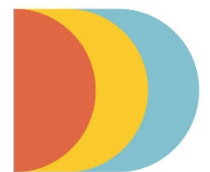# Developing Indicators of Active School Travel

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Ontario Active School Travel

"Developing Indicators of Active School Travel"

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Developing Indicators of Active School Travel

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Background

[Ontario Active School Travel](#) (OAST) is a provincial framework to get more children to walk and cycle to school. OAST is managed and delivered by Green Communities Canada (GCC), with financial support from the Government of Ontario. As part of the OAST framework, GCC established the [OAST Council](#), an advisory committee composed of selected provincial leaders in active school travel, working to identify and address strategic opportunities, priorities, and threats. The OAST Council adopted a Change Framework in December 2018 with the vision statement:

> *A culture of active school travel is established in Ontario, such that walking and wheeling on the school journey is supported and becomes the norm.*

One of the eight priority areas of the OAST Council Change Framework is **Measuring, monitoring, and demonstrating progress**. As a first step in addressing that priority area, GCC commissioned Dr. Subha Ramanathan (Evaluation Consultant, Atmoco Limited) to seek input from a panel of experts and develop an indicator framework for measuring change in active school travel in Ontario. The objective of this work was to **identify and prioritize process indicators of Active School Travel** (AST) that were both important to measure and feasible to collect. Of note, panellists provided feedback regarding outcome metrics for AST (Appendix 1), but these did not undergo the ranking exercise described below.

Method

A three-round Delphi survey and two-hour web meeting was used to seek input from a panel of experts. The Delphi survey is a structured and systematic method that has been widely used for the specific task of identifying measurement indicators in education, public health and healthcare. Using a series of simple questionnaires for brainstorming and ranking indicators, the Delphi technique synthesizes experiential knowledge from an expert panel with existing evidence. This is superior to alternate approaches to knowledge synthesis, e.g., an environmental scan or systematic review, because it captures knowledge from practitioners and may also capture emerging data sources and indicators that are not yet published. Additionally, the survey captures feedback from geographically diverse experts anonymously and at their convenience. This minimizes scheduling conflicts and bias as experts consider the perspectives of others.

The Delphi survey was conducted using email, worksheets and an online survey tool. In the first round, a worksheet was sent to each panelist with a list of six Core Areas: Partnerships and Collaboration/Coordination, Strategic Investments, Developing Supportive Policies, Generating Evidence and Demonstrating Progress, Designing Walk-and Bike-Friendly Communities, Quality and Accessible Programming for Independent Student Mobility. The Core Areas were followed by sample indicators, and were generated from existing AST reports and research.

After ranking Core Areas from most to least important to measure or track, panelists were instructed to add to the indicator list and provide comments regarding the Core Areas or individual indicators. Panelists had approximately three weeks to submit Round 1.

In Round 2, the worksheet of Core Areas was reordered based on mean group ratings, with the addition of indicators suggested by panelists, and collated feedback. Round 2 was personalized so that each panelist could compare their Round 1 Core Area rankings with the average rankings across the group. An additional task for Round 2 was to rank indicators within each Core Area from most to least important to measure or track, and rate feasibility for measurement (1= most feasible, 2= somewhat feasible, 3 = least feasible). At the suggestion of one panelist, an online survey tool (Qualtrics) was employed to assist

with ranking Round 2 indicators. This tool allowed participants to select an item, drag it and drop it into the desired position, and prevented duplicate or missed rankings. Comments were captured in the worksheet and submissions were requested within a two-week timeframe.

The final round, Round 3, employed a similar process as Round 2. Once again, the worksheet of Core Areas and indicators was reordered based on mean group ratings and experts had the opportunity to compare and revise ratings as desired, and include any comments. The online tool was also updated, and any final ranking decisions were made. Participants had one week to complete Round 3.

Round 3 results were collated and emailed to participants prior to the web meeting. The two-hour web meeting took place on 29th August 2019 using Zoom meeting technology (i.e., audio group chat and text chat). The purpose of this meeting was to present and discuss Round 3 results, explore and resolve conflicting perspectives, and capture any final comments regarding provincial-level indicators that are sensitive enough to indicate progress in OAST projects.

Participants

GCC Staff spearheading the Ontario Active School Travel Program identified twenty-five experts in Active School Travel. Panellists were invited in July 2019 to take part in the study. Two declined, 7 did not reply to the invitation or reminder emails, yielding a response rate of 64%.

All 16 consenting participants held high level positions, e.g., research associates, managers, directors, and senior specialists, and represented one or more of the following areas: AST research, population health, transportation planning, AST programming and student transportation planning. Of note, three panellists were from provincial organizations outside Ontario, and three were research associates from institutions outside Ontario or Canada, suggesting that the final framework may be useful beyond the Ontario Active School Travel project.

