What’s “Quickest and Easiest?”
Parental Perspectives of the Trip To and From School

by

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A thesis submitted in conformity with the requirements
for the degree of Master of Science
Graduate Department of Exercise Sciences
University of Toronto

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Abstract

This study examined perspectives of the trip to/from school and travel mode choice among parents who differed in socio-economic status (SES), and whose children attended schools located in different areas (i.e., urban vs. inner-suburban) across Toronto. Thirty-seven parents (20 active and 17 non-active travelers) of grade four to six students from four elementary schools (capturing diversity with respect to built environment and SES) participated in qualitative interviews after taking photos of their trip to/from school. Data were analyzed using thematic analysis linking the text and visual data. School travel was a habitual behaviour involving a 2-step parental decision-making process; these decisions were influenced by different factors. While escort decisions were dictated by safety concerns, the behavioural cost and reinforcing value of travel mode alternatives dictated mode choice. Strategies addressing these behavioural cost and reinforcing value factors may be helpful in making walking to/from school the quickest and most convenient choice.
Acknowledgments

Thank you to all the parents, students and staff from the Toronto District School Board who made this study possible. It is my hope that someday soon walking to and from school will be a more desired mode choice in this city. This thesis would also not have been possible without support from the Heart and Stroke Foundation of Canada and the Canadian Institutes of Health Research.

I would like to acknowledge my supervisor and professor, Dr. Guy Faulkner, for guiding me through this thesis project. You challenged me to think outside the confines of theory, and helped me to grow as a researcher and an advocate. Thank you for your constant support and sense of humor over the years – it got me through this degree. A sincere thanks to Dr. Caroline Fusco and Dr. Ron Buliung, who helped create an interdisciplinary piece of research. You have both opened my eyes to the different ways of exploring active school transportation.

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Chapter 1
Introduction

1  A Personal Note . . .

When I was a kid I walked to school in the snow barefoot, uphill, both ways. Okay, maybe not exactly, but my trips to and from elementary school were memorable nonetheless. Every weekday morning and afternoon I would walk with friends along the quiet residential streets in our neighbourhood. Oftentimes we would play games and tell stories as we passed by the same three crossing guards and familiar landmarks along the way. How we got to and from school was not something we really thought about – walking was the only way we knew.

As a physical education student who has spent the last six years learning about how to encourage people to be more active, only recently have I considered travel to and from school as a significant opportunity for daily physical activity for children and youth. Perhaps this is because I was an active kid myself (and still am), and take for granted the habitual nature of my trips to and from school and the type of household I grew up in. My father reminds me to this day that it costs money to drive a car, but it only costs calories to walk. Although my mother has had her drivers license for years, my dad still never lets her drive his truck - another reason why I was never chauffeured to and from school.

Given that more and more children today are using inactive modes of transportation, I was left wondering more about the trip to and from school. Is school travel really just habitual, or does it involve a more complex decision-making process by parents and caregivers? If so, what kinds of factors influence these choices? The aim of my Masters thesis was to answer these questions in hopes of informing future efforts to promote active school transportation.

2  Physical Activity and Active School Transport (AST)

Despite the well-known benefits of regular physical activity, over half of Canadian children and youth aged 5 to 17 are not active enough for optimal growth and development (Canadian Fitness and Lifestyle Research Institute, 2002). Physical inactivity among children can lead to increasing risk for negative health outcomes such as diabetes, hypertension, and cardiovascular disease (Stephens, 2002); insufficient activity has also been linked to obesity in Canadian children
(Tremblay & Willms, 2003). In 2004, 26% of children and adolescents aged 2 to 17 in Canada were overweight or obese; 8% were obese (Shields, 2004).

Spanier, Marshall and Faulkner (2006) argue that this obesity pandemic is not just a matter of decreased physical activity levels per se, but is partly influenced by increased involvement in sedentary behaviours such as a greater dependence on passive modes for transportation. A growing body of literature is showing support for the health-enhancing benefit of reducing sedentary behaviour (Spanier et al., 2006). For example, studies show that reinforcing children for being less sedentary (e.g., watching less television) results in equal or greater positive changes in weight or fitness than reinforcing children for being physically active (Epstein & Roemmich, 2001). Given such findings, Spanier et al. find it somewhat surprising that most behavioural research in the area of physical activity and health continues to focus on what people are not doing (physical activity) rather than on what people are doing (sedentary activities).

Spanier et al. (2006) note that the importance of considering sedentary behaviours (and not just the absence of physical activity) is reflected in Canada’s current physical activity guidelines for children and youth (Health Canada and Canadian Society for Exercise Physiology, 2002). These guidelines recommend children should accumulate up to 90 additional minutes of physical activity per day, while also decreasing non-active time, such as time spent watching television, by an additional 90 minutes. Active school transportation (AST) not only reduces a sedentary behaviour (passive commuting), but replaces it with moderate intensity physical activity (active commuting; Tudor-Locke, Ainsworth, & Popkin, 2001).

AST most often refers to walking or cycling to and from school, but it can also include traveling by kick scooter or inline skates. Conversely, non-active modes of transportation (NON AST) include (but are not limited to) traveling by car, bus, tram, or train (Bringolf-Isler et al., 2008). Tudor-Locke et al. (2001) suggest that it is intuitive to promote AST because “The fact that children must travel to school in some manner, day after day, should be viewed as a unique opportunity to impart the multiple benefits of physical activity” (p. 312). This habitual transportation mode is also accessible, eco-friendly, and cost-efficient from an energy and infrastructure point of view (Badland & Schofield, 2005).

AST has declined in most parts of the Western world (Lee, Orenstein, Richardson, & Ragland, 2008a). In Canada, over half of children aged 5-17 rely solely on inactive modes of
transportation to and from school (Craig, Cameron, Russell, & Beaulieu, 2001), which is not surprising given that industrial societies today are dominated by motor vehicle transportation and prevalent bussing and chauffeuring practices (Tudor-Locke et al., 2001). Although a recent study by Buliung, Mitra and Faulkner (2009) found AST mode share in the Greater Toronto Area (GTA) to be relatively high compared to urban regions in the United States, Australia, and England, AST participation in the GTA has declined by 12.6% and 9% in the a.m. and p.m. period, respectively, over the past twenty years (Buliung et al., 2009).

There has been little Canadian research to date exploring AST and the factors influencing travel mode choice. Panter, Jones, and Van Sluijs (2008) recently developed a conceptual framework (see Appendix A) for youth’s active travel. Although the outcome behaviour in this framework is active/inactive travel to a destination and not AST per se, the majority of the studies reviewed in the paper were focused on walking and cycling to school and provided evidence for the framework development. My study used the Panter et al. (2008) framework as a guide to investigate the mode choice decision-making process from the perspectives of parents and caregivers, while qualitatively exploring the physical environment, individual, and external factors influencing this process. Although Panter suggests that child/youth characteristics and attitudes are key variables affecting the decision-making process on mode choice, according to McMillan (2005), up to a certain age the final decision about the trip to school is most often made by the parents or caregivers in the household; parental decision making is the causal variable. Consequently, this thesis focused on the parental influences on travel mode choice.

3 Study Purpose

The purpose of this qualitative investigation was to examine parents’ perspectives of the trip to and from school and travel mode choice. These decision-making processes were explored among parents who differed with respect to SES, and whose children attended schools located in different areas (i.e., urban vs. inner-suburban) across Toronto. To the best of my knowledge, this is the first qualitative study in a Canadian context to specifically investigate how parents make school travel mode choices.
4 Study Rationale and Significance

Research suggests that AST can make an important contribution to a child’s overall physical activity for the day (McMillan, 2007). Since little research has taken a qualitative approach to understanding how parents decide on their child’s travel mode to and from school within a Canadian context, this study builds on the current AST literature and can inform the development of theoretically-informed policies and interventions to increase the number of children actively travelling to and from school. AST may help children integrate physical activity into their daily lives and establish good habits of an active healthy lifestyle (Hahn, 2007).
Chapter 2
Literature Review

1 Introduction

The purpose of this qualitative investigation was to examine parents’ perspectives of the trip to
and from school and travel mode choice. These decision-making processes were explored among
parents who differed with respect to SES, and whose children attended schools located in
different areas (i.e., urban vs. inner-suburban) across Toronto. Although a report by O’Brien
(2001) described results from focus group discussions with parents about their attitudes and
travel behavior regarding the trip to school, to the best of my knowledge, this is the first
qualitative study in a Canadian context to specifically investigate how parents make school travel
mode choices using a structured sampling framework and a theoretically informed interview
guide.

1.1 Purpose of the Literature Review

Largely driven by declines in rates of AST, research on children’s active commuting behaviour
has rapidly expanded over the past five years (Davison, Werder, & Lawson, 2008). In 2001,
Tudor-Locke and colleagues were the first to identify active commuting to school as an
overlooked source of physical activity for children. They set the stage for AST research,
proposing that we did not fully understand all of the factors related to travel mode decision-
making and needed information about AST prevalence, mode, and distance travelled.
Furthermore, Tudor-Locke et al. outlined the need to understand the relative importance of AST
to overall physical activity in schoolchildren and to investigate children’s perceptions of AST.
Since then a number of frameworks have been proposed; they will now be reviewed.

In 2005, McMillan developed the first conceptual framework (see Appendix B) to highlight
factors that may influence parents’ decisions about how elementary school children travel to
school and the hypothesized relationship between the factors and children’s travel behaviour. In
particular, the urban form (or design) is highlighted as potentially shaping school travel
behaviour. Handy, Boarnet, Ewing, and Killingsworth (2002) describe urban design as referring
“to the design of the city and the physical elements within it, including both their arrangement
and their appearance, and is concerned with the function and appeal of public spaces” (p. 65).
Urban form can be defined using terms such as density, mixed uses, connectivity, and proximity (Cervero & Kockelman, 1997).

The McMillan (2005) framework assumes that up to a certain age the decision about how a child gets to school is most often made by the parents or caregivers. Therefore, parental decision-making is a variable linking urban form and a child’s trip to school. However, the relationship between urban form and parental decision-making is not direct. Neighbourhood safety, traffic safety, and household transportation options (e.g., physical access or proximity to destinations) are considered as intervening causal variables, which are directly related to both urban form and parental decision-making. Therefore, it is suggested that urban form factors influence parents’ opinions about the ability of the physical environment to support different modes of transportation. Thus, McMillan suggests that interventions to increase AST that focus on changes in urban form should target elements known to affect these mediating factors. Furthermore, her framework outlines other factors that are not directly related to urban form, but do influence travel choice. These moderating factors include social/cultural norms, parental attitudes, and socio-demographics. The relationship between a mediating variable and parental decision may vary depending on these moderating factors. Although McMillan offered a conceptual framework addressing the complexity of the relationship between urban form and the trip to school, as well as the importance of the parental decision-making process, she recognized that many questions regarding children’s travel behaviour to school remained. For example, although urban form is a key variable in the framework, it was still not exactly clear how urban form related to behaviour and the relative importance of urban form compared to other influencing factors (McMillan, 2005). Furthermore, McMillan acknowledged that “the question of what determines the travel behaviour for the trip to school has yet to be answered” (p. 452).

An active travel framework developed by Panter et al. (2008) integrates the built (or physical) environment into the wider decision around travel choices for children and youth. Although Panter et al. intended to provide a framework within which the environmental determinants of children’s travel (not AST per se) behaviour may be studied, most of the research providing evidence for the framework development focussed on walking and cycling to school. It is therefore an appropriate framework to consider when looking at AST behaviour. Panter et al.’s conceptual framework for youth’s active travel contains four main domains of influence on active travel behaviour: individual factors, those associated with the built environment, external
factors, and main moderators. Unlike McMillan (2005), Panter et al.’s framework allows for the fact that both parental and child characteristics and attitudes influence the actual decision-making process on travel mode. Furthermore, while McMillan considered only urban form as the core element of her framework, Panter and colleagues described broader built environmental factors such as attributes of the neighbourhood, destination, and route environment. Handy and colleagues (2002) define the built environment as comprising urban design/form, land use, and the transportation system that encompasses patterns of human activity within the physical environment. This definition will be used to conceptualize the built environment within the context of this study. Unlike McMillan, Panter et al. also highlight external factors that may influence travel mode decisions such as weather, cost of travel, and policy. Finally, Panter et al. identify main moderating factors (e.g., age, distance) that will alter the strength of the association between the influential factors and the travel mode decision-making process. For example, safety may be a more significant moderator of AST for younger children versus adolescents, while children may be unlikely to walk or cycle to school if the distance is perceived to be too far.

Most recently, the Ecological and Cognitive Active Commuting (ECAC) Framework (see Appendix C; Sirard & Slater, 2008) has been developed by researchers in the fields of urban planning, transportation, and physical activity; it incorporates elements of the social ecological model, the MacMillan framework, and constructs from social cognitive theory (Bandura, 1986). The ECAC framework reflects policy, neighbourhood, and parent/family levels of influence. Policy decisions can have direct effects on physical infrastructure, as well as social environment initiatives to promote neighbourhood AST. With input from the child, parents combine their perceptions of these physical and social environments with attitudes and social norms. Available resources to a family (e.g., work schedules) may also influence parent perceptions of environments. Sociodemographic factors are positioned at the bottom of the framework, suggesting that these characteristics can moderate perceptions, availability of resources and psychosocial mediators (Sirard & Slater, 2008). Sirard and Slater explain that the ECAC is a starting point to help researchers organize future studies and can be later modified based on this research.

The purpose of this review is to assess the AST literature since McMillan’s 2005 review and framework. This will inform readers of the research progress made over the past three years, as
well as the current state and future directions in this area of research. Knowledge gaps in the literature were used to inform my thesis methodology, discussed in Chapter 3.

1.2 Literature Review Process

Studies within the “Medline” database were searched using the keywords “active school transport,” “walk(ing) to school” and “active school commuting.” There search was not limited by child/youth age. Article reference lists were also reviewed for relevant research articles. Studies were included in the review if they were published since January 2005 to February 2008; written in English; and were primary source, peer-reviewed research reports with a specific focus on AST. For qualitative research, the publication date criterion was expanded to include any AST qualitative research to date. Because the proposed thesis is qualitative in nature, I wanted to review all available qualitative research in the AST literature. The five qualitative AST studies I reviewed were published between 2006 and 2008.

Fifty-three articles were initially selected for review. However, only a vague abstract was available for the Merom, Rissel, Mahmic, and Bauman (2005) study, so it was subsequently omitted. It is important to note that this is not a systematic literature review, as the articles presented here were published literature from only one database and some recent AST research studies may not have been included. However, this review does provide a substantial general overview of what we do and do not know about AST.

A total of 52 studies were reviewed (see Appendix D). Most research was survey-based (n=44) and from the United States (n = 28) or Australia (n = 11). Only four of the studies were conducted in Canada (Buliung et al., 2009; Orsini & O’Brien, 2006; Pabayo & Gauvin, 2008; Robertson-Wilson, Leatherdale, & Wong, 2008). Only two studies (Boarnet, Day, Anderson, McMillan, & Alfonzo 2005b; Sirard, Ainsworth, McIver, & Pate, 2005a) used an objective method of assessing travel mode (direct observation), while the remaining studies used self-reported measures. Below, I will first discuss research on the benefits and prevalence of AST, followed by the influencing factors on travel mode choice. I will then review intervention and qualitative studies on active commuting to and from school. The sampling frameworks and methods of the qualitative studies will be further analyzed in order to identify future qualitative research directions. Finally, I will identify the knowledge gaps that still remain and the
implications for this study. Before we look at the factors associated with travel to and from school, however, the issue of defining and measuring AST needs to be discussed.

### 1.3 Measuring AST

The measurement of active travel is not straightforward, and definitions of AST vary greatly across studies. Some researchers have classified children as “active commuters” if they reported travel by walking or cycling at least once (Kerr et al., 2006; Martin, Lee, & Lowry, 2007; Merom, Tudor-Locke, Bauman, & Rissel, 2006; Saksvig et al., 2007) or twice (Rosenberg, Sallis, Conway, Cain, & McKenzie, 2006) per week, while children in the Booth et al. (2007) study had to use a specific mode of transportation ≥ 4 times per week in order to be categorized as a user of that mode. Furthermore, some researchers focus on children who use AST modes before or after school (Saksvig et al., 2007), while others define AST as usually walking or cycling to and from school (Bringolf-Isler et al., 2008).

These discrepancies in defining AST may account for the various and sometimes conflicting findings in the literature. Therefore, readers must take these measurement issues into consideration when reading the findings in this review, and be cautious about drawing comparisons between studies. For the purposes of this study, AST will be defined as using active modes of transportation to/from school on most days of the week (i.e., 3 or more days/week; 6 or more of the 10 trips/week). Although there are no straightforward criteria, this definition identifies a threshold whereby an active traveler must use active modes of transportation for the majority of trips to/from school. This definition infers stability in travel mode decision-making and behaviour choice; it also assumes differences in levels of physical activity among AST children, those who use active modes of transportation less than three days/week (i.e., less than 6 of the 10 trips/week) and those who do not use active modes to/from school at all.

### 2 Benefits of AST

The benefits of physical activity are well documented. Given that walking at any intensity, for example, expends energy (Morris & Hardman, 1997), theoretically it can be argued that AST may help combat childhood obesity. Lee et al. (2008a) suggest that walking or cycling to school may increase activity levels in several ways. First, the act of commuting itself could be a significant source of physical activity. Second, opportunities may arise during the commute for
additional activity and spontaneous play. Third, AST may encourage active behaviour in other areas of the child’s life. However, research to date suggests that although AST is related to children’s overall physical activity levels and may influence cardiovascular fitness, no relationship has been found between AST and decreases in BMI (Davison et al., 2008; also see Faulkner, Buliung, Flora & Fusco, 2009 review).

2.1 AST and Physical Activity Levels

Twelve of the reviewed studies in this review investigated the benefits of AST. Some studies show that children who actively commute to school accrue more daily minutes (ranging from 4.7 to > 34 minutes) of moderate- to- vigorous physical activity (MVPA) levels compared to those children who use non-active modes of transportation (Alexander et al., 2005; Cooper, Andersen, Wedderkopp, Page, & Froberg, 2005; Heelan et al., 2005; Saksvig et al, 2007; Sirard, Riner, McIver, & Pate, 2005b). Based on objective measures of physical activity such as accelerometry (Cooper et al., 2005), total number of minutes walking before and after school (Saksvig et al., 2007), and pedometer counts (Duncan, Duncan, & Schofield, 2008), children who actively commute to school have higher total daily physical activity levels compared to those who do not use AST. Dollman and Lewis (2007) found that those who actively commuted were 30% more likely to actively commute to other neighbourhood destinations. Furthermore, Landsberg et al. (2007) found that 28.4% of overall physical activity levels among active commuters were explained by commuting activity alone. However, Cooper et al. acknowledge that these results can be explained by the possibility that children who are active in general choose to travel to/from school by active means. This does not, however, seem to be the case, as Cooper et al. investigated physical activity levels over the weekends and found no statistically significant differences in activity levels between active and non-active travel groups, suggesting that differences in activity level among children do not explain this phenomenon.

2.2 AST, Cardiovascular Fitness and BMI

The effects of AST on cardiovascular fitness and adiposity have also been explored. Those who cycled to school were five times more likely to be in the top quartile of cardiovascular fitness compared to those who used motorized transportation (Cooper et al., 2006). However, in the same study, no such association was found among those who walked to school. The authors suggest that the greater overall physical activity levels (and intensity) among the cyclists could
explain these observed differences in fitness levels. An analysis by Rosenberg et al. (2006) revealed that mode of transportation to school could not predict overweight; however, at baseline, boys who actively commuted to school had significantly lower BMI and skinfold values than boys who did not actively commute. Again, the question here is whether AST helps reduce BMI and skinfolds, or if leaner boys are more likely to actively commute than heavier boys (Rosenberg et al., 2006). Other evidence does not support the former, as Landsberg et al. (2007) found that active commuting to school per se does not affect BMI until distance to school is considered. Furthermore, Ford, Bailey, Coleman, Woolf-May, and Swaine (2007) found no significant difference in either daily activity levels or body composition between those who walk to school and those who travel by car.

In summary, it is uncertain whether an intervention to increase AST would by itself impact activity-related health outcomes (Lee et al., 2008a). Although some evidence that higher intensity AST (e.g., cycling) may increase cardiovascular fitness, there is no evidence to support a relationship between AST and decreases in BMI. However, associations between AST and increased MVPA and overall physical activity levels are encouraging. Although AST may not make very large contributions to overall daily energy expenditure, it is possible that substantial increases in physical activity among children will occur by accumulating many small increases throughout a typical day (Booth et al., 2007). Saksvig et al. (2007) recommend focusing on opportunities for energy expenditure. AST is a low-cost, attainable daily physical activity opportunity with the potential for many positive long-term outcomes. From a public health perspective, AST may also improve air quality and traffic safety (see Lee et al., 2008a for a review on the health impacts of the school commute). Despite these potential benefits, however, rates of AST are declining internationally and in Canada.

3 Prevalence of AST

Fourteen of the studies in this review looked at the prevalence of both walking and cycling modes of AST, while five of the studies considered walking rates alone. It was interesting to find no studies specifically focusing on rates of cycling alone. Although most investigators used self-report methods via questionnaire or objective measures such as accelerometry, Sirard et al. (2005a) used a direct observation method to count the number of children who either walked or cycled to school. Comparison of prevalence rates across studies or countries/cities of interest is
difficult because of the varied sample populations, measurement methods, and definitions of AST. Although comparison of prevalence rates is not an aim in this review, it is important to consider general trends in AST and how definitions of AST can influence research approaches in this field.

3.1 International AST Trends

Two studies have used population-based surveys to look at trends in AST over time in the United States (McDonald, 2007a) and Australia (Van der Ploeg, Merom, Corpuz, & Bauman, 2008). These studies found that AST rates have decreased from about 40-45% of students in the early 1970s to 12-21% in the early 2000s. Furthermore, Van der Ploeg et al. found that car usage increased from 12%-48% over the same time period. Across all of the studies reviewed, AST prevalence rates ranged from 5% in a study conducted in the United States (Sirard et al., 2005a) to 78% found in a Swiss study (Bringolf-Isler et al., 2008). With one exception (Cooper et al., 2006), walking is usually the most common mode of AST, followed by cycling (Duncan et al., 2008; Wen et al., 2008). Cycling prevalence rates are generally low, ranging from 1% (Wen et al., 2008) to 5% (Schlossberg, Greene, Phillips, Johnson, & Parker, 2006). However, in the Cooper et al. (2006) study, cycling was the most common form of AST (38.3%), followed by walking (25.8%) and travel by car (23.2%). The sample population may explain the high walking and cycling rates found in the Bringolf-Isler et al. and Cooper et al. studies, respectively. These studies were conducted in Switzerland (Bringolf-Isler et al., 2008) and Denmark (Cooper et al., 2006), countries where active transportation is perhaps more of a social norm and facilities such as bike paths are more common. However, no research to date has specifically examined active transportation to/from school and social/cultural norms across countries.

3.2 AST in Canada

Three Canadian studies measured the prevalence of active commuting to/from school. Pabayo and Gauvin (2008) used a population-based sample of youth aged 9, 13, and 16 years who participated in the 1999 Quebec Child and Adolescent Health and Social Survey to determine the proportion of students using different modes of transportation to and from school. Results showed that 40.3%, 15.2%, and 13.0% of 9, 13, and 16 year olds walked to school, respectively, while 14.3%, 7.3%, and 5.0% of 9, 13, and 16 year olds were transported by car, respectively. In Ontario, 21345 students from 76 high schools across the province completed the School Health
Action, Planning and Evaluation System Module survey. Less than half of these students (42.5%) reported actively commuting to school (Robertson-Wilson et al., 2008).

A recent study by Buliung et al. (2009) used data from a population-based transportation survey of the Greater Toronto Area (GTA) looking at mode share for school trips among children and youth aged 11 years and older. They found that walking mode share for a.m. trips has decreased from 53.4% in 1986 to 42.5% in 2006, while cycling mode share declined from 2.5% to 0.8% (for both a.m. and p.m. periods). Moreover, these decreases in active modes seem to have been replaced by passive modes of transportation, as automobile trips (parental drop-off) increased from 14.3% to 28.5% during the same time frame. Declines in AST were also found for trips home from school, as walking mode share has decreased from 56.9% (1986) to 49.5% (2006). Buliung et al. (2009) argue that these declines in AST within the GTA over the past two decades are “not insignificant and should provide some focus for the development of local AST policy” (p. 13). Outcomes from the current study will provide valuable evidence to inform these local policies.

In summary, the prevalence of AST varies across studies. This is likely due to discrepancies in AST measurement, and possibly differences in social norms around transportation across countries. Although the prevalence of Canadian children and youth using active modes of transportation to/from school may be relatively high compared to some American results, findings from Buliung et al. (2009) show that AST is on the decline. Examining the factors influencing transportation mode choice will provide us with a better understanding as to why this may be the case.

4 Factors Influencing AST

Understanding the determinants of children’s travel behaviours is necessary in order to develop and implement effective interventions (Tudor-Locke et al., 2001). The majority of studies (n = 32) in this review explored correlates of AST. Accordingly, these factors are organized using the four domains of influence proposed in Panter et al.’s (2008) conceptual framework for youth’s active travel: individual factors, those associated with the built environment, external factors, and main moderators. The first three domains are proposed to most likely influence travel mode choice, while the main moderating factors are believed to alter the strength and form of the association between the factors and the transportation decision made.
4.1 Individual Factors: Child Characteristics

4.1.1 Ethnicity

Research on the influence of ethnicity on AST behaviours is mixed. Yarlagadda and Srinivasan (2008) found Caucasian children to be less likely to be walked to school by their mothers, whereas Asian children were more likely to walk independently to school compared to children of other ethnicities. Although researchers have yet to look at the culture of AST across different populations, Yarlagadda and Srinivasan suggest that these differences may be capturing cultural difference across ethnicities. However, McDonald (2008b) suggests that the apparent variation in travel behaviour across ethnic groups result from differences in underlying explanatory factors such as household income, density, and neighbourhood composition. For example, white children in the USA have the lowest rates of walking or cycling to school because they are less likely to live close to schools, have higher incomes, and live in lower-density areas (McDonald, 2008b).

4.2 Individual Factors: Child Perceptions and Attitudes

4.2.1 Motivation to walk/cycle

While Cole, Leslie, Donald, Cerin and Owen (2007) reported that walking being the child’s preferred option of transportation was an influencing AST factor, Merom et al. (2006) found no significant associations between a child’s keenness for walking and AST. Children’s perceptions of how their friends view the importance and enjoyment of physical activity were also not found to influence AST in one study by Martin et al. (2007). In addition, perceptions of being too overweight to do physical activities have no association with participating in AST (Robertson-Wilson et al., 2008; Timperio et al., 2006). Further research is needed to explore if or how children’s perceptions and attitudes toward AST influence travel behaviour.

4.3 Individual Factors: Household Characteristics

4.3.1 Sex and ethnicity

Only one study found that having a male parent/guardian responsible for taking a child to school was positively correlated with AST (Merom et al., 2006). The authors proposed that as more mothers enter the workforce, involvement of fathers in school-related travel might lead to an
increase in AST; however, there is a lack of strong evidence to support this claim, and the authors also assume a traditional family structure where both a mother and a father are responsible for the child. There is weak evidence to suggest that race/ethnicity correlates with school transportation behaviours among parents. Although Bringolf-Isler et al. (2008) found a higher prevalence of children driven to school among the French versus German-speaking participants, the authors argued that cultural factors, by which they mean overall lifestyle habits, might influence these differences. Furthermore, Duncan et al. (2008) argued that the high rate of AST found in their study among Maori people in New Zealand might be related to the importance of physical activity among this ethnic group (see “Norms” section for additional research addressing cultural factors).

4.3.2 Education and SES

Martin et al. (2007) argued that parental education and other measures of socio-economic status (e.g., household income) might explain the unadjusted relationship they found between active travel and race/ethnicity. There are mixed results relating to AST and parent education. While two studies found no relationship (Bringolf-Isler et al., 2008; Kerr et al., 2006), two other studies (Martin et al., 2007; Mota et al., 2007) found a negative association between parental education and AST (i.e., children of parents with lower levels of education were more likely to travel to school actively). Duncan et al. (2008) found a positive association between AST and children of low/medium socio-economic status (i.e., children from schools categorized as low/medium SES were more likely to travel to school actively). Conversely, Spallek, Turner, Spinks, Bain and McClure (2006) found that walking to school was least common among children of high socio-economic status. Perhaps compared to high SES children, low SES families do not have access to a vehicle, and are therefore more likely to use active modes of transportation.

4.3.3 Income

At a household level, McDonald (2008b) found income to have a moderate effect on travel behaviour. For example, results from their national transportation survey showed that a 10% increase in household income led to a 2.6% decline in walking and a 2% increase in being driven. Similarly, McMillan (2007) found that as household income increased, the likelihood of non-motorized travel decreased. Pabayo and Gauvin (2008) specifically found that more children living in a household with an annual income of less than $30,000 walked to school,
while children living in a household with an annual income greater than $60,000 were mostly driven to school.

4.3.4 Occupational status

Work by Yarlagadda and Srinivasan (2008) suggests that employment characteristics of both mothers and fathers seem to influence travel mode choice to and from school. Mothers who are employed full-time are less likely to walk their children to school compared to part-time and non-workers. Among working mothers, those who do not have full flexibility in their work schedule are more likely to drive their children to school. On the other hand, fathers with little to no work flexibility are less likely to drive their children to school and those with full flexibility are more likely to chauffeur their children. These findings remain unclear; the current study will further investigate the role of work schedules/flexibility and AST.

4.3.5 Car access

Wen et al. (2008) argue that the number of cars per household is a proxy measure for socio-economic status. Two studies (Bringolf-Isler et al., 2008; Wen et al., 2008) found the number of cars per household to be positively associated with non-active forms of transportation to school (i.e., the more cars available, the more likely kids are driven to school). Although Merom et al. (2006) and McMillan (2007) found no relationship between these variables, Merom et al. present the possibility that low SES families may choose (if they can) to live closer to their child’s school or send their child to a local school. This idea of self-selection emerged in one qualitative study reviewed (Ahlport, Linnan, Vaughn, Evenson & Ward, 2008; see “AST Policies and Other Facilitators” section).

4.3.6 Physical activity and transportation

Although not much research exists, there is some evidence that parents’ physical activity levels and modes of transportation to work also influence AST. Two studies found that more physically active parents, in general, actively transport their children to school (Cole et al., 2007; Martin et al., 2007). Another area of inquiry that warrants further research is how parents’ trips to work influence the travel behaviours of their children. Two studies found a strong association between children being driven to school and their parents’ car journey to work (Merom et al., 2006; Wen et al., 2008). Therefore, targeting parents’ travel modes to their place of work may be an effective strategy
in decreasing non-active transportation to school.

4.3.7 Family structure

According to McDonald (2008a) and McMillan (2007), having siblings makes children less likely to be driven to school and more likely to walk. They suggest that this may be a result of parents’ increased comfort in allowing children to walk together in a group. On the other hand, perhaps it is easier for a parent with more than one child to drive them all to school, as Yarlagadda and Srinivasan (2008) found children more likely to be driven to school by their mother when multiple children who attend school are present in the household. However, two other studies by Martin et al. (2007) and Timperio et al. (2006) found no relationship between the number of siblings and AST.

