

SCHOOL AREA TRAFFIC SAFETY GUIDELINES FOR MANITOBA

Prepared For:

Manitoba Infrastructure and Transportation

July 2015

ACKNOWLEDGEMENTS

This guide was developed under the supervision of a Project Steering Committee representing several school and transportation-related organizations. The participation of these organizations throughout the project is gratefully acknowledged.

- Manitoba Infrastructure and Transportation
- Manitoba Education and Advanced Learning
- City of Winnipeg
- Manitoba Public Insurance
- Green Action Centre
- RCMP
- Manitoba School Boards Association

There were also numerous stakeholders who attended three consultation workshops throughout the course of the project. Their participation is also gratefully acknowledged.

- CAA Manitoba
- City of Portage la Prairie
- Interlake School Division
- Manitoba Association of Parent Councils
- Manitoba Association of School Business Officials
- Manitoba Association of School Superintendents
- Prairie Rose School Division
- Safety Services Manitoba
- Winnipeg Parking Authority
- Winnipeg Police Service

REVISIONS

May 2018 - Crossing Guards and School Patrols section (page C-50 to C-52), revised to remove information related to STOP paddles.

TABLE OF CONTENTS

GLOSSARY	III
EXECUTIVE SUMMARY	VII
A. INTRODUCTION	A-1
B. PLANNING FOR NEW SCHOOLS.....	B-1
C. USER GUIDE FOR EXISTING SCHOOLS.....	C-1
STEP 1: CREATE TEAM.....	C-6
STEP 2: COLLECT DATA AND REVIEW EXISTING CONDITIONS.....	C-9
STEP 3: IDENTIFY POTENTIAL IMPROVEMENTS	C-27
TOOLKIT: Educating Drivers.....	C-30
TOOLKIT: Off The School Site.....	C-37
TOOLKIT: On the School Site.....	C-82
TOOLKIT: School Processes	C-101
STEP 4: PRIORITIZATION AND COST ESTIMATES.....	C-108
STEP 5: COMPLETING THE STIR.....	C-114
STEP 6: REVIEW BY AUTHORITIES	C-115
STEP 7: IMPLEMENTATION AND FOLLOW UP	C114
REFERENCES.....	i
APPENDIX 1: EXAMPLE SURVEY FORMS.....	iv
APPENDIX 2: EXAMPLE INFORMATION FROM A SCHOOL.....	xx
APPENDIX 3: TOOLKIT SUMMARY.....	xxvi
APPENDIX 4: OBTAINING EXPERT HELP	xxxii
APPENDIX 5: TRAFFIC CALMING MEASURES	xxxiii
APPENDIX 6: EXAMPLE OF PRIORITIZATION PROCESS	xxxvi

STANDARD LIMITATIONS

This report was prepared by MMM Group Limited (MMM) for the account of **Manitoba Infrastructure and Transportation** (the Client). The disclosure of any information contained in this report is the sole responsibility of the client. The material in this report reflects MMM's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. MMM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

GLOSSARY

Active Modes: Modes of transportation that require people to be active, such as walking or riding a bicycle, rather than riding in a vehicle. In general, walking and cycling are the two most common modes that are considered active modes, although other modes are also active, such as rollerblading, skateboarding, or operating a wheelchair.

AutoTurn: A commercial software tool used to determine if there is clearance for a vehicle to move through a parking lot, around a corner, through a roundabout, etc. It is used when designing or modifying these road features using computer-aided drafting (CAD) computer programs.



Curb Extensions Road widths can be reduced with curb extensions (also known as curb bulbs or bulb-outs), which are extensions of the curb and sidewalk that protrude into a parking lane. They make it easier for motorists and pedestrians to see each other, and they reduce the distance pedestrians must walk across the road. Curb extensions also have a traffic calming or

slowing effect on vehicles.



Curb or Corner Radius: The radius of a curb on the corner of a block. The larger the radius, the faster a vehicle can make the turn, and the longer the distance a pedestrian will have to walk when crossing from one corner to another. Generally, smaller radii are preferable from a pedestrian standpoint. However, large vehicles like school buses require larger radii, so they do not drive over curbs/boulevards or come into contact with pedestrians on the curb.



Drive Aisle: A drive aisle is the part of a parking lot adjacent to a row of parking stalls where vehicles drive in order to access parking stalls. Drive aisles can be one-way or two-way in operation. Typically, a two-way drive aisle will be wide enough (between 6.0 to 7.5 metres) to accommodate two vehicles passing one another, and to permit a vehicle to make a 90° turn into, or out of a parking space.



Driveway Throat: A clear length of driveway (with no intersections) between the street and the parking lot that allows vehicles to queue while waiting to leave a site without getting in the way of vehicles moving inside the parking lot. Generally the throat length in school parking lots should be able to hold at least one vehicle, preferably without blocking the sidewalk.

Informal Paths: Paths made into grass, dirt, or even snow by repeated walking or bicycling activity. The grass typically stays short or is gone altogether in the areas where many people walk. Often these paths will be the shortest distance between two points, and will be made even when there is a longer paved sidewalk. These pathways may show the routes people want to take and may be worth converting into paved pathways or sidewalks, although this may not always be practical, such as if the route cuts across a sports field.

Highway Traffic Board: This is a board that has several responsibilities related to highways in Manitoba, including permits for access to highways, permits for structures/development adjacent to highways, and the approval of traffic control devices. It also establishes speed limits throughout the province, including the City of Winnipeg. The Board conducts public hearings on all the above, as well as on current issues; makes orders and regulations; and provides policy input to the Minister of Manitoba Infrastructure and Transportation.

Local Government: In this document the term local government refers to the jurisdiction that has authority for the roadways adjacent to a school site.

Mode (of transportation): A “mode” is a way of traveling. Walking, riding a bicycle, driving a vehicle, riding in a private vehicle, and riding a bus are all modes of transportation.

Manitoba Public Insurance (MPI): Amongst its other roles, MPI is a source of information on safe driving practices and driver education, and it provides services such as the Speedwatch program, which loans traffic radar devices.

Manual of Uniform Traffic Control Devices for Canada (MUTCDC): This is a manual commonly used by traffic agencies/authorities, which provides standards and practices with respect to traffic signs and pavement markings. Manitoba Regulation 300/B9 “Traffic Control Device Order” approves the signs and other traffic control devices contained in the MUTCDC for use in Manitoba. Signs and other traffic control devices not in the MUTCDC cannot be used in Manitoba, unless approved by the Highway Traffic Board.

Near Miss: A near miss is an unplanned event that had the potential to result in injury or damage but did not do so. The opportunity to learn from the near miss is like that of an actual incident but without the loss; it is best that one learns from near misses, so similar incidents do not occur.

Patrol Supervisor: An adult who oversees the student members who make up a School Patrol crew.

Road Shoulder: The edge of a roadway beside the lanes used for vehicle movements. Shoulders may be paved or unpaved gravel. They may be used by pedestrians where there are no sidewalks.

STIR Document: A School Transportation Issues Report (STIR) is a review of transportation conditions existing at a school. It outlines where problems are occurring with evidence (photos and numerical data), and outlines how to resolve these issues. It is created to address one or more existing problems and to explain how the problem or problems could be addressed. It can be used by school officials and the transportation authority to plan and implement the recommended solutions.

Transportation Association of Canada (TAC): This is an organization that is a source of information on best practices related to transportation, including road design, traffic signals, etc.

Through Traffic: Traffic traveling through a certain area (such as a neighbourhood) that doesn’t start or end its trip there. This is different from “local” traffic, which starts or ends a trip within a neighbourhood.

Transportation Master Plan (TMP): A document specific to a school that outlines in detail how transportation is supposed to work in and around the school site, including rules related to parking, loading, school bus pickup, walking and biking, etc.

Traffic Safety: Methods and measures for reducing the number and severity of traffic collisions.

Transportation Authority: This is the local government that has authority over traffic control devices on a certain road. More information can be found in the Introduction under “The Role of Authorities”.

Travel Lanes: The lanes on a roadway used by vehicles when driving. Usually distinct from parking lanes, although a lane can act as a parking lane some of the time and a travel lane during other periods. 3.7 metres is a typical width for a travel lane.

Turning Radius: The turning radius of a vehicle is the outer radius of the smallest circular turn the vehicle is capable of making. This is used when designing the size of a loop that a school bus will need on a site, or when designing a parking lot to ensure vehicles can make movements properly. For regular passenger vehicles, a typical turning radius would be approximately 7.2 metres, whereas a school bus has a turning radius of approximately 12.8 metres.

EXECUTIVE SUMMARY

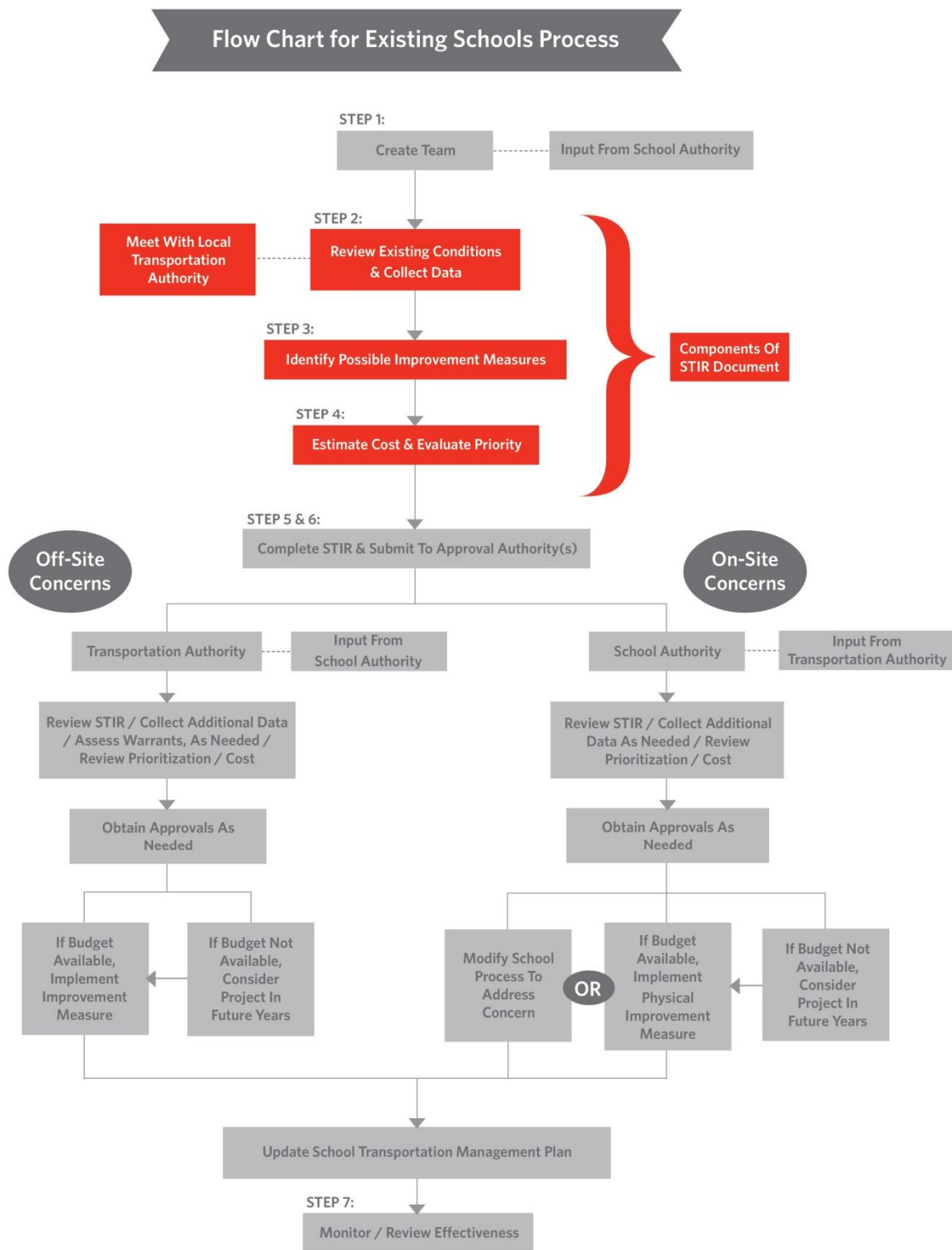
Schools throughout Manitoba need to consider transportation safety, both on-site and in the surrounding community. With more children being driven to school today than in the past, a school's transportation facilities may not be operating as originally planned.

So how does an existing school go about rectifying transportation issues? The purpose of this document is to provide a procedural manual and toolkit to those who may not necessarily have a technical background, but are interested in seeing improvements to school area infrastructure and/or policies. In addition to a toolkit that summarizes effective improvement measures, this document will provide a comprehensive, step-by-step process to help school teams see improvements through to implementation. It also helps school teams understand the challenges that may occur along the way. All schools have differing surroundings and circumstances, and a one-size-fits-all strategy will not work. For this reason, the creation of a team representing an individual school is the foundation of the process. A flowchart of the process is shown on the following page.

With the release of this document, it is anticipated that Manitoba municipalities may receive a higher than usual number of requests for school area traffic improvements. The prioritization method outlined in the guideline will be a useful tool for road authorities and school officials alike.

While the primary focus of this document is to outline a process that can be followed at existing schools with transportation issues, the guideline includes information that will be useful in developing new schools so that transportation issues are not inadvertently created as a result of how the school's transportation elements are laid out. Much of the information pertaining to mitigation methods can be considered as part of the design of a new school. The section "Planning for New Schools" in the guide should be reviewed during the process of site selection and design for new schools in Manitoba.

Flow Chart for Existing Schools



A. INTRODUCTION

Purpose

MMM Group Limited (MMM) was hired by Manitoba Infrastructure and Transportation (MIT) to prepare a guideline document to address school area traffic safety concerns in Manitoba. Specifically, the scope of the project is to develop a procedural manual and safety assessment toolkit that provides direction for both transportation authorities and school administrations/divisions to effectively and consistently address traffic safety issues within school areas.

The purpose of this work is to assist school divisions in Manitoba in resolving transportation-related issues. Often a school might need to address transportation issues, but not know how to proceed. MIT, in addition to municipal jurisdictions in Manitoba, receive many requests each year from schools, school divisions, and parent groups for infrastructure improvements in school areas. Those making these requests can vary widely in their level of understanding of the process that must be undertaken to study the need for such improvements, as well as the requirements for implementation. The fundamental purpose for the guideline is, therefore, to assist school teams in their understanding of this process and to provide consistency in the improvement measures installed in school areas across Manitoba.

These guidelines will help a school to create a School Transportation Issues Report (STIR). This is a document that can be provided to the local transportation authority, who will then review the report to determine if improvements or changes are required.

Intended Users

The guidelines are intended to be a resource for schools throughout the province of Manitoba.

The primary users of these guidelines are teams of volunteers, consisting of parents, school staff, and community representatives who have come together to resolve traffic safety issues at an existing school. These guidelines will also be useful to the planners, technicians, and engineers from the local transportation authority that will work with such groups, and provide the technical knowledge necessary to assist them in addressing their concerns while following consistent standards related to school area traffic safety. These guidelines will also be of use to the multi-disciplinary team working on the planning and approval of new schools.

These guidelines are primarily written for an audience that may or may not have an engineering or technical background. Throughout the process outlined in these guidelines, it is anticipated that the school teams will defer some analysis to technical experts such as the engineers or technicians at the local transportation authority, and these experts will assist the school team.

Guiding Principles

The safety of children during the school day is a concern to all. Parents depend on teachers and other school employees to keep their children safe while they are in the classroom; however, the school day does not start and end in the classroom. The trips to and from school are important components of every student's day, and their safety during those trips can be directly influenced by the decisions made by transportation authorities and school divisions, as well as parents.

For many reasons, more children are being driven to school in private vehicles today than in the past, resulting in increased traffic congestion and parking issues in school areas. While there are innumerable benefits to encouraging increased active transportation options for trips to and from school, the objective of the guideline, while definitely supportive of active modes, is to provide guidance on resolving transportation issues for ALL modes of transportation used in school areas.

As such, the guideline is steered by the underlying principles of:

- **Safety** – the safety of children travelling to and from school should be of the utmost importance to all members of the community.
- **Consistency** – a consistent approach for mitigating safety concerns will help to meet driver and pedestrian expectations.
- **Cost-effectiveness** – cost-effective measures are important to transportation authorities and school divisions, as there are competing priorities for funding.
- **Effectiveness of Measures** – measures suggested in this guide have been proven through engineering studies in North American jurisdictions to be effective in mitigating safety concerns.

A “one-size fits all” strategy across all schools in Manitoba is not the solution. All schools (including existing schools and those in the planning stages) have differing surroundings and circumstances, and what is appropriate at one school might not work at another. Nevertheless, there are common transportation issues facing schools that could be addressed with similar mitigation measures.

An effective mitigation measure should not create other road safety concerns or shift the problem elsewhere. For example, a measure that would lessen interaction between pedestrians and parked cars but would result in increased jaywalking would be problematic. Similarly, a solution that shifts school-related traffic to an adjacent residential street is generally not recommended.

Sometimes, transportation improvements are not implemented because of other factors. A balance between resolving problems with transportation and other needs at a school (such as protecting green space) is required.

The Role of Authorities

A basic understanding of who has authority over different types of roads is necessary before embarking on a transportation plan in Manitoba. Knowing who to ask for help could be a valuable time-saver in the process of improving school area infrastructure. Below are some important considerations to keep in mind:

- Traffic laws in Manitoba are defined in *The Manitoba Highway Traffic Act*.
- The Province of Manitoba Highway Traffic Board has approved the Transportation Association of Canada's *Manual of Uniform Traffic Control Devices for Canada* (MUTCDC) for use in Manitoba. All traffic signs used in Manitoba must be in the MUTCDC or otherwise be approved by the Highway Traffic Board.
- Manitoba Infrastructure and Transportation (MIT) is the transportation authority for all declared highways making up the provincial highway network (ex: Provincial Trunk Highways (PTH's), Provincial Roads (PR's), and Provincial Access Roads (PA's)).
- All other roads and highways are under the jurisdiction of the local municipal authority (ex: cities, towns, rural municipalities, etc.).
- The governing transportation authority will manage all aspects of a roadway including signs, signals, and pavement markings, among others.
- Speed limits are under the jurisdiction of the Highway Traffic Board for all roads, streets, and highways in the province regardless of the local transportation authority. However, the new reduced-speed school zone policy is the exception to this -- Manitoba's Bill 3 gives local transportation authorities or a local government entity the authority to designate segments of highway (including provincial highways) as school zones and to implement modified speed limits in such zones. This authority, given to municipalities to set reduced-speed school zones, is subject to a set of regulations. For more information please refer to <http://web2.gov.mb.ca/laws/regs/pdf/h060-136.13.pdf>.

The following organizations can be contacted for information related to this guideline:

- Manitoba Infrastructure and Transportation – Director of Traffic Engineering; and
- Manitoba Education and Advanced Learning – Pupil Transportation Unit or Public School's Finance Board.

The Importance of Active Modes

The best interests of students are at the heart of this document, and physical activity is very important to a child's mental and physical health and safety in many ways. Walking and cycling to and from school and after-school activities are a major source of physical activity for children. Research indicates that students prefer to walk and bike to school over being driven in a school bus or private vehicle. A 2011 study in Toronto found that if given the choice, approximately one-half of students would choose to walk (49.1 percent), or ride a bicycle (41.2 percent) to school.¹

The *2013 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth* gives Canada's children a D- on overall physical activity levels. Many of the recommendations in the Report Card, aimed at parents, school administrators and policy-makers, are likewise described in the toolkit section of these guidelines. Briefly, the recommendations provided by the 2013 Report Card are as follows:

- Parental encouragement and support of active travel to and from school, such as by forming a walking school bus with other parents or parking a further distance from school and walking the rest of the way, if it is not possible to walk the whole way.
- Encouraging school administrators to supply adequate and highly visible bicycle racks on school property.
- Considering children's travel needs when considering locations for building new schools.
- Facilitating the implementation of school travel plans, road safety education, and other measures to ensure active and safe routes to school.
- Advising policy-makers to encourage employers to offer flexible hours that would allow parents to support active travel opportunities.
- Encouraging implementation and enforcement of traffic safety measures in communities around schools and parks.

The full 2013 Report Card by Active Healthy Kids Canada can be viewed at www.activehealthykids.ca.

Over the last half century, the design of many Manitoba communities did not consider active transportation modes as a top priority. Walking or cycling can be difficult due to a lack of infrastructure, or the presence of barriers and long or circuitous routes. Active travel may also

¹ https://physical.utoronto.ca/Libraries/Project_BEAT_documents/BEAT_Summary_Report_for_Schools- July_5_2012.sflb.ashx

be a cause for concern to parents where students have to cross or walk alongside high-speed or high volume roads. In addition to this, policies that allow students to attend schools outside of their catchment area for programs not offered at their local school are not coupled with corresponding transportation options, often resulting in students being driven to school. Consequently, large numbers of trips to and from school are being made by private vehicles, making traffic safety in school areas an issue for all.

These guidelines play a complementary role to “Safe Routes to School” programs now common throughout North America, and currently being deployed in Manitoba by Green Action Centre since 2002. These guidelines outline (from a technical standpoint) how to address and resolve transportation issues for all modes of transportation.

School Categories

Factors such as the age of students at a school, and the geographic location of a school, should be considered when reviewing that school’s transportation issues, or when comparing the measures in place at two schools. What may be suitable measures at one school, may not apply at another.

Types of Schools

The range of ages served by a proposed school is an important consideration in the design of a traffic plan. Schools are generally designed to suit a limited age range of students and each of these ranges has unique transportation demands. As example, students at the kindergarten to grade four level will have different transportation needs, walking abilities, and responsibilities than students at the grades five to eight level. Students from grades nine to 12 will also have unique needs and challenges. Despite their obvious ability to walk or bicycle longer distances than younger children, or take public transport, when students reach driving age, they often want to drive themselves to school in their own vehicle.

Elementary Schools: A school that includes kindergarten to grades five, six or eight. Younger elementary school students generally need supervision while travelling, and are likely to be accompanied by parents when they travel to school.

Middle/Junior High Schools: A school at a level between elementary and high school, typically grades six or seven through eight or nine. These students generally are more independent.

High Schools: A school for grades nine or ten through 12. Students have more freedom to come and go to classes, so they may be travelling at a variety of times during the day. Grade 11 and 12 students may drive themselves to school.

Private Schools: From a transportation perspective, private schools generally have students who travel greater distances, with more private vehicle pick-up and drop-off, and sometimes, more bussing of students.

Geographic Location

The geographic location of a school also plays a role in transportation-related issues.

Rural Schools. As students who go to rural schools are spread out over a wide area, it is less likely they will walk or ride bicycles to and from school – school bus and private vehicle use are the prevailing modes of travel. Often, these schools are located near or along highways to facilitate transportation by school bus or car.

- These schools are most likely to have large sites.
- Due to a reliance on buses and private vehicles to travel to school, these schools are most likely to have developed infrastructure for motorized vehicles already in place.
- Infrastructure for pedestrians or cyclists may be minimal, or not be required or present.
- Design features may include large driveways and gravel lots with undefined parking layout.
- Throughout rural Manitoba, there are numerous school sites where the school is located on one side of the main highway corridor while residential developments are on the other side of the highway, thus creating safety concerns with respect to crossing the highway.

Suburban Schools are located in predominantly residential areas of cities or towns. Suburban schools may feature the following:

- Large buildings and sites.
- School buses may be more common due to larger areas being served by these schools, but may be a relatively new addition to the school's transportation mix due to shifting demographic patterns in the area and expanding catchment areas set out by school divisions.
- Facilities for vehicles (bus loops, parking lots) may or may not be present.
- Long walking distances or missing pedestrian infrastructure may limit the feasibility of walking to school.
- Cycling may be common.
- The adjacent roads may be local residential or collector streets with lower speed limits.

Inner City Schools are located in the central region of urban areas. The schools tend to be older, smaller, and typically will have a large percentage of students walking to/from school, rather than using other modes of transportation.

- The area where they are located may have commercial and industrial land uses in close proximity.
- Tend to have small sites, which will result in a limited ability to make changes to on-site layout of parking facilities or bus loading areas.
- Limited parking capacity on site, perhaps only for staff.
- Cyclists may or may not be common. Some inner city schools may be in areas with high traffic volumes, which discourage bicycle use.

Other School Users

Other users of the school may have an impact on transportation activity before and after school, which may need to be considered.

Child Care Facilities

Licensed child care facilities are now frequent co-tenants on school sites throughout Manitoba, either in stand-alone buildings or inside the school building, and potentially sharing outdoor play-space. Children using these facilities may be school age or younger. Vehicles from off-site daycares may also pick up students at school sites.

These programs may run before, during, or after school, or they may run throughout the day. The facilities serve large catchment areas and operate over a longer period of the day than the school itself, meaning traffic from daycare parents at drop-off and pick-up times may both overlap the school day and extend beyond it in the mornings and the evenings. Parent drop-off or pick-up of daycare children requires that parents accompany children into and out of the school, sign them in and out, and assist in disrobing or dressing children in their outdoor clothes. As such, parent vehicles need a place to pull out of the way of traffic for as much as 10 to 15 minutes at a time.

Non-School Users of School Facilities

In addition, school properties throughout Manitoba are often used in the evenings or early morning by non-school users, such as community and sports groups. This community use of schools can take place throughout the entire year, including in the summer and during vacation breaks. Use of school buildings as joint-use facilities for the community is growing, and will likely continue to increase in the future. If such uses are present at a school, a review of their operation will need to be included in the process and any issues unique to their operation should be properly considered and investigated.

School Transportation Management Plan (TMP)

Schools typically have a plan that describes the various aspects of transportation at the school. This is a separate, but related document to the STIR report, which a school team will generate by following this guideline to address specific transportation concerns at the school.

A STIR and a TMP are distinct from one another:

- A TMP is a set of instructions, directives, rules, etc., that explain how transportation operations, in their entirety, are to occur on the site. It is a permanent document that makes up part of the school's operating procedures.
- A STIR is a review of transportation conditions at a point in time. It outlines where problems are occurring with evidence (photos and numerical data) and outlines how to resolve these issues, which might include modifications to the processes in a TMP. It is created to address one or more existing problems and to explain how the problem or problems could be addressed.
- Unlike a TMP, which might be updated annually, generally a STIR will be a one-time project. A STIR would only need to be repeated when a major change to operations takes place at a school, such as school bus service being added to a school where it did not already exist, a major change in traffic conditions near the school, such as a change in speed limit, or the opening of a child care facility at the school.

If a TMP is not in place, one can be created by documenting all aspects related to travel to/from the school. Even if these processes aren't working ideally at present, or actual practice doesn't follow what should be occurring, this documentation is useful as a starting point when reviewing what works, and what needs to be reviewed at a school.

Note that, as changes are made to a school's infrastructure or operational protocols for things like school bus loading/unloading, the TMP will need to be updated.

All students/parents/staff should be aware of the TMP – it should be part of the “school handbook” and available online. The plan should also be familiar to all regular visitors to the school, such as staff, parents, delivery drivers, school bus drivers, etc.

TMP's may include some or all of the following:

- Mapped routes for bicyclists and pedestrians entering the school grounds, indicating what paths and/or entrances to use.
- Arrival and dismissal procedures, including if there are staggered start and dismissal times for students by grade or by mode of travel.
- Documentation of traffic signage on school property and in the vicinity of the school.

- Documentation regarding how bus loading takes place at the school.
- Locations and times where student safety patrol or crossing guards are provided.
- Locations where parents should drop off or pick up students by either parking and waiting for students or leaving their vehicles unattended, and areas where parking or stopping is prohibited.
- Areas where children should wait to board buses or private vehicles.
- Information regarding before- and after-school activities, joint use operation, and child care drop-off/pick-up, as well as how these programs extend operation of the school beyond the standard school day should be highlighted in the plan. These operations may present operational challenges different to those during the school day, such as parking requirements that may overlap with regular school hours. There may also be different issues related to seasonal operations (winter versus non-winter) and/or time of day (night versus daytime).
- The TMP document should include a detailed diagram or map that shows the approved traffic flow for the morning drop-off and afternoon pick-up of students by buses and cars, as well as by active modes (perhaps on separate sheets to avoid one cluttered diagram).