Participation rates for each segment of the study was as follows:
- Round 1: n = 16
- Round 2: n = 14
- Round 3: n = 14
- Web meeting: n = 9

Data Sources

This report collates and presents data from three sources: 1) indicator rankings and comments submitted through the Delphi process, 2) a verbatim transcript of the audio group chat during the web meeting, and 3) text chat captured during the web meeting.

Results

[1]Round 1	Round 2 *M(SD)*	Round 3 *M(SD)*	[2]Key Comments
Partnerships and Collaboration/ Coordination	Designing/ Building Walk- and Bike-Friendly Communities: *2.4(1.5)*	Designing/ Building Walk- and Bike-Friendly Communities: *1.6(1.1)*	• Well-designed communities foster *Partnerships and Coordination* • Well-designed communities can support *Quality and Accessible Programming* and vice versa
Strategic Investments [amount, duration]	Strategic Investments [amount, duration, type]: *2.7(1.5)*	Strategic Investments [amount, duration, type]: *2.3(0.9)*	• Investments are usually directed or facilitated by *Policies*
Developing Supportive Policies	Developing Supportive Policies: *3.0(1.4)*	Developing Supportive Policies: *3.5(1.5)*	• Need to *Generate Evidence* in order to develop policies • Approval of policies and creation of advisory committees can lead to *Design* "rules" for *Building Walk- and Bike-friendly Communities* • Policies provide leverage to *Design/Build Walk- and Bike-Friendly Communities*
Generating Evidence and Demonstrating Progress	Quality and Accessible Programming in schools for Independent Student Mobility: *3.9(1.7)*	Quality and Accessible Programming in schools for Independent Student Mobility: *3.6(1.3)*	• Need to *Generate Evidence* and Demonstrate Progress so that there is a demand for programming
Designing Walk- and Bike-Friendly Communities	Partnerships and Collaboration/Coo rdination: *4.4(1.2)*	Partnerships and Collaboration/Coo rdination: *4.9(0.9)*	
Quality and Accessible Programming for Independent Student Mobility	Generating Evidence and Demonstrating Progress: *4.6(1.8)*	Generating Evidence and Demonstrating Progress: *5.0(1.5)*	

Notes: Blue text within the table indicates text additions from panellists.
[1]Round 1 is not in priority sequence
[2]Key Comments refer to the Round 3 list of indicators

Discussion Summary

Delphi rankings approached consensus, with no change in Core Area mean rank order and generally smaller standard deviations between Rounds 2 and 3. Results showed that Designing/Building Walk- and Bike-Friendly Communities and Strategic Investments emerged as the most important Core Areas to measure at a Provincial level. According to one panelist, "The built environment is the first tangible thing that parents notice and are really aware of….if the municipal government makes the investment in [active] infrastructure, this is a good measure of whether the barrier that parents are first encountering in AST is being addressed. … It is the first thing that people recognize and thus it is the most important to measure." Another panelist agreed, "Everything flows backwards from what parents perceive of the built environment."

At the same time, final comments submitted with Round 3 and discussions at the web meeting showed that Core Areas were not easy to rank because of issues related to interdependence and political situations (see final column, Table 1).

For instance, though Quality and Accessible Programming landed in the middle of the ranked list, tracking changes in Quality and Accessible Programming was deemed most important by some experts because of current Strategic Investments to communities through the Ontario Active School Travel Fund (i.e., evidence of return on investment). It was also suggested that data on programming and tools in relation to AST might feed into Designing/Building Walk- and Bike-Friendly Communities, and, in turn, address physical infrastructure, a key barrier faced by families considering AST.

Several participants also indicated that it was not always clear how to differentiate between how important it was to measure a Core Area, and how important it was for a Core Area to exist and support active school travel. One panelist felt that, "We need to distinguish between what is the most important thing that needs to happen and what is the most important thing to measure. It is not necessarily the same thing." For example, all participants agreed that it was crucial to have funding (Strategic Investments) in active school travel, but tracking changes (increases) in investments would not necessarily show progress in AST unless there were Supportive Policies to direct and ensure the quality of such investments. One participant explained, "I always place policy before funding. You need government commitment to actually move in the right direction. You're not going to get sustained and effective amounts of funding [and] move in the right direction if you don't have this vision from government." Another participant supported this sentiment, "Once you have a policy set up, you have the ability to implement different local solutions that will facilitate walking."

Recommendations for Assessing Core Areas as a Collective

- Interrelationships and dependencies between the Core Areas must be considered when measuring indicators of AST.
- A selection of indicators from all six areas needs to be tracked in order to show progress in AST in Ontario.