Marital status of parent(s) (Bringolf-Isler et al., 2008; Merom et al., 2006; Wen et al., 2008) or living with one parent (Timperio et al., 2006) also does not seem be associated with AST. Although Fulton, Shisler, Yore, and Caspersen (2005) found a positive association between children living with one parent and AST, no relationship was found after adjustment for parent education. Martin et al. (2007) argued that although it might be assumed that children living in a single-parent household may lack resources (e.g., cars per household), this does not explain the positive relationship they found between AST and children of divorced parents. The question of how family structures may influence children’s travel behaviour remains unclear.

4.4 Individual Factors: Caregiver Perceptions & Attitudes

4.4.1 Values

Little research has addressed if or how parents’ perceptions of physical activity and the benefits of walking for transport are related to travel behaviour. Are parents aware that AST is a potential source of moderate-to-vigorous physical activity? Do they value it? Only one study explored some of these issues and found that AST was related to parents’ belief in the health benefits of walking for transport (Merom et al., 2006). Active commuting to school may also be influenced by parents’ perception/confidence in their child’s ability to walk to school safely, as Wen et al. (2008) found that non-active forms of transportation were related to parents’ belief that their
child does not have the road safety skills needed to walk to school. This finding may have implications for AST interventions aimed at strengthening children’s road safety skills.

Social interaction and convenience may also be important values influencing travel mode choice. Caregivers in the McMillan (2007) study who valued social interaction for their child on the trip to school had children who were more likely to use active modes of transportation (see “Attributes of Neighbourhood” section). Driving as a perceived convenient travel mode to/from school seems to influence behaviour, as children of parents/caregivers who report driving as being a more convenient mode choice are less likely to walk/cycle to school (McMillan, 2007). Furthermore, in a case example of Sky View Middle School in Bend, Oregon, parents/caregivers reported convenience as the most common reason why they drive their children to school (Schlossberg, Philips, Johnson, & Parker, 2005).

4.4.2 Norms

Although little research has focused on the culture of AST across different populations, some research exists suggesting that societal differences may influence travel mode choice to/from school. For example, Timperio et al. (2006) found children in Australia to be more likely to walk or cycle to school when parents perceived that other children in the neighbourhood actively commute. Furthermore, an interesting result from the McMillan (2007) study found that being born in the United States (controlling for all other variables) decreased the likelihood of AST. McMillan (2007) argued that these results validated the car-dominated culture predominant in the United States.

In summary, individual characteristics of both children and parents/caregivers appear to influence the trip to/from school, although some associations are not clear. There are mixed results surrounding a child’s ethnicity and AST. Differences in prevalence of AST among children of different ethnic groups may be better explained by SES. There is no consistent evidence to suggest that a child’s perceptions and attitudes towards AST influence engagement in active travel behaviours. There is weak evidence to suggest that a parent/caregiver’s sex or ethnicity influences AST. SES (education and income) has been found to influence travel behaviour, as children of lower SES appear to use active modes of transportation more than high SES children. Although car access within households can be used as a proxy measure for SES, it has been argued that the positive association between the number of cars per household and non-
active forms of transportation to school may be explained by low SES families choosing to send their child to a local school. This idea of self-selection needs to be explored further. Further research is also needed to better understand the role of parents/caregiver workplace policy and how flexible work hours and transportation to/from work can influence AST. Finally, very little research to date has explored parent/caregiver’s values and cultural norms surrounding AST. The parents in this study discussed their perceptions of AST and the role of school travel in their lives.

4.5 Built Environment Factors: Attributes of Neighbourhood

4.5.1 Personal safety

Of the ten reviewed studies examining perceptions of safety, only one (Mota et al., 2007) surveyed children. Safety concerns surrounding actively commuting to school are generally those of parents. Although general crime danger has been reported as a barrier to AST (CDC, 2007), the impact of perceptions of neighbourhood safety on active commuting to school is unclear. While Fulton et al. (2005) found no relationship after adjustment for parental education, the negative association between children’s perceptions of neighbourhood safety and AST found in the Mota et al. study was only marginally significant statistically. On the other hand, Bringolf-Isler et al. (2008) found a positive relationship between general safety concerns of parents and non-active modes of transportation, while caregivers reporting concerns about neighbourhood safety decreased the probability of their child using AST modes (McMillan, 2007).

4.5.2 Social interaction

Although there has been a strong interest in the relationship between travel and the environment, researchers have conceptualized the environment as only a physical entity (McDonald, 2007b). However, Lefebvre (1991) conceptualizes space as “neither a ‘subject’ nor an ‘object’ but rather a social reality – that is to say a set of relations and forms” (p. 116). McDonald (2007b) notes that “Studies in urban sociology show that social processes are spatially embedded and have strong impacts on individual behaviour” (p. 53). Consequently, in order to better understand how neighbourhood social interactions influence AST behaviours, McDonald (2007b) used measures of neighbourhood social cohesion and control from the 2003 California Health Interview Survey. The results showed the social environment to have a significant effect on whether children walk
to school. The strongest social environment influence on behaviour was neighbourhood social trust and cohesion, with a one-point increase in rating resulting in a 0.1 increase in the probability of walking to school. Furthermore, Timperio et al. (2006) found that children whose parents reported that there were few other children in the neighbourhood for their child to play with were less likely to use active modes of transportation to school. Further investigation in this area is warranted. In the current study, ideas of neighbourhood/school community and social capital were addressed by parents.

Facilities and aesthetics Three studies found a positive association between AST and the presence of sidewalks and biking infrastructure (Evenson et al., 2006; Fulton et al., 2005; Kerr et al., 2006); however, Mota et al. (2007) found no relationship between these variables. Parents in the Schlossberg et al. (2006) study reported a lack of adequate sidewalks as a reason for driving their children to school. There is some evidence to suggest that features in a neighbourhood such as availability of physical activity facilities (Martin et al., 2007), having stores within 20 minutes of home, and overall neighbourhood aesthetics support AST (Kerr et al., 2006). However, Evenson et al. (2006) found no association between AST and aesthetic features such as trees and better scenery among sixth- and eighth-grade girls.

4.5.3 Urban form

It has been consistently shown across studies that children who live in urban/denser populated areas (Bringolf-Isler et al., 2008; Martin et al., 2007; McDonald 2008a; Merom et al., 2006; Nelson, Foley, O’Gorman, Moyna, & Woods, 2008; Pabayo & Gauvin, 2008) are more likely to use active modes of transportation compared to those who attend rural schools (Robertson-Wilson et al., 2008). This may be due to issues of distance, pedestrian facilities, and bussing policies. Kerr et al. (2006) found a positive association between objective measures of residential density and AST. The relationship between intersection density and AST, however, is not clear. While Schlossberg et al. (2006) found a positive association with AST, Kerr et al. found no relationship. A consistent factor influencing AST across two studies is street connectivity. Both Kerr et al. and Mota et al. (2007) found a strong association between street connectivity and AST.
4.6 Built Environment Factors: Attributes of Destination

4.6.1 Level of urbanization

Sirard et al. (2005a) found no association between AST and levels of urbanization around four elementary schools located in both urban and suburban areas. Although several studies show that children are more likely to use AST if they live in an urban area (see “Urban Form” section), Sirard et al. suggested that they were unable to detect these differences based on school surroundings because of their small sample size and limited geographic diversity.

4.7 Built Environment Factors: Attributes of Route

4.7.1 Road safety

Issues of general traffic safety are a consistent concern of parents and a barrier to AST (CDC, 2007; Cole et al., 2007; Kerr et al., 2006). Parents with traffic concerns are more likely to accompany their child to school (Bringolf-Isler et al., 2008). Perceptions of dangerous driving and high-speed traffic are specific reasons for parents to drive their children to school (Schlossberg et al., 2006). This is ironic, given that parents then choose to drive their children on the very roads that they deem to be unsafe. Caregivers in the McMillan (2007) study reporting traffic speeds greater than 30 miles per hour along the route to school decreased the probability of a child walking/bicycling to school. Wen et al. (2008) found that more non-AST parents agreed with the statement “There are roads that are dangerous to cross on the way to school.” Parents’ concerns seem to have a significant impact on commuting behaviours, as children whose parents had few safety concerns were five times more likely to actively commute to school than parents who had many concerns (Kerr et al., 2006). These findings suggest that both environmental changes and educational safety programs for parents may be needed to increase AST (Kerr et al., 2006). Many aspects of the built environment also serve as barriers to AST. For example, Timperio et al. (2006) found a negative relationship between AST and parents who reported there being no lights or crossings on their child’s route to school. Two studies found major roads en route to school to be a barrier to AST (Bringolf-Isler et al., 2008; Timperio et al., 2006).
4.7.2 Urban form and topography

Timperio et al. (2006) found a steep incline en route to school to be negatively associated with AST among 5-6 year-olds. Furthermore, one study identified high dead end densities as a barrier to actively commuting to school (Schlossberg et al., 2006).

In summary, built environment characteristics of the neighbourhood and en route to/from school have been shown to influence AST. Neighbourhood safety is a parental safety concern; however, exactly how the environment influences perceptions of safety is still not clear. Another area of inquiry that is not fully understood is the social aspect of AST and if or how social trust and cohesion within a neighbourhood influences how children travel to/from school. There is evidence to suggest that neighbourhood features such as walking and cycling infrastructure support AST. Several studies have shown that children are more likely to use active modes of transportation if they live within urban areas (characterized by high street connectivity and residential density). A consistent parental concern is traffic safety, specifically dangerous driving and high speeds, en route to/from school. Other urban form barriers to AST include major roads en route, steep inclines and high dead end densities.

4.8 External Factors

Panter et al.’s (2008) framework highlights external factors which may influence travel mode choice, but are peripheral to the neighbourhood and family. These factors include things such as weather, cost of travel, and government (or school, in this case) policy.

4.8.1 Weather

It is intuitive that bad weather would deter parents and children from actively commuting to school. Indeed, weather is a reported barrier to AST (CDC, 2007), and a main reason for parents to drive their children to school (Bringolf-Isler et al., 2008; Schlossberg et al., 2006). Robertson-Wilson et al. (2008), however, found season, average temperature, and days of precipitation to have no influence on AST. This is surprising, given that the study took place in Ontario, where cold and snowy winters often make active commuting difficult. However, the authors of the study suggest that attention needs to be given to how weather is assessed before dismissing it as an influential variable. They argue that their study used proxy indicators of the weather, as some school regions had multiple weather stations, while other areas had weather stations almost 25
km away from the school. On the other hand, perhaps these results confirm the stability of AST despite weather conditions. Longitudinal studies of active commuting patterns across seasons are needed to better understand the effect of weather on transportation mode (Robertson-Wilson et al., 2008).

4.8.2 Work policy/characteristics

Although a parent/caregiver’s trip to work may have an impact on children’s active commuting behaviours, little research has addressed the role of parent workplace policies and AST. Yarlagadda and Srinivasan (2008) found that mothers who go to work during the school week (especially those without flexible work hours) are more likely to drive their children to school. Wen et al. (2008) and Merom et al. (2006) suggest that flexible working hours could assist parents in not using cars to commute. This may be true if alleviated time pressures in the morning reinforce parents/caregivers to take the time to walk/cycle to school with their children. No studies to date have assessed parent work policy interventions and their influence on AST.

4.8.3 School policy/characteristics

Fewer non-AST parents agreed with the statement “My child’s school encourages the children to walk to school” (Wen et al., 2008). Although school initiatives to support AST have been made, such as restricting parking around the schools (Wen et al., 2008) and school siting policies that encourage the building or renovation of schools within existing neighbourhoods rather than placing them on the edge of communities and on busy streets (Kerr et al., 2006), there has been no empirical research to assess the effectiveness of these specific interventions. A recent initiative by Canada’s Active & Safe Routes to School program is School Travel Planning (STP), a national program aimed at helping to maximize active transportation and its benefits by bringing community stakeholders together to identify AST barriers for individual schools and to develop a written action plan to overcome them (Hahn, 2007). In order to ensure that the STP model that has been developed will be useful in Canada, a two-year pilot test was launched in Fall 2007 to test the model’s effectiveness in changing the travel behaviour of primary school students (Hahn, 2007).

In summary, weather may be a barrier to AST, although its effect may not always be clear depending on how it is measured. As previously mentioned, flexible work hours may assist
parents/caregivers in not using cars to chauffeur their child to/from school. Further research on parent work policy and its influence on AST is warranted. In Canada, the effectiveness of the STP program is currently being tested to determine if it is helpful in promoting AST among primary school students.

4.9 Main Moderators

The main moderating factors in Panter et al.’s (2008) framework alter the strength and form of the association among the three domains of influence. For example, the age of a child may alter parental/caregiver perceptions of safety (i.e., the older the child, the less impact perceived safety has on the decision making process). The other main moderators in the model include the sex of the child and distance to destination, or in this case, to school.

4.9.1 Child age and sex

A child’s age and sex are related to AST participation. Several studies found AST to be most common in younger children (5-10 years old) compared to older youth (Bringolf-Isler et al., 2008; CDC, 2007; Duncan et al., 2008; Fulton et al., 2005; Pabayo & Gauvin, 2008; Robertson-Wilson et al., 2008). Researchers speculate that this may reflect the transition from elementary/intermediate schools to secondary school, because the former are likely to be closer to children’s homes since they generally outnumber high schools (CDC, 2007; Duncan et al., 2008; Fulton, 2005). However, three studies found no relationship between a child’s age and AST (Kerr et al., 2006; Timperio et al., 2006; Wen et al., 2008). McDonald (2008a) found that a one-year increase in a child’s age led to a 0.4% increase in the probability of walking and a 1.4% decline in the likelihood of the child being driven to school.

While some studies found no relationship between a child’s sex and AST (Kerr et al., 2006; Bringolf-Isler et al., 2008; Martin et al., 2007; Wen et al., 2008), other studies found girls to be low users of AST (Merom et al., 2006) and boys to actively commute to school more than girls (Fulton et al., 2005; Pabayo & Gauvin, 2008; Timperio et al., 2006). Reasons for these differences between the sexes have not been explored.
4.9.2 Distance to school

The relationship between distance to school and actively commuting to school has been the most researched topic in the AST literature. Distance is a consistent reported barrier to AST among parents (CDC, 2007; Heelan et al., 2005) and children (Nelson et al., 2008). Yarlagadda and Srinivasan (2008) found that the impact of distance on the choice of walking to school is stronger for travel to school than it is for travel home from school. Issues surrounding convenience and parents’ travel to work may provide an explanation for this phenomenon (see “Trip Chain” section). It is intuitive that a negative relationship exists between distance to school and AST (Merom et al., 2006; Schlossberg et al., 2006; Timperio et al., 2006) and a positive association exists between distance and non-active modes of transportation (Bringolf-Isler et al., 2008; Wen et al., 2008). Indeed, Nelson et al. found that the majority of walkers in their study lived within 1.5 miles and cyclists within 2.5 miles; those who perceived distance as a barrier to AST lived greater than 2.5 miles from school.

The AST rates of children living within a “reasonable walking distance” of their school are perhaps the most important rates in the literature, since these children theoretically have the option of using active modes of transportation. However, some studies show less than half of children who live within 1.6 kilometres (1 mile) of school actively travel to school (Heelen et al., 2005; Martin et al., 2007), while 63% of these trips made to and from school were made by car (Heelen et al., 2005). Therefore, the question for practitioners is how to get children who live within a reasonable walking distance actively traveling to school. However, an even bigger question remains: What is considered a “reasonable distance” to actively travel to/from school?

In the United States it has been suggested that 1.6 km (1 mile) is a fair distance for grade-school children (CDC, 2002). Falb, Kanny, Powell, and Giarrusso (2007) used a pedestrian catchment area with a 1- and 0.5-mile radius to estimate the proportion of students in Georgia who lived within a “reasonable and safe walking distance” from their neighbourhood school. According to the Toronto District School Board (TDSB) transportation policies, a 1.6 km (1 mile) distance is also appropriate, as school bus transportation is provided for students in junior kindergarten to grade 5 only if they live 1.6 km or more from the school (TDSB, 2000). However, it is not clear how 1.6 km was deemed a reasonable distance or how people’s perceptions of their distance to school influence their travel modes choices.
The issue of perceived versus objective measures of distance is important, as not all parents and children may perceive 1.6 km as a reasonable walking distance to/from school. For example, studies have shown that parents who report distance as a major barrier to their child actively commuting were objectively measured to live within 0.5 miles (Heelen et al., 2005) and 1.5 miles (Schlossberg et al., 2006) from school. For those children and parents who live close to school, how can perceived distance be combated as a barrier to AST? Regarding objective measures of distance from school, Timperio et al. (2006) make an important point that the use of tools such as Geographic Information Systems is not without limitations, as the measured shortest route between home and school may not be the route that would be taken by children and parents. This must be taken into consideration in future research or intervention studies using objective measures of routes to school.

In summary, many of the studies reviewed here found AST to be most common among younger children compared to older youth; however, other studies found no relationship or contradictory results. There is mixed evidence surrounding the likelihood of using active modes of transportation to/from school and a child’s sex. Distance is a consistently reported barrier to AST. Interventions aiming to increase AST need to target those children and families living within a “reasonable distance” from school. Although 1.6 km is considered a reasonable distance in the literature, perceptions of distance and what is “reasonable” and how this influences travel decisions have yet to be determined.

4.10 Other Influencing Factors

Because the Panter et al. (2008) framework is not specific to AST, it does not account for trip chain influences and the differences between AM and PM trips to and from school.

4.10.1 Trip chain

As previously mentioned, several studies show differences in children’s travel modes in the morning and afternoons. A greater number of children walk home in the afternoon than walk to school in the morning (Buliung et al., 2009; Merom et al., 2005; Saksvig et al., 2007; Schlossberg, 2005; Ziviani, Kopeshke, & Wadley, 2006). Furthermore, Merom et al. noted the lowest and highest prevalence of walking was on Monday morning and Friday afternoon, respectively. This could be explained by the time-pressures associated with the need
for family members to get to school/work on time in the mornings (Yarlagadda & Srinivasan, 2008) or the availability of parents to drive their children home in the afternoon since school ends in the middle of a typical workday (Schlossberg et al., 2005 & 2006). Findings from two studies point to the former. Parents report being more likely to drive their child to school if the child is running late (Bringolf-Isler et al., 2008); furthermore, if parents have the same way to go on their way to work, they are more likely to drive their children to school (Bringolf-Isler et al., 2008; Schlossberg et al., 2006). Based on these findings, driving children to school in the morning is a more convenient option during the “get ready and off to school” routine (Wen et al., 2008). Wen et al. recommend that walk to school programs acknowledge the link between a parents’ journey to work and their child’s mode of transportation to school.

Buliung et al. (2009) show that the total number of trips directly home from school in the GTA is lower than trips to school, which may represent an increase in children’s participation in extracurricular activities after school. There is a need for a better understanding of the trip chain to/from school/work and how it influences AST. What do parents/caregivers (and their children) do before and after school that may influence their travel mode choice? How does the trip to and from school fit into daily household travel patterns and activity scheduling (Buliung et al., 2009)? Parents in the current study begin to answer these questions.

5 Interventions

Seven studies addressed the subject of AST initiatives implemented within schools and communities. Three studies assessed interventions addressing children’s safety skills and education (Johnston, Mendoza, Rafton, Gonzalez-Walker, & Levinger., 2006; McKee, Mutrie, Crawford, & Green, 2007; Ziviani et al., 2006); two studies assessed modifications to the built environment (Boarnet, Anderson, Day, McMillan, & Alfonzo, 2005a; Boarnet et al. 2005b); one study conducted a comparative case study analysis of two elementary schools with AST initiatives (Fesperman, Evenson, Rodriguez, & Salvesen, 2008); and one study examined school and community characteristics associated with the level of implementation of walk to school programs in the United States (Ward et al., 2007).
6 Safety Skills and Education

Ziviani et al. (2006) used a group-comparison design to determine if children who attended a school with an active walk-to-school program were more likely to walk to and from school compared to children who attended a school without such a program. The program promoted “walk to school days” and implemented “walking school buses” (where walker volunteers meet students along set points on their route to school). No significant differences were found between the two schools in the mean number of children walking to or from school. Johnston et al. (2006) assessed a similar walking school bus program, except with the addition of pedestrian safety skill instruction. Using a pre-post test design, the researchers surveyed children’s mode of transportation and also directly observed pedestrian safety behaviors. McKee et al. (2007) also evaluated an intervention with an educational component. Teachers were given educational materials to incorporate school travel projects into the existing curriculum. In addition, children received a family resource kit consisting of community maps, distance/time charts, and goal setting activities. Pre- and post- computerized mapping surveys were used to measure distance traveled and mode of transportation. Both interventions assessed by Johnston et al. and McKee et al. were deemed successful, as both schools saw increases in children walking to school and decreases in children being driven to school. Johnston et al. also found some improvements in observed measures of street crossing safety. Based on these three studies, walking school buses alone may not be as effective in increasing AST as teaching children the skills necessary to enable them to commute to school safely. These mechanisms remain unclear, and the long-term effects (i.e., > 6 months) of these programs are not known. In addition, initiatives such as walking school buses may not be sustainable, given the difficulty in getting volunteers to help out with programs (Baslington, 2008).

6.1 Built Environment

Two studies (Boarnet et al., 2005a; 2005b) assessed the California Safe Routes to School Program, which provides funds for construction projects (e.g., sidewalk/crossing improvements and traffic control) near schools in an attempt to increase AST. Both studies sampled ten school sites before, and up to 18 months after, the completion of the projects. Boarnet et al. (2005a) asked parents of third to fifth graders whether their child used active modes of transportation; findings were assessed across two groups, those who pass and do not pass the construction
projects on their regular route to school. Boarnet et al. (2005b) also surveyed parents, but in addition, directly observed characteristics of vehicle, pedestrian, and bicycle safety traffic that were potentially related to perceived and actual traffic safety (e.g., vehicle speed). Both studies found some encouraging results. Of children who passed the project(s), 15.4% walked more compared to the 4.3% who walked more following the construction but did not pass any of the projects (Boarnet et al., 2005a). However, one should question what led to a change in travel behaviour among those who did not pass any of the construction projects en route to school. Half of the projects assessed by Boarnet et al. (2005b) were deemed successful. The number of students/parents walking increased after construction of each of the three sidewalk-gap closure projects. Observed reductions in vehicle speed and increased pedestrian counts were seen after the replacement of 4-way stop signs with traffic signals. However, crosswalk and crosswalk signal improvement projects yielded limited evidence of success (Boarnet et al, 2005b).

Although the California Routes to School program has shown some success, McMillan (2007) argues that it is “an example of a policy in practice ahead of the science” (p. 70). These initiatives assume a simple, direct relationship—change urban form; kids walk more to school (McMillan, 2005). However, based on the evidence presented in this review of the literature, a child’s trip to school is a complex behaviour; the structure and direction of relationships that exist in travel mode decision-making are still misunderstood and need to be explored. Indeed, Ahlport et al. (2008) conclude that the principal finding of their study is that “access to a supportive physical environment is a necessary but not sufficient condition for increasing active travel” (p. 20).

6.2 Case Study

Fesperman et al. (2008) interviewed representatives from two elementary schools with AST initiatives to investigate how to improve their chances of success. Participants from both schools considered the importance (and difficulty) of gaining buy-in from parents. A key stakeholder at one of the schools commented on one AST initiative:

If [parents are] not comfortable with their kid walking, they’re not going to let their kid walk or run. There has to be that, some kind of an outreach program I guess, to let the parents know it’s been thought through, it’s safe, it’s connected. (p. 4)
Indeed, the Fesperman et al. (2008) study highlights the importance of parents/caregivers in promoting AST, as walking and biking safely to and from school is “more of a parental decision” (p. 4).

### 6.3 Level of Implementation

In surveying “walk to school” program coordinators from schools and school districts across the United States, Ward et al. (2007) found that the use of such programs varied greatly. More than half (56%) of the schools sampled implemented only a Walk to School Day event (considered low implementation); 23% implemented a Walk to School Day event in addition to other activities (medium implementation); and only 21% of the schools made policy/environmental changes to support AST (high implementation). The nature of these AST initiatives were not described, and given that Ward et al. only assessed coordinators’ *perceived* impact of these initiatives on promoting AST, the relevance of program implementation is unclear.

In summary, walk to school programs (e.g., walking school bus) alone are not effective in increasing AST without an educational component to teach children the necessary skills to enable them to commute to school safely. The long term effectiveness and sustainability of such interventions are unknown. A direct relationship does not exist between urban form and AST. The structure and direction of relationships that exist in parental travel mode decision-making are still misunderstood and need to be explored further in order to better inform future AST interventions.

### 7 Qualitative Analyses

Five studies reviewed adopted a qualitative approach to studying AST; only one was conducted in Canada (Orsini & O’Brien, 2006). Three studies focused on parent and children’s perceptions of the barriers and facilitators (Ahlport et al., 2008; Greves et al., 2007; Orsini & O'Brien, 2006); one study explored policies that may influence AST (Eyler et al., 2007); and one study (Fesperman et al., 2008) investigated how different strategies might improve the chances of success for AST initiatives (see “Interventions” section). Focus group and interview data support some of the survey/quantitative findings in this research field, while adding depth to the literature by enabling parents, children, and other stakeholders to voice their own opinions and experiences of commuting to school. The qualitative analyses also provide novel insight into the
effects of sibling dynamics, weather, media influences, trip chain factors, and social norms around cycling to/from school.

7.1 AST Barriers

7.1.1 Household characteristics

Although the quantitative studies by Martin et al. (2007) and Timperio et al. (2006) found no relationship between the number of children in the household and AST, sibling barriers emerged in the Ahlport et al. (2008) study. For example, some children did not want their younger siblings tagging along on their way to school. For parents, walking to school was inconvenient if their children attended different schools.

7.1.2 Built environment

The influence of the built environment on AST emerged in three qualitative studies. A lack of safe walking routes/sidewalks was a significant AST barrier for these participants (Ahlport et al., 2008; Eyler et al., 2007; Greves et al., 2007). Blocked pathways and incomplete sidewalks were also a problem (Eyler et al., 2007).

7.1.3 Weather

The qualitative data in three of the studies provide some more insight into the “bad weather” barrier to AST. Participants in the Eyler et al. (2007) study that were from colder regions, such as Massachusetts, found homeowners’ failure to shovel the snow off their sidewalks and poor quality control of ploughing around intersections as major barriers to active commuting to school during the winter months. Another element of the natural environment that has not been discussed in any of the quantitative AST studies is the barrier of darkness in the morning at certain times of the year. Darkness can be a barrier to actively commuting to school due to safety concerns (Ahlport et al., 2008; Greves et al., 2007).

7.1.4 Perceptions of safety

As previously mentioned, parental concerns surrounding their children’s safety are significant barriers to AST. Such concerns include perceived threats of violence, child abduction, and presence of bullies (Ahlport et al., 2008; Greves et al., 2007). Parents also describe their anxiety surrounding their children actively commuting to school alone because then they do not know
whether or not their child arrived at school safely (Ahlport et al., 2008). Interestingly, in the Greves et al. study, most parents cited a media story of kidnapping or threatened kidnapping near their child’s school. No other studies have addressed the potential role of the media in AST behaviours. Similar to the Wen et al. (2008) study findings, parents’ perception of their child’s immature judgement (e.g., ability to follow traffic rules) was a barrier to AST. Traffic concerns included heavy volume and lack of crossing guards (Ahlport et al., 2008; Greves et al., 2007), speed (Eyler et al., 2007), and unorganized school bus/car drop off/pick-up zones (Ahlport et al., 2008). One parent commented, “Buses make it [the street in front of the school] incredibly dangerous . . . [and] the parents that come in and drop their kids off, they’ll go around other cars, they’ll pull out in front of cars. It’s absolutely nuts the way people behave” (Ahlport et al., 2008, p. 12).

7.1.5 Trip chain

Two of the qualitative studies provide some detailed insight into some of the trip chain factors influencing active commuting to school. Inflexible work schedules often prevented parents from walking with their children to school (Ahlport et al., 2008; Greves et al., 2007), and it is perceived to be more convenient to drive children to school when the parent is on his/her way to work (Ahlport et al., 2008). Participants in the Greves et al. study described mornings as a time of “rushing” to drop kids off at school or daycare on the way to work. Parents commented that during these chaotic mornings they would have to get up earlier and make the extra effort to get organized, including dressing for extreme weather and children having to deal with heavy backpacks (Ahlport et al., 2008). Walking after school is a suggested easier time for parents and caregivers to walk with their children (Greves et al., 2007). Nevertheless, walking to school is not seen as a necessity or the norm given the busing policies and availability of cars in the United States (Greves et al., 2007). In the only study focused on cycling as an active mode of transportation, cycling to school at the age of 16 or 17 was generally viewed as “odd,” “weird,” or “uncool” (Orsini & O'Brien, 2006).
7.2 AST Policies and Other Facilitators

7.2.1 School and work policies

Eyler et al. (2007) aimed to identify policies and relevant factors that may influence AST initiatives. Although these initiatives were not empirically evaluated, they may be helpful in addressing AST research gaps. To overcome the distance barrier, one school in their study had buses drop off children a quarter mile away from the school at specified “drop areas” so that they could partly participate in AST (Eyler et al., 2007). This challenges the suggestion made by Kerr et al. (2006) that nothing can be done to increase AST if distance to school is too far. Interestingly, several parents who actively traveled to school with their children commented that they had chosen their home for its proximity to school so that their children could be more physically active by walking and cycling to school (Ahlport et al., 2008). This is one qualitative study that touched upon the issue of self-selection bias and active commuting behaviours. Other school-based initiatives included having active commute route plans in every school, as well as incorporating pedestrian safety into physical education classes (Eyler et al., 2007). For parents, flexible work schedules were identified as a time management facilitator with the potential to increase AST (Ahlport et al., 2008).

7.2.2 Traffic controls

Careful design of school pick-up/drop off areas and parking lots are important factors that influence AST (Ahlport et al., 2008; Eyler et al., 2007). One parent commented, “At [our school] . . . if you don’t ride the bus and you’re picking your kids up in a car, the line is so long that we could be home by the time people get through that car circle” (Ahlport et al., 2008, p. 14). Although a long car drop-off/pick-up queue may encourage AST, Eyler et al. warn that while an expanded lot, for example, may mitigate traffic congestion and increase pedestrian safety, it may also, in turn, make driving children to school easier. In one school, children who walked to school were dismissed 10 minutes earlier than those who rode the bus, giving walkers a chance to leave the school grounds before the heightened school-dismissed traffic (Eyler et al., 2007). Other traffic regulator initiatives include speed signs, banning trucks from school roads, school personnel directing bus traffic, and “no-transport zones” surrounding the school where bus services are not provided for students (Eyler et al., 2007).
7.2.3 Safety concerns

Parents reported that an early notification system to alert them if their child did not show up at school would perhaps facilitate active commuting (Ahlport et al., 2008). Several schools included in the Eyler et al. (2007) study worked with local police departments to increase enforcement around the school during peak hours to ensure general and traffic safety.

