tr>
<td>Shows/Concerts</td>
<td>Night</td>
<td>Transit</td>
<td>Transit,Drive</td>
<td>Ride</td>
<td>Ride</td>
<td>Transit, Ride</td>
<td>Drive, Drive</td>
<td>Drive</td>
</tr>
<tr>
<td>Bars/Pubs/Clubs</td>
<td>Night</td>
<td>n/a</td>
<td>Walk,Transit, Taxi</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>Walk,Transit Taxi</td>
<td></td>
</tr>
</tbody>
</table>

Unlike the Harbord group, the Westdale group has a hard time completely avoiding getting rides from their parents. Although they do not like to, when distance and lack of adequate service are combined, they feel it is the most reasonable way to travel.

“I don’t like having to coordinate my schedule with my parents. My friends and I don’t make ‘plans’ in the way my parents expect me to. Like, I won’t know what I’m doing on a Friday night until 10pm sometimes. So I don’t want to bug them to wait around for me, and I also don’t like getting them involved in the plan because then they’ll keep nagging me [laughs].”
- Male 18, Westdale

“Driving is always faster. Don’t get me wrong. I like walking, but not if it’s going to take me more than 20 minutes to get somewhere. The bus works out if you’re right on schedule or if you’re on King or Main Street²⁴, but other than that, it could end up taking longer than walking. That’s so frustrating. So yeah, if I can drive or get a ride somewhere, I will choose that every time.”
- Male, 17, Westdale

---
²⁴ Very common bus routes with frequent, reliable service.
While safety issues came up several times throughout the Harbord focus groups, this theme did not emerge strongly during the Westdale discussions. The 13-15 year olds do travel less independently than the 16-19 year olds, but this seems to be more a factor of parental influence than fear. The younger group seems to walk around their neighbourhood just as much as night as the older group. They do not express much personal concern in terms of safety.

7.6.3.1 After school trips

A large number of discretionary trips take place after school – many of the participants mentioned that they do not always go straight home once school is finished. Both the Harbord and Westdale groups discussed the kinds of after-school trips they make and how they get their destinations.

“Usually I go straight home after school unless I play sports.”
- Female 15, Harbord

“I live two blocks away from Dufferin Mall so I’m always stopping off there after school with my friends or by myself”
- Female 16, Harbord

“I don’t really go straight home after school. I usually just chill and walk around with my friends. A lot of the time we’ll go to Bickford Park or Christie Pitts and joke around.”
- Female 15, Harbord

“In the spring and fall, we always go chill in Churchill Park after school, or walk around Westdale, get slushies, hang out.”
- Male 17, Westdale

“A lot of the time I’ll have sports practice after school, then I’ll head home after that”
- Male 16, Westdale

“A lot the time kids just go to someone’s place and hang out, play music and then head home for dinner”
- Female 17, Westdale

“I have a part-time job, but it’s pretty close to the school, so I walk there and then I’ll take the bus or get a ride home after.”
- Female 17, Westdale

7.6.3.2 Weekend trips

Weekend trips are of a similar nature – lots of sports practices and time spent wandering around the city with friends. Other weekend activities include trips to movies, concerts, large house parties, religious services, visiting family, and for some, sneaking into bars and pubs.

“On the weekends I like to go downtown and hang out with friends and walk around or go to the Eaton Centre. On Sundays we go to church at Dufferin and Eglinton, which is really far from our house so we have to drive there.”
- Female 15, Harbord

“I usually go to the YMCA to workout or do pilates, and also I walk up and down Queen street and go to some shops. At night, I’ll hang at a friend’s place, or go to the movies.”
- Female 16, Harbord
“Often there will be a party everyone goes to. Usually it’s in the Harbord neighbourhood, but sometimes it’ll be further away. Like last weekend there was a party up at Keele and Lawrence…a house party that a lot of people from Harbord were at. It was supposed to be huge, but then it got broken up. It took me sooooo long to get there on the TTC. I can’t imagine living there.”
   - Male 16, Harbord

“Living downtown, you have lots of options. Like, we’ll go out for sushi on Bloor Street, and go to Dance Cave on all ages nights.”
   - Female 17, Harbord

“Weekends are a different story. At night, pretty much every kid in Westdale is wandering around the streets… [laughs]. The res25 is a big thing – we’ll get a bonfire going and drink in the park. We do that in Churchill Park too. I mean, kids don’t have that much to do in Hamilton at night. It’s either a house party or drinking in the park! Yes, we’ll go to the movies or the odd music show here and there, but most high school nights are spent wandering around with your buds, looking for something fun to do.
   - Male 18, Westdale

“It’s true, I mean, even in grade 9 we were partying at the res [Laughs], those were the days! You could also figure out which bars in Hess Village don’t ID and go there, I guess.”
   - Female 18, Westdale

7.6.3.3 Challenges involved in making discretionary trips

Participants were asked to describe some of the challenges they face when trying to get to their discretionary destinations. A total of 103 comments relating to such challenges were tagged and are shown in Table 7.6. The most frequently described challenges were inconveniences associated with riding transit. Both groups said that for easy, independent travel they need to rely on public transportation; however, they feel that there are various aspects their transit systems that make this hard. It is clear that transit systems in the two cities have different issues.

The Harbord kids mostly complain about unreliable transit, having to wait longer than expected for buses or streetcars, and experiencing delays that make their transit trips longer than anticipated (i.e. traffic delays, streetcars breaking down, subways stopping for long periods of time unexpectedly). The Westdale kids do not find the HSR to be particularly unreliable, but do think that the schedules are inconvenient. They have problems with wait times between buses and the fact that certain destinations across the city are difficult to get to using transit, requiring multiple transfers.

25 “The res” is an area located in Highland Gardens Park, at the foot of the escarpment in Hamilton. This area is surrounded by woods and is a popular hang out spot for teenagers from all across Hamilton.
Table 7.6 Challenges faced by participants while trying to make discretionary trips.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord</th>
<th></th>
<th>Westdale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Share</td>
<td>Number</td>
<td>Share</td>
<td></td>
</tr>
<tr>
<td>Transit is unreliable</td>
<td>11</td>
<td>24%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Transit can't take you there</td>
<td>4</td>
<td>9%</td>
<td>10</td>
<td>17%</td>
</tr>
<tr>
<td>Transit takes too long</td>
<td>8</td>
<td>17%</td>
<td>7</td>
<td>12%</td>
</tr>
<tr>
<td>Bus schedules are inconvenient</td>
<td>4</td>
<td>17%</td>
<td>10</td>
<td>17%</td>
</tr>
<tr>
<td>Bus/streetcar gets stuck in traffic</td>
<td>8</td>
<td>13%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Destinations are too far apart</td>
<td>0</td>
<td>-</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>No straightforward transit route (too many transfers)</td>
<td>0</td>
<td>-</td>
<td>8</td>
<td>14%</td>
</tr>
<tr>
<td>Do not have vehicle access</td>
<td>0</td>
<td>-</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Cannot get a ride</td>
<td>3</td>
<td>7%</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td>Carrying heavy bags</td>
<td>4</td>
<td>9%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Do not have gas money</td>
<td>0</td>
<td>-</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td>No trouble getting around</td>
<td>2</td>
<td>4%</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>44</td>
<td>100%</td>
<td>59</td>
<td>100%</td>
</tr>
</tbody>
</table>

Students living outside of the catchment area and in more suburban neighbourhoods have more trouble making some of these after school and weekend trips. These participants, in both groups, feel that their destinations are too far apart, necessitating vehicle travel. An added issue is that most of their friends live near the school and thus many of their social destinations are not in their own neighbourhood, again requiring vehicle access. None of the students in the focus groups have their own cars and must rely on borrowing a vehicle from their parents. This can be tricky to do a lot of the time, and becomes even harder if the teenager does not have a part-time job to pay for gas.

“I have to get rides to and from the Harbord area to hang out with friends. I could take TTC there, but my parents would rather pick me up than have me take TTC home late at night. It can get kind of embarrassing having your parents picking you up all the time [laughs].”
- Male 16, Harbord

Participants living within the neighbourhood of each school find it generally easy to make their social discretionary trips. Westdale teens have a harder time getting to the movies because of the small number of cinemas left in the city of Hamilton. The most popular movie theatre is the Silver City Theatre in Ancaster, which is about 7km from the Westdale area. It is very difficult to take public transportation to this theatre, and thus, unless they live nearby, vehicle access is the most convenient way of traveling there.

In generally, it appears that the biggest impediment to independent, discretionary travel for both groups is inadequate transit and distance between home and other destinations. Both have an impact on their mode choices and on the amount of time they must spend traveling.

7.6.4 Transit

After getting a sense of the types of trips made and the modes chosen by the participants, the dialogue shifted towards a more in-depth discussion of specific modes, their advantages and disadvantages, and the group’s perceptions towards each one. In this section the results pertaining to transit use and experiences are presented. As a
group with limited mobility, teenagers are a prime transit user market; it is a particularly important part of their independent travel. Participants living near efficient public transit tend to use it as their primary mode of travel; however, those living in areas with sparse, unreliable transit supply find that they cannot rely on it to meet all of their needs.

7.4.6.1 Transit Use

Transit use varied by city, neighbourhood and individual. As mentioned, the two locations have varying levels of transit supply and this is reflected in the levels of use.

Table 7.7 Frequency of transit use during temperate weather conditions.

<table>
<thead>
<tr>
<th>Group</th>
<th>Almost daily (4 or more times per week)</th>
<th>Weekly (1 to 3 times per week)</th>
<th>Sometimes (less than 1 time per week)</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westdale</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Harbord</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td>0</td>
</tr>
</tbody>
</table>

It is clear that transit is an important mode for this group and is relied on regularly at least to some extent. All participants self-identify as transit users, mostly out of necessity. The daily transit users in both groups are those who use it to get to and from school. Weekly users are those who use a combination of modes to get to and from school depending on variables such as weather or time constraints. Within the Harbord group, the more infrequent users live close enough to walk to school, or feel comfortable biking to get around. Transit would be used for school trips during poor weather conditions or for longer trips. In other words, the infrequent transit users from Harbord are substituting walking and biking trips for potential transit trips. Within the Westdale group, half of the infrequent transit users walked for most of their non-transit trips (school and discretionary), and the others drove or received rides for the majority of their non-transit trips. The latter half does not live close enough to the school to walk there in a reasonable amount of time. This group has the added problem of having to take transit or get rides for many of their social travel trips because of the fact that the majority of their friends live close to the school.

7.4.6.2 Advantages and disadvantages of transit

If we dig deeper to explore the reasons behind choosing or avoiding transit, several different factors come to light. Themes such as convenience, cost and safety were prominent throughout the discussion.

The advantage cited most often by both groups is that taking transit is usually faster than walking when traveling longer distances. They also appreciate that transit provides the ability to travel independently, on their own schedule, without having to rely on their parents for rides or the possibility of using their family's car. Another common comment was that transit enables participants to get to places they often have no other good way to get to. Several participants in the Westdale group mention the cost advantage of taking transit home late at night rather than calling a taxi. They did express that they would appreciate some 24 hour transit lines, which currently do not exist in Hamilton.
Table 7.8 Comments identifying advantages of transit

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord</th>
<th></th>
<th>Westdale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Share</td>
<td>Number</td>
<td>Share</td>
</tr>
<tr>
<td>Faster than walking</td>
<td>8</td>
<td>25%</td>
<td>9</td>
<td>36%</td>
</tr>
<tr>
<td>Gets you where you need to go</td>
<td>6</td>
<td>19%</td>
<td>4</td>
<td>16%</td>
</tr>
<tr>
<td>Enables independent travel</td>
<td>7</td>
<td>22%</td>
<td>8</td>
<td>32%</td>
</tr>
<tr>
<td>Environmentally friendly</td>
<td>2</td>
<td>6%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Safer than driving</td>
<td>4</td>
<td>13%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cheaper than taking a taxi at night</td>
<td>1</td>
<td>3%</td>
<td>4</td>
<td>16%</td>
</tr>
<tr>
<td>Don't have to worry about finding parking</td>
<td>4</td>
<td>13%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>100%</strong></td>
<td><strong>25</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

In light of the differences in transit supply and service between the TTC and the HSR, it is not too surprising that the Harbord teens are more avid transit users. In general, this group felt that they could use transit to get around the city. Although they find the service frustrating at times, overall, all Harbord participants felt that TTC service is easily accessible with good frequency. Even those living outside of the Harbord catchment area, in the inner suburbs of Toronto, did not feel it was difficult to access transit. One participant living at Keele and Eglinton, about 8.2 km northwest of the school relies heavily on the TTC for both school and discretionary trips:

“I like the TTC because it helps me avoid walking, especially because things are so far away where I live. It would take forever to walk”
- Male, 16, Harbord

Harbord teens also recognize the price difference between transit and driving, and the fact that transit allows for avoiding the difficult feat of finding affordable parking downtown.

“I would rather not drive because of parking and gas costs. The TTC is still cheaper than driving when you consider all the costs cars have.”
- Male 16, Harbord

The Westdale teens felt a little bit more ambivalent about transit, particularly as a result of accessibility issues and infrequent service. For both groups, there were many more comments describing the disadvantages of transit than advantages (128 versus 57; see Table 7.9).

In terms of reliability and wait times, both groups of teens felt that while in general, transit is reliable; there are many incidences during which problems arise. These incidences, though not the norm, tend to stick with riders and make them perceive the transit system to be inconvenient and unreliable. This issue was particularly problematic for the Harbord group.