Table 2: Ranked Indicators for Core Area 1: Designing/Building Walk- and Bike-Friendly Communities

[1]Round 2 *M(SD)*	Round 3 *M(SD)*	Final *M(SD)*	[2]Key Comments
'Municipalities' or local governments' Master Plan for public transit and AST infrastructure	'Municipalities' or local governments' Master Plan for public transit and AST infrastructure: *1.5(0.9)*	'Municipalities' or local governments' Master Plan for public transit and AST infrastructure: *1.2(0.6)*	Presence or absence of a Plan is an important first step and feasible to collect
Bike lanes [quality and distance]; network, coverage; paved shoulders/trail networks; cyclist count	[3]Traffic calming measures [number and quality]: e.g., speed humps, road width restrictions, reduced speeds, bump outs: *3.7(1.8)*	Traffic calming measures [number and quality]: e.g., speed humps, road width restrictions, reduced speeds, bump outs: *3.0(0.9)*	• Variations in definitions, implementation and tracking pose challenges for tracking traffic calming measures • Need to identify and use municipal standard metrics
Traffic calming measures [number and quality]: e.g., crosswalks, crossing guards, sidewalks	School AST infrastructure improvements [identified and prioritized]: *4.7(2.3)*	School AST infrastructure improvements [identified and prioritized]: *4.3(2.1)*	Only feasible to assess if working directly and intensively with a school
Car-free zones [time-dependent or permanent]	[4]Cycling infrastructure: bike lanes [quality and distance]; network, coverage; paved shoulders/trail networks; cyclist count: *4.7(2.3)*	Cycling infrastructure: bike lanes [quality and distance]; network, coverage; paved shoulders/trail networks; cyclist count: *4.8(1.6)*	• Switch priority order with *Pedestrian infrastructure* Need to identify and use municipal standard metrics
Enforcement of safe walking spaces/routes, e.g., number of tickets issued for traffic violations [speeding, illegal parking, unsafe driving], frequency of unsafe behaviours, frequency of traffic safety hazards	School plan for AST: *5.6(2.8)*	Pedestrian infrastructure, e.g., crosswalks, crossing guards, sidewalks: *4.9(2.3)*	• Need to identify and use municipal standard metrics May be more useful to track gaps in pedestrian infrastructure
Walkability Index or Walking Hazard Assessment	Car-free zones [time-dependent or permanent]: *6.1(2.1)*	School plan for AST: *5.8(2.0)*	• Presence or absence of a Plan is an

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			important first step and feasible to collect
Public transportation [affordability, quality and connectedness]; private buses in rural areas	Enforcement of safe walking spaces/routes, e.g., number of tickets issued for traffic violations [speeding, illegal parking, unsafe driving], frequency of unsafe behaviours, frequency of traffic safety hazards: *5.8 (2.5)*	Car-free zones [time-dependent or permanent]: *7.2(1.8)*	No car-free zones in Ontario at present
School plan for AST	Walkability Index or Walking Hazard Assessment: *6.4(2.6)*	Enforcement of safe walking spaces/routes, e.g., number of tickets issued for traffic violations [speeding, illegal parking, unsafe driving], frequency of unsafe behaviours, frequency of traffic safety hazards: *7.4(2.1)*	• Unsafe behaviours create challenges for using pedestrian infrastructure Important to measure but challenging to track
School AST infrastructure improvements [identified and prioritized]	Public transportation [affordability, quality and connectedness]; private buses in rural areas: *6.5(1.9)*	Walkability Index or Walking Hazard Assessment: *7.8(2.5)*	Factors into bussing decisions; not as important to track for showing progress in AST
	[5]Pedestrian infrastructure, e.g., crosswalks, crossing guards, sidewalks	Public transportation [affordability, quality and connectedness]; private buses in rural areas: *8.5(2.5)*	Public transportation can reduce traffic volume in school zones and foster a safe and inviting AT network within a community

Notes: Panelists were first asked to rank indicators within a Core Area in Round 2.
[1]Round 2 is not in priority sequence
[2]Key Comments refer to the final list of indicators
[3]Traffic calming measures was modified in Round 3 with new examples
[4]Bike lanes was renamed Cycling Infrastructure in Round 3
[5]Pedestrian infrastructure was added to the list in Round 3

Discussion Summary

The purpose of this Core Area was to identify indicators of supportive environments so that the quality of built environments within communities could be quantified and eventually linked with travel mode share among students. Several panelists felt that a checklist identifying the presence or absence of an indicator would be an important first step, however, the quality of each indicator (context) was also important to consider.

Although specific measurement tools were not part of the present study, discussion time was devoted to the feasibility of collecting metrics related to the built environment. One participant explained, "It would be cumbersome to track all of the traffic calming measures and even the school AST infrastructure improvements since we don't always know when and where they are happening."

Issues raised included definition/precision of indicators, effectiveness of indicators, and tracking mechanisms currently in place. For instance, speed humps are presently installed at various heights, but may not effectively reduce vehicle speed and change driver behaviour unless they are several inches off the ground. Panelists recommended that it was important to identify and collate municipal data that is uniformly assessed and currently collected across Ontario.