In summary, the qualitative AST literature provides some novel insight into the “bad weather” barrier surrounding poor quality snow plowing and concerns about darkness in the early mornings at certain times of the year. Parents have voiced their concerns about bullies and their anxieties about allowing their children travel to school alone and not knowing whether they arrived safely. Media influences on perceptions of safety have not been explored in depth. Parents have also claimed that driving their children to school in the morning on the way to work is most convenient. Qualitative evidence also suggests that some parents do choose where to live, in part, so that their children can actively travel to/from school. Careful design of school pick-up/drop-off areas and parking lots may prove to influence AST behavior. The effectiveness of other school policy initiatives such as early dismissal times for active commuters and early notification systems for students when they do not arrive at school have yet to be assessed.

7.3 Sampling Framework and Methods – Qualitative Studies

Few qualitative research studies were found in the AST literature. A qualitative research approach in this field may be helpful in understanding the relationships among AST influencing factors and how these factor influence travel mode choice. In this section I will briefly analyze the sampling frameworks and methods of the qualitative studies in this review in order to identify knowledge gaps and future qualitative research directions (see Appendix E for summary chart).

The five qualitative studies explore various aspects of AST. The Orsini and O’Brien (2006) study is the only one that has explored the motivators of cycling to school. Six teenage cyclists from East and West Vancouver who were old enough and had the opportunity to drive to school talked with researchers about their cycling experiences. Further exploration into the motivators of cycling to school among students of different ages and in different locations across Canada may give researchers a better understanding of how to promote cycling as a mode of AST.
Both Eyler et al. (2007) and Fesperman et al. (2008) conducted comparative case studies in elementary schools in the United States. Both studies involved interviewing key stakeholders to explore policies and strategies that may encourage AST initiatives. Eyler et al.’s (2007) study was more extensive, covering nine elementary schools (across seven states) and interviewing 69 stakeholders, while Fesperman et al. interviewed 16 stakeholders from two school communities in North Carolina. The effect of policy on AST behaviour is an important and under-researched area of inquiry. Although speaking with community stakeholders is an important first step in understanding how policy may influence behaviour, we must be careful when making comparisons across different school communities. The unique needs of schools within diverse types of neighbourhoods (different physical environment and social factors) need to be taken into consideration when discussing policy changes.

Greves et al. (2007) and Ahlport et al. (2007) talked to people about the beliefs/barriers/facilitators of AST. A qualitative approach in this area is important, as novel ideas and experiences may emerge that have not been considered in the many survey-based studies. Greves et al. focused on the unique needs of immigrant families, using a purposive sample to obtain representation from various ethnic groups. Fifty-three participants were recruited from clinics, community centres and elementary school in Seattle to take part in focus group discussions.

Ahlport et al. (2007), on the other hand, used a very different sample. Children in grades four and five, and their parents, were recruited from four elementary schools in North Carolina. All participants had to live within 1.5 km of the school and were categorized as either active (students who regularly or occasionally walked/cycled to/from school) or non-active travellers to school. Separate focus groups were conducted for both active and non-active children and parents. There are several strengths of the Ahlport et al. study. First, it had a large sample size of 74, with an equal split of girls and boys. Second, the use of both parents and child focus groups allowed researchers to explore different perspectives. Third, since all participants lived within 1.5 miles of the school (the “reasonable distance” in this case), various barriers and facilitators of using AST could be explored (including perceived distance and the surrounding physical environment). Last, differences in perceptions between active and non-active travellers could be explored. Despite these strengths, the Ahlport et al. study has some drawbacks. The sample was 95% white participants, which the researchers note is not representative of the school district.
Therefore, some important ethno-cultural factors may have been missed in the analysis. Participants were recruited from four elementary schools, but it is unknown how these schools compared across variables such as the built environment and SES.

8 Limitations of the Literature

The trip to and from school is an opportunity for habitual physical activity among elementary school-aged children. Although many factors appear to influence travel mode choice, including built environment and individual child and parent factors, several gaps in the AST literature still remain.

8.1 Factors and Mechanisms

The study of the built environment and its impact on children’s transportation modes remains in its early stages (Lee et al., 2008a; Panter et al., 2008). Furthermore, a greater understanding of the interplay among environment, policy, and socio-cultural predictors of children’s active commuting to school is warranted (Lee, Tudor-Locke & Burns, 2008b), as the structure and direction of relationships that exist in parental travel mode decision-making are still misunderstood and need to be explored in order to better inform future AST interventions. Lee and Moudon (2004) argue that self-selection can weaken some of the research findings on the environmental determinants of physical activity, and therefore requires further research attention. The question of what is a “reasonable distance” to walk or cycle to school has yet to be determined. Additional personal factors such as convenience and cost must also be considered (Lee et al., 2008a).

8.2 Qualitative Inquiry

While further quantitative research is needed in the AST field, qualitative approaches may be especially useful in gaining a better understanding of perceptions and attitudes, as well as identifying new AST correlates. For example, Wen et al. (2008) acknowledge that “[T]he attitudinal statements included in the study survey may not represent the full range of attitudes that might influence children’s mode of travel to school” (p.7). Qualitative inquiry may help build AST theories, understand bi-directional mechanisms, and will be helpful in testing Panter’s recent framework.
8.3 Sampling Framework

Panter et al. (2008) suggest that “Research to date has often failed to consider the potentially complex role parents’ decision making play in controlling their children’s travel behaviours and how environmental characteristics interact with these processes” (p. 14). As reviewed, no qualitative studies to date have explored travel mode choice by sampling parents from different geographic areas. Both McMillan (2005) and Panter et al. highlight the importance of built environment factors such as urban form and individual factors such as socio-demographics in the travel mode choice decision-making process. Only when researchers sample populations who live in areas that differ in physical environment and SES will we begin to understand exactly how these factors influence AST.

As previously mentioned, potential reasons for some of the inconsistent results in the AST literature include different definitions of AST, as well as the specificity of factors depending on location. Although there are some AST influencing factors that can be generalized across locations, it is important to remember that cities can vary in terms of factors such as climate, design, and urban form. Therefore, research findings generated from one context such as Copenhagen (Cooper et al., 2006) or Seattle (Greves et al., 2007), for example, may or may not be relevant for understanding AST in Toronto. Therefore, there is a need for local research to inform local AST interventions. To the best of my knowledge, no studies to date have explored the parental decision-making process about AST within a Canadian context.

8.4 Atheoretical Nature

Handy et al. (2002) suggest that research design and analysis should be guided by a behavioural framework to advance the discussion on urban form, travel behaviour, and health. Indeed, Davison et al. (2008) argue that no clear theory-based rationale exists for the identification and examination of the factors influencing AST. None of the studies identified in this review used any theoretical constructs to explain travel behaviour. Davison et al. also claim that predictor variables have been poorly conceptualized in many studies, as significant associations have been found between AST and variables classified as “other.” This shows that important variables do exist that have yet to be identified; qualitative research techniques may help determine these variables for further analysis (Davison et al., 2008).
9 Theoretical Framework

For my thesis, constructs from the Theory of Reasoned Action (TRA; Fishbein, 1967)/Planned Behaviour (TPB; Ajzen, 1991) and Behavioural Economics (BE; Vuchinich & Tucker, 1988) will be used to address my research questions. The constructs outlined below have been used to design a theoretically informed interview guide (see Appendix F and “Interview Guide” section for theory applications) that was used to explore parents’ perceptions of the trip to and from school and travel mode choice processes.

9.1 Theory of Reasoned Action/Planned Behaviour

Together, the TRA/TPB (see Appendix G) posit that measures of attitude, social normative perceptions, and perceived control determine one’s behavioural intention which, in turn, affects behaviour. All other factors (e.g., demographic, environment) operate through these model constructs to influence the likelihood of performing a behaviour. The relative weights of attitude, social norms, and perceived control vary for different behaviours and populations (Montano & Kasprzyk, 2002).

Attitude is determined by a person’s beliefs about the outcomes or attributes of performing a behaviour (Ajzen, 1991). Therefore, if a person believes AST has many advantages and perceived positive outcomes, he or she is more likely to walk/cycle to/from school. Subjective norms are determined by one’s normative beliefs, or whether important people in one’s life approve or disapprove of a behaviour and how much a person wants to comply with those referents (Ajzen, 1991). For example, some parents/caregivers’ travel mode choices may be influenced by how other parents and their children get to and from school. Perceived control is determined by perceptions of the presence or absence of facilitators and barriers to performing the behaviour (Ajzen, 1991). For example, if a parent believes that inclement weather is the perceived biggest barrier to walking to/from school and a parent/guardian believes there is no way to mitigate this barrier, then he or she is less likely to use active modes of transportation in such weather.

9.2 Behavioural Economics

Behavioural Economics provides an alternative theoretical framework for the study of how people make decisions (Epstein, 1998; see Appendix H). Raynor, Coleman, and Epstein (1998)
suggest that if we conceptualize activity patterns as a series of choices between being physically active (AST) and sedentary (NON AST), BE can help us to understand the factors that influence how we allocate our time. Unlike rational choice theories, BE posits that decision-making is not just about weighing the pros and cons of each alternative, but is a response to the circumstances of a given situation. It emphasizes that physical activity behaviour (e.g., walking to/from school) “targeted for change should be considered in the context of the alternative behaviours that are concurrently available and their differential reinforcing value” (Epstein et al., 1995, p. 114). A BE approach demonstrates the role of the environment, in part, on the choice of being sedentary or active (Epstein & Roemmich, 2001), and is therefore an appropriate framework in the context of this research study for examining travel behaviours to and from school.

Epstein (1998) outlines four general principles of BE. First, the choice and reinforcing value of an activity depends on what alternatives are available. For example, the main reason a parent/guardian may not drive his or her child to/from school may be due to a lack of access to a vehicle. In this case, active modes of transportation may be the only feasible option. Second, the choice of an alternative depends on the behavioural cost, or work needed to access an activity. One way to reduce sedentary behaviours would be to increase the cost of being sedentary and increase the accessibility (or convenience) of active alternatives. Within a travel mode choice context, for example, restricted parking and highly connected walking/cycling paths within school neighbourhoods may increase AST participation. Third, choices are based on the reinforcing value (or reward) of engaging in a behaviour. For example, some people may enjoy driving to school rather than walking, or they may continue to drive to school because it allows them to get their children to school on time. Fourth, choices depend on the delay (or immediacy) between choosing and receiving the alternative or reinforcer. “Individuals typically assign less importance to outcomes in the distant future than those in the present. For this reason, individuals may assign little importance to future health consequences when deciding how much time to spend in recreational exercise. . . ” (p. 119). Within this research context, immediacy will be conceptualized as the time or effort associated with behavioural cost and the reinforcing value of travel mode choices (e.g., what choice gets me where I want the fastest).

This study addresses the research gaps outlined above by qualitatively exploring how parents view the trip to/from school and make travel mode choices. The study sampling framework allowed for comparison of school travel experiences and mode decision-making processes
among parents of different SES backgrounds, and whose children attend schools located in different areas across Toronto. Furthermore, the approach to data collection was theoretically informed. The methodology of this study is discussed in the next chapter.
Chapter 3
Methodology

1 Study Purpose

The purpose of this qualitative investigation was to examine parents’ perspectives of the trip to and from school and travel mode choice. These decision-making processes were explored among parents who differed with respect to SES, and whose children attended schools located in different areas (i.e., urban vs. inner-suburban) across Toronto.

2 Design – A Qualitative Approach

Few studies in the AST literature have taken a qualitative research approach to understanding travel mode choice to/from school. Qualitative studies are designed to explore and discover using inductive logic (Patton, 1990) in order to learn about a phenomenon of interest where people are the participants (Maykut & Morehouse, 1994). We conduct qualitative research when we need a complex and detailed understanding of the issue (Creswell, 2007). This inquiry was qualitative to allow for an in-depth exploration of how parents view the trip to and from school and the factors influencing their travel mode choices.

There are many characteristics of qualitative research to consider (Creswell, 2007; Lincoln & Guba, 1985; Patton, 1990). I will outline four characteristics that are relevant to qualitative study design. First, qualitative investigations study real world situations by directly talking to people and/or observing them within their context (Creswell, 2007; Patton, 1990). Second, qualitative researchers try to develop a holistic account, or a complex picture of the problem they are studying by identifying the many factors involved in a situation (Creswell, 2007). Third, qualitative research is interpretive, as the researcher is the key instrument through which data are collected and analyzed (Creswell, 2007). Because researchers’ interpretations cannot be separated from their own background, they include personal experiences and insight as part of the data (Patton, 1990). Finally, qualitative study designs are emergent, open to adaptation as the research process unfolds (Creswell, 2007; Patton, 1990). While there was an element of deductive reasoning in the current study, as a priori theoretical constructs of the TRA/TPB and BE frameworks informed many of themes, the constant comparative method allowed for alternative constructs to emerge.
3 Philosophical Assumptions and Paradigm

A paradigm is a worldview, or a general perspective on how to break down the complexity of the world (Patton, 1990). As researchers, a paradigm guides our actions (Lincoln & Guba, 1985) by telling us what is important, legitimate, and reasonable (Patton, 1990). The current study employed qualitative methods within a social constructivist paradigm (Glaser, 1978). Social constructivist researchers seek to understand the world in which they live. The goal of their research is to rely on participants’ views of the issue of inquiry; these subjective meanings are believed to be socially and historically influenced (Creswell, 2007). In other words, people’s realities are believed to be “formed through interaction with others (hence, social constructivism) and through historical and cultural norms that operate in individual’s lives” (Creswell, 2007, p. 19). Therefore, constructivist researchers focus on the specific contexts in which people live, work, and play in order to interpret the meanings others have about the world (Creswell, 2007). The relevance of this paradigm in studying parents’ and caregivers’ experiences of travel to and from school is that it allowed myself (as the researcher) to explore social, organizational and built environment factors that may impact travel mode choice.

Complementing the social constructivist paradigm, this research also adopted an ecological perspective, which focuses on “the nature of people’s transactions with their physical and socio-cultural surroundings” (Stokols, 1992, p. 7). McLeroy, Bibeau, Steckler, and Glanz (1988) proposed five levels of influence in their ecological model of health behaviours: intrapersonal factors (e.g., knowledge, attitude, skills), interpersonal processes and primary groups (e.g., family, work and friendship networks), institutional factors (e.g., social institutions with organizational characteristics and formal/informal rules and regulations), community factors (e.g., relationships among organizations, informal networks), and public policy (e.g., local, state, and national laws and policies). This study explored influencing factors on travel mode choice at all of these levels.

4 Research Setting and School Sample

The current study is part of a large scale, multi-disciplinary, and mixed methods research project examining the built environment and active transport (BEAT Project). BEAT is comprised of a series of related studies, the first of which involves “Qualitatively Exploring Ways of Seeing Active School Transport” from the perspectives of children and parents/caregivers living in the
Greater Toronto Area (GTA). Findings from Study 1 will also inform the development of a questionnaire that will be given to a larger number of children and parents in Study 2. The third and final study will assess the prevalence and demographics of children using active and non-active modes of transportation to and from school across Ontario. This thesis is a component of Study 1 with a focus on parental perceptions of the trip to/from school and travel mode choice.

A sample of four elementary schools in the GTA was recruited for Study 1 to capture diversity with respect to built environment characteristics and SES. The rationale for sampling from heterogeneously designed environments is that the structure of the transportation system (e.g., road layout), and geographical organization of buildings is a determinant of pedestrian behaviour. One way to develop more knowledge about the influence of the built environment on children’s AST behaviours is to compare experiences and perceptions of people within these different areas (Holt, Spence, Sehn, & Cutumisu, 2008). To do this, elementary schools within Toronto’s inner suburbs (e.g., typically characterized as having curvilinear, looping streets, with arguably less pedestrian connectivity and walkability) that border the city centre, and schools from within the traditional downtown urban core (i.e., characterized by gridded streets, with arguably higher levels of pedestrian connectivity and walkability) were chosen. Moreover, given the consistent finding that AST is related to household income (McDonald, 2008a; McMillan, 2007; Pabayo & Gauvin, 2008), school selection also involved an examination of school location against median household income (from the 2001 Canadian Census) in and around the immediate vicinity of each school.

Information letters outlining the BEAT Project were sent to principals of the following elementary schools within the Toronto District School Board (TDSB) based on neighbourhood design and SES: School D (grid streets – low SES); School B (grid streets – high SES); School T (looping streets – low SES); and School R (looping streets – high SES).

Parents and guardians of students from each school were recruited as study participants (see “Sampling and Recruitment” section, p. 49); these sites became case studies. Gerring (2004) defines a case study as “an intensive study of a single unit for the purpose of understanding a larger class of (similar) units” (p. 342). A cross-case comparison was conducted across the four schools in order to look at the similarities and differences of participants’ experiences and travel decision-making processes between sites (see “School Site Visits” section, p. 50). The focus of
this research was on elementary schools because the neighbourhoods they serve may support AST for a greater proportion of the school population (i.e., there are a greater number of elementary schools compared to middle and high schools) and because of the more prominent role parents and caregivers play in transportation decisions for elementary school-aged children (McMillan, 2007).

5 Sampling and Recruitment

The goal of qualitative research is not to build a random sample, but to seek participants who represent a range of experiences of the phenomenon of interest. This approach does not require the construction of a representative sample for the purpose of drawing inferences about the population of interest. (Maykut & Morehouse, 1994). Accordingly, a purposive sample using a maximum variation sampling technique was used in the current study to recruit participants. This sampling technique aims to capture information-rich cases that represent the greatest differences in a certain phenomenon (Lincoln & Guba, 1985; Patton, 1990). It provides some variability in the sample while recognizing that the goal of qualitative inquiry is not generalizability (Maykut & Morehouse, 1994), since different and multiple realities exist (Lincoln & Guba, 1985).

Principals from the selected elementary schools identified a staff member to act as a project facilitator. This person assisted with participant recruitment, distribution of study information letters, and interview scheduling. Poster advertising within schools (see Appendix I) also informed students, parents/caregivers and staff about the study.

Participants from the four selected schools were selected based on the following inclusion criteria: 1) had an interest in participating in the research and a willingness to share information; 2) was a parent/caregiver of a grade four, five or six student who accompanied him/her to and from school by either active (AST) or non-active (NON AST) modes of transportation (as defined for the current study); 3) lived within a 1.6 km radius of the school (in accordance with TDSB bussing policies) but not closer than 500 metres from the school; 4) was available either before, during, or immediately after school hours for an interview; 5) was able to communicate in English. However, during the recruitment process, criterion #3 and #5 did change. Some teacher facilitators found it difficult to find participants who used non-active modes of transportation to get to/from school and lived within 1.6km from the school. The low SES
schools had a high population of students/parents whose first language was not English; interpreters (1 Cantonese and 2 Vietnamese) were used for three of the interviews in this study.

For Study 1, it was anticipated that 5 child-parent dyads who walk/bike or use other active modes of transport to and from school at least three times a week (active transporters as defined for Study 1 and the current study), and 5 child-parent dyads who use non-active transport (e.g., drive/taxi/transit/school bus) would be recruited. Only the sample of parents from Study 1 would be interviewed for this thesis. However, only eight parents were recruited from School T, and one guardian from School D did not complete the interview. Therefore, data were collected from a total of 37 parents—seventeen who used AST and 20 who use NON AST (5 X 4 schools). This sample size allowed for comparison of AST and NON AST parents within and between schools, while maintaining the manageability of the data collection procedures.

All of the participants in this study (with the exception of one guardian who did not take part in an interview) were parents; more mothers (n=30) than fathers (n=7) took part in the study. The main modes of transportation to/from school were either walking or driving. Therefore, AST and NON AST will refer to walking and driving, respectively, when referring to the study results in the following chapters. At school D, most of the parents reported their place of birth as Canada or Vietnam; at School T it was Jamaica and Guyana; at both School B and R, most parents were born in Canada (see Appendix J for a full summary of participant demographic information).

6 Data Collection Procedures

Traditional qualitative interviews were enhanced through the use of photo voice (Wang & Burris, 1997), a methodology that enables people to “reflect on photographs that mirror the everyday social and political realities that influence their lives (Wang, Wu, Zhan, & Caravano, 1998 p. 80). Three separate but overlapping research procedures took place (see Appendix K).

6.1 School Site Visits

First, preliminary school visits were conducted to profile each sampled school and the school’s immediate environment. Photographs of the school grounds and surrounding neighbourhood were taken, with an emphasis on physical features such as pedestrian facilities and conflicts, presence of crosswalks and crossing guards, maintenance, path size, buffer, accessibility, and
aesthetics (Dannenberg, Cramer, & Gibson, 2005). See Appendix L for a narrative of each school’s characteristics. Furthermore, the teacher facilitator at each school completed a questionnaire providing background information and specific characteristics (including existing AST programs/policies) about the individual schools. A summary of these results can be found in Appendix M.

6.2 First Meeting with Participants

Second, when all of the research participants were identified at each site, an information meeting at the school was scheduled by the teacher facilitator. At this time, all consent forms were discussed and signed, and participant demographic information (see Appendix N) was collected. Parents also scheduled a time to come to the school for their interview.

Both AST and NON AST parents (with the exception of those who drove their child to/from school) were given the use of an easy-to-use digital camera (labelled with a code). Parents who drove were not asked to take photographs on their way to/from school for safety reasons. Eighteen parents (17 AST and 1 NON-AST traveler who used public transportation) were given the use of a digital camera and instructed to take photographs of places, objects, or things that they notice, like, or dislike on their journey to school (8 photographs) and from school (8 photographs). Participants were asked to try and not take photographs of people. Parents were given instructions on how to use the cameras, which were programmed to hold a total of 16 photographs. I asked that all parents, if possible, take the photographs on the way home from school the afternoon before their scheduled interview, and take the photographs to school the morning of their interview. This way, it would be easier for them to remember where and why they took the photographs.

6.3 Second Meeting with Participants

At the scheduled interview date and time, I met with participants at the schools to collect the cameras and to conduct one-on-one interviews (including photo voice session). All interviews were recorded (with one exception at school D) and lasted between 30 and 60 minutes. All participants had the opportunity to ask any questions upon completion of the interview.
6.3.1 Interviews

“Qualitative interviewing begins with the assumption that the perspective of others is meaningful, knowable, and able to be made explicit” (Patton, 1990, p. 278). The purpose of interviewing is to allow researchers to enter into the other person’s perspective (Patton, 1990) and to create knowledge through the interaction between the interviewer and the interviewee (Hall & Hall, 2004). In the current study, a semi-structured interview schedule was used to enable participants to provide their own account of the trip to/from school and the factors influencing travel mode choice. Probes were used to deepen or expand on a point (Price, 2002).

6.3.2 Interview guide

Theoretical constructs from the Theory of Reasoned Action (TRA; Fishbein, 1967)/Planned Behaviour (TPB; Ajzen, 1991) and Behavioural Economics (BE; Vuchinich & Tucker, 1988) were used to design the interview guide (see Appendix F) to explore decision-making processes around travel choices. In accordance with the TRA/TPB, the “Attitudes,” “Norms,” and “Control + Barriers & Facilitators” sections of the interview guide explored the advantages and disadvantages of AST and NON AST, the culture surrounding school transportation, and the ease/difficulty in making travel mode decisions, respectively.

BE’s constructs of reinforcing value were explored in the “Factors” section of the interview guide addressing preferred mode of transportation. The concept of behavioural cost and travel mode choice were raised throughout the pilot interview (see “Pilot interview” section below), as driving to school for the interviewee was not a suitable method of transportation due to cost. In this case, cost was conceptualized as financial cost for parking and time cost due to heavy traffic. The concept of reinforcer immediacy (as it relates to behavioural cost) was also explored in the “Attitudes” section of the interview guide addressing the advantages and disadvantages of AST and NON AST modes. Finally, the available alternatives construct of BE was addressed in the “Control + Barriers & Facilitators” section of the interview guide.

6.3.3 Pilot interview

One pilot interview was undertaken in June 2008 to test the interview process and to modify it prior to data collection if necessary. I interviewed a mother who actively travels to and from school with her children on a regular basis. She suggested that questions in the interview guide
pertaining to attitudes toward active and non-active modes of transportation should be asked in a different order depending on the interviewee. For example, asking a parent/guardian who drives his or her child to/from school about the advantages of AST before asking about the advantages of NON AST modes may lead the interviewee to perceive the research emphasis to be on promoting AST. This may cause participants to get defensive if their views are not the same as their perceived views of the researcher. Subsequently, the interview guide was formatted to explore and probe travel mode choice (without an emphasis on AST per se) and the experiences of traveling to and from school. Although the ultimate goal of this project was to contribute to the literature in hopes of increasing the number of children who are physically active through increases in AST, the interview questions with parents were aimed at exploring decisions around travel choices. In the pilot interview, I found that talking about the photographs elicited a more detailed account of the trip to/from school and prompted further discussion of specific factors influencing travel mode choice.

6.3.4 Photo voice

Photo-elicitation is a visual research method whereby photographs are used to evoke comments, memories and discussion during a semi-structured interview (Banks, 2001). Photo voice takes this concept one step further in that the photographs used are taken by the participants themselves (Wang & Burris, 1997). Photo voice is a research methodology traditionally used in participatory-action research and is based on the understanding that people are experts in their own lives (Wang & Burris, 1997). The method is based on Freire’s idea that one way of enabling people to think critically and discuss the everyday social influences in their lives is through the visual image (Wang & Burris 1997). Photo voice provides people with cameras and gives them the opportunity to record and represent their everyday realities (Wang, Morrel-Samuela, Hutchison, Bell, & Pestronk, 2004). The main advantage of the photo voice methodology is that it is highly flexible and it can be adapted to specific research goals (Wang & Burris, 1997).

In the current study, parents’ experiences of the trip to and from school were documented through photographs. Hume, Salmon, and Ball (2005) used a similar methodology exploring children’s perceptions of their environments using photography. Children in their study were provided with disposable cameras and instructed to take photographs of places and things in their
home and neighbourhood environment that were important to them. They later provided a brief written explanation of each photograph.

The use of visual research methodologies can be approached in different ways. There are those who believe that visual images are inherently interpretive, meaning that the photograph (in this case) itself is symbolic and can be coded and quantified (Emmison, 2004). However, Harrison (2002) argues that use of a visual image can be used as a means to an end – the generation of verbal data for analysis. In this study, I adopted the latter approach, as the photographs became prompts for discussion in order to elicit a more detailed account of the trip to/from school and the factors influencing travel mode choice. Furthermore, photograph data were collected from only half of the sampled participants, thereby limiting analysis possibilities. Parents brought the digital cameras to the interview, and their photographs were uploaded on laptop computers. After the initial segment of the interview, I asked parents to describe their photographs and the reasons for each image.

7 Data Analysis

All interviews were transcribed verbatim, except for minor changes required to maintain anonymity. I transcribed the interviews, as Braun and Clarke (2006) suggest that this informs the early stages of analysis through developing a thorough understanding of the data. Data were imported into NVivo-8 software to organize participant photographs and interview transcripts. During the analysis process, however, I read through the data and highlighted and/or cut and pasted relevant information using Microsoft Word.

All data were analyzed based on thematic analysis, a method for identifying, analyzing, and reporting themes within data (Braun & Clarke, 2006). Both interview and photo voice descriptions were analyzed together. The flexible nature of thematic analysis allows the researcher to determine themes in a number of ways. In this study, all data were coded using Glaser and Strauss’ (1967) constant comparative method, where inductive category coding is combined with a simultaneous comparison of all the obtained units of meaning. As each new meaning unit is selected for analysis, it is compared to all other meaning units and subsequently grouped with similar meaning units. New categories are formed if there are no similar units of meaning. From these meaning units and categories, main themes and new relationships between categories were explored to better understand travel mode choice. While there was an element of
deductive reasoning, as a priori theoretical constructs of the TRA/TPB and BE frameworks informed many of these themes, the constant comparative method allowed for alternative constructs to emerge. Below is an excerpt from one of the transcripts and an example of my analysis process.

It’s really safety concerns. I think he [my son] knows how to cross the street. He certainly knows his way home and he knows people along the way in stores and that sort of thing, it’s just, you know, there’s a needle exchange along the way, there’s bars, things that we’ve never had any problem with, if he were walking alone, I’m not sure how he would deal with it if he did have a problem. We’d probably end up getting him a cell phone [if we let him walk alone] even though we don’t want to. (DP9NON)

While reading through the transcripts line by line, I highlighted words or phrases (meaning units) that were relevant to my research questions. The meaning units in this excerpt are italicized. I then categorized these meaning units and looked for relationships between the categories to create themes. First, “cross the street,” “dealing with problems” and “needle exchange” were categorized as types of safety concerns; these concerns are related because they are types of safety concerns associated with children’s independent travel. Second, “knows people along the way” related to social capital, and “cell phone” is a way of maintaining communication with a child; these categories are related in that they are ways of overcoming concerns associated with independent travel. After more thought and discussion, I realized that these two themes (concerns associated with and ways of overcoming concerns associated with independent travel) were not related to travel mode choice per se, but rather, whether or not parents chose to escort their children to/from school. My analysis was an ongoing and dynamic process, as I went back and forth between what participants said (meaning units), how these meaning units related to one other, and what it all meant for understanding school travel decision-making.

8 Provisions of Trustworthiness

According to Lincoln and Guba (1985), the term “trustworthiness” refers to the quality of a qualitative research study, or how a researcher can judge that the findings are worth paying attention to. Qualitative research has special criteria for trustworthiness since conventional standards such as internal and external validity, reliability and objectivity are not consistent with the themes of qualitative inquiry. Lincoln and Guba (1985) use the terms credibility, transferability, dependability and confirmability as equivalents to these conventional standards,
respectively. It is by the credibility and transferability criteria that I want my research to be judged.

8.1 Credibility

Credibility of research findings refer to their “truth value” (Lincoln & Guba, 1985) or accurate representation of participants’ perspectives (Mackey, 2007). This study utilized two strategies to increase its credibility. First, the use of a reflexive journal (see “Reflexivity” section, p. 56) and my substantial engagement in data collection and analysis helped assist me in clarifying my biases. Reflecting on the research process and writing down my thoughts, struggles and uncertainties enabled me to question my analysis of what participants were telling me. Second, peer debriefing was employed. During the analysis and writing process I had regular discussions with my supervisor and members of my thesis committee. Talking about the results of the study helped me to clarify my thoughts, restructure ideas, challenge myself to think more critically, look for inconsistencies, and take a step back and look at the “bigger picture.”

8.2 Transferability

Transferability refers to the applicability of study findings to other contexts or settings (Mackey, 2007). For this study, a thorough description of the research context, participants, and findings will allow readers to evaluate the transferability of the research to the existing AST literature and their own locations.

9 Reflexivity

The behaviour of a qualitative researcher will always affect participant responses, influencing the direction of the research findings (Finlay, 2002). Reflexivity is a tool to assist researchers in analyzing how subjective and inter-subjective elements influence their research (Finlay, 2002). For social constructionists, reflexivity is necessary to examine how the researcher and the participants influence each other and the research itself (Finlay, 2002). Finlay defines reflexivity as a thoughtful, conscious self-awareness. . . [that] encompasses continual evaluation of subjective responses, inter-subjective dynamics, and the research process itself” (p.532 ).