B. PLANNING FOR NEW SCHOOLS

This section of the guideline is intended for use by community planners and school officials who are involved in the planning of a new school. Advance planning and consideration of transportation issues can prevent costly and troublesome problems later on.

Where multiple options exist for locating a school, the options should be compared from a transportation standpoint to determine the strengths and weaknesses of each site for use in the decision-making regarding the final selection of a site. Selecting sites with fewer potential transportation issues eliminates the potential for ongoing safety concerns and problematic operation or the need for costly retrofits later on.

An amendment to *The Public Schools Act* assented to on June 30, 2015 has established new rules surrounding planning requirements for pedestrian safety prior to the opening of any new schools or significant expansion of existing schools. The amendment is described in more detail below. It is highly recommended that the transportation network, including road layout and related transportation infrastructure features, be designed and professionally certified by a qualified engineer.

When a transportation impact analysis for a new community is conducted, ensure that schools are considered. The standard practice is often to not include school operations when performing traffic/transportation analysis for residential subdivisions because the afternoon peak hours for residential areas and schools generally do not coincide. A school may need to be analyzed separately as part of the transportation analysis.

Schools can generate significant traffic, particularly in areas where large numbers of students are driven to school. For any given school, it may be hard to estimate which mode of transportation students will choose. A school with similar characteristics should be used as a reference.

The Public Schools Amendment Act (Pedestrian Safety)

As of June 30, 2015, when the Public School Finance Board has approved the construction of a new school or a significant expansion to an existing school, the responsible school division must notify the traffic authority responsible for each road and highway that borders the school site. After being notified, the traffic authority must conduct an analysis of the roads and highways. Following the study, a timeline for implementing any changes must be provided to the school division and if the new school opens before all the changes can be implemented, the act requires the traffic authority (after consulting with the school division) to implement any temporary pedestrian and traffic safety measures that are considered appropriate.

The Planning and Land Dedication for School Sites Act

The Planning and Land Dedication for School Sites Act is a Provincial policy:

The Planning and Land Dedication for School Sites Act (The Act) was enacted in June 2011. The legislation, jointly prepared by the Departments of Local Government (LG) and Education (EDU) – Public Schools Finance Board, is intended to address the ambiguities and inconsistencies that exist in the “planning for schools process” by bringing consistency, transparency and clarity to this process for all involved. The legislation requires all planning authorities and school boards to consult on the need for school sites as part of the development plan process and to ensure those needs are reflected in the development plan. The act has not been proclaimed as LG and EDU are currently developing regulations to support the new legislation.

This school area traffic safety guideline is intended to work with the regulations mentioned above, once they are created.

Travel Modes To and From School

A mode is a method of travel. School buses, private vehicles, walking, and cycling are all types of travel modes. Opportunities to reduce the overall number of private vehicle trips to school through use of alternative modes will be significantly different in rural areas, suburban areas, and urban areas. Generally speaking, only a few urban areas in Manitoba have reasonable and efficient access to public transportation networks. In suburban areas, which are a current high growth area for school-age population, low population densities generally translates to a lower level of public transit service (in terms of the number of bus routes and bus frequency) than in higher density inner city areas.

In rural areas, there is often no other alternative to arriving at school other than by vehicle. In a small village, for example, the school-age population may derive from anywhere within a one-hour highway driving radius from the school, and the population of the school itself may outnumber the population of the village in which it is located. Schools in rural areas may have greater constraints on the ability to achieve meaningful active transportation improvements as the population of students and staff will likely be restricted to travel either by private vehicle or school bus.

Some schools, called “collector schools,” offer special programs to a large geographic catchment area. For example, at collector French Immersion schools in the Winnipeg School Division, or at division scolaire franco-manitobaine (DSFM) schools, opportunities for active transportation by students is limited by the long distances students may need to travel to attend school.

Despite the aforementioned considerations, good school site planning and site design should strive to encourage and make possible the use of active transportation modes, and efforts should be made to provide an environment where active transportation can be a viable option and flourish.

Checklist of Transportation-Related Considerations

The following checklist is intended for use as a compilation of transportation-related issues to be considered when determining locations for school sites. It should be used in conjunction with other school planning tools, as appropriate. For some of the conditions, a YES or NO answer may be advantageous or desirable – it is not important to score all YES answers in order to create a good quality school site. Consider each item individually and reflect how it will affect the operations of a future school and, in particular, the safety of pedestrians, cyclists, bus operations and motorists on and around the school site.

Site Selection Considerations	Yes/No	Comment
Is the school site adjacent to built or natural barriers, such as railroad tracks, high speed roadways, or rivers/streams?		<i>The presence of these barriers will limit the ability of children to walk or bike to school.</i>
Is the school's catchment area predominantly on one side of an arterial (or higher classification) road?		<i>Such roads act as barriers to walking and biking and there is a need to consider how students will negotiate these safely.</i>
What is the adjacent land use expected to be in the future, or already approved in the area surrounding the school site?		
Commercial?		<i>Generally, commercial, industrial, or agricultural uses are undesirable near a school, in part due to the mix and volume of traffic they create. Lower volumes of traffic near a school are desirable.</i>
➤ Are traffic volumes expected to grow significantly in the future?		
Industrial?		
➤ Are traffic volumes expected to grow significantly in the future?		
➤ Will the traffic mix consist of a high proportion of large vehicles?		
➤ Does the nature of any traffic to and from a nearby industrial development pose significant concerns (ex: hazardous waste)?		
Agricultural?		
➤ Will adjacent farming operations create any traffic-related concerns (ex: over-dimension vehicles periodically needing to occupy the entire road surface and obscuring pedestrian/cyclist lines of sight)?		

Residential?		<i>Ideally, a school will be located in a residential area.</i>
➤ Is the site situated in a convenient location to encourage a mix of travel modes to and from school?		<i>A range of potential mode choices is better than limiting choice to a small number of options.</i>
➤ Will headlight glare and other environmental factors (such as noise, vehicle emissions, dust, etc.) associated with drop-off/pick-up and parking operations post a concern to adjacent residents?		<i>Ideally, no; ensure the design of such areas does not create a nuisance for members of the community.</i>

Road Network Considerations	Yes/No	Comment
<i>Access to and from collector streets in urban areas is generally appropriate for elementary and middle schools. Access solely from a local residential street or cul-de-sac can result in congestion and greater conflicts with pedestrians and cyclists, especially if there are no sidewalks. In rural areas, avoiding sites adjacent to high-speed, high-volume expressways is recommended.</i>		
What is the road classification of the adjacent street network? (Check all that apply.)		
➤ Expressway (high-speed/high-volume)?		<i>If the answer is YES to either of these two road types, is an alternate site available?</i>
➤ Arterial?		
➤ Collector?		<i>Lower classification roads generally have slower speeds and lower volumes of traffic.</i>
➤ Local?		
Is visibility adequate on the road where school access is located (ex: not on a curve or a hill)?		<i>A YES answer is desirable; a NO will mean a greater potential for traffic safety concerns.</i>
Can school driveways be aligned with existing streets to create four-way, right-angle intersections?		<i>A YES answer is preferable; it reduces the number of conflict points and non-standard vehicle movements.</i>
Is the school site close to existing controlled crossing points (crosswalks)?		<i>A YES answer will potentially reduce the need for construction of new controlled crossings (crosswalks).</i>
Can on-site pedestrian pathways align and connect with existing sidewalks on the street network?		<i>Connected networks are essential to their use.</i>
Can access be provided from more than one direction and at least two adjacent streets?		<i>More options mean that traffic volumes will be distributed rather than concentrated, which can result in congestion and unsafe operation.</i>
Is the school site accessible by public transit (if available)?		<i>A YES answer means that public transit can be an option for school users.</i>

Consider all modes of travel to and from school and their access points to the site:		
➤ Is there adequate space on-site for bicycle storage?		<i>Adequate storage is desirable if cycling is to be an option.</i>
➤ Can the separation of travel modes (school buses, private vehicles, bicycles, and pedestrians) occur on the site?		<i>Separating modes reduces the potential for conflicts.</i>
➤ Can the transportation needs of disabled / physically challenged students be integrated into the site?		<i>The needs of these users should be integrated into the design of the school.</i>

Parking/Loading Considerations	Yes/No	Comment
Is there adequate storage space either on the school site or off to park buses?		<i>It is very desirable to have adequate storage space on site, but not always possible. If it is not possible, find alternatives for bus loading/unloading such as on nearby streets, or through agreements with nearby property owners.</i>
If school bus pick-up/drop-off will occur not on the school site but on the adjacent street network, is it possible to install a pull-out lane to prevent buses from sitting in the travel lane of the road?		<i>If buses must block traffic, motorists may become frustrated and try to pass.</i>
Is there adequate storage space for queuing of private vehicles picking up and dropping off students?		<i>This should be carefully considered. Many existing schools have inadequate storage space for these activities. Space requirements may be difficult to estimate and provide. If it is not provided, where will this activity take place?</i>
Is there permanently reserved space for deliveries and/or emergency vehicles?		<i>A space for these activities is essential and may be a bylaw requirement.</i>
Are staff parking requirements accommodated on site?		<i>Very desirable and may be a bylaw requirement.</i>
Are visitor parking requirements accommodated on site?		<i>Review similar schools to determine adequate visitor requirements. Likely a bylaw requirement.</i>
Has the on-site location for garbage collection and other similar activities been considered?		<i>Avoid conflict between garbage vehicle operation and other vehicle movements on site, particularly during peak traffic periods.</i>
Consider the age range of students/users of the school:		
➤ Will students be young enough that parents will park and		<i>If YES, then additional parking for this use may be required, where this can</i>

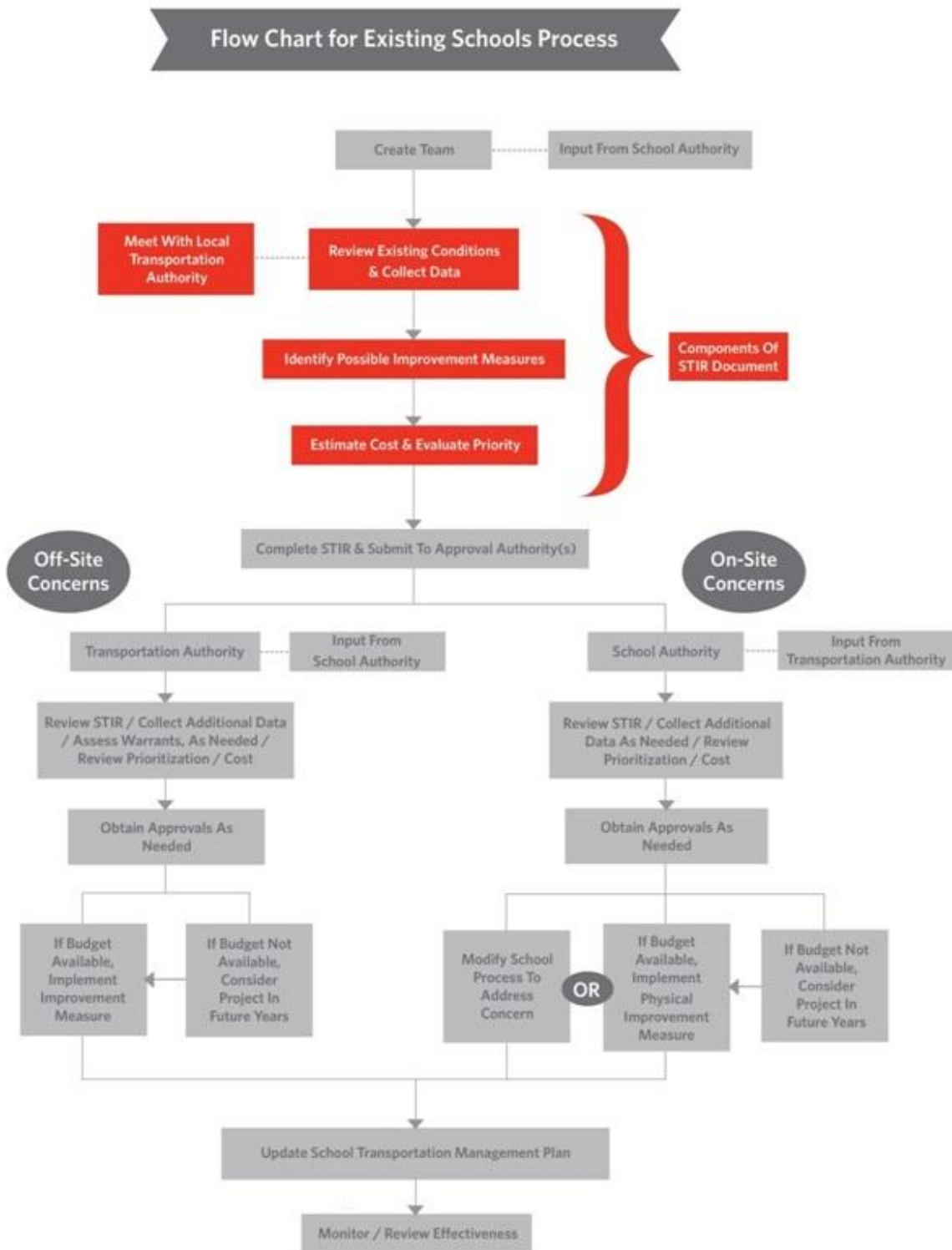
accompany their child in and out of school?		<i>safely occur.</i>
➤ Will student parking be provided, in the case of a high school?		<i>If NO, where will this occur off site? Will this be an issue for the surrounding community? If it will, how can this be resolved?</i>
➤ Will the school include an in-house child care facility that will require additional parking supply and a child pick-up/drop-off area?		<i>If YES, then these features should be provided on site.</i>

C. USER GUIDE FOR EXISTING SCHOOLS

When there are traffic safety concerns at an existing school, it is recommended that a team of individuals is assembled to follow a step-by-step process of investigation. This process is outlined in the flow chart included on the following page in the Executive Summary. The end result of the process is the development of a School Transportation Issues Report (STIR) that can be used by school officials and the transportation authority to plan and implement the recommended solutions.



Existing Schools Process



Following are the steps in the process for investigating and evaluating transportation issues at a school. More detail for each step is given later in the document.

- 1. Team Creation:** A team is formed to investigate transportation issues at the school. A team arrangement allows members of varying backgrounds and perspectives to come together to address issues and allows the project's tasks to be divided. **Action By: School Team**
- 2. Review of Existing Conditions & Data Collection:** Document the existing transportation operation of the school. This should begin with a review of the school's Transportation Management Plan, if one exists, and a meeting held with the local Transportation Authority. A meeting at this point of the process will make the transportation authority aware of the problem, and allow them to offer advice on the type of existing information/data that should be gathered. The review of existing conditions may also include conducting surveys (both in-class and take-home), walkabouts by team members, and preparation of neighbourhood route maps to be used to illustrate existing safety concerns, both on and off the school site.

Data based on current operations is then collected and summarized. This may include, but not be limited to, data such as: pedestrian volumes, vehicle volumes, cyclist volumes, vehicle speeds, parking utilization, bus schedules, etc. **Action By: School Team with possible advice from Transportation Authority**

- 3. Identify Potential Improvement Measures (Toolkit):** This step in the process uses the "toolkit" component of the guidelines. The purpose of the toolkit is to assist school teams and approval authorities (either jurisdictional traffic personnel or school officials) in selecting the most appropriate measure to address the problem.

Not all measures require engineering improvements. For example, changes to arrival times or improvements to on-site signage within a parking area may help to resolve an issue.

The ramifications of the measure should always be taken into consideration. Care should be taken that the solution to one problem does not generate another problem.

Measures will fall into one or more of four categories:

- Educating Drivers
- Off the School Site
- On the School Site
- School Processes

Action By: School Team with possible advice from Transportation Authority

4. **Cost Estimates and Prioritization:** This stage is essential in order to prioritize measures under consideration (as this may be an issue if the budget for implementation is limited or there are other schools that also require improvements at the same time.)

Action By: School Team with possible advice from Transportation Authority

5. **Finalize STIR Report:** A report summarizing steps 2 to 4 should be completed to document the process. This report should include information on existing conditions at the school, documentation on the improvement(s) proposed and why the specific measures were selected. In this document, this report is referred to as a **School Transportation Issues Report (STIR)**. **Action By: School Team**

6. **Review by Authorities:** The STIR report, with its recommendations on resolving the problem, would then go to the appropriate approving authority (ex: the school board and/or the transportation authority) for review and approval of improvements. They may have questions, may request additional information, or recommend that changes be made to the study. If the measures are off-site, then the transportation authority takes the lead on the review. If the measures are on-site or related to school processes, then the school authority takes the lead on the review, though the transportation authority will still need to review the report (in part to ensure that changes on-site do not cause problems for the adjacent streets or public sidewalks).

Action By: School Authority and/or Transportation Authority

- 6a. **Approval:** If the approving authority supports the findings of the study and the improvements can be funded, the approving authority will indicate that the project can proceed. This may require the approval of more than one decision-making authority or board depending on funding responsibility or cost-sharing agreements.

Action By: School Authority and/or Transportation Authority

- 6b. **Treatment Installation:** The measure is constructed and goes into service. Off-site measures may take longer to implement because they will need to have funding assigned to them by a transportation authority and then will have to be scheduled for construction (programmed into an upcoming capital program). Small scale improvements on the school property may take much less time, particularly if they are policy/operational changes.

OR

School Process Improvements: The changes to the school's process are enacted.

Action By: Transportation Authority and/or School Authority

- 7. Implementation and Follow-Up:** After the school and the public have become familiar with the operation of the improvement, it should be evaluated to confirm that the improvement is operating as anticipated and is having the desired effect on transportation. If needed, refinements to the improvement(s) should be identified. This may be completed by the School Team or may be undertaken by the relevant authority.

Action By: School Team and/or School/Transportation Authorities

STEP 1: CREATE TEAM

In order to complete a review of transportation issues at a school, it is necessary to create a traffic safety team to take on this project. A team approach is the most appropriate method for undertaking a review of transportation concerns at a school. A team allows expertise from various backgrounds and perspectives to come together to address issues and allows the project tasks to be divided amongst a number of people.

Here are a number of important items to consider when assembling a team:

- Parents, school staff (including school division/board representation), local police agency, local government (administration), traffic engineers (local transportation authority representation or private engineering service providers/consulting firms), neighbourhood representatives, and community leaders are all potential participants in such a team. For instance, the local road/traffic authority may have useful advice related to team composition, and can put you in touch with local traffic safety experts.
- Students could be involved in the team. They would be able to offer a user's perspective on current conditions and a "reality check" on whether or not certain concepts would be adopted by the student body.
- It is recommended to keep the size of the team at around six to ten people. This will encourage participation from all members of the team.
- Part of the work will involve processing data and presenting it in an easy-to-understand format. If there are teachers or parents with experience in engineering, science, geography, or mathematics who would be interested in processing the data and compiling a report, either alone or as part of a project with students, then include them in the team or as a resource to work on specific components of the work as it progresses.
- It is important, even during the early stages of the process, that there be a long-term plan for succession. For instance, good policies could be initiated by a group but if the members leave then the policies may be lost or abandoned, with the result being that the work would be lost. Creating a STIR (and implementing any recommendations) is likely to be a long-term project, spanning a year or more.
- It is essential that the team have support from the school board or division. The team should contact the school board/division as soon as possible to ensure they are in

support of the team’s efforts. It is possible that changes to the school’s site may be recommended, which will likely require funding and support.²

- Once the team begins work on the STIR, it should speak with the local transportation authority. Local staff should be knowledgeable when it comes to transportation analysis on school area projects and will be able to either help directly or direct you to experts who can help with certain elements of the analysis. Making municipal offices aware at an early stage can build support for the process and outcome(s).
- Where possible, gathering with other teams at other schools that have gone through this or a similar process is beneficial to find out what has worked and not worked at other locations, particularly if that team’s school has similar characteristics.
- It is useful to have a record of volunteers that is accessible to team members so that they can contact one another during the process. Such a form might look like the example in **Table 1**. A blank form is provided on the next page for teams to fill in.

Table 1: Example STIR Team Member Record

Name	Contact Number	Contact Email	Relationship to School	Interest / Experience
Otis Smith	204-555-5505	o.smith@example.ca	Parent	Technician with experience with drafting, drawing diagrams. Familiar with road design. Bicycle rider in the area.
Jane Jones	204-555-1234	jj@example.ca	Crossing guard	Knowledge of issues related to crossing Main Street, knowledge of school patrol policy.
Sunny Green	204-555-4433	sunzie5@example.ca	Teacher	Knowledge of school arrival/dismissal process, have been a teacher for 10 years here. Familiar with neighbourhood. Friends with area Councillor.
Zoran Scott	204-555-1010	zs1@test.ca	Area resident	Lives on street opposite school, has made complaints to city government in the past regarding drop-off activity at school.

² Support may take the form of each school division creating a team that can work across the multiple political jurisdictions that a school board spans and share information to resolve issues on behalf of the individual school teams. Because multiple schools will eventually be seeking solutions, a set of subject matter experts that eventually becomes a group of experts in typical school issues will help to streamline the process.

School Transportation Issues Report (STIR) Team

(Name of School)

Name	Contact Phone	Contact Email	Relationship to school	Interest / Experience

STEP 2: COLLECT DATA AND REVIEW EXISTING CONDITIONS

Conducting Surveys

Surveys (both in-class and take-home), walkabouts by team members, and preparation of school area maps can all be used to illustrate existing safety concerns.

Begin by collecting information from school families and staff to get an overview of existing traffic safety issues at the school. Information may also be gathered by interviewing school bus drivers.

If available, examine school records for historical site conditions and review these with teachers or other staff who have been at the school for some time. The records may illustrate how the school operated in the past, or if changes were made to the physical layout of the school. Schedules, policies that changed how the school's transportation system operates, or incident reports may be among the items that can be investigated. This information would be useful to know if changes in policy or reversions back to past operation are being considered.

Example survey forms are provided in **Appendix 1**. These forms are reproductions of material used by Green Action Centre as part of their "Safe Route to School" program. Copies of this information and additional worksheets and spreadsheets for compiling the collected data are available online at <http://saferoutestoschool.ca/school-travel-planning-toolkit>.

Classroom Survey

Conduct a classroom survey to determine transportation modes used to travel to and from school, as well as a survey of perceived transportation issues at the school. This is a quick survey that each classroom does at the start of the day. Each teacher asks questions to the class as a whole (such as what mode they used to get to school) and records the number of students raising their hand for each answer. This is recorded on a form which is returned to the office, and the results compiled. This can be done repeatedly over a number of days to get averages. An example survey form and spreadsheet for compiling the data³ is included in **Appendix 1**.

The percentages of students using each mode can assist in determining which modes to focus on when making changes. For example, if few people bicycle to school, is there an issue that

³ Source: Green Action Centre, and Green Communities Canada's material from www.saferoutestoschool.ca

might be remedied to increase this? If large numbers of people are driven to school but live relatively close to the school, are there changes that could be made that would encourage more students to walk?

Take-Home Survey

More detailed information on families' travel habits to and from school can be gathered using a family take-home survey. This survey does not preclude the value of the in-class survey. Allowing one week to complete and return the surveys to the school is sufficient.

The first page of the survey is generally a letter that explains the purpose of the survey. Providing contact information for the team is also recommended, in case someone wishes to discuss issues in more detail, or become involved with the team, or obtain information about the confidentiality of the information gathered.

If there are specific issues at a school that have been previously identified, these may be a focus for a component of the survey.

A take-home survey may include some or all of the following questions:

- How does your child usually get to and from school?
- Where is your home located? This can be used to determine distances travelled.
- How long does it take to get to and from school?
- Which drop-off and pick-up locations do you use? Why?
- A section which provides a printed map where the route to/from school can be marked. Areas of concern can be plotted on the map and described in detail.
- Questions about the parent's reasons for choosing one mode over another for their children to travel to/from school.
- Are there any locations along the route that are of concern to parents? Are there any seasonal issues, or issues that arise only during certain times of day?
- An open-ended question where survey participants can make any other comments.
- Contact information section that can be filled in by the parent if they are interested in participating on the team.

An example take-home survey form⁴ is included in **Appendix 1**.

⁴ Source: Green Action Centre's material from www.saferoutestoschool.ca

Information from the completed surveys should be compiled and similar issues identified by multiple respondents should be flagged. Information about routes, obstacles to walking or cycling, etc. can be consolidated into the Active Transportation Route Mapping component in the following section.

Walkabout Survey

Another tool that is useful at this stage is a “walkabout”. This would consist of the team members walking around the school property and the surrounding area during the start and end times of a typical day, observing and recording information with notes, photos, drawings, asking questions of students and parents, etc. and observing existing conditions at the school. At this point, a “sense” of what the conditions are like (rather than numerical observations) is what is desired.

Very conspicuous observations by team members may result in poor data since pedestrians and motorists may change their behaviour if they notice they are being observed. Limit the numbers of walkabout participants in an area and spread observation periods over multiple days to avoid this problem.

After the walkabout takes place, it is often useful to compare findings and discuss what was observed.

Materials for conducting a walkabout⁵ are included in **Appendix 1**.

The next page has some examples of observations that might take place on a walkabout.

⁵ Source: Green Action Centre's material from www.saferoutestoschool.ca



Missing Infrastructure: At this entrance to a school, there are no sidewalks connecting to the crosswalk; students must cross the street to walk on a sidewalk or walk in the ditch or on the shoulder.



Path Maintenance: At this school, students walk through the sports fields to a nearby residential area; these unofficial pathways are not maintained in the winter, and this could be reducing the number of students walking in the winter.



Graffiti: This school's signage has been damaged and should be replaced.

Existing Conditions Map

A detailed map should be prepared showing the school site as well as the transportation network surrounding it. Tools like Google Earth can assist in this process. Blueprints of the school site or CAD drawings from previous projects at the school may also be starting points for these maps.

Depending on the transportation network around the school and the location of issues such as busy crosswalks, signalized intersections, nearby businesses, and the location of the nearest homes for walking/cycling routes, the map could extend several hundred metres from the school.

The map should include:

- Entrances to the school
- Location of pick-up and drop-off areas
- Parking locations
- Fencing and gate openings
- Illumination locations
- Location of crosswalks
- Sidewalks and bike paths, bike lanes, etc.
- Transit stops
- Traffic control measures (ex.: stop signs, traffic signals) on major roads
- Names of roads
- Nearby shopping centres, convenience stores, fast food restaurants, etc.
- North arrow and scale

This map will be useful when describing the existing issues and the location of proposed improvements throughout the creation of the STIR.

Active Transportation Route Mapping

If a clear picture of the routes used by students when walking or cycling to school is important for a team's school area traffic safety study, it is helpful to prepare a map of the walking or cycling routes students take to/from school.

Students who walk or bicycle to school should mark on a neighbourhood map the route or routes they commonly take to school. This might be done as part of the take-home survey that goes home to students or it might be completed as an in-class activity.

Compile the results of all of the individual maps. This might be an in-class group activity where each class creates one large map under the supervision of the teacher, or the individual maps may be compiled by a team member separately.

Detailed maps are needed – ensure that the route indicates which side of the street students are using, including if they cross a street mid-block or at an intersection. Any issues related to problems with the quality of a route, including places where students feel unsafe, or missing segments of sidewalk should be noted on the map. Later, all such observations should be confirmed by visiting the locations and documenting, using photographs (such as the samples shown in **Appendix 1**), video, and by taking notes.