Another point to consider was that even with quality infrastructure in place, unsafe driver behaviours might prevent AST; thus, Enforcement of Safe Walking Spaces was important for fostering AST. According to one panelist, "Pedestrian infrastructure isn't as much of a challenge [in my community]…school zone chaos [is often] not due to a lack of sidewalks and safe crossing points. That's a behaviour piece… [driver] behaviours are not allowing the infrastructure to meet its potential." At the same time, it was acknowledged that this indicator is not feasible to collect as part of the OAST program, and therefore remains halfway down the priority list.

Finally, though last on the list, it was noted that a strong public transportation system was important for reducing traffic volume, and that in some countries around the world, children use general public transit systems to get to school, which strengthens public transport and also reduces the need for dedicated (and expensive) school buses.

Recommendations for Indicators of Designing/Building Walk- and Bike-Friendly Communities

- Presence or absence of a) Municipal Master Plan for public transit and AST infrastructure, b) School AST infrastructure improvements and c) School Plan for AST is feasible to collect from OAST Funded communities
- Need to identify and collate municipal metrics that is uniformly assessed and collected across Ontario for a) Traffic Calming Measures, b) Pedestrian infrastructure and gaps, and c) Cycling infrastructure

Table 3: Ranked Indicators for Core Area 2: Strategic Investments

[1]Round 2 *M(SD)*	Round 3 *M(SD)*	Final *M(SD)*	[2]Key Comments
Funding for province-wide coordinating entity	Funding for province-wide coordinating entity: *2.5(2.2)*	Funding for province-wide coordinating entity: *2.1(2.3)*	
Funding for Regional, Municipal, and local AST programming [staff and other resources, e.g., discounted public transit programs for staff and students]	Funding for Regional, Municipal, and local AST programming [staff and other resources, e.g., discounted public transit programs for staff and students]: *2.8(1.4)*	Funding for capital works/improvements to infrastructure/facilities that support AST [installment, maintenance]: *2.7(1.4)*	• Moved up one rank Round 3-Final
Funding for monitoring and surveillance systems	Funding for capital works/improvements to infrastructure/facilities that support AST [installment, maintenance]: *3.7(3.5)*	Funding for Regional, Municipal, and local AST programming [staff and other resources, e.g., discounted public transit programs for staff and students]: *2.9(0.7)*	
Funding for research [intervention evaluations, assessments]	School Board: Funding for AST programming and school staff: *5.1(1.8)*	School Board: Funding for AST programming and school staff: *3.8(0.6)*	
Funding for social marketing campaigns	Sustainability funding and financing plan, e.g., secure diverse financial opportunities: *6.1(3.6)*	Sustainability funding and financing plan, e.g., secure diverse financial opportunities: *4.7(2.1)*	
School Board: Funding for AST programming and school staff	Funding for social marketing campaigns: *6.2(2.4)*	Funding for research [intervention evaluations, assessments]: *6.7(1.8)*	• Moved up one rank Round 3-Final
School Board: Funding for volunteer training	Funding for research [intervention evaluations, assessments]: *6.3(1.9)*	Funding for social marketing campaigns: *6.8(0.9)*	
Philanthropic funding for AST	Funding for monitoring and surveillance systems: *6.8(2.0)*	Funding for monitoring and surveillance systems: *7.2(2.3)*	
Private sector or industry funding for AST	School Board: Funding for volunteer training: *8.0(2.2)*	School Board: Funding for volunteer training: *8.5(0.8)*	
Sustainability funding and financing plan, e.g., secure diverse financial opportunities	Private sector or industry funding for AST: *8.8(2.2)*	Private sector or industry funding for AST: *10.1(0.6)*	

Funding for capital works/improvements to infrastructure/facilities that support AST [installment, maintenance]	Philanthropic funding for AST: *9.8(0.8)*	Philanthropic funding for AST: **10.5(1.0)**	

Notes: Panelists were first asked to rank indicators within a Core Area in Round 2.
[1]Round 2 is not in priority sequence
[2]Key Comments refer to the final list of indicators

Discussion Summary

When considering indicators of Strategic Investments, the main discussion point was the distinction between funding and financing, i.e., the allocation of funds. A panellist explained, "From a municipal perspective, the funding itself isn't the issue, it is how it is being spent. …There is lots of funding rolling around, and lots of expensive road widening and parking lot projects happening. That money isn't necessarily being put towards …active transportation infrastructure." Others agreed, reiterating that the effectiveness of investments was driven by policies (see Table 1), however, policies without funding attached to it would not be effective either.

