Examining the Built Environment and Active Travel in Toronto: Lessons from the Canadian BEAT

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Fitness of Canadian children and youth:
Results from the 2007-2009 Canadian Health Measures Survey
Figure 3

**BOY**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>150.9 cm (4'11&quot;)</td>
<td>Height</td>
<td>155.8 cm (5'1&quot;)*</td>
</tr>
<tr>
<td>41.6 kg (92 pounds)</td>
<td>Weight</td>
<td>48.0 kg (106 pounds)*</td>
</tr>
<tr>
<td>18.1 kg/m²</td>
<td>Body mass index</td>
<td>19.2 kg/m²*</td>
</tr>
<tr>
<td>64.9 cm (25.6&quot;)</td>
<td>Waist circumference</td>
<td>66.2 cm (26.1&quot;)*</td>
</tr>
<tr>
<td>78.0 cm (30.7&quot;)</td>
<td>Hip circumference</td>
<td>84.0 cm (33.1&quot;)*</td>
</tr>
<tr>
<td>0.83</td>
<td>Waist-to-hip ratio</td>
<td>0.82*</td>
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</tbody>
</table>

**FITNESS TESTS**

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>49 kg</td>
<td>Grip strength</td>
</tr>
<tr>
<td>26.5 cm</td>
<td>Sit-and-reach</td>
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**GIRL**

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<thead>
<tr>
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<tbody>
<tr>
<td>153.1 cm (5'0&quot;)</td>
<td>Height</td>
<td>155.9 cm (5'1&quot;)*</td>
</tr>
<tr>
<td>42.7 kg (94 pounds)</td>
<td>Weight</td>
<td>47.6 kg (105 pounds)*</td>
</tr>
<tr>
<td>18.4 kg/m²</td>
<td>Body mass index</td>
<td>19.5 kg/m²*</td>
</tr>
<tr>
<td>62.4 cm (24.6&quot;)</td>
<td>Waist circumference</td>
<td>68.0 cm (26.8&quot;)*</td>
</tr>
<tr>
<td>81.2 cm (32.0&quot;)</td>
<td>Hip circumference</td>
<td>86.0 cm (33.9&quot;)*</td>
</tr>
<tr>
<td>0.76</td>
<td>Waist-to-hip ratio</td>
<td>0.79*</td>
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</table>

**FITNESS TESTS**

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>43 kg</td>
<td>Grip strength</td>
</tr>
<tr>
<td>32.0 cm</td>
<td>Sit-and-reach</td>
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Sources of Youth Physical Activity

- Physical Education
- School Break-times
- Extra-curricular Activities
- Active Travel
- Incidental Activity
- Leisure Time
Active School Transport

• A source of physical activity
Active School Transport

• A source of physical activity
• Psychosocial benefits
• Environmental benefits
Every school day in Ontario, more than 800,000 students rely on student transportation services to transport them to and from school safely, punctually, and efficiently. Every Ontario school board provides transportation services to eligible students, through funding from the Ministry of Education's Transportation Grant. Virtually all (99 per cent) of this student transportation service is provided through contracts with private transportation companies. Ontario's Transportation Grant for 2011-12 is projected to be $845 million, comprising four per cent of all education funding in the province.

<table>
<thead>
<tr>
<th></th>
<th>Toronto District School Board</th>
<th>$42,712,406</th>
<th>$576,024</th>
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<tr>
<td>12</td>
<td></td>
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<table>
<thead>
<tr>
<th>Provincial Totals</th>
<th>$778,578,562</th>
<th>$10,500,000</th>
</tr>
</thead>
</table>
Active School Transport

• A source of physical activity
• Psychosocial benefits
• Environmental benefits

• Provides context for examining the built environment
BEAT Objectives

1. identify the prevalence and correlates of active school transport in Ontario;
2. examine the personal, family, social and environmental correlates of active school transport in the Toronto region.
3. develop research and evaluation capacity to appraise the impact of initiatives promoting active school transport.
BEAT Objectives

1. identify the prevalence and correlates of active school transport in Ontario;
2. examine the personal, family, social and environmental correlates of active school transport in the Toronto region.
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Primary Studies

Study 1 – Prevalence and Correlates of School Transport in the GTA and Ontario

Study 2 – Ways of Seeing School Transport

Study 3 – Childhood Mobility and the Built Environment
Today’s Objectives

Sharing BEAT Lessons

• Space
• Time
• Gender
Study 1 – Prevalence and Correlates of School Transport in the GTA and Ontario
Transportation Tomorrow Survey

- A repeated cross-sectional survey of travel behaviour in Southern Ontario, Canada, conducted every 4 years since 1986.
- Covers 5% of the households in the study area.
- Largest travel survey in the world.
- One-day retrospective travel data (telephone interview).
- All trips by household members aged 11 years and older.
- Proxy reported by an adult household member.
Active school transportation in the Greater Toronto Area, Canada: an exploration of trends in space and time (1986-2006).