Ensure that students indicate all routes they use (if they use more than one route they should provide their rationale for selecting one route over another at certain times). It may be that certain routes are only used during certain seasons, for example. If they use different modes of travel on different days of the week, they should show the routes they use for each mode.

As the routes are overlaid on a “master map” either hand-drawn or using mapping software, certain segments will show up as being common to many routes. The number of students using each route is important; this will provide a metric that can be used to determine the priority in which missing pieces can be requested – in most cases, the more students that would benefit, the higher the priority. However, if there is an area of serious concern, this might become a higher priority.

You may also be able to have large-scale base maps plotted for you by your local transportation authority, using GIS (Geographic Information Systems) data. This would show sidewalks, pathways, street names, large buildings (such as the school), parking areas, bus stops, signals, etc. Data can be plotted on top of these.

Another source of mapping background data may be the school division itself, if it maintains data on student locations for bussing purposes.

After all the routes are mapped, make a simplified version for general use that shows the recommended routes along streets, places to cross, and places to avoid on a map. This will form part of the school’s Transportation Management Plan.

An example of this type of map⁶ is included in **Appendix 1**.

⁶ Source: Green Action Centre, Winnipeg

Summary and Team Discussion

The information gathered from the surveys and walkabout should be reviewed and discussed with all members of the team. Other sources of information, such as concerns from students and parents, or issues that staff or students have previously noted or commented upon, should also be incorporated. Some of the issues flagged for further investigation will be on-site (within the school's property) and some will be off-site (not on the school property, but within the surrounding area).

Summarize the issues in a list. At this point, focus upon the team's observations of the problems faced at the school, rather than immediately attempting to identify a solution. For instance, if an identified issue is a crossing at a particular intersection, state that "The team observes that it is difficult to cross intersection X due to traffic volumes, sight lines, etc.", and do not immediately focus on installing a traffic signal or crosswalk to fix the problem. Discussion questions may include:

- Do children wait a long time to cross a particular street?
- Does it appear (to those surveyed) that cars are travelling too fast?
- Do issues exist with how parents pick up and drop off their children using private vehicles?
- Is there an unacceptable mix of private vehicles and school buses in a particular location?

The reason for not identifying the solution to an issue initially is because there can be more than one solution to a particular problem; if the wrong solution is chosen, a safety issue can be aggravated, or a new problem created. In some cases, analysis is required before a solution can be selected. Not conducting the appropriate analysis that the transportation authority will require may only result in a delay in implementation. A report that explains the problem that is occurring, identifies possible solutions, and then recommends a specific solution based on an evaluation is typically preferred by road authorities.

Meet With Approval Authority

It is recommended that the team meet with the local transportation authority at this stage before continuing, particularly if this has not already occurred. At the meeting, provide copies of the information the team has already assembled up to this point.

The transportation authority should be able to provide good information on how to proceed with any further data collection that may be required: what type data should be collected and how the following work should be distributed between the team and the transportation authority's resources.

Data Collection

Following the initial stage of observing existing conditions through mapping exercises and surveys, it may be necessary to collect quantitative (numerical) data to more precisely document the existing transportation conditions at the school during actual school days. This will help in the creation and evaluation of solutions, particularly if the solution is a type where the installation varies, depending on measurable quantities such as number of pedestrians or vehicles.

The data collected should be linked to the school's issues. If a traffic/road authority or engineering firm is involved, then they may be able to assist with the data collection, but much of this work can be done by school staff or parent volunteers. It is possible for students to be involved if they are properly supervised and have permission to participate, and are able to follow standard practices as described in the following section. If a transportation engineer is involved in the project team, then they can oversee the data collection and ensure that it meets the needs of the traffic authority, but this is not essential if efforts have been made to collect quality data.

Some of the necessary data may already exist, or there may be other ways to collect certain information, other than through manual observations and collection.

- Information about the number of school buses, schedule for buses, operational rules, where they park, the routes taken, and typical bus occupancy should be available from the operators of the bus system (private school bus company or school division).
- The local traffic authority may have data on the roads near the school (such as traffic counts, pedestrian counts, collision records, and speed studies) or may be able to assist with technology, staff, and skills in data collection. Manitoba Public Insurance (MPI) can loan speed reader boards for collecting vehicle travel speed information.

When to Collect Data

The most appropriate times for data to be collected is on Tuesdays, Wednesdays and Thursdays during typical times of the year (ex: not within the first few weeks of school, during exam periods or other unusual periods). It is also helpful to abandon the data collection session if an unusual weather event occurs or if there is road work activity taking place at the same time. Data does not need to be collected all on the same day, but can be spread out over a period of a week or more.

The modes used to travel to school can vary with the seasons. If possible, data should be collected over a range of seasons to capture any changes in transportation conditions throughout the year.

Data collection should occur during a variety of peak time periods (morning, lunch, and afternoon), generally a half hour to one hour before and after school start/end times, taking into account any activities at the school that might result in travel before or after school, such as breakfast or before- and after-school programs at the school). For instance, if a school starts at 8:00 a.m. and ends at 3:30 p.m. and lunch time is 12:00 p.m. to 1:00 p.m., then a data collection schedule might look as follows:

- 7:30 to 8:30 a.m. (covers time before and after school starts to cover early and late arrivals at the school).
- 11:30 a.m. to 1:30 p.m. (covers time before and after the lunch hour; if most students remain at school for lunch, this time period may not be important).
- 3:00 to 4:30 p.m. (covers time before and after school ends to capture parents arriving for pick-up as well as students who may be leaving late due to after-school activities). If it is known that after-school periods are much longer, then adjust the time to take this into account.

Data Collection Materials

Sample standard data collection forms are included at the end of this section, including a parking count form, a pedestrian count form, and a standard four-leg, four-hour intersection traffic count form.

These can be used or your own forms can be created. When developing your own data collection materials, consider the following:

- Do not make a data collection form too complicated. When in doubt, simplify, and separate the collection into multiple manageable tasks that can be shared between multiple individuals. It is better that each data collector take on a small task that they can understand and do well, rather than overwhelming a smaller number of data collectors with overly complex forms that will lead to mistakes.
- Will the form be easy to understand in the future if there is a delay between the time the data is recorded and when it is reviewed? Will others be able to interpret what the information on the form is referring to? Also, is it easy for the data collector to understand? A practice run for the data collector is a good way to check for problems with the form. If users encounter problems with the form, revise the form.
- It is very important to record dates, times, locations, directions, etc. on the form. Data may be unusable if it cannot be determined exactly where and when the data was recorded.
- When collecting data that is numeric, such as counts of pedestrians crossing the street, include a space on the form or have separate paper where observations can be noted.

- A sketch or small diagram of the intersection on the form is helpful to confirm directions.
- The supervisor should take some photos during the collection period to provide a visual record of conditions.



This data collector has a portable seat, high-visibility vest, and drinking water. A hat and sunscreen are recommended if collectors are spending extended time in the sun.

Preparing to Collect Data

An accurate data collection session takes a great deal of preparation, as it is not easy to make adjustments once the session begins. Consider the following:

- One team member should be responsible for overseeing all of the data collection – this person will be the primary Supervisor.
- In the case of students participating in data collection, ensure that all students have parental approval to allow them to participate. It will be useful to inform parents of the reason for doing the data collection (explaining how this is part of the study into traffic safety issues at the school), outlining the risks involved, and explaining how the students will be supervised. Ensure only students who have completed permission slips participate in the project.
- Conduct an orientation session with all adults who will be supervising and all of the students or volunteers who will be collecting data. At this time, it is important to explain the type of information being collected and to go over safety issues with the group.
- Provide pre-formatted data recording sheets, clipboards, and pens/pencils to the data collectors. Review the format of the sheets with data collectors, making sure they understand their tasks. If data is being recorded in time intervals, all participants should have a watch or use the clock on a cell phone.

- Ensure the data collectors wear the appropriate personal protection equipment (such as reflective safety vests). This is to make the data collectors visible to motorists. This equipment may need to be purchased or it may be possible to borrow it from local engineering firms or the local transportation authority. Professional transportation data collectors wear such vests to be safe and it is recommended that this practice be followed.
- With novice data collectors, the fact that the data collection process can be tedious should be considered. It may help to have students each doing shorter collection periods and combining their data later.
- Consider utilizing parent volunteers as data collectors in addition to using students.

Recording Data

It is important for the collected information to be as correct as possible. If the data collector has a valid reason why data is missing, such as if they had to take a break to go to the washroom and couldn't collect data during part of a period, they should note this in the documentation rather than making up information. It may be helpful to choose to use multiple teams of students reviewing the same location to ensure data is complete and accurate.

Data collectors should print their names on the data sheets they are responsible for, so the data collector can offer clarification, if questions arise later. However, if data is unclear or appears flawed in some way, it should be discarded. Any unusual circumstances should also be noted (ex: a collision occurring during the count period, a stalled vehicle, or a mistake in the data collection).

Further considerations include:

- Data is generally collected in 15 minute increments using pre-formatted data collection forms.
- It is important to confirm directions before beginning to count. A sketch of the particular intersection that is being counted is helpful.
- Photos of an entire area, such as a photo of a parking lot taken during a data collection period, can be used as checks of the data and allow for a visual record of activity.
- Adult supervision should be provided during the count period to ensure data collectors understand their task, are out of the way of moving vehicles, are not exposed to excessively cold or hot weather conditions, etc.
- Expect that people may make comments to data collectors wanting to know what is going on. Adult supervisors (particularly the lead Supervisor) should field all such queries.

- At the end of the data collection period, collect all data collection materials (pens, clipboards) and protective equipment (safety vests). Ensure the forms have been filled out properly and have the collectors' names on them, and ensure any process concerns, etc. from the data collectors are documented and resolved.
- Thank the data collectors for their time and effort.

Data Collector Safety

The supervisor should determine the potential risks associated with data collection and develop a plan for mitigating the risk. Typical risks are described below:

- **Being too close to moving vehicles, parked cars, etc.** While collecting data, data collectors should stay away from the edge of the roadway, out of parking lots, not dart into traffic, etc. All students should be supervised by adults as a part of any data collection work. Prior to the data collection session, the lead Supervisor should consider where data collectors will be located so as to be able to observe the parking area, street, crosswalk, etc. without being in harm's way, disruptive to the public, on private property⁷, etc. Although engineering studies often have data collectors complete their work while sitting in parked cars, this is not recommended for student data collectors.
- **Data collection should not be conducted during extreme weather**, and data collectors should wear appropriate clothing, sunscreen, etc. for the conditions. Also, ensure all data collectors remain hydrated.
- Students should stay in a group and **not talk to strangers**; the adult supervisor should handle any discussion/debate with the public or media.

There may be additional risks unique to a certain area – consider the potential risks and how to mitigate them.

Review and Summarize Data

Once the data is collected, the results should be summarized in the STIR document. This work will involve transferring the data from hand-completed forms to spreadsheets (while retaining the raw data sheets), creating tables, charts and maps from the data, and considering what the data means through discussion with the STIR team. This may be an educational opportunity for students as they could participate in the creation of charts and graphs from the raw data.

⁷ If it is necessary to be on private property, then prior to the data collection session, the Supervisor must contact the owner of the property to see if it is possible to be on their property for the purpose of collecting data. Often they will say yes. Asking is easy and is preferable to being forced to leave a site if permission is not requested ahead of time, or receiving complaints after the fact.

What do your observations lead the team to conclude? Do they reflect a problem limited to a particular part of the school, a particular time of day, or an interaction between specific types of transportation? Do they happen in both the morning and afternoon time periods? Are issues taking place over a long time period, or are they limited to a short time period?

It may be that an issue that was initially considered a concern, does not actually appear to be a serious problem once the data is collected.

Case Study

A case study of the data collection procedure described above was conducted by MMM staff at an elementary school in Winnipeg. The case study is included in **Appendix 2**.

Observation Sheet: Parking/Loading Area

Location: _____ Date: _____

Observer Name: _____

Time	Parked / Standing Vehicles	Loading / Unloading Vehicles	Moving vehicles	Total Vehicles	Pedestrians (students & adults)	Photo # (if necessary)	Notes
3:15							
3:16							
3:17							
3:18							
3:19							
3:20							
3:21							
3:22							
3:23							
3:24							
3:25							
3:26							
3:27							
3:28							
3:29							
3:30							
3:31							
3:32							
3:33							
3:34							
3:35							
3:36							
3:37							
3:38							
3:39							
3:40							
3:41							
3:42							
3:43							
3:44							
3:45							
3:46							
3:47							
3:48							
3:49							
3:50							
3:51							
3:52							
3:53							
3:54							
3:55							
3:56							
3:57							
3:58							
3:59							
4:00							

Date: _____
 Counter Name: _____
 Weather conditions: _____

Pedestrian Count

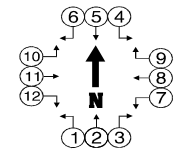
Use 15 minute intervals, but modify start and end times of collection period to suit your location	Crossing the west side of Street X				Crossing on the east side of Street X				Crossing on the north side of Street Y				Crossng on the south side of Street Y			
	ADULT	CHILD	TEEN	Total	ADULT	CHILD	TEEN	Total	ADULT	CHILD	TEEN	Total	ADULT	CHILD	TEEN	Total
8:15-8:30																
8:30-8:45																
8:45-9:00																
9:00-9:15																
3:15-3:30																
3:30-3:45																
3:45-4:00																
4:00-4:15																

INTERSECTION TRAFFIC COUNT FIELD SHEET

Project No: _____ **Location:** _____

Day and Date: _____ **Time:** **7:00** to **9:00** **A.M.**

Observer: _____ **Comments:** _____



Label Street Names and fill in blanks

PEDESTRIANS				Movement	1 NB LT	2 NB TH	3 NB RT	4 SB LT	5 SB TH	6 SB RT	7 WB LT	8 WB TH	9 WB RT	10 EB LT	11 EB TH	12 EB RT
WEST LEG	EAST LEG	NORTH LEG	SOUTH LEG													
				TIME Start:												
				7:00												
				End: 7:15												
				Start:												
				7:15												
				End: 7:30												
				Start:												
				7:30												
				End: 7:45												
				Start:												
				7:45												
				End: 8:00												

Light: (circle) daylight, dusk, dark, street lights on

Weather: (circle) clear, cloudy, rain, snow, mist, fog, other _____

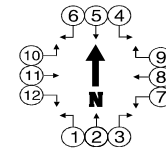
Road Surface: (circle) dry, damp, wet, snowy, icy, smooth, rough, slippery

INTERSECTION TRAFFIC COUNT FIELD SHEET

Project No: _____ **Location:** _____

Day and Date: _____ **Time:** 7:00 to 9:00 **A.M.**

Observer: _____ **Comments:** _____



PEDESTRIANS				Movement	1	2	3	4	5	6	7	8	9	10	11	12
WEST LEG	EAST LEG	NORTH LEG	SOUTH LEG		NB LT	NB TH	NB RT	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	EB LT	EB TH	EB RT
				TIME												
				Start:												
				8:00												
				End:												
				8:15												
				Start:												
				8:15												
				End:												
				8:30												
				Start:												
				8:30												
				End:												
				8:45												
				Start:												
				8:45												
				End:												
				9:00												

Light: (circle) daylight, dusk, dark, street lights on

Weather: (circle) clear, cloudy, rain, snow, mist, fog, other _____

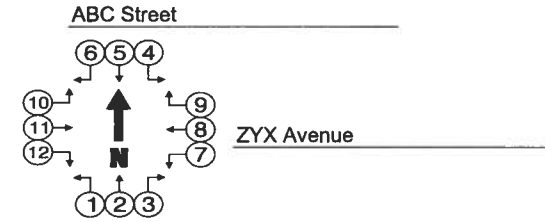
Road Surface: (circle) dry, damp, wet, snowy, icy, smooth, rough, slippery

INTERSECTION TRAFFIC COUNT FIELD SHEET

Project No: 123456 Location: ABC Street & ZYX Avenue

Day and Date: January-01-00 Time: 8:00 to 9:00 A.M.

Observer: John Smith Comments: queuing in NB LT lane



PEDESTRIANS				Movement	1 NB LT	2 NB TH	3 NB RT	4 SB LT	5 SB TH	6 SB RT	7 WB LT	8 WB TH	9 WB RT	10 EB LT	11 EB TH	12 EB RT
WEST LEG	TO SOUTH	WEST LEG	SOUTH LEG													
				TIME												
				Start:												
				8:00		56			41							
				End:												
				8:15												
				Start:												
				8:15												
				End:												
				8:30		51			39							
				Start:												
				8:30												
				End:												
				8:45		49			40							
				Start:												
				8:45												
				End:												
				9:00		52			38							

Note that a clicker can be used for directions with high volumes

Light: (circle) daylight, dusk, dark, street lights on

Weather: (circle) clear, cloudy, rain, snow, mist, fog, other _____

Road Surface: (circle) dry, damp, wet, snowy, icy, smooth, rough, slippery

STEP 3: IDENTIFY POTENTIAL IMPROVEMENTS

The following sections provide a “toolkit” that highlights a number of transportation measures that can be implemented to address traffic safety issues in school areas. Engineering studies show these measures to be effective when used appropriately. The toolkit is not meant to be an exhaustive source of information on these measures – consider it a starting point for further research.

As indicated previously, each school is unique and the measures selected for implementation should be tailored to the conditions at each school, rather than identical measures being applied to all school areas.

A number of the recommended measures in this section involve a change in behaviour and do not require construction or installation of infrastructure or traffic control devices. These non-engineering solutions are important to consider, because they can be very effective, low-cost improvements.

The toolkit is divided into four sections:

- Educating Drivers
- Off the School Site
- On the School Site
- School Processes

Table 2 below lists the various tools described in the toolkit for each of the four sections. A summary table of the toolkit measures is also included in **Appendix 3**.

How to Use the Toolkit

If a measure/approach in this section of the report appears to be an appropriate response to a traffic safety issue that is being investigated, the STIR report should have an explanation regarding how the measure will make conditions better. Use the content of this section to help write about how the measure could be incorporated into the school environment. Consider possible ramifications or side effects due to the recommendation, if any. For example, if recommending prohibiting parking on the streets surrounding a school, what will happen to those vehicles that formerly parked in that location? The appropriate sequencing of recommended measures may have to be considered as well. **Table 2** lists the various tools described in the toolkit and the page where they can be found.

Table 2: Tools in the Toolkit

Educating Drivers	Off the School Site	On the School Site	School Processes
<p>Transportation Education & Enforcement Campaigns (p.C-31)</p> <p>Speed Reader Boards (p.C-32)</p> <p>PACE Car Program (p.C-35)</p>	<p>Pedestrian Networks (p.C-38)</p> <p>Sidewalks & Pathways (p.C-39)</p> <p>Walking School Buses (p.C-41)</p> <p>Crossing the Street (p.C-43)</p> <p><i>Crosswalks (p.C-44)</i></p> <p><i>Curb Extensions (p.C-47)</i></p> <p><i>Crossing Guards (p.C-49)</i></p> <p><i>In-Street Signs (p.C-52)</i></p> <p><i>Waiting Areas (p.C-53)</i></p> <p><i>Raised Crosswalks (p.C-54)</i></p> <p><i>Audible Signals (p.C-56)</i></p> <p><i>Countdown Timers (p.C-58)</i></p> <p><i>Parking Restrictions (p.C-60)</i></p> <p><i>Right Turn on Red Restrictions (p.C-61)</i></p> <p>Cycling Networks (p.C-63)</p> <p>On-Street Bike Lanes (p.C-64)</p> <p>Multi-Use Pathways (p.C-66)</p> <p>Bike Trains (p.C-68)</p> <p>Vehicle Networks (p.C-70)</p> <p>Stop Signs & Signals (p.C-71)</p> <p>Parking & Loading (p.C-73)</p> <p>Traffic Calming (p.C-76)</p> <p>Reduced-Speed School Zones (p.C-79)</p>	<p>Fencing (p.C-81)</p> <p>Signs & Pavement Markings (p.C-83)</p> <p>School Driveways (p.C-86)</p> <p>School Bus Loading Areas (p.C-88)</p> <p>Bicycle Parking Areas (p.C-91)</p> <p>Vehicle Parking Areas (p.C-94)</p> <p>Illumination to Enhance Safety (p.C-96)</p>	<p>School Bus Loading Protocols (p.C-99)</p> <p>Private Vehicle Pick-Up/Drop-Off Protocols (p.C-101)</p> <p>Staggered Dismissal Times (p.C-102)</p> <p>School Access Protocols (p.C-103)</p>

Is Expert Help Required?

Note that in some cases, the recommended measures may require additional technical analysis, expertise and detailed technical drawings and/or reports. If the issues raised include modifications to the road network external to the school, or physical changes on the school's property (such as a new driveway or an on-site loading area for school buses), an engineering report prepared by a qualified transportation engineer may be required. See **Appendix 4** for more information related to obtaining expert involvement.

TOOLKIT: Educating Drivers

Education of drivers and pedestrians to address traffic safety problems may not always be successful, but should be attempted before resorting to more complex measures such as law enforcement or changes to infrastructure. This first section of the toolkit summarizes education programs that are available to help modify behaviour on and off school property.

The tools considered in this section include:

- Transportation Education and Enforcement Campaigns
- Speed Reader Boards
- PACE Car Program

Transportation Education & Enforcement

Definition

In many cases, drivers and pedestrians know the rules but do not follow them. Although motorists (both parents of students, students who drive, and area motorists) and pedestrians should know the “rules of the road” regarding driving, crossing streets, etc., it is unfortunately common to see these rules being broken and unsafe practices taking place near schools. Reminders of traffic rules may resolve many issues at a low cost, compared to the cost of physical changes.

Drivers (including parents and students) may need measures to discourage poor practices and encourage safe driving habits. Measures to encourage proper driver behaviour can take the form of soft or hard measures.

Soft measures attempt to alter negative driver behaviours without resorting to law enforcement, through persuasive actions to drive in a safe fashion. These might take the form of messages in newsletters; automated phone messages to school families; or messages on the school website or volunteers patrolling the school and actively communicating with motorists they observe acting in an unsafe manner once they are stopped. Law enforcement is a valuable ally in this and can participate by issuing warnings rather than tickets at this point.

If soft measures aren’t effective, a school may need to request law enforcement (**hard measures**) with financial penalties (tickets) or demerit points (resulting in higher licence and insurance costs) to impress upon motorists the seriousness of road safety around schools.

Placement

Both on-school property and on the roads adjacent to the school.

Initially, the use of messages to motorists using the phone, school website, or school newsletter are suggested. If this is not effective, adults (either volunteers, school staff, or law enforcement) can patrol areas near the school site, such as near pick-up/drop-off areas where traffic issues were occurring, and if possible, communicate with drivers regarding unsafe practices (such as when the vehicle is stopped to let student passengers out).

Specifications

- Information sheets on safe driving practices and an educational video series are available from MPI.
- Local law enforcement may also have educational resources available.

- Reflective vests or some type of identifier to make the participants stand out would be recommended.

Keys to Success

- Provide clear messages to parents on the traffic rules of the school area. All school families should be made aware of the school's Transportation Management Plan at the outset of the school year, with reminders provided throughout the year.
- Where new types of infrastructure are proposed, which may be uncommon in an area, ensure that all users who come in contact with the infrastructure are instructed in their proper use (ex: if a new pedestrian corridor with push-button activation is the first of its type in an area).

Factors to Consider

- Even if students are taught the correct procedures, parents may sometimes override such teaching when they are with their children and act as poor role models. It is important that both adults and students follow safety rules.
- Some parents may not appreciate being approached to discuss traffic safety and may react negatively.

Cost

Low- to no-cost, but this must be an ongoing effort at a school rather than a short-term effort. Moderate, if a long-term law enforcement presence is required.

Speed Reader Boards

Definition

Manitoba Public Insurance Corporation (MPI) loans electronic equipment (speed reader boards) to schools or parent groups. The equipment can be used to collect and record data on vehicle speeds passing a location. The measured speed is displayed to motorists to make them aware of their behaviour. The speed data is recorded into a computer file that may be of interest to the transportation authority or local law enforcement for further review.



Speed reader board and adult data collectors outside of a Winnipeg school

Placement

Equipment is loaned to schools or parent groups for multi-day periods to collect data at locations where speeding is a concern. Locations may include near school driveways and crosswalks.

Specifications

Equipment consists of portable radar-equipped speed reader boards that are monitored by volunteers.

Keys to Success

- It is important that volunteers are properly trained in the use of the equipment.
- It may be desirable to link this program to law enforcement, such as the **MPI Check It or Ticket** program that implements both speed reader boards (soft enforcement) and hard

enforcement (if a motorist does not slow down for the speed reader board they are given a ticket).

Factors to Consider

- This is an education tool and it should be noted that effectiveness is limited if it is used independently of other measures.

Cost

No cost, this equipment can be loaned for free to schools by MPI. For more information on the MPI programs, visit <http://www.mpi.mb.ca/en/Rd-Safety/Speeding/Pages/s-programs.aspx>.

PACE Car Program

Definition

A program that a community can adopt where motorists agree to individually self-police themselves and drive in a safe manner (ex: not speeding, using signals, etc.). A window decal is provided for participants to display to demonstrate their commitment to the program. Several Canadian communities are participating in such programs, including Portage la Prairie.



Example of PACE car decal.

Placement

The program can be run by a group of volunteers in a neighbourhood or community. It can be localized, span multiple communities, or operate over a larger area such as a city or a rural municipality.

Specifications

As part of the program, motorists:

- Sign a pledge form that says they will operate their vehicles safely and considerately.
- Place a decal onto the window of their car to publicize the program.
- Drive safely and courteously, acting as “mobile speed bumps,” which slows down speeding motorists and reduces the pace of traffic.

Keys to Success

- Although such programs could be implemented by the parents/guardians of students at a single school, rolling out the program in a community-wide effort could make it more successful.
- The program needs to be actively promoted and “bought into” by drivers.
- Once a PACE Car program is established, it should be reviewed periodically to check the program’s impact and ensure the concept is still active and fresh in people’s minds.

Factors to Consider

- Volunteers are required to start up and run the program.
- There is an ongoing need to promote the program.
- Some participants have indicated they would rather not display the window decal.

Cost

Low, as materials can be provided to interested groups by the originator of the concept in Canada, Safe Kids Canada.

More information on this program can be found at:

<http://saferoutesns.ca/index.php/special/pacecar/> and

<http://www.safekidscanada.ca/Parents/Safety-Information/Pedestrian-Safety/Pace-Car/Pace-Car-Program.aspx>.

TOOLKIT: Off The School Site

This section of the toolkit deals with: traffic safety issues off of the school site – on adjacent streets and in the surrounding neighbourhood. Nonetheless, some of the tools considered in this section may also be applied to issues on the school site, such as sidewalks, crosswalks or signs and pavement markings.

In this section, we look at three separate modes of transportation and the networks these modes use:

- Pedestrian Networks
- Cycling Networks
- Vehicle Networks



Interaction between multiple transportation modes (pedestrians, school buses, private vehicles).

Pedestrian Network

Issues examined within the Pedestrian Network section of the toolkit include:

- Sidewalks and Pathways
- Walking School Buses
- Crossing the Street



Students and parents walking home from school.

Sidewalks and Pathways

Definition

A sidewalk or pathway is a walkway that clearly delineates a route for pedestrians. They are typically paved but may be surfaced with crushed stone. A sidewalk may be separated from a motor vehicle travel lane by a curb and other buffer area, or may butt up against the curb.



Shifted pavers on this sidewalk create a potential tripping hazard.

Placement

Sidewalks are recommended along a school route in any location where they do not already exist, especially in urban areas.

Specifications

- A minimum sidewalk width should be 1.5 to 1.8 metres; however, 2.4 to 3.0 metres is recommended, especially if there is no buffer along arterial routes.
- Sidewalk width should match widths of available snow-clearing equipment.
- Common sidewalk materials include concrete, asphalt, crushed stone, or paving stones.