Recommendations for Assessing Indicators of Strategic Investments

- Track total funds as well as percentage of budgets devoted to AST whenever possible
- Identify policy drivers for Strategic Investments

Table 4: Ranked Indicators for Core Area 3: Developing Supportive Policies

[1]Round 2 *M(SD)*	Round 3 *M(SD)*	Final *M(SD)*	[2]Key Comments
School siting and design policy to maximize AST [including accessibility of sites, re-design of existing sites]	School siting and design policy to maximize AST [including accessibility of sites, re-design of existing sites]: *2.7(1.8)*	School siting and design policy to maximize AST [including accessibility of sites, re-design of existing sites]: ***1.8(1.3)***	
Reduced speed limit in school zones	Complete streets policy, e.g., sidewalk instalment, traffic calming, bike lanes (increase #, separated), limit crosswalk distance, pedestrian priority signals): *3.4(2.8)*	Complete streets policy, e.g., sidewalk instalment, traffic calming, bike lanes (increase #, separated), limit crosswalk distance, pedestrian priority signals): ***2.1(1.0)***	
Anti-idling policy and restrictions for vehicles at school entrance	Reduced speed limit in school zones: *4.2(2.1)*	Student transportation policy, e.g., walk zone distance, provisions for students living in the walk zone, school accommodation review policy: ***3.8(1.6)***	• Moved up one rank Round 3-Final • Identify explicit support for AST in student transportation policies • Identify "goodwill" directed towards AST by consortia and school boards • Presence of AST in the transportation policy or practices is an indicator of school board buy-in
Shade policy along school routes	Student transportation policy, e.g., walk zone distance, provisions for students living in the walk zone, school accommodation review policy: *3.8(1.6)*	AT and PA elements legislated into all new developments or re-developments: ***4.3(1.7)***	
Priority snow removal policy along school routes	AT and PA elements legislated into all new developments or re-developments: *4.4(2.5)*	Reduced speed limit in school zones and corridors: ***4.5(1.6)***	• Vehicle speed must be limited in corridors beyond the school zone; related to

			Complete Streets policy • Need umbrella policy to restrict other unsafe driver behaviours in school zones, i.e., 3-point turns, reverses, U-turns
Policy for lighting on and off school route trails	Priority snow removal policy along school routes: *5.8(2.4)*	Priority snow removal policy along school routes: **5.6(1.4)**	
Student transportation policy, e.g., walk zone distance, provisions for students living in the walk zone, school accommodation review policy	Anti-idling policy and restrictions for vehicles at school entrance: *7.0(2.3)*	School: Anti-idling policy and restrictions for vehicles at school entrance: **7.3(0.8)**	
AT and PA elements legislated into all new developments or re-developments	Policy for lighting on and off school route trails: *7.5(1.3)*	Transportation Demand Management policy for developers: **7.7(2.2)**	• Moved up one rank Round 3-Final
Transportation Demand Management policy for developers	Transportation Demand Management policy for developers: *7.7(2.6)*	Policy for lighting on and off school route trails: **8.2(1.3)**	
Complete streets policy, e.g., sidewalk instalment, traffic calming, bike lanes (increase #, separated), limit crosswalk distance, pedestrian priority signals)	Shade policy along school routes: *8.4(1.6)*	Shade policy along school routes: **9.8(0.6)**	

Notes: Panellists were first asked to rank indicators within a Core Area in Round 2.
[1]Round 2 is not in priority sequence
[2]Key Comments refer to the final list of indicators

Discussion Summary

The Supportive Policies core area and indicators were generally focussed at schools, rather than wider communities. It was noted that existence of policies were generally feasible to track, however, enforcement and interpretation of policies were critical and not easy to document. Discussions focussed on three indicators, school siting and design policy, unsafe driver behaviours like speeding, and student transportation policy.

Concerns were voiced at the meeting that the top ranked indicator, school siting and design policy, applied to new school sites more so than existing schools (though re-design of existing school sites was a component). Panellists also noted that there were disparities between school siting and design policies, and the actual processes for designating school sites due to the presence of competing organizations (e.g., different governments, developers, school boards). A participant explained, "When we go into community design plans, it all looks good on paper, but by the time all of the other roadways have come through, and the developers have picked and chosen where they are going to build, what the school board actually has left to deal with is not what they originally signed up for." In the end, while important to identify and track whether school siting policies take AST into account, panellists did not consider this a universal policy supporting all Ontario schools, and felt that greater emphasis should be placed on lower ranked indicators.

With respect to speed limits in school zones, some felt that vehicle speed was only one element making school zones (and corridors) unsafe for children. Other driver behaviours, like U-turns, reverses and 3-point turns were also cause for concern, particularly because traffic congestion in the school zone naturally restricted speeding, and there were no restrictions on driver behaviours unless specific signs were posted. There was suggestion to advocate for the creation of an umbrella policy specific to school zones - or better yet, a school zone traffic law - restricting all driver behaviours that would lead to unsafe conditions, e.g., speeding, U-turns, 3-point turns, parking on curbs, and parking on cross-walks.