Throughout this study, I kept a reflexive journal to record my personal insights, ideas, questions, concerns, and any decisions made throughout the research process. As suggested by Finlay
(2002), even at the pre-research stage I closely examined my motivation and assumptions in the research topic in order to identify potential biases. For example, during the pilot interview I found myself strongly identifying with the participant, perhaps because we lived in the same area. I could relate to her photographs and her similar experiences in walking and cycling around the neighbourhood. In subsequent interviews with participants, I was wary of assuming that most people have had similar experiences to mine. Furthermore, I kept in mind that not all participants are as conscious of their surroundings and articulate in their descriptions of the factors influencing their travel mode choice as the participant in the pilot interview.

10 Ethical Considerations

Ethical approval for Study 1 of the BEAT Project was granted by both the Ethics Committee at the University of Toronto and the Toronto District School Board. Before any data were collected, informed consent was obtained through the distribution of an information letter (see Appendix O) and consent form (see Appendix P). Standard principles of protection, such as the right to refuse, withdraw, or stop the interview were implemented. To ensure confidentiality, no information obtained during the course of the study was discussed or shared with anyone outside of the research team. Furthermore, schools and participants were identified using codes. All research notes, audio-tapes, transcripts and photographs were stored in a secure place. Finally, school protocols for disclosure of sensitive issues were not implemented, as the research methods did not, to my knowledge, induce any unanticipated psychological stress or discomfort for the participants.

11 Data Representation

Study findings are presented as main themes and subthemes across the four case studies. Participant quotes are used to illustrate parental perspectives of the trip to/from school and how parents make travel mode choices. I chose quotes that best illustrated the theme/category; each section begins with a quote that summarizes the main idea being conveyed in a given section. All parents in the study are represented in the result section. Although the photos taken by participants (260 in total) in this study were not analyzed independent of their descriptions, they did illuminate participants’ narratives. For this reason, I embedded photographs in the results section that I thought best highlighted certain participant quotes. Some additional participant photographs can be found in Appendix Q.
Participants in this study were asked to discuss their perspectives on travel mode choice, the journey to/from school, and concerns about allowing their children to travel independently. Parents’ attitudes toward active and non-active modes of transportation were also discussed. Findings associated with factors influencing mode choice will be presented using the behavioural cost and reinforcing value constructs from Behavioural Economics.

Please note that active modes of transportation (AST) refers to walking to/from school, as other actives modes such as cycling and scootering were not often mentioned by parents. Unless otherwise specified, non active modes (NON AST) refer to driving to/from school. Also, participant quotes are identified using codes. The first letter of the code refers to the school (School T, B, R or D); the second letter of the code is “P” to identify the participant as a parent; the third part of the code is the participant number (1-10); the final part of the code characterizes participants as an AST or NON AST traveler. For example, code TP1AST refers to the first parent from School T who walked to/from school.
Chapter 4
Results

A content thematic analysis was conducted using the constant comparative method. Some of the data were categorized based on the constructs used to develop the interview guide, while other themes emerged outside of these theories. The first two sections of this chapter address parents’ perspectives on school travel, including their attitudes toward AST and NON AST. The factors influencing travel mode choice are presented in the last section of this chapter using the behavioural cost and reinforcing value constructs from Behavioural Economics.

12 Parental Perspectives on School Travel

Parents described their role in travel mode decision-making, as well as the habitual nature of getting to/from school. Parents also talked about changes in school travel from the days they went to school. Concerns about allowing their children to travel to/from school independently (without adult supervision) and ways of overcoming these fears were also discussed.

12.1 Travel Mode Choice

Within the context of this study, travel mode choice refers to how decisions are made surrounding children’s travel to and from school. Parents in the current study explained that they were the ones responsible for making these choices, and that over time school transport became habitual.

“I decide” (RP3AST). When it comes to deciding how to get to and from school, parents are the ultimate decision makers: “My husband and I [decide] . . . because we’re the parents and we’re looking after them so we have to find the best ways to send them to school” (RP8NON). Rather than engaging in any type of negotiation with the child regarding travel mode, parents did not offer any alternatives: “[T]hey’ve never really had a choice, you know, we’ve always walked and that’s the way it is” (BP5AST). According to these parents, travel decisions are a parental responsibility, with little to no input from their children.

“Just do it” (RP4AST). Although participants described many factors that influenced their travel mode choices, they discussed school travel as a habitual behaviour, a “routine” (TP7NON) involving “no real thought” (BP9NON) because it was something they did on a daily basis: “I
suppose it’s habitual because obviously it’s what we do all the time” (RP2AST). One participant from School R described the trip to school as being as routine as waking up in the morning:

No [I don’t think about it], if anything I don’t even have that in my mind; it’s like okay, we’ve got to go to school the same way – you have to stand up to wake up is the same way we have to take the car to school. (RP8NON)

Although these parents may have taken certain factors into consideration when they first started making mode choices for their children’s trip to/from school, they described school travel as a routine that no longer required conscious decision-making processes.

### 12.2 Trip To/From School

I asked parents about their own journeys to/from school. In contrast to school travel today, these parents remember walking long distances to school, without their parents, at a very young age.

“When I was a kid . . .” (DP9NON). Parents discussed their perceptions of changes in walking patterns over time. Both AST and NON AST parents explained that when they were kids “everybody just walked” (BP9NON) and “that was the norm” (TP9NON). One AST participant commented, “[N]ever in my life would I have thought of calling my parents to have them come and pick me up, ever, ever, ever” (BP4AST). Another AST parent talked about travelling with friends or alone at a very young age:

I had three sisters, two older and one younger and we just walked to school by ourselves. I don’t have memories of my mom walking us to school . . . but my husband, he can remember being, ‘cause he’s the eldest, he can remember being in kindergarten and walking to school by himself. (BP1AST)

Not only did children walk, but parents explained that they travelled longer distances compared to what kids travel today. While one parent from School T said she walked “two and a half miles to school and two and a half miles back home” (TP10NON), another mother from School T walked “eight miles to six miles and I was only five, six years old” (TP8NON). During the interviews I did not ask parents to thoroughly discuss their family circumstances and the type of built environment they grew up in; this would have been helpful in learning more about parents’ journeys to/from school.

“It just doesn’t happen anymore” (RP7NON). Although parents describe their experiences actively traveling to and from school when they were children, this situation was described as “a
totally different world” (RP9NON) compared to today, as “there has been a tremendous change in people’s attitude towards walking.” Although their reasons for these changes in travel patterns were not necessarily representative of their own personal perspectives (i.e., they did not explain their own behaviours and attitudes), parents did provide some interesting reasons as to why they think walking to/from school is no longer the norm.

According to these parents, walking to/from school when they were children was the norm, but they did not perceive this to be the case today. Parents believed that general lifestyle change and the “pace of life that people want to lead” (RP5AST) has been a contributing factor in changing walking patterns over time. While “everybody’s lives are busier” (BP4AST) and “nobody ever has time anymore” (TP6NON), one parent explained that “there’s too many people with too many [things to do] and it’s making society lazy” (BP6NON). Laziness, in this case, refers to taking the car. Parents explained that taking the car is now the way to overcome today’s “rush, rush, rush” (TP6NON):

I think it’s just the convenience factor for a lot of people, it’s easier to get in the car and go and you’re there in five or ten minutes . . . people don’t have the time anymore . . . like, if I’m working then we use the car, and so if people have to walk their kids to school and then walk back and then get in the car and drive to work, it’s more of a hassle than just driving them. (RP3AST)

While parents remember walking long distances to school at a young age, they blame today’s car-dependent society on busy family schedules.

Parents also spoke about the role of the media in heightening people’s general perception of safety concerns. These changes in perception, parents explained, may have contributed to the changes in walking patterns to/from school since they were kids:

Society has changed. We’re scared of traffic, and you know what, we’re scared about predators. It’s in the media, it does happen. I’m sure it happened when we were kids, we just didn’t read about it, now, it’s in the media, it’s the sensationalism. (RP7NON)

I think a lot of parents are much more cognizant of dangers that are out there in society because it’s much more publicized, much more televised, much more aware, top of mind with parents. (BP5AST)
These responses suggest that the media do influence parents’ perceptions of safety in their neighbourhood; future research is needed to explore the role of the media in children’s independent travel to/from school.

12.3 Concerns about Independent Travel

Parents were very responsive to questions about independent travel (allowing their children to travel to/from school without adult supervision). They voiced concerns surrounding road/traffic safety, stranger danger and fears that their children did not yet have the skill level to safely travel to/from school on their own. Parents also discussed ways of helping overcome these fears.

“[C]ars and crossing the street” (TP8NON). Concerns about road safety were particularly expressed by NON AST parents from schools R and T (situated in neighborhoods characterized by looping streets) creating hesitation in letting children travel alone (without adult supervision) to/from school. “Crossing a major intersection” (RP7NON) was a common concern for these parents, as one mother from School T explained:

I know she [my daughter] would look [both ways when crossing the street], yes, but I don’t know, sometimes in a split of a second something can happen. Let’s say I allow her to walk with a group of friends when she’s twelve . . . and they didn’t see some vehicle coming . . . and something happens. It’s unpredictable for that. (TP7NON)

Another mother from School T took this photograph because she was concerned about children crossing this major street if they walked to/from school on their own:

So it just shows rush hour, this is what it’s like. Some kids walk home from school at that time of the day, so I’d like to show how it is when they’re walking by themselves or whatnot, how bad it can be. (TP2AST)
“She might meet a stranger on the way to school” (BP1AST). Both AST and NON AST parents voiced concerns about not knowing “who they’ll sort of meet along the way” (BP7NON). There was the fear of “some freak person,” (BP4AST) or “some wacko grabbing her and putting her in the back of the truck” (BP6NON). One AST parent explained, “I don’t think somebody would come up to them and talk to them and maybe take them away, but there’s always that fear I guess” (RP3AST).

“He’s not at that stage yet” (TP10NON). Both AST and NON AST parents expressed that they were uncomfortable with allowing their children to travel alone to/from school because they were “still too young” (BP7NON), “not ready” (BP10NON), or not “responsible enough to cross the street” (TP10NON). One AST parent explained the importance of having the maturity and skills to travel safely:

[I]t’s a matter of wondering if she has the skill level yet to deal with situations that may occur . . . Just recognizing a good scene or a bad scene or a potential for something that’s not right occurring and being able to pull back from it and go that distance to say ‘Hey, no, this isn’t for me, I’m outta here.’ (RP5AST)

Although parents felt the need to accompany their child to/from school until they had the skills to travel safely on their own, most parents did not discuss if/how their children would learn these skills. Whether road safety skills are taught by parents or in schools, these parents felt that it was necessary to accompany their children to/from school until they were able to do it safely on their own.

Overall, parents anticipated allowing their children to travel to/from school alone (i.e., without adult supervision) “When they’re older” (DP6NON). For many, grade 6 seemed to be the “magic year for the kids . . . because you’re getting them ready for grade seven, where they go to a different school” (BP2AST). One parent from School R explained that “they’re becoming teenagers and they’re just a little more cognitive about the world around them” (RP4AST). Parents also discussed ways of overcoming the fears associated with or factors contributing to parents’ overall feelings of safety surrounding solo travel, including maintaining contact with their child (observation or phone calls) and knowing other people in the neighbourhood that their children could travel with.
“We spy on our kids” (BP2AST). Both AST and NON AST parents who have allowed their children to travel alone in the past spoke about how they stay connected in order to ensure their safety. Many parents talked about how they “watch them . . . to see what they’re doing” (TP2AST). One AST mother explained how, when her children first started walking alone, she observed their behaviour by walking behind them:

> I let them go [when my eldest was 10] and then I would walk behind them to see what they do on the street . . . See what they’re doing in terms of, like, if they were to start walking by themselves what would they be on the street doing. So I used to walk and watch them, but, they just walked. (TP2AST)

Another way to ensure their children arrived home safely was maintaining communication via telephone. One mother from School B took the photograph below to explain how parents keep in contact with their children to ensure their safety:

> So there’s [sic] the girls chatting with their cousin. She is walking to school by herself now in grade 7, so my sister and brother-in-law just got her a cell phone for emergencies and so she took it out and was showing my daughters “Oh, look what I got” so they’re all huddled around this little cell phone. (BP1AST)

Some parents in the current study would “always let them [their children] have a phone” (DP10NON) so that they could call for emergency purposes, while others instructed their children to “call me when you get home” (DP1AST) “so that I know that you’re home safely” (DP7NON).

> It’s about social capital” (DP9NON). Social capital is a concept originally stemming from sociology and political science to describe resources available to individuals through their social networks (Kawachi, 1999). Parents in this study who occasionally allowed their children to travel to/from school without adult supervision ensured that “there’s always that buddy system” (BP9NON) or they are travelling “with a group of friends” (TP7NON). Some parents explained
that they may consider solo travel if there are other children to walk with or “if it’s a whole bunch of kids walking up at the same time” because there is “safety in numbers” (BP1AST). One parent from School B commented: “if she wanted to walk with friends and it was safe then I would be okay with that” (BP7NON).

Parents also explained that they feel safe when “there’s [sic] so many people about” (RP2AST) and “there’s lots of people on the road” (BP4AST) when their children travel to/from school. One mother from School B explained that her daughter “knows a lot of people on the way to school, so I know that if there was a problem, there would be people that she could go to their home and get help” (BP1AST). Knowing or being familiar with the people in the neighbourhood who will “kind of watch out” (DP6NON) for their children provides a sense of comfort for these parents. “It’s about social capital along the way too – do you know people, are you likely to run into somebody who will keep an eye out for him” (DP9NON).

In summary, while parents appear to be the ones who ultimately decide, for this age group, how their children get to/from school, the decision is not a conscious one that is made on a daily basis. The trip to/from school is a habitual behaviour, involving little contemplation. Parents believed that, contrary to when they were children, more people are driving to/from school due to busy lifestyles and parents’ heightened safety concerns. NON AST parents from School R and T (looping streets) expressed their hesitations about allowing their children to travel to/from school independently because of the busy roads and the need to cross busy intersections. Overall, parents were concerned about allowing their children to travel independently because of the fear that they will meet strangers along the way and that they do not yet have the necessary skills to safety travel to/from school alone. Observing their children, maintaining contact with them, and social capital were discussed as ways of overcoming these hesitations.

13 Attitudes

Parents readily identified some of the advantages of actively travelling to/from school. It is important to keep in mind that these advantages relate to participants’ attitudes toward AST and are not necessarily factors influencing their travel mode choice. For example, although both AST and NON AST parents described physical activity as an advantage of AST, this was not a main reason why AST parents walked and was certainly not an influencing factor for NON AST parents.
13.1 Advantages of AST

Both AST and NON AST parents readily described what they thought were the positive aspects of walking to/from school. Not only did parents acknowledge the health benefits of AST, but they also explained how walking to/from school provided opportunities to interact with the environment and socialize.

“[K]ids are like dogs . . . you have to walk them” (BP9NON). Overall, both AST and NON AST parents recognized the advantage of actively travelling to/from school because it is “an easy way to get a little extra exercise” (RP7NON), “it’s healthy” (TP5AST), “it’s good for your body” (BP1AST) and “it clears the cobwebs out of your brain” (RP1AST). Many parents described these physical and mental benefits:

I always say kids are like dogs . . . you have to walk them. You have to walk them, you have to make them run, you have to let them play, otherwise they’ll just start to run in your house and start knocking things over [laughs]. (BP9NON)

She loves walking because she can exercise, she can relax and, you know, save money . . . The best is walking. She says that walking makes her mental [mind] very relaxed, and more fun, enjoyable walking. (DP8NON; use of interpreter)

Parents described the health benefits of walking as being beneficial for both themselves, as well as their children, as it provided time for children to play and expend their energy, giving parents the opportunity to relax and enjoy the commute.

“[P]ause and smell the roses.” (DP7NON) Being able to see and interact with the environment “rather than whooshing past it” (BP8NON) was also viewed as an advantage of active travel by both AST and NON AST parents. The “connection to the outdoors and that physical interaction” (RP5AST) was described by many parents as an experience that children miss out on if they are always in the car:

But if they have to walk . . . they learn much more because they can be able to see and observe better as they go along . . . Like if you see a bug, you know, you look and talk about the bug. You see someone doing something funny and you talk about it, stuff like that. (TP10NON)

I find kids are so oblivious to flowers, trees, grass, what does this feel like, you know. They get in their car and they go and they get dropped off, they get picked up . . . you need to feel it, you need to breathe it, you need to be out there. As a society I think we’re really lacking in that, which is unfortunate. (RP1AST)
One mother’s photograph was used to explain how children miss out if they are always driven to/from school: “And then we stopped because our neighbour was out and then they started patting the cat. I was like “see, if we were in the car this wouldn’t happen” (BP1AST). Another AST mother took this photograph below of an interesting object she and her son found on the way to school:

![Interesting object](image)

I have no idea what this thing is, but it was on the street right before we turned the corner, and it comes from a tree and my son and I stopped to look at these things before and we decided to squish this one. (RP1AST)

By driving to/from school, according to these parents, children are missing out on a fun and educational journey where they can discover what is in their environment.

“How was your day?” (DP1AST). The trip to/from school was viewed as “a great chance for the family to be together and chat” (BP1AST). This “time shared together [is an opportunity to] really focus on each other” (DP7NON) before their kids are wrapped up with other activities and “forget to talk to you” (RP2AST):

Well I like that we talk . . . we’re walking home I can talk “how was your day?” and I get to hear about it before they’re home and distracted by TV’s and everything else. In the morning I find if they have a spelling test coming on we can actually practice their spelling on their way to school . . . I just find it’s family time together to talk. (DP1AST)
One mother from School B took these photographs to symbolize AST as an opportunity to increase “just spending time together” (BP1AST).

“[I]t’s social to walk” (BP2AST). Both AST and NON AST parents, specifically in the high SES schools, spoke more about the “social aspect” (BP6NON) of the trip to/from school, while there was little to no mention of this advantage among the low SES parents. These moments of interaction were viewed as positive experiences as opposed to “rushing through the traffic” (RP5AST):

I think it’s also social, we have a chance to chat as we’re walking, have a chance to see neighbours and my niece now goes to the middle school around the corner so we see her like once a day. (BP1AST)

And it’s social too, I have to say. In this neighbourhood it’s social to walk ‘cause you do run into other parents and you can chat and touch base. People that you’re not necessarily good friends with but their kids are in your kid’s class, that’s how you find out what’s due when and how people are doing and what they think of the teacher . . . so when you walk you get that as opposed to when you’re driving you don’t. (BP2AST)

To complement their narratives, AST parents from the high SES schools took many photographs of people and places on their trip to/from school that made them feel as though they were part of the neighbourhood. One mother from School B explained why she took the photograph below:
“It’s just when we leave there are always a lot of people, it feels like the community, it’s nice, so that’s why I did that one” (BP3AST). Previous research shows that low SES and lack of social capital often coincide (Kawachi, 1999), and based on the current study findings, the high SES parents may have more social ties in their school communities and therefore view the walk to/from school as an opportunity to connect with their neighbours.

13.2 Disadvantages of AST

Compared to discussions of AST advantages, parents had a more difficult time describing the disadvantages of walking to/from school. While weather and time factors were sometimes an issue, many parents said they did not think there were any real drawbacks of AST.

“Only when the weather is lousy” (TP7NON). Being subject to elements such as the “cold” (DP1AST) or “lots of snow or pouring rain” (TP7NON) were seen by many as disadvantages of active travel by both AST and NON AST parents. One NON AST parent commented that “I don’t think kids should sit in school, if it’s pouring, with wet pants or wet shoes . . . they start to get clammy” (BP9NON). Similarly, another NON AST parent explained that driving to school is an easy way to prevent kids from being uncomfortable during the school day:

And I think if the weather was, if it was winter and we had no choice but to walk, that would be horrible . . . Just feeling that pain of being cold or wet or, you know, having to get there . . . I don’t think it would be a great beginning to the school day. You’re wet, you’re cold, you’re probably trying to concentrate more on getting warm or maybe getting your hair dry, you know, that yucky feeling; in the car it’s just easy . . . I don’t want to get wet, I don’t want to feel cold. (RP8NON)

Therefore, the weather is a perceived disadvantage of AST when conditions are not ideal, as parents do not want their children to be wet and/or cold at the beginning of the school day.
“[Y]ou have to get up earlier” (RP10NON). The time factor associated with active travel was perceived by both AST and NON parents as a disadvantage. With active travel “distances become more of a factor” (DP2AST) and “it might take longer time” (BP7NON). One NON parent described how walking could be hectic given her busy weekday mornings:

I would say the only disadvantage . . . is the time factor. It’s rushing everywhere, right. Where I could get to in 5 minutes when I’m rushing to get the next round of kids by car, to get there by foot would take me twice as long because their school is in the other direction, so it is further . . . Plus, you have to get up earlier [to walk], and every minute of sleep counts in the morning. (RP10NON)

Since it often takes longer to walk to/from school, the time commitment was described as a disadvantage of AST. Parents’ and children’s busy schedules often contributed to this time crunch, therefore making walking to/from school a drawback for some parents.

“I don’t think there are any” (BP1AST). Many parents (including NON AST parents) commented that they could not think of any disadvantages associated with AST. One parent said, “I don’t think there are really any disadvantages to walking, honestly” (BP10NON), while another NON AST parent explained that there were no disadvantages, “not in my eyes” (DP6NON).

### 13.3 Advantages of NON AST

Complementary to the perceived disadvantages of AST presented above, parents described advantages of driving to/from school such as speed, protection again harsh weather conditions, and the convenience factor.

“[I]t’s strictly speed” (RP4AST). The main advantage of driving discussed by both AST and NON AST parents was the “time issue” (BP1AST). Parents explained that “it’s still a lot faster” (DP9NON) and “Even with traffic I can still get here faster than the bus” (TP6NON). A quicker trip to/from school allows parents and their children to “get a little bit of extra time instead of rushing, rushing all the time” (TP2AST):

So it gives you that flexibility, and obviously saves you [time]. After school when she had to stay for sports, then we get home faster so that she has some time to be able to eat and get organized because she plays basketball three nights a week so she practices, so we have to get to practice at the other end of Scarborough, so it just allows more down time at home to relax and get ready to go to the next thing. (BP10NON)
Although driving was described as an advantage because it gave parents and children more time, this time was often used to drive to/from other organized physical activities or sports outside of school. These families were therefore using inactive means of transportation in order to attend physical activities elsewhere.

“[P]rotection against the elements” (RP4AST). Complementary to the disadvantage of AST, parents perceived driving to/from school as an advantage because it gets you “out of the weather” (DP2AST). Parents acknowledged the “comforts of being in a car” (BP10NON) such as staying “warm” (BP9NON) and “dry” (BP9NON).

“[I]t’s easier” (BP10NON). The potential ease of taking the car was described by both AST and NON AST parents. Driving to/from school was viewed as being easy for three reasons. First, taking the car was advantageous if “you have a lot of things to carry” (DP10NON) or “if you have to bring something heavy” (BP10NON). Second, taking the car can be “comfortable, quick, [and] direct” (DP9NON). One AST parent described how she could sometimes just jump in the car and get the kids to school on hectic weekday mornings:

I don’t have to be dressed, as in, if I’m rushed I can just put my pyjamas on and shove a sweatshirt on and a pair of boots away I go. I don’t feel like I have to kind of, get washed and dressed [laughs]. When you’re the mother of three boys, sometimes there’s no time for these things in the morning [laughs]. (RP2AST)

Third, parents described driving as a “convenient” (BP10NON) choice “if you were going to go somewhere else that you were driving to after” (BP1AST). The ability for parents to be on their “own schedule” (TP6NON) and the “flexibility to be able to go somewhere if you have to” (BP6NON) was viewed as convenient, as one NON AST parent explained, “Then I have the car also after I’ve dropped everybody if I want to go someplace else, if I want to go to the gym, if I want to go to the store then I have the car and I can go” (BP7NON).

13.4 Disadvantages of NON AST

Parents also described some of the negative aspects of driving to/from school. While only the high SES parents talked about environmental concerns and a lack of exercise, NON AST parents commented on the financial costs associated with driving.
“The environment suffers” (RP8NON). Both AST and NON AST parents from the high SES schools mentioned the “environmental damage” (RP2AST) caused by non active modes of transportation. Driving to/from school was described as “not doing the nicest thing for the environment” (BP6NON).

One mother from School B took this photograph of a car exhaust pipe because “It’s just a symbol that that’s [pollution] what I’m avoiding by walking (BP3AST).

“[L]ack of exercise” (RP10NON). High SES parents also perceived non active modes of transportation as being “bad for me” (BP3AST) because “you’re not being as active” (BP7AST). While “It’s not such a great thing just to be sitting in the car,” (RP6NON) one parent from School B commented, “Well you’re not getting any exercise, absolutely. I’d rather be walking for sure so that I don’t have to walk on the treadmill three mornings a week at home” [laughs] (BP6AST).

“And the gas!” (BP8NON). Only NON AST parents commented on the cost of gas as being a disadvantage of driving to/from school. One parent explained “it’s like there’s more expenses, you’ve go to pay your car, you’ve got to pay for gas” (RP8NON). Parents’ comments were reflective of the skyrocketing gas prices in Toronto at the time of the interviews. “[Y]ou’re wasting gas, especially when gas was a dollar thirty” (BP9NON). Another NON AST parent commented, “Economically it certainly costs more. Gas is not cheap now” (BP6NON). Indeed, drivers in the GTA were paying between $1.05 and $1.30/L for gas at the time these interviews were conducted in September/October 2008 (CityNews, 2008).

In summary, according to the parents in this study, the advantages of using active modes of transportation to/from school are physical and psychological benefits associated with physical activity, the opportunity to interact with the physical environment, spending time with their
children, and socializing with other friends and neighbours (high SES only). While some of the disadvantages of AST included dealing with the weather (cold and rain) and the extra time associated with walking, many parents reported that there were no disadvantages of AST. The advantages of non active modes of transportation included efficiency, protection from weather elements, and being an easier, more comfortable, and convenient way to travel to/from school. High SES parents perceived environmental damage and a lack of exercise as disadvantages of NON AST, while drivers commented on gas expenses as a drawback of non active modes.

14 Factors Influencing Travel Mode Choice

Many advantages and disadvantages of walking and driving to/from school were discussed by parents; however, some of these attitudes (or factors) were more salient in dictating travel mode choice. These attitudes addressed the behavioural cost and the reinforcing value associated with active and non-active modes of transportation, and will therefore be presented using these Behavioural Economics constructs.

14.1 Behavioural Cost

The choice of an alternative depends on the behavioural cost, or work needed to access an activity. Within the BE and physical activity studies, varying the proximity of physically active and sedentary alternatives is one way of manipulating their accessibility or convenience (Raynor, Coleman & Epstein, 1998). For the purposes of this study, however, behavioural cost or convenience refers to how much effort or time is associated with walking and/or driving.

“Whatever makes my life easier” (RP8NON). Both AST and NON AST parents described their respective travel modes as being “easy” (TP1AST) “simpler” (TP7NON), or “convenient” (DP4AST). One AST father took the photograph below and explained why he walked rather than cycled to/from school:
J: [N]ot too many [people] use bikes to go to school.
I: How come?
J: Because I think the walk is easier. (DP5AST)

While some parents perceived walking to be the easier mode compared to driving, “it’s really hard to get parking here” (BP2AST), others recognized the trip chain convenience of dropping their children off on their way to work:

Convenience as in this is our way to head to our streetcar, so we drop our children off on the way to where we have to go to be to work. We’re not going out of our way in any possible manner. We’re literally walking the same route, our kids would walk to school, dropping them off, watching them coming in to the playground, we know they’re safe . . . and [we] continue on walking. (DP1AST)

Ideally, I think it’s great, it’s wonderful thing to be able to walk or cycle to school, but given the demands on parents these days, I think you often opt for what’s most convenient and quickest, and allows you the time and supervision of the children. Often when you are working, even though there are opportunities to walk, time doesn’t allow it and so you do what’s best; so non active modes of transport become the order of the day. (BP8NON)

A trip chain refers to multi-stop trips or sets of activities by individuals (Fox, 1995). NON AST parents also discussed this trip chain convenience, as one parent commented, “‘Cause she’s [my wife’s] home and it’s convenient [to] get them dressed, get them up, get them together, and then on her way to work she’ll drop them off and then take off” (TP9NON). Another NON AST parent concluded, “But again, it goes back to whether you want to do it. You always have to go back to that, if you can do it the easy way, I’m going to choose the easy way versus the best, healthy way to do it, I’m always going to choose the easy way, unfortunately” (RP8NON).

When prompted to provide any suggestions of ways schools could support AST, a few of the NON AST parents from the low SES schools discussed the need for daycare centres or breakfasts programs to “make my life a lot easier” (DP7NON). Although these parents did not
suggest that such services would necessarily enable them to walk more to/from school, they may cut back on the amount of time parents spend time commuting in the morning, make things “less complicated” (DP8NON), and increase the overall convenience of school travel. One NON AST mother from School T who brings her child to her work in the morning before bringing him to school suggested:

Maybe if the school have a breakfast program, sure I wouldn’t have to take him to work . . . [I’d be able to] Bring him straight to school and just, you know, instead of back and forth. Save the environment a trip. (TP10NON)

One low SES mother who commuted about an hour to and from school by public transportation explained how access to daycare services closer to her home would benefit her:

They need to have more daycare centres to make my life easier [laughs] . . . Well, with my oldest daughter now being in school, it’s like, I have to rush to leave work and I have to rush to work and I’m always late for work now . . . it would be easier if there was a daycare that would take all my kids close to where I live. (DP7NON)

These low SES parents did not have flexibility in their work schedules and therefore needed to make alternate (often more inconvenient) arrangements in order to get their children to/from school.

“Who is not in a hurry?” (RP10NON). AST parents described their walk to/from school as “fairly fast” (DP2AST) compared to driving “it’s faster to walk than get the car out of the driveway” (BP2AST). In addition, not having to find parking made walking to/from school the faster choice:

Even if we drove we’d still have to find parking and so it’s basically an even balance. Walking is the fastest . . . Even if we got in the car it would only save us . . . maybe 2 minutes, so what’s the point, right? (DP2AST)

Issues of time were especially seen among the NON-AST parents, who spoke more about their busy work schedules and the lack of availability of time as being an important factor in their decision to drive:

Five minutes makes a difference of getting to work, so it’s faster to just, because when they walk they’re gunna take their time and look at this, look at that. [With the car] you just jump in, get them and we’re off, run inside and leave them and I’m off to work (TP8NON).
NON AST parents said that “if I had more time” (TP6NON) they would be more likely to walk to/from school more often. They discussed the weekday morning time crunch and explained that “basically what it takes to be able to walk in the morning is just leave 20 minutes earlier” (DP9NON). This will involve “just getting more disciplined and getter up a bit earlier” (DP9NON). Although “it’s feasible” (TP8NON) to wake up earlier in order to have more time in the mornings, one parent laughed, “Do I want to wake up earlier? No!” (RP8NON).

“It’s a distance issue” (BP8NON). AST parents walked because of their proximity to the school: “We’re lucky because, as I said, we’re like a block and a half [from the school]” (BP1AST). For those who drove to school, distance was an important influencing factor: “We’re just unfortunate that we don’t really have a choice because it’s too far” (BP10NON). It is important to note that many NON AST participants did not live within the designated school catchment area. A “reasonable” distance (conceptualized as time) to walk to/from school for both AST and NON AST parents was between 15 and 20 minutes. One AST mother commented: “I don’t know, a 20 minute walk for me, for a child, is okay. Anything more than that and they get to school [and] they’re going to be all burnt out” (TP2AST).