Keys to Success

- Sidewalks should be continuous paths and follow pedestrian desire lines of travel.
- Installation of curb ramps at intersections, and perhaps detectable warning tiles.
- Adequate buffer space between the edge of the sidewalk and the edge of the vehicle travel lane.
- Sidewalks should be properly maintained and kept clear of overgrown landscaping.

- Ideally, pedestrians should be directed to arrive at the school with the sidewalk on the same side of the street as the school.

Factors to Consider

- It may be especially difficult to install sidewalks in a development that did not include sidewalks at the time it was built. There may be opposition from adjacent property owners who do not want a sidewalk in front of their property.
- Sidewalks require regular, year-round maintenance.
- Ideally, sidewalks should avoid pedestrian-unfriendly areas, such as industrial areas, high traffic areas, or areas along rail corridors.

Cost

Costs vary depending on width and material. The City of Winnipeg estimates that in 2015, each linear metre of a 1.5 metre wide concrete sidewalk would cost \$350 to provide.

Walking School Bus

Description

A walking school bus is a program that encourages students to walk to school while being supervised by adult volunteers. It is similar to a regular school bus route in that the group travels through a neighbourhood on a dedicated route picking up or dropping off children along the route to or from school.



Walking school bus in Halton Region, Ontario.⁸

Placement

A walking school bus can be initiated following a survey of school families to determine interest. Interest is generally highest among families within easy walking distance to the school. Beyond a certain distance from the school, a walking school bus may not be realistic.

Specifications

Depending on the requirements of the school, volunteers may require first aid certificates or child abuse registry checks. Reflective vests may be distributed to volunteers and a cart or wagon to carry backpacks and other items can be used. Detailed information about how to start a walking school bus can be found at <http://greenactioncentre.ca/content/asrts-handbook-and-resource-guide/>.

Keys to Success

- A coordinated effort between volunteers, school staff and parents is required to keep an initiative like this moving forward.

⁸ <http://i1208.photobucket.com/albums/cc373/greencommunitiesphotos/ASRTS/Cycling/BikePool2.jpg>

- In rural areas, where a walking school bus may be more difficult to organize, students may be let off the school bus at a designated site away from the school, and then participate in a supervised walk along a safe route for the remaining distance to school.

Factors to Consider

- An ongoing pool of trained volunteers is required to keep the program going from year to year.

Cost

The cost of a walking school bus is very low due to volunteer staffing.

Crossing the Street

Crossing the street on the way to and from school is an important part of a student's trip. For younger children who lack the ability to judge the speed of approaching traffic, special features at school crossing locations might be considered to enhance their visibility to motorists. This section of the toolkit examines a wide array of tools that may be used at crossing locations in school areas. The tools considered in the following pages include:

- Signed and Marked Crosswalks
- Curb Extensions
- Crossing Guards and School Patrols
- In-Street Signs
- Waiting Areas
- Raised Crosswalks
- Audible Signals
- Countdown Timers
- Parking Restrictions at Intersections
- Right Turn on Red Restrictions



Parents and students crossing mid-block rather than at signalized intersection.

Signed and Marked Crosswalks

Definition

A signed and marked crosswalk is installed at a crossing location to give pedestrians the right-of-way to cross the street. There are several types of signed and marked crosswalks. Traffic authorities use engineering analysis to determine the best type for each location.

Placement

The Transportation Association of Canada (TAC) has published the Pedestrian Crossing Control Guide to assist traffic authorities in determining the appropriate level of crosswalk treatment. While this manual is the standard for many jurisdictions in Manitoba, a community's local transportation authority may use a different set of standards for crosswalks.

- Crosswalks are normally located at intersections, and are generally not recommended at mid-block locations where they are more likely to be unanticipated by motorists.
- Crosswalks may **NOT** be placed at an intersection where another type of stop control already exists, such as a stop sign or traffic signals.

Specifications

As mentioned above, the standards for crosswalks are laid out in the TAC Pedestrian Crossing Control Guide, or another similar set of standards used by a local jurisdiction. The TAC Guide outlines a hierarchy of crosswalk treatments. The type chosen at a particular location depends on factors such as speed limit, traffic volume, and the number of lanes a pedestrian must cross. Briefly, the types of crosswalks used in Manitoba and their specifications are as follows:

1. **Side-Mounted Signed Crosswalk:** This type of crosswalk includes signs mounted on posts on the side of the road. On provincial highways, the standard pavement markings at a school crosswalk are “zebra-style”, although local jurisdictions may have a different standard.



These signs (RA-3L and RA-3R) are used at side-mounted crosswalks in school areas. The signs are oriented on either side of a road so that the students in the image are walking into the street.



This signed crosswalk includes the RA-3 signage.

- 2. Overhead-Mounted Signed Crosswalk:** This type of crosswalk, which is new to Manitoba, uses the same signs as the side-mounted signed crosswalk but the signs are mounted over the road. This gives an added level of visibility to the crosswalk. Unlike a pedestrian corridor (described below), this crosswalk does not include push-buttons and flashing lights.



Overhead-Mounted Signed Crosswalk

- 3. Pedestrian Corridor:** This type of crosswalk includes overhead signs with flashing lights and pedestrian-activated push buttons. The standard pavement markings for this type of crossing are zebra-style markings.



A typical pedestrian corridor in Winnipeg.

4. **Half or Fully Signalized Intersection:** This type of crosswalk uses traffic signals to indicate pedestrian right-of-way to motorists. If they are used along busy arterial streets, these crosswalks can be coordinated with other adjacent traffic signals.



A crosswalk at a fully signalized intersection in Winnipeg.

Keys to Success

- The crossing location should be placed at convenient locations frequented by pedestrians and visible to motorists.
- Ideally, sidewalks should connect to the crosswalk on either side.

Factors to Consider

- Crosswalks have the potential to create a false sense of security for pedestrians who assume that due to its presence, vehicles will stop. The onus is always on the pedestrian to make sure vehicles have come to a complete stop prior to stepping out into the travel lane.
- Pavement markings and signs must be maintained to remain visible to motorists.

Cost

Costs must consider the type of treatment being installed, access to electricity (if required), and long-term maintenance. The costs of side-mounted signs and pavement markings may be relatively low (less than \$3,000). An overhead-mounted signed crosswalk and pedestrian corridor each cost approximately \$75,000 (they use the same structural components), and a fully-signalized intersection costs approximately \$300,000 (2015 dollars).

Curb Extensions

Definition

A curb extension is an extension of the curb out from the sidewalk into the street, narrowing the width of the roadway. Curb extensions, which can also be referred to as bulb-outs, help to increase visibility of the pedestrian to a motorist, decrease crossing distance, and slow turning speeds of vehicles.



Curb extension under construction near a school in Winnipeg.⁹

Placement

Curb extensions are generally located at crosswalks, extending the sidewalk out into the street.

Specifications

They are wider than the actual sidewalk and may incorporate space for landscaping and street furniture like benches and garbage containers. They may be designed to create an end to a row of on-street parking spaces and are usually as deep as a parking lane (2.5 metres or more.)

Keys to Success

- These features must be designed by technical experts; they are not appropriate on all roadways.

⁹

<http://i1208.photobucket.com/albums/cc373/greencommunitiesphotos/ASRTS/Infrastructure%20Solutions/Oct2011StMattsBumpOuts003.jpg>

- Adequate lighting and signage are required to prevent motorists from running into the curb extension.
- These features are one type of traffic calming measure. Other such measures are covered in the section on Traffic Calming Measures.

Factors to Consider

- Curb extensions are most effective on streets where on-street parking is in use, but can be used on roadways with no parking.
- They may reduce the amount of parking along the street.
- Should be avoided on bus/truck routes where there are frequent turning movements by large vehicles.
- Curb extensions should not make it impossible or difficult for cyclists to use the road.
- Should not cause sight line problems at intersections, particularly if street furniture is installed.
- Drainage needs to be considered.

Cost

Construction costs are moderate. Costs increase if utilities or signals must be relocated.

Crossing Guards and School Patrols

Definition

Crossing Guards and School Patrols assist students in crossing streets near a school and discourage unsafe crossing practices by students. Their presence can also contribute towards parents being more comfortable allowing their children to use active modes to travel to/from school, as well as making students feel safer crossing streets.

Typically, crossing guards are adult employees or volunteers, while school patrols are older students of the school.



Two student patrol members at a crosswalk.

Placement

The locations where school patrols and crossing guards are stationed may vary from one school to another, but may include:

- Crossing locations where large numbers of students cross roads near a school.
- Major driveways (such as school driveways) on the school property.
- Crossings of collector or arterial roadways/intersections, ex: locations with higher traffic volumes close to the school.
- Lower-utilized locations further from a school where it can be difficult for students to cross due to traffic volume or speed of motorists.
- School bus or private vehicle drop-off/pick-up areas.

Specifications

Adult crossing guards are generally placed at locations that require the most attention, such as where speeds or traffic volumes are considered high or where there are multiple lanes of traffic, or where student patrols are ineffective due to a lack of gaps in traffic. They may work independently or in teams of two.

Student patrols are located at lower volume, lower speed crossings. Usually there is one student stationed on each side of the crossing location.

- Student patrols and adult crossing guards wear high visibility vests.
- Student patrols and crossing guards carry high-visibility flags.
- Student patrols and crossing guards are generally stationed at their locations during a 10 to 15 minute window before school starts in the morning and after school ends in the afternoon. They may also be deployed before and after lunch at some schools.

The School Safety Patrol program in Manitoba is led by the Canadian Automobile Association (CAA) and Manitoba Public Insurance (MPI).

- CAA provides all materials (including flag, and training materials) at no cost to participating schools.
- MPI assists with the purchase of high-visibility safety vests for patrols and by producing the School Safety Patrol Handbook.
- The Manitoba School Boards Association (MBSA) distributes the flags and vests to schools in Manitoba.

- In Winnipeg, the Winnipeg Police Services School Resource Unit train patrol supervisors (generally teachers), patrol captains and patrollers. Outside of Winnipeg, local community groups or police (ex.: RCMP) provide the training.

Keys to Success

- Ensure best practices are followed by crossing guards and student patrols, and ensure they are properly trained prior to engaging in this activity.
- It is important that the students and adult staff who are carrying out the duties are doing so effectively and taking the work seriously.

Factors to Consider

- Ongoing monitoring is required to ensure procedures are followed. This is done most often by the principal of the school.
- Motorists and students need to respect the authority of crossing guards and student patrols.
- Staffing may be an issue year-to-year.

Cost

Costs are low, as the majority of materials required are provided at no cost to the schools. Student patrols are volunteers. However, adult crossing guards may be volunteer or paid positions, perhaps even being school staff.

In-Street Signs

Definition

In-street signs are portable signs that can be placed on the centreline of the road at unsignalized school crosswalks.. They make the crosswalk more noticeable to motorists and are intended to increase driver awareness and compliance with the crosswalk.



An in-street pedestrian crossing sign (Carman, MB)

Placement

MIT allows temporary portable signs to be used on Manitoba roads at school crosswalks, preferably where crossing guards are already present. They are to be set-up and removed by the crossing guard at the start and end of each shift. They should be placed in the crosswalk at the road centre in such a way that they don't block pedestrian or vehicular turning movements. They can be easily damaged and need to be reset or replaced if they are hit by motorists.

Specifications

The standard RA-8 type sign should be used.

Keys to Success

- These signs are generally more effective on two-lane lower speed streets than on wider streets.

Factors to Consider

- They must be removed outside of peak periods, when there are no students crossing the street. No permanent installations are



allowed in Manitoba.

- Their use should be reviewed/confirmed with the local traffic authority before implementation.

Cost

Low, signage can be purchased from traffic sign companies.

Waiting Areas

Definition

Waiting areas are paved additions to the sidewalk (that extend away from the sidewalk) which increase the amount of space students can stand on while waiting to cross so that they aren't close to the edge of the curb. They are a useful addition when large numbers of students arrive at a crossing location in a short period of time.

Placement

Locate these features at crosswalks where large numbers of students cross the street and must congregate in groups before the crossing guard or student patrol allows the group to cross.

Specifications

- The paving material for the waiting area would follow similar standards to sidewalks.
- The waiting area may form part of a curb extension (see the section on Curb Extensions).

Keys to Success

- These should be used at locations where large amounts of students are waiting at once to cross; pedestrian counts or observations should be completed to evaluate where this occurs.
- Students, parents/guardians, and crossing guards/student patrols would need to be educated in their use.

Factors to Consider

- Discuss with local transportation authority before implementing.

Cost

Waiting area would be similar to constructing a short segment of sidewalk or pathway (see the sections on Sidewalks and Pathways).

Raised Crosswalks

Definition

Raised crosswalks are a non-standard type of crosswalk featuring a physical change in elevation in the road, thus creating a feature similar to a wide speed bump or speed table. This may be done to reinforce the correct crossing location to pedestrians, and/or increase driver awareness of the crosswalk and slow down vehicles through the crosswalk.



Raised crosswalk (Source: FHWA Pedestrian Facilities Users Guide).

Placement

Locate these features at crosswalks where large numbers of students cross the street. Generally limited to low speed roadways/driveways, a raised crosswalk is generally not used on major roads.

Specifications

- Raised crosswalks increase the crosswalk elevation to match the adjacent curb, with transition ramps for vehicles. This has an added benefit of reducing vehicle speeds through the crosswalk.
- To make them more visible, triangular pavement markings are used and they may incorporate different colours of concrete or asphalt, or may use pavers.
- The Canadian Guide to Neighbourhood Traffic Calming recommends an 80 millimetre height and a 6.5 metre width for these features.

Keys to Success

- In low speed areas such as within school sites, they can encourage students to use one location to cross a parking lot drive aisle.
- Adequate pedestrian crossing signs must be installed.
- Annual repainting of crosswalk measures is not required; however, the triangular pavement markings should be repainted.

Factors to Consider

- Discuss with transportation authority before implementing, as raised crosswalks must be properly designed and may not be appropriate in all locations. These are essentially speed tables which may be contentious to road users or create operational issues for transit service, emergency vehicles, snow removal, etc.
- Ensure that the materials used for the surface (such as textured pavers) do not inadvertently create a slipping hazard for pedestrians when they are wet or snow-covered.
- Non-standard paving materials for the surface of the crosswalk (such as paving stones) may present a maintenance issue for the road authority if an adequate stock of replacement construction materials is not available when repairs are required.

Cost

Costs may be in the range of \$10,000 to \$20,000 for implementation (2015 dollars). Costs vary based on local construction costs and if the existing road surface must be removed; costs may be reduced if it is part of new construction versus retrofit implementation.

Audible Signals

Definition

Audible signals incorporate equipment used with traffic signals and pedestrian corridors that emit audible sounds at the same time walk phases are in effect. They are directional, using different sounds (cuckoo for north/south and chirp for east/west) so that pedestrians with visual impairments who are familiar with the technology can recognize in which direction they are permitted to cross.

Placement

Incorporated into signalized intersections or crosswalks with overhead flashers (ex: pedestrian corridors).

Specifications

- Newer models of these systems are compact and can be mounted inside existing pedestrian signal head boxes at intersections.

Keys to Success

- The public should be informed as to what the audible signals mean if they are not familiar with the technology.

Factors to Consider

- Must be implemented in such a way that they do not give the public an ambiguous sense of which direction is safe to cross. This is sometimes an issue at intersections which are not oriented in a north-south configuration.
- Some people consider these audible signals a source of noise pollution. Generally they are only implemented in downtown areas.
- They may give a false sense of security to those with visual impairments, especially if large numbers of vehicles are turning at the same time as pedestrians are crossing a street. They may be incorporated alongside “No Right Turn on Red” measures.

Cost

It costs approximately \$12,000 to implement a full complement of audible signals at an existing four-way intersection (2015 dollars).

Countdown Timers

Definition

Countdown timers indicate to pedestrians how much time is left in the flashing don't walk phase of a pedestrian movement. A visible timer is displayed during the same time the hand symbol is flashing. This allows people to make better decisions about crossing the intersection and will make them feel safer if they are still walking across when the flashing don't walk phase begins.

Placement

- These components are incorporated into two-section pedestrian signal heads at signalized intersection crosswalks.

Specifications

- These are generally LED units, and are often implemented when a signal is upgraded to LED components from conventional light bulb components.

Keys to Success

- Pedestrians and motorists should be educated to what the signals mean if they are not familiar with the technology.
- The timer is an augmentation of the flashing don't walk indication, it does not replace it.

Factors to Consider

- They are not designed to provide motorists with information related to the amount of green time remaining or to address vehicular red light running violations.

Cost

It costs approximately \$8,000 to implement a full complement of these timers at an existing four-way intersection (2015 dollars). Costs are reduced when implementing these timers as part of a new signal installation rather than retrofitting existing equipment.



Countdown timer at a pedestrian crossing in Winnipeg.

Parking Restrictions at Crossings/Intersections

Definition

By law, parking or stopping is prohibited within 3 metres of an intersection, within 9 metres of the approach to a stop sign or traffic signal, and within 3 metres of the approach to a crosswalk. This is so pedestrians waiting to cross are not blocked from driver's sight lines by parked vehicles.

Placement

- Signs to prohibit parking can be located in advance and following a crosswalk location; however, the minimum distances mentioned above are in place, whether signs are present or not.

Specifications

- Signs can be used to reinforce *The Highway Traffic Act* regulations or to impose additional prohibitions as given in the TAC Pedestrian Crossing Control Guide, where the recommendations are to have a stopping prohibition for a minimum of 15 metres on each approach to the crossing, and 10 metres following the crossing.
- It is desirable to increase this distance to a minimum of 30 metres on each approach to the crossing, and 15 metres following the crossing to improve pedestrian conspicuity in situations where there are high volumes of children crossing a street or where there are larger than usual pedestrian volumes.

Keys to Success

- Once this measure is implemented, enforcement may be necessary to ensure parking is not occurring in the prohibited areas.

Factors to Consider

- Motorists may have an issue with parking being eliminated in areas that used to be available for parking.

Cost

Costs are low, limited to signs. There may be costs associated with enforcement, which may be required initially.

Right Turn on Red Restrictions

Definition

Generally, right turns are permitted on red lights at signalized intersections provided the motorist has come to a stop. However, a vehicle's right turn on red potentially conflicts with pedestrians who are permitted to cross at the same time. Although pedestrians have the right of way, they may have to wait if a vehicle is turning on the red signal phase. To eliminate potential conflict, right turn on red movements can be prohibited with signage.

Placement

These signs should be mounted on the far right corner of the intersection, often adjacent to the signal head for the right turn that is prohibited.

Specifications

- The type of sign is known as a RB-17R.
- Circumstances such as a wide intersection may require the installation of additional signs.



Keys to Success

- Enforcement may be required if right turns have previously been permitted at the intersection.

Factors to Consider

- Pedestrians must remain aware of the actions of individual vehicles, and not assume motorists will obey the signage.
- Motorists may object to the additional delay to vehicles that this measure will create.
- Contact the transportation authority before implementing this option. A traffic study may be required to investigate what impact prohibiting right turns on red has on the volume of traffic moving through the intersection. Signal timings may need to be modified to accommodate the change.
- Because the standard is to permit right turns on red, it is important that these signs be replaced when damaged or lost as the lack of a sign would mean that a right turn on red is permitted.

Cost

Costs are low if no other changes to the intersection are required other than the installation of the sign. A transportation study may add significant cost to the work, potentially \$10,000 to \$25,000. There may be costs associated with enforcement.



**Example of No Right Turn on Red sign at intersection near school in Winnipeg.
Note time restrictions (no turns during school hours).**

Cycling Network

Cycling to and from school is more popular in some areas of Manitoba than others. The following tools may help to increase the use of bicycles to get to and from school.

- On-Street Bicycle Lanes
- Multi-Use Paths
- Bike Trains



On-Street Bicycle Lanes

Definition

On-street bicycle lanes are exclusive travel lanes for bicycles on the same road surface as motorized vehicles. They may be separated from the other lanes by paint, parked cars, or physical dividers.



Parking-protected bicycle lane in Winnipeg

Placement

Most bicycle use around schools will take place on the streets where students live. Bicycle lanes are mostly used on higher volume, multi-lane roadways in urban and suburban areas. They are not typically used on low volume residential streets.

Specifications

- Bicycle lanes on streets should be at least 1.5 metres wide.
- Bicycle lane markings and signage should be in accordance with local best practices and/or the TAC Bikeway Traffic Control Guidelines for Canada Second Edition (2012).
- Best practices vary; it is becoming more common for bicycle lanes to be separated from other travel lanes on the road by dividers such as planters or bollards.

Keys to Success

- The support of the local jurisdiction is essential when implementing cyclist infrastructure.
- Support from the community is desirable.

Factors to Consider

- It is essential that a transportation authority be contacted. These require significant planning and engineering efforts to implement.
- Bike lanes are typically installed as part of a community-wide bicycle network, rather than serving a single destination, such as a school.
- Even with on-street bicycle lane infrastructure in place, sharing the road with motorized vehicles may be inappropriate for young students.
- Snow clearing operations on bicycle lanes should be considered.

Cost

The cost for these measures can be considerable, into the hundreds of thousands of dollars per kilometre at a minimum, bearing in mind that a network of such infrastructure is more useful than an isolated segment. It is unlikely a school would initiate a program to construct these, but a school might be a stakeholder if a community was instituting such infrastructure.

Multi-Use Pathways

Definition

Separated multi-use paths (also known as shared-use paths) increase connectivity for bicyclists and pedestrians. Their width makes it possible for both pedestrians and cyclists to travel side-by-side. Motorized vehicles are not permitted to travel on these pathways. These pathways are often located parallel to roadways but may also go where roads do not, such as through parks or neighbourhoods.



Multi-use pathway in Winnipeg

Placement

Pathways may run through parks, along roads, or along corridors, such as abandoned rail corridors or utility (hydro) corridors.

Specifications

- Winnipeg's standard for such pathways is 3.5 metres. Where heavy pedestrian and/or bicycle traffic is anticipated, a wider path would be used.
- To reduce the potential for incidents, multi-use pathways must be carefully designed where they intersect with roadways.
- Ideal surfacing for a multi-use pathway is asphalt or concrete. Multi-use paths should be designed so that motor vehicles cannot use them, yet still allow maintenance or emergency vehicles to access them. Removable bollard posts spaced to permit bicycles and pedestrians to move between them are one measure that can be used to regulate access.

Keys to Success

- The support of the local jurisdiction is essential when implementing cyclist infrastructure.
- Support from the community is desirable.

Factors to Consider

- Pathways should not be routed in such a way that they are isolated, as this may be potentially hazardous to users.
- Adequate lighting must be provided, and any necessary signs should be installed along the pathway.

Cost

The City of Winnipeg estimated the cost to provide a 3.5 metre wide asphalt pathway at \$400 per linear metre. The cost for these measures can be considerable, into the hundreds of thousands of dollars per kilometre at a minimum, bearing in mind that a network of such infrastructure is more useful than an isolated segment. It is unlikely a school would initiate a program to construct these, but a school could be a stakeholder if a community was instituting such infrastructure.

Bike Trains

Definition

A bike train is a bicycle version of a walking school bus. Volunteers oversee the travel of a group of cyclists that follow a route to school that allows students to join as it passes their home.



Bike train in New Westminster, B.C.¹⁰

Placement

A bike train can be initiated following a survey of school families to determine interest. A bike train route may be longer than a walking school bus route.

Specifications

Depending on the requirements of the school, volunteers may require first aid certificates or child abuse registry checks. Bike train volunteers (and participants) should have training in safe cycling procedures. Reflective vests may be distributed to volunteers, and a bicycle cart to carry backpacks and other items can be used.

Keys to Success

- A coordinated effort between volunteers, school staff and parents is required to keep an initiative like this moving forward.

¹⁰ http://guide.saferoutesinfo.org/encouragement/walking_school_bus_or_bicycle_train.cfm

- May be difficult to implement in rural areas if cycling infrastructure is not in place, or cycling is not safe on the transportation network.

Factors to Consider

- An ongoing pool of trained volunteers is required to keep the program going from year to year.
- Routes should be planned that are safe for young cyclists.

Cost

The cost of a bike train is low due to volunteer staffing. Equipment such as vests can be obtained at low cost.

Vehicle Network

The use of vehicles for trips to and from school has increased over time and it is necessary that vehicles are accommodated in a safe manner in school areas. The following tools are examined in this section:

- Stop Signs and Signals
- On-Street Parking and Loading Zones
- Traffic Calming Measures
- Reduced-Speed School Zones



On-site private vehicle loading zone at a Winnipeg School

Stop Signs and Signals

Definition

Stop signs and traffic signals control the flow of traffic at intersections and stop vehicles to provide right-of-way for vehicles and pedestrians to cross streets.

Placement

Installing new traffic signals or stop signs at locations where they are not already in place may be warranted when traffic volumes are high, when vehicular queues are long, and/or when pedestrians have trouble crossing the street safely.

Specifications

The implementation of stop sign control or traffic signals should follow standard practices established by the transportation authority; typically, these are based on TAC standards.

Keys to Success

- Installation of these devices should be limited to locations where they are warranted based on traffic volumes. Compliance is often low where stop signs are not warranted by traffic volumes, resulting in a false sense of security for pedestrians and a disrespect for traffic signs in general.
- These measures can make it much easier for both motorists and pedestrians to move through an intersection. Where warranted, these measures should improve pedestrian safety, and also reduce vehicle crash severity at intersections.

Factors to Consider

- The transportation authority must be contacted to review what measures are appropriate at an intersection. Before traffic signals or stop signs can be considered for installation, they will complete a traffic study with detailed traffic counts and an engineering analysis.
- Stop signs or signals can increase some types of traffic collisions, such as rear-end collisions.
- Stop signs are not effective for speed reduction and should not be used as a traffic calming measure. If they are inappropriately implemented, motorists may ignore them, creating a safety issue.
- Transportation authorities may consider such measures inappropriate on higher classification roadways, or in isolated rural locations where maintenance would be difficult (in the case of signal installation).

Cost

A traffic signal can cost approximately \$300,000 to implement, whereas stop signs can be implemented at relatively low cost. Costs may be substantially higher if dedicated turn lanes need to be constructed to accommodate storage of turning vehicles.

On-Street Parking and Loading Zones

Definition

Parking and loading of students from parents' vehicles often takes place on the streets surrounding a school at the start and end of the day or during times when activity is taking place at the school. This can be an issue if:

- parents are parking/loading in areas where this activity is prohibited;
- there is inadequate capacity for parking, creating driver frustration and queuing issues;
- motorists are not operating their vehicles safely in these areas.



Parents' vehicles parked in on-street loading areas by a school in Winnipeg



Vehicle parked beside "No Stopping" sign by a Winnipeg school

Placement

Generally, parking and loading occurs on the streets that front and flank the school property. Usually, signs will already be in place, permitting or restricting parking and/or loading during school hours.

Specifications

- Schools are generally designed to follow local bylaw requirements regarding on-site parking supply, including parking for parents and students. However, school parking requirements have changed over time. What was approved in the past, may not necessarily meet current needs/bylaws, thus the need for off-site (ex: street) parking/loading.
- Signs for on-street parking should follow local transportation authority guidelines.

Keys to Success

- Discuss parking conditions off-site with the local parking or transportation authority. They may ask that a parking study be conducted by an engineering firm, or instruct the school team how to gather the data they require.

Factors to Consider

- Banning parking/loading is not a solution, as it will result in the problem moving elsewhere.
- Changes to on-street parking regulations affect the whole neighbourhood, and as such, affected residents or businesses should be consulted.
- Ensure existing signs are visible and easy to understand. Signage may need to be modified if changes are made to loading zones.
- Ensure the location where dropping-off/picking-up occurs is not causing problems, such as jaywalking.
- Consider the creation of a protocol that provides loading on-site, particularly if queuing becomes a concern due to a lack of capacity off-site.
- If additional capacity is the issue, it may be possible to come to an agreement with the owner of an adjacent parking lot that is not busy during the times when the school requires additional parking spaces (such as a church or community centre). A written easement agreement would be required between the school (or School Division) and the adjacent lot owner. Care would need to be taken to ensure this does not create new transportation issues, due to the movement of students between the school and the parking location.
- A potential solution may be to construct additional parking on the school site.