“I’ve had to wait for over an hour in downtown Hamilton before at night. That is the worst because it’s a bit creepy down there. Also, you feel like as soon as you start walking, the bus will come so you wait and wait….and wait.”
“To be honest, I don’t usually have problems with the bus not coming on time. The thing is, every now and then, when I happen to be in a rush to get somewhere on time, the bus will be late and that’s when I get angry.”
- Male 17, Westdale

“I hate waiting for the bus or streetcar. The worst is when the one you want won’t come but then three in a row going in the opposite direction.”
- Female 15, Harbord

“Sometimes the subway stops for no reason apparent reason in between stops or at a stop, it’s so annoying. They try to explain what’s going on but you can never understand because the PA system is so muffled.”
- Male 17, Harbord

“It’s very unreliable. Sometimes you have to wait over an hour [for the bus]. Even in the winter! The service is so bad sometimes. There’s no way of knowing what’s going on, like, whether the bus is even coming or not.”
- Female, 17, Harbord

“So often, I’ll get so close to a stop, miss a bus, get stuck waiting at a light, and then miss another bus that for some reason is right behind it. Then I have to wait forever for the next bus. It’s so stupid, I don’t understand why they don’t time the buses properly. I mean, two in a row and then nothing?? WHY? And this happens often on Dufferin [common bus route in Harbord catchment area]”
- Female 16, Harbord

“Yeah that’s exactly why, if I can get a ride somewhere, I’ll get a ride. I hate the TTC.”
- Male 16, Harbord

### Table 7.9 Comments identifying disadvantages of transit

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord Number</th>
<th>Harbord Share</th>
<th>Westdale Number</th>
<th>Westdale Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wait times can take way too long</td>
<td>5</td>
<td>7%</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td>Routes are limited, must make many transfers</td>
<td>0</td>
<td>0%</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Transfers are not smooth</td>
<td>2</td>
<td>3%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Scheduling is limited on certain routes</td>
<td>3</td>
<td>4%</td>
<td>8</td>
<td>14%</td>
</tr>
<tr>
<td>Not frequent enough</td>
<td>2</td>
<td>3%</td>
<td>9</td>
<td>16%</td>
</tr>
<tr>
<td>Unreliable - does not stick to schedule</td>
<td>15</td>
<td>21%</td>
<td>5</td>
<td>9%</td>
</tr>
<tr>
<td>Does not run late enough</td>
<td>0</td>
<td>0%</td>
<td>7</td>
<td>12%</td>
</tr>
<tr>
<td>Expensive</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Drivers are rude and grumpy</td>
<td>8</td>
<td>11%</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Hassle when carrying big backpacks or bags</td>
<td>5</td>
<td>7%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Too full and crowded</td>
<td>6</td>
<td>9%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Smelly and dirty</td>
<td>7</td>
<td>10%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Weird people talk to you</td>
<td>9</td>
<td>13%</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Feel threatened by other passengers</td>
<td>2</td>
<td>3%</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Gets expensive if you are making multiple trips</td>
<td>4</td>
<td>6%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Need exact change</td>
<td>2</td>
<td>3%</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td><strong>100%</strong></td>
<td><strong>58</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

While Westdale students did not complain too much about reliability, they did have a lot to say regarding infrequent, inconvenient scheduling and having to make several transfers to reach a destination. Participants felt that
depending on where you were traveling, you could have a very hard time taking transit. The popular bus routes are easy to use, however, if you are attempting to make a trip that is significantly outside your neighbourhood, infrequent service and slow transfers become a big issue.

“Sometimes you’ll miss the bus by 30 seconds and have to wait 20 minutes for the next one. You might as well walk at that point. It’s so annoying if you’re in a rush”
- Female 16, Westdale

“The worst for me is living in Ancaster [suburb of Hamilton] because there are no buses heading to Westdale on the weekends. I have to take the most roundabout routes to get down to Westdale to hang out with my friends. A trip that normally takes 30 minutes on the bus would take me 1.5 hours, and that’s if everything runs smoothly”
- Male 18, Westdale

“If I want to go play basketball at MAC [McMaster University, located within Westdale], I have to take two buses, one of which comes infrequently. Basically, it takes me 35 minutes to walk there and I’d rather do that than wait around for buses.”
- Male 18, Westdale

As mentioned, several participants also expressed the need for buses to run later, especially on weekends.

“I would way rather take the bus home on a weekend night than pay for a cab. A cab ride home costs me about $25, which can really add up if you go out a lot. I end up having to crash at a friend’s place a lot. Or me and my friend [who also lives on the mountain26] will walk up the Dundurn stairs and take a cab from the top of the escarpment. That’ll only cost us about 12 bones”.
- Male 18, Westdale

“If the buses ran later, I honestly think less kids would drink and drive. You’d be surprised at how many do! They tell themselves they’re fine, but really, it’s so bad. If the buses ran all night, less people would drive places to avoid taking an expensive cab ride home.”
- Female 16, Westdale

“I agree. For the longest time, my parents would insist on picking me up from wherever I was at night because they didn’t want me wandering the streets, trying to find a way home, or always sleeping over at people’s houses. It was seriously the worst. Like, who wants to call their parents at 2am when they’re drunk?! Oh man…the worst [laughs]. But yeah, when I turned 18 they backed off a bit and I started taking cabs, which still isn’t ideal because it’s expensive.”
- Male 18, Westdale

Although not too many people complained about transit fares being too expensive, a few people mentioned having trouble paying the fares with exact change when they are not carrying a transit pass or tickets. Also, a few participants mentioned that trip-chaining could get expensive without a transit pass. One participant said that having a transit pass had a large influence on the amount of transit she took because she felt she wanted to “get her money’s worth”.

---

26 The City of Hamilton is situated on the Niagara escarpment in such a way that the north end of the city is below and the south part above. The south end of the city is referred to as "the mountain" by its residents. A number of roads, referred to as "mountain accesses", separate the urban core below from the suburban expansion above. It is possible to walk up the escarpment as well using various sets of stairs.
Another complaint from both groups had to do with rude bus or streetcar drivers. Participants felt that when they traveled in a group, the drivers would be wary and suspicious of them. Mostly, they were sympathetic to the drivers in this scenario; however, they generally feel that unpleasant drivers hinder their overall transit riding experience.

“The drivers are really grumpy sometimes, especially at night or really early in the morning, basically during rush hour!”
- Male 16, Harbord

“I have a problem with the drivers. I understand that they’re under a lot of stress, but sometimes they’re so rude to me.”
- Female 15, Harbord

“If you’re in a big group of teenagers, they assume you’ll be destructive. They hate teenagers in a crowd because we’re so loud”
- Male 17, Harbord

“Some of the drivers are pretty grumpy, but they’re grumpy to everyone, not just kids.”
- Female 17, Westdale

The Harbord teens also complained about the state of cleanliness on the TTC, saying that it can be very smelly and dirty at times making the ride quite unpleasant. Sometimes there is garbage on the seats or floors, and unidentifiable stains on the seats. The Westdale group did not have any complaints regarding cleanliness. Both groups, however, do find that riding transit results in meeting and sometimes having to talk to strange characters. This is not always a deterrent, but can make the rider uncomfortable. One female Harbord rider mentioned feeling very threatened at one point by a stranger on the TTC. Again, this was mostly a problem for the Toronto group.

“I hate it when someone who smells really bad sits beside me and I can’t get up and move because that’s really rude”
- Female 16, Harbord

“I hate the TTC, it’s dirty. I’d way rather ride my bike everywhere than have to deal with it.”
- Male 17, Harbord

“I’m more comfortable being on the TTC with other people, especially at certain stations. There’s lots of sketchy people on the TTC. Some of them talk to you for way too long”
- Male 15, Harbord

“This one time someone followed me home off the TTC and it was really scary. It makes me feel unsafe. I’m thinking to myself ‘Why is driver all boarded in? Where’s my seatbelt? Who’s going to protect me if something happens?’ [laughs] But seriously!”
- Female 15, Harbord

“I hate riding the TTC at night when I’m alone. It’s way too sketchy. I feel safer walking than on the subway, because on the subway you feel like you can’t escape”
- Female 16, Harbord

As can be noted from the commentary, although the participants all use transit, and even feel that it meets their needs for the most part, when asked about the issue of convenience, many of them automatically revert to events that
frustrate them. This led to the question: Will you continue to use transit once you get your license and have regular vehicle access? If you already have your license, would your behaviour change if you had your own car? Answers varied between groups. The Harbord group seems to feel more bound to transit due to aspects of Toronto that make driving difficult. However, almost all of them felt that if the problems they identify with the transit system were to worsen, they would have to find alternative ways of getting around.

“I don’t want to drive, but if the TTC keeps getting worse, I’ll have to”  
- Male 17, Harbord

“I don’t take TTC out of some kind of moral belief. I would only take public transit if it’s convenient. The minute it becomes inconvenient, I’ll stop talking it.”  
- Female 17, Harbord

The Westdale group was very clear about the fact that if they had a license and steady vehicle access, they would almost never take public transit. They did not see any reason why they should, given that traveling by automobile is viewed as being exponentially more convenient. The participants feel that the transit system in Hamilton simply cannot compete with driving and is the number one choice of transportation only for captive travelers.

“If I had a car, I would always drive rather than take transit. It’s faster, more convenient, you don’t have to wait around, you’re on your own schedule, you can load your car up with whatever you need and you don’t have to worry about carrying anything. Also, you have your own space.”  
- Male 18, Westdale

“I mean, if the transit system was more convenient, that would be one thing, but as it stands, I would rather drive or get a ride from a friend.”  
- Female 17, Westdale

“I can’t wait to get my license! Right now I don’t even have the option to drive. Once I get my license, I’ll drive more than I’ll take transit for sure.”  
- Male 15, Westdale

Clearly, convenience is important for both groups. One Harbord participant noted that as she grows older, she has less patience for slow, unreliable transit. She attributes this to becoming busier and having less time to waste traveling throughout your day. She feels this is a chief reason why adult travelers take transit less than teenagers and youth.

7.6.5 Automobiles – Driver and passenger modes

Examining the role of the automobile in the lives of the two different groups had very interesting, albeit intuitive results. The Westdale group generally had a very positive view on the private vehicle, associating it with the notion of freedom and flexibility. On the other hand, the Harbord group seemed to feel indifferent towards the automobile, with none of the Westdale group’s enthusiasm and desire for possessing their own car. This section will describe the nature of automobile use in both groups, as well as some of the attitudes and perceptions then participants have toward private vehicle usage.
7.6.5.1 Automobile use

Automobile use varied significantly between the Harbord and Westdale groups. Table 7.10 summarizes the frequency with which participants use auto driver and passenger modes.

Table 7.10 Frequency of automobile use amongst all groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Almost daily (4 or more times per week)</th>
<th>Weekly (1 to 3 times per week)</th>
<th>Sometimes (less than 1 time per week)</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DM</td>
<td>PM</td>
<td>DM</td>
<td>PM</td>
</tr>
<tr>
<td>Westdale</td>
<td>0</td>
<td>5</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Harbord</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>5</td>
<td>7</td>
<td>13</td>
</tr>
</tbody>
</table>

DM = Driver Mode
PM = Passenger Mode

Clearly, the automobile is a more important mode for the Westdale group. About 43% of the group makes almost daily use of the auto passenger mode, whereas none of the Harbord participants identify as daily users of the mode. Most of the rest of the Westdale group get rides on a weekly basis, with only one participant using this mode less than once a week. For the Harbord group, 50% identify as weekly users of the auto passenger mode, and the other 50% say that they use this mode less than 1 time per week. Since none of the Harbord participants have their license, they never use the auto driver mode. The participants in the Westdale group who could drive generally do not have daily vehicle access and thus usually cannot drive more than 3 times a week.

7.6.5.2 Advantages and disadvantages of automobiles

The two groups have different attitudes towards automobiles and driving. While both groups can agree that they prefer traveling independently to getting rides from their parents, they have varying attitudes about cars and driving in general. While the Westdale group seems to consider driving to be the most preferred mode of transportation, the Harbord group seems perfectly happy to avoid it until necessary. This is clearly a function of the differences in urban form characteristics and transit accessibility/supply between the two neighbourhoods. Also, the Westdale group is generally more immersed in an automobile-dependent lifestyle. Of the twelve participants, all but one live in two car households. In contrast, only three of the fourteen Harbord participants live in two car households, while nine live in one car households, and two live in zero car households. For the Westdale students, automobile travel is a fact of life, they could not imagine choosing to live a car-free lifestyle if they could afford not to. For Harbord students, living a car-free lifestyle does not seem as far-fetched. In fact, the two participants living in zero car households both have parents who are members of car-sharing programs. Thus, the idea of only using vehicles when absolutely necessary is not entirely foreign to this group. These key differences between the groups are reflected in the number of participants with a driver’s license. Although both groups had 8 participants who were of legal driving age, none of the Harbord students have a driver’s license, while all 7 of the 8 Westdale students do.
“I got my license when I was 17. Most of my friends got it around that time as well. No one was in a serious rush or anything, but it’s nice to have it so that you can drive around sometimes. It makes your life easier for sure”
- Male 17, Westdale

“I did [want to get my license] when I was younger, like I couldn’t wait. But then I got hit by a car when I was riding my bike and now I don’t even feel like I want to learn to drive”
- Female 16, Harbord

“A few months into my 16th birthday I felt really pressured to get it, but I don’t feel like I really need it. Going through the process seems like such a hassle.”
- Male 17, Harbord

“I don’t feel like I need to drive because I live close to transit. I don’t see the point in getting my license.”
- Male 17, Harbord

“We have a car, but we rarely use it because my mom hates driving in the city. We’re a biking family for the most part, but not when we’re going to hockey with all our equipment. My parents keep telling me that I should get my G1, just to have it, but I don’t care that much. I can’t be bothered”
- Female 17, Harbord

Despite their differing opinions on the automobile, both groups identified several advantages to driving or getting rides (see Table 7.11).

**Table 7.11 Comments identifying advantages of cars either as a driver or a passenger.**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord Number</th>
<th>Harbord Share</th>
<th>Westdale Number</th>
<th>Westdale Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast, no waiting involved</td>
<td>5</td>
<td>18%</td>
<td>10</td>
<td>16%</td>
</tr>
<tr>
<td>If you can drive, brings greater independence</td>
<td>0</td>
<td>7%</td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>More direct and flexible - takes you exactly where you want to go</td>
<td>4</td>
<td>14%</td>
<td>10</td>
<td>16%</td>
</tr>
<tr>
<td>Easier to carry things</td>
<td>7</td>
<td>25%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>More spontaneous than transit</td>
<td>0</td>
<td>7%</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td>More comfortable during very hot or cold weather</td>
<td>2</td>
<td>7%</td>
<td>5</td>
<td>8%</td>
</tr>
<tr>
<td>More private than transit</td>
<td>0</td>
<td>7%</td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>Can listen to music</td>
<td>0</td>
<td>7%</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td>Less expensive than transit if traveling in group</td>
<td>7</td>
<td>25%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Lots of fun when with your friends</td>
<td>0</td>
<td>5%</td>
<td>5</td>
<td>8%</td>
</tr>
<tr>
<td>If you're a passenger, can sleep in car</td>
<td>0</td>
<td>5%</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Feels more safe and protected</td>
<td>3</td>
<td>11%</td>
<td>4</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>100%</strong></td>
<td><strong>61</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The Westdale group spent more time expounding on the advantages of driving or being driven somewhere and as a result made about twice as many comments as the Harbord group regarding this matter. Both groups stated that driving has the advantage of not having to wait for a bus or walk a long distance, making it much faster than other modes. The car is seen as a very flexible mode, which allows for a more precise route to be taken toward a particular destination. Both groups also enjoy the comfort of driving or riding around in a car during very cold or very hot weather. They also feel that the car provides a feeling of safety and protection, with no possibility of being harassed or threatened.
Several Harbord participants mention that driving makes more sense when traveling with their whole family. Firstly, driving can be less expensive than paying for several transit fares, especially if traveling out of town. The group agreed that using cars for longer distances, out of town trips, and trips with large numbers of people makes more sense than using transit.

“Sometimes in my family, it’s cheaper for all of us to get in the car and pay for parking than to pay for TTC”
- Female 16, Harbord

Westdale participants mentioned several advantages to driving that did not come up in the Harbord group. For example, several comments were made relating to the enjoyment of driving with friends and being able to listen to loud music while cruising around the city. This group was also much more inclined to associate driving and cars with independence and the ability to make spontaneous travel decisions. Finally, the issue of privacy came up several times. Participants enjoy the idea of having their own private space to travel in where they can be as loud or as quiet as they want. Many of these advantages were stated in comparison to the pitfalls of taking transit.