Overall, travel mode was generally found to be consistent over the years (i.e., JK to child’s current grade). AST parents explained that they’ve “always walked to school” (BP3AST) as it was “just something we’ve always done with the kids” (BP5AST). The only change in mode choice was seen among NON AST parents from low SES schools because of changes in home address that led to an increased distance from school. One NON AST parent commented “We used to be able to walk, we were walking distance to the school . . . bike, scooter, everything, we used to walk” (DP6NON). Other NON AST parents explained why they no longer actively travel to/from school:

We used to walk but two years now we’re driving . . . We moved, we used to live right across there, there’s a building across the road so we walked. Now we’re living a bit farther. (TP7NON)

We used to walk and they’re still at this school but we cannot walk any longer because we moved, so we’ve had to take the streetcar . . . We used to walk all the time because we lived . . . very, very close and we really enjoyed walking, we always walked to school. (DP7NON)
“We actually moved here because it was close to the school” (DP2AST). Distance also played a key factor in the decision about where to live. Both AST and NON AST parents spoke about the “conscious decision” (BP3AST) to live in an area where their children could actively travel to and from school. One parent from School R explained, “I wanted the fact that I could walk to school. I don’t like to have to take the car every five minutes to go everywhere, you know, I like the fact that we live close to school” (RP2AST). Another parent commented:

We actually moved here because it was close to the school. We used to live right over here . . . then when we moved we wanted to be within the same, more or less, walking distance to the school. (DP2AST)

Although one NON AST mother from School R considered distance from school when buying her house, she still used non-active modes of transportation to travel to/from school:

[W]here we are he [my son] will be able to walk to the middle school, as well as he’ll be able to walk to his high school . . . it would have been nice if he could have walked here, but it just didn’t work out. It was a thought. If it could have worked it would have been good. (RP6NON)

The ability to walk to places, in general, was also an important consideration for parents when they were choosing where to live. One mother told her husband, “If I can’t walk to get a cappuccino, I’m not living there” (BP2AST). She went on to explain that it was “definitely a conscious decision when we were buying a house that we wanted to stay where we could walk to get things” (BP2AST). The ability to actively travel to/from places such as shops and health care facilities was important for both AST and NON AST parents living in both types of neighbourhoods:

This is part of the reason we live [here], is it’s a great neighbourhood for, you can walk wherever, you can walk for groceries . . . you can walk wherever you need to go. I can walk to the chiropractor or I can walk to the doctor, so that’s great. (BP1AST)

I come here . . . so I choose [sic] this place for myself. And you know, the hospital, shopping, everything close to me. Sometimes by myself I do everything. If I need something, like doctor, he’s [my son] sick and my husband is so busy, I bring him. Yesterday I bring him to doctor and last week I am sick I go by myself, I don’t need my husband. (TP5AST)
One mother from School T took a photograph showing an important facility that is easy to walk to in her neighbourhood:

T: That’s showing kids just walking to the library. It shows the facilities being used, you can see kids going to the library.
I: Yeah, you said it was easy to walk from your place to the library; it’s easy to walk to school, you can walk to the mall, so there’s things in the areas that are close to you.
T: Uh huh. (TP2AST)

Although these low SES parents discussed their reasons for living where they do, it cannot be assumed that all people have the means to choose where they live.

“We have to be somewhere” (BP7NON). Notably among the NON AST parents, the trip to/from school fell within a broader trip chain involving destinations other than work. All of the sampled schools ran a number of various extra-curricular activities such as coaching sports, art and reading clubs, and peer mediators. Because of these sport practices and other activities, parents needed to drive in order to get everyone to where they needed to be:

[My daughter] usually will either have another practice or something after school here and if she doesn’t we have to rush home because she has to get her homework done and eat before she has to go to her other commitments. (BP10NON)

I would say in terms of affecting the mode of transportation, I would say the practice schedule. My oldest daughter is on three teams, my other daughter is on two teams, so that often dictates the mode of transportation . . . the [skating] rink is unfortunately not two seconds away, so you have to drive. (BP7NON)

Indeed, travel mode choice is linked to families’ busy schedules and children’s extra-curricular activities. Another mother from School D did note the irony that active travel is sometimes sacrificed in the morning in order to get her son to school on time for a sporting activity:

[My son] really wanted to go to school early throughout September because they had cross country running, so the only way we could get to cross country running on time was
to drive. So it’s sort of an ironic thing that he turns down the opportunity to exercise in order to get to some collective exercise. (DP9NON)

One single mother from School R explained that “I have to get two other children to school directly after [my daughter] and then I have to go to work” (RP7NON). Therefore, many of these NON-AST parents had to drive in order to get to these multiple destinations.

Furthermore, AST parents would choose to drive if they had an “appointment,” (RP2AST) “meeting,” (RP4AST) or other commitment. For example, one parent explained:

“The only time I would take the car is if I’m going somewhere directly, say, I’ve got an appointment or I’ve got to go to the doctors or I’ve got something on and I’m going straight from school, which is very rare I have to say. (RP2AST)

In these cases, the trip to/from school was part of a broader trip chain where taking the car was the mode of choice because of time constraints. Children’s extra-curricular activities were a common destination within this broader trip chain:

This year’s been so busy so far because in the morning my daughter’s had slow pitch practice almost everyday . . . until last Wednesday. Now basketball’s started and this week it’s three mornings a week so right now at this point in the year she’s gotten driven to school more often than not because it’s early, I just get her here. (BP4AST)

Well today we have to do Greek school, or swimming, so it depends on the extra-curricular activities. We just have two a week but it only just started this week, so since September we’ve been walking. (RP3AST)

“I have to be at work” (BP6NON). An important part of the travel trip chain is parents’ commute to/from work. AST and NON AST parents explained how their work schedules dictated whether they were able to travel to/from school with their children. “I have a flexible schedule . . . I work from home, so it’s easy . . . Now if I had to work downtown and be there by 9 o’clock, I can see that crunch for time (RP5AST). One low SES mother explained her unique way of being able to bring her son to/from school:

[W]hen I leave home [in the morning] I take my son with me; I take him to my workplace because there’s no point to put him to a babysitter for just an hour or a little bit over an hour. So he’s at work with me until 8:30am, and then I bring him to school and I finish work at 3pm . . . so I leave work at 8:30am and reach back at about 8:50, so I would consider that my lunch. (TP10NON)
For other parents, however, travelling to/from school with their children is “impossible” (RP7NON) because “Generally the school world and the working world are not in sync” (RP4AST), and “the work world is not set up to deal with families” (RP4AST). At the sampled schools class started and ended between 8:40 and 8:45am and 3:20 and 3:45 pm, respectively. Although schoolyards were supervised by a teacher as early as 8:30am, timing and scheduling was still an issue:

I would love to be able to pick them [my children] up after work, of course, definitely. I just can’t because I finish at 5:30pm and I leave at 5:30pm and school ends for my son here at a quarter to four, so it’s just not possible. (DP7NON)

I start work at 8 o’clock, I leave my home at 7:30am and school starts after 8am, so I have to leave my home before school time . . . because I have to go to work so I cannot drive her to school or walk her to school. (TP1AST)

Since work dictates time schedules, many NON-AST parents discussed work as being a significant factor in dictating their mode choice:

Well, actually, probably another reason why sometimes I end up driving is if I have a [work] meeting right away, after. To walk back home and get to my meeting, it makes more sense just to drive them and go. (RP6NON)

[I]t’s just that it doesn’t make sense on the days he [my husband] has to drive [to work] to walk the kids to school, and then walk home and then hop into his car and just drive when you’re going west, so you might as well keep going. (BP9NON)

One single mother from School R explained that changes in her work hours could influence her travel mode: “If I could finish [work] at one or two [o’clock] I would walk to get my kids, but I can’t, I have to work, I have to have the income” (RP7NON).

NON AST parents also explained how they would walk if they did not have to go to work:

“When I do walk it’s mostly the days that I’m not working” (TP8NON). Another parent from School T commented:

I mean if I was at home I’d love to walk or ride, whatever, whatever makes him happy, you know what I mean. But I have to work. I really can’t allow him to do that [on his own]. (TP10NON)
Work schedules as a barrier to AST for these NON AST parents was related to the time pressures associated with having to be at work at a certain time: “Like, if I take a day off it’s not such a big deal. At that point it’s choosing to want to do it or not . . . If time wasn’t an issue I would [choose to walk], yep” (RP8NON). Another parent from School R commented:

Time factor, right; I mean, if there was time I’d walk, but there isn’t. I get her to school, the others [siblings] have to be at school ten minutes later and then I have to be at work, should be at quarter past nine, but it’s generally half past nine. (RP7NON)

For many parents it is impossible to walk their children to/from school because their work schedules do not allow it. Although some parents had more flexible work hours than others, these time conflicts are also related to school and community resources such as childcare services.

“[M]eet me at the daycare” (DP6NON). Only NON AST parents described daycare/after school programs as playing a role in their ability to pick up/drop off their children:

I: So if she [your daughter] didn’t go to that after school program would you be available to pick her up right after school?
C: No.
I: Because you have work?
C: Uh huh.
I: And what time do you get off work?
C: Five.
I: So there’s no way you could be here to pick her up.
C: She would have to walk to my work and stay there. (TP6NON)

All of the sampled schools housed daycare facilities. Daycare facilities within schools allowed these parents to drop off their children on their way to work in the morning and home from work in the evening. One mother explained, “I drop him off at the daycare here, then I go to work, then they go to school from the daycare, so the daycare is in the building” (TP8NON). Another mother from School B commented, “Tuesdays to Fridays my husband drops them off at school, driving, and then he goes off to work and I pick them up after school, after daycare, driving, because I’m coming from work (BP9NON).

“[I]t’s more likely we’ll walk in the evening than in the morning” (DP9NON). The feasibility of walking as a mode choice differed in the AM and PM periods because of trip chain and work influences described above. Although the majority of participants consistently used the same travel mode in the AM and PM periods, fluctuation in travel mode among typical active travelers
was seen on the trip to school, as parents would sometimes drive their children to early morning practices or drop them off on their way to work. On the contrary, changes in travel mode choice among NON AST parents and their children were most often seen for the trip home from school in the afternoon (i.e., when typical drivers did sometimes walk they tended to walk home from school).

This increase in active travel in the afternoon period seemed to reflect a time issue. Weekday mornings “seem to be worse” (DP9NON) because, as one low SES mother explained, there is “so much to do, I mean, lunches, gathering up homework, getting people regimented and out the door. There’s not a lot of sitting around” (DP9NON). Although time may be an issue in the morning for some, “after school it’s not so much of an issue” (RP8NON).

In summary, parents opted for modes of transportation that were the most efficient and convenient. The efficiency and convenience of each mode were, in turn, determined by the distance required to travel to/from school, as well as the number of destinations within the broader trip chain. Travelling to/from work, extra-curricular activities and daycare services was part of this larger trip chain for many parents in this study. While changes in travel mode among AST parents would often be seen in the AM periods when they would sometimes drive their children to early morning practices or drop them off on their way to work, typical drivers would often change their travel mode on the trip home from school. The availability of time was explained as the reason for this increase in active travel in the afternoon period.

14.2 Reinforcing Value

Factors other than time and convenience also influenced parents’ travel mode choice. According to Behavioural Economics, choices are also based on the reinforcing value of the activity. As presented in the previous section, walking or driving to/from school will be reinforcing if it is easy, efficient, and/or convenient. Furthermore, parents discussed other factors that reinforced their travel mode choices. Within this study context and for the purposes of discussing theses results, I conceptualized reinforcing value as what makes walking or driving a more appealing mode. For some parents in this study, weather and the opportunity to be able to walk to/from school with their child as part of an overall active healthy lifestyle were some of the factors influencing their mode choice by increasing or decreasing the appeal of walking and/or driving.
“Weather is another issue” (RP6NON). Both AST and NON AST parents described the weather as a factor influencing their travel mode choice. While for one driver “there’s no way” (RP8NON) she would choose to walk her children to/from school in the rain or snow, for some AST parents, such extreme elements made walking the preferred mode choice:

I mean, especially in the winter, I mean, I know people say they don’t walk because of the weather, [but] I walk because of the weather in that for me to clear the driveway, clear the car, and get it out for such a short distance, it’s silly, so we just walk. (RP2AST)

At one of the schools, driving in the winter was also a problem because of the slope of some of the surrounding roads:

The weather actually affects whether I can drive in the winter too in terms of if it’s very snowy I have no way to get back home because these streets are on enough of a slope that I can’t . . . you literally can’t get up a number of the hills so it may force me to walk. (BP3AST)

One other parent from School R also mentioned the steepness of the hills in her area as being a barrier to walking. She explains:

It [the road] goes down into a deep valley by the river and then goes up. For me, I had bypass heart surgery not too long ago. I’m supposed to walk, but I don’t like those hills – it’s kind of steep for me. You have to go really slow and if you’re in a hurry, well, forget it [laughs]. (RP10NON)

Both AST and NON parents explained how their mode choice can change depending on the weather. Parents who typically drive to/from school said that they walk “when the weather is nicer” (TP8NON). One NON AST parent commented, “But if it’s a beautiful day like summer or even fall, spring, even winter, if it’s a nice day then we just walk” (BP9NON). AST parents, on the other hand, said that they would choose to drive if it’s “raining very heavy” (DP1AST) or “it’s freezing cold” (BP4AST). AST parents described situations when they would opt to take the car:

Okay, so here, its pouring rain and we’re bringing the diorama to school, or its cupcake day and you’re bringing the cupcakes and it’s pouring rain. Those would be some times where I might consider [driving]. (BP2AST)

Well, we don’t walk if it’s pouring rain. In the winter we don’t walk if . . . that sidewalk is icy and it hasn’t been shoveled, then we don’t walk. Well, sometimes we do, sometimes we go on the road, but just depending on the conditions of it, if it’s safe to walk on. (RP4AST)
One high SES mother took a photograph on a rainy morning on the way to school. She explained:

Yeah, it was POURING [laughs] . . . I was just thinking, “I wouldn’t be walking to school today if I didn’t have to take these pictures [laughs]. So I wouldn’t have walked to school today, no. (RP3AST)

Therefore, nice weather contributed to the overall appeal of walking to/from school. On the other hand, the rain and cold made walking unpleasant for these parents, and therefore a less desirable mode choice.

“If you can do it, you have to do it” (RP4AST). Due to work responsibilities and trip chain influences, one NON AST parent described walking to school as “not feasible, it’s not practical, it just wouldn’t work” (RP7NON). In contrast, AST parents (High SES only) considered themselves “lucky” (BP4AST) to be able walk to/from school with their children “because we can” (RP4AST). One participant from School B attributed her opportunity to use active transportation modes to her work situation: “I have flex hours, so as long as I get done what I have to get done, so that has some bearing on it. If I had to be there [at work] exactly at whatever time, maybe I would drive” (BP1AST). Among these AST, high SES parents, walking to/from school was perceived to be the best (most reinforcing) mode choice if circumstances allowed it:

I think if you can do it [walk], you have to do it. I mean, if it’s possible, you should do it, meaning, you don’t live somewhere where it’s going to take you an hour and a half to walk or something. (RP4AST)

“It’s a good habit to get into” (BP1AST). Notably, only the high SES parents who used active modes of transportation were the ones who described their trip to/from school as a part of an overall “active healthy lifestyle” (BP2AST) or “regular routine” (BP1AST) and a reason why they enjoyed walking to/from school. One parent commented that “We’re just active, there’s no
way that we will get into the vehicle and drive somewhere if we can walk or bike” (RP1AST).

Another high SES parent described the importance of active transport later in her children’s life:

But that whole idea of promoting an active healthy lifestyle for the kids is really important to me and my kids are super, super active. But the idea of walking to me is keep them when they’re not playing hockey or when they’re too old to play hockey, that there’s always something good to do. (BP2AST)

Why these views were only seen among high SES parents requires further investigation. Perhaps English-language health literature is more readily available to them and they want to and are able to make healthier active lifestyle choices. However, this does not explain why all parents (including low SES) viewed health and physical activity as an advantage of AST.

“[AST for physical activity is] not my priority.” (RP8NON) Overall, however, parents did not acknowledge the trip to/from school as an important opportunity for physical activity. Although they recognized health and exercise as an advantage of actively travelling to/from school (see attitudes section below), these trips were not valued for physical activity purposes. One high SES parent explained that actively travelling to/from school was not important for her family because they were already very active.

Well, the advantages of walking [to/from school] are health reasons, obviously – your activity. But that’s not really a concern for us because we all do a lot of physical activity. For some families it’s good because that may be the only physical activity their kids, or even they get, but for us it’s not a concern. (BP10NON)

The walk to/from was also “not that big a deal” (BP4AST) because for some parents “it really isn’t that long of a haul from our house to school” (DP1AST). Another parent from School R commented that “three minutes up the hill is really not what I would consider physical activity; it’s just getting you outside” (RP4AST).

“They [schools] try and promote the physical activity” (RP7NON). Parents acknowledged the general health initiatives at their children’s school to “encourage an active lifestyle” (BP1AST). Some AST parents described some of the health initiatives that have taken place at School B:

There are a lot of sports and so there’s a lot of kids involved in different teams and different activities, and not just competitive sports. They have skipping club, juggling club, so not just competing but also just being active. (BP1AST)
In the spring they usually do a mileage club, so they get all the kids out and they run laps on the track and every time they go around a lap they get a popsicle stick, right, so if they do ten laps they trade in the popsicle sticks and they get this little plastic foot that they can put on a wristband, it’s like a charm bracelet . . . it promotes the activity. (BP5AST)

Although these programs are not specific to active travel per se, only parents at the high SES schools spoke about specific “Walk to School Day” (BP1AST) events that tend to occur on an annual basis. One AST parent described the event and his uncertainty about its effectiveness and sustainability:

I think once a year they have a “bicycle or walk to school week” . . . It probably slips out [of mind] pretty quick if the attention goes on to something else, but if they [schools] did that more often. But then again, it requires someone to monitor it, put it in place and run it and a parent volunteer. The kids are quite willing to get into it. It’s just the parent “oh, I gotta get them to school” and “I don’t want to walk” [laughs]. (RP5AST)

“I don’t think there’s much more [schools can do]” (RP4AST). Parents were content that schools were “doing what they can” (RP4AST) to support active transportation and that “there’s nothing really they can do” (DP6NON). AST promotion was not something parents expected from schools, as they had other priorities and expectations such as quality education and safety, as expressed by one high SES mother:

The school has got its hands full with teaching my children so many hours a day. My main concern is that they keep the kids safe and give them a good education, and look after them around the grounds. (BP8NON)

When prompted to provide any suggestions of ways schools could help make AST more appealing, a few parents discussed initiatives similar to a walking school bus (WSB). A WSB involves parents or other adults escorting children along a walking route to/from school (Kingham & Ussher, 2007):

It’s hard to tell other people what to do. I don’t know, unless it was something like . . . instead of carpooling, walkpooling, you know what I mean, one parent and a few people that live on the same street say “for Monday you take the kids to school, Tuesday, you take the kids to school.” (RP2AST)

There was mention of “just more encouragement. Having little campaigns [at school] to see how many people walked to school today and keep a tally” (BP1AST). It was also suggested that schools integrate “some of that walking and cycling stuff into the curriculum, like little
handouts” (DP2AST) and “actually help kids learn how to bike and have training programs and that kind of thing” (DP2AST).

“I think it’s more of a parental thing” (DP1AST). When asked about the role of the school in encouraging active school transportation, parents felt that this was “more of a parental issue than a school issue” (TP7NON). One parent from School B explained, “I don’t know how much more a school [can do] . . . but I think in the end it’s going to be the parent’s decision and it’s going to be based on, often parents’ job” (BP7NON).

“There’s not too much discussion around it” (BP4AST). Despite travel mode being a parental decision, the trip to and from school is not something that parents often talked about with other parents. One participant commented that “I don’t think it’s anything I would discuss on a daily basis” (RP2AST) while another AST parent explained that “it’s kind of a personal thing; it’s kind of like talking about religion or politics” (DP2AST). However when discussion of school transportation did come up in conversation, high SES parents talked most about the possibility of friends travelling together and carpooling to and from school in order to “help each other out” (BP6NON):

The only conversation I’ve had recently was with a mom, her daughter and my daughter, we switch Mondays for lunch . . . So I had asked her if she would be comfortable with the two of them walking home rather than me coming to the school. That was the only kind of conversation I’ve had about it. No, there’s not too much discussion around it. (BP4AST)

I think there’s a fair amount of discussion with trying to save gas, but with the carpooling. I think that is a definite discussion . . . Why are four people going to the same place – you don’t all have to drive 20 minutes and waste our time. (BP7NON)

These high SES mothers knew other parents in the neighbourhood to car/walkpool with, which was not the case for many low SES participants.

“Community is important” (BP1AST). Although parents reported that they did not readily discuss school travel with other parents, developing relationships with the people in their neighbourhood and maintaining friendships was important. The concept of social capital and a sense of overall neighbourhood and school community were significant considerations for all parents (with the exception of School D) when they were deciding where to live. Why this was
not seen among parents in School D is unknown and requires further inquiry. Some parents explained the importance of a sense of community for both their kids and themselves:

I think it’s important for the kids to go [to a local school] . . . with their neighbours and their friends, so yeah. We’ve moved a lot in this neighbourhood and have stayed in the neighbourhood for the school. (BP1AST)

I didn’t want to move my kids to another school . . . I volunteer here too and I socialize with all the teachers and I know everybody and they’re so nice to me too, you know, I wasn’t thinking of going and building new relationships . . . everybody here knows me. (TP7NON)

One parent from School R explained that when “we bought the house, location in terms of type of community, was it a nice community, was it an area you felt comfortable in being outside and talking to neighbours, absolutely that plays a factor” (RP7NON).

Parents were asked what would help them make more active transportation choices for the trip to/from school and what would make their neighbourhood a better place to walk in. Many participants struggled with these questions. Although parents thought that their neighbourhoods were conducive to walking, the safety and unpleasantness associated with high-traffic roadways made AST a less than desirable option. Some parents suggested more green play spaces as a way of increasing the walkability of the physical environment.

“I think everything is pretty okay” (DP6NON). Overall, parents did not feel there was a real need to change the built environment in order to facilitate active transportation because “everything is fine” (RP3AST) and “It [the neighbourhood] certainly supports walking and biking” (BP10NON). One parent commented that “they’ve done everything they can without, you know, kicking the cars off the road . . . I think they’ve got everything set for biking and walking” (BP10NON). Another high SES parent talked about his struggles to think of ways to change the environment. “I can’t think of anything. I was trying to think of how I’d change the environment to make it more friendly for people who walk, uh, but this neighbourhood is, it’s pretty nice” (RP5AST).

“It’s just the busyness of the roads” (RP6NON). Despite struggles to think of ways of changing the built environment, the NON AST parents from School R (high SES, looping streets) were the only ones to discuss traffic (noise) and road safety as a factor influencing travel mode choice. Most parents mentioned one main street bordering the school as a concern that influenced their
decision to drive because of the “volume of traffic and getting across the street [safely]” (RP9NON).

One mother from School R took the above photograph and explained: “I just wanted to show how busy [the street] was . . . lots of transport trucks and everything is pretty close [to] the road” (RP3AST).

Another mother went on to describe the unpleasantness and negative impact of the traffic noise:

[The street] is so busy; by the time you get home you’re just stressed out because it’s such a busy avenue . . . It’s just loud. If it [the walk] was into these little streets, I think that would be very enjoyable but the fact that I have to go through [the street] to get to my house is just pretty loud, it’s not like an enjoyable walk at all. (RP8NON)

Parents voiced their concerns about cars that “travel fast . . . [and] can lose control easily” (RP8NON). One mother described the main street by saying “I think it’s just [the street], which for us, I don’t think it is too safe” (RP8NON). She went on to say:

Well, the problem is the crossing guard is only at one spot, not all [of the street], so if somebody loses control it’s not going to be when they’re stopped for the crossing guard. It could be there, but I mean, it’s going to be more on the actual stretch [of road]. (RP8NON)

The increased traffic in the parking lot at this school was described as “dangerous” (RP9NON) and “quite hectic” (RP10NON). One NON AST parent exclaimed: “You should be here at half past eight and you should see, it’s mayhem!” (RP7NON).

To complement their narratives, AST parents (especially from School R) took many photographs of busy roads and intersections on their trip to/from school and voiced their safety concerns.
One mother from School R explained the above photograph that she took on her way to school in the morning: “We have to cross the intersection here, that’s no sidewalk here so we just sort of have to, and it’s pretty busy . . . there’s no crossing guard there” (RP1AST). Therefore, walking to/from School R was not perceived as the most desired mode choice because of the busy and noisy main road bordering the school.

“[I]t’s just not as nice” (TP6NON). The only physical environment factor that parents suggested to improve their neighbourhoods was discussed among a couple of NON AST parents (from School B and School T) was the availability of green play spaces for children. While the parent from School B explained that “for the amount of children walking and hanging out outside. . . there’s not a lot of place for children to play (BP6NON), the parent from School T said that the area is “just not as nice” (TP6NON) as it used to be. “[T]here’s not as much, for example, nice flowers to walk across and pick, there’s not as much, you know, green things I guess you could say, or parks to stop at” (TP6NON). She suggested “Having people come and clean the parks every so often so you don’t have to walk in garbage” and “updating parks . . . I think updated stuff as far as picnic benches” (TP6NON). Therefore, according to these participants, more aesthetically pleasing areas in their neighbourhoods such as clean and green play spaces for kids may make walking to/from school a more appealing mode choice.

In summary (see the following page for a summary chart of the study findings), many factors influenced the relative reinforcing value of using active or non-active modes of transportation to/from school. NON AST parents from the high SES schools said staying out of the rain and/or cold was a reason why they drive to/from school. For all drivers, they would sometimes choose to walk on days when the weather was nice. Parents from the high SES schools were the only participants to identify the trip to/from school as part of an overall active lifestyle and the best mode choice if the circumstances allowed it. However, overall, parents did not value the journey
to/from school as a significant opportunity for physical activity. Although parents acknowledged that schools do promote general health initiatives, how children get to/from school was perceived as more of a parental responsibility. While parents thought there was little that schools could do to promote AST, suggestions such as “walkpooling,” campaigns, and curriculum integrations were discussed. Even though school travel was not discussed among parents, relationships with people in the neighbourhood and school community was an important consideration for parents when they were choosing a place to live. While many parents said that their neighbourhood was adequate for active modes of transportation, the busyness of roads and traffic concerns were influencing factors for NON AST parents from School R; there was some suggestion among NON AST parents that more green play spaces would make their neighbourhoods more appealing to walk in.
### Table 4.1: Results Summary – Perspectives & Attitudes

<table>
<thead>
<tr>
<th>Parents’ Perspectives on School Travel</th>
</tr>
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</table>
| **Travel Mode Choice** | Parent is travel mode decision maker  
Habitual behaviour |
| **Trip To/From School** | When I was a kid everyone walked to/from school  
Times have changed – lifestyles + perceptions of safety (media) |
| **Independent Travel Concerns** | Traffic/road safety$^E$  
Stranger danger  
Maturity/skill level |
| **Overcoming Independent Travel Concerns** | Observation/phone contact  
Group travel/social capital |

<table>
<thead>
<tr>
<th>Attitudes</th>
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</thead>
</table>
| **AST Advantages** | Health & physical activity  
Interaction with the environment  
Family time  
Time to socialize with friends and neighbours$^A$ |
| **AST Disadvantages** | Lousy weather  
Takes time  
None |
| **NON AST Advantages** | Efficiency  
Protection from the weather  
Easier (carry things, comfortable, convenient) |
| **NON AST Disadvantages** | Bad for the environment$^A$  
Lack of physical activity$^A$  
Cost of gas$^B$ |

$^A$ High SES parents only.  
$^B$ NON AST parents only.  
$^C$ Low SES parents only.  
$^D$ AST parents only.  
$^E$ Looping streets only.  
$^F$ School B and T only.
Table 4.2: Results Summary – Factors Influencing Mode Choice

<table>
<thead>
<tr>
<th>Factors Influencing Travel Mode Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavioural Cost</strong></td>
</tr>
<tr>
<td>Easiest (simple &amp; convenient; childcare services helps(^c))</td>
</tr>
<tr>
<td>Efficiency</td>
</tr>
<tr>
<td>Distance</td>
</tr>
<tr>
<td>Trip chain (sports, multiple schools, appointments)</td>
</tr>
<tr>
<td>Work Schedules</td>
</tr>
<tr>
<td>Childcare facilities(^B)</td>
</tr>
<tr>
<td>AM versus PM</td>
</tr>
<tr>
<td><strong>Reinforcing Value</strong></td>
</tr>
<tr>
<td>Weather</td>
</tr>
<tr>
<td>Lucky to walk(^A,D)</td>
</tr>
<tr>
<td>Part of an active healthy lifestyle(^A)</td>
</tr>
<tr>
<td>School travel not discussed among parents</td>
</tr>
<tr>
<td>Not an important opportunity for physical activity</td>
</tr>
<tr>
<td>Schools try to promote AST(^A)</td>
</tr>
<tr>
<td>School travel is a parental issue</td>
</tr>
<tr>
<td>Busy roads/traffic safety(^B,E)</td>
</tr>
<tr>
<td>How to make neighbourhoods more walkable: everything is fine, more green play spaces(^F)</td>
</tr>
<tr>
<td><strong>Self Selection</strong></td>
</tr>
<tr>
<td>Walk to school</td>
</tr>
<tr>
<td>Walk everywhere (in general)</td>
</tr>
<tr>
<td>Neighbourhood/school community (except School D)</td>
</tr>
</tbody>
</table>

* A. High SES parents only.  D. AST parents only.
* B. NON AST parents only.  E. Looping streets only.
* C. Low SES parents only.  F. School B and T only.
Chapter 5
Discussion

The results of this qualitative study reaffirm that there is a complex interplay of factors influencing how children get to and from school. Most importantly, what emerged from these study findings was the notion of an initial two-step school travel mode decision-making process, whereby parents first decide if they will escort their child to/from school; if they do wish to escort their child, the second decision is whether to use active or non-active modes of transportation. This study’s sampling framework allowed me to look at similarities and differences in perceptions and experiences of school travel among parents who differed in SES, and whose children attend school in different areas of Toronto. Although the primary focus of this thesis is travel mode choice, I have noted similarities and differences among parents with respect to SES and the built environment. Exactly how SES and built environment factors influence these similarities and differences is still unknown. Moreover, exploring the role of gender and ethnicity on school travel mode choice is beyond the scope of this study and requires further inquiry.

For parents in this study, travel to/from school becomes a habitual behaviour where they do not consciously think about these decisions. However, while the first decision about independent travel may be revisited when their children are around twelve years of age, the second decision related to mode choice is somewhat more flexible and should therefore be the focus for intervention. These two decisions are dictated by different but related factors. In this chapter I will discuss the study findings in relation to current research in the field, and how they contribute to the overall AST literature.