Cost

High if the solution to off-street parking/loading issues is to construct new additional parking on-site or employing ongoing enforcement by law enforcement or parking enforcement. Low if the solution is by means of education and enforcement of rules by volunteers.



At this school in Winnipeg, no private vehicle loading is permitted on-site.

Traffic Calming Measures

Definition

Traffic calming measures are physical measures that can be implemented on the road network around a school to make conditions safer for pedestrians, specifically by reducing traffic speeds or traffic volumes. Traffic calming measures include features designed to slow vehicles down or discourage through traffic from travelling on residential streets.



Speed hump

Several such measures have been covered in other sections of the toolkit -- the measures in this section are those that have not already been covered. A summary of traffic calming measures is listed in **Table 3**, and more information on a number of these calming measures is provided in **Appendix 5**.

Placement

The placement of traffic calming measures varies by the type being used.

Specifications

Two sources of information on traffic calming measures are:

Canadian Guide to Neighbourhood Traffic Calming. TAC (1998)

Pedestrian Facilities Users Guide: Providing Safety and Mobility. FHWA-RD-01-102. USDOT (2002)

Table 3: Application and Impact of Traffic Calming Measures¹¹

Type	Potential for Use on:			Impact on Traffic Volume
	Arterial Road	Collector	Local Road	
Speed hump	No	No	Yes	Possible
Speed table	No	Yes	Yes	Possible
Raised crosswalk	No	Yes	Yes	Possible
Raised intersection	No	Yes	Yes	Possible
Textured pavements	Yes	Yes	Yes	Possible
Speed cushion	No	Yes	Yes	Possible
Rumble strips	Yes	Yes	Yes	No
Traffic mini circle	No	Yes	Yes	Possible
Roundabout	Yes	Yes	Yes	Possible
Chicanes	No	Yes	Yes	Yes
Realigned intersection	Yes	Yes	Yes	Possible
Tighter radii on corners	Yes	Yes	Yes	Possible
Centre island (median) narrowing	Yes	Yes	Yes	Possible
Chokers	Yes	Yes	Yes	Possible
Road diets (lane reductions)	Yes	Yes	Yes	Yes
Speed limits	Yes	Yes	Yes	No
Speed alerts, enforcement	Yes	Yes	Yes	No
Perceptual design	Yes	Yes	Yes	Possible
Warning signs	Yes	Yes	Yes	No
Half closure	Yes	Yes	Yes	Yes
Diagonal diverters	Yes	Yes	Yes	Yes
Lateral shift	Yes	Yes	Yes	No
Median barriers	Yes	Yes	No	Yes
Gateway treatments	Yes	Yes	No	No
Traffic signal co-ordination	Yes	No	No	No
Vehicle-activated signs	Yes	Yes	No	No
Permanent speed display signs	Yes	Yes	Yes	No

¹¹ Based on information from: Pedestrian safety: A Road Safety Manual for Decision-Makers and Practitioners – World Health Organization, 2013

Keys to Success

- Due to the impact these have on the surrounding community's travel, it is extremely important that a traffic authority consult with the public before considering the implementation of such measures.
- Ensure the public has the opportunity to become familiar with the traffic calming measure prior to implementation and understands the issue the measure is intended to address.
- If possible, consider a temporary version of the measure (removable) on a trial basis to determine if a permanent measure will be effective.

Factors to Consider

- The transportation authority must be contacted to review what measures are appropriate in an area. They will complete a traffic study with detailed traffic counts and an engineering analysis before any traffic calming measures can be considered for installation.
- Traffic calming measures should only be considered after other methods of addressing poor driver behaviour have been demonstrated to be ineffective.
- Local motorists may not agree with the need for such measures and may oppose them.
- Only low volume (ex: local residential) roads are appropriate locations for many traffic calming measures.
- If applied improperly, some traffic calming measures can negatively impact safety or cause other problems.
- Traffic calming measures are not usually installed on rural highways, but some types may be considered on lower speed highways running through towns and communities.

Cost

Construction costs for traffic calming measures are moderate to high. Features requiring modifications to existing roadways or major construction such as diverters and chicanes might cost as much as \$25,000 to \$55,000 or more (2015 dollars).

Reduced-Speed School Zones

Existing Manitoba regulations that support reduced-speed school zone legislation give local transportation authorities or local government the authority to designate segments of roadway (including provincial highways) as school zones and implement modified speed limits.

The regulations set out distances around a school for which a reduced-speed zone is to be applied, as well as signage requirements. For more information please refer to:

http://dev4.manweb.internal/mit/pdf/guide_reduced_speed_school_zones.pdf.

Placement

Located on a street adjacent to a school where student pedestrians are common.



Reduced-speed school zone sign in Winnipeg

Specifications

- Incorporates signage to indicate when a reduced-speed school zone is in effect and what the speed limit is within the zone.
- Regulations include specifications regarding length of the reduced-speed school zone and how to handle overlaps (when there are two schools on the same street).
- The TAC School and Playground Areas and Zones: Guidelines for Application and Implementation is a recommended document for background information on school zones.

Keys to Success

- These measures are new to Manitoba so driver education as to their use will be important as some motorists may not be familiar with them.

Factors to Consider

- May require a transition zone on roads with high initial speeds.
- Not every road adjacent to a school may require a reduced-speed school zone depending on the roadway and the layout of the school site.
- Law enforcement may be required if compliance is low.

Cost

The cost of implementation is fairly low (cost for signs). Enforcement may increase the cost of implementation.

TOOLKIT: On the School Site

Many schools throughout Manitoba and North America, particularly older schools in urban areas, were designed and constructed when driving students to school was much less common.

A frequent issue related to existing school sites is how to address shortfalls related to automobile and bus needs, including driveways, travel lanes, parking lots, drop-off/pick-up areas, loading zones, etc. Similarly, facilities for bicycles and pedestrians, including sidewalks, safe crossing areas, and bicycle parking, may be lacking on the school site.

Implementing infrastructure improvements can be an expensive undertaking, or may not be possible depending on the layout of the existing infrastructure and the size of the site itself. However, not all improvements require construction. Some changes may be possible through policy (ex: how existing infrastructure is used) or small modifications (including paint and signage), which are relatively easy to implement and have a low cost associated with them.

This section evaluates various improvement measures that can be implemented on the school's property. The tools examined in this section include:

- Fencing
- Signs and pavement markings
- School driveways
- School bus loading areas
- Bicycle parking areas
- Vehicle parking areas
- Illumination to enhance safety

Note that all of these measures potentially require the involvement of experts; consult with your local transportation authority to determine if your team should engage the services of an engineering/planning firm to assist with the design or implementation of such measures.

Fencing

Definition

Fencing can be used on school sites to restrict student movements, such as inadvertently walking into vehicle travel lanes, bus loading areas, etc. This type of measure can help to separate modes of travel (ex: vehicles, cyclists, and pedestrians) from one another, reducing potential conflicts.



Chain-link fence limits access to school bus loading area.

Placement

Fencing is placed along the edge of driveways, parking lots, etc., with openings as appropriate, such as at crosswalks, locations where school bus doors open, etc. Fencing is also used at schools to fence off abutting roadways to guide students to appropriate crossing/access points.

Specifications

- Chain-link is a common type of fence used for this purpose due to its relatively low cost; common heights for commercial chain-link fencing range from 6 to 12 feet. Other options for fencing material are available as well.
- Fencing is available in different colours and can be galvanized to increase the lifespan of the material.

Keys to Success

- The openings in the fence need to be carefully considered so that the fence does not force pedestrians/cyclists to detour long distances.

Factors to Consider

- Chain-link fencing is effective, but is generally not considered aesthetically pleasing.
- There may be concerns that such fences limit movement, and potentially create safety hazards by restricting movement to a limited number of locations.
- These fences are prone to being cut open if they block unofficial routes that are heavily used. Such routes should be investigated to see if there is the option to formalize the routes rather than block them.

Cost

Chain-link fence is relatively low cost and is in use at many Manitoba schools. Costs grow as the length of fence increases and may be significant if a large area needs to be fenced in this way.

Signs and Pavement Markings

Definition

Signs on school property can be used to indicate important information to motorists, such as access and parking rules. Messages must be easy to read and concise. Line painting, such as parking space demarcation, no parking areas, bus loading areas, and directional arrows, are also a form of messaging and should be considered signage.



This cluster of signs is difficult for motorists to “take in” when entering the parking/drop off area. There is a lot of text, some of it is hard to read, and one sign is obscured by another. As a result, the messages may be ignored.

Placement

Consider using signs anywhere it is important that information be communicated, such as:

- Where visitor parking should take place, or if it is prohibited on-site.
- Where pick-up or drop-off of students in private vehicles should take place, if it is prohibited on-site, and if there are any specific procedures or rules related to this.
- Where staff-only parking is located.
- Where student parking is permitted at high schools.
- Where other types of loading take place.
- Signage for fire lanes or where emergency vehicles should park.

- Areas where rules related to operation are required, such as one-way operation, speed limits, bus-only lanes, turning lanes, internal crosswalks, etc.

Specifications

- It is recommended that signs be professionally-made and come from a supplier of traffic control signs. Professional signs are more durable and more recognizable to drivers (since they should be in conformance with traffic authority standards) when compared with traffic signs that may be custom-made by the school. Most sign suppliers can tailor non-standard signs (such as restrictions on parking for staff only) when required, but note that non-standard signage must be restricted to on-site use only.
- White pavement markings are standard in Manitoba. White paint is used for pavement markings (such as crosswalks, stop lines and lane lines) and directional arrows on pavement in Manitoba. Yellow paint is reserved for use in centerlines dividing directions of traffic flow.

Keys to Success

- Messaging must be concise and easy to understand.
- Should follow Manual of Uniform Traffic Control Devices for Canada (MUTCDC) standards where applicable. This is a manual on standards for traffic-related signage.
- Use of images, rather than text, is encouraged.

Factors to Consider

- May require enforcement to ensure messages are being obeyed.
- Confusing signage should be replaced by easy-to-understand signs with a limited amount of text to read.
- Overuse of signs can result in driver non-compliance and visual clutter.
- May need to be bilingual or multilingual, or motorists may need to be taught the meaning of signage via the school newsletter.
- Signs must be maintained – they wear out and must be replaced. Damaged or worn-out signs with hard-to-read text or graffiti should be replaced. Note that there are specialized inks and printing processes that are designed to be graffiti-resistant.
- Check the adequacy of on-site lighting to effectively illuminate signs.
- Line painting at schools and crosswalks must be maintained. This could take the form of paint programs once a year, preferably in the early spring.

Cost

Varies, but is generally low. Sign costs vary depending on manufacturer, and include installation costs. Some signs are off-the-shelf designs, which will be a lower cost than custom-made signage.

School Driveways

Definition

Driveways are where vehicles enter and leave the site, connecting the school to the road network. Driveways are generally intended for motorized vehicles but may be being used by other modes, such as bicycles and pedestrians. Ideally, each mode would have its own facilities.

Placement

Driveways will already be in place at existing schools.

Specifications

- Use appropriate driveway width dimensions, according to the local bylaw (for example, in Winnipeg, see the Private Access Bylaw). In general, a 7.0 to 10.0 metre driveway width for a two lane driveway is appropriate for a school, depending on the size of vehicle to be accommodated. Driveways larger or smaller than this are not recommended. Consult local standards.
- Provide adequate spacing between adjacent driveways serving a school site. This will vary from one jurisdiction to another; consult local standards.
- The driveway throat (a clear length of driveway with no intersections between the street and the parking lot) should be long enough to allow vehicles to queue while waiting to leave a site, without getting in the way of vehicles moving inside the parking lot. Generally the throat length in school parking lots should be able to hold at least one vehicle, preferably without blocking the sidewalk. The throat length may be specified by local bylaws as well. Confirm with your local transportation authority.

Keys to Success

- Use local standards for design (such as drive aisle widths, turning radii). The transportation authority may have this information.
- The separation of travel modes is considered a very important characteristic of current best practices in the layout of school sites. This refers to separating private vehicle, bus, and cyclist/pedestrian pathways, thereby greatly reducing the likelihood of interaction between two (or more) modes. Thus, it may be advisable to develop separate driveways for:
 - A pick-up/drop-off area for private vehicles, which might include a dedicated traffic loop and short-term parking.

- A separate parking area that is restricted to staff, students, or visitors to the school.
- An area for school buses to pick up and drop off students.
- Separated routes for pedestrians and cyclists that limit conflict with motorized vehicles.
- Separated loading and parking areas for licensed child care facilities at the school.

Factors to Consider

- It may be impractical or impossible to develop separated driveways at an existing school. It may not be possible to reconfigure a site, depending on how the school is located on the site or where accesses to the road network are located.
- While a redesign to a school site may be possible, there may be reasons for not proceeding, such as protecting green space on school sites. Procedural changes can sometimes address issues at much lower cost.



This school's driveway throat is very short, and vehicles queued to leave prevent vehicles entering from turning into the loading area, causing queuing onto the street. Also, students leaving the school are weaving between queued cars.

Cost

Considerable (if new construction is required). Some measures, such as repainting pavement markings, may be relatively inexpensive as they shouldn't require construction.

School Bus Loading Areas

Definition

Bus loading areas are dedicated areas for school bus loading and unloading.

Placement

School bus loading areas may already be in place, but if school buses are introduced at a school that did not have them in the past, those schools must incorporate bus loading areas. All loading and unloading of students should occur off-street. As an alternative, when loading cannot be accommodated off-street, loading should occur on the school side of the roadway.

Specifications

- On-site bus loading areas commonly have signed and areas of painted cross-hatching where no other vehicle can park and where students should not walk while the buses are in the area. These areas delineate blind spots for buses, where it is difficult for drivers to see students walking around the bus.
- Turnaround areas must be designed to match the turning radii of the vehicles that will use them. For a school bus, this is approximately a radius of 12.8 metres. Vehicle swept path analysis software can be used to ensure that such features are sized to match vehicle requirements. Be aware that the space required to properly turn a full-sized school bus can be quite large. Curb radii should also match the turning radius of the largest vehicle that will use it. Mountable curbs should be avoided as a safety precaution for pedestrians.

Keys to Success

- Students should be aware of the hazards involved in bus loading/unloading and act in a safe manner around school bus loading. Supervision of students should take place when loading/unloading. See the section on school bus loading protocols.
- There is a dedicated area for buses during the morning and afternoon loading periods and no other vehicles can use the loading area at that time.
- Where there is the potential for conflict between buses and private vehicles, consider prohibiting private vehicles from entering or circulating on school grounds while buses are on school property (either moving or stopped).



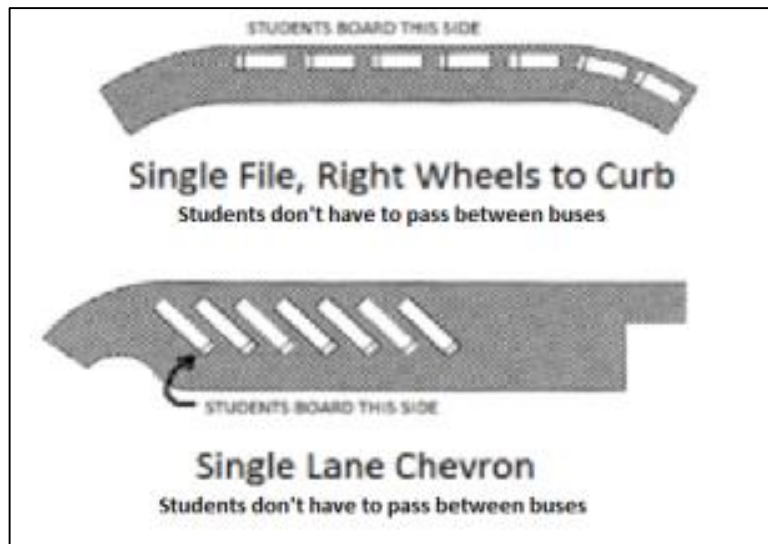
This school has a dedicated bus-only area for buses with fencing to restrict student movement. A supervised loading protocol exists at this school.

Factors to Consider

- Bus loading areas should not require buses to reverse.
- Maintain on-site, pavement markings or raised concrete channelizing islands marking bus loading areas. On-site areas adjacent to the curb may be painted to denote they are prohibited to students when buses are present. This is intended to keep students out of bus blind spots. It is especially important to ensure that these no go areas are still apparent in winter when ice and snow may cover pavement markings.
- As part of the Transportation Management Plan, it should be required that buses can only pick up or drop off children at a curb. Children should not be permitted to walk across lanes of traffic in a parking lot.
- Parking configurations that reduce the potential for students to move about in bus blind spots include chevron-style parking (where buses drive forward out of their stopped position) or parking single file along the curb, with the right wheel to the curb. **No reverse movements should be required by a bus.** Parking buses in multiple rows is not recommended, as this configuration results in students having to walk around buses, potentially in the blind spots. Two recommended options are illustrated below.

Cost

- Considerable (if new construction is required). Some measures may not require construction, such as repainting pavement markings, and may be relatively inexpensive.



Typical school bus loading area arrangements.

Bicycle Parking Areas

Definition

Dedicated areas for storing bicycles at a school.

Placement

Bicycle parking areas may already be in place at schools, but facilities may be older and would benefit from being replaced with modern equipment. Bicycle parking should be located near a main entrance to the school so that bicycles are secure and easily observable by adults, to ward off theft or vandalism.

Specifications

- Modern bicycle parking racks are designed so that bicycles are secure and less likely to be damaged or stolen than older-style racks.
- Bicycle parking areas are often enclosed in chain-link fence cages which restrict access to bicycle users only.
- Vélo Québec (a Quebec-based bicycle advocacy organization) recommends that where no data on student bicycle use exists, a rate of one bicycle stall per five to 20 students be used.
- Bicycle parking areas often incorporate elements to protect bicycles from inclement weather (rain, snow).

Keys to Success

- In order to minimize damage, bike racks should not crowd bikes together.
- Ensure the size of the facility is large enough to handle demand so that over flow bicycles do not have to be parked in less ideal locations.

Factors to Consider

- Bicycle parking facilities are likely to be less useful in rural areas, if on-road bicycling is unsafe for students due to higher traffic speeds or larger distances. They may also be less useful in areas where bicycle use is limited due to routes with heavy traffic volumes or high speeds in urban or suburban areas.
- Locate bike racks in a manner that minimizes the potential for vandalism and avoids conflict with buses, vehicles, and pedestrians.

Cost

Moderate. Modern bicycle parking facilities are generally more elaborate than what was previously considered adequate in the past.



Secure bicycle parking (bicycle cage) in Winnipeg.



High bicycle usage at a school in rural Manitoba.



Older style rack. Not recommended.



One of several newer styles of bicycle rack. (photo: Vélo Quebec)

Vehicle Parking Areas

Definition

Where possible, vehicle loading of students should take place in parking areas on school property. These areas may be separated by user or mixed areas for staff, visitors, pick-up/drop-off by parents/guardians, and student parking for high schools. Some of these users may be prohibited from parking on-site at a school, particularly if the parking area is small.



Signage used to indicate where different users should park at a school.

Placement

Parking areas will already exist at schools.

Specifications

- At older schools, it is likely that a school's facilities were designed appropriately when the school was originally constructed, but changes to needs and standards may have occurred. The dimensions of on-site infrastructure (size of stalls in parking areas, width of drive aisles and driveways, flared curb layouts, and other dimensions of curb cuts, etc.) should conform to current local standards if any changes are contemplated. These can be obtained from the local transportation authority or local engineering/planning firms.

Keys to Success

- It is important that the lot be designed in such a way that movement is safe. This means considering sightlines, how vehicles will enter/leave stalls, and potential conflicts with pedestrians or cyclists.
- Low cost barriers, such as cones, signs, and chains, may be used to prevent vehicles from entering parts of the parking lot where they should not be, such as parents driving into the staff parking area.
- See the section on pavement marking and signage, and off-site pick-up/drop-off areas (as the same issues can apply to on-site areas as well).

Factors to Consider

- Private vehicle loading should occur in designated areas to minimize conflict with pedestrians. Vehicles should not be parked in loading zone locations where through movement is essential. Provide signage and enforcement to prevent this.
- Consider snow clearing operations when layout of curbing is planned.
- Enforcement may be required if users do not comply with restrictions on which areas of the lot are for their use.

Cost

Considerable (if new construction is required). Some measures may not require construction, such as repainting pavement markings, and may be relatively inexpensive.

Illumination to Enhance Safety

Definition

Lighting solutions can create a safe environment for students, specifically those on-site in the evening or early in the morning participating in child care or after-school programs. Lighting benefits transportation by making it safe for pedestrians and making it easier for motorists driving on school property after dark. Lighting is also a component of Crime Prevention through Environmental Design (CPTED). CPTED concepts contributing towards making a site less prone to criminal activities through the use of design features which discourage crime and encourage legitimate use of an area.

Many school facilities, including parking lots and driveways, were either built before modern lighting technologies were available, or did not make use of optimal lighting design.

Placement

- Site lighting should be designed not to flood or spill into adjacent property.
- Consider location of lighting in relation to security cameras, if cameras are in use.

Specifications

- Maintain a constant level of light, providing good visibility at night. Bright spots and shadows should be avoided.
- Illuminate signage so that it can be read at night.
- Parking lot lighting design should minimize glare for drivers and pedestrians, focusing more light on the driving lanes and less on the parking areas.
- Use controllers (such as motion detectors, timers, light sensors, or pager controls) to control lighting, conserve energy and avoid unnecessary use. Though safety is a priority, outdoor lighting should be kept at levels that respect local ordinances. These ordinances should be reviewed as part of the lighting design process.

Keys to Success

- Light fittings/housings/luminaires should be robust to limit potential damage due to balls, frisbees, etc.
- Lighting should be maintained (bulbs replaced, housings kept in good repair and clean) so it remains effective.
- The lighting design of a site and the selection of proper equipment and wiring is a complex task that should involve professional lighting designers. To ensure efficient, cost-effective illumination, lighting design should include measuring light levels, and

calculating energy consumption. Care should be taken to avoid light pollution and wasted energy.

Factors to Consider

- The locations of trees and shrubs close to school buildings, and the placement of lighting, should be carefully planned, taking site security into account.
- High-pressure sodium light bulbs (bright yellow light fixtures) have been a very common option at schools, but this type of lighting does not always provide the best illumination, as they typically are not designed to direct light towards the ground where it is most useful to pedestrians or motorists. LED light fixtures are designed to direct light toward the ground, and eliminate the issue of light pointing toward the sky is common with high-pressure sodium lighting.
- Energy efficient lighting fixtures such as light-emitting diodes (LEDs) may be more expensive initially but result in reduced energy usage and maintenance costs over their operating life.
- Exterior lighting redesign is often postponed until major school renovations take place. However, a stand-alone exterior lighting retrofit project may have a short payback period, depending on the cost of electricity and the efficiency of a new system, compared to the existing infrastructure.
- Exterior lighting is often replaced at the same time interior lighting of a school undergoes a retrofit to make it more energy efficient.

Cost

The type and quantity of light required will vary from one school to another, and will vary depending on whether it is a new installation or a retrofit of existing lighting.

TOOLKIT: School Processes

Not all school area traffic safety improvements require physical changes to infrastructure. Sometimes, changes to the way schools operate can help alleviate safety concerns. Tools examined in this section of the toolkit include:

- School bus loading protocols
- Private vehicle pick-up/drop-off protocols
- Staggered dismissal times
- School access protocols



Supervised school bus loading

School Bus Loading Protocols

Definition

These are the safety processes and rules followed when students get on or off a school bus at a school.

Placement

This will occur in the school bus loading area at a school.

Specifications

Specific issues related to school bus operations will vary from one school to another, depending on what practices are already in effect at the school. Various approaches are possible, but the concept is the same – that the loading of buses is adult-supervised and regulated, with students lining up and attendance being taken before boarding. These processes would form part of the Transportation Master Plan for the school.

- Using colour-coding that identifies each bus with a different route (red route, blue route, etc.); students are provided corresponding tags to affix to their jackets and bags that identify which bus they should be on, with a backup being a continually updated list of names of students that will be on each bus based on attendance at school that day. These names would be checked by a supervisor before children enter the bus.
- Before leaving the building (or schoolyard), students are organized by staff so they line up in one line for each bus and then exit the school one busload at a time, while supervised by staff. Since their movement is regulated, this ensures that students board the correct bus, and it minimizes the potential for students to dart between vehicles.
- As an alternative to the second option, the students may leave the school freely but line up outside with one line for each bus. A supervisor would check off the attendee's names from a list to ensure all students are accounted for before they are released to board a bus.

With any of these methods, it remains possible for students to travel on their non-typical bus, as long as this has been approved in advance and is permitted by the school division's regulations.

Keys to Success

- It is important that all students, staff, and parents/guardians understand and follow the protocols. Protocols should be widely publicized (ex: in the School Transportation Management Plan; on the school website) and students should be reminded of the protocols on a regular basis.

Factors to Consider

- Following proper practice must become commonplace at a school, which means it must be enforced every school day.

Cost

Generally, no cost is associated with this, as school bus loading is routinely monitored at schools.

Private Vehicle Pick-Up/Drop-Off Protocols

Definition

These are the processes and rules followed when students are picked up or dropped off by private vehicles at a school. It is important this be done in a way that is safe for both motorists and pedestrians in the area. In some cases, this can be a chaotic process with motorists attempting to get in and get out of the area in a hurry, and not wishing to be delayed by other loading/unloading vehicles. This can create safety issues due to unsafe driver behaviour.

Placement

This will occur in the private vehicle loading/unloading area at a school, which might be on-site or off-site on a nearby street.

Specifications

Protocols should specify issues, such as:

- where pick-up/drop-off is to take place
- practices regarding driving in this area (ex: no U-turns)
- reminders to pay attention to students and adults crossing the streets in the area
- rules regarding where students and parents should cross the street

Keys to Success

- It is important that all students, staff, and parents/guardians understand the protocols in place and follow them. This information should be in the school Transportation Management Plan, on the school website, etc. and reminders of the protocol made each term at the school, perhaps through a school newsletter or recorded telephone messages.

Factors to Consider

- Following proper practice must become commonplace at a school, with daily enforcement
- If there are areas where traffic flows slowly in queues into a dedicated loading zone area, consider using staff that act like valet parking attendants and rapidly load/unload vehicles and keep them moving in quick and safe succession. Some schools in the United States have detailed protocols in place for these situations.
- See the sections on loading/unloading areas and driver behaviour.

Cost

Cost would be limited to staffing/supervision.

Staggered Dismissal Times

Definition

To eliminate conflict between different modes, such as pedestrians being in conflict with motorized vehicles, the school could potentially dismiss students using different modes at different times at the end of the day, waiting for one mode (such as all students walking home) to leave the school property before dismissing students being driven home for example. This would be more of an issue in the afternoon, when all students are generally leaving at once (versus in the morning when students are arriving over a wider range of times).

Placement

N/A

Specifications

- Before implementing on a permanent basis, this should be tested to determine if it is workable.

Keys to Success

- It is important that all students, staff, and parents/guardians understand the protocols in place and follow them. This information should be in the school Transportation Management Plan, on the school website, etc. and reminders of the protocol made each term at the school.
- Students would need to be encouraged to leave the school in a safe, but expedient fashion, to avoid delaying students using other modes.

Factors to Consider

- Some students or parents/guardians may not appreciate being delayed when leaving the school, and having to wait for other transportation modes to clear the area.
- Scheduling of school buses would need to be considered, as some buses serve multiple schools and the scheduling of arrival/departure at one school would impact other school schedules.
- Enforcement may be required.