When discussing student transportation policy, it was noted that in some regions, written policies were broadly related to student travel to and from school and did not explicitly outline support for AST. It was therefore important to track explicit support for AST in written policies, as well as "goodwill" directed towards AST by school boards and transportation consortia, e.g., paid permanent positions for AST. In terms of existing metrics related to student transportation policy, panellists noted that the Ministry of Education already tracks walk zone distance, and some transportation consortia track requests for courtesy bussing as a proxy measure for (lack of) student/family interest in walking. It was suggested that it might be helpful to track whether school boards/transportation consortia allow courtesy bussing (yes or no) and the number of requests for courtesy bussing year to year.

Recommendations for Indicators of Developing Supportive Policies
- Track complete streets policies for data regarding corridors beyond the school zone
- Identify restrictions on driver behaviours within school zones, i.e., signage restricting speed limits, U-turns, 3-point turns, parking
- Identify explicit support for AST in student transportation policies
- Identify "goodwill" AST supports from school boards and transportation consortia
- Identify data collected and available from the Ministry of Education e.g., whether or not courtesy bussing is permitted and requests for courtesy bussing

Table 5: Ranked Indicators for Core Area 4: Quality and Accessible Programming in Schools for Independent Student Mobility

[1]Round 2 *M(SD)*	Round 3 *M(SD)*	Final *M(SD)*	[2]Key Comments
School Travel Planning, AT/ST-related action plans	School Travel Planning, AT/ST-related action plans: *2.2(1.4)*	School Travel Planning, AT/ST-related action plans: ***1.1(0.3)***	• Feasible to collect presence of action plans • Content analysis of action plans is more time consuming and may be possible • Need to monitor long-term impact of action plans
Safety training, e.g., for pedestrians, cyclists, transit users	Organized active/sustainable transportation groups, e.g., walking school buses, bike trains, organized carpool for teachers: *2.9(1.4)*	Organized active/sustainable transportation groups, e.g., walking school buses, bike trains, organized carpool for teachers, [3]Park and Stride/Walk a Block: ***2.9(1.1)***	• Feasible to collect whether active/sustainable transportation groups exist • Quality and frequency of organized groups challenging to track
Organized active/sustainable transportation groups, e.g., walking school buses, bike trains, organized carpool for teachers	School champion(s) [presence, continuity]: *2.9(1.4)*	[4]School champion(s) [presence, continuity]: ***2.9(1.2)***	• Challenging to retain or track champions • Lower priority indicator • Better suited to Partnerships and Collaboration core area
School champion(s) [presence, continuity]	Safety training, e.g., for pedestrians, cyclists, transit users: *3.0(1.2)*	Safety training, e.g., for pedestrians, cyclists, transit users: ***3.4(0.9)***	• Feasible to track existence of training programs, but not quality
Participation in seasonal programming/events, e.g., International Walk to School Day, Winter Walk Day, Bike to School Week, Park and Stride/Walk a Block	Participation in seasonal programming/events, e.g., International Walk to School Day, Winter Walk Day, Bike to School Week: *4.0(1.3)*	Participation in seasonal programming/events, e.g., International Walk to School Day, Winter Walk Day, Bike to School Week: ***4.7(0.7)***	• Participation is feasible to collect by collating event registration/evaluation

Notes: Panellists were first asked to rank indicators within a Core Area in Round 2.
[1]Round 2 is not in priority sequence
[2]Key Comments refer to the final list of indicators

[3]Park and Stride/Walk a block was initially suggested as an example of seasonal programming, but was allocated to organized active/sustainable transportation groups in Round 3
[4]School champions was moved to Partnerships and Collaboration core area during the web meeting, as a component of Local partnerships: School AST committees

Discussion Summary

Only five indicators emerged within the core area of Quality and Accessible Programming in Schools for Independent Student Mobility. Indicators maintained the same order from Round 2 to Round 3, with AT/ST related action plans ranking highest. Several panellists explained that collecting and collating data on AST programming was challenging beyond tracking presence or absence of a component. For instance, it was deemed easiest to track presence or absence of an action plan and safety training programming at a provincial level. However, focus areas of an action plan, or quality of safety training programming (e.g., training content and how well it is delivered) would raise measurement reliability issues.