“Driving is fun. You can play your music, pick up your friends and get where you need to go without waiting around for a bus.”
- Male 17, Westdale

“I like the privacy of riding around in a car. Like, it’s only your trip that matters. With transit you sometimes take really indirect routes that take longer, especially buses that travel on the mountain. They go through all these side streets that you can bypass if you’re driving. Plus, you can take the highway instead of going through the city. It’s way more efficient”
- Female 18, Westdale

“With a car, you don’t have to worry about bus schedules, you can just pick up and leave when ever you want, and you go straight to your destination, instead of having to walk another 10 or 15 minutes from the bus stop to wherever you’re trying to go.”
- Male 18, Westdale

| Table 7.12 Comments identifying disadvantages of using cars as a driver or passenger |
|-----------------------------------------|---------------------------------|---------------------------------|
| Issue | Harbord | Westdale |
|       | Number | Share | Number | Share |
| Cost of gas | 3 | 7% | 5 | 9% |
| Fear of accidents | 6 | 14% | 2 | 3% |
| Requires greater responsibility | 4 | 9% | 4 | 7% |
| Finding and paying for parking | 8 | 18% | 0 | 0% |
| Always having to be designated driver | 0 | 3% | 3 | 5% |
| Traffic congestion | 8 | 18% | 2 | 3% |
| Tendency to underbudget time, forgetting about traffic | 0 | 4 | 7% |
| Fear of dangerous weather conditions | 4 | 9% | 2 | 3% |
| Makes you lazy | 5 | 11% | 3 | 5% |
| If getting a ride, have to be on someone else's schedule | 6 | 14% | 5 | 9% |
| Total | 44 | 100% | 30 | 52% |
In terms of disadvantages associated with automobiles, the Harbord group had more to say than the Westdale group (see Table 7.12). Both groups identify the greater responsibility involved in driving a vehicle and perceive the weight of this responsibility as a disadvantage. For example, none of the participants were too keen on paying large sums of money for gas and did have some awareness as to the effects of rising oil prices. Within the Harbord group, several participants cited the cost of parking in downtown Toronto as a significant disadvantage to driving. Parking was not mentioned by the Westdale group, which is not surprising in light of the abundance of free parking availability throughout the City of Hamilton.

“Not only do you have to pay for gas and parking, which can be super expensive downtown, but you have to actually be able to find parking! This can be really hard downtown, especially in the evenings and on the weekends. Like, I don’t even drive, but when I’m with other people and they’re trying to parallel park on College St. on a Friday night, I get so nervous for them [laughs].”
- Female 17, Harbord

Both groups also had a sense of fear related to getting into a car accident. In fact, two Westdale participants described stories of minor accidents they were involved in shortly after obtaining their license. This fear is heightened during poor weather conditions such as heavy rain, snow, sleet and icy roads. Both groups felt that driving can be a very dangerous mode of transportation. They also felt that regular automobile access can make a person lazier than they need to be, often citing examples of their parents’ behaviour.

“My parents drive everywhere, no matter how close it is. They’re so lazy that they’ll even drive to the corner store. I seriously hope I never get that lazy.”
- Male 18, Westdale

“I think that once you start driving, you get used to that and always want to drive. My parents rarely take TTC even though me and my sister take it all the time.”
- Male 16, Harbord

The Harbord group also felt that traffic conditions in Toronto make driving more of a hassle than other modes. Several participants mention the frustration of being stuck in traffic when getting a ride from a parent. The Westdale group did mention traffic, but did not dwell on the idea of congestion for very long. A few comments were made with regards to not taking congestion into account when trip-planning and, as a result, being late for an appointment or a part-time job.

“I find that when I drive somewhere, I always assume it’s going to take very little time and so I under-budget the amount of time I need to get somewhere. I’ll forget that traffic can add a lot of time to the route.”
- Male 18, Westdale

As mentioned, both groups enjoy getting rides to cut down on the time it takes to get somewhere, but they do not like being on someone else’s schedule, particularly that of a parent or guardian.
7.6.6 Walking

Despite the sharp differences between the Westdale and Harbord groups when it comes to transit and driving, both groups are avid, frequent walkers. Most participants walk for the majority of their trips – with the exception of those who live far outside of their school’s catchment area. Although many participants mention speed as a benefit to using motorized modes, when distance or time is not a factor, they do not mind walking to their destinations. The following section explores the walking behaviour of the focus groups, as well as their attitudes and perceptions related to the walk mode.

7.6.6.1 Use of Walking

As can be seen in Table 7.13, 23 out of the 26 participants walk at least 4 times a week in order to meet their travel needs. Only 3 participants identify as weekly walkers, and those are the same participants who live in more suburban areas, outside of the catchment area for each school. These participants tend to participate in social activities that occur with the neighbourhood of their school, and thus tend to rely more on transit and automobiles to reach these destinations.

Table 7.13 Frequency of walking for both focus groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Almost daily (4 or more times per week)</th>
<th>Weekly (1 to 3 times per week)</th>
<th>Sometimes (less than 1 time per week)</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westdale</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Harbord</td>
<td>13</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Participants had different reasons for choosing to walk somewhere. Sometimes they walk because their destination is very close by, other times because they cannot get a ride or do not want to wait for transit. Many also identified walking as an enjoyable, social activity that they engage in by choice. When asked how long they would be willing to walk in order to reach a destination, answers ranged from 20 minutes up to a couple of hours.

“In good weather, as long as I’m not carrying a really heavy backpack I could walk for hours”
- Female 16, Harbord

“I could do a twenty minute walk anywhere, no problem, even in bad weather”
- Male 17, Westdale

“I would walk for hours if I’m with friends, but not by myself because it’s too boring”
- Female 16, Westdale

“Twenty minutes is my limit on my own”
- Male 15, Harbord

“If there’s a destination, I want to get there as quickly as possible. But when it comes to wandering around, I could walk around all day, for like 5 hours. But I wouldn’t want to walk more than 45 minutes to a destination”
- Female 17, Harbord
These comments match up with the results of the mapping exercise. All participants indicated several walking trips and routes on the map, often spanning several kilometers. Most of these longer walking trips seem to take place along streets with many shops and cafes.

### 7.6.6.2 Advantages and disadvantages of walking

Both groups were very positive about walking – there were almost twice as many comments related to advantages than to disadvantages (100 versus 54). As a whole, both groups felt that walking is the most immediate, spontaneous, reliable and flexible mode. It does not involve waiting for the bus, trying to maneuver a ride, or arranging to borrow a car. Participants appreciate the ability to get from origin to destination without having to negotiate all of these things and find walking to be the simplest way to travel.

“A lot of the time I’ll choose walking over taking the bus because it’s the easier option. You don’t have to check schedules or buy bus tickets or wait around, you just go. I like that about it.”
- Male 16, Westdale

“I go to piano lessons and [to get there] I have to take the Christie Street bus. Sometimes it takes forever so I’d rather just walk because I hate waiting. Plus on a good day, it’s a nice walk. I’d way rather walk than stand around for ten or fifteen minutes.”
- Female 15, Harbord

Besides being simple, spontaneous and reliable, walking also provides a great way of traveling independently. Participants frequently expressed their appreciation for being able to walk places on their own, without having to worry about getting a ride from a parent. Several Westdale participants mentioned that they wish they could walk to more of their destinations.

**Table 7.14 Comments identifying the advantages of walking**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord</th>
<th>Westdale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate, spontaneous and flexible</td>
<td>6 13%</td>
<td>5 10%</td>
</tr>
<tr>
<td>Enjoyable</td>
<td>7 15%</td>
<td>6 12%</td>
</tr>
<tr>
<td>Entertaining, social activity, provides bonding time</td>
<td>6 13%</td>
<td>8 15%</td>
</tr>
<tr>
<td>Healthy, burns calories</td>
<td>4 8%</td>
<td>4 8%</td>
</tr>
<tr>
<td>Cheaper than the bus or driving</td>
<td>4 8%</td>
<td>7 13%</td>
</tr>
<tr>
<td>Allows greatest independence</td>
<td>8 17%</td>
<td>10 19%</td>
</tr>
<tr>
<td>Faster than waiting for the bus</td>
<td>6 13%</td>
<td>7 13%</td>
</tr>
<tr>
<td>Reliable</td>
<td>3 6%</td>
<td>3 6%</td>
</tr>
<tr>
<td>Allows you to understand the city, learn where you're going</td>
<td>4 8%</td>
<td>2 4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>48 100%</td>
<td>52 100%</td>
</tr>
</tbody>
</table>

Participants also appreciate that walking is the least expensive option of transportation available to them. Several participants commented that they would rather walk a few blocks than “waste money on the TTC”. They also mentioned the health benefits of walking, appreciating that it is a good way to “burn calories” and stay in shape.
Both groups agreed that walking is an enjoyable way of traveling, and can be entertaining for hours when surrounded by good company. Several comments were made regarding the fact that many walking trips, while utilitarian, are also a social, bonding time.

“Walking with others is kind of bonding time. You’re make conversation with whoever you’re with so it’s social. For example, walking home with friends from a party can lead to some great conversations.”
- Male 16, Harbord

“Walking with my friends is entertaining. Sometimes we walk just to hang out. Like we’ll walk all the way from my house to the Eaton Centre [mall], which is a good hour walk. We could take the streetcar, but sometimes it’s just more fun to walk.”
- Female 16, Harbord

“My friends and I will walk anywhere between 2km and 10km on a Friday or Saturday night in the summer. We walk everywhere. Through parks, through laneways, down main streets, across bridges – it’s a pretty sweet way to get around when you’re with your friends.”
- Male 17, Westdale

“I love walking; I can walk for hours on a good day. I just listen to my iPod and walk.”
- Female 18, Westdale

Another point raised by both groups is that walking gives the traveler a sense of direction within their city, allowing them to become more and more familiar with it. Although they do mention feeling unsafe at times, they are fully aware that the more walking you do, the less fear you have of your own city. You begin to understand what is safe and what is not, as well as routes you can divert toward if you are feeling threatened. Table 7.15 summarizes some of the disadvantages of walking as identified by both groups, which includes, of course the notion of sometimes feeling vulnerable when walking alone at night.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord</th>
<th>Westdale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takes a long time if destination is far</td>
<td>5 17%</td>
<td>8 33%</td>
</tr>
<tr>
<td>Exposure to elements</td>
<td>4 13%</td>
<td>4 17%</td>
</tr>
<tr>
<td>Feeling unsafe at night</td>
<td>9 30%</td>
<td>2 8%</td>
</tr>
<tr>
<td>Tiring if you’re carrying things</td>
<td>5 17%</td>
<td>4 17%</td>
</tr>
<tr>
<td>Dangerous when walking along busy arterials</td>
<td>7 23%</td>
<td>6 25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30 100%</strong></td>
<td><strong>24 100%</strong></td>
</tr>
</tbody>
</table>

Throughout the discussion with the Harbord group, the theme of safety in relation to walking emerged strongly, especially as compared with the Westdale group. The Westdale group did not dwell on the idea of feeling scared while walking alone at night. Even the female participants said that they felt fairly safe walking around the Westdale area. When asked if they felt equally safe in the rest of the city, most participants said that they felt less safe being downtown. However, many of them felt that this was more a function of being unfamiliar with some of the neighbourhoods in that area.
“I feel safe walking alone at night. I don’t feel threatened. My philosophy is: walk quickly, and keep your head down”
- Female 16, Westdale

“How about you, do you feel safe walking alone at night? I actually think it’s better if you keep your head up cause then you don’t look like an easy target. It’s true! You look tough.”
- Female 17, Westdale

The Harbord participants had a lot to say with regards to safety. Many participants mentioned feeling unsafe walking around at night alone, even in relatively safe neighbourhoods in Toronto.

“I mean, I guess I’m okay with walking alone at night, but it really depends on the neighbourhood. But I wouldn’t even want to walk around Harbord late at night. People get robbed around here even during the day.”
- Male 16, Harbord

“I don’t feel safe walking around downtown by myself. Definitely not alone, maybe with other people. I wouldn’t walk around the Annex by myself at night.”
- Female 16, Harbord

Interestingly, several participants agreed that walking alone at night through the Annex is a bad idea. The Annex is a very walkable neighbourhood located within the Harbord catchment area. The neighbourhood has a plethora of bars, restaurants, shops, grocery stores, a movie theater and two parks. According to the Toronto Police crime statistics, this area is very safe. Violent incidences are extremely rare, with most crime being related to auto theft or breaking and entering. When the participants were probed to describe what exactly made them uncomfortable to be alone in certain area, they listed several factors, such as:

- Scary looking, sketchy people
- Unlit, dark areas
- Deserted areas
- Areas where there are no open stores or restaurants
- Areas full of drunk, rowdy people

While the Annex is certainly not deserted and is relatively well-lit and populated at night, it is populated by some less than savoury looking characters (although they are harmless), and home to one of the most notoriously rowdy bars in the area, “The Brunswick House”. The female participants in particular do not feel comfortable walking around alone in the area for this reason.

In general, the Harbord participants seemed to be aware of the different factors that make them feel safe to walk alone in a particular area. Several comments were made regarding the benefit to being in well-populated and well-lit places.

“Yeah I would not want to walk around the Annex or Queen Street at night by myself. If I had to choose, I would choose Queen Street because I think it has better lighting and more people around. I don’t like walking in overly quiet areas at night by myself.”
- Female 17, Harbord

---

27 According to the Toronto Police crime statistics, the Harbord area is very safe, with no violent incidences reported this year. Besides a handful of residential break-ins, the area is virtually crime-free.
“More people around is good, as long as they aren’t scary people. It’s better if there are a lot of different kinds of people”
- Female 16, Harbord

“I’m ok walking in places where you know there will always be other people around. Like, at night, I’d definitely rather walk on Bloor street than on a residential street. Also, streets like Bloor tend to be well-lit”
- Male 17, Harbord

Again, the idea of familiarity came up several times. Participants from both groups agreed that the more familiar a person is with a neighbourhood, the safer they tend to feel walking alone within it.

“I’m okay walking places I’m familiar with at night, because I know how safe it is. Especially in busier areas…but I don’t feel place at say Wellesley and Sherbourne, where the school dance was held last night. This is only because I’ve never been there before so I have no idea what to expect.”
- Male 16, Harbord

“Being familiar with an area is really important because you’ll know where to go if something happens and you need to get away. If it’s an area you don’t know, you’re pretty vulnerable. The more you walk the more familiar you get.”
- Female 17, Harbord

Unlike the Westdale group, there seemed to be a general consensus amongst Harbord participants that walking during the day and at night resulted in different behaviour. While night time walking involves choosing routes that are well-populated and well-lit, daytime walking involves criss-crossing along old residential streets and walking in more picturesque areas.

“I prefer walking down residential streets during the day because it’s prettier. But at night I stick to main streets”
- Male 16, Harbord

“I’d rather walk around Harbord than on a major avenue because there are lots of trees for shade, and the houses are nice and different”
- Female 17, Harbord

“In the summer, Palmerston looks like it has a giant green archway cause of the trees. It’s so nice. I always choose to walk down Palmerston over any other parallel street.”
- Male 17, Harbord

Despite the differences between the groups relating to the fear of walking alone at night, both Harbord and Westdale participants are concerned about pedestrian safety issues related to walking on busy, high-traffic streets. Both groups frequently commented on the difficulty of crossing the street in high-traffic areas, and even simply walking down major arterials lined with parking lot exits or alleyways.