Cost

No cost; this measure is simply a revision to existing operation of the school.

School Access Protocols

Definition

These are the processes and rules that apply to the doors students are allowed to use to enter/leave a school. Sometimes the rules in place related to which doors can be used to access the school (such as certain doors for certain grades) make it challenging (by increasing route length significantly) for students to walk or bicycle to school, as doors that would make routes efficient cannot be used.

Placement

Dependent on the school.

Specifications

- The impact on route length or quality of the route for students walking or cycling should be considered when altering protocols regarding door use at the school.

Keys to Success

- It is important that all students, staff, and parents/guardians understand the protocols in place and follow them. This information should be in the school Transportation Management Plan, on the school website, etc. and reminders of the protocol made each term at the school. Documentation should include the rationale for why the rules are in place so they aren't inadvertently altered in the future without considering the impact it will have on mobility.

Factors to Consider

- Rules regarding door use also relate to other factors, such as security at the school.
- Signage may need to be altered when processes are changed.

Cost

Essentially no cost.

STEP 4: PRIORITIZATION AND COST ESTIMATES

As a team completes its STIR report, a list of suggested improvements will be generated. It would be ideal if all improvement measures could be implemented at once; however, this might not be possible.

There may be other schools working on separate STIR documents at the same time. A transportation authority and school authority may receive STIR documents from a number of schools, all with various improvements being requested. Transportation budgets and resources for implementing changes are limited and it may not be possible to implement all of the requested measures simultaneously.

Both the team working on the STIR and the transportation or school approval authority should go through a process of evaluating and prioritizing the measures. The following section provides a simple methodology that could be used¹².

Evaluation Methodology for Ranking STIR Measures

When considering how to prioritize proposed measures to upgrade transportation safety at a school, there are several competing factors:

- How much will the improvement cost (a measure that is more expensive might have to wait until there is funding available)?
- Is a measure essential to addressing safety, or only desirable?
- How many students will this improvement affect (a measure that benefits a large number of students would be prioritized above one that benefits only a few students)?
- Are the proposed improvements potentially contentious? If a measure is beneficial, but unpopular with many people, it may be more challenging and time-consuming to approve/implement.

¹² Other methods could also be used. The paper [Prioritizing Schools for Safe Routes to School Infrastructure Projects](#) (ITE Journal, February 2010) may be of interest to school STIR teams or transportation authorities reviewing submissions and need to consider how to prioritize projects, given a limited infrastructure budget. While the ITE article focusses exclusively on pedestrian-oriented measures, it might be possible to expand it to a wider range of measures related to school transportation.

Cost Estimates

Developing cost estimates to implement and maintain a piece of infrastructure, such as a crosswalk, or a small improvement, such as a widened driveway, is beyond the scope of what a school team developing a STIR would be expected to complete.

Some of the concepts within the toolkit include very brief references to cost that may be useful, but local conditions play a major role in the costing of materials and labour. Therefore, projects should have their costs estimated using local expertise, rather than relying on data from publications which can become out-of-date quickly.

School teams should ask traffic authorities if they are willing to provide cost estimates on their behalf, as part of the STIR submission. If the transportation authority cannot generate cost estimates internally, the school team should discuss with the authority whether it would be useful to have a private firm or contractor prepare these numbers, and if the transportation authority is able to cover the cost of this work. It may be possible to obtain assistance from a parent volunteer who has experience with preparing cost estimates of this type.

Once costs are estimated, the funding options of the measures should be explored. This might also be outside the scope of a school team's means¹³, but a school division or board may be able to work with the transportation authority and various levels of government to find ways to fund transportation improvements through cost-sharing arrangements.

Impact, Need, and Resistance

Cost is an important consideration, but it should not be the only consideration in prioritizing improvements. In addition to cost considerations, evaluate impact, need and resistance of the measures recommended in the STIR.

Impact: How significant an impact will this measure have on transportation safety? Is it essential or nice to have?

Need: How many students will benefit from the measure?

Resistance: How difficult will it be to implement? Will there be opposition from the public or local government? Do regulations or policies need to be changed to make it possible to implement a change? Is a public consultation/communication strategy required?

¹³ A school or a school board might consider alternative ways of funding, such as applying for grants or fundraising to fund a needed improvement.

Rate the standards on two matrices:

- Degree of Impact vs. Degree of Need
- Degree of Impact vs. Degree of Resistance

A simple way to do this is to create large flip-chart paper versions of the next page for each measure and have team members grade a measure on the charts. Team members should be asked to think about how other parents, school neighbours and the wider community will view the proposed improvement. Each group member may have different thoughts on how to rate each measure using the criteria. If there is major disagreement on the rankings, then the rationale for the discrepancies should be discussed and if possible a consensus achieved.

When the process is considered complete by the team, a copy of the final rankings matrices should be incorporated into the STIR along with any explanation necessary to explain how the ratings were arrived at.

Use **Table 4** to evaluate degree of **impact**. Higher rankings mean a greater number of people (generally students) will benefit from the measure, and the measure is potentially more important from a transportation point of view. As part of this measure, the actual number of students who will benefit should be estimated and recorded.

Table 4: Evaluating Impact

1	Measure will likely go unused.
2	The measure is anticipated to resolve an operational or safety issue at the school, but a minor one (at this school) in terms of the number of students who will benefit from the change.
3	A moderate number of students at the school will benefit from this measure being in place.
4	A majority of students at the school will benefit from this measure being implemented (greater than 50 percent of the student body).
5	All students at the school, and potentially the general public in the area, will benefit from this measure being implemented.

Use **Table 5** to evaluate degree of **need**. Higher rankings mean a greater need, so a high score here means the measure is potentially more important from a transportation point of view, and should be higher priority.

Table 5: Evaluating Need

1	Measure is not required.
2	The measure will resolve an operational or safety issue at the school, but a minor one when compared to other transportation issues.
3	The measure will address an operational or safety issue.
4	The measure will address an operational or safety issue that has already resulted in complaints.
5	The measure is considered essential to correct an operational or safety issue where incidents have occurred in the past.

Use **Table 6** to assist in evaluating **resistance**. For resistance, higher values represent greater anticipated opposition. A low score here is better than a high score. Particularly for this measure, your transportation authority (or a firm working with your school) may have insight into how to score a measure.

Table 6: Evaluating Resistance

1	This measure will be seen as beneficial to essentially all with few if any negative impacts. This measure is a common practice in the area and has been implemented successfully elsewhere.
2	The majority of users will benefit from the measure, but a small number of residents in the area may be negatively impacted by the measure.
3	Some negative response anticipated from the local community.
4	This measure will impact the local community significantly in such a way that large numbers of residents will raise complaints related to the measure. Current transportation operation will be significantly modified.
5	Significant opposition anticipated from the public, including political opposition to the concept. Measure is uncommon in the area, there is little experience with implementing this type of measure, or it has not worked elsewhere.

The following pages include matrices that can be used by school teams in the prioritization process and a full example of how to complete the process is included in **Appendix 6**.

Measure Description: _____

Degree of Impact Higher impact ↑	5					
	4					
	3					
	2					
	1					
		1	2	3	4	5
Degree of Need Higher Need →						

Number of students anticipated to benefit from the measure _____

Degree of Impact Higher impact ↑	5					
	4					
	3					
	2					
	1					
		1	2	3	4	5
Degree of Resistance Higher Resistance →						

For the Approval Authority

The transportation and school authority should review the prioritization provided in the STIR, but consider performing their own rankings to double-check the assertions made.

If more than one school is competing for improvements, then the ratings will have to be compared against one another. Particularly for the impact rankings, it may be that one school's rankings may have to be adjusted when compared to another school's because of the number of students at each school. One school's high number of students may be low when compared with a moderate number of students at a much larger school.

STEP 5: COMPLETING THE STIR

Gather the information compiled by the team in the previous steps and insert it into the STIR document. The report should include the following sections:

1. Introduction

This explains to a reader what the purpose of the document is, describes the school's location and its surrounding neighbourhood, and provides background information on the number of students, number of staff and other details on the nature of the school.

2. Site Plan

A diagram/map showing detailed information about the school site and the surrounding transportation network.

3. Summary of Existing Conditions

This section identifies the transportation issues at and nearby the school (on-site and off-site issues) and provides data that describes the nature of these issues using maps, written descriptions, photos, graphs, etc.

4. Identification of Potential Improvement Measures

This section describes an appropriate measure (or measures) to address each issue (or issues). Issues are identified and described, including the ramifications of implementing the measures.

5. Prioritization/Cost Estimates

Prioritization and cost estimate processes are described in the previous chapter. As noted, the cost estimation may be very simple and short.

6. Conclusions/Recommendations

This should be a brief (one to two pages) section outlining the major points from Sections 3 to 5.

7. Appendices of Data

Where data is quite lengthy or requires multiple pages, it is best to include it as an Appendix and provide references to the data in the report itself.

STEP 6: REVIEW BY AUTHORITIES

This is where the process separates into two streams, according to either off-site or on-site improvements. If recommended measures are off-site, there is a need to focus on obtaining the approval of the local transportation authority. If the recommended measures are on-site, approval by the school authority is needed and further notification to the transportation authority for information may be necessary. If the recommendations are a combination of on- and off-site measures, approval by both authorities is needed.

Off-Site Improvements

Review with Traffic Authority and School Division/Board

The school board or division should have the opportunity to review the STIR document before it is provided to the transportation authority, to ensure they are familiar with the existing conditions and understand and support what is being requested.

Once the school authority has reviewed the document, the document should be forwarded to the local transportation authority for review. By this time, the school team should have already met with the transportation authority to ensure that they are aware that a school is investigating transportation issues.

Review by the Transportation Authority

The transportation authority may require that changes be made to comply with local policies or recognized best practices, or because they are looking for more details or see issues with the proposed improvements. Additional information or discussion may be needed.

As noted in Step 4, limited budget may mean not all of the improvements listed in a STIR can be implemented at once. A transportation authority may have limited resources and multiple schools wishing to make improvements. Thus, certain improvements may be approved incrementally. A transportation authority may also prioritize improvements differently than a school STIR team does.

Certain improvements, such as new crosswalks or signals or proposed changes to speed limits, may require the transportation authority to conduct additional analysis. Simpler improvements can often be reviewed, approved, and implemented more quickly. More complex projects, or those with higher capital budgets, may need multiple stakeholders to review them, further extending the time before installation can occur.

At the end of the review, the recommendations regarding improvements will either be approved or rejected, or an alternative may be suggested for consideration. The authority should provide a detailed response, indicating why the decision was made.

During this process, the transportation authority may seek public input from the community, possibly through an "open house" type of event. This will help gauge public reaction, and is particularly important if the measure causes significant disruption to the existing road network.

If capital budget allocation is needed for a project, the project may be delayed by at least one year, as budgets for new projects are done on an annual basis. If there are no resources available, it may need to wait for the next budget cycle. Costly or complex projects may need to be staged over many years. Lower cost measures typically can be implemented more quickly, whereas more complex measures take longer to implement.

Design plans, a work plan/schedule and preliminary budget(s) will need to be prepared for physical improvements, and the time to construct the improvements has to be incorporated into a construction schedule. Sometimes, other area construction projects may need to be done before school improvements, to ensure work is done in a logical way that saves money and reduces the need to repeat efforts.

On-Site Improvements

Review STIR with School Authority and Traffic Authority

The school authority should have the opportunity to review the STIR document before it is released to the transportation authority. This will ensure they are familiar with the existing conditions and understand and support what is being requested. By this time, the school team should have already met with the transportation authority, to ensure they are aware that a school is investigating these issues.

On-site changes, specifically policy changes (such as the hiring of new crossing guards, new rules related to dismissal, or rules related to which doors should be used, etc.), should still be provided to the transportation authority for information, even if a physical change to the school's transportation network is not proposed.

Types of improvements that a traffic authority generally would comment upon, most of which also require detailed construction drawings to be prepared, include::

- Parking lot changes
- Pathways/sidewalks
- Changes to driveways/street accesses
- Constructing a bus loop

- Changes to loading areas
- Right-of-way or drainage alterations
- Changes to illumination, signs, or other traffic control devices

Since on-site measures are somewhat less of a concern to transportation authorities than external changes that impact the transportation network, the response from the transportation authority may be relatively quick. The main purpose of the review is to ensure that nothing is being proposed that is counter to any standards or bylaws in place (such as design requirements for parking lots or loading areas) or that will cause operational problems on the street network that the team may not have considered.

STEP 7: IMPLEMENTATION AND FOLLOW UP

Once the measures are approved, they can be implemented.

If possible, construction should be scheduled to take place during the summer. This will minimize disruption to school activities and lessen the potential for students to be around an active construction site. If having students around is unavoidable, potential risks associated with the construction site must be mitigated. Keep in mind that a construction site may be an attractive, but dangerous place for curious students.

As noted earlier, many off-site measures will take longer to implement because they may need additional analysis, require funding approval, before being scheduled for construction (programmed into an upcoming capital program). Small scale improvements on the school property may take less time, particularly if they are policy changes.

Minor improvements, which are not disruptive to the operation of the school (such as sign replacement), could be implemented at any time during the school year. Measures related to school processes that are not physical in nature could be implemented at any time, but might be best initiated at clear breaks in the school year in order to minimize confusion in changing from one way of doing things to another.

Certain measures, such as the implementation of hard enforcement using police, might be done without fanfare (ex: a stealth approach would be most effective). Other measures would benefit from being combined with education/awareness measures, such as press releases, so they are obvious when in place.

Once in place, the change to how the school operates would have to be integrated into the schools' TMP and communicated to all students, staff, parents/guardians, school bus operators, delivery people, and visitors to the school.

Post-Implementation Monitoring

In general, no matter the type of the measure (large or small, on-site or off-site), it is recommended that it be monitored and data be collected in order to compare **before and after conditions**. It is important to collect data before and after a change is made. This is useful to other schools that may start this work in the future. It also will be useful to the local transportation authority to know the effectiveness of such measures at a school and any possible effects that reach into the neighbourhood.

Some measures may take time (possibly several months) to become “established” as more users become familiar with the changes. A follow-up study might include:

- Did the improvement encourage students to cross at the new crosswalk?
- Has parking enforcement resulted in fewer vehicles parking where they should not?
- Are more students walking or cycling to school, reducing the number of cars dropping off or picking up students?
- Did changing a school bus loading zone location improve safety for private vehicle pick-up/drop-offs?

Working with Other Schools

With your STIR completed and the improvements in place, other schools or the local transportation authority may approach your team seeking information on what went well or what they can learn from your experience. This sharing of information is encouraged; it can only help schools to learn from each other.

REFERENCES

Active Modes

<http://kidsonthemove.ca/uploads/Rural%20Guidelines%20v3%20SR.pdf> (considerations for children's travel in rural areas)

Kids on the Move: Child- and Youth-Friendly Land-Use and Transportation Planning Guidelines
http://www.walk21.com/papers/Jackie_Avent_et_al.pdf

Active and Safe Routes to School in Manitoba Program Guide and Handbook:
<http://greenactioncentre.ca/content/asrts-handbook-and-resource-guide/>

Bicycle Parking

City of Calgary Bicycle Parking Guidelines
http://www.calgary.ca/Transportation/TP/Documents/cycling/bike_parking_2008_order.pdf

Velo Quebec : How-to Guide Bicycle Parking
http://www.velo.qc.ca/files/file/OVB/Parking_guide.pdf

Crossing Guards

http://guide.saferoutesinfo.org/crossing_guard/pdf/crossing_guard_guidelines_web.pdf

http://www.th.gov.bc.ca/publications/eng_publications/Ped_X_Manual/1358-ch7.pdf

Crosswalks

NCHRP 562: Improving Pedestrian Safety at Unsignalized Crossings
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf

TAC Pedestrian Crossing Control Guide (Second Edition), available at:

<https://onlineservices.tac-atc.ca/English/bookstore/products.cfm?catid=12&subcatid=21&prodid=74>

Crosswalk Condition Audit

Star Rating of School Walking Routes
<http://www.monash.edu.au/miri/research/reports/muarc275.html>

Loading Protocol for On-site Private Vehicles

<http://www.cleanaircarolina.org/wp-content/uploads/2010/09/CAC-Best-Practices-Guide.pdf>

PACE Car Program

<http://saferoutesns.ca/index.php/special/pacecar/>

School Bus Policy

<http://www.brandonsd.mb.ca/Transportation/pdf/StudentConductBrochure.pdf>

http://www.mnasbo.org/UserFiles/Institute_Docs/MASBO_Institute10_Handout2_Wosika_Vandervall.pdf

School Zones

TAC School and Playground Areas and Zones: Guidelines for Application and Implementation (2006)

School Travel Planning

Green Action Centre: www.greenactioncentre.ca

Green Communities Canada: www.saferoutestoschool.ca

Signage

MUTCDC - Manual of Uniform Traffic Control Devices for Canada, available at <https://vws3.primus.ca/dev.tac-atc.ca/english/bookstore/products.cfm?catid=12&subcatid=21&subcat=0>

Organizing, Managing a Grassroots Team

Dobson, Charles. 2003. The Troublemaker's Teaparty: A Manual for Effective Citizen Action. Gabriola Island, BC: New Society Publishers.

Prioritizing Improvements

Medina, Velasco, Díaz. Simplified Methodology for the Evaluation of Pedestrian Safety in School Zones. ITE Journal, 2010.

Radar/Speedwatch Programs

http://www.mpi.mb.ca/english/rd_safety/Speeding/s_programs.html

<http://www.chilliwack.com/main/page.cfm?id=1364>

Traffic Calming

http://www.tc.gc.ca/media/documents/programs/cs35e_trafficcalming.pdf

<http://www.vtpi.org/tdm/tdm4.htm>

<http://trafficcalming.org/>

Engwicht, David. 1999. Street Reclaiming: Creating Livable Streets and Vibrant Communities. Gabriola Island, BC: New Society Publishers.

Pedestrian Facilities Users Guide: Providing Safety and Mobility. USDOT. FHWA-RD-01-102, March 2002.

Walking School Buses and Bike Trains

http://guide.saferoutesinfo.org/walking_school_bus/index.cfm

<http://www.atlantabike.org/sites/default/files/Guidelines%20for%20WaRtS%20Bike%20Trains.pdf>

APPENDIX 1: EXAMPLE SURVEY FORMS



School Travel Planning Classroom Survey Process

<Insert date>

<Insert principal name>

<Insert school name>

<Insert address>

<Insert city, prov, pcode>

Dear <insert principal name>:

Enclosed you will find the student surveys that are to be completed by every class at your school over one full week: <insert recommended dates>.

I will handle the data entry, tabulation and analysis of the student surveys personally, so please [notify me when the surveys are complete and I will come and pick them up OR please courier/mail completed surveys to me OR (if you know school will not allow surveys to leave the building) notify me when the surveys are complete and I will come to the school to tabulate and analyze them].

Of course, if you are interested in using these surveys as a learning opportunity for your students, simply keep copies of the surveys for the students to tabulate and analyze. For example, some schools have senior students calculate school-wide averages and percentages, graph those results and then perform comparisons between classes. They may then display these graphics in the school as an engagement strategy to stimulate project interest.

If you have any questions, please call or email me.

Sincerely,

<Insert STP Facilitator Name>

<Insert STP Facilitator Contact Info>



School Travel Planning

Classroom Survey

<school name>

Please complete this survey, using hands-up, for the week of: < Day/Month to Day/Month of Year >

Grade: _____ Room/Class #: _____ # Students: _____

Teacher: _____ Dates: Mon. _____ to Fri. _____

Ask students: “How did you travel to school this morning?”

	Weather	Walked	Walked part-way*	Bicycle	School Bus	Public Transit	Carpool (2 or more families)	Car (Just my family)	Other?	Total
Mon	Example: Rainy/6C									
Tues										
Wed										
Thurs										
Fri										
Total										
Daily Avg=Total/5										

*Walked at least one entire block.

Ask students: “How will you travel from school today?”

	Weather	Walked	Walked part-way*	Bicycle	School Bus	Public Transit	Carpool (2 or more families)	Car (Just my family)	Other?	Total
Mon	Example: Sunny/25C									
Tues										
Wed										
Thurs										
Fri										
Total										
Daily Avg=Total/5										

*Walked at least one entire block.



School Travel Planning *Baseline Family Survey*

Edit as necessary and print on school's letterhead.

<insert date>

Dear Parent:

<School Name> is taking part in a School Travel Planning project that will help more students walk, cycle or otherwise use active transportation for the school journey wherever possible.

The benefits of more students making the school journey on foot include:

- Increased safety
- Improved health
- Arriving alert and ready to learn
- Less stress, greater happiness
- Less pollution
- Reduced traffic congestion at and around the school

Through School Travel Planning, concerned parents, teachers and I will work with municipal, school district and public health officials to deal with the issues that stop our students from using active transportation.

Every single family's input is important to the success of this project. When we know what school travel choices you're making and why you're making them, we can create a travel plan that considers the needs of all our students. Please take 8 to 10 minutes with your eldest child who attends this school to complete the <survey online at link and the attached map OR the attached survey and return it by date>.

If you have any questions about the survey or the School Travel Planning project, please contact: <facilitator name> at <email or phone>.

Thank you,

<Principal name>

To protect your privacy this survey does not require you to provide your name. Any mapping information will be used to identify obstacles along main routes. *All information will be kept strictly confidential.*



School Travel Planning Baseline Family Survey

<Insert school name>

Please include the date (month/day/year) that you filled this survey out (e.g. October/1/2012): _____/_____/_____

Please answer the questions thinking about your **eldest** child attending this school. If more than one child brings a survey home, please **complete one only**.

1a. How does your child usually get to and from school? (Choose **one** in each column. If he/she uses two, e.g. *walking* and *bus*, choose the one he/she spends the most **time** doing.)

	TO school from home	FROM school to home or after-school program
Walk	<input type="checkbox"/>	<input type="checkbox"/>
Walk part-way (at least one entire block)	<input type="checkbox"/>	<input type="checkbox"/>
Bicycle	<input type="checkbox"/>	<input type="checkbox"/>
School bus	<input type="checkbox"/>	<input type="checkbox"/>
Public transit (bus, subway, streetcar)	<input type="checkbox"/>	<input type="checkbox"/>
Carpool (2 or more families)	<input type="checkbox"/>	<input type="checkbox"/>
Car (just your family)	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

If Other (explain) _____

1b. **If your child takes the school bus or public transit**, how many minutes does he/she walk each day (i.e. to get to and from the stop)?

Number of minutes: _____

1c. Was the travel FROM school to an after-school program?

Yes No

2a. Do you usually accompany your child to school?

Yes No

2b. If yes, how do you usually feel on the trip to school? (Please circle **one** word).

- | | |
|-----------|---------------------------|
| • Relaxed | • Frustrated |
| • Rushed | • Other (please describe) |
| • Happy | _____ |

3a. What is the age and sex of the child you are answering this survey for?

Age: _____ sex: Boy Girl

3b. How many of your children go to this school? _____

4. How far away from the school do you live? If you are not sure, check Google Maps (<https://maps.google.ca/>)

If you are unfamiliar with Google Maps, instructions can be found at: http://bit.ly/qmaps_instructions.

Less than 0.5 km 0.51 to 1.59 km 1.6 to 3 km Over 3 km

MAPPING EXERCISE: FOR PARENTS & STUDENTS TO ANSWER AS A FAMILY

5a) Please complete the following map. If you usually drive your child to school, mark the route that you/your child would take if walking (or biking), not the route that you drive to school. **If possible, please complete the map while walking with your child to school.** Identify any locations that are of concern to you with a number (e.g. 1, 2, 3) and describe these in the table below.

school

5b) Describe any areas of concern in this table.

Location (e.g. nearest intersection)	What do you think is unsafe in this area?
E.g. on ___Rd near ___St	E.g. Cars turn right without looking for pedestrians.
1.	
2.	
3.	

6. Our neighbourhood is safe for children to walk to and from school. (Please circle one answer).

STRONGLY AGREE

AGREE

DISAGREE

STRONGLY DISAGREE

If your child is usually driven to or from school, please complete questions 7-9. If not, please skip to question 10.

7. What are the main reasons your child is **usually** driven to/from school?

(Choose up to three).

Distance from home too far

Convenience/time pressures

Traffic danger

Personal safety issues (e.g. bullying, stranger danger, etc.)

I'm on my way somewhere else (e.g. to work)

Weather

Other (explain) _____

8. I would allow my child to **walk** to school if... (choose up to three)

He or she did not walk alone

There was a safer or improved walking route

There were reduced traffic dangers

He or she were older

He or she did not live so far from school

Other (explain) _____

9. I would allow my child to **cycle** to school if... (choose up to three)

He or she did not cycle alone

There was a safer or improved cycling route

There were reduced traffic dangers

He or she were older

He or she did not live so far from school

He or she received bicycle safety training

He or she could lock the bicycle in a safe place

Other (explain) _____

Everyone continue at question 10 below.

10. **The next question is for the ELDEST child at this school. Please ask your child the following question:** What feeling do you have most of the time when you are travelling to school and from school? Please only circle **one** word in each column.

a) Trip TO school:

• Relaxed

• Rushed

• Happy

• Tired

b) Trip FROM school:

• Relaxed

• Rushed

• Happy

• Tired

11. Please share any further comments about your child's journey to and from school.

12. Do you support ongoing School Travel Planning efforts to make the school area safer, healthier and better connected to the community, by focusing on ways to reduce the number of children travelling to and from school by car?

YES

NO

13. If you would like to help with School Travel Planning efforts at your school (for example on the School Travel Planning Committee or helping put STP plan ideas into action), please contact **<insert school committee member or STP Facilitator contact info>** or provide your name, telephone number and email below:

THANK YOU FOR YOUR TIME. PLEASE HAVE THIS SURVEY COMPLETED ONLINE OR RETURNED TO SCHOOL BY **<insert deadline>.**



School Travel Planning

Walkabout Instruction and Checklist

Walkabout Timing

The Walkabout will be conducted either at the same time as the baseline surveying takes place or immediately after, but NOT before. The time of day for the Walkabout will be determined by the school but should coincide with either drop-off or pick-up time at the school.

The Walkabout process includes both a walking tour of the neighbourhood and a debriefing session indoors immediately following the tour. The debriefing session will include discussion of solutions that can be part of the Action Plan. It will take approximately 2.5 hours for the whole process.

An optional second walkabout could be done later in the STP process to review the walking routes as collected on maps during baseline surveying.

Who Needs to Participate?

It is ideal that the following people participate:

- Municipal transportation engineering/planning.
- Police or bylaw services.
- Municipal council, i.e. Councillor.
- Public Health professionals.
- School board/district.
- Parents.
- School staff.

The Walkabout is a valuable learning opportunity and those who participate will be in the best position to contribute constructively to Action Plan development.

Student Walkabout - optional

Some Facilitators choose to do an additional walkabout with **older students (typically grade 5 or older)**. This can be a simplified version where the students do not leave the school grounds or the full version in which case parental permission would be needed for a “field trip” to explore the neighbourhood. The benefits of a student walkabout are: (1) students are able to provide their input to a process that directly impacts them, creating positive feelings about the process, i.e. their ideas and input are valued; and (2) the input of the students enhances the data collected, i.e. they have a unique perspective that is important to consider. Sometimes what a child views as a barrier would not be noticed by adults.

Stakeholder Busabout - optional

Some communities have also taken a ‘Busabout’ in a school district bus, to reach known issues on routes to school too far to walk to within the timeframe (participants dismount from the bus for mini-walkabouts in each area). The school district transportation manager may be able to arrange this.

How to organize a Walkabout

The STP Facilitator will take the lead to organize the Walkabout.