Recommendations for Indicators of Quality and Accessible Programming in Schools for Independent Student Mobility

- Track presence or absence of an action plan, organized active/sustainable transportation groups, and safety training
- Track participation in seasonal programming/events through registration/evaluation forms

[1]Round 2 *M(SD)*	Round 3 *M(SD)*	Final *M(SD)*	[2]Key Comments
Province-wide coordinating entity	Local partnerships [e.g., dedicated municipal staff]: *2.4(1.4)*	Local partnerships [e.g., dedicated municipal staff]: **1.5(0.7)**	• Existence of a municipal staff member dedicated to AST and municipal staff on regional AST committees should both be tracked • Rename indicator as Local partnerships: Dedicated municipal staff and municipal support for AST, e.g., membership on AST groups/committees
Local partnerships [e.g., dedicated municipal staff]	Province-wide coordinating entity: *2.5(1.7)*	Province-wide coordinating entity: **2.4(1.4)**	• Track presence/absence of such an entity
Local partnerships: School AST committees [composition: e.g., police, student ambassadors, parents, number of members]	Departmental partnerships within government for AST: e.g., transport, planning, health: *3.3(1.8)*	Departmental partnerships within government for AST: e.g., transport, planning, health: **3.1(1.0)**	• Feasible to collect at a provincial level
Local partnerships: Regional AST committees [composition, number of members, representation of key stakeholder groups]	Local partnerships: School AST committees [composition: e.g., police, student ambassadors, parents, number of members]: *4.2(1.3)*	Local partnerships: School AST committees [composition: e.g., police, student ambassadors, parents, number of members]: **3.8(1.2)**	• School champion should be incorporated into this indicator, though it is cumbersome to track specific individuals
Government and private sector partnerships for AST: e.g., local shops	Local partnerships: Regional AST committees [composition, number of members, representation of key stakeholder groups]: *4.2(1.3)*	Local partnerships: Regional AST committees [composition, number of members, representation of key stakeholder groups]: **4.3(0.6)**	• Presence of a school board member on regional AST committees and school board-municipal partnerships are critical to capture • Map stakeholders on committees and identify gaps in key stakeholder groups

			• Regional AST committee sub-indicators feasible to collect
Departmental partnerships within government for AST: e.g., transport, planning, health	Government and community organization partnerships for AST: *5.0(2.2)*	Government and community organization partnerships for AST: ***6.0(0.0)***	
Government and community organization partnerships for AST	Government and private sector partnerships for AST: e.g., local shops: *6.5(0.9)*	Government and private sector partnerships for AST: e.g., local shops: ***7.0(0.0)***	

Notes: Panellists were first asked to rank indicators within a Core Area in Round 2.
[1]Round 2 is not in priority sequence
[2]Key Comments refer to the final list of indicators

Discussion Summary

Rank order of indicators for Partnerships and Collaboration/Coordination remained the same from Round 2 to Round 3. Discussions focussed on indicators under the umbrella of local partnerships. The top ranked indicator was modified so that municipal staff dedicated to AST became an indicator on its own, rather than an example of a local partnership. This also helped to distinguish the highest priority indicator from another at the local-level, Regional AST committees. "School champion" was moved from a stand-alone indicator within the Core Area of AST Programming (in the previous section) to a component of the School AST committee.

With respect to identifying indicators of Partnerships and Collaboration/Coordination, panellists suggested that presence of partners (organizations) within committees were feasible to track and incorporate into a provincial level evaluation framework, though specific individuals (like champions) were not. Stakeholder mapping and identifying gaps in representation from stakeholder groups were suggested for data collection and analysis. One panellist explained, "We have good stakeholder maps for AST for typical communities, and who should be involved. You can do a gap analysis of partnerships and stakeholders with different levels of detail."

Recommendations for Indicators of Partnerships and Collaboration/Coordination
- Identify and track municipal support for AST, e.g., dedicated staff person, membership to AST groups/committees
- Track presence of specific stakeholder groups on school and regional AST committees
- Track presence/absence of a province-wide coordinating entity
- Identify departmental partnerships within government for AST

Table 7: Ranked Indicators for Core Area 6: Generating Evidence and Demonstrating Progress

[1]Round 2 M(SD)	Round 3 M(SD)	Final M(SD)
Evaluation framework and standardized instruments for measuring AST	Evaluation framework and standardized instruments for measuring AST: *1.8(0.9)*	Evaluation framework and standardized instruments for measuring AST: ***1.2(0.4)***
Evaluation framework: Framework for AST intervention evaluations	Evaluation framework: Framework for AST intervention evaluations: *2.7(1.7)*	Evaluation framework: Framework for AST intervention evaluations: ***2.3(0.5)***
Monitoring and surveillance system for AST	Monitoring and surveillance system for AST: *3.6(1.9)*	Monitoring and surveillance system for AST: ***3.1(1.6)***
Research and publications: Population health impacts of AST	Research and publications: Effectiveness of specific AST investments: *4.0(1.6)*	Research and publications: Effectiveness of specific AST investments: ***4.1(0.7)***
Research and publications: Effectiveness of specific AST investments	Research and publications: Changes in built and natural infrastructure vs. AST participation: *4.9(1.2)*	Research and publications: Changes in built and natural infrastructure vs. AST participation: ***5.4(0.8)***
Research and publications: Changes in built and natural infrastructure vs. AST participation	Research and publications: Population health impacts of AST: *5.4(1.1)*	Research and publications: Population health impacts of AST: ***5.9(1.1)***
Research and publications: Effectiveness of social marketing campaigns on AST	Research and publications: Effectiveness of social marketing campaigns on AST: *5.7(2.0)*	Research and publications: Effectiveness of social marketing campaigns on AST: ***6.0(1.5)***