1 Parental Perspectives on School Travel

According to the Panter et al. (2008) framework, youth characteristics, perceptions, and attitudes are equally important as parents in the decision-making process on mode choice. Only one study (Cole et al., 2007) has reported a positive association between a child’s preference for walking and AST. In the current study, however, parents reported that their children had little to no say in how they travelled to and from school. Indeed, Fesperman et al.’s (2008) qualitative study highlights the importance of parents/caregivers in promoting AST, as walking and biking safely
to and from school is “more of a parental decision” (p. 4). Likewise, McMillan’s (2007) framework assumes that up to a certain age the decision about how a child gets to school is most often made by the parents or caregivers. Most of the parents in this study commented that they may consider allowing their children to travel to/from school independently at the age of twelve, in preparation for the change in school starting in grade seven. However, parents are still the ones who make the decision of whether to escort their child to/from school. For parents in the current study, this decision was influenced largely by safety concerns.

2 Decision One - To Escort or Not to Escort?

2.1 Safety Concerns

Parental concerns about traffic/road safety and stranger danger are not new to school travel literature. Issues of general traffic safety are a consistent concern of parents and a reported barrier to AST (CDC, 2007; Cole et al., 2007; Kerr et al., 2006). Specifically, parents with traffic concerns are more likely to accompany their child to school (Bringolf-Isler et al., 2008). Parental concerns about personal safety have also been shown in the literature to be associated with decreased use of active modes of school transportation (Bringolf-Isler et al., 2008; McMillan, 2007); these fears are heightened if children commute to school independently (McMillan, 2007). In a qualitative study by Ahlport et al. (2008), parents described their anxiety about letting their children travel solo because they would not know if they arrived to school safely. In the current study, concerns about road safety were identified by NON AST parents from schools R and T (looping streets) as hesitations in letting their children travel independently; fear of violence and kidnapping was also reported by parents from all schools as being significant fears in allowing their children to travel alone to/from school.

Greves et al. (2007) is the only study in the literature to have addressed the potential role of the media in AST behaviours. In the focus groups that they conducted with immigrant parents and grandparents of school-age children from low income neighbourhoods in Seattle, most participants cited a media story of kidnapping or threatened kidnapping near their child’s school. Parents in this study also spoke about the role of the media in heightening people’s general perception of safety concerns, claiming that these potential dangers were “top of mind” because they are “much more publicized” in the media today. Further research on the role of the media on children’s independent travel is warranted.
Sirard and Slater (2008) suggest that there needs to be a better understanding of parents’ perceptions of their child’s ability to navigate the physical and social environments that they encounter as they commute. The safety skills necessary to walk to/from school have been associated with non-active forms of transportation in previous research (Wen et al., 2008). Greves et al. (2007) found that parents’ perception of their school-aged child’s immature judgment (e.g., ability to follow traffic rules) was a barrier to AST. In this study, rather than influencing travel mode choice per se, both AST and NON AST parents explained that one of the fears or hesitations of allowing their children to travel independently to/from school was that they were still “not ready” or “responsible enough” to manoeuvre through streets and traffic alone. Johnston et al. (2006) assessed a walking school bus initiative incorporating pedestrian safety skill instruction for inner public school children in Seattle. Using a pre-post test design, the researchers surveyed children’s mode of transportation and also directly observed pedestrian safety behaviours. The initiative was deemed successful, as the school saw increases in children walking to school and decreases in children being driven to school. Furthermore, they found slight improvements in observed measures of street crossing safety, suggesting that teaching children the skills necessary to enable them to commute to school safely may be effective in promoting AST. If parents perceive that their children have the skills necessary to safety travel to/from school, this may lessen their hesitation in allowing them to travel alone, thereby increasing the potential for active travel.

In the transportation literature it has been shown that older children travel more independently compared to younger children (Johansson, 2006; Prezza et al., 2001). Parents’ attitude toward independent travel has also been found to be related to child maturity levels and the need to protect their child (Johansson, 2006). Social factors also seem to influence independent mobility, as Prezza et al. (2001) found that mothers having stronger neighbourhood relations (e.g., interactions with other mothers) allowed their children greater outdoor play and autonomy.

### 2.2 Overcoming Safety Concerns

Social capital is a concept originally stemming from sociology and political science to describe resources available to individuals through their social networks (Kawachi, 1999). Frumkin, Frank, and Jackson (2004) describe social capital as “the glue that helps bind communities together” consisting of “attitudes such as trust and reciprocity, and behaviours such as social
network and civil participation (p. 184). Studies show that perceptions of the social environment are related to how children get to/from school. For example, McDonald (2007b) found that higher measures of social cohesion such as neighbourhood social trust and cohesion increased the probability of walking to school. In this study, parents from all schools described social capital and travelling with groups of friends as a way of overcoming the fears and hesitations associated with allowing their children to travel to/from school alone. Knowing people in the neighbourhood gave them a sense of comfort that someone would be keeping an eye on their children as they travelled to/from school, while “safety in numbers” gave parents some peace of mind that their children would arrive at school/home unharmed.

In summary, for parents in this study the decision of whether to escort their children to/from school was influenced by safety concerns about independent travel. Fear of road crossings and traffic were expressed by NON AST parents from the schools situated in neighbourhoods with looping streets. All parents discussed violence and kidnapping concerns; media stories played a role in keeping these fears top of mind. A child’s maturity levels and lack of safety skills also contributed to parental concerns about independent travel. Therefore, it is not surprising that there is evidence in the literature that independent travel among children increases with age. Comments from the participants in the current study suggest that social capital may help parents overcome these hesitations. For participants in this study, allowing their children to travel independently (without adult supervision) automatically eliminates driving as an alternate mode choice. However, if parents do decide to escort their child(ren), the second step in the decision making process is whether to use active or inactive modes to get to/from school. In this study, the alternatives were primarily walking or driving.

3 Decision Two – Walk or Drive?

An attitude toward a behaviour refers to the degree to which one has a favourable or unfavourable appraisal of the behaviour in question (Ajzen, 1991). For example, if a person believes AST has many advantages and perceived positive outcomes compared to perceived disadvantages, he or she is more likely to walk/cycle to/from school. However, although parents in this study discussed what they perceived to be the advantages and disadvantages of walking and driving to/from school, these attitudes did not always explain travel mode choice. For example, while the opportunity to interact with the natural environment was identified as an
advantage of AST and the negative environmental consequences of driving were viewed as a
disadvantage, these were not factors parents identified as influencing why they chose to walk or
drive to/from school. Furthermore, many parents (both AST and NON) claimed that there were
no disadvantages associated with active modes of transportation, yet some parents still opted to
drive for other reasons.

3.1 Behavioural Economics

Unlike recreational physical activity, which requires a high level of motivation, utilitarian
physical activity is performed for a purpose, such as getting to school, and therefore may be
easier to build into a daily schedule (Frumkin, et al., 2004). Indeed, parents in this study
described school transport choice as this daily “routine” or “habitual behaviour.” Aarts,
Verplanken and Van Knippenberg (1998) describe three characteristics of habit. First, habitual
behaviours are prompted by a specific goal (e.g., getting my child to school on time). Second,
positive (reinforcing) experiences make it more likely that an individual will repeat the
behaviour because it becomes more strongly associated with the initial goal (e.g., driving was a
quick and convenient way to get my child to school on time). Third, performance of a behaviour
in a specific situation facilitates activating the mental representations of the action by situational
cues (e.g., I always drive my child to school if I’m running late and it’s raining outside).

Aarts et al. (1998) suggest that habitual choices (under similar circumstances) follow cognitive
shortcuts in that they no longer require a process of reasoning or evaluative interpretation to
occur, which might be inferred from rational choice theories such as the Theory of Planned
Behaviour. Yet, according to Ajzen (1991), it is important to remember that “past behaviour is
best treated not as a measure of habit but as a reflection of all factors that determine the
behaviour of interest” (Ajzen, 1991, p. 203). Therefore, I am not discrediting the TPB as a
potential theory to help explain and understand parental mode choice; however, Behavioural
Economics extends beyond a rational choice theory approach and considers the characteristics
and contexts of both the sedentary and physically active alternatives (Epstein & Roemmich,
2001). Furthermore, although there is some overlap in the theoretical constructs of both the TPB
and Behavioural Economics (e.g., perceived control from the TPB may be conceptualized as
being similar to the construct of available alternatives from BE), attitudes reported by parents
reflecting behavioural cost and the reinforcing value of walking and/or driving were most salient
in dictating school travel mode choice. For these reasons, Behavioural Economics may be more profitably used in explaining and understanding travel mode choice to/from school.

3.2 Behavioural Cost

The choice of an alternative depends on the behavioural cost, or work needed to access an activity. Within the BE and physical activity studies, varying the proximity of physically active and sedentary alternatives is one way of manipulating their accessibility or convenience (Raynor et al., 1998). For the purposes of this study, however, behavioural cost or convenience refers to how much effort (including social and physical cost) or time is associated with walking and/or driving.

Parents explained that they would choose the fastest and easiest mode to travel to/from school with their children. Within the study context, the “easiest” or most “convenient” mode referred to one that was efficient, simple, direct, comfortable, and/or allowed parents to arrive at multiple destinations on time. There is little mention of convenience as a factor influencing travel mode choice in the AST literature. Only McMillan (2007) reported that the perception of driving as a convenient travel mode was negatively associated with walking and cycling to school. In the current study, convenience appears to dictate both AST and NON AST travel decisions. When prompted to provide any suggestions of ways schools could support AST, some of the NON AST parents from the low SES schools discussed the need for daycare centres or breakfasts programs to “make my life a lot easier” by possibly cutting back on the amount of time spent commuting in the morning and increasing the overall convenience of school travel. Research to date has not addressed the accessibility of childcare services in parental travel mode choice.

Parents spoke about factors that dictated the feasibility of either walking or driving to/from school. Such factors call into question whether walking to/from school is always a choice, or only a choice under certain circumstances. For example, both AST and NON AST parents explained how their work schedules dictated whether they were able to travel with their children to/from school since “the school world and the working world are not in sync.” In their qualitative studies, Ahlport et al. (2008) and Greves et al. (2007) reported that inflexible work schedules often prevented parents from North Carolina and Seattle, respectively, from walking with their children to school in. In this study, many parents said that the days they did not work were usually the days they actively travelled to/from school with their kids. Work schedules as a
barrier to AST for these non AST parents was related to the time pressures associated with having to be at work at a certain time. Four studies in the AST literature found an association between children being driven to school and their parents’ car journey to work (Bringolf-Isler et al., 2008; Merom et al., 2006; Schlossberg et al., 2006; Wen et al., 2008). In addition, parents in Ahlport et al.’s (2008) qualitative study reported the convenience of driving their children to school on their way to work.

Destinations other than work, such as extra-curricular activities or multiple school drop offs, were also part of the broader trip chain to/from school for NON AST parents. These participants reported that they needed to drive in order to get everyone to where they needed to be on time. Therefore, these multiple destinations/trip chain influences are associated with the size or number of children per household. Similar to the current study findings, Ahlport et al. (2008) found walking to school was inconvenient for parents if their children attended different schools. These findings are contrary, however, to McDonald (2008a) and McMillan (2007), who suggest that having siblings makes children less likely to be driven to school and more likely to walk because it increases parents’ comfort in allowing children to walk together in a group. However, if siblings attend different schools they might not necessarily always be travelling together in groups.

Several studies in the AST literature show that a greater number of children walk home in the afternoon than walk to school in the morning (Merom et al., 2005; Saksvig et al., 2007; Schlossberg, 2005; Ziviani, Kopeshke, & Wadley, 2006), including in the GTA (Buliung et al., 2009). This could be explained by the time-pressures associated with the need for family members to get to school/work on time in the mornings (Yarlagadda & Srinivasan, 2008) or the unavailability of parents to drive their children home in the afternoon since school ends before the end of a typical workday (Schlossberg et al., 2005 & 2006). Based on the findings from this study, both may be operating. For many parents, the feasibility of walking as a mode choice differed in the AM and PM periods because of trip chain and work influences described above. Furthermore, as suggested by qualitative research conducted in the United States, after school may be an easier time for parents to walk with their children (Greves et al. (2007) given that during chaotic weekday mornings they would have to get up earlier and make the extra effort to get organized in order to actively travel (Ahlport et al., 2008). Although the majority of parents in my study consistently used the same travel mode in the AM and PM periods, fluctuation in
travel mode among those who usually actively travelled was seen on the trip to school, as parents would sometimes drive their children to early morning practices or drop them off on their way to work. On the contrary, changes in travel mode choice among NON AST parents and their children was most often seen for the trip home from school in the afternoon (i.e., when usual drivers did sometimes walk they tended to walk home from school). This increase in active travel in the afternoon period seemed to be a time issue, as weekday mornings “seems to be worse” with “so much to do.” After school, however, time is “not so much of an issue.”

In summary, parents decided to walk or drive to/from school depending on which alternative was associated with the least amount of behavioural cost or effort. For these participants, this meant the most efficient and convenient mode; efficiency and convenience, in turn, were primarily dictated by work schedules and other trip chain destinations, including extra-curricular activities and daycare services. These factors also contributed to the time pressures associated with weekday mornings.

3.3 Reinforcing Value

Choices are based on the reinforcing value of the activity. Epstein and Roemmich (2001) suggest that making physical activity more reinforcing is the most direct approach to reducing sedentary behaviour because regardless of the sedentary options, people will opt for the physically active alternative. However, the reinforcing value of an activity differs among individuals and little is known about how to increase the reinforcing value of physical activity (Epstein et al., 1999). Within this study context, the construct of reinforcing value refers to parents’ desire to walk or drive to/from school. It is important to keep in mind that the constructs of behavioural cost and reinforcing value are related in that a behaviour or travel mode is reinforced if it provides an individual what he/she desires (i.e., remains convenient). As presented in the previous section, walking or driving to/from school will be reinforcing if it is (and remains) easy, efficient, and/or convenient. Within this study context and for the purposes of discussing these results, I conceptualized reinforcing value in terms of the factors that continued to make one mode choice more or less appealing than another. For some parents in this study, weather and the opportunity to be able to walk to/from school with their child as part of an overall active healthy lifestyle were some of the factors influencing their mode choice by increasing or decreasing the appeal of walking and/or driving.
Both AST and NON parents in the current study explained how their mode choice often changed depending on the weather. While parents who typically walked would choose to drive in bad weather, NON parents said that they would sometimes choose to walk on days when it was nice outside. Similar findings have been found in the AST literature, with bad weather being a reported barrier to AST (CDC, 2007), and a main reason for parents to drive their children to school (Bringolf-Islcer et al., 2008; Schlossberg et al., 2006). However, Robertson-Wilson et al. (2008) found season, average temperature, and days of precipitation to have no influence on AST. It is important to note that their study focused on Ontario high school students; perhaps bad weather is a greater concern for parents who have younger, elementary-aged children compared to high school students who may have more travel autonomy. Nonetheless, the effect of weather on AST across Canadian seasons is not fully understood. The current research was conducted during the late fall months, aiming to understand why parents may choose to drive even when the weather is ideal. It is evident based on these results, however, that weather was a factor in modifying usual mode choice.

The high SES parents in this study considered themselves “lucky” to have the opportunity to walk to/from school with their children because of their living and working situations. They claimed that walking was the best mode if circumstances allowed it. Furthermore, these high SES, AST parents were the only participants who said that they walked as an overall “active healthy lifestyle.” Therefore, walking to/from school was the preferred or most reinforcing mode choice for some parents in this study because they perceived it as being inherently good to incorporate active travel in everyday life. Little research has addressed if or how parents’ attitudes toward physical activity and the benefits of walking for transport are related to travel behaviour (Merom et al., 2006).

Interestingly, although parents in this study recognized the potential health benefits (physical and mental) associated with AST as an advantage of active travel and AST was part of an active healthy lifestyle for the high SES parents who typically did walk to/from school, overall, parents did not value the trips to/from school for physical activity purposes because their children were either already active enough or the trip was too short to have any perceived health benefit to them. Therefore, even though some high SES parents said they walked as part of their lifestyle, overall, AST for physical activity purposes does not appear to be a significant consideration or
priority. Perhaps framing AST in a different way (e.g., emphasis on the environmental benefits of walking to/from school) would be a more effective way of promoting active travel.

Parents talked about the role of schools in promoting or reinforcing AST participation. Although they acknowledged the general health initiatives at their children’s school to “encourage an active lifestyle,” only parents at the high SES schools spoke about specific “Walk to School Day” events. This is interesting, given that all schools across the TDSB take part in the International Walk to School Week as part of Toronto Schools on the Move, an initiative aimed at promoting healthy active school environments (TDSB website, 2009). Perhaps these high SES parents are more informed of such initiatives. In response to the School Profile Questionnaires (see Appendix M for summary) that were distributed at each school, all project facilitators (with the exception of School B) reported AST initiatives at their school such as annual walk to school events. Although such initiatives do take place at these schools, parents did not attribute these efforts or school travel policies (e.g., with the exception of School T, scooters, roller blades and skateboard are not allowed on school property) for having a significant impact on their travel mode decisions. Furthermore, parents also did not think there was much more schools could do to reinforce AST, since they felt transportation decision-making was ultimately “more of a parental issue than a school issue.” However, the role of schools in AST promotion cannot be disregarded completely, as school policy may be associated with the reinforcing value and/or behavioural cost associated with mode choices. These implications will be discussed further in Chapter 6.

Unlike results reported by Timperio et al. (2006), parents in this study claimed that the behaviours of other children and parents in the neighbourhood had no influence on their personal travel mode choices. Indeed, travel to and from school was not something that parents in the community often talked about with other parents, but instead was described as more of a “personal thing.” This would suggest that parents do not experience any external reinforcement during discussions with other people in the neighbourhood if, for example, they increase their walking trips and/or decrease their driving trips to/from school. Nonetheless, participants talked about the importance of developing relationships with the people in their neighbourhood and maintaining friendships. The concept of social capital and a sense of overall neighbourhood and school community were significant considerations for all parents (with the exception of School D) when they were deciding where to live.
I asked parents what they would change about their neighbourhoods to make it a better (or more reinforcing) place to walk in. This was a difficult question for the participants and many said that “everything is fine.” Despite these struggles, however, the NON AST parents from School R (high SES, looping streets) were the only ones to discuss road safety and the unpleasantness of the traffic noise as a factor influencing travel mode choice. For these parents, the negative impact of the road traffic in their neighbourhood decreased the appeal of walking to/from school. Only parents from School B and T suggested that the availability of clean and safe green play spaces would improve their neighbourhood and make walking a more desirable mode choice.

In summary, weather can modify usual mode choice. While warm and sunny weather motivates individuals to use active modes of transportation, cold and rainy weather can act as a deterrent. Although high SES parents who typically walk to/from school attribute their mode choice to an active healthy lifestyle, overall, participants did not value school travel per se as an important opportunity for physical activity. In the following section I will analyze how SES and the built environment can influence school travel mode choice.

4 Role of Built Environment and SES on School Travel

To date, only Kerr et al. (2006) have quantitatively explored the possible effect of interactions between SES variables and a neighbourhood walkability index on active commuting to school. They found that income was not related to commuting behaviour in low walkability neighbourhoods, and that AST was highest when parental concerns about active commuting to school were low. Parents in high walkability, low income neighbourhoods had the most concerns. These results suggest that concerns about child safety take precedence even within highly walkable environments.

Although the primary objective of this study was to explore parental travel mode choices, the sampling framework allowed for the comparison of influencing factors among parents of different SES backgrounds, and whose children attended schools situated in different built environments (i.e., gridded vs. looping streets) across Toronto. While parents described built environment characteristics such as distance/proximity and busy roads as influencing their travel mode choices, issues of time and convenience were more central to this decision-making process. However, influence of the built environment cannot be disregarded, as it contributes to these issues of time and convenience.
4.1 Built Environment

Behavioural Economics research aims “to understand how modifying environmental variables influence choice” (Faith, Rose, Pietrobelli & Epstein, 2006, p. 1501). It is generally accepted that children who live in urban areas (Bringolf-Isler et al., 2008; Martin et al., 2007; McDonald 2008a; Merom et al., 2006; Nelson et al., 2008; Pabayo & Gauvin, 2008) are more likely to use active modes of transportation compared to those who attend rural schools (Robertson-Wilson et al., 2008). Other aspects of the built environment such as residential density (Kerr et al., 2006) and street connectivity (Kerr et al., 2006; Mota et al., 2007) have been positively associated with AST. On the other hand, studies have also found no relationship between AST and other built environment factors such as the presence of sidewalks (Mota et al., 2007), neighbourhood aesthetics (Evenson et al., 2006), and intersection density (Kerr et al., 2006). Although the built environment/urban form plays a role in travel behaviour in both McMillan’s (2005) and Panter et al.’s (2008) framework, these relationships remain unclear.

As discussed, efficiency of the trip to/from school was an important component of the convenience/behavioural cost factor influencing parental travel mode choice in this study. How fast one can get to/from school was inextricably linked with distance/proximity. The relationship between distance to school and actively commuting to school has been the most researched topic in the AST literature. It is intuitive that a negative relationship exists between distance to school and AST (Merom et al., 2006; Schlossberg et al., 2006; Timperio et al., 2006) and a positive association exists between distance and non-active modes of transportation (Bringolf-Isler et al., 2008; Wen et al., 2008). In their 2008 review, Sirard and Slater reported positive associations between both perceived and objective measures of distance and being driven to/from school. In this study, AST and NON parents (irrespective of the type of built environment that they lived in) explained that they walked and drove because of their proximity and distance to school, respectively.

According to the Toronto District School Board (TDSB) transportation policies, a 1.6 km (1 mile) distance is a reasonable walking distance from school, as school bus transportation is provided for students in junior kindergarten to grade 5 only if they live 1.6 km or more from the school (TDSB, 2000). Therefore, the difference between perceived versus objective measures of distance is important, as not all parents and children may perceive 1.6 km as a reasonable
walking distance to/from school. Parents in the current study perceived a “reasonable” one-way AST trip to/from school to be no more than 15 or 20 minutes. This may, however, be contingent on the frequency of travel (i.e., parents may be willing to travel longer, less times per week). This short, 15-20 minute ideal travel time is perhaps the reason why parents did not see the journey to/from school as an important opportunity for physical activity. However, school travel can contribute to the accumulation of 90 additional minutes of daily physical activity, as per Canada’s physical activity guidelines for children and youth (Health Canada and Canadian Society for Exercise Physiology, 2002). Perhaps these guidelines should be promoted more to children and parents.

Self selection refers to the argument that differences in transportation behaviour occur because of people’s preferences for certain types of neighbourhoods and/or travel choice (Frank & Kavage, 2008). For example, individuals who prefer walking to driving will “self-select” into pedestrian-friendly neighbourhoods. Lee and Moudon (2004) argue that self-selection can weaken some of the research findings on the environmental determinants of physical activity. In the AST literature, there is qualitative evidence to suggest that some parents do choose where to live, in part, so that their children can actively travel to/from school (Ahlport et al., 2008). Parents in this study were asked why they chose to live in their neighbourhood and if they considered the ability of their children to actively travel to/from school. For both AST and NON AST parents, distance from school played a key factor in the decision about where to live, as they spoke about the “conscious decision” to live in an area close to the school. Although distance from school is on parents’ minds when they are looking for a place to live, other influencing factors still come into play, since driving to/from school still occurs among parents who live within a “reasonable distance” from school.

Furthermore, parents discussed the ability to walk to places in general (high mixed land use) as being an important consideration when choosing a place to live. In studies reviewed by Sirard and Slater (2008), results indicate that perceptions of having places to walk (in addition to school) are positively associated with active commuting to school. A sense of neighbourhood and/or school community was also a factor when choosing a home for parents from all schools (with the exception of School D). McMillan and Chavis (1986) define sense of community as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be
together” (p. 9). In addition to proximity of social networks contributing to the emergence of neighbourhood communities (Valentine, 2001), other built environment factors also influence a sense of community. Nasar and Julian (1995) hypothesized that mixed land use (neighbourhoods combining homes, schools, stores, parks, etc.) would increase walking and, in turn, encourage social contacts, therefore building a sense of community. As they predicted, the researchers found that the single-use residential neighbourhood had less sense of community than the neighbourhoods with mixed land uses (Frumkin et al., 2004). In the current study, however, distinct differences between schools situated in different areas (i.e., gridded vs. looping streets) and the importance of community did not clearly emerge.

Issues of general traffic safety are a consistent concern of parents and a reported barrier to AST (CDC, 2007; Cole et al., 2007; Kerr et al., 2006). Specifically, major roads en route to school have been found to be a barrier to AST (Bringolf-Isler et al., 2008; Timperio et al., 2006). Notably, in this study NON AST parents from School R (high SES, looping streets) were the only ones to discuss busyness of the roads as a factor influencing their travel mode choice. Most of these parents were concerned about one particular main street bordering the school because of the constant heavy traffic. Furthermore, concerns about road safety were also identified by NON AST parents from schools R and T (looping streets) as hesitations in allowing their children travel alone to/from school. Bringolf-Isler et al. (2008) found in their study that parents with traffic concerns were more likely to accompany their child to school.

The traffic environment can influence mode choice as well as attitudes toward independent travel. Children’s independent mobility has been found to be greatest in rural environments and smallest in urban areas, where social and traffic risks have been found to limit children’s independent mobility (Kytta, 1997). A study by Johansson (2006) focused on 8- to 11-year olds’ trips to organized leisure activities and the environmental and parental factors influencing mode choice and attitudes toward independent travel. The traffic environment was found to have one of the strongest built environment relationships with attitudes and travel mode choice, as few cars, low speeds, presence of pedestrian crossings and/or tunnels were correlated with a negative attitude towards driving their children, fewer car trips, and more independent travel. Since parents who expressed a high level of trust in the urban environment (e.g., parents thought it was safe for their child to use underpasses or walk along alleyways) were more positive towards
independent travel, Johansson suggested that urban planners aim to reach a standard where most parents would come to trust the environment.

The role of neighbourhood aesthetics and AST is not fully understood in the literature, perhaps because “aesthetics” is often used as a broad term referring to trees and scenery. In this study, NON-AST parents were asked what would help them make more active transportation choices for the trip to/from school and what would make their neighbourhood a better (more reinforcing) place to walk in. Most participants struggled to suggest ways of improving the built environment because they perceived everything as being “okay.” A couple of NON AST parents from School B and School T suggested that more “green play space” would make the area around the school more walking-friendly. According to Valentine (2001), urban parks and open spaces are highly valued spaces for social encounters. For example, parents value these landscapes “as non-materialistic environments where their children can enjoy controlled adventure and exploration while they meet up with and talk to other adults” (Valentine, 2001, p. 239).

As previously discussed, built environment factors can influence one’s sense of community. In this study, parents struggled to suggest ways of improving walkability around their child’s school, failing to make a connection between how physical environments can influence some of the social characteristics (e.g., social capital) they discussed in relation to school travel. Pedestrian-oriented or mixed land use neighbourhood designs (the gridded street schools) are expected to enhance social capital because they enable individuals to interact with each other (Frumkin et al., 2004). For example, spontaneous conversations with neighbours can increase a sense of trust and connection between people and their neighbourhood (Leyden, 2003). Results from a study by Leyden (2003) confirm this theory, as people living in mixed-use neighbourhoods were more likely to display four key aspects of social capital: knowing their neighbours, participate politically, trust others, and be involved in their community socially. In the current study, however, social capital and children walking in groups to/from school were described by parents from all schools as a way of overcoming their hesitations surrounding independent travel. With the exception of School D, parents from all schools also discussed a sense of school and neighbourhood community as a reason for choosing where to live.

For parents in this study, attitudes surrounding perceived time and convenience factors were more salient than the built environment in dictating travel mode choice. However, as discussed in
this section, it is important to recognize how the built environment inherently influences time, convenience and reinforcing value, as well as social space characteristics relating to school travel. This study also raises questions about how individuals perceive the environment within this research context. For example, perhaps Toronto (including its inner suburbs) is overall a walkable city and therefore major differences in perceived environmental characteristics were not seen across the different schools in this study. Given that we live within a built environment, it is easy to take for granted and not consciously think about its effects on the complex interplay of personal circumstances, attitudes, and relationships contributing to school travel behaviour.

4.2 Socio-Economic Status

Studies reviewed by Sirard and Slater (2008) found that measures of parental employment, education level and income were either not associated or inversely associated with AST. However, the reasons for these differences in SES groups are not understood. In this study, differences were seen between parents from high and low SES schools with respect to some of the factors influencing travel mode choice. There were no differences between SES groups in the safety concerns surrounding independent travel. It is important to note that there was greater ethnic diversity among participants from the low SES schools. Although ethnic and cultural influences may have likely played a role in travel mode choice, for the purposes of my thesis I did not focus on these potential influences, nor did any readily emerge from the interview data.

As discussed in an earlier section, parents from the high SES schools (AST only) believed that everyone who has the opportunity to travel actively to/from school should do it. These parents considered themselves “lucky” to be able to walk to/from school “because we can.” School AST initiatives were readily recalled by high SES parents in this study. Furthermore, only high SES parents who typically used active modes of transportation explained that they did so as part of an overall “active healthy lifestyle.” Although some literature suggests that children from high SES families may be more likely to use non active modes (Duncan et al., 2008; Spallek et al., 2006), the value of regular physical activity may play a larger role in travel mode choice among more affluent parents in this study who actively commute to/from school. In turn, these parents also recognize that they are fortunate enough to be able to actively commute. Furthermore, these high SES parents may be more aware, or have greater access to health and physical activity knowledge.
High SES parents also showed unique attitudes toward active and non-active modes of transportation. Only high SES parents (both AST and NON-AST) talked about a “lack of exercise” as a significant disadvantage of driving to/from school. They identified driving as a less advantageous mode choice with respect to physical activity, health, and environmental damage. These parents also discussed the “social aspect” of walking to/from school as an important advantage of AST. The opportunity to talk to neighbours, friends and family on the trip to/from school conveyed a sense of neighbourhood community that was not discussed among parents from the low SES groups.

Unfortunately, low SES and lack of social capital often coincide (Kawachi, 1999). It has been hypothesized that income inequality is detrimental for health because it decreases social capital (Frumkin et al., 2004). A study by Kawachi, Kennedy, Lochner, and Prothrow-Stith (1997) confirmed this hypothesis, as they found that “disinvestment in social capital [or decreased levels of social trust] appears to be one of the pathways through which growing income inequality exerts its effects on population-level mortality (p. 1495). Although in this study the social aspect of AST was not described by parents as a reason to walk versus drive to/from school, this acknowledgement of the social aspect of AST among high SES parents is worth highlighting. Furthermore, Frumkin et al. (2004) suggest that “Income inequality might also be a marker for disinvestment in human capital, such as decreased school funding, which could in turn contribute to poor health” (p. 182), or in this case, contribute to a decreased investment in AST and/or general active healthy lifestyle initiatives and promotion.