Well in advance of the Walkabout:

- Set the date and time. Because municipal politicians have very busy schedules, approach them first and choose a date/time based on their availability—experience shows that a better response is likely if the invitation comes directly from the school. (Getting a municipal politician to attend the Walkabout is a must as his/her presence increases the profile of the STP project and builds political support at the beginning of the process.)
- Circulate notifications to all stakeholders. An email announcement sample is below.
- Track RSVPs.
- Identify the route and key areas to highlight based on input from the school, as they know the neighbourhood well and will identify ‘hot spots.’ Baseline Family Survey input is helpful too; as is input from the transportation department, police or bylaw officers and the local municipal councillor.
- If there are issues pertaining to school bussing and the bus routes, the school board may also have some input.
- Arrange meeting space (i.e. school library or meeting room) and, if able, provide refreshments for the discussion period. Assign a person to be responsible for the space and the refreshments.
- Coordinate the creation of a map to use during the Walkabout.
- Have copied the materials that will be used during the Walkabout, including a map with key issues highlighted and a checklist (see below).
- Coach the principal and any other stakeholders that will be sharing introductory information at the beginning of the Walkabout, e.g. helping them summarize issues and traffic/injury data

Things to do on the day of the Walkabout:

- Consider providing clipboards and pencils for participants to use on the walk to record their own notes for the discussion following the Walkabout. (Other stakeholders may have a supply of clipboards you can use).
- Bring a copy of the Action Plan section of the School Travel Plan to the Walkabout debriefing.
- Be sure to record decisions for actions.
- Ensure refreshments are in place in your debriefing room prior to the Walkabout.

How to Lead a Walkabout

1. Start by having the principal or parent representative give the group an overview of the traffic and safety issues they face each day. Have municipal staff update the group on any relevant historical data, e.g. recent traffic counts, what has been tried in the past, etc.
2. Have stakeholders introduce themselves very briefly.
3. Mention that the STP Facilitator will take minutes of the discussion but encourage all attendees to take notes of their own observations to help with the discussion later.
4. Allow adequate time to observe the drop-off or pick-up activity and split the group up to cover different areas around the school where this is necessary.
5. Conduct the walking tour of the neighbourhood. Be sure to take photographs of the key areas of concern (and inspirations!) you see along the way. This is important for documenting the issues and will provide helpful illustrations to use in the School Travel Plan.
6. Return to the school for discussion.
7. Start the Action Plan.

Walkabout follow-up

1. Remember to type up and distribute minutes/photos from the Walkabout in a timely manner.
2. Record action items in the minutes.
3. Add actions agreed upon, and the person tasked with their undertaking, to the Action Plan section of the School Travel Plan.
4. Write a summary, detailing key points of the Walkabout, in the School Travel Plan document, and provide that section to stakeholders who may request it.

The Walkability Checklist

At the School Site

Parking lot, or on road parking at school

- Is there potential for vehicle and pedestrian conflict?
- Is traffic flow clearly signed? (on ground and on signs)
- What is the parking and driving behaviour of driving parents and staff?
- How do children access the school from parked vehicle? (do they use a crosswalk, is one available?)
- Is there parking lot supervision?

Facilities for walkers on the street next to the school site

- Number and position of safety patrollers, adult and/or student, if any. If they are not currently organized, are they needed?
- What are the sight distances from school crossing to road curves, blind corners, or school and transit bus zones?
- How is the placement of the school crossing in relation to driveways and bus loading zones?
- Are there sidewalks?

Walking paths to the school

- Where are the access points for students?
- Is there potential conflict with vehicles?
- Is the lighting adequate along walkways?
- What is the maintenance of walkways, i.e. snow and ice removal; mud, puddles; holes needing filling?
- Can routes from backfields, adjacent parks, be used year-round?

Bicycle facilities

- Bike racks: do they exist? Are they secure, sheltered?
- Is there potential for conflict with vehicles to access the bike storage area?

School Bus/After School Care Loading Zone

- Where do students wait for busses, and for how long? What type of supervision is employed?
- How many busses, vans and special needs transportation vans/busses access the school?
- Are there ramps, any special entrances or accommodations for differently-abled students?

Further items to look for

- Emergency vehicle access
- Location of garbage dumpsters and other school maintenance equipment
- No-idling signage
- For waiting students and families:
 - Shelter from inclement weather/shade
 - Play area
 - Natural landscape

The Walkability Checklist continued

In Areas Surrounding School Site

Walking facilities and traffic observations

- How far do sidewalks extend around the school and into the surrounding community?
- What is the type, volume, speed, noise and pollution of traffic on surrounding streets—perceived and real (the municipality might have volume and speed counts).
- Are there heavy trucks? Are there problem areas where a heavy truck might mount the sidewalk to turn at an intersection?
- Are there on-street signs that indicate to drivers they are approaching a school zone? Are they visible?
- Timing of traffic lights? Do they allow enough time for small children to cross safely?

Alternative safe parking locations

- Is there an area away from the school to suggest for distant driving families to safely park to take part in a walk-a-block-or-two scheme?

Bicycle facilities

- Are bike paths or lanes suitable for families?
- Are best cycle routes identified?

Non-traffic related items to consider

- Types of buildings surrounding school: residential, recreational, commercial, industrial
- Location of other public spaces near school: parks, community centres, libraries, churches
- Number of shade trees on streets
- Green space vs. concrete space
- Graffiti on buildings
- Physical state of the sidewalks
- Size of the sidewalks
- Garbage along the routes to school
- Obstructions on the sidewalks
- Block Parent or Neighbourhood Watch community—if so, where are Block Parents located?
- Potential or known areas where crime, bullying, loitering or intimidation is possible

Sample Email Announcement

The sample email below can be used to notify committee members of the Walkabout (after the school has confirmed the date/time with the municipal councillor). Have the school send out this information to the police and elected representatives, as experience shows this to be more effective. STP Facilitators can contact the other stakeholders. (Another option is to extend invitations by phone.) You may wish to send the map and plan for the Walkabout along with this invitation, if it is ready in time. Alternatively, the route can be discussed with stakeholders upon arrival for the Walkabout.

SUBJECT: Notification of Walkabout for <insert school name>

Dear <insert committee member name>:

One of the most important steps in the School Travel Planning process is participating in a Walkabout. Participating in this step will provide a critical opportunity for you to learn first-hand about the travel issues being faced by students and their families. Direct observation of the common school routes and key areas of concern will help you prepare for participating in the development of the Action Plan.

When?

The Walkabout for <insert school name> has been scheduled for <insert date and start & approx. end time>.

What to Expect?

The group will meet <insert starting point, e.g. by the main office inside the school> then walk a predetermined route through the neighbourhood around the school that will highlight areas of concern. The walking tour will be followed by a debriefing session where the group will discuss the issues they've just seen and set some short and long-term goals to address them. The debriefing session will be held in <insert location, e.g. the library>, where refreshments will be served.

RSVP

Please RSVP to <insert STP Facilitator email address> by <insert deadline>. If you are unable to attend personally, please try to arrange for a colleague to participate in your place.

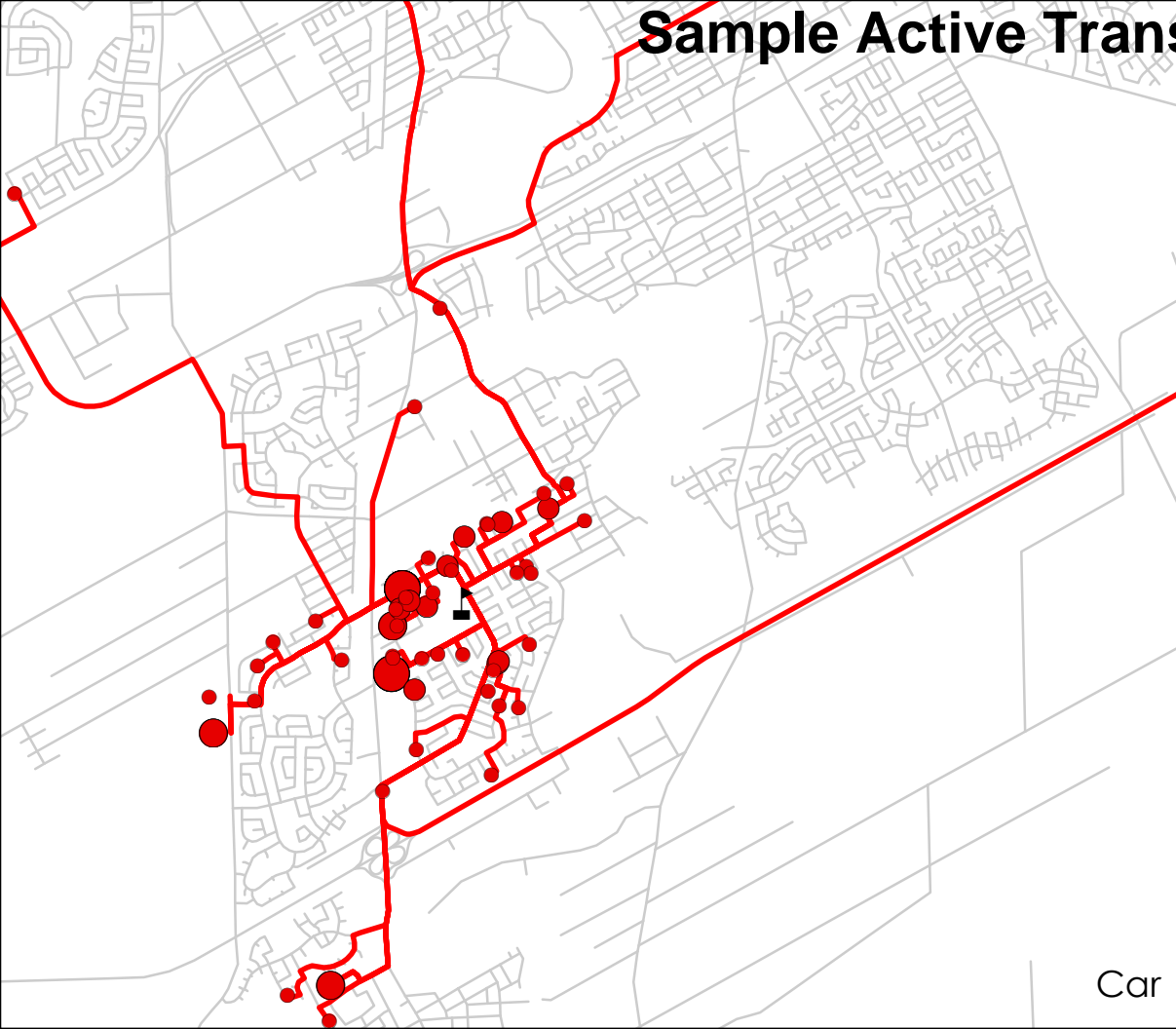
Sample Active Transportation Route Maps

Friday, June 15, 2012

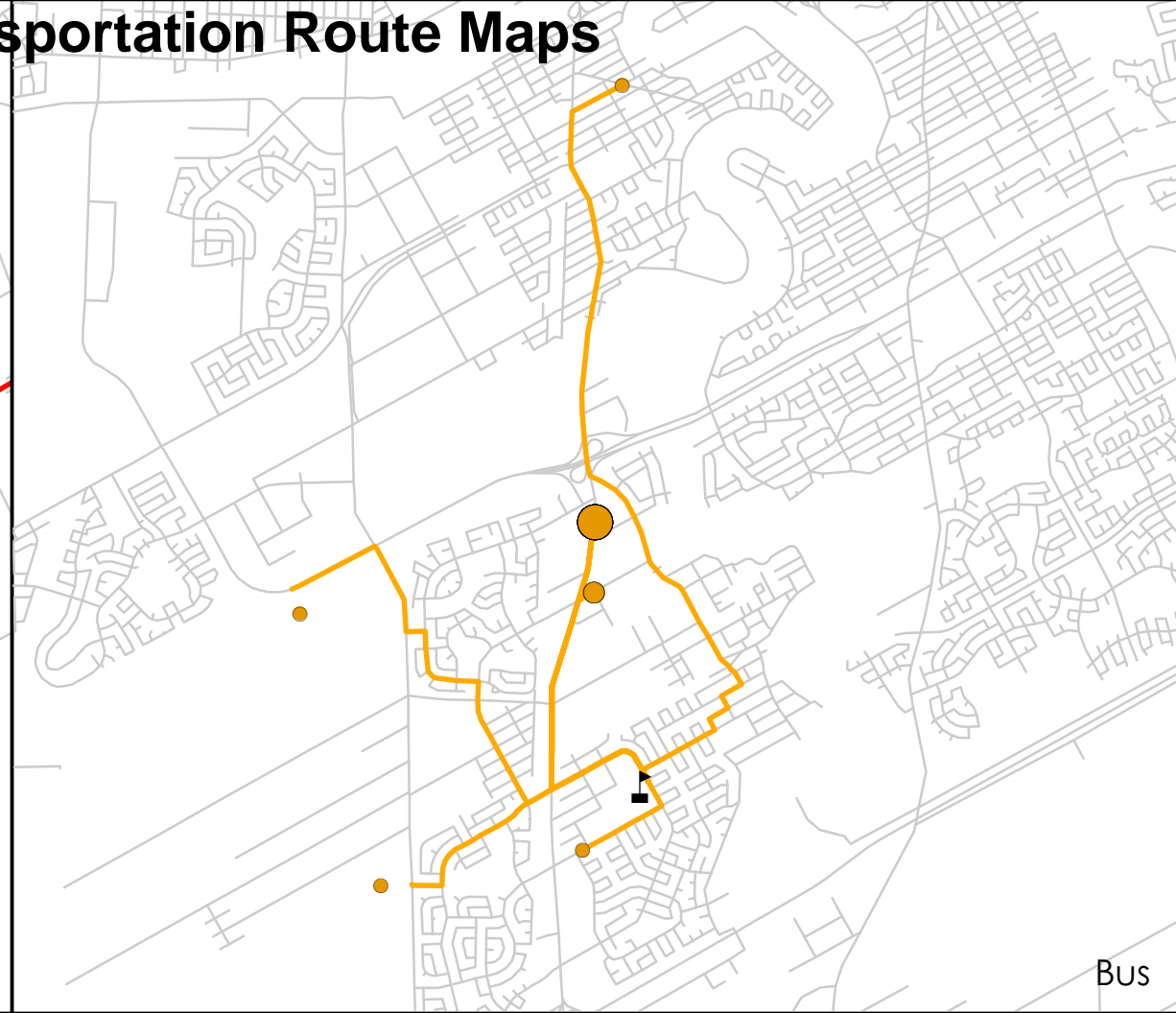
Number of Students at Origin:

- 1
- 2
- 3
- 4 - 6
- 7 - 9
- 9 - 12

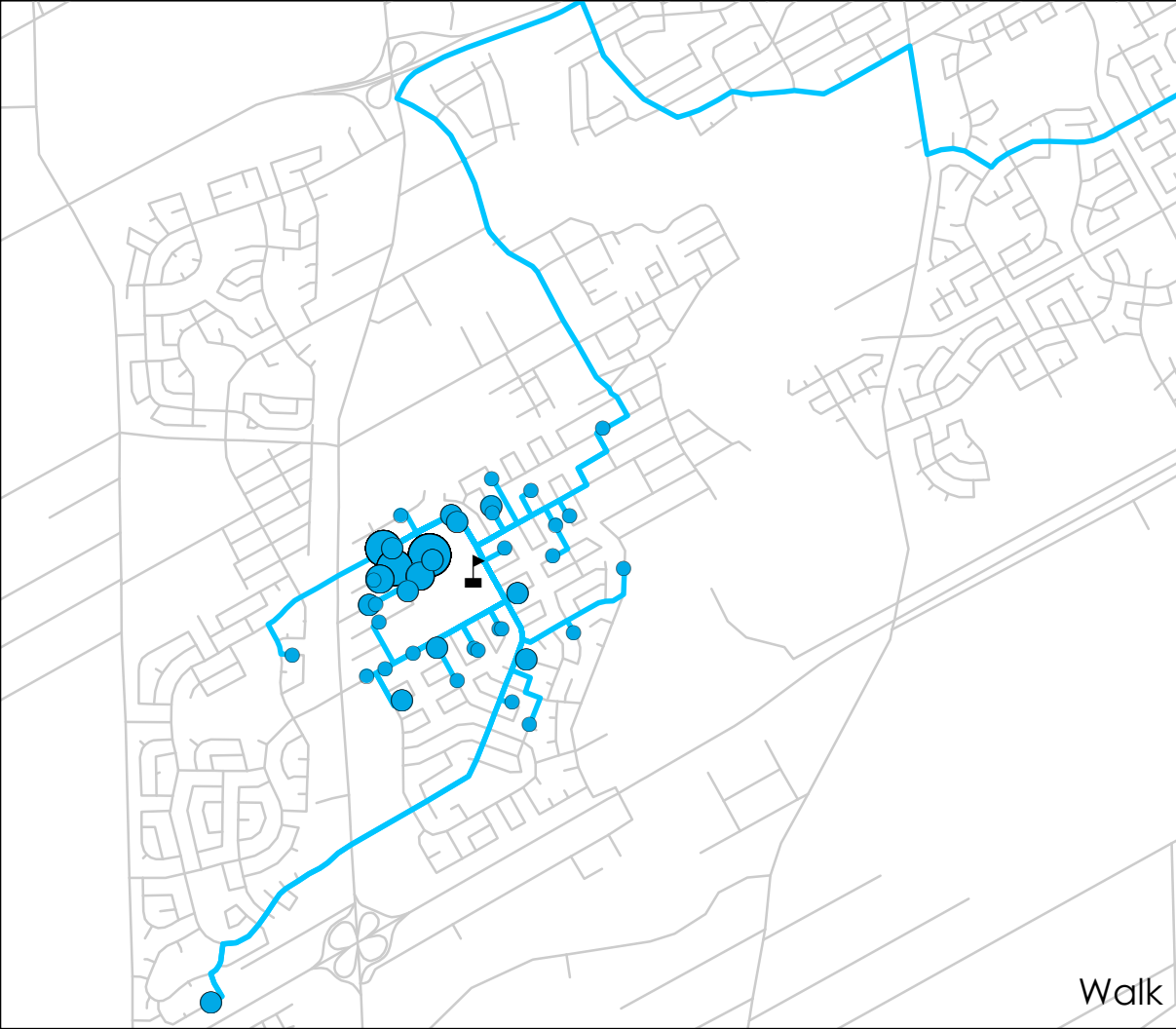
Location of School



Car



Bus



Walk



Bike/ Skate

APPENDIX 2: EXAMPLE INFORMATION FROM A SCHOOL

This appendix provides examples of the types of material that might be generated from data collected by individual data collectors at a school. Although adults completed this work¹⁴, students working under the supervision of adults would be able to generate similar data.

PM Site Observations & Commentary

The map that appears below in this section shows site observations of activity taking place during the weekday p.m. period at a school in Winnipeg. As part of an actual STIR, such a map would also be created for the weekday a.m. period.

The work of several data collectors was combined to create this map, showing when students are crossing the streets nearest to the school, and on-street locations where parents are picking up students in private vehicles (the main lot where this occurs is not mapped here; this was done separately for this school). Other information, such as the number of students picked up by public transit and the times when school patrols were active, was also recorded and incorporated into this map.

At this school, the data shows that most activity takes place within a 15-minute window between 3:15 and 3:30 p.m.

On the west side of the school, there are few issues related to parking or crossing the street. Although an observation was made of a crossing at a midblock location, most students crossed where the school patrol was located.

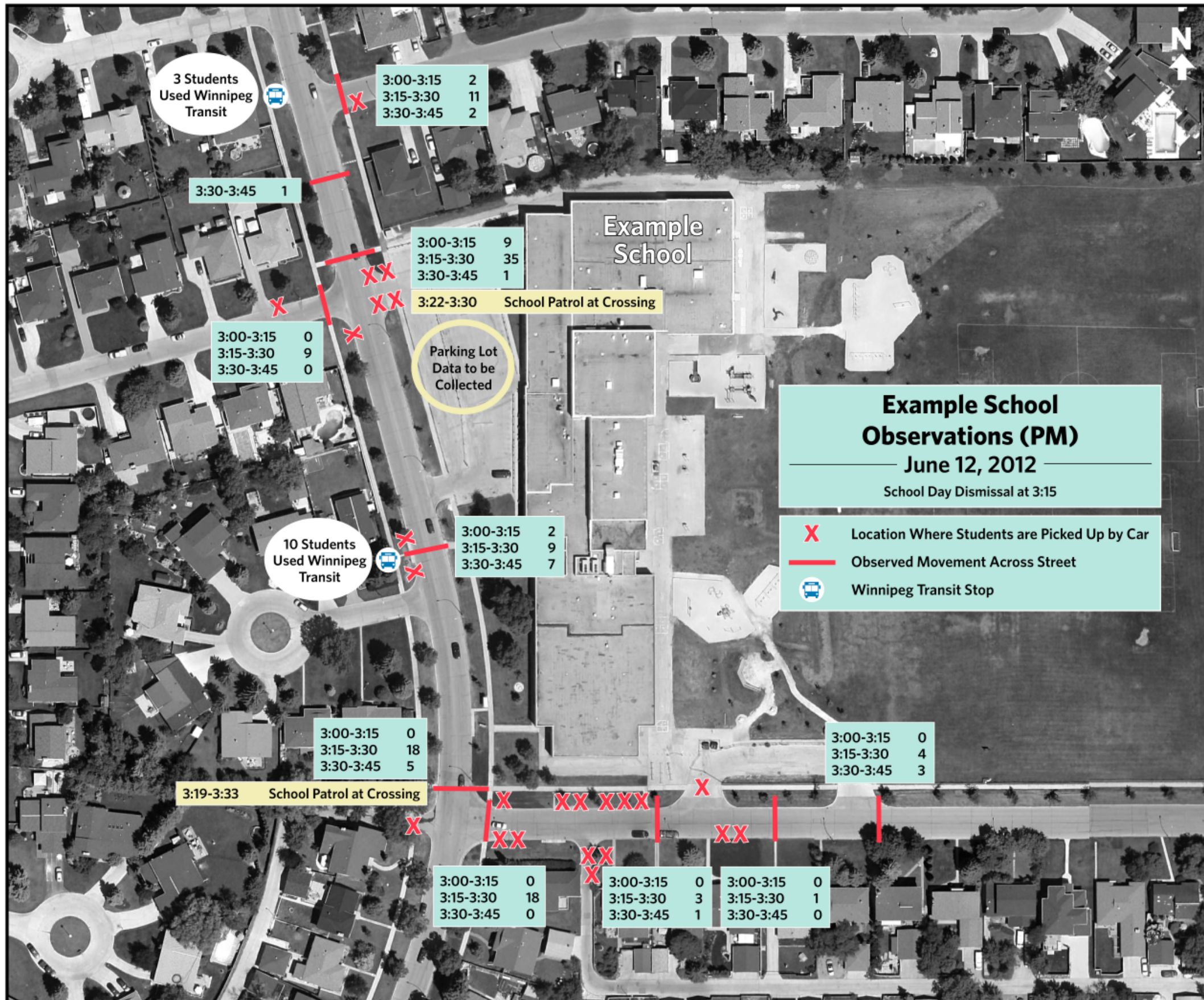
Although there is a parking lot area designated for pick-up/drop-off, it is observed that students are being picked up outside of this area on the residential streets to the west and south of the school, and at other locations on adjacent residential streets. The most common location is south of the school. In this area, there is some disorder in that crossing is happening midblock and without the assistance of school patrols, with some students running across the street.

Even though only a small number of students are doing this, it is the sort of issue that a STIR should document and try to resolve. Is there anything that can be done to make the loading and street crossing activity here safer? Can anything be done to encourage the use of the

¹⁴ Three MMM staff (one engineering staff member, a summer engineering student intern, and a staff member from a non-engineering group) acted as “test” data collectors at a Winnipeg school, following the instructions that students might be expected to follow.

parking area for this loading? Can there be a school patrol member dedicated to assisting with crossing, where the loading is taking place on-street?

Also, note there are still students crossing the street throughout the area around the school after the school patrol is finished for the day. This could be investigated further – is it reasonable to increase the length of time the patrol is active? Could students be encouraged to leave the school more expeditiously and not linger?



Parking Lot Data Collection

The data provided below is a record of activity taking place in the example school's loading area during the weekday p.m., end-of-day time in June 2012.

The data recorded included the number of vehicles parked, the number of vehicles actively loading, and the number of people (students and parents) walking in the parking area each minute.

An MMM Group staff member took on the role of data collector, sitting in a car parked at one end of the lot (in a row of spaces for longer-term parking in this lot) and collected data each minute from 3:00 to 3:45 p.m. The paper version of the data sheet was then manually entered into an Excel spreadsheet, which appears on the following page.

Parking Observations

The number of parked cars waiting, the number of cars actively loading, and the number of pedestrians (adults and students) in the parking lot area each minute, was plotted.

- The number of pedestrians within the lot is relatively low, apart from the time when a school bus was loading in this area. Had the number of pedestrians been higher, this might have indicated a potential conflict between pedestrians and vehicles to resolve.
- From 3:05 to 3:29 p.m., there were at least 10 vehicles in the lot at any point.
- The number of parked vehicles (with parents waiting for students to arrive) at any point is much higher than the number of vehicles actually loading.
- The lot begins to fill ahead of the actual dismissal time for school. At 3:15 p.m., when school ends, there were 17 vehicles in the lot.

There were some problematic practices taking place which were recorded, such as parents using the staff parking lot (which is signed to prohibit this practice) and loading taking place in the driveways (which causes queues onto the street or blocks the sidewalk). Having an adult lot supervisor (a staff member or parent volunteer) would be recommended (soft enforcement). In addition, educating parents and students on lot operation and safe practices would be recommended to address these issues.

The lot appeared to be heavily used and close to capacity. Some issues related to a lack of places to park were occurring during the p.m. period. Although the number of vehicles varied, at times no additional cars could park due to the spacing of the cars that were parked in the lot.

Example School PM Loading Zone Observations

12/06/2012, Data Collector: 1

Time	Parked / Standing Vehicles	Loading / Unloading Vehicles	Total	Peds (kids & adults)	Notes
15:00	7	0	7	0	
15:01	7	0	7	0	
15:02	7	0	7	0	
15:03	7	1	8	2	s+a
15:04	9	0	9	0	
15:05	10	0	10	0	
15:06	12	1	13	2	s+a
15:07	12	1	13	1	a
15:08	13	0	13	0	
15:09	13	1	14	1	a
15:10	14	1	15	1	a
15:11	15	0	15	0	near capacity in drive-thru
15:12	16	0	16	0	
15:13	16	1	17	2	s+a
15:14	16	1	17	2	s+a
15:15	16	0	16	0	School lets out
15:16	15	1	16	3	2s + 1a
15:17	15	1	16	1	
15:18	19	1	20	1	
15:19	17	0	17	0	
15:20	14	1	15	2	s+a
15:21	16	1	17	1	
15:22	16	1	17	1	
15:23	17	2	19	2	students ran between cars in aisle to get to a vehicle
15:24	15	1	16	4	Day care van, stopped in exit and blocked it
15:25	15	1	16	1	
15:26	15	2	17	2	
15:27	9	1	10	4	3s, 1a
15:28	9	2	11	4	3s, 1a
15:29	10	2	12	4	
15:30	9	0	9	0	
15:31	7	1	8	2	s+a
15:32	5	2	7	6	3s, 1a
15:33	7	0	7	0	
15:34	4	2	6	6	4s+2a, school bus arrives, parks
15:35	3	1	4	13	12s+a, bus is loading
15:36	5	0	5	0	
15:37	2	1	3	2	s+a
15:38	2	0	2	0	
15:39	1	0	1	0	
15:40	2	0	2	0	
15:41	1	1	2	1	a
15:42	2	1	3	1	s, parent pulled into exit and stopped to pick up
15:43	2	0	2	0	
15:44	2	0	2	0	
15:45	2	0	2	0	

s = student; a = adult

Notes:

1. When busy, vehicles drive thru, stop and pick up at entrance, or go out and stop on street or try again.
2. Some parents use the staff lot.
3. Students waiting by drop off area exit.
4. Some students picked up at the entrance.
5. Some vehicles drive thru but no spaces.
6. Vehicles stop in aisle when no spaces, prevents parents ready to leave from exiting.