Notes: Panellists were first asked to rank indicators within a Core Area in Round 2.
[1]Round 2 is not in priority sequence

Discussion Summary

Due to time constraints within the meeting, as well as the nature of these indicators being more suited for study by a dedicated research group rather than GCC, the core area for Generating Evidence and Demonstrating Progress was not discussed in the web meeting. Nevertheless, it is worth noting that the indicators within this core area maintained the same rank order from Round 2 to Round 3, with an evaluation framework and standardized instruments for measuring AST as the top ranked indicator.

Summary of Recommendations

The objective of this work was to create an indicator framework for AST in Ontario. Key considerations for this framework were feasibility for a) measurement, b) analysis, and c) reporting in the short term (e.g., by the end of August 2020 for the OAST program). Overall, the Delphi process and web meeting (transcript and chatbox components) captured rich discussions from expert panellists on the interplay between Core Areas, and differences between measuring/tracking the presence of an indicator, and assessing its qualities (e.g., implementation components). The final collection recommendations for evaluating the Ontario Active School Travel Program are listed below:

Assessing Core Areas as a Collective
- Interrelationships and dependencies between the Core Areas must be considered when measuring indicators of AST.
- A selection of indicators from all six areas needs to be tracked in order to show progress in AST in Ontario.

Assessing Indicators of Designing/Building Walk- and Bike-Friendly Communities
- Presence or absence of a) Municipal Master Plan for public transit and AST infrastructure, b) School AST infrastructure improvements and c) School Plan for AST is feasible to collect from OAST Funded communities
- Need to identify and collate municipal metrics that is uniformly assessed and collected across Ontario for a) Traffic Calming Measures, b) Pedestrian infrastructure and gaps, and c) Cycling infrastructure

Assessing Indicators of Strategic Investments
- Track total funds as well as percentage of budgets devoted to AST whenever possible
- Identify policy drivers for Strategic Investments

Assessing Indicators of Developing Supportive Policies
- Track complete streets policies for data about corridors beyond the school zone
- Identify restrictions on driver behaviours within school zones, i.e., signage restricting speed limits, U-turns, 3-point turns, parking
- Identify explicit support for AST in student transportation policies
- Identify "goodwill" AST supports from school boards and transportation consortia
- Identify data collected and available from the Ministry of Education, e.g., whether or not courtesy bussing is permitted and requests for courtesy bussing

Assessing Indicators of Quality and Accessible Programming in Schools for Independent Student Mobility
- Track presence or absence of an action plan, organized active/sustainable transportation groups, and safety training
- Track participation in seasonal programming/events through registration/evaluation forms

Assessing Indicators of Partnerships and Collaboration/Coordination
- Identify and track municipal support for AST, e.g., dedicated staff person, membership to AST groups/committees
- Track presence of stakeholder groups on school and regional AST committees
- Track presence/absence of a province-wide coordinating entity
- Identify departmental partnerships within government for AST

Appendix 1: Outcome Indicators for AST

As part of the Delphi study, panellists generated a list of outcome indicators for AST. These outcomes are listed below, but were not included in the ranking exercise for importance of tracking or feasibility for measurement.

- Travel mode share, e.g., walked all of the way or part way, bicycle, school bus, public transit, carpool, car, scooter/taxi/other mode
- Increased awareness and positive attitudes towards AST among target groups: students; staff/administration; parents/caregivers; community members
    o Awareness of benefits of AST
    o Support for policies and investments of AST
    o Changes in school culture, e.g., social acceptability of AST, sense of community
    o Reduced perceived barriers for AST
- Increased AST among target groups: students; staff/administration; parents/caregivers; community members
    o % of walk zone students that use AST
    o school bus ridership levels
- Noise pollution
- Air quality
- Vehicle Miles of Travel (VMT)
- Increased safety in school zones
    o Fewer collisions
    o Fewer injuries to pedestrians
    o Fewer tickets/fines for drivers
    o Fewer frequency of unsafe driver behaviour
- Vehicle speeds
- Prevailing route choice
- Psychological wellbeing from AST
    o Autonomy among children who are independently mobile
    o Relatedness, e.g., extent to which students feel affiliated with and connected to peers and teachers
    o Competence to navigate home-school routes using active modes
    o Attention restoration among children who are independently mobile

List of Abbreviations

AT   Active Transportation
AST   Active School Travel
GCC   Green Communities Canada
OAST   Ontario Active School Travel
M   Mean
SD   Standard Deviation
ST   Sustainable Transportation
STP   School Travel Planning
VMT   Vehicle Miles of Travel