Based on the findings from this study, the value of regular physical activity may play a larger role in travel mode choice to/from school among more affluent parents. The opportunity to talk to neighbours, friends and family on the trip to/from school was described as an advantage of AST among the high SES parents that was not discussed among parents from the low SES groups. These differences between parents from high and low SES schools are worth highlighting since the inverse association between SES and AST is not fully understood in the literature. Furthermore, overall inconsistencies in AST correlates may be explained by the 2-step decision-making process identified in the current study, as different factors were found to influence each decision. While escort decisions were dictated by road/traffic and personal safety concerns, time and convenience factors contributed to travel mode decision-making.
5 Contributions to the AST Literature

5.1 Current Frameworks

McMillan (2005) presented the first conceptual framework to highlight factors that may influence parents’ decisions about how elementary school children travel to school and the hypothesized relationship between the factors and children’s travel behaviour. However, many questions regarding children’s travel behaviour to school remained and McMillan acknowledged that “the question of what determines the travel behaviour for the trip to school has yet to be determined” (p. 452). In 2008, Panter et al. developed a conceptual framework for youth’s active travel, highlighting the four main domains of influence on active travel behaviour discussed in Chapter 2. Most recently, the Ecological and Cognitive Active Commuting (ECAC) Framework (see Appendix C; Sirard & Slater, 2008) has been developed by researchers in the fields of urban planning, transportation, and physical activity; it incorporates elements of the social ecological model, the MacMillan framework, and constructs from social cognitive theory (Bandura, 1986).

Although all of these frameworks provide researchers with an intricate picture of the complex interplay of correlates related to school travel, they fail to specify how these decisions are made. Using the findings from this study I will present an empirically informed framework that can help researchers and practitioners better understand this process.

5.2 School Travel Parental Decision-Making Framework

The School Travel Parental Decision-Making Framework was developed based on the current study findings:
School travel mode choice is a two-step process. First, independent travel is dictated by parents’ concerns about road/traffic and their child’s personal safety, as well as their maturity level and ability to navigate their way to/from school safety. Maintaining communication with their children by phone and having their children travel with friends and/or knowing other people in the neighbourhoods may help in calming parents’ concerns about independent travel. If parents choose to escort their child, the next decision is whether to walk with or drive their child to/from school. Parents choose transportation modes that require low behavioural cost. In other words, parents opt for the easiest and most convenient way to travel. Factors that contribute to the ease or convenience of a transportation mode can depend on time and distance (e.g., how can I get my child to school in the least amount of time?) as well as behavioural costs associated with multiple trip chain destinations. Parents also make travel decisions based on the availability and feasibility
of alternatives. If parents get off work at a certain time and the trip home includes stops at school and daycare facilities, driving may be the most convenient way to accomplish all of these tasks within a reasonable amount of time. Factors other than time and convenience can also reinforce travel modes. Parents in the current study were more motivated to walk to/from school on a nice day rather than when it was cold and rainy outside. Some parents walked because they enjoyed an active healthy lifestyle. While busy and noisy roads made it unpleasant for walking for some parents, more green play spaces may be more aesthetically pleasing and contribute to school neighbourhoods that are more pleasant to walk in.

As discussed, it is important to recognize the broader physical and social environments within which travel decisions are made. The urban design of a neighbourhood dictates an individual’s proximity and time associated with travel to/from school, work, and childcare services, as well as influences feelings of safety and connection with other people. Furthermore, the resources available to families (e.g., work schedules, time, social capital) are influenced, in part, by SES. Because the built environment and SES shape perceptions of safety and convenience, they must be taken into consideration in order to understand how parents make decisions around travel to/from school. The implications of this study and future directions of AST research will be discussed in the following chapter.
Chapter 6
Implications and Future Directions

The 2-step decision-making process presented in Chapter 5 is applicable to parents who do not generally allow their children to travel to/from school independently. These two decisions are influenced by different factors, and therefore different interventions are required to support independent travel and encourage AST. Travel mode choice (decision #2) may be more malleable (at least for children under 12 years of age) and therefore should be a primary focus for intervention. In this chapter, I will first present implications of these two decisions using the five levels of influence in the ecological model of health behaviours (McLeroy et al., 1988) presented in Chapter 1: intrapersonal, interpersonal, organizational, community, and public policy. Second, the strengths and limitations of the study will be discussed, along with questions for future research in the area of AST. Finally, the overall study conclusions will be presented.

1 To Escort or Not to Escort?

1.1 Intrapersonal (e.g., knowledge, attitude, skills)

On an individual level, it is not enough to promote AST as something parents “ought to do” because it is an opportunity to increase levels of daily physical activity and benefits the environment by reducing our carbon footprint. In this study, these attitudes were not always the most salient in parents’ travel mode choices. Instead, addressing some of the hesitations about independent travel may increase parents’ desire to allow their children to actively commute on their own. To ease parents’ fears of crossing main roads and stranger danger, emphasis should be placed on pedestrian safety skills and self-defense training in younger grades. If parents are confident in their children’s ability to safely navigate their social and built environments on their way to/from school, they may be less hesitant to allow them to walk to/from school independently while they are still attending elementary school.

1.2 Interpersonal (e.g., family, friends, social networks)

At an interpersonal level, parents and children need to be able to network and communicate with others about travel to/from school. Parents in this study talked about feeling more comfortable if their children travelled in groups and knew a lot of people in the neighbourhood. “Walkpooling”
was suggested by one parent as an initiative that would make her consider walking to/from school more often.

The first Walking School Bus (WSB) program was started in Canada in 1996 (Go for Green, 2004), and since then they have been developed in the UK, USA, Denmark, and New Zealand. A WSB involves parents or other adults escorting children along a walking route to/from school (Kingham & Ussher, 2007). In a study conducted in Christchurch, New Zealand, Kingham and Ussher found that a WSB initiative increased social connections among participants and a heightened sense of community. Parent coordinators also reported increases in children’s independence and the time saved by not having to escort their children to school every day as significant benefits of the WSB. In a study conducted in California, Sirard, Alhassan, Spencer, and Robinson (2008) found that the WSB was a feasible initiative in their sample and that students who took part in a WSB increased their moderate-to-vigorous-physical activity levels by 14 minutes per day compared to students who were driven to school. Despite these advantages, the long-term effectiveness and sustainability of a WSB program is unknown. WSB leaders in the Eyler et al. (2008) study reported that they were expected to volunteer for less than an hour at a time on Walk-to-School Days; the success of the program depended “on a good volunteer base” (p. 144). Given that a lack of time was a barrier to AST for the parents in the current study, maintaining a committed parent volunteer base for a WSB program may not be realistic. Instead of a formal, school-based WSB program, perhaps communication around “walkpooling” can be announced through school newsletters and parent councils. This could be a way for parents to connect with other individuals who are interested in sharing the responsibility of supervising a group of children on the trip to/from school.

1.3 Organizational (e.g., organizations, social institutions)

As mentioned above, road/traffic and stranger danger contribute to parents’ hesitations surrounding independent travel to/from school. The Toronto District School Board already has a Safe Arrival Program in place, where parents are notified if their child is not in class. However, this might not ease a parent’s concern about the safe arrival of their child at school because of the time it takes for teachers to take attendance and administration to notify parents if their child is not at school. Perhaps informing parents that their child can call home from the office upon their
arrival will provide the more timely feedback they may need to lessen their hesitations about independent travel.

1.4 Community (e.g., relationships among organizations)

At a community level, schools can work together with outside organizations to heighten perceptions of neighbourhood safety and social capital. In this study, School T has a partnership with the Toronto Police where students are trained to patrol the crosswalk at the front of the school. Similar programs, along with visible police presence within school neighbourhoods during peak arrival and departure times may also decrease safety concerns and therefore increase the potential for an increase in AST participation.

1.5 Public Policy (e.g., national, provincial, local)

According to Sirard and Slater’s (2008), review policy-level correlates have not been well studied in the AST literature, although it appears as though policy can have significant effects on the use of active mode of transportation to/from school. Based on the results of the current study, policies around modifiable built environment factors, as well as transportation and land-use planning policies for developing neighbourhoods may be significant in AST promotion.

In 2005, Gilbert and O’Brien developed guidelines directed towards reducing the amount of car travel by children and youth in Ontario, as well as reducing the amount of all road traffic near children and youth. They recommend that after identifying where children and youth want and need to go (e.g., to/from school), safe ways of getting there by foot need to be provided. This can be assessed, in part, by ensuring there are pedestrian crossings and traffic signals at road crossings and/or two-stage crossings on wide roads, increasing the visibility of pedestrian crossings to drivers, separating walking routes from high speed traffic, and reducing traffic speeds where walking routes must be close to traffic (Gilbert & O’Brien, 2005). Such initiatives would help address parents’ fears about road/traffic safety.

2 Walk With or Drive Child?

According to Behavioural Economics, AST may be encouraged if walking was the most convenient and reinforcing mode choice compared to the driving alternative. Based on the results of this study, by addressing trip chain factors and the time pressures associated with weekday
mornings, as well as creating school neighbourhoods that are enjoyable to walk in, AST may become a more desired mode choice. While interventions addressing parental fears associated with independent travel may be implemented at all levels of influence, mode choice decisions, however, require more upstream interventions at the organizational, community, and public policy levels. These broader approaches have the potential to filter down and influence individuals on an intra/interpersonal level (e.g., public policy supporting AST may influence social norms surrounding school travel).

2.1 Organizational (e.g., organizations, social institutions)

At a school level, the challenge is creating sustainable ways of supporting AST that are not onerous on school administration and staff. Based on the results of this study, changes in schoolyard supervision times may allow for more AST participation. The schools in the current study provide about 15 minutes of yard supervision before the start and after the end of the school day. Parents claimed they could not walk because of the time pressures associated with work schedules and other trip chain factors in the morning; earlier yard supervision may provide parents that extra time (decrease behavioural cost) they need to actively commute to school and get to work on time with peace of mind, knowing that their child is being supervised.

A parent’s place of work is also an important organization that influences travel mode decision making. Work schedules can dictate how much or how little time parents have to get to school and other destinations in the trip chain, as well as the feasibility of picking up their children at the end of the school day. Based on the results of this study, if workplaces provide parents with more flexible working schedules, walking to/from school may be a realistic and easier mode choice.

2.2 Community (e.g., relationships among organizations)

At a community level, schools, childcare services and recreation centres can work together to provide services that may alleviate some of the time pressures associated with travel to/from school. For example, in-house daycare services may eliminate multiple drop off/pick up destinations for parents, therefore decreasing the time it takes to travel to/from school and the necessity to drive. Likewise, recreation centres within or close to schools may allow parents to
drop their children off at school earlier (or pick them up later) if extra-curricular programming is offered on site.

2.3 Public Policy (e.g., national, provincial, local)

At a broader level, policies can also be implemented to make walking to and from school an easier and more appealing mode choice. Gilbert and O’Brien’s (2005) guidelines were developed so that municipalities could become more child- and youth- friendly in their transport and land-use planning projects. They recommend that transport and land-use planning issues must be seen from the perspectives of children and youth, which could involve opportunities for youth to review new neighbourhood plans and proposals. Keeping this child-centered perspective in mind, Sirard and Slater (2008) noted that it is “impractical or impossible for children to walk or bicycle to school, sport practice, or a friend’s house” (p.372) if they live in isolated housing developments. Given that issues surrounding time (distance), trip chain (work and childcare), and safety (social capital) were expressed by parents in the current study, these results have implications for school citing and neighbourhood design policies, and can contribute to creating a transportation system that enhances sustainability and quality of life (Metrolinx, 2009).

Although school location determines how far students must travel to/from school, and shorter distances may be the best way to encourage AST (Larsen et al, 2009), a recent study by Van Dyck, Cardon, Deforche and De Bourdeaudhuij (2009) found a positive association between a larger distance to school and more cycling for transport. However, the authors suggest that these different results could be explained by Belgian adolescents’ positive attitude towards cycling. According to the parents in this current study, the time it takes for the journey to school (not the straight-line distance) needs to be taken into consideration when designing school neighbourhoods. Furthermore, schools need to be situated within high mixed land-use areas where children can live, play, shop, and go to school. A mixed land-use school neighbourhood will not only make the journey to/from school quicker but green spaces to play in and shops will increase people traffic in the area, leading to greater potential for interaction, social capital, and heightened perceptions of safety.

According to Behavioural Economics, AST can be promoted by not only decreasing its behavioural cost (i.e., make walking more convenient), but also by increasing the behavioural cost of NON AST (i.e., make driving less convenient). For example, policies limiting parking
and easily accessible drop-off areas around school communities would make dropping off/picking up children by car less convenient and possibly a less desirable mode choice. Furthermore, creating “no vehicle zones” around school areas would make driving a more time-consuming and effortful travel alternative.

In summary, implications for this study can be made at the intrapersonal, interpersonal, organizational, community, and public policy levels of the social ecological model. Some of the hesitations around independent travel may be addressed by heightening children’s pedestrian safety skills, communication around “walkpooling” through school newsletters and parent councils, quicker safe arrival feedback, community partnerships with Toronto Police, and safe road crossings. While earlier yard supervision may provide parents that extra time they need to actively commute to school and get to work on time with peace of mind, knowing that their child is being supervised, providing parents with more flexible working schedules may make walking to/from school a more realistic and easier mode choice. While public policy can ensure that school neighbourhoods are places where children can live, play, shop, and actively travel to/from school safely, limiting parking and vehicle use around schools may make driving to/from school less convenient for parents.

3 Study Strengths and Limitations

First, the study sampling framework was a strength of this study, as it allowed for cross-site comparisons of factors influencing mode choice among people of different SES backgrounds, whose children attended schools located in different areas across Toronto. While differences between SES groups emerged in some of the attitudes surrounding AST as part of an overall active healthy lifestyle, road/traffic concerns were particularly reported by parents living in the looping street neighbourhoods. Second, the use of interpreters allowed me to interview parents who are traditionally excluded in research studies. Third, this study also utilized a relatively large sample size compared to other AST qualitative research and explicitly addressed the atheoretical nature of the AST literature. Finally, this exploratory study also used photo voice and input about school policy from key informants at each of the sites in order to better contextualize the study findings.

It is also important to consider the limitations of this study and the applicability of the findings. First, parents who typically escorted their children to/from school were invited to participate in
this study, and therefore it is unknown if factors influencing travel decisions are similar for those parents who do not escort their children. Second, because parents who drive to/from school were unable to take photographs, analysis of the photo voice data was limited. It would have been interesting to compare drivers’ and walkers’ perceptions of the social and physical environment through photography, and it would have enriched the NON AST interviews. Third, some NON AST parents were recruited who did not live within the school catchment area. Because the intent of this study was to explore how choices between AST and NON travel modes are made for individuals living within a “reasonable” distance from school, these interviews were often not as in depth, as distance was the central factor influencing mode choice. Nevertheless, these parents provided valuable insight into their travel experiences to/from school. Due to the qualitative nature of this study, these findings are not intended to be generalizable across all school locations in various cities and countries. However, it can assist AST researcher and practitioners in thinking about how physical and social environments can influence the behavioural cost and reinforcing value of AST and NON AST alternatives.

4 Future Directions

This study raises many questions that warrant further exploration. First, can modifications in the behavioural cost and/or reinforcing value of mode choice alternatives from these study findings actually change travel behaviour? Only through experimental interventions will the effect of such modifications be truly understood. Furthermore, what is the relative importance of behavioural cost and reinforcing value factors on mode choice? Can the reinforcing value of AST be enhanced, or should efforts focus on decreasing the convenience of driving to/from school? Second, do the factors influencing the decision to escort a child to/from school and/or travel mode choice differ among different populations? For example, would findings differ among parents who were unable to escort their child, or for parents and children with differing physical abilities? Third, are these findings unique to Toronto compared to other major urban centres and if so, how come? Fourth, how do SES and built environment factors moderate attitudes/factors at each level of this two-step decision-making process? For example, how much influence can changes in the built environments have on decision making? Designing school neighbourhoods with few thoroughfare streets may ease parents’ fears around independent travel; however, flexible work hours may play a more significant role on travel mode choice than any built environment intervention. This may be important for future quantitative research modeling
parental mode choice, as the influence of the built environment may be more significant in explaining escorting decision and not the mode choice per se. This may help explain inconsistent findings in the AST literature regarding the role of BE (and other) factors on travel mode choice. Since escort and mode choices have not been examined as two distinct decisions in the literature, future research can examine the relative importance of the influencing factors identified in the current study on escort and mode choices. Finally, given that school transportation appears to be influenced by a complex interplay of intrapersonal, social, organizational and built environment factors, continued research collaboration from sectors such as physical activity, transport/urban planning and social geographies will remain essential.

5 Conclusions

Although the findings of this study reaffirm many of the correlates found in the AST literature, it also changes how AST and travel mode choice is conceptualized. Based on the findings from this study, travel to/from school is a habitual behaviour that involves a 2-step parental decision-making process and these choices are influenced by related but different factors. While escort decisions are dictated by road/traffic and personal safety concerns, Behavioural Economics can be used to understand how the behavioural cost and reinforcing value of travel mode alternatives dictate mode choice. Behavioural Economics alone cannot explain school travel, as broader SES and built environment factors appear to moderate their effects on mode choice. The School Travel Parental Decision-Making Framework presented in this thesis should be used to design, implement and evaluate future AST interventions.
Chapter 7
Personal Reflection

Throughout this thesis project, I have learned the role of a school-based researcher, as well as the challenges of qualitative interviews and working with translators. I have become more aware of the ethical issues, strengths, and limitations of using a photo voice methodology to investigate travel to and from school. Most of all, this project has allowed me to stretch my thinking beyond the confines of physical activity research. I can now better appreciate the importance of interdisciplinary research and collaboration in understanding how to increase physical activity levels of Canadian children and how to promote sustainable and supportive transportation options. In this final chapter I will present my reflections on these experiences.

1 School-Based Research

This was my first time conducting research within a school setting. Although I had rightly anticipated that there would be unique challenges at each of the four different schools (e.g., participant recruitment at School T), I had not considered what it would be like to be a researcher entering into four very different school communities. Although all of the sampled schools showed interest in the study and agreed to participate, staff and participants at each school responded very differently to the research process.

The initial information meeting was the first contact I had with teacher facilitators, principals, and study participants. At the high SES schools, all of the participants attended the meetings, listened to the study instructions intently, and asked questions. At the low SES schools, these information meetings were much more disengaged, with people coming in and out of the meeting; some participants displayed obvious signs of a lack of enthusiasm. I wondered why these participants (the ones who did not listen when I spoke or who rolled their eyes when I asked them to fill out the participant information sheet), were there at all? Why had they agreed to participate? What had they been told by the teacher facilitator? Perhaps they were just anxious, unsure about who I was and what I was doing there. Although I tried my best to explain my role as a researcher, perhaps these parents did not know what or how to ask me questions. When working with similar populations in the future, perhaps one-on-one information meetings
would be a more effective and engaging way to communicate with participants about my and their role in the research process.

How I was received by the school during the interviews also differed at every school. For example, on my first day interviewing parents at School R there was an announcement made welcoming the “BEAT Researchers” and I talked with teachers and students in the hallways. At School T, on the other hand, I felt invisible, as if no one really knew who I was or what I was doing wandering around their school trying to find a private space to conduct my interviews. I quickly learned that each school had different priorities, and the BEAT Project was not always at the top of everyone’s list. I realized that my job was not only to collect data, but also to create and maintain a rapport with school principals, teachers, secretaries, students and all parents I came into contact with.

2 Interviews

The interview process started with scheduling interview times and ensuring that participants showed up to their appointments. I found it more difficult at the low SES schools to schedule and coordinate interview times with parents’ busy work schedules. Most of these parents required reminder phone calls for interviews, and I ended up giving out my personal cell phone number to many of the participants at these schools in order to ensure they could contact me. I was nervous before and during the first couple of interviews. At some points I found myself moving quickly from one question to the next, until I realized that silences that I thought were awkward can in fact be a great opportunity for interviewees to think and speak.

3 Lost in Translation

Three participants in this study were interviewed with the help of an interpreter (1 Cantonese and 2 Vietnamese). Sending some background information about BEAT to the interpreter was helpful because he/she had an idea of what the project was about before arriving at the interview. Working with an interpreter was challenging because, instead of the interview being a conversation between myself and the interviewee, I found myself so preoccupied with what the interpreter was trying to say that I felt as if I was not really acknowledging the participant. I even noticed that my use of language may have been exclusionary, using “she” or “he” in my
questioning rather than “you.” I tended to direct my questions and attention to the interpreter because that was the person I understood and was conversing with.

Overall, the interviews with the interpreters were not as rich because I spent a lot of the time clarifying answers and trying to re-phrase questions. It was also difficult to really know how the participant interpreted the interview questions. Sometimes I tried to probe in order to elicit a more detailed response, but oftentimes the answers remained vague. Although participants did their best to answer direct questions, I suspect that a lot of the context behind these participants’ stories was “lost in translation.” The use of interpreters is an important strength of this study; however, these challenges need to be taken into consideration when contemplating the use of such services. Additional interview time may be required, and perhaps a modified interview guide in addressing key questions and simplified prompts.

4 Photo Voice

Overall, parents did not express any difficulties taking the photographs. Although not everyone took the recommended eight photographs on the way to and from school, this was expected and did not compromise the quality of the photograph descriptions. Overall, I was not surprised by the kinds of photographs that were taken by participants, although I had not anticipated some of the ethical issues that arose with the use of the digital cameras.

Because parents who drove their child(ren) to/from school were not asked to take photographs, only half of the participants discussed photographs in their interviews. This is one limitation of the study, as photograph comparisons could not be made between the AST and NON AST participants. Among the parents who did take photographs, they used photography to show aspects of the built environment that concerned them and aspects that they liked to look at or were aesthetically pleasing. Overall, parents took many photographs of intersections, traffic, road crossings, and issues surrounding sidewalk safety. Parents used these photos to re-emphasize their concerns about travel to/from school. This was not surprising, given that these are things one would easily notice or think about on the journey to/from school and because the study instructions were to “take photographs of places, objects, or things that you notice, like, or dislike on your journey to and from school.” Some parents followed study instructions very closely by taking exactly 16 photographs, even if it meant taking photographs just for the sake of it.
After completing and submitting applications to the University of Toronto and the TDSB Ethics Boards, I assumed that any potential ethical matters had been considered. However, this was not the case, as the use of photo voice caused some discomfort for both me, as the researcher, and one study participant in particular. First, while conducting interviews at one of the low SES schools, I was experiencing some difficulty getting one of the guardians to come in for his scheduled interview time. I approached him one day after school and, to my surprise, he handed me the digital camera he had used to take photographs and we set up an interview time for the following day; he did not show up. I decided to upload his photographs; they were inappropriate and not relevant to the current study. I did not feel comfortable pursuing the participant for the interview and decided to remove him from the study.

Second, one mother at the other low SES school was very anxious about both her and her son being interviewed and taking photographs. The mother sat in on her son’s interview and claimed that the camera did not work and that was the reason why he did not take any photographs. After talking with this participant, I learned that she did not want the school to know where her and her children were living because it was not situated within the school catchment area. Since she valued the quality of the school and in-house daycare facilities, she feared that if the school knew this she would be forced to send her children to another school. In this situation, I had to reassure the mother that her identity, address, and any photographs taken would remain confidential outside of the immediate research team.

Based on my experiences using photo voice, and the ethical issues it raised for me, there are many strengths, challenges, and things to consider before using this methodology. One of the first questions any researcher should ask before using a photo voice methodology is, “What do I want to get out of the photographs?” Before the start of this study, I obviously was unsure of exactly what kinds of photographs parents would take; although I chose to use the photographs as prompts for discussion, researchers should have a good idea of how the photographs will be used and analyzed. This may depend on the logistical issues surrounding the use of photo voice. For example, in this study parents who drove to/from school were not able to take photographs while driving, and therefore photograph data were collected from only half of the participants. This had a significant effect on how I was able to use the data, eliminating the opportunity for cross-mode comparison. Photo voice, in this study, also required the use of a laptop computer to upload the photographs; this was often a distraction for both me and the participants, especially
when I encountered technical difficulties. Furthermore, researchers must remember that participants are not always going to follow study instructions; do not be surprised if the cameras are not always used the way you had intended.

If you do decide to use photo voice, carefully consider what it is that you are asking participants to take photographs of. I found that there is a fine line between providing the study instructions and prompting participants to take photographs of what you want or expect them to. In this study, the photographs really helped conversation, as I found the AST parents to be more engaged in the interview as they described their photographs and reiterated some of their insights and concerns. The photographs were also very helpful in adding depth to my conversations with parents whose first language was not English, or with people who were not overly talkative. Description of the photographs provided a good break for participants to talk freely, as the focus was directed away from them and to the photographs. In this particular study, photo voice was an effective way of getting people to talk about their environments; I found this to be more difficult with the NON AST participants who did not take photographs. Given that photo voice methodologies have only recently started being used in physical activity literature, it may be an effective and creative way of gaining insight into people’s perspectives within physical activity research.
Afterward

When I was a kid I walked to school in the snow barefoot, uphill, both ways. Okay, so maybe my trek to/from school was not quite as challenging. However, trying to understand school travel throughout this entire thesis project was no easy task. From managing the logistics of a research project to interpretation of the data, this experience has changed my perception of what it means to be a researcher. Throughout this process I realized that I was doing more than just research – I was building rapport with everyone I met within each of the school communities, I was providing comfort and a listening ear to parents who just wanted to talk, I was a problem solver who needed to be resourceful when things did not always go as planned, and I was (and will continue to be) a resource for parents who were interested in these study findings and learning more about AST promotion. I learned that a qualitative analysis is an ongoing process, and that there will always be more questions to ask and more answers to discover.
References


Toronto District School Board (TDSB). (2000). *Transportation of students* No. E.0


Appendices
Appendix A: Determinants of Children/Youth’s Travel Behaviour (Panter et al., 2008)

**Physical Environmental Factors**
- Attributes of neighbourhood
- Provision of facilities
- Personal safety
- Road safety
- Social interaction
- Facilities to assist walking and cycling
- Urban form
- Aesthetics

**Attributes of destination and surroundings**
- **Destination**
  - Facilities at destination
  - School size
  - School policy
- **Characteristics of surroundings**
  - Level of urbanisation
  - Urban form
  - Sidewalk completeness

**Attributes of route**
- Length
- Route directness
- Road safety
- Urban form and topography
- Friends houses/shops
- Parks/greenspaces

**Individual factors**
- Parental characteristics
  - e.g., Household income
  - Car access
  - Occupational status
- Parental attitudes
  - e.g., Attitudes towards active transport
  - Attitudes to environment and climate change

**Perceptions of the environment**
- Parental Perceptions
- Youth Perceptions

**Decision making process on mode choice**
- Operates on child
- Operates on adolescent

**Outcomes**
- Youth TPA
- Walk or cycle to destination
- Inactive travel to destination

**Main moderators**
- Age of youth
- Gender
- Distance to destination

**External factors**
- e.g., Weather
- Cost of travel
- Government policy
Appendix B: Conceptual Framework of an Elementary-Aged Child’s Travel Behaviour (Adapted from McMillan, 2005)

**Mediating Factors**
- Neighbourhood safety
- Traffic safety
- Household transportation options

**Moderating Factors**
- Social/cultural norms
- Parental attitudes
- Sociodemographics

Urban Form

Parental decision-making

Children’s travel behaviour (trip to school)
Appendix C: Ecological and Cognitive Active Commuting (ECAC) Framework
(Adapted from Sirard and Slater, 2008)
### Appendix D: AST Review Summary

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### Appendix E: Sampling Framework and Methods - Qualitative Studies

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<td><strong>Purpose</strong></td>
<td>-Describe barriers/facilitators of walking/biking to school as reported by parents and children who live within a 1.5-mile radius of their school.</td>
<td>-Identify policies and related factors that may influence ATS programs/initiatives.</td>
<td>-To qualitatively investigate how a comprehensive use of the 5 P strategies that influence physical activity (preparation, promotions, programs, policies, and physical projects) might bolster AST initiatives and improve their chances of success.</td>
<td>-To examine beliefs and barriers among immigrant families for walking to school and school breakfast participation in order to guide development of a school-based obesity prevention program.</td>
<td>-What influences and motivators have caused teenagers who are old enough to drive to regularly cycle to school instead?</td>
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<td><strong>Sampling</strong></td>
<td>-Convenience Sample -Children who regularly or occasionally walked/cycle to/from school = active travelers (AT); other students = non-active travelers (NAT) - Fourth- and fifth-grade students (and their parents) who lived close enough to walk or bicycle to school (live within 1.5 miles)</td>
<td>-Elementary schools having a current or past ATS initiative; the overall sample of schools had to be racially, ethnically and economically diverse.</td>
<td>-Representatives of two elementary schools with ATS initiatives and their communities. -Site selection based on having: *multiple public agencies and/or organizations involved in the ATS initiative *at least three of the 5 P strategies, including some policy or environmental intervention, as part of the ATS initiative *a heavily used road as a primary access route to school. *school and community locations and initiatives.</td>
<td>-Purposive sampling frame to obtain representation from different ethnic groups. -Participants were recruited through pediatric clinics, community centres and elementary schools. -Adults eligible for inclusion were foreign-born, spoke one of the study languages as the primary language in the home, and lived with an elementary school child or grandchild.</td>
<td>-Participants’ principals deemed them as the most recognizable commuter cyclists at their school who were old enough to drive.</td>
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<td>Sample Demographics</td>
<td>-Average age of child = 10 years -48.6% boys -48.6% girls -Evenly split between grades 4 and 5 -Parents: 94.6% White (not representative of school district - 53.3% White)</td>
<td>-Elementary schools in 7 states - 69 stakeholders involved in schools’ AST initiatives including teachers, principles, community organizers, school officials, city officials &amp; public safety representatives</td>
<td>-School A: small town in north eastern North Carolina; -School B: central area of a larger city in central North Carolina -School A &amp; B: had several residential neighbourhoods within a quarter-mile radius -Key stakeholders identified on the basis of their knowledge and involvement in AST initiatives -Several of the interviewees also were parents or grandparents of children who were attending or had previously attended the elementary schools</td>
<td>-Each focus group included 8–12 people; total of 17 Vietnamese, 18 Somali, and 18 Spanish speakers -86% were female -Education: 45% had grade school or less, 32% had a high school degree, and 10% had a college degree or more, with 13% not responding -5% were grandparents; 95% had at least 2 children in the home; 41% had 4 or more children - Most participants had lived in the U.S. between 5 and 15 years</td>
<td>-All participants came from different secondary schools within the city of Vancouver (half from East Side, and half from the more affluent West Side; 4 were of European descent, 1 Latino, 1 Asian-Canadian; 4 were 16-year olds in Grade 11; 2 were 17-year olds in Grade 12; 4 male, 2 female; 1 had a driver’s license; 3 had their learner’s permit; 2 had not begun the driver licensing process; as a group, they cycled to school more than two-thirds of the time (68 percent); 4 of the households had two cars; 1 had three cars; 1 had one car (suggesting that the decision to regularly cycle was a personal choice)</td>
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<td>Sample Size</td>
<td>-Children: 37</td>
<td>-9 elementary schools in 7 states - 69 stakeholders involved in schools’ AST initiatives</td>
<td>-16 people were interviewed (8 participants connected with School A, 7 connected with School B, and 1 connected with both)</td>
<td>-Six focus groups (n = 53)</td>
<td>-6 teenage cyclists who were old enough to drive a car</td>
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<td>-Parents: 37 (11 NAT and 26 AT of each)</td>
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<td>Data Collection</td>
<td>-12 focus groups (6 parent groups and 6 student groups)</td>
<td>-Interviews</td>
<td>-Interviews</td>
<td>-2 focus groups were held in each of three languages: Vietnamese, Spanish, and Somali</td>
<td>-Individual and group interview -Life histories</td>
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<td>-Both parent and student AT and NAT focus groups</td>
<td>-66 interviews conducted in person + audio recorded; 3 conducted by phone; 1 interview conducted in Oromo, with the remaining 67 in English.</td>
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<td>Data Analysis</td>
<td>-Common themes + differences between AT and NAT groups</td>
<td>-Case study &amp; cross-site comparison - Overall themes were further subdivided and categorized.</td>
<td>-Comparative case study analysis -Thematic analysis to examine patterns related to the 5 Ps</td>
<td>-The socio-ecological model was used to organize the themes and subthemes according to individual/family, community, institutional and environment factors</td>
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Appendix F: Participant Interview Guide

BEAT Interview Schedule for Parents/Guardians

Today we are going to talk about the environment and how it affects your decision about how your child gets to and from school. There are no right or wrong answers; this is not a test, as there is no right or wrong way to think about your neighbourhood. After the question segment I’ll ask you to draw your route to/from school on a map; then we are going to take a look at some of the photographs that you took, and identify on the map, the location of the photographs.