“I feel unsafe crossing certain streets. Like Harbord and Ossington, the cars are never paying attention to pedestrians. Even when it’s my turn to go, I hesitate because I’ve almost been hit there a few times.”
- Female 16, Harbord

“I feel unsafe sometimes walking, especially around Eglinton West station, where I take karate lessons. There’s never a time where there aren’t cars around. It’s so busy”
- Male 17, Harbord
“At that party, crossing Lawrence at Keele was ridiculous. The road is so wide you literally have to run to make it across”
- Female 16, Harbord

“Yeah the cars go way faster around there. It’s scary. Plus it’s ugly, who wants to walk there?”
- Male 17, Harbord

“Yeah all the houses look the same, it’s so boring”
- Female 17, Harbord

“Walking down the Golf Links Rd in Ancaster is so rough. First of all, it’s a four lane road that’s always very busy. Secondly, there are a bunch of big box stores with giant parking lots. Good luck walking down the sidewalk without having at least 3 cars almost hit you. They’re not even looking cause they don’t expect to see a person walking. Even driving around those parking lots is dangerous, let alone walking.”
- Male 18, Westdale

“The intersection right at Longwood and Main, where Westdale [Secondary School] is, is pretty bad for pedestrians. You can’t cross the west side of the street, there are no pedestrian lights. It’s such a busy intersection so you have to be pretty careful”
- Female 15, Westdale

Participants from both groups also expressed that walking was not their first mode of choice during very cold, snowy or rainy weather. Under these conditions, Harbord participants revert to taking transit, while Westdale participants try to get rides, and take transit as a second choice. Both groups also expressed that walking while carrying a heavy backpack, a large amount of sports equipment, bags of books, etc, is not very desirable.

7.6.7 Biking

Utilitarian cycling was mostly discussed in the Harbord focus group, and only touched on by the Westdale group. According to the TTS dataset, cycling trips, in both Hamilton and Toronto, account for only about 1% of the total number of trips made by this age group. Even so, biking was mentioned during the discussions. There seemed to be two types of cyclists in the groups: ardent, frequent cyclists, and casual cyclists who used their bicycle for the occasional, short-distance trip. The Harbord group had more of the former kind than the latter, whereas the Westdale group only had the latter kind. Looking at Table 7.16, it is clear that the Harbord group had a greater number of cyclists than the Westdale group. The five people with the Westdale group that do cycle do so less than once a week.

<table>
<thead>
<tr>
<th>Table 7.16 Frequency of biking for both groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Westdale</td>
</tr>
<tr>
<td>Harbord</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
7.6.7.1 Advantages and disadvantages of biking

Several participants in both groups commented on the flexibility of using a bicycle as a mode of transportation. Much like walking, biking allows the traveler to avoid conforming to the schedules of others, enabling easy, independent travel. It is also much faster than walking, and in the case of the TTC, sometimes faster than taking transit.

“Biking allows me to zip through the city! If you consider all the waiting that you have to do when taking the TTC, biking can often be the faster choice. Also, walking can be frustratingly slow compared to biking. I come from a family of bikers – we know how to bike safely. So I really don’t see any reason to take any other mode around Toronto unless I’m traveling really far”
- Female 17, Harbord

Biking is also seen as being a very economical, environmentally friendly way of traveling, while also providing the opportunity to get some exercise.

“I spent about $400 on my bike, but it saves me about $100 a month in TTC fares...so it basically paid for itself in four months. Sounds like a good deal to me!”
- Male 17, Harbord

I also think it’s healthier to bike around. Better for your health and also better for the environment.”
- Male 18, Harbord

Another commonly stated advantage of biking is that it is an enjoyable activity. Many of the more casual riders mention that biking is a fun way to get around town, if you feel confident enough to do it.

Table 7.17 Comments identifying the advantages of biking

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord</th>
<th></th>
<th>Westdale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Share</td>
<td>Number</td>
<td>Share</td>
</tr>
<tr>
<td>Immediate, spontaneous and flexible</td>
<td>4</td>
<td>14%</td>
<td>3</td>
<td>21%</td>
</tr>
<tr>
<td>Enjoyable</td>
<td>5</td>
<td>18%</td>
<td>4</td>
<td>29%</td>
</tr>
<tr>
<td>Healthy</td>
<td>3</td>
<td>11%</td>
<td>2</td>
<td>14%</td>
</tr>
<tr>
<td>Environmentally friendly</td>
<td>2</td>
<td>7%</td>
<td>2</td>
<td>14%</td>
</tr>
<tr>
<td>Faster than walking</td>
<td>6</td>
<td>21%</td>
<td>3</td>
<td>21%</td>
</tr>
<tr>
<td>Faster than buses and streetcars</td>
<td>4</td>
<td>14%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cheaper than driving or taking transit</td>
<td>4</td>
<td>14%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100%</td>
<td>14</td>
<td>100%</td>
</tr>
</tbody>
</table>

The most commonly cited disadvantage of cycling is that it can be extremely dangerous. Both cyclists and non-cyclists identify fear of getting hurt as the number one problem with cycling, which is exacerbated by the lack of biking infrastructure in both Toronto and Hamilton. Almost all participants had an anecdote to share regarding either personally being injured while biking, or knowing someone who had been injured.

“There aren’t very many bike lanes in Hamilton, at least in my area. I don’t really feel comfortable biking with traffic because drivers here aren’t used to sharing a lane with a bike. I know a few people who have almost been hit by cars biking on Main Street.”

---

28 A TTC student monthly metropass costs $99.
"My friends and I usually bike around our neighbourhood on the residential streets. I don’t really feel safe biking on busy streets. There are no bike lanes, so you always feel like you’ll get pushed off the road. Most people I know who bike farther distances bike on the sidewalk a lot. I know that’s a no-no, but it’s either that, or get hit!"
- Male 17, Westdale

"Yeah, remember when R was biking home from basketball and he got hit right in front of Earl Kitchener [primary school in residential area]? So bad! Luckily he didn’t get too hurt, but still, it was scary"
- Male 18, Westdale

"I find biking in Toronto to be super scary. I bike on sidewalks a lot because even in bike lanes, you’re not protected. It’s not like there’s a barrier stopping the car from hitting you."
- Female 16, Harbord

"Downtown is a bit safer for biking. Anything north of Eglinton, it’s impossible because you have to ride beside cars that are going over 60 km/hour"
- Male 16, Harbord

"Not many streets have good bike lanes and plus cars park in them and then they hit you when they open their doors! In Montreal they have way better bike lanes, like they actually have those barriers on a lot of them, which prevents cars from parking in the lane and veering into riders."
- Female 17, Harbord

"I still bike even though it’s scary. I’ll stick mostly to residential streets even though it takes me longer to get where I’m going. I’ve been hit by car doors opening before. Most people I know who bike a lot have been in some kind of accident."
- Male 17, Harbord

"I use a combination of biking on smaller streets and riding through parks because it’s safer. Like he said, it takes longer, but it’s better than getting sandwiched between a bus and a truck! Seriously, that happened to me once."
- Female 18, Harbord

<table>
<thead>
<tr>
<th>Issue</th>
<th>Harbord</th>
<th></th>
<th>Westdale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Share</td>
<td>Number</td>
<td>Share</td>
<td></td>
</tr>
<tr>
<td>Dangerous</td>
<td>10</td>
<td>25%</td>
<td>10</td>
<td>48%</td>
</tr>
<tr>
<td>Lack of bike lanes and other cycling infrastructure</td>
<td>8</td>
<td>20%</td>
<td>6</td>
<td>29%</td>
</tr>
<tr>
<td>No protection from the elements</td>
<td>5</td>
<td>13%</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>Get too sweaty</td>
<td>3</td>
<td>8%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Can’t carry too much with you</td>
<td>4</td>
<td>10%</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Bikes get stolen often</td>
<td>7</td>
<td>18%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>People don’t like cyclists</td>
<td>3</td>
<td>8%</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100%</td>
<td>21</td>
<td>100%</td>
</tr>
</tbody>
</table>

Another complaint is that biking provides no protection from the elements, and thus is not as enjoyable during cold, winter months, extreme heat, or during heavy bouts of rain. Also, participants mentioned that if they are carrying a large amount of baggage or sports equipment, biking is not an ideal mode of transportation. Harbord participants also noted that biking is not always appropriate depending on the destination. For example, if heading somewhere formal, it is not desirable to arrive dripping with sweat.
Unlike Westdale participants, the Harbord participants are extremely concerned with bike theft. Bike theft is a significant problem in Toronto; according to various estimates, anywhere from 7,000 to 12,000 bikes are stolen each year in Toronto (CBC News, 2008). This requires devoted cyclists to invest in expensive locks and to be keenly aware of smart bike parking practices. For several participants, the prospect of having yet another bike stolen is enough to deter them from using cycling as a mode of transportation.

“My bikes always get stolen. It’s ridiculous. There’s no point in even having one in Toronto. I can’t keep buying new bikes!”
- Female 15, Harbord

“You have to be so careful about where you park your bike. Even at school bikes get stolen all the time. Even really bad, Canadian Tire bikes! I mean it’s not like people are riding super fancy bikes to school. It’s so disappointing!”
- Male 16, Harbord

Many of the avid bikers in the group argue that buying a good quality lock, not leaving your bike outside overnight, and using tricks like locking the wheel, as well as the frame to the bike parking stand can help avoid bike theft. Even these participants did, however, complain that most bike racks leave bikes exposed to rain and snow, which can be damaging to the bike.

7.7 Discussion: Crosscutting themes

7.7.1 Land use and urban form variables

Throughout the focus group discussions, several themes emerged despite not being explicitly brought up through questions from the researcher. While built form and land use were not explicitly discussed, their importance was understood, at least to some extent, by both groups. It became apparent that many of the participants had a sense of which elements they think made an area more walkable, vibrant and livable. It was interesting that they identified all of Jane Jacobs’ principles for livable streets and neighbourhoods without even having heard of her.

When asked about their travel behaviour and mode choice, participants stated that besides the convenience factor attributed to a particular mode, distance between origins and destinations was a significant driver of travel outcomes. Those living in older, more urban and mixed-use areas are appreciative of the variety of destination choices that are within walking or biking distance. Those living and traveling in these areas talked about their ability to walk and bike to go to school, to shop, to socialize, to go to the park and to participate in various extra-curricular activities. Participants who live in more dispersed, suburban areas are aware that their travel behaviour is at least in some capacity determined by the lack of destinations within their vicinity. These participants expressed feeling trapped in their neighbourhood and did not like the fact that getting from their home to many of their destinations requires so much effort. The sense of frustration with the limitations of such urban areas was very obvious.

“I’m originally from Thunder Bay and that is the worst place ever for walking and biking. It was really frustrating trying to travel on your own there. That’s why I love Toronto. I feel way more free here. Everything is close. I walk all the time, I bike all the time, I wouldn’t want to live anywhere else.”
- Female 17, Harbord

“I make a lot of trips that are not with my parents, which lets me actually learn about where I’m going. My cousins in the U.S. had to get their license as soon as they turned 16. They either have to get a ride with their parents, or if they can get the car, they’ll drive. So they really only know the car route somewhere, which is so different from walking. They have no idea how to walk anywhere in their area…not that there’s too much to walk to!”
- Female 16, Harbord

“My dad lives in Mississauga and all the kids I know around there get rides everywhere. It’s so lame cause there’s no where to walk to.”
- Male 17, Harbord

“Living in Westdale is really different from living on the Mountain. I have the option to walk places, but my friends who live up there can only walk to a few places and have to get rides a lot. I like my area better. Plus it’s nicer, with older homes and nicer buildings.”
- Male 16, Westdale

“Yeah, I’m one of those people [laughs]. Like I said, it takes me 20 minutes to walk to a bus stop. It’s so frustrating because if I want to do anything, I have to budget like an hour to get there. All my friends walk there in 10 minutes, and I’m still walking to the bus stop all with way in Ancaster. I hate Ancaster! Why would anyone want to live here? I mean, I understand living in the older areas, but not in the new developments. We moved there when I was in grade 10 I think, we used to live in a real neighbourhood.”
- Male 18, Westdale

“I don’t live in Ancaster, but I live in Dundas, which is similar. I don’t know if it’s as bad, but it definitely takes me longer than most of my friends to get places because of where I live. I’d rather live closer to things for sure.”
- Male 17, Westdale

Both groups also expressed opinions on urban elements that made traveling by foot or on their bikes more enjoyable. Several comments were made regarding the aesthetic value of having large trees lining the streets, a mix of old and new architecture, a variety of housing styles and a presence of cafes and restaurants. Others commented on the importance of sidewalks and streets with slower-moving, calmer traffic conditions. This commentary is reflected in the results of the mapping exercise. As mentioned, participants indicate taking long walks along streets that are lined different kinds of businesses and activities. There are also walking trips shown that zig-zag through older residential streets.

“It’s harder to walk in certain areas. When you go north of Eglinton in Toronto, things get crazy. The major streets are really wide, with lots of cars. It’s hard to cross them. The cars go way faster around there and it’s not very picturesque. The streets just seem to go on and on forever, with not too many interesting things to look at.”
- Male 16, Harbord

“Yeah, I live in that part of the city. It’s ugly, with lots of strip malls and parking lots. I’d way rather walk downtown than up there.”
- Male 16, Harbord
“My aunt and uncle live in one of those clone suburbs in Oakville, but my grandparents live in another part of Oakville where the houses are older and look different. It’s way better, they actually have sidewalks.”
- Male 16, Harbord

“Walking in the suburbs is not as enjoyable. All the houses look the same, it’s so boring. Also, drivers in the suburbs are less aware of pedestrians”
- Female 17, Westdale

“Yeah no one walks around the suburbs. It’s so boring, there’s no where to actually go, all the houses look the same. Some suburbs don’t even have sidewalks”
- Female 15, Westdale

All participants had been exposed to both urban and suburban landscapes and had many opinions regarding the differences between them. Throughout the conversation, they were asked whether they believed their travel choices would be different if they lived in a neighbourhood that looked different from where they currently reside.

“Like I said, my dad lives in Kitchener and if you live in a place like that you have to drive because everything is totally spread out. To get to a grocery store you have to drive for like 10 minutes, it’s ridiculous, it’s horrible. If I lived there I’d have to drive, but I would rather not live there. It’s all either residential or Big Box”
- Female 16, Harbord

“I walk and bike because it’s fun and cheap but it ties in nicely with what I believe. At the same time, if I lived in a place where you had to drive, I probably would drive.”
- Male 17, Harbord

“I feel like when you get older, you don’t have as much time to do anything. So maybe you won’t walk an hour to get somewhere because you have more things to do.”
- Female 15, Harbord

“It all depends on the choices you’re given. If you’re given enough choices, you can make different decisions. That’s why I’m always going to stay in Toronto. It’s way cheaper not to drive and it’s really easy to get around using TTC”
- Male 17, Harbord

“Depending on where you live, it’s way easier to drive. Since I’ve spent so much time living in a suburban area, hating it, I will try my best never to live in this kind of area again. I was to live somewhere where I have to option not to drive. If it’s a well built city, things would not be spread out.”
- Male 18, Westdale

“It’s nicer not to have to drive everywhere. But I would only take public transit if it’s convenient and I’ll only walk if it’s convenient.”
- Male 16, Westdale

Participants who indicated sometimes feeling scared or unsafe when walking around alone at night also recognized the role of urban form in helping this problem. Many said that they feel safer in well-lit, well-populated places that have a lot going on during all hours of the day and night. Active streets and storefronts make them feel much safer when walking around.
In terms of public transit, most participants did not make the connection between viable, efficient transit supply and built form variables. They did recognize that urban areas tend to have more extensive transit systems and appreciate the accessibility and availability of transit in these areas. Those living in more dispersed areas consistently identified lack of transit as being a very significant barrier to their independent travel.