SPACE: Spatial-temporal Clustering of AST in the GTA

Built Environment Correlates of Walking for School Travel in Toronto

Variable in the models

**Enabler**
- Density of street blocks
- Intersection (block * distance from downtown)

**Barrier**
- Smaller blocks (near home), closer to the downtown, increased the odds of walking
- Larger blocks (near home), far from the downtown, discouraged walking

**No Association**
- Density of local streets
- Retail employment / population ratio

NOTE: Binomial logistic regression results, adjusted for household SES and distance.
Relative Influence on School Travel Modes

Major Findings and Implications

**FINDINGS**

- Walking was more common in “urban” areas, compared to the “suburban” areas.

- Built environment near both home and school influence school travel behaviour **but influence greater at home**.

- Children escorted by adult caregivers were more likely to be driven to school.

- Students attending Catholic schools were more likely to travel by school bus.

**IMPLIEDATIONS**

- Policy to address local enablers and barriers.

- Considerations for AST should be incorporated in the neighborhood planning practice.

- Educational programs and community mobilizations that encourage independent or autonomous travelling to school could potentially improve AST rates.

- Consider implications of school closures
Study 2 – Qualitatively exploring ‘ways of seeing’ active school transport
Purpose

To qualitatively explore how parents/caregivers of children going to school in different neighbourhoods in Toronto make decisions about the trip to/from school.
Low income, new neighbourhood

High income, new neighbourhood

Low income, old neighbourhood

High income, old neighbourhood
Sampling & Recruitment

Purposeful Sample
- 37 parents (40 children)
  - 17 AST
  - 20 Non-AST

Inclusion Criteria:
- Interest in project
- Parent/guardian of grade 5/6 student + accompanies child to/from school
- Lives within 1.6 km from school
Results: Parents

2-Step Decision-Making Process:

a) Escort decision?
b) Mode decision?

Walk       Drive

Different influencing factors

Parents who live <1.5 km from school and are still driving

Main reasons for driving children to school (n = 1489)

- Convenience/time: 23.1%
- Distance from home too far: 7.6%
- Traffic danger: 11.8%
- I'm on my way somewhere else: 20.4%
- Personal safety issues: 13.9%
- Other: 5.3%
- Weather: 17.9%

Matched Pairs Analysis

- 118 Matched Pairs
- Households within 200m (walk vs drive)
- Parental survey

### Conditional logistic regression for the matched pairs with walking vs driving as the dependent variable

<table>
<thead>
<tr>
<th>Individual and socio-demographic</th>
<th>B</th>
<th>SE</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% CI for Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender (Male)</strong></td>
<td>1.293</td>
<td>0.571</td>
<td>0.024</td>
<td>3.642</td>
<td>1.19 (11.147)</td>
</tr>
<tr>
<td><strong>Age (Years)</strong></td>
<td>-0.477</td>
<td>0.363</td>
<td>0.189</td>
<td>0.621</td>
<td>0.305 (1.264)</td>
</tr>
<tr>
<td><strong>Vehicles per licenced driver</strong></td>
<td>-1.219</td>
<td>0.93</td>
<td>0.19</td>
<td>0.295</td>
<td>0.048 (1.827)</td>
</tr>
<tr>
<td><strong>Educational attainment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>-0.812</td>
<td>0.782</td>
<td>0.299</td>
<td>0.444</td>
<td>0.096 (2.058)</td>
</tr>
<tr>
<td>University</td>
<td>0.427</td>
<td>0.729</td>
<td>0.558</td>
<td>1.532</td>
<td>0.367 (6.392)</td>
</tr>
<tr>
<td><strong>Perceived safety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are not enough sidewalks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>-1.06</td>
<td>0.895</td>
<td>0.236</td>
<td>0.346</td>
<td>0.06 (2.001)</td>
</tr>
<tr>
<td>Neither</td>
<td>-0.919</td>
<td>0.973</td>
<td>0.345</td>
<td>0.399</td>
<td>0.059 (2.689)</td>
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<tr>
<td>We are worried about strangers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>-0.158</td>
<td>0.717</td>
<td>0.826</td>
<td>0.854</td>
<td>0.209 (3.483)</td>
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<tr>
<td>Neither</td>
<td>-0.95</td>
<td>0.937</td>
<td>0.311</td>
<td>0.387</td>
<td>0.062 (2.426)</td>
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<td>There are not enough crossing guards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Agree</td>
<td>-1.197</td>
<td>0.636</td>
<td>0.06</td>
<td>0.302</td>
<td>0.087 (1.051)</td>
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<tr>
<td>Neither</td>
<td>-1.416</td>
<td>0.829</td>
<td>0.088</td>
<td>0.243</td>
<td>0.048 (1.232)</td>
</tr>
<tr>
<td>Travelling by car is safer than by foot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.487</td>
<td>0.714</td>
<td>0.495</td>
<td>1.628</td>
<td>0.402 (6.596)</td>
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<tr>
<td>Neither</td>
<td>-0.163</td>
<td>0.629</td>
<td>0.795</td>
<td>0.849</td>
<td>0.248 (2.911)</td>
</tr>
<tr>
<td><strong>Preferences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We prefer to drive whenever possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.449</td>
<td>0.846</td>
<td>0.595</td>
<td>1.567</td>
<td>0.298 (8.231)</td>
</tr>
<tr>
<td>Neither</td>
<td>-0.231</td>
<td>0.773</td>
<td>0.769</td>
<td>0.793</td>
<td>0.174 (3.612)</td>
</tr>
<tr>
<td>Driving to school is easier than walking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>-1.997</td>
<td>0.659</td>
<td>0.002</td>
<td>0.136</td>
<td>0.037 (0.494)</td>
</tr>
<tr>
<td>Neither</td>
<td>0.796</td>
<td>0.634</td>
<td>0.21</td>
<td>2.216</td>
<td>0.639 (7.685)</td>
</tr>
<tr>
<td>Driving is the quickest way to get to school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>-2.09</td>
<td>0.859</td>
<td>0.015</td>
<td>0.124</td>
<td>0.023 (0.666)</td>
</tr>
<tr>
<td>Neither</td>
<td>-1.29</td>
<td>0.863</td>
<td>0.135</td>
<td>0.275</td>
<td>0.051 (1.496)</td>
</tr>
</tbody>
</table>