Everything you say will remain confidential. You do not have to answer any questions you are not comfortable answering. If you want to stop the interview at any point, just let me know. There are no repercussions for not completing the interview. I’ll be recording our conversation – is that okay with you? Do you have any questions or concerns?

Section #1: Factors influencing travel mode choice

Factors
- Let’s first look at the trip to school. Can you tell me who makes the decision about how [insert name during interview] travels to school?
- What factors influence the decision about how [insert name during interview] gets there?
  
  Prompts:
  a) Are there any aspects of the neighbourhood that influence your decision?
  b) Would you say that your child’s age or gender influences this decision?
  c) What would you consider to be an unreasonable distance to walk to/from school?
  d) Safety - What is it about your neighbourhood that makes you feel safe/unsafe?
  e) Traffic
  f) Weather
  g) Environmental concerns
  h) Concern about fuel prices
- Has [insert name during interview] always walked/biked/been driven/taken the bus to/from school? If not, when did his/her mode of transportation change? Why?
- Are there any fluctuations in your transportation mode throughout the week (also refer to information sheet)? Why/why not?
- Describe a typical weekday morning – what activities do you and your family do before the journey to school? Do these activities influence your mode of transportation? Why/why not?
- Where do you go after you drop [insert name during interview] off at school? How do you get there? Does this influence how you get [insert name during interview] to school in the morning? Why/why not?
- Now let’s look at the trip home from school. Can you tell me who makes the decision about how [insert name during interview] travels home from school?
- Are the factors influencing the decision about how [insert name during interview] gets home from school similar to what we have discussed in relation to the journey to school - does how you decide on your mode of transportation change? If so, why?
What activities do you and your family do at the end of the school day? Do these activities influence the mode of transportation used by how [insert name during interview]? Why/why not?

Are there any fluctuations in you transportation mode throughout the week (also refer to information sheet)? Why/why not?

How do you think your child would like to travel to/from school? Why?

Do you ever let [insert name during interview] decide how he/she will travel? Explain why/why not?

Would you allow [insert name during interview] to walk to school alone? With other parents? With friends? Why/why not?

**Attitudes**
- What are some of the **advantages** of driving or using public transportation?
- What are some of the **disadvantages** of driving or using public transportation?
- What are some of the **advantages** of using active modes of transportation to/from school like walking or cycling?
- What are some of the **disadvantages** of using active modes of transportation to/from school like walking or cycling?

*Reflect back on responses: given the advantages and disadvantages you provided, it seems as though ______________ seems to be the biggest defining factor?*

Is school transport an important issue for you? Is it something that you think about?

**Norms**
- Do you think that patterns of walking/cycling to school have changed over time since you were a child? Why or why not?
- How do most kids at your child’s school get there? Do you talk to other parents about how kids get to/from school? Do their behaviours influence your travel mode decisions?
- Is your child’s school supportive of walking/cycling to and from school?
- Has your thinking about school transportation changed recently – why/why not?

**Prompts:**
a) Environmental concerns
b) Concern about fuel prices

**Control+ Barriers & Facilitators**
- How easy or difficult do you find it to make active school transport decisions?
- How much control do you have over some of the factors you described earlier?
- What are the biggest barriers for you to active school transport? How have you overcome these (if a walker – how do you maintain AST)?
- What might help you (or further help you) in making the decision to let your child walk or cycle to school?
- Do you think your workplace influences travel mode choice to school? What changes could be made at your workplace to help encourage AST?
Section #2: Spatial Mapping & Photo voice

Spatial Mapping Exercise

This is a map of your neighbourhood (identify location of home and school). Please outline your route to/from school.

- Is your route to school always the same as the route home from school? If so, why/why not? If it is different, please also draw it on the map (need two different pens for this)
- Do you ever come a different way to school or go home a different way?
- Is there any particular environmental factor that you have considered while choosing route to school (e.g., distance, street type, congestion, safety)?
- What was your reasoning (if any) for choosing to live in this particular neighbourhood?

Prompts:
- a) Type of neighbourhood
- b) Close to public transit

Photo voice

Now we are going to take a look at your photographs (find out how many the participants took on the journey to versus from school). I’ll ask you a few questions about each photo. If you can remember where you took each photo, please identify the location on the map by photo number (e.g., write the number “1” on the map where you took photograph number one and number ’2’ for photograph number two and so on for each photograph). Can you also let me know whether it is a photograph of something on the journey to school or from school (colour coded)?

For EACH Photo:
- Why did you take this photo?
  
  Prompts: What do you like/dislike about this place; how does this place influence your decision about [insert name during interview] way of getting to/from school?
- Do you remember where you took this photo? If so, please identify the location on the map (colour-coded).

Additional photo voice questions
- What is your favourite place on your way to/from school with your child? Is this your child’s favourite place too? Why/Why not?
- Is there anything else about the buildings, streets or neighbourhood that you would like to tell me about in relation to [insert name during interview] journey to/from school that you think I should know about?
Appendix G: Theory of Reasoned Action and Theory of Planned Behaviour (Adapted from Ajzen, 1991)

- Behavioural Beliefs
- Evaluation of Behavioural Outcomes
- Normative Beliefs
- Motivation to Comply
- Control Beliefs
- Perceived Power
- Perceived Behavioural Control
- Subjective Norms
- Intentions
- Behaviour
- Attitudes
Appendix H: Behavioural Economics
(Adapted from Epstein and Roemmich, 2001)

Environmental Modifiers
   Access
   Availability
   Reinforcing Value
   Time (delayed/immediate)

Individual Differences
   Impulsivity
   Reinforcer sensitivity

Behavioural Choice
   Physical Activity (AST)
   vs
   Sedentary (NON AST)
Appendix I: Recruitment Flyer

Participants Needed

**BEAT Project**

**Built Environment Active Transport**

Funded by the Heart and Stroke Foundation of Canada

The BEAT Project research team wants to find out about the reasons why children and parents go to and from school different ways, and how the environment (things like neighbourhoods, buildings, roads or sidewalks, traffic, crime) influence people’s choices.

If you drive or walk/cycle to/from school with your child, and if you choose to participate, you and your child will be given the use of a digital camera to take photographs of things that interest you on your journey to and from school. We then want to ask some questions about the photographs and about other things you and your child think and feel about the buildings, streets and neighbourhood while travelling to and from school.

The project will show how the environments we live in influence our choices about how we go to school. The findings from this study may help your school and people in the community make the environment better so that you can choose more active ways of travelling to and from school. If you participate your child will receive a certificate, a disposable camera and lots of other free stuff! In addition, your child’s school will receive $1000 for participating in the project!

If you would like to hear more about the project to see if you would like to participate, you can contact the researcher, Dr. Caroline Fusco at 416-946-7717 or c.fusco@utoronto.ca

Dr. Caroline Fusco, Ph.D., Faculty of Physical Education and Health, University of Toronto
55 Harbord Street, Toronto, ON, M5S 2W6

www.BEAT.utoronto.ca
## Appendix J: Sample Demographics

<table>
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<th>Code</th>
<th>Notes</th>
<th>Travel Mode</th>
<th>Distance to School (m)</th>
<th>Mode Fluctuation?</th>
<th>Gender</th>
<th>R/ship to child</th>
<th>Birth Place</th>
<th>Ethnicity</th>
<th>Age</th>
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<td>Length of Time at Current Home (yrs)</td>
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<td># Household Members Holding Valid Drivers License</td>
<td>Spouse Currently Employed?</td>
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Appendix K: Study Protocol

Study 1 Protocol Overview – Parents/Guardians

Facilitator Responsibilities?
- Recruitment & distribution of information letters
- Book a quiet room/space to conduct interviews (designated BEAT Office?)
- Scheduling of initial information meeting and interview dates & times

Supplies/Prep for Initial Meeting with Parents/Caregivers
“BEAT Bag” consists of:
- Camera (participants tag?)
- Study/camera instructions
- Copy of study information letter (with contact info)
- Copy of Consent Forms (participant copy)
- BEAT Pen
- Interview date/time/location reminder

*Remember to record camera serial number on demographic info form (with participant ID)
  - Check date-stamped
  - Check batteries
  - Check set to 16 shot mode – Image Mode (Normal [2592])

Supplies: batteries (AA), pens, consent forms (researcher copy to be signed); copies of demographic information sheet; BEAT interview calendar for the week.

Initial Meeting - Introduction to the BEAT Project
BEAT stands for the Built Environment and Active Transport. The aim of the project is to understand more about the trip to and from school and how the environment shapes this trip.

We will ask you to 3 things:
- We will lend you a digital camera to take photos during one trip to school and one trip from school to home
- We will ask you to draw your route to and from school on a map
- We will ask you questions about the photos and what you think about how you get to and from school.

2) Review information sheet – any questions?
3) Complete consent form (researcher + extra copy?)

This is a consent form outlining the research purpose and procedures. All information that you and your child provide will remain confidential and will only be seen by members of the research team. Any identifying information will be removed and you and your child will be assigned an ID number. You and your child may refuse to participate or answer any questions asked of you or him/her in the interview without penalty or
explanation. You and your child can withdraw from the study at any time and you have the option to withdraw the information that you have provided. Please take a few minutes to review the consent form, and by signing it you accept the conditions of the research process.

4) Complete family participant information survey (direct questions to parents)
I'm going to start by asking you some questions about your background and school travel routines; then I’ll show you how to operate the cameras.

5) Give study instructions:
BEAT is exploring how children and parents travel to and from school. As part of this project, we are asking both children and parents to take photos during this trip. While we understand there may be some discussions among families, we would prefer that parents and children make their own decisions about what to take photos of. We don't have any specific instructions about what to take photos of - it could be of specific objects, places or things that you like or dislike, enjoy or worry about. For example, if it was winter, someone might take photos of a 'snowman' or of icy footpaths. However, we do request that you try not to take photos of people. For parents, if you are driving, we also request that you do not take photos. There are no right or wrong photos – take photos of things that show us what the trip to and from school is like for you. You have a total of 16 photos (approximately 8 for the trip to school and 8 for the trip home from school) you can take and we will talk about them with you the day after you take them. Any questions?

6) Give camera instructions (see other document)
7) Explain contents of BEAT Bag
8) Schedule interview date/time and instruct participants to return camera and BEAT bag when they come in for the interview

Preparation/Supplies for Interview: review demographic information sheet and adjust interview questions accordingly (i.e., based on travel behaviors); interview schedule; print neighborhood map; turn laptop on

Supplies: laptop; USB connector for camera; recorder (x 2) with extra AAA batteries + USB connector, pens (different colors), free stuff

Interview
1) Collect cameras and download photos – save as file by ID number
2) Participants may review interview schedule as researcher prepares photos
3) Review slideshow that photos have been loaded and are appropriate
4) Start interview (see Interview Schedule)
5) Conduct draw the route exercise (maps prepared in advance)
6) Review pictures and identify on route where pictures were taken while addressing why each was taken
7) Complete interview
8) Thank participant and provide compensation
9) Ensure voice recordings and photos are saved by ID number
10) Label and file map by ID number
Appendix L: School Profiles

School D (Gridded Streets - Low SES)

This gridded street neighborhood is bordered by a main road to the north and quieter residential streets to the east and south. The school shares its grounds with an intermediate public school on the west side, bordered by another thoroughfare street. Each of the two main intersections at the northwest and northeast corners of the school is patrolled by a crossing guard. The parking lot is easily accessible from the front of the school, while bus and child drop off primarily takes place at the east end of the school. Sidewalks in the area are a standard width; however, only parked cars serve as buffers along most streets. The school is surrounded by a large playground area, and there are many mature trees in the neighborhood. Many shops and restaurants are found within the school catchment area.

School B (Gridded Streets - High SES)

This gridded street neighborhood is situated at a top of a hill, surrounded by quiet residential streets. The school has a tight catchment area, bordered by two main roads to the north and south. However, children within the catchment area do not have to cross any main streets, and therefore there are no working crossing guards within the area. The parking lot is located at the northwest side of the school; however, street parking in the area is very limited. The student drop off area is located on the south side of the school. Sidewalks in the area are a standard width; parked cars act as a buffer on most streets surrounding the school. The school is surrounded by a large playground area, and there are many mature trees in the neighborhood. Many shops and restaurants are found within the school catchment area.
School R (Looping Streets - High SES)

This inner-suburban neighborhood is bordered by quiet residential streets to the south, west and north, and a main road to the east that many parents in the study had to cross to get to/from school. A crossing guard patrols the intersection at the southeast side of the school. The parking lot is easily accessible at the east side of the school, where many parents drop off their children. The official bus and student drop off area is located on the front (north) end of the school. Although the main street does have sidewalks of adequate width a buffer, many of the residential streets in the surrounding area do not have sidewalks. The school is surrounded by a large green playground area and there are many mature tree in the neighborhood.

School T (Looping Streets - Low SES)

This inner-suburban neighborhood is surrounded by quiet residential streets; however, many parents have to cross a main road to the north of the school. A crossing guard is situated at this main road. The parking lot is easily accessible at the east side of the school; the bus and student drop off are at the front (north side) of the school. Sidewalks in the area are adequate in width and have a buffer. The school is surrounded by a large green playground, and there are some young trees in the area.
## Appendix M: School Profile Questionnaire Summary

<table>
<thead>
<tr>
<th>Role of Informant</th>
<th>School R (High SES; Looping Streets)</th>
<th>School B (High SES; Grid Streets)</th>
<th>School D (Low SES; Grid Streets)</th>
<th>School T (Low SES; Looping Streets)</th>
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<tbody>
<tr>
<td></td>
<td>Special Ed., Methods &amp; Resource, PHE teacher</td>
<td>PHE Teacher, coach</td>
<td>PHE teacher, coach</td>
<td>Vice Principal</td>
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<tr>
<td>Student Population</td>
<td>55% speak a primary language at home other than English</td>
<td>White &amp; English speaking</td>
<td>80% Asian 12%White 8% Other</td>
<td>Somalian, Vietnamese, Spanish, Chinese, East &amp; West Indian, Tamil, Caribbean, Laos</td>
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<tr>
<td>Grade Levels</td>
<td>JK – Grade 6</td>
<td>JK to Grade 6</td>
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<td>School Day</td>
<td>Grade 1-6 Day 8:40am – 3:30pm 11:30 – 12:40 (lunch)</td>
<td>Grade 1-6 Day 8:42am-3:30pm 11:30-12:42 (lunch)</td>
<td>Grade 1-5 Day 8:45am-3:45pm 11:45-12:45 (lunch)</td>
<td>Grade 1-5 Day 8:42am – 3:20pm 11:30-12:35 (lunch)</td>
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<td>Recommended Student Arrival</td>
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<td>8:30 - 8:40am</td>
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<td>Teacher Supervision</td>
<td>8:30 – 8:40am 3:30 – 3:45pm</td>
<td>15 minutes before and after school on yard duty</td>
<td>Reading Club @ 8am Yard supervision @ 8:30am</td>
<td>8:30 – 8:32am 3:20 – 3:35pm</td>
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<td># Bussed Students</td>
<td>75 (live within catchment; beyond 1.6km)</td>
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<td>7 special ed. students</td>
<td>Students in the Intensive Special Education Program</td>
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<td>Bike Racks on Property?</td>
<td>Yes, have been there for 20 years+</td>
<td>Yes, have been there for 10 years+</td>
<td>Yes, accommodates 10 bikes; installed upon parent request</td>
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<td>Banned Travel Modes?</td>
<td>Scooters, roller blades, skateboards not allowed on school property</td>
<td>Scooters not allowed on school property</td>
<td>Roller blades, skateboards &amp; scooters not allowed on school property</td>
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<td># of Crossing Guards within catchment</td>
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<td>1</td>
<td>4</td>
<td>None; trained student safety patrollers (partnership with Toronto Police)</td>
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<td>Other Organizations Within School</td>
<td>School R (High SES; Looping Streets)</td>
<td>School B (High SES; Grid Streets)</td>
<td>School D (Low SES; Grid Streets)</td>
<td>School T (Low SES; Looping Streets)</td>
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<td>Daycare Cochlear Implant Programs</td>
<td>Daycare Community Centre (Toronto Parks &amp; Recreation)</td>
<td>Daycare Parenting Centre Head Start (Reading &amp; Writing) Program</td>
<td>Daycare Toronto Parks &amp; Recreation Partnerships with York University</td>
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<td>Extra-Curricular Activities</td>
<td>Coaching sports Scrap booking club Arts and crafts club Peer mediators Green team</td>
<td>Coaching Sports Badminton, skipping, mileage and juggling club</td>
<td>AM: reading club, tutoring, running club PM: coaching sports (until 5pm)</td>
<td>Sports clubs Reading Clubs Peer Mediators Tutoring International Languages</td>
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<tr>
<td>AST Initiatives</td>
<td>Go Outside the Box I Walk to School (+ Walking School Bus)</td>
<td>No need, as most students live close to school</td>
<td>Walk to School Week (TDSB); Toronto Schools On the Move (Annual) Walk To School Day</td>
<td>Walk To School Day (TDSB)</td>
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Appendix N: Participant Information Form

Child-Parent Participant Information Form

Demographics
Name (child): ________________________ Name (parent): ___________________________
Gender (child): _______________________ Gender (parent): __________________________
Place of Birth (child): __________________ Place of Birth (parent): _____________________
Age (child): __________________________ Age (parent) _____________________________
Grade (child): ________________________ Highest level of Education (parent): ___________
Home address: ______________________________________________________________
Contact number: ______________________________________________________
People living in Canada come from many different cultural and ethnic backgrounds. Which cultural
group or ethnic background would you identify yourself with? __________________________
Language spoken at home: ______________________________________________________
Length of time at current school ___________________________________________________
Length of time in current home ______________________________________________________
How many persons in your household hold a valid driver’s license? __________________
How many vehicles does your household own? __________________
Parent work address (if applicable)______________________________________________
If you have a spouse, is he/she currently employed? ________________________________

Travel Routines
In each box, please circle how you usually get to school and home from school on each day of the week.
AST = Active Modes of Transportation (e.g., walking, cycling)
Non-AST = Non-active modes of transportation (e.g., driving, public transportation)

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<th></th>
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<th>Tuesday</th>
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<td><strong>To school</strong></td>
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<td><strong>Home from school</strong></td>
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How long does your journey from home to school take? _____________________________
How long does your journey from school to home take? _____________________________
With whom do you usually travel to school with in the morning? __________________
With whom do you usually travel home with at the end of the school day? _____________

Questions
Camera serial numbers: Child: ________________________ Parent: ________________________
DATE/TIME for Camera return and interview: ________________________________
Appendix O: Participant Information Letter (BEAT Project Study 1)

Dear Parent or Guardian:

I am a researcher from the Faculty of Physical Education and Health at the University of Toronto. I want to find out what factors influence the way your child travels to and from school. The study is called the BEAT Project: Qualitatively Exploring 'Ways of Seeing' Active School Transport and is funded by the Heart and Stroke Foundation of Canada. The project team wants to know how environments (like neighbourhoods, buildings, roads, sidewalks) influence your choice about how your child comes to school. Findings from this study may help your school and people in the community make the environment better so that you can choose more active ways of travelling to and from school.

If you are a parent of a grade 5/6 student at _________School and you travel to/from school with your child, I am inviting you to participate in the study, which has been reviewed and approved by the University of Toronto's Office of Research Ethics, the Toronto District School Board and your principal. If you would like to participate in the BEAT Project, please contact the researcher at the phone number below. Once this is done, we will arrange a good time to meet with you, sign BEAT Project assent and consent forms and hand out a digital camera to take photographs. All assent and consent forms have to be completed and signed by the parent(s)/guardian(s), and then signed by the researcher before you take part in the study.

During the research study, which will be conducted at your school in October 2008, if you accompany your child to/from school (by walking, biking or if you use transit or car), you and your child will be given the use of digital cameras at the end of a school day. You and your child will be asked to take photographs of your route from school to home and from home to school the next day. You will be asked to take photographs of notable places to you along the way. If you drive your child to and from school, only your child will be given the use of a digital camera. When you arrive at school the next day, you will return the camera and arrange an interview time. During the interviews we will talk about the journey to and from school while taking a look at some of the photographs. Sample interview questions include: Can you talk about the things that you like to look at in your neighbourhood when you come to school? Why do you like to look at these things? Your interview will be conducted at a time that is convenient for you at the beginning or end of the school day. Your child will also participate in an interview during the school day with the permission of the school principal. When you have completed these things, your child will receive a Certificate of Participation and a BEAT Project disposable camera. In addition, _________School will receive $1000 for participating in the study. The total time that you and your child will spend with the researchers in the school will be about 60 minutes.

There are no known harms associated with participation in the study. You do not have to participate in this research and it will not affect your son’s/daughter’s evaluation by the school. Nobody will be upset if you decide not to participate in the study. Only the researcher and research assistants will know what you said during the study.

We really look forward to working with you on the BEAT Project. Please do not hesitate to contact me if you have further questions.

Sincerely,

Dr. Caroline Fusco, Ph.D., Faculty of Physical Education and Health, University of Toronto
55 Harbord Street, Toronto, ON, M5S 2W6, Tel: 416-946-7717 Email: c.fusco@utoronto.ca
Appendix P: Participant Consent Form (BEAT Project Study 1)

CONSENT to PARTICIPATE and to Audio-Tape (Child-Parent Dyad)

Research Project:
Built Environment and Active Transport (BEAT)
“Theory Building – Qualitatively Exploring ‘Ways of Seeing’ Active School Transport”

Principal Investigator (Study #1): Dr. Caroline Fusco, Faculty of Physical Education and Health, University of Toronto, Tel: 416-946-7717, Email: c.fusco@utoronto.ca
Co-Investigators (Study #1): Dr. Guy Faulkner, Dr. Ron Buliung, Dr. E. Adlaf (University of Toronto)
Co-Applicants: D. Howard, A. Salmon, Jackie Kennedy

Research Project: Funded by the Heart and Stroke Foundation of Canada

Purpose of Research:
You and your child are invited to participate in the BEAT Project because you travel to school with your child by walking or cycling or you use public transit or private transport to come to school. The purpose of this study, which has been approved by the University of Toronto’s Office of Research Ethics and the Toronto District School Board, is to provide evidence, through parents and children’s own accounts, of the factors that help or hinder active transport participation; and to analyze how environments (neighbourhoods, buildings, roads, sidewalks) influence the choices of how children come to school.

Research Procedures
1) Preliminary school visits will be conducted to begin mapping and profiling each sampled school. Visits in all schools will focus especially on examinations and observations of existing school active transport programs, spatial design, aesthetic features, and how individuals interact in these spaces, and with the local environment (neighbourhoods, buildings, roads, sidewalks).
2) A selected sample of 5 children and 5 parents who use active transport to and from school and 5 children and 5 parents who use public or private transport modes to and from school will be given the use of digital cameras at the end of a school day. If you accompany your child to and from school (by walking, biking or if you use transit or taxi), you and your child will be given the use of digital cameras at the end of a school day. You and your child will be asked to take photographs of your route from school to home and from home to school the next day. You will be asked to take photographs of notable places to you along the way. You should not take photographs of people. If you drive your child to and from school, only your child will be given the use of a digital camera. Children who travel alone or with other siblings/other children will not be recruited for the BEAT project.
3) The following day or the next most convenient day, the researcher and research assistants will meet each child-parent dyad to collect the cameras. Each camera will be placed in a bag labeled with the child's and parents’ pseudonym. If agreed to by the principal, the research and research assistants will be on site (in a designated room) for approximately 1-10 days to: a) print photographs; b) interview any parents who can schedule an interview during the day; c) interview each child (for approximately 60 minutes) during a time that is convenient during the school day (e.g., at lunch) or another time that is agreed upon by the principal or subject teacher; and d) interview any parents who can schedule an interview at the end of a school day or in the early evening. Overall, there will be minimal intrusion, if any, into the child's normal school day.
4) In the interview session itself, each parent and child will be asked a series of questions pertaining to active transport, and the environment (neighbourhoods, buildings, roads, sidewalks), and we will probe the decision-making process underpinning their child’s transport to school. Each parent and child will also be asked to draw a spatial map of their route to school. If the internet is available, you will be asked to look at a special Google earth map of your area and point roughly to where you took your photographs. From this a computer program called ArcGIS will be used to create a database containing all the digital photographs of spatial landmarks in order to map parents’ and children’s worldviews, and to explore perceptions regarding the influence of the built environment on active travel choices.

5) At the end of the children's interviews, each child-parent dyad will be given a Certificate of Participation and a disposable camera. The total time that participants will spend with the researchers will be about 60 minutes. You will be given the option of dividing your interview session into two interviews.

Confidentiality
Interview tapes will be typed into a computer by me or a research assistant member of the research team, but will not include your name, your child's name or the names of other people. All information that your child shares with the researcher and research assistants will be kept strictly confidential. All information will be stored in locked cabinets at the researchers’ offices at the University of Toronto and will only be seen by members of the research team. To maintain confidentiality, your child’s name and any identifying information about him/her will be removed from the interview transcripts. Codes and a pseudonym that you and your child choose will be assigned. All respondent pseudonyms will be applied to the geographic data and address information will be anonymised.

Your child’s school does not need to know that you and your child have participated in the BEAT study. Confidentiality will be respected and no information that discloses the identity of your child or your family will be released or published without consent, unless required by law. This legal obligation includes a number of circumstances, such as suspected child abuse and expression of suicidal ideas, where research documents are ordered to be produced by a court of law and where researchers are obliged to report to the appropriate authorities. After interview tapes are transcribed and checked, original tape recordings of interviews will be erased by physically destroying them or dubbing over the tapes. Transcripts, photographs and spatial maps (DIGITAL OR OTHERWISE) will be stored by the BEAT research team for up to 10 years.

Dissemination of Findings
You should know that the researchers intend to publish the findings of the study and to make public presentations based on the research. Articles will be written in special magazines that architects, principals, teachers and people at the university read. You and your child’s name will not be given in any verbal or written reports or publications, made by the researchers. If you or your child would like to know the results of the study when finished, a summary will be sent to you.

Reimbursement
There will be no monetary compensation for you or your child’s participation, but the study will involve no expense on his/her or your part, and will be carried out at your and at his/her (and the school's) convenience. You and your child will receive a certificate of participation and a disposable camera at the end of your participation.

Potential Harms or Discomforts
There are no known harms associated with participation in the study. There is very little likelihood that the If unanticipated disclosures were to occur, I would follow the protocol of ___________________________ School regarding disclosure of sensitive issues.
**Potential Benefits**
You and your child will not benefit directly from participating in the study. The results of this study will be sent to the Toronto District School Board and to the principal and to others who help design environments (buildings, roads, sidewalks) and neighbourhoods.

**Voluntary Participation and Early Withdrawal**
You and your child’s participation in this study is voluntary and involves no risk to you or to his/her person. You and your child may refuse to participate or answer any questions asked of you or him/her in the interview without penalty or explanation. You and/or your child may withdraw your/their consent to participate in the study at any time. If you or you or your child chooses to withdraw from the study, you and your child will also have the option to withdraw the information that they provided. You or your child may withdraw from the study at any time by contacting the researcher by phone (416) 946-7717 or by e-mail at e.fusco@utoronto.ca. If you have any questions or concerns about your rights as a research participant, please contact Jill Parsons, Research Ethics Officer, Health Sciences jc.parsons@utoronto.ca or 416-946-5806.

As part of your participation in the study you should know that the researcher’s project is scheduled for completion by June 2009 and that during the research if you consent, you or your child may be contacted for clarification purposes only and that this contact will be kept to a minimum.

**Acceptance of the Conditions of the Research Process and Consent:**
By signing this form, I acknowledge that:

a) The researcher has given me and my child the opportunity to ask questions regarding the BEAT research study and its procedures and that these questions have been answered to my satisfaction.

b) At any time during the study, I or my child may request further clarification from the researcher. I or my child can do this by contacting the researcher by phone (416) 946-7717 or by e-mail at c.fusco@utoronto.ca

c) I understand that this study is investigating the factors that help or hinder active transport participation and is analyzing how environments (neighbourhoods, buildings, roads, sidewalks) influence the choices of how children come to school.

d) Dr. Fusco would like to interview me ____________________ and my child___________________(names).

e) My child and I are under no obligation to participate in the research study and are free to withdraw from the study at any time, without explanation and that we are free to withdraw my permission and consent at any time during the research study.

f) We are free now, and in the future, to ask any questions about the study.

g) I have been told that my child's and my information will be kept confidential, except where release of information is required by law, e.g., suspected child abuse, public health.

h) The possible harms and discomforts and the possible benefits (if any) of the BEAT research study have been explained to me, and in no way does signing this consent form waive my legal rights nor does it relieve the researchers or involved institutions from their legal and professional responsibilities. I have been given a copy of this consent form for my records.

I, ____________________ (print parent's name), agree to participate and allow my child ____________________ (print child's name) to participate in the BEAT Project (“Theory Building- Qualitatively Exploring ‘Ways of Seeing’ Active School Transport) by Dr. Caroline Fusco (University of Toronto) at ________________ School

_________________________ (signature) _____________________________ (date)
In addition, I also grant permission to the researcher to audio-tape record the interview with me and with my child.

________________________________ YES (signature required)  ____ NO (check)

In addition, I give permission for the data to be used for:
Research publications & Teaching and demonstrations at professional meetings

________________________________ YES (signature required)  ____ NO (check)

I, the undersigned, have, to the best of my ability, fully explained the nature of this study to the parent/guardian. I believe that the person whose signature appears above understands the implications and voluntary nature of his/her child's participation in the research procedures.

Researcher’s signature  Location  Date
Appendix Q: Participant Photographs

Most of the photographs taken by the parents in this study related to the environment/aesthetics and road/traffic safety. Photographs of the social aspects of the community were taken predominantly by high SES parents.

Environment/Aesthetics

![BP5AST](image)
![RP4AST](image)
![DP1AST](image)
![TP1AST](image)

Road/Traffic Safety

![TP2AST](image)
![BP1AST](image)
![DP2AST](image)
![RP5AST](image)

Community

![BP2AST](image)
![RP5AST](image)
![BP4AST](image)
![RP2AST](image)
Copyright Acknowledgements

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