### 7.7.2 Parental influence on travel decisions

Another theme that emerged throughout the discussion was the impact of parental concerns and attitudes on mode choice. When it comes to independent travel, it is not surprising that, as teens grow older, parental influence lessens. The younger participants frequently mentioned the feelings of their parents when discussing traveling alone by foot or on transit. Many seemed to agree with their parents that such habits can lead to dangerous situations. Some Harbord participants mentioned that their parents do not want them wandering around parts of the city that they deem to be “unsafe”. When asked about the kinds of places that would fit this category, participants threw out several examples of intersections throughout Toronto, most of which are located downtown or on the edge of downtown. They could not isolate the aspects of theses areas that made their parents, and themselves, uncomfortable, except to comment on the kinds of people they might run into in those areas. These include drug dealers, drug users, thugs, rowdy people and “crazy” people. Some also mentioned that their parents did not like for them to walk through deserted areas or parks at night, particularly areas that are not well-lit.

Within the Westdale group, some participants did cite parental influence as a fact that determines their travel. For example, some of the younger participants living within the Westdale area are discouraged to travel alone at night outside of this area. Many mentioned that their parents are uncomfortable unless they know exactly where they are going, who they will be with and when they will come home. There were also a few comments related to parental discomfort with traveling in the downtown core of Hamilton. Participants acknowledge that downtown Hamilton can be a scary place at night. When asked to expand on why they think their parents are uncomfortable downtown, they cited several reasons:

- “Deserted, not very many open shops, a lot of abandoned storefronts”
- “Empty streets at night, except for Hess Village and maybe James North”
- “Too many crazy people”
- “Lots of drug dealers”
- “Not very many things to do, except for a few spots here and there”
- “Dark and grimy”

Both groups sympathized with some of the fears expressed by their parents, and agreed with some of their concerns. However, there were several participants in both groups that deemed some of these parental fears to be irrational and ill-informed. Some accused their parents of never actually spending time in some of these so-called “dangerous” places. Some also expressed that it would be nice for parents to trust that their child will know what to do in a dangerous situation, rather than trying to shelter them.

“If my parents knew half they stuff we get up to, they’d never let me leave the house! The thing is, the more you experience and mess up, the more you learn how to act. I’m glad I don’t live a super sheltered life”
Parental fear related to teenaged drivers was another common thread. When asked how their parents feel about them driving alone or with others their age, about half of the participants said that their parents were uncomfortable with the notion. The parents of some Harbord participants are particularly concerned about their children driving through the busy streets of downtown Toronto.

“My parents aren’t really into me driving with other people my age and they’re not crazy about me using their car cause they think I would get into an accident.”  
- Male 16, Harbord

“My parents do not want me to drive with other people my age. They assume we’re all driving crazy.”  
- Male 16, Harbord

“My mother doesn’t trust any male drivers. She’ll let me drive with a girl, but not with a guy! She thinks they’re reckless [laughs].”  
- Female 16, Harbord

“My parents don’t even like driving in Toronto, let alone letting me drive.”  
- Female 17, Harbord

Overall, many participants felt that the attitudes and perceptions their parents have on various modes do have an impact on their travel outcomes. This feeling is more pronounced amongst the younger participants. The older participants, while aware of their parents’ concerns, tend to work around this barrier in order to gain more travel independence.

7.8 Results of parental questionnaire

The Harbord participants were given a take-home parental questionnaire that they returned to the researcher during the focus group sessions. Unfortunately, this parental questionnaire was not developed when the Westdale focus groups were held and thus there are no results to present for this group. The purpose of this questionnaire was to get a sense of what the parents/guardians of the participants thought about their child traveling independently within Toronto, and to identify some of their concerns. It was also intended to gather some information directly from the parents with regards to the modes used by their children, and their level of involvement in chauffeuring their kids to their destinations.

As mentioned, 86% of participants come from car-owning households, with 64% having one vehicle and 22% having two vehicles. Nine participants come from dual parent households, and five come from single-parent households. As seen in Table 7.19, none of the single-parent households had more than one vehicle. Also, both zero car households are single-parent households, and both are also members of a car-sharing organization called Autoshare. They mention that the only use this service when traveling as a family, usually to destinations location outside of the City of Toronto.
Parents were asked a number of questions regarding how their child travels within their city and neighbourhood.

When asked how their child travels to school, 50% of parents said that their child walks, 29% said transit, and 21% said that their child consistently bikes to school. None of the parents drive their child to school unless there are very special circumstances. This is not surprising in light of the focus group discussions with the teens. In terms of discretionary travel, parents say that their kids mostly walk, cycle and take transit, and occasionally get rides to their destinations when parents think it is appropriate.

It is interesting to note that when asked if they drive their child to discretionary destinations, all single-parent parent participants said that they did not. Clearly those living in zero-car households do not have the choice to regularly drive their children places, but even those in one-car households said that they do not do so. This could be a function of work schedules and other household timing constraints. It does suggest that perhaps children in single-parent households are more reliant on transit, walking and biking to get around. The nine respondents who do drive their children to discretionary locations emphasized that this happens only occasionally. All nine said that they do not drive their child somewhere more than once or twice a week. They do so when the destination is too far, when the child must carry sports equipment, or if they feel that they do not want their child traveling home alone at night. One parent said:

“My child has complete freedom to travel on his own without adult accompaniment during the day. However, once it is dark and/or after 9pm, I will pick him up and it does not matter where in the city he is.”

In terms of cycling, only three participants described their child as an avid cyclist, using their bike to travel more than four times a week. Others said that there child cycles approximately once or twice a week, and only one participant said that their child does not own a bicycle.

All respondents said that they feel comfortable allowing their child to walk, bike and take transit within their neighbourhood and their city, depending on the distance they travel and the location of their destination. Parents were asked to indicate how far they feel it is appropriate for their child to walk or bike, and whether their answer changes if the child is traveling alone, with friends, during the day or at night (see Tables 7.20 and 7.21).
Table 7.20 Maximum distance parents feel it is appropriate for their child to walk.

<table>
<thead>
<tr>
<th></th>
<th>Less than 1km</th>
<th>2km</th>
<th>3km</th>
<th>4km</th>
<th>More than 4km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone day</td>
<td>7.1%</td>
<td>28.6%</td>
<td>64.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone night</td>
<td><strong>71.4%</strong></td>
<td>28.6%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends day</td>
<td>14.3%</td>
<td>7.1%</td>
<td><strong>78.6%</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends night</td>
<td>21.4%</td>
<td><strong>42.9%</strong></td>
<td>35.7%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is clear that parents feel more comfortable with their child walking alone or with friends for longer distances during the day. At night, they prefer that their child remain within 1km of their home, and even then, 45% of participants mentioned that they would prefer their child not walk alone at night at all. When walking with friends, parents seemed to feel a little more comfortable with night time travel; however, 21% still would prefer their child not to travel very far from home.

Table 7.21 Maximum distance parents feel it is appropriate for their child to bike.

<table>
<thead>
<tr>
<th></th>
<th>Less than 1km</th>
<th>2km</th>
<th>3km</th>
<th>4km</th>
<th>More than 4km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone day</td>
<td>38.5%</td>
<td>7.7%</td>
<td>61.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone night</td>
<td><strong>76.5%</strong></td>
<td>15.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends day</td>
<td>38.5%</td>
<td>61.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends night</td>
<td><strong>69.2%</strong></td>
<td>30.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In terms of biking, responses were very polarized. Parents seemed to be either completely fine with their child cycling, or very uncomfortable. Again, during the day, most parents feel that it is safe for their child to bike long distances (alone or with friends). Still, almost 39% would prefer that their child bike less than 1km during the day. This group expressed the sentiment that biking in Toronto is unsafe unless it is done on quiet, residential streets. Many parents feel very uncomfortable with the idea of their child biking on high-traffic streets, or streets with no bike lanes.

“I still don’t think that my child is mature enough to negotiate streets filled with cars, trucks, buses and other vehicles, whilst cycling. Traffic moves very quickly.”

“It’s important that traffic is controlled, that there are proper stoplights and that there are bike lanes”

Those who felt comfortable with their child biking longer distances emphasized that their child has been cycling for many years and is aware of the appropriate safety precautions. One parent said:

“We have been active community members living downtown where we know the neighbourhood and neighbours very well. Since my 4 children were very young, cycling was the mode of transportation. They have learned cycle safety and are confident cyclists.”
In terms of night time cycling, only 15% of participants felt comfortable with their child traveling longer distances alone, and 30% felt it was appropriate when their child is accompanied by friends. Parents explained that this fear is mostly related to the danger that their child will not be seen by drivers at night. Many felt that the risk of accident is greater at night, regardless of whether the child is alone or with friends.

The questionnaire also intended to explore the factors that influence a parent’s decision to allow his or her child to walk or bike independently. Participants were asked to consider a list of various built form and social elements, and to circle the number that most closely represents the influence of each on their decisions.

### Table 7.22 Factors influencing a parent’s decision to allow their child to walk or bike without accompaniment.

<table>
<thead>
<tr>
<th>Concern</th>
<th>Frequency distribution % response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Heavy or fast traffic</td>
<td>21.4%</td>
</tr>
<tr>
<td>Uncontrolled crossings</td>
<td>35.7%</td>
</tr>
<tr>
<td>Lack of sidewalks</td>
<td>57.1%</td>
</tr>
<tr>
<td>Intimidating strangers</td>
<td>21.4%</td>
</tr>
<tr>
<td>Other teens causing trouble</td>
<td>21.4%</td>
</tr>
<tr>
<td>Provision of bike lanes</td>
<td>14.3%</td>
</tr>
<tr>
<td>Provision of street lights</td>
<td>28.6%</td>
</tr>
<tr>
<td>Distance between origins and destinations</td>
<td>14.3%</td>
</tr>
<tr>
<td>Number of other people around</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

1 Where (1) represents “Not an influence” and (4) represents “Major Influence”

Two major influences that can be noted on Table 7.22 are the distance between origins and destinations and the number of other people present on the street or in the area the child is traveling in. Both of these factors were also identified by the teens in the focus group as major determinants of where they will travel on foot. It is not difficult to understand why these two factors would be cited; however, it should be highlighted that the two are related. When a variety of destinations are located within a walkable distance from each other, the tendency for activity to occur during various hours of the day increases. In other words, the more mixed-use an area is, the more effective the “eyes on the street” safety measure tends to be. About 57% also mention the provision of streetlights as being a major influence, which again, was mentioned by the teenagers in the group as well. Heavy or fast traffic are another major concern for parents, although most of them do not seem to worry about their children walking or biking in areas with no sidewalks and uncontrolled crossings. Lack of sidewalks is not really an issue for those who

29 This is explained very well by Jane Jacobs in her seminal work *The Death and Life of Great American Cities* (1961).
reside within the Harbord catchment area, which could be why parents do not feel this is an issue. In terms of uncontrolled crossings, some parents seem to worry about them, while others do not.

About 64% of parents worry about the prospect of “intimidating strangers” being present around their children. It would have been interesting to explore this issue further with the parents in order to tease out the details of this concern. Obviously there are certain areas of the city that parents feel are populated by people who may intimidate or harm their children. About 57% of the participants are also concerned about the prospect of other teenagers bothering their child. Some parents noted that they worried about rough teens robbing, harassing or bullying their child in certain parts of the city. The teens in the focus groups indicated that mugging does occur in the Harbord neighbourhood; however, none of them had been victims of any such incident. When asked whether they knew anyone who had been hurt or mugged near the school, many had stories that they had heard, but did not seem to know many details regarding the incidents.

Finally, much like the focus group participants, the parents felt that the lack of bike lanes and cycling infrastructure in the city is a major concern. Anyone who has biked in Toronto will agree that it can be very dangerous, particularly if the cyclist is inexperienced or hesitant.

While none of the teenagers who participated had obtained their license yet, about 50% of the parents felt that it would be inappropriate for their child to drive alone within the city. Several comments were made regarding the dangers of teenagers driving, particularly with other teenagers.

“Until my child is 18, there is no sense is applying for a license. Young people’s brains can not fully multitask until they are at least 21, and so I would prefer to get a call at 3am to pick her up than let her be in a car driven by someone under the age of 25.”

“My child does not have a driver’s license yet. I am reluctant to allow her to drive with other young people unless I know that person well and the drive is a simple trip. In other words, no ‘driving around’ and no highway trips.”

“I would not want my son driving until he is out of his teenaged years, and I would not want him to be driven by another teen. I feel it is unsafe because they are too irresponsible and careless.”

“I do not support riding in a car full of kids. It is okay if it is just him and a driver. He can get his license whenever he wants to, but he will drive supervised until very skilled. My philosophy is four wheels bad, two wheels good!”

“The prospect of my daughter driving frightens me. I also do not like the thought of her driving with other teenagers. I worry they will not obey the law and that they will get too distracted.”

“I would not want my child being driven by other young people. This is not yet a major issue for us as we live very close to public transit.”

The rest of the parents expressed that they would be fine with their child driving alone or with other teenagers as long as they know where they are going. Several parents mentioned that they trust their child enough to realize whether a situation is safe or not.
“At some point, I decided that my child is responsible enough to keep himself safe. If he feels uncomfortable or unsafe, he always knows that he can call. I am comfortable with other people driving him around as long as they have not been drinking.”

Parents were also asked to comment on how they felt about their child traveling alone using public transit. All participants felt that it was perfectly safe for their child to travel alone within the downtown core, up until the late evening. After this point, opinions varied. Some feel that traveling anytime, on any route is perfectly okay, while others felt that late night travel on the TTC alone is not a good idea.

“My child is often with a sibling or with friends when on public transit. If the destination is not too far away, I am comfortable with her traveling alone. If it is far away or at night, I prefer that she not be alone.”

Overall, the results of the parental questionnaire were well-aligned with the perceptions the Harbord teenagers had regarding their parents’ thoughts on travel. Many of the concerns expressed by the parents came up throughout the discussions; some were mentioned by the teens as well. The message is clear regarding the importance of well-lit, mixed-use areas, safe streets with controlled crossings and lighter car traffic, and the provision of more effective cycling infrastructure. Both parents and teens benefit from these things – parents will worry less and feel less inclined to chauffeur their children around, and teens will gain the ability to travel throughout their neighbourhood more efficiently, safely and independently. A more in-depth discussion of the focus group results, as well as the implications for policy are discussed in the next chapter.
Chapter 8: Conclusions

This study contributes to the understanding of the ways in which teenagers travel within urban and suburban settings and the barriers to their independent mobility. The findings emphasize that although the role of built form does not always directly influence teenage travel choices, it plays a significant role in shaping behaviour through its impact on mode and safety perceptions. Built form variables also play a role in shaping the attitudes adults have with regards to their child’s travel.