TIME: Mode Shifting


Implications

**Research**

- Quantitative studies modeling the influence of different factors on school travel mode should consider differentiating escort and mode
- Focus on independent mobility?

**Practice**

- Interventions tailored to each decision
- Greater attention given to the issue of time & convenience – not commonly considered within intervention work such as ASRTS
Study 3 – Childhood mobility and the built environment
Objectives

• To examine the relationship between the built environment and school transport decisions, using a sampling frame that purposefully locates schools in varying neighbourhoods, to ensure variability in built environment characteristics

• To determine whether active school commuters in the GTA are more physically active and have healthier body weights in comparison to passive commuters
Sampling design must ensure sufficient representation in built-form characteristics.

BEAT’s strategic selection of schools across quadrants (Old Neighbourhood/Low SES (OL), Old Neighbourhood/High SES (OH), New Neighbourhood/Low SES (NL), and New Neighbourhood/High SES (NH)).
Methodology

16 schools (Toronto District School Board)
1027 Grade 5 and 6 students & parents

Parents: travel behaviour survey, activity diary
Children: travel behaviour questionnaire, activity diary, map,

Data collection: April-June 2010; September-December 2011; April-June 2011
Results: Mode Variation by Neighbourhood & Gender

Attaining Physical Activity Guidelines (>60 mins MVPA daily)

What is Independent Mobility?

The freedom of children to travel around their own neighbourhood or city without adult supervision (Tranter & Whitelegg, 1994)
Independent Mobility

• Girls are more likely to never be allowed out by themselves in comparison to boys
  – they are also less active, are less likely to use AST and spend less time playing outdoors

• The level of independent mobility afforded to girls differs by neighbourhood
  – Girls in suburban neighbourhoods are twice as likely to never be allowed out on their own compared to girls living in urban neighbourhoods

So what restricts IM in girls?

- **Overall Safety**
  
  Boys tend to feel their neighbourhood is safer than their female peers, especially in lower-SES neighbourhoods.

- **Road and Traffic Safety**
  
  Girls worry more about road and traffic safety than boys. Gender differences are more marked in lower-SES neighbourhoods.

- **Stranger Danger**
  
  Girls worry more about stranger danger than boys. Gender differences are more marked in NH neighbourhoods. Parents of girls worry more about stranger danger than parents of boys, especially in low SES neighbourhoods.
Where do we go from here?

- Perceptions of safety appear to be tied to neighbourhood design and social framework, and are limiting girls’ IM.

- Limits on IM mean that less girls get the opportunity to navigate their neighbourhood, travel actively to/from school, and accumulate health-promoting levels of physical activity.

- Gender is also perhaps one of the more difficult concepts to unpack and turn into policy...that doesn’t mean we should not try to do so.
Final Considerations

To achieve desirable outcomes, health promotion, policy, and community-based interventions, designed to increase active school transportation, will likely need to internalize the spatial, temporal, and demographic heterogeneity of AST processes.

• SPACE
• TIME
• GENDER
Note of Thanks

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• George Mammen, PhD
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• Bonny Wong, PhD
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• Parminder Flora
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• Jason Lacombe
• Cora McCloy
• Fiona Moola
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• Ryan Lanyon (Metrolinx)
• Jacky Kennedy (GCC)
Any Questions?

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