The application of three complementary research methods enabled a unique approach towards this subject that strikes a balance between breadth and depth. The analysis of the TTS data provides a means to describe the past decade of teen travel trends within the GTA. It also helped identify a broad understanding of mode shares and how they vary across urban and suburban jurisdictions. Finally, it allowed for an exploration of the differences between teen and adult travel behaviours across the GTA.

This data was supplemented with data collected through an on-line survey administered to groups of first year students at the University of Toronto. This supplemental data gave a more detailed and focused picture of teen travel, particularly in terms of discretionary trips and modes. It also allowed for a preliminary look at some mode-specific travel barriers identified by GTA teens. Finally, this data began to explore the role of parental attitudes and influences on determining teen mode choice.

Both of these datasets were quite revealing, but still did not answer all the posed research questions. In fact, the analysis of these data led to the development of further research questions to be explored. This exploration was conducted through a series of focus groups held in two areas within the GTA, each having unique built form and transit supply characteristics. This part of the study was the most revealing in terms of descriptive information regarding teen travel choices. It also provided a sense of how some barriers to independent teen travel are overcome by travelers, and gave insight to how teens form some of their attitudes and perceptions towards different modes.

This final chapter explores the broader implications of this work for the study of urban design and travel behaviour, and outlines the methodological framework that emerged from the analysis. It also reviews the key findings of the research through a discussion of potential policy responses, and suggests opportunities for future research on this topic.

8.1 Broad implications

The idea for this research was born out of a general concern regarding urban growth patterns, particularly since the Second World War. As the rate of urbanization rapidly increases, we are faced with many complex interacting issues relating to both environmental and social health. Researchers and practitioners in many disciplines struggle to find effective ways of tackling issues such as climate change, energy constraints and resource depletion. These challenges have many implications for all people, including impacts on public health, social equity and
general livability throughout daily-life. It becomes even more difficult to manage such challenges when they are couched in increasingly complex and opaque economic systems. In fact, it is almost impossible to discuss these problems without becoming overwhelmed, not only by their complexity, but also by the plethora of sub-issues that emerge from each one. It is clear, however, that in order to take steps toward finding more sustainable solutions, we cannot rely on a business-as-usual approach.

The methodological difficulties encountered in the attempt to quantitatively establish a link between urban form and mobility confirms the importance of using both experiential and discipline-based knowledge. Until the 20th century, societies managed to build cities that were mostly livable and sustainable by means of symbolization. The process of industrialization led to the devaluation of this approach in favour of more scientific or technical discipline-based methods. It must be recognized, however, that like all human creations, discipline-based approaches have their own limitations, which derive from trading breadth for depth. Many of the serious issues we face today are symptoms of this underlying problem. We are increasingly confronted by evidence suggesting that conventional urban development schemes will have negative consequences for human life and the biosphere. A precautionary approach – one based on a synergistic use of both technical and experiential knowledge – is clearly required.

In terms of mobility, energy issues are particularly worrisome; the need for more precautionary thinking becomes apparent when we undertake the qualitative equivalent of a sensitivity analysis. Currently, most major urban centres in North America suffer to some degree from poorly planned land-use schemes that do not support effective public transportation, and also make it difficult for people to walk and bike to their destinations. In such areas, having automobile access is paramount for uninhibited mobility. This type of design has the potential to cause serious problems for residents when faced with increasingly high oil prices. If peak oil proponents are correct, it is only going to get more difficult and expensive to extract oil from the earth, which could eventually lead to an energy crisis. This issue, coupled with the unstable politics around petroleum, could make daily-life travel very difficult for people who rely almost exclusive on their car. Regardless of whether oil production has peaked, or will ever peak, is it advisable to build cities that do not provide residents with more than one viable travel option? Not to mention the possible implications for air quality, greenhouse gas emissions and the health and well-being of a population that has become accustomed to an increasingly sedentary lifestyle.

In other words, if problems such as climate change and peak oil turn out to be either far more serious or far less serious than is currently anticipated, we will be ahead by developing urban forms that facilitate multiple feasible travel options for residents. If the problems turn out to be less serious, we will permanently benefit from more livable cities. If the problems turn out to be worse than anticipated, we may have to do a great deal more, but we will have been going in the right direction. In either case, we will enjoy more livable and sustainable urban forms. Thus, a precautionary approach will lead to no regrets, because in either scenario we will be better off.
To move urban form research forward in this way, experiential knowledge must cover the limitations of our discipline-based knowledge, and vice versa. Such an approach can readily be included in education and research. For example, it could involve taking students on field trips to examine different streets and neighbourhoods in terms of how well they seem to work for people. The students would thus begin to acquire a knowledge of their surroundings that is embedded in experience and culture. This knowledge should be critically examined through discussion, and further strengthened through discipline-based analyses. In this way, a synergistic relationship between the two approaches can be established, bringing a heightened awareness of the need for both design exemplars and analytical exemplars. In order to genuinely challenge the status quo, universities must develop an iconoclastic orientation in higher education, allowing for a more meaningful collaboration between the quantitative and qualitative approaches.

What does all this mean for the relationship between urban form and mobility? To what extent will our current understanding of this relationship be a guide for the immediate future? Can the present approaches in transportation modeling be relied on, or will these trends make predictions unreliable? Looking at the results of this research, it is clear that both teenagers and their parents have intuitions about the types of urban designs they find more safe, accessible, livable and enjoyable. Their attitudes, preferences and opinions regarding travel are shaped through their experiences of built form throughout their daily-life. This kind of knowledge is very useful for the development of more sensitive and representative quantitative models, and ultimately, policy that meets the needs of all kinds of urban residents over a long period of time.

8.2 Methodological framework

One of the unique features of this study is its recognition of our dependence on two parallel modes of knowing and doing: one based on symbolizing our experiences, and the other based on using knowledge from disciplines. In Chapter 2, it was explained that Jane Jacobs’ work embodies the synergistic use of both approaches to the study of urban form. Much of the existing research in this area applies discipline-based approaches, which approximate complex realities with a set of variables to determine the influence of various factors on behavioural outcomes. These methods can be very useful and have led to important findings in the field. This work suggests that the explanatory power of such approaches could be strengthened through the parallel use of qualitative methods, which provide a more nuanced picture of how urban form facilitates or impedes the mobility. The most interesting information presented in this study comes from the focus group interviews with the teenagers. Their experiences do not limit their awareness of built form to a particular set of variables, but instead rely on symbolically relating all aspects of their surroundings to each other (Wilson, 2004; Deacon, 1997; Vanderburg, 1985). These experiences are shaped by the built environment that each individual is exposed to, and in turn, they play a large role in shaping

---

30 The greatest obstacle in our path is the presence of myths in our contemporary cultures. They do what myths have always done in human history. Their positive contribution is providing the members of a society with a shared orientation. The price we pay is enslavement to our contemporary ways of life. We therefore find it difficult to believe that the issues we face require a radically different orientation. Few people take issues such as peak oil or climate change as signs that we must rebuild our way of life from the ground up. This will involve university reforms (Vanderburg, 2006), economic reforms (Vanderburg, 2009b), reforms in the professions (Vanderburg, 2009a), and much more.
mobility behaviour. The results of the focus group interviews help to make sense of the large-scale survey data and contribute to the development of a more nuanced and descriptive teen travel narrative. Overall, this dissertation suggests that qualitative approaches toward studying urban form and travel behaviour can prove to be very powerful. In addition to yielding revealing and unexpected results, the descriptive data can later be used to refine quantitative methodologies, producing more robust models that provide a more accurate representation of the real world.

8.3 Discussion of key findings

All three research approaches yielded some interesting results, many of which have implications for future policy. The TTS analysis shows that in general, active transportation has decreased, while auto passenger mode shares have increased across the region. Younger teens walk more and older teens use transit more for both school and discretionary travel. Jurisdictions with better transit supply and orientation have higher transit mode shares for school trips, but discretionary trips have very low transit mode shares. Walk mode shares for both school and discretionary travel are similar across all jurisdictions, regardless of whether they are urban or suburban. While, built form characteristics and transit supply do not appear to have a direct relationship with teen mode-choice, they do appear to exert an indirect influence on teen travel. This notion was confirmed throughout the rest of the research results.

The TTS analysis also shows that, over the past decade, less and less GTA teens are rushing out to get their license the minute they turn sixteen. This is confirmed by the online survey data, as well as the focus group study. It is clear from the latter two analyses that this is a result of land use variables and available transportation options. These factors seem to influence the attitude teens have towards driving. The less auto-oriented an area is, the less likely teens are to view the automobile as an important mode. While both focus groups agreed that they prefer traveling independently to getting rides from their parents, the Westdale group considered driving to be the most preferred mode of transportation, while the Harbord group was happy to avoid it until necessary. Those living in the more auto-oriented areas could not imagine choosing to live a car-free lifestyle if could afford not to. Similarly, those living in more dense, urban areas felt that driving had many disadvantages such as getting stuck in traffic and having to find and pay for parking. These thoughts are clearly formed on the basis of the experiences individuals have throughout their daily-life.

Both the TTS analysis and the online survey results indicate that getting rides is a common way of getting to many discretionary destinations, regardless of age. Results showed that built form plays a role in shaping this outcome. Toronto travelers have less of a need for automobile access than the rest of the GTA in order to meet discretionary needs. The online survey analysis indicates that 68% of GTA respondents needing a car for almost all their trips live in areas that are poorly served by transit, and about 70% live in single-family homes in areas with mostly curvilinear street patterns. All of these factors suggest that those respondents relying on automobile trips likely reside in more dispersed, suburban areas with lack of adequate transit. Both the online survey and focus group results indicate that participants find traveling to sports games and practices without the use of an automobile
challenging and rarely do so unless no equipment is needed. Also, automobile use tends to increase for trips that involve parental accompaniment. This is a result of parental travel habits, as well as concerns parents and teens have regarding walking, biking or taking transit on their own at night. According to the online survey, female teens are more likely to be discouraged to take transit alone.

Within the focus groups, the Harbord participants mostly walk and take transit for their discretionary travel needs, particularly when traveling independently. This suggests that within the City of Toronto, certain neighbourhoods with particular built form characteristics break away from the general trend of using auto passenger for discretionary travel. Most Harbord participants agreed that their preferred modes are walking, biking and transit. Westdale participants also walk for many of their trips, but find it more difficult to do so. They walk mostly because they would rather not ask for rides or wait around for transit. Even when distances are longer than they would like to walk, participants note that they would rather walk 2km than wait 40 minutes for a bus they just missed. When asked to rank their preferred modes, they consistently ranked driving at the top, then walking (depending on the distance), transit and biking. Biking is used very casually and not usually as a mode of transportation due to a lack of cycling infrastructure. Participants from both groups indicated that they dislike asking for rides from their parents. They would prefer to be able to get around without having to ask for rides, but sometimes feel that they have to out of necessity. For example, when they cannot reach their destination easily using transit, walking or biking, or when they feel it is not safe to travel unaccompanied by an adult.

One surprising result from the online survey and focus groups is that cycling mode shares for both the Toronto and for the rest of the GTA are high as compared to the results of the TTS data. While none of the Westdale participants cycled to and from school, 21% of the Harbord group regularly bike as a mode of travel. Lack of adequate cycling data is a well-known limitation of the TTS dataset. These results could mean that cycling plays more of a role in discretionary teen travel than is suggested by the TTS data.

It is also useful to re-examine the issue of self-selection in relation to this group of travelers. It was hypothesized that self-selection does not impact the relationship between built form and the teen travel outcomes because teens do not usually have the power to choose where they live. Reflecting on this idea within the context of the focus group study results, it appears that the preferences of the parents, who presumably could self-select into certain urban forms, can sometimes have an impact on teen travel preferences/behaviours. For example, several of the Harbord participants who walk and bike for most trips identify as coming from a “biking family” or families who “don’t like cars”. Their parents have likely chosen to settle in a neighbourhood that would allow them to avoid using automobiles. Thus, the travel behaviour of these children could be to some degree a result of their parents’ ideas. At the same time, it seems that the teens’ preferences align with their parents’ only when it is mutually convenient. Those living in suburban locations (selected by their parents) strongly express their displeasure with the accompanying urban design characteristics. In other words, the issue of self-selection and how it affects this group is not entirely straightforward. The interaction between the preferences of parents and their children varies from case to case.
One very important result from this work is the understanding of how travel behavior evolves and changes based on experience. Thus, regardless of attitudes and preferences that may exist prior to living in a particular built environment, behavior will certainly evolve as a result of new experiences in that environment. For example, participants were very clear on the notion that as their experiences within an area increased, their familiarity and comfort also increased, which would then alter their travel patterns. These changes in behavior are not only linked with experiences of the physical environment, but also the social environment, which includes household dynamics, parental constraints, peer influences and the sense of community within a particular neighborhood. For example, within the urban neighborhoods, the presence of “eyes on the street” becomes important; active streets and storefronts make teens feel safer when walking around alone. In contrast, participants from the Westdale group indicated that while their streets are not always bustling with activity, their sense of community provides a feeling of safety. In a way, this group appeared to feel ownership of their neighborhood, which brings about a level of comfort that was not described by the Harbord participants. This is where the role of the social environment in shaping travel patterns becomes clear. These results reveal the complexity of travel decision-making processes and highlight the importance of considering the overall experience of daily-life within both the built environment and the social, urban or suburban environment.

8.3.1 Barriers to Transit

Results indicate that for easy, independent travel, teens must rely on public transportation. Teens feel that transit is usually faster than walking when traveling longer distances, and appreciate that transit provides them with the ability to travel independently, on their own schedule, without having to rely on their parents for rides or the possibility of using their family’s car. The most highly rated concern for GTA travelers outside of the downtown cores is infrequent service and long, time consuming trips with too many transfers. Teens in these areas complain about the lack of accessible transit as being a major barrier to their independent mobility. They felt that bus stops in the suburbs are “poorly placed” and that the distances they have to walk in order to get to a transit stop are unacceptable. Some teens recognize that poor land use planning and lack of population density cause this issue. Westdale students complained about infrequent, inconvenient HSR scheduling and having to make several transfers to reach a destination.

Many suburban travelers are also frustrated the lack of coordination between regional transit agencies and the TTC, which can cause a lot of confusion when trying to travel across the region using transit. As mentioned, participants also expressed the need for buses to run later, especially on weekends. Some think this would contribute to curbing the number of teens who drive home drunk at night.

For Toronto teens, a major barrier to smooth transit travel is unreliable bus and streetcar schedules. One problem is that fact that most buses and streetcars share the road with cars, and as such, get stuck in traffic during
rush hour. Overcrowding on buses and subways during rush hour is another barrier, mentioned primarily by those who lived in the Toronto area.

In sum, although many teens use transit, and some even feel that it meets their needs for the most part, when asked about the issue of convenience, many of them automatically revert to events that frustrate them. Municipalities and transit agencies should recognize that declining levels of transit service results in lasting negative impressions. Those who are bound to transit out of necessity will likely stop using it once a more desirable option presents itself. Even the Harbord focus group, with their overall positive impression of transit and negative impression on the automobile, feel that if the problems they identify with the transit system were to worsen, they would have to find alternative ways of getting around. The Westdale group already asserts that having a license and steady vehicle access means rarely taking public transit. They do not see any reason why they should, given that traveling by automobile is viewed as being exponentially more convenient. The HSR simply cannot compete with driving and is the number one choice of transportation only for captive travelers.

8.3.2 Barriers to walking

Despite the sharp differences between Toronto and the rest of the GTA when it comes to transit and driving, most teens in this area are frequent walkers. Although many participants mention speed as a benefit to using motorized modes, when distance or time is not a factor, they do not mind walking to their destinations. Both the Harbord and Westdale focus groups were very positive about walking. As a whole, they feel that walking is the most immediate, spontaneous, reliable and flexible mode. It does not involve waiting for the bus, trying to maneuver a ride, or arranging to borrow a car. Participants appreciate the ability to get from origin to destination without having to negotiate all of these things and find walking to be the simplest way to travel. They also appreciate that walking is the least expensive option of transportation available to them. It is viewed as an enjoyable and often social mode of transportation.

The most commonly cited barrier by online survey respondents, focus group participants, and their parents, was the distance between origins and destinations within their neighbourhoods. Suburban dwellers said that walking simply takes too long and is not a convenient, viable mode of transportation. They would rather get a ride, sacrificing some of their freedom to travel independently, than have to walk very long distances, and expressed “feeling stuck” or “trapped” because of this barrier. Parents also generally do not want their children walking more than a couple kilometers a day on their own. When walking distances are long, weather becomes more of an issue; teens do not want walk too far (or at all) if it is raining, very cold and snowy, or very hot and humid.

Safety concerns were also mentioned as barriers to walking alone, particularly for urban dwellers. Some teens mention feeling unsafe walking at night in certain areas of the city due to the presence of “weird people”. Within the focus groups, participants were aware that the more familiar a person is with a neighbourhood, the safer they tend to feel walking alone within it. Urban participants who indicated sometimes feeling scared or unsafe when
walking around alone at night also recognized the role of urban form in helping this problem. Many said that they feel safer in well-lit, well-populated places that have a lot going on during all hours of the day and night.

Both the online survey respondents and the focus group participants expressed concerns regarding pedestrian safety when walking on busy, high-traffic streets. They commented on the difficulty of crossing the street in high-traffic areas, and even simply walking down major arterials lined with parking lot exits or alleyways. Many mention that within suburban areas, there are many careless, distracted drivers that do not expect to see pedestrians: “Drivers tend to neglect to signal and have very little regard for cyclists and pedestrians”

Another built form barrier is the lack of pedestrian friendly infrastructure in certain areas. Participants mention that it is unpleasant walking in areas that do not have trees, or in areas that have “sidewalks on one side of the road” or lack sidewalks all together. Others commented on the importance of streets with slow-moving, calmer traffic conditions.

**8.3.3 Barriers to biking**

Many GTA teens enjoy the flexibility of using a bicycle as a mode of transportation. Much like walking, biking allows the traveler to avoid conforming to the schedules of others, enabling easy, independent travel. It is also much faster than walking, and in the case of the TTC, sometimes faster than taking transit. The most commonly cited disadvantage of cycling is that it can be extremely dangerous. The results of the online survey and the focus group study point to the lack of bike lanes and other cycling infrastructure as a problematic barrier to cycling in the GTA. Sharing the road with cars, trucks, buses and streetcars causes some serious safety concerns for this age group, particularly downtown, where many construction projects occur on the already crowded roads. Another barrier identified is inadequate bike security and difficulty biking in the winter due to inadequate snow removal.

Finally, teens find it difficult to obtain information on where to cycle with the GTA. Many do not know where to find bike paths and lanes, or how to find information on the best ways of getting around the region by bike. They feel that there is a lack of readily available information on this topic.

**8.4 Implications for policy**

Two general types of policy could help teen travelers in the GTA meet their independent travel needs, and both involve making car-free travel more feasible. These include (1) policies related to making improvements to public transit, and (2) policies related to making active travel easier and safer. Although this study was targeted towards making independent travel more feasible for teenagers, the policy recommendations made would also benefit many other groups of travelers.
8.4.1 Improving public transit

Transit is a very important mode for teenagers. Participants of this study indicate that although they are willing to make transit work for them, shortcomings in the service sometimes push them to seek alternative modes. In order to retain this demographic, improvements to the level of service provided by transit are necessary. Findings suggest that teens who rely mostly on cars for their discretionary travel likely reside in more dispersed, suburban areas with lack of adequate transit. Increasing the frequency of service along suburban routes and extending the hours of service, at least on the weekends, would do a lot to help this group of travelers. Increases in frequency should target residential areas with large youth populations. Clearly, significantly increased service in all suburban areas would not be economically viable as a result of low density planning. However, in certain cases, this could be as simple as adding some service on routes that currently do not run at all on weekends. Extending weekend service hours could also help reduce the number of drunk-driving incidences amongst teens.

Increased service on the TTC would help alleviate issues of overcrowding on subways, buses and streetcars during peak periods. There have been proposals put forward to expand the system with a number of new light-rail lines that would help commuters across the city. At the moment, the city is unsure of whether or not all of these lines will be funded and built. There are also long-term plans in place to improve coordination between the various transit systems across the GTA, which would help suburban teens a great deal. Participants identify the need for better information regarding how to use various systems in combination, and feel that the current situation is very confusing and difficult to navigate.

Improvements to service reliability would also be helpful, particularly for the Toronto travelers. The TTC has already begun installing screens at certain subway and streetcar stations that indicate when the next one will arrive, but it has a long way to go in making improvements to reliability. This can be done in a number of ways. One way suggested by participants of this study is to have more buses and streetcars in designated (right-of-way) lanes, to prevent them from competing with car and truck traffic. Other ways include using GPS systems on buses and streetcars to exercise more control on timing, and avoid situations where there are three streetcars in a row heading west, and zero heading east. Obviously this type of control is made easier when buses and streetcars are not stuck in the same rush hour traffic as cars and trucks.

8.4.2 Improving active travel options

8.4.2.1 Walking

Improving the pedestrian experience is a very important part of facilitating independent, teen mobility. Again, the most commonly cited barrier is the distance between origins and destinations within many GTA neighbourhoods. While this is not as much of a problem downtown, it makes walking in the suburbs very difficult. Increasing the density of destinations in the suburbs will help alleviate this problem. Many participants in this study mention that they would rather walk than ask for a ride or take the bus, but destinations are often too far.
Pedestrian infrastructure, particularly outside of the downtown core, also needs some improvement. Participants described various types of infrastructure issues that made walking difficult, uncomfortable or dangerous. Destination density would help in this case as well, seeing as many teens feel safer walking in areas that are well-populated. The more active storefronts and streets are, the more people will be around, and thus, the safer travelers will feel. All focus group participants mentioned feeling safer in well-lit areas suggesting that improved street lighting could go a long way in improving their sense of security while walking at night.

Traffic calming measures such as roundabouts and narrowed streets could also make walkers feel safer. Teens do not enjoy walking on long, busy, arterials that are very wide, difficult to cross and filled with fast moving cars. Clearly, building streets that prioritize the comfort of automobiles over the comfort of people will be less likely to be filled with pedestrians. Suburban streets with no sidewalks are another problem that can be rectified by changing the design approach.

8.4.2.2 Biking

GTA cyclists have been fighting for years to improve biking conditions, infrastructure and safety. The policy implications of this work fall in line with those from many other studies. In short, there are not enough bike lines in the GTA, making cycling very dangerous. Without bike lanes, especially ones that are separated from traffic, cyclists run the risk of being hit by cars, trucks or buses, being hit by people opening their car doors, and getting their wheels stuck in streetcar tracks.

Another way to improve cycling for teens in the GTA is to provide better information on cycling safety and best practices. Maps showing bike paths and safe bike routes throughout the city could be distributed through high school offices. This would go a long way in improving the confidences of teen cyclists and perhaps encouraging them to use this mode more often.

8.5 Conclusions and suggestions for future research

The overall message is clear: teens and parents recognize a need for higher destination densities, well-lit and well-populated mixed-use areas, safe streets with controlled crossings and lighter car traffic, more efficient, high-quality public transportation, and the provision of more effective cycling infrastructure. Both parents and teens benefit from these things – parents will worry less and feel less inclined to chauffeur their children around, and teens will gain the ability to travel throughout their neighbourhood more efficiently, safely and independently. The participants of this study can intuitively recognize the differences between streets and neighbourhoods that make independent, active travel feasible and enjoyable, and those that do not.

Building pedestrian friendly, transit-oriented communities that make it convenient to get around independently without cars will almost certainly result in behavioural shifts for teen travelers. This study suggests that the less exposure teens have to auto-oriented behaviour, the less likely they are to view the automobile as an important mode. Those living in more dense, urban areas felt that driving had more disadvantages than advantages.
In other words, regardless of previously established attitudes and preferences, continual experiences of the built environment, mingling with experiences of the social environment, brings about evolutionary changes in travel behaviour. Perceptions and attitudes are continually shaped and re-formed through daily-life experiences based on availability, accessibility and quality of modes, parental constraints, social norms and more. Ultimately, these factors interact in order to influence behavioural outcomes. Thus, the role of built form in influencing travel behaviour of teenagers cannot be reduced to particular, measurable factors, but can be understood as playing a part in shaping their overall urban experience, which then impacts their travel choices.

The work presented in this study has some limitations, mostly related to the small study sample. A broader focus group study that includes participants from other parts of the GTA would help enrich the findings. GIS systems could then be used to map the results in order to gain a sense of the spatial patterns at work. The descriptive data from these studies could then be used to help develop more accurate microsimulation activity-based models of travel in the GTA. The analysis can help transportation planners understand some of the ways in which built form variables interact to influence the experiences, and ultimately, the travel outcomes of teenagers, and other groups of travelers with limited mobility. As such, the exploratory, qualitative work can lead to more accurately modeled “agents” in the microsimulations.

Other future research in this area could include conducting a large study of just teen travelers in the GTA in order to get a more statistical snapshot of some of the topics explored in this work. A future paper could present the analysis of just Toronto data within the TTS dataset, and consider the differences between modal shares throughout its many different neighbourhoods. Additionally, the economics of various mode choices could be teased out to determine the different costs associated with various household transportation options that involve youth travelers.

The methodological framework of this dissertation can also be extended to look at other mobility-limited groups such as low-income travelers, recent immigrants and the elderly. A future project currently under development involves studying the mobility of recent immigrants in the inner suburbs of the GTA, and the barriers they face when trying to meet their daily-life needs. Finally, the results of this study can be used as a starting point for future research in the health implications of various urban design factors for teens, or other groups with limited mobility.

To lessen auto-oriented travel behaviour in general, it is important for the GTA region to learn from its mistakes with regards to coordinating land use with transportation planning. Current planning patterns make it difficult to implement quick fixes for improving the transit system. It is hard to increase the frequency of service in regions that are not built to generate high numbers of transit users. But what does this mean for those living in these areas, without access to a private vehicle? These planning patterns make autonomous travel very difficult for this group. Therefore, the most important, overarching message is that dispersed, low-density, single-use planning will never be conducive to efficient public transportation and walkable neighbourhoods. In light of issues such
globalization, peak oil and climate change, governments are going to be forced to curb automobile use and provide genuine travel alternatives. A precautionary approach towards managing these difficult issues involves the creation of more livable cities, which is the best strategy for also creating a more environmentally sustainable future.
9. References


  Part 1: From wealth creation to wealth extraction, 48-56.

  Part 1: Rethinking the intellectual and professional division of labour and its knowledge Infrastructure, 171-177.
  Part 2: Intellectual map making and the tension between breadth and depth, 178-188.
  Part 3: A strategy for transforming the profession, 189-203.
  Part 4: Extending the strategy to medicine, the social sciences and the university, 204-216.


Appendix A: First Year Student Survey

For all questions, please draw from your experience in your last year of high school.

Personal Information
Date of Birth:
Sex (Male/Female):
Place of Birth (City, Country):
First spoken language:
Other languages:

Locational Information
1. Name the town or city in which you lived as a teenager in high school (age 13-19). If you moved frequently during this period, name the town or city in which you lived for the longest period.

2. If you lived in or near a large city, where was your home in relation to downtown. (check one)
   __ less than 1 km
   __ 1-5 km
   __ 6-10 km
   __ more than 10 km
   __ not applicable

3. Would you describe your neighbourhood as (check all that are applicable):
   __ conducive to walking or biking to get from point A to point B
   __ served poorly by public transit
   __ served well by public transit
   __ most easily navigated using an automobile

4. a) Was your neighbourhood located near a shopping district?
   Yes__
   No __

   b) If so, how far from your home (in walking time) was the district?
      __1-5 minutes ___15-20 minutes
      __6-10 minutes __over 20 minutes
      __11-15 minutes __do not recall

5. a) Was your neighbourhood located near a grocery store or food shops?
   Yes__
   No __

   b) If so, how far from your home (in walking time) was the district?
      __1-5 minutes ___15-20 minutes
6. a) Was your neighbourhood located near entertainment such as movie theaters, restaurants, art galleries, clubs, etc?
   Yes__
   No __

   b) If so, how far from your home (in walking time) was the district?
   __1-5 minutes  __15-20 minutes
   __6-10 minutes  __over 20 minutes
   __11-15 minutes  __do not recall

7 a) Was the area in which you lived as a teenager in high school served by public transit?
   Yes__
   No __

   b) If so, how far from your home (in walking time) was the nearest transit stop?
   1-5 minutes
   6-10 minutes
   11-15 minutes
   15-20 minutes
   over 20 minutes
   do not recall

8. Did you live close to a 3 or 4 lane road, generally busy with car traffic?
   Yes__
   No __

9. Did your neighbourhood have bike paths?
   Yes__
   No __

10. Please check off the characteristics that best describe your neighbourhood that you lived the longest while you were in high school:

   **Sidewalks**
   __long blocks
   __wide sidewalks
   __narrow sidewalks
   __no sidewalks
   __well-lit
   __not very well-lit, with minimal street lights

   **Streets**
   __quiet, not very busy, not very many people outside
   __busy, lots of commotion and activity
   __lots of cars
   __many people biking or walking
   __high-traffic
many lanes
one lane
lots of trees
grid layout (put pic)
curvilinear (pic)
mix of grid and curvilinear (pic)

Housing
varied buildings (old, new, large, small, apartments, houses)
mostly detached houses
mostly apartment buildings

Uses
mostly residential
a few corner stores
a variety of stores
restaurants
office buildings
large plazas containing fast-food, retail stores, grocery stores with large parking lots
medium-sized plazas containing fast-food, retail stores, grocery stores with small parking lots
entertainment

Socio-economic Information
1.a) While you were a teenager in high school, how many people (including you) lived in your household?

2
3
4
5
more than 5

2. What type of dwelling did you live in?

detached house
semi-attached house
townhouse
apartment building
other (please specify)____________

3. What was your approximate household income?

under 20 000/year
20 000 – 40 000/year
40 000 – 60 000/year
60 000 – 80 000/year
80 000 – 100 000/year
100 000 – 120 000/year
120 000 – 140 000/year
More than 140 000/year
Not sure

4. While you were a teenager, how many cars were there in your household?

none
5 a) How many licensed drivers were there in your household?
   b) Who were they?
      __father
      __mother
      __self
      __siblings (please put number of siblings with a license)
      __other adults (please put number)

c) If you had your license in high school, how old were you when you got it?
   __16
   __17
   __18
   __19
   __>19

6. While you were in high school did both of your parents work full-time?
   __yes
   __no, one worked part-time
   __no, one did not work

Attitudes
1. Did your parents encourage or discourage you from using public transit?
   __encouraged
   __discouraged
   __expressed no opinion

b) If your parents discouraged you from using public transit, what reason did they usually give for doing so?
   __It is unsafe. Explain________________________________________
   __It is too expensive.
   __They did not want me to go away from my own neighbourhood.
   __They wanted me to walk or ride my bike for the exercise, or another reason.
   __They were afraid I would get lost.
   __Other, explain________________________________________

8. Which type of public transit vehicles did you use as a teenager?
Indicate each type used and rank in order of frequency, starting with 1 for the most frequently used mode.

   __city bus
   __school bus
   __streetcar
   __subway
   __commuter train
   __other, explain________________________________________

9a) How would you describe the quality of public transit service available to you as a teenager?
   __very good
   __good
   __fair
b) If you were dissatisfied with the quality of service, what were the reasons for your dissatisfaction? (Please rank in order of importance, starting with 1 for the most important)

__service too expensive
__service too infrequent
__trips took too much time
__service too irregular and not dependable
__available transit seldom took me where I wanted to go
__too many transfers
__vehicles uncomfortable
__too hard to get information
__public transportation employees were unpleasant to teenagers
__other, explain____________________________

10. As a teenager in high school, did you ever have an unpleasant experience while using public transit?
__No
__Yes: ___got lost
      ___got hurt
      ___was assaulted
      ___was treated unkindly by public transit employee
      ___was treated unkindly by other passenger
      ___other, explain____________________________

11. Did your parents encourage or discourage you from walking or biking?
__encouraged
__discouraged
__expressed no opinion
__do not remember

b) If your parents discouraged you from walking or biking, what reason did they usually give for doing so?

__It is unsafe. Explain____________________________
__They were afraid I would get lost.
__Other, explain____________________________

12. As a teenager in high school, did you ever have an unpleasant experience while walking or biking alone?
__No
__Yes: ___got lost
      ___got hurt
      ___was assaulted
      ___other, explain____________________________

13. How did you usually travel to high school?
__walk
__bike
__drove myself
__driven by parent or other adult
__driven by friend
__public transit
__bus, streetcar etc
__school bus
__other, explain____________________________

126
14a) In which of the following activities did you regularly participate as a teenager in high school?

__medical or dental appointments
__music, dancing, arts lessons
__individual sports (swimming, skiing etc)
__team sports
__spectator at sports event
__movies
__live entertainment (shows, concerts, plays, etc.)
__shopping with friends or by yourself
__part-time or summer job
__meetings (clubs, volunteering etc)
__social events (parties)
__hanging out at friends place
__hanging out downtown
__other, specify____________

b) For these activities, how often did you require some form of transportation other than walking or biking?

__rarely
__about half of my trips
__over half of my trips
__almost all of my trips

c) In general, which type of transportation did you use most frequently for activities other than school?

Ages 13 to 15
__walk
__bike
__drove myself
__driven by parent or other adult
__driven by friend
__public transit
__school bus
__other, explain_______________________________________

Ages 16 to 19
__walk
__bike
__drove myself
__driven by parent or other adult
__driven by friend
__public transit
__school bus
__other, explain_______________________________________
14. Please complete the following table, designed to determine what form of transportation you used for your daily activities. If you used more than one, please check the one that you used most frequently.

**Ages 13-15**

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Mode of Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Walk</td>
</tr>
<tr>
<td>Attending School</td>
<td></td>
</tr>
<tr>
<td>After School/Summer Job</td>
<td></td>
</tr>
<tr>
<td>Shopping with friends</td>
<td></td>
</tr>
<tr>
<td>Shopping with parents</td>
<td></td>
</tr>
<tr>
<td>Social activities</td>
<td></td>
</tr>
<tr>
<td>Spectator Sports</td>
<td></td>
</tr>
<tr>
<td>Participatory Sports</td>
<td></td>
</tr>
<tr>
<td>Other extracurriculars</td>
<td></td>
</tr>
<tr>
<td>Cultural Events (plays, art/music shows, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

**Ages 16-19**

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Mode of Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Walk</td>
</tr>
<tr>
<td>Attending School</td>
<td></td>
</tr>
<tr>
<td>After School/Summer Job</td>
<td></td>
</tr>
<tr>
<td>Shopping with friends</td>
<td></td>
</tr>
<tr>
<td>Shopping with parents</td>
<td></td>
</tr>
<tr>
<td>Social activities</td>
<td></td>
</tr>
<tr>
<td>Spectator Sports</td>
<td></td>
</tr>
<tr>
<td>Participatory Sports</td>
<td></td>
</tr>
<tr>
<td>Other extracurriculars</td>
<td></td>
</tr>
<tr>
<td>Cultural Events (plays, art/music shows, etc.)</td>
<td></td>
</tr>
</tbody>
</table>
Barriers
1. What do you identify as some of the barriers to walking and biking?

2. What do you identify as being a barrier to good public transit?
Appendix B - Interview Guide

Teenage Attitudes and Perceptions Regarding Walking, Biking and Transit use

Topic Guide for Focus Groups

This topic guide provides a general overview of the discussion topics to be covered in the focus group sessions. The topic guide will be used by the focus group moderators to ensure that the structure of the session is maintained, and that the time is used effectively. It should be noted that free discussion is encouraged in the sessions and that the moderator will permit digression onto related topics if they feel they are of importance to the main topic area.

Introductory Statement from Focus Group Moderator: 2 mins

“Hello everyone and thanks for coming along today / tonight. My name is Rei and I am helping conduct a research project for the University of Toronto on active travel and public transportation. Today we will be talking about your views on the different options you have for getting around. This is intended to be an informal discussion group, so please feel free to give your views on what we are discussing as we go along. Remember, there are no right or wrong answers, and the main thing is to be honest about your view on each topic of discussion. As you can see, I will be taping the discussion.”

[points to tape recorder / microphone]

“This is so that I will have an accurate record of what was said. Please try to ignore the tape recorder, everything discussed today / tonight is completely confidential. Please try to speak one at a time and try not to interrupt anyone else while they are talking. The discussion will last for approximately one hour. Are there any questions before we get started?”

[answer any questions / switch on tape recorder]

Current Travel Behavior

⇒ Moderator asks each group member to state their first name, age, the area where they live, and to provide some details on their travel behavior, including the following aspects:

- How do you usually travel to school?
- How do you usually travel to all your other destinations?
- If you can drive, do you prefer to drive? Why or why not?
- Do you like to travel by bus? Why or why not?
- What are some of the places you like to travel to?
- Are you able to get to all these places easily?
- How often do you have to ask your parents for rides in a week? How do you feel about asking for rides?
- What determines whether or not your will walk or bike to your destination?

Attitudes and Perceptions

- Do you feel safe walking alone in your neighbourhood? Your city?
- What worries you most when walking or biking alone?
- Do you feel safe biking in your city? Why or why not?
- What is the farthest you walk in one evening of hanging out with your friends?
- What is it like to use public transport – easy / hard, cheap / expensive?

Parental Influence

- Do your parents use public transit?
- How do your parents feel about you traveling in cars (driving their car / being in cars driven by other young people)?
- How do your parents feel about you using public transit?
- Has parental influence changed as you’ve grown older?
**Future Travel**
- Is it possible to use public transport instead of a car for certain trips? If yes, why is it not used? If no, why not?
- Ideally, how would you like to get around your neighbourhood? Your city?
- What would you like to improve about how you get around the city?
- Any specific problems associated with car travel?
  - Congestion? If so, where, when, and how severe? PROBE
  - Parking
  - Fuel prices
  - Other?
- How do you expect your travel behavior to change once you move away from home?
  - Will you get your own car?
  - Will you continue to use public transit?
- Is car travel adequate in the city?
- Is public transit adequate in the city?
- What should be done to improve transport in and around the city?
- If these improvements were made, would your travel behavior change? If so, how?

Participants will also be shown a series of photographs that typify different types of streetscapes and urban form designs and in order to determine their aesthetic and functional preferences.

Note: This is just a general guide that I will add to depending on the findings obtained from the session with the smaller focus group this summer. That said, the above questions are representative of the general thrust of the group interviews.
Appendix C - Parental Questionnaire

You and your child have been asked to volunteer in a research study on the travel patterns of teens at Harbord CI. This questionnaire is intended to gauge your child’s dependency of his or her parents or guardians for transportation, as well as your general opinions and concerns regarding teen mobility. The purpose of the study is to gain a better understanding of the transportation options available to youth and to use this understanding to help inform more effective transportation policy for this demographic. This survey will take approximately fifteen minutes to complete. Your participation is voluntary and all information in this survey will be kept confidential. If you do not feel comfortable answering any of these questions you may leave the question blank and skip to the next one.

Section 1 – This section is intended to compile the personal information necessary to identify the factors that could affect answers in parts 2 and 3.

1. Do you own a car?
   ( ) yes
   ( ) no

   If yes, please indicate the number of cars are in your household:_______

2. If no, do you have access to a car if needed?
   ( ) yes
   ( ) no

3. Please list the age and gender of all members of your household
   Adults:
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )

   Children:
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )
   Age___ Gender: male ( ) female ( )

4. Please check the box that best describes your family situation?
   ( ) Single Parent
   ( ) Dual parent
   ( ) Legal guardian – more than one guardian
   ( ) Legal guardian – sole guardian

5. Please list the number of household members that work outside the home.
   Full-time:_____
   Part-time:_____


Section 2: The following section is intended to determine your child’s travel habits.

1. What is the maximum distance you feel is appropriate for your child to walk?

<table>
<thead>
<tr>
<th>Distance</th>
<th>Less than 1 km (0.62 miles)</th>
<th>1.5 km (0.9 miles)</th>
<th>2 km (1.2 miles)</th>
<th>3 km (1.9 miles)</th>
<th>4 km (2.5 miles)</th>
<th>5 km (3.1 miles)</th>
<th>More than 5 km (please specify distance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone (day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone (night)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends (day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends (night)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. What is the maximum distance you feel is appropriate for your child to bike?

<table>
<thead>
<tr>
<th>Distance</th>
<th>Less than 1 km (0.62 miles)</th>
<th>1.5 km (0.9 miles)</th>
<th>2 km (1.2 miles)</th>
<th>3 km (1.9 miles)</th>
<th>4 km (2.5 miles)</th>
<th>5 km (3.1 miles)</th>
<th>6 km (3.7 miles)</th>
<th>7 km (4.3 miles)</th>
<th>8 km (5.0 miles)</th>
<th>More than 8 km (please specify distance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone (day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone (night)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends (day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With friends (night)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Do you allow your child to travel without adult accompaniment, using active modes (walk, bike):
   a) within your neighbourhood?
      ( ) yes
      ( ) no
   
   b) within the city?
      ( ) yes
      ( ) no

4. Do you allow your child to travel without adult accompaniment, using motorized modes (public transit, car):
   a) within your neighbourhood?
      ( ) yes
      ( ) no
   
   b) within the city?
      ( ) yes
      ( ) no

5. How does your child typically travel to school? Please check the most appropriate response.
   ( ) walks alone
   ( ) walks with a friend or with many friends
   ( ) walks with a sibling
   ( ) walks with a parent or guardian
   ( ) cycles
   ( ) skateboards or rollerblades
   ( ) takes the bus
   ( ) drives
   ( ) ride from an adult
   ( ) ride from friend
5. For other trips (sports, hobbies, shopping, parties, part-time jobs), do you or does someone in your household ever drive your child to his or her destination?
   ( ) yes
   ( ) no (if no, please skip to question 7)

6. If yes, in a given week, how many trips do you make in order to drive your child to a destination solely for his/her benefit?
   a) within your neighbourhood:________
   b) within the city:_______

7. Typically, where do you or someone in your household, drive your child?
   Please check all answers that apply.
   ( ) school
   ( ) friends homes
   ( ) lessons
   ( ) sports or recreational activities
   ( ) shopping
   ( ) work
   ( ) other (please specify)________

8. Does someone else outside of your household drive your child to his/her destination?
   ( ) yes
   ( ) no

9. Does your child own a bike?
   ( ) yes
   ( ) no (skip to question 11)

10. If yes, how often does your child typically use his/her bike as a mode of transportation?
    ( ) less than once a week
    ( ) once or twice a week
    ( ) three to five times a week
    ( ) more than five times a week

11. Does your child have his/her driver’s license?
    ( ) yes, they obtained their G2 license at age:
    ( ) no

12. If yes, how often does your child typically use the car as a mode of transportation?
    ( ) less than once a week
    ( ) once or twice a week
    ( ) three to five times a week
    ( ) more than five times a week

13. How does your child commonly travel around your neighbourhood?
    ( ) walk
    ( ) cycle
    ( ) skateboard
    ( ) rollerblade
    ( ) drive
    ( ) transit
    ( ) other (please specify)____________________
Section C: This section is intended to determine what influences a parent's decision making in allowing their child to travel independently.

1. Please circle the number that most closely represents the influence the following has on your decision to allow your child to travel actively (walk or bike, sometimes in combination with transit) without accompaniment in your neighbourhood or city.

<table>
<thead>
<tr>
<th></th>
<th>Not an influence</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy or fast traffic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncontrolled crossings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Lack of sidewalks</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Intimidating strangers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Other teens causing trouble</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Proximity of a bus stop</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Provision of bike lanes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Provision of street lights</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Distance between origins and destinations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Short block lengths</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>A mix of retail/residential/office buildings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

2. Please comment on any barriers you identify that prevent you from allowing your child to travel actively (walk, bike) on their own.

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

3. Please comment on how you feel about your child driving a car or being in a car driven by other young people.

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

4. Please comment on how you feel about your child traveling alone using public transit (i.e. do you think it is safe? Do you think it is too expensive?)

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________
Appendix D – Sample of map used for Harbord mapping exercise

INSTRUCTIONS

1) Put a ★ where you live
2) Mark your walking routes in:
3) Mark your biking routes in:
4) Put a ● to mark places you usually drive to
5) Put a ● to mark places you usually take TTC to
6) Write you destinations in black pen

Harbord CI
Subway station
Streetcar route
Bus route
Appendix E – Maps of Focus Group Areas

Figure 7.1 Map of Westdale catchment area
Figure 7.2 Map of Westdale neighbourhood
Figure 7.3 Map of Harbord catchment area
Figure 7.4 Map of Harbord neighbourhood