Considerations for Further Data Collection

More detailed data could have been collected. For instance, the arrival and departure time of each car could have been collected, but this would have required more data collectors within the parking area. Such data would indicate if vehicles arrive and depart promptly, or if there are some vehicles that monopolize the lot and stay for very long periods of time (which might be behaviour to eliminate).

Alternatively, instead of manually collecting the data, a video of the lot activity could have been created (if a high point for filming was available) and data obtained by reviewing the footage.

Next Steps for a STIR Team Using This Data

Discouraging long-term waiting for students in the lot might be considered, but the ramifications of this would need to be considered; it might result in increased loading in other locations, which is already taking place (such as south of the school) as noted in the previous example. Enforcing a short stay at this lot might also result in vehicles circling the block rather than pulling in and parking at the lot or parking elsewhere, which are also potentially problematic. The STIR team might consider interviewing parents using the lot on their thoughts on such measures before coming to a decision.

APPENDIX 3: TOOLKIT SUMMARY

The following pages contain a summary of components of the Toolkit from Step 3 of the STIR process.

Table 2: Potential Transportation Issues to Resolve at a School

Problem	Measure	Methodology	Rationale NOT to Implement	Cost	Expert or Warrant Required?	Ongoing Commitment?	Notes
Private Vehicle / Pedestrian Interaction at Crosswalks Students having difficulty crossing at crosswalks or other street crossing locations.	School Patrol	<ul style="list-style-type: none"> Document issues using maps, counts, photos & video Review available best practices & local standards, create revised plan Take concept to local transportation / planning authority to review, approve implement and monitor 	<ul style="list-style-type: none"> May be difficult to find volunteers for program at high volume locations Motorists may not respect authority of student patrols 	Low	No, could be implemented by each school independently as required. Information on best practices available from MPI, CAA, etc.	Requires ongoing supply of volunteers to run program. Need to ensure program is overseen, duties are carried out properly, etc.	School patrols have limited ability to assist pedestrians
	Adult Crossing Guard	<ul style="list-style-type: none"> Document issues using maps, counts, photos & video Review available best practices & local standards, create revised plan Take concept to local transportation / planning authority to review, approve implement and monitor 	<ul style="list-style-type: none"> May be difficult to find adults to run the program each year Participants must be trained, and ideally know first aid 	Low, but may be moderate if the position of crossing guard is a paid position.	No, could be implemented by each school independently as required.		Restricted from directing traffic. May be difficult to find adults to run program each year.
Private Vehicle / Pedestrian Interaction Concern with unsafe driving practices around school	Traffic Control Measures (all way stop, signal) required where they are lacking	<ul style="list-style-type: none"> Determine safe efficient bus-like routes that could be used to "capture" large number of pedestrians Recruit adult volunteers to supervise Communicate concept with parents/students, implement and monitor 	All way stops are prone to being demanded when they are not justified. When this occurs, the measure may be ignored in the field, creating a more hazardous situation.	Varies. Signals can be expensive (>\$250,000)	Yes, for design, review, approval Detailed warrants exist, could supply simplified version of warrant	Signs need to be maintained. Replace signs if they are damaged, defaced or go missing.	Will require approval by local authority.
	PACE car program	<ul style="list-style-type: none"> Document Issues (counts, speed studies, photo, video) Take information to transportation authority to discuss traffic control measures Traffic authority investigates, analysis (including warrants if necessary) Transportation authority implements in community Monitor 	<ul style="list-style-type: none"> Effectiveness of program not known Requires ongoing maintenance of program, participants Relatively new concept in Canada 	Low to moderate	Should consult with local traffic calming authority and stakeholders such as law enforcement before implementing Could be implemented independently by school but recommend consultation with local transportation authority for greater uptake by community	Requires ongoing publicity to keep program "fresh" in people's minds.	This program may be appropriate community-wide rather than just around individual schools.
	Traffic Calming Measures (various)	<ul style="list-style-type: none"> Document Issues (counts, speed studies, photo, video) Take information to transportation authority to discuss traffic calming measures Traffic authority investigates, analysis (including warrants if necessary) Transportation authority implements in community Monitor 	<ul style="list-style-type: none"> Traffic calming measures are often opposed by residents who are inconvenienced. Traffic calming measures are often opposed by Fire, EMS, etc. if delays in response time are possible Often politically sensitive / galvanizing issue with community Some measures are more effective than others 	Yes, for design, review, approval	No, could be implemented by each school independently as required. Complicated issues - consult with local transportation authority.	Recommended that measures be monitored once installed to ensure they have been designed and implemented properly	Consider implementing measures on a temporary trial basis before permanently installing them, to test impact.

Problem	Measure	Methodology	Rationale NOT to Implement	Cost	Expert or Warrant Required?	Ongoing Commitment?	Notes
<p>Interaction between Vehicles & Active Modes</p> <p>Unsafe interaction between modes of travel</p>	Eliminate interaction by revising routing of modes through site or timing of activities	<ul style="list-style-type: none"> Document issues using maps, counts, photos & video Review available best practices & local standards, create revised plan Take concept to local transportation / planning authority to review, approve implement and monitor 	Lack of cooperation from the group(s) asked to change.	Varies. Potentially high if construction is required, potentially low if scheduling adjustments resolve issues.	<p>Yes if required for design, review, approval</p> <p>No. Would be good to have some examples of when this has been successfully implemented.</p>	Important to document rationale so that in the future the benefit of certain scheduling or operations is not eliminated inadvertently.	Altering timing is a very low cost way to eliminate interactions under certain circumstances.
<p>Motorized Vehicles</p> <p>Vehicles parked and maneuvering at on-site paved areas, lots, driveways cause operational issues and conflicts</p>	<p>Revise layout of aisles, entry/exit points</p> <p>Revise layout of existing parking</p> <p>Provide additional capacity</p>	<ul style="list-style-type: none"> Document Issues (incidents, queuing, photo, video) Take information to transportation authority to discuss possible measures Revise using best practices & local standards, create revised plan Take concept to local transportation / planning authority to review, approve implement and monitor 	<ul style="list-style-type: none"> Might not be possible to come up with a good solution if site is very restricted in size or by the layout of buildings Cost 	Varies, particularly if additional surface area is required.	<p>Yes, for design, review & approval.</p> <p>No. Would be good to have some examples of when this as been implemented.</p>	Review operation once modifications are made to ensure the design works as intended; ensure paint markings, signage, and barriers are maintained year-to-year.	Improvements may be limited if school site is compact (common in inner city).
<p>Motorized Vehicles</p> <p>Motorists travelling too rapidly near schools</p>	School Speed Zones	<ul style="list-style-type: none"> Discuss with local roads authority; a jurisdiction may have to create a set of standards specific to the area they oversee Implement infrastructure Educate motorists Monitor 	Will be unpopular with those causing the issues; must be constantly enforced.	Low to high depending on level of enforcement.	<p>No, could be implemented by each school independently as required. If hard enforcement is required, discuss with parking authority or law enforcement as appropriate.</p> <p>Not determined yet; this is a very new policy. Recommend reviewing TAC guidelines until Provincial standards are determined.</p>	Unless efforts to enforce proper vehicle operation are long-term, once the enforcement ends, the negative behaviours may return.	Each jurisdiction may have separate standards (e.g., with respect to hours of operation) of the speed limits).
<p>All Modes</p> <p>On-site signage is confusing or missing</p>	<ul style="list-style-type: none"> Update signage using best practices, MUTCD standards. Use warrants to determine if off-site signage is required (e.g., four-way stops) if concerns exist 	<ul style="list-style-type: none"> Review signage for compliance with MUTCDC. Local traffic authority may assist Make plan of changes to signage Review with local traffic authority Implement new signage Monitor 	None.	Relatively low; signage is inexpensive compared to construction costs.	<p>Highly recommended that a traffic authority review on-site design, even though this may not be a requirement.</p> <p>No warrant required. Would be good to have some examples.</p>	Signs need to be maintained. Replace signs if they are damaged, defaced, or go missing.	<ul style="list-style-type: none"> Even the best signage may be ignored May need bilingual signage Professional signage Remove damaged signage
<p>All Modes</p> <p>Students and/or parents engaged in poor safety practices</p>	Education & Reinforcement	<ul style="list-style-type: none"> Document Issues (incidents, queuing, photo, video) Discuss with law enforcement Implement educational plan related to changes Hart & soft enforcement of rules implemented Monitor 	Will be unpopular with those causing the issues; must be constantly enforced.	Low to high depending on level of enforcement.	<p>No, could be implemented by each school independently as required. If hard enforcement is required, discuss with parking authority or law enforcement as appropriate.</p> <p>No warrant required, but law enforcement will have commentary on when they should be brought in.</p>	<ul style="list-style-type: none"> Recommended that rules be kept enforced by school on ongoing basis. Ongoing hard enforcement likely to be limited to spot checks by law enforcement. 	Police may not be able to continually dedicate resources to enforce rules; they have limited resources to address these issues.
<p>All Modes</p> <p>Problems with driver behaviour (parking, pick-up, ignoring rules, unsafe driving practices) or pedestrian behaviour (jaywalking)</p>	Education and enforcement by volunteers or law enforcement (including SpeedWatch / radar board programs	<ul style="list-style-type: none"> Document issues in detail using various technologies Discuss with law enforcement Implement educational plan related to changes Hard & soft enforcement to changes of operation Monitor 	Will be unpopular with those causing the issues. Must be constantly enforced.	Low	No, could be implemented by each school independently as required.	Constant enforcement highly recommended.	Police may not be able to continually dedicate resources to enforce rules.

Problem	Measure	Methodology	Rationale NOT to Implement	Cost	Expert or Warrant Required?	Ongoing Commitment?	Notes
<p>Parking of Private Vehicles</p> <p>Insufficient parking or parking issues related to parking use by parents/visitors (potentially staff as well)</p>	Modifications to On-Street Parking (changes to signage, enforcement, protocols)	<ul style="list-style-type: none"> Document issues in detail using maps and counts Review existing signage Discuss conditions with parking authority Implement changes Hard & soft enforcement of changes to operation Monitor 	<ul style="list-style-type: none"> Will be unpopular with motorists causing the issues. Must be constantly enforced. Parking restrictions in one location may move the issue to a different street rather than resolve the issue which is not recommended. 	Moderate	Recommend engaging local parking authority/law enforcement.	Consistent and ongoing enforcement highly recommended.	Requires discussion with local parking authority or public works/transportation authority.
	Shared parking for parents/visitors off-site	<ul style="list-style-type: none"> Document Issues (counts, speed studies, photo, video) Discuss with local stakeholders suitable sites. Local planning authority/transportation authority may have suggestions Develop agreement Develop protocol regarding vehicle operation on site Migrate vehicles to begin using new site Monitor 	<ul style="list-style-type: none"> Less convenient for students and parents than loading on-site Not all parents will make use of the facility. 	Low	<p>Recommend discussion with local traffic authority and parking authority if they have knowledge of shared parking arrangements.</p> <p>No warrant required. An example of such an agreement should be added to the document when available. Known to occur in Winnipeg</p>	Check in with shared parking provider on regular basis in case of concerns or issues.	<ul style="list-style-type: none"> Requires an adjacent site that will agree to a long term arrangement. Not an option for all schools
	Expand parking supply on-site	<ul style="list-style-type: none"> Determine available parking and demand for parking using counts. Need to link parking demand with enrollment if enrollment is unstable Use parking standards (available from local authority) to design parking improvements/expansion Take concept to local transportation/planning authority to review, approve Implement improvements Monitor 	<ul style="list-style-type: none"> Opposition due to loss of green space on site may be a concern. Opposition due to concern over urban form. 	Generally high. School would have to fund this improvement; unlikely that local government would contribute.	Expert required for design, review, & approval.	Will require proper maintenance of surface, signage, painted markings, etc.	Not an option for all schools
<p>Active Modes</p> <p>Students having difficulty walking to school due to missing segments of infrastructure.</p>	Complete Active Mode Network (sidewalks and pathways)	<ul style="list-style-type: none"> Document routes taken to school (part of school's transportation management plan) Determine missing links Contract local authority re: having missing links constructed Improvements implemented Monitor to keep records current 	<ul style="list-style-type: none"> Property owners along route may object to new sidewalk in front of their homes. 	Moderate to high. Local authority may fund.	<p>Yes, for design, review and approval.</p> <p>Active mode network infrastructure (sidewalks, pathways, bike lanes) typically not a warrant process but local authority may have policies on how priority/timing decisions are made.</p>	Ensure records are kept updated regarding network and routes used. Winter maintenance may also be required.	See "Active and Safe Routes to School" materials, available from sources such as Green Action Centre.
<p>Active Modes</p> <p>Students having difficulty bicycling to school due to missing segments of infrastructure.</p>	Complete Active Mode Network (bicycle network)	<ul style="list-style-type: none"> Document routes taken to school (part of school's transportation management plan) Determine missing links Contract local authority re: having missing links constructed Improvements implemented Monitor to keep records current 	<ul style="list-style-type: none"> Bike routes may be unpopular with public if they require reductions to travel lanes for other vehicles. Some students may feel uncomfortable riding on the road even in a separated lane. 	Moderate to high. Local authority may fund.	<p>Yes, for design, review and approval.</p> <p>Active mode network infrastructure (sidewalks, pathways, bike lanes) typically not a warrant process but local authority may have policies on how priority/timing decisions are made.</p>	Ensure records are kept updated regarding network and routes used. Winter maintenance may also be required.	See "Active and Safe Routes to School" materials, available from sources such as Green Action Centre.

Problem	Measure	Methodology	Rationale NOT to Implement	Cost	Expert or Warrant Required?	Ongoing Commitment?	Notes
<p>Active Modes: Travel to/from School</p> <p>Parents uncomfortable with students walking to school unsupervised.</p>	<ul style="list-style-type: none"> Walking School Bus Walking Buddies 	<ul style="list-style-type: none"> Document routes taken to school by students Determine safe, efficient bus-like routes that could be used to “capture” large numbers of pedestrian Recruit students (for buddy system), adults (for walking school bus) Communicate concept with parents/students, implement and monitor 	<p>Lack of volunteers may be a problem</p> <p>Requires ongoing volunteers year to year.</p>	<p>Low. Sometimes these programs include carts to carry books on, and special reflective vests as a uniform for the adult volunteers.</p>	<p>No, could be implemented by each school independently as required.</p> <p>Note that bike train volunteers should be trained in bicycle safety.</p>	<p>Ensure records are kept updated regarding network and routes used.</p> <p>Requires constant supply of volunteers to run.</p>	<p>“Bike train” is much less common than “walking school bus”, both are relatively new concepts in Canada.</p>
<p>Active Modes: Travel to/from School</p> <p>Parents uncomfortable with students bicycling to school unsupervised.</p>	<p>Bike Train (A bike train is a bike version of the walking school bus)</p>	<ul style="list-style-type: none"> Document routes taken to school by students Determine safe, efficient bus-like routes that could be used to “capture” large numbers of pedestrian Recruit adult volunteers to supervise Communicate concept with parents/students, implement and monitor 					
<p>Active Modes: Crossing Streets</p> <p>Students having difficulty crossing streets due to traffic, speed (any road type)</p>	<p>Crosswalk</p>	<ul style="list-style-type: none"> Collect information on number of pedestrians per hour (plus information on potential pedestrians if possible) based on routing information documentation. Collect information on speed of traffic on corridor. Collect information on number of vehicles along corridor per day Use warrant process or other tools to determine appropriate measures to provide. Provide information to local authority for approval, construction. Monitor once in operation. 	<p>On higher volume roads, specifically highways, it may not be advisable to provide crosswalks or signals. In these cases, grade separation may be an alternative.</p>	<p>Varies from low to high depending on what is warranted. Local authority may fund.</p>	<p>Yes, for design, review, approval.</p> <p>Detailed warrants exist. There is a new TAC manual coming out with a simple process a school could follow to determine the appropriate measure to provide at a given location.</p>	<p>Over time, as road conditions change (increased volumes of traffic, changes to school programs) crosswalk provisions should be reviewed by transportation experts to ensure the provided infrastructure is appropriate, or upgraded as required.</p>	<p>The new TAC manual makes the process for crosswalk provision simpler, but has yet to be adopted.</p>
<p>Active Modes: Crossing Streets</p> <p>Students having difficulty crossing high volume roads (highway conditions)</p>	<p>Grade-separated Active Mode Crossing</p>	<p>Same as for crosswalk, where authorities would indicate that traffic conditions make a crosswalk unacceptable.</p>	<p>High cost, requires land on either side of roadway.</p>	<p>High</p>	<p>Yes, for design, review, approval.</p>	<p>Requires driver and vehicle</p>	<p>Uncommon</p>
<p>Active Modes: Crossing Streets</p> <p>Students having difficulty crossing high volume or high speed roads or highway conditions between two schools separated by highway.</p>	<p>Use a motorized vehicle as shuttle “Hazard Bussing” or a Grade-separated Active Mode Crossing</p>		<p>Operational cost for use of vehicle. High cost, requires land on either side of roadway for an overpass.</p>	<p>Varies. Might be lower if vehicle and driver already available. High for an overpass.</p>	<p>Complete standard warrant for crossing -- would only be considered in cases where authority deemed safety or uninterrupted flow an overriding concern. Would be case-by-case basis.</p>		

Problem	Measure	Methodology	Rationale NOT to Implement	Cost	Expert or Warrant Required?	Ongoing Commitment?	Notes
<p>Bicycles</p> <p>On-site bicycle storage is poor, resulting in low utilization</p>	Upgrade storage facilities at school	<ul style="list-style-type: none"> Review best practices Develop concepts regarding bicycle parking Discuss with local bicycle parking experts, bicycle groups, etc. Implement improvements Monitor 	Little benefit to non-bicycle users, may not be a priority if other issues limit bicycle use.	Moderate (higher if bike lockers or indoor storage needed)	<p>Recommend discussion with local cycling experts (potentially at local transportation authority) regarding best practices.</p> <p>There is documentation available on best practices that can be followed.</p>	Monitor utilization, add to the capacity of bike racks if there is insufficient capacity and this is a problem at the school.	Determine that external conditions are not contributing to poor bicycle utilization (such as unsafe routes). Resolve these issues first; if they exist, then improving storage facilities will not have a major effect.
<p>School Buses</p> <p>School bus loading is chaotic, potential for incidents</p>	Protocols for loading students onsite	<ul style="list-style-type: none"> Document issues (counts, description of activity) Select a protocol (there are several) Implement protocol changes) Monitor 	Some students may not like the added supervision if it was lacking in the past, or if following protocol results in delay oin their departure from school.	Low	No, could be implemented by each school independently as required.	For programs to be effective, they must be enforced throughout the year.	Involve the school bus provider when reviewing school bus operation and related policies.
	Revise operational protocols, parking layout of buses or increase school bus parking area	<ul style="list-style-type: none"> Document issues, (counts, speed studies, photo, video) Discuss modification to site with local stakeholders and local traffic authority, considering best practices for bus loading. Take concept to local transportation/planning authority to review, approve Implement improvements (Improvements may include signage, gates, and cones or large infrastructure changes Monitor 	<ul style="list-style-type: none"> Opposition due to loss of green space on site may be a concern Opposition due to concern over form 	Varies. Potentially low if only minor changes are needed but high if construction of modifications to loading areas required.	<p>Recommended that traffic professionals review on-site design for any changes, particularly if changes to site layout are required.</p> <p>No warrant required, but documentation exists on best practices.</p>		
<p>School Buses</p> <p>Insufficient room at school site for bus loading</p>	Revise/expand bus loading area onsite	<ul style="list-style-type: none"> Document issues in detail using maps and counts (also photos, video - optional) Review available best practices regarding loading area design Take concept to local transportation/planning authority to review, approve Implement improvements Monitor 		High	Yes, for design, review, approval by local authority	Requires driver and vehicle	This paved space will go unused most of the time (only in use during pick up and drop off times).
	Shared parking arrangement for buses offsite	<ul style="list-style-type: none"> Document issues in detail using maps and counts (also photos, video - optional) Discuss with local stakeholders with suitable sites. Local Planning authority/transportation authority may have suggestions Develop agreement Develop protocol regarding vehicle operation on site. Migrate vehicles to begin using new site. Monitor 	<ul style="list-style-type: none"> Less convenient for students than loading on-site May not be long term if conditions change at off-site location, such as the land use changing at the off-site location 	Low	<p>Recommend discussion with local traffic authority and parking authority if they have knowledge of shared parking arrangements.</p> <p>No warrant required, an example of such an agreement could be included in the future once one is in place.</p>		<ul style="list-style-type: none"> Requires an adjacent site that will agree to a long term arrangement May not be a long term agreement Not an option for all schools Some people find school buses problematic (noisy, pollution) and may not want them nearby off-site

APPENDIX 4: OBTAINING EXPERT HELP

In rare cases, it may become necessary to obtain advice from an external firm for tasks such as assisting with a large amount of data collection, conducting a traffic analysis, or determining the cost of proposed improvements.

If this appears necessary, first speak with the school board, and then the local transportation authority. The cost of having such services provided will need to be discussed with the school division before proceeding. The school division may have a preferred provider of such services, or a process on how to contract out such work.

For most of the work related to transportation improvements at or near a school, seek out an engineering/planning firm that has local experience dealing with the local transportation authority, and experience working on school-related transportation issues or other comparable projects.

Before starting work with any company, ask them to tell you about projects they have done at other schools, and ask for references your team can contact.

Once a firm has been selected, discuss the project with them and ask for a work plan, budget and timeline for the work you require. This takes some time to prepare, and there may be a cost associated with it. Share the information received with the school board, and proceed with a firm that the team and the school board agree upon.

During the process, keep in touch with the firm; they should be willing to provide you with periodic status updates and information on how the work is proceeding.

APPENDIX 5: TRAFFIC CALMING MEASURES

These are traffic calming measures not covered individually in the text of the Toolkit.



Photo: Richard Drdul

Neighbourhood traffic circles can help to slow traffic on local and collector streets. They can add to the aesthetics of an area if the central area has landscaping features incorporated into it. They should be designed so they cannot be driven over by traffic, and should be large enough to require traffic to deflect from a straight route through the intersection. Special consideration also needs to be taken to ensure appropriate sight lines are maintained through the intersection.



Photo: Richard Drdul

Reduced corner radii increase the amount of sidewalk at a corner, and require vehicles to turn more slowly. Smaller radii reduce the distance pedestrians must travel when crossing a street. They can be more difficult for large vehicles such as trucks and buses to maneuver around.



Photo: FHWA

Narrow lanes can be implemented using paint to reduce the apparent lane width. Narrower lanes can result in motorists travelling more slowly and cautiously to stay in their lanes. Often used when new bicycle lanes or medians are added to a road, or potentially as part of a “Road Diet” concept.



Photo: FHWA

Chokers narrow both sides of a street to form a narrower segment approximately 6.0 to 7.3 metres wide. **Chicanes** provide alternating narrow and wide sections similar to a slalom course and similar to bulb-outs (described below). They need to include vertical elements (ex: object marker signage) so that motorists can see them and not collide with them. Drainage is a consideration with these elements, as is on-street bicycle routing through these areas. They often have a significant impact on on-street parking.

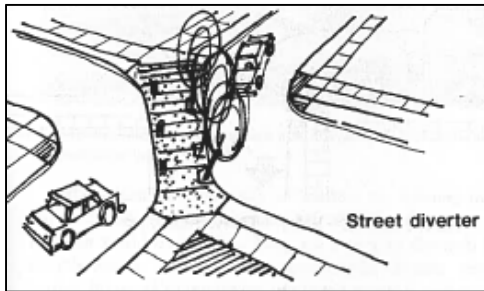


Image: FHWA

Diagonal diverters are barriers that are placed diagonally across an intersection. They create more circuitous routes for motorists and are often designed so that emergency vehicles, pedestrians, and cyclists can still move through the barrier.



Photo: Richard Drdul

Speed humps (and longer and flatter **speed cushions**) are 25 to 100 millimetre high strips or pads in the street that require motorists to slow down to travel over comfortably. Speed humps are generally feasible only within parking lots and on local roadways with low volumes of traffic. They can be a concern for transit, snow removal, and emergency vehicles on roads. Winnipeg has a warrant process for the installation of speed humps on local streets.

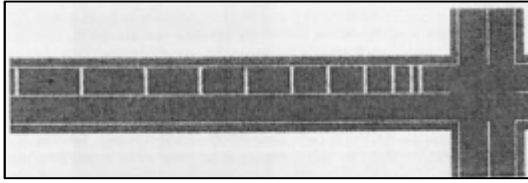


Image:
NZ Transportation Research Report 423

Perceptual design is the use of psychological principles such as patterns painted onto road surface that encourage drivers to reduce their speed. An example of this is to use lines that are spaced at decreasing intervals; drivers passing over these markings think they are accelerating (because of the decreasing spaces between lines) and slow down.

APPENDIX 6: EXAMPLE OF PRIORITIZATION PROCESS

This is an example of the process a STIR team would follow when completing an evaluation of a proposed measure as part of the prioritization component of their report.

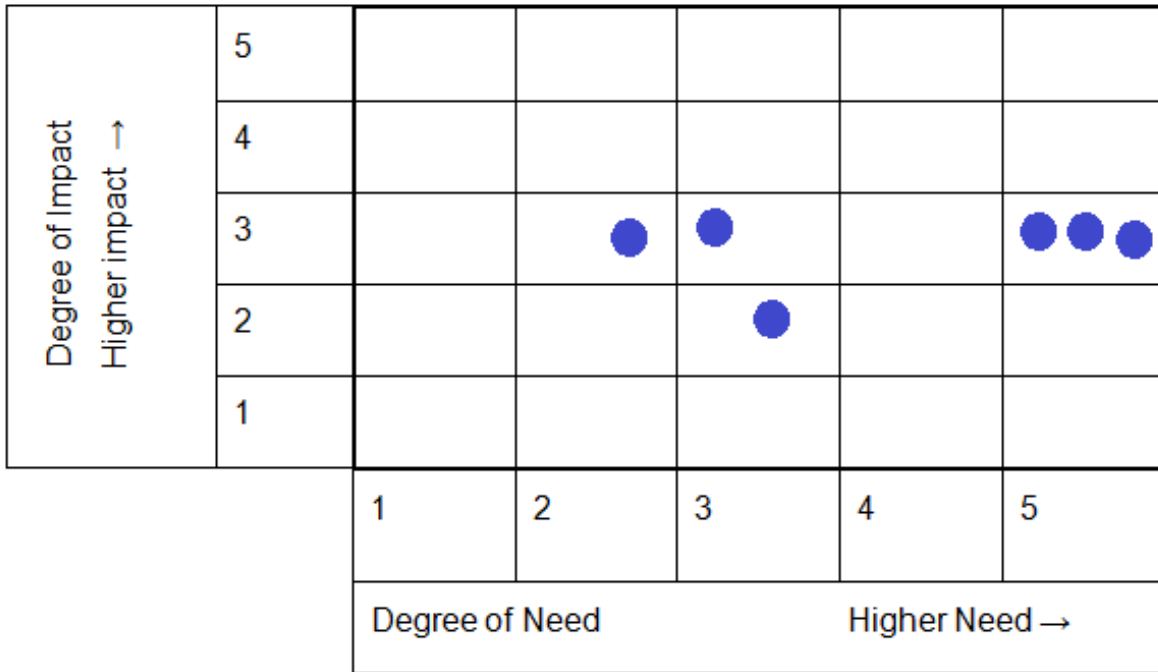
One of the measures under consideration is to consider banning parking on a certain street near the school to eliminate an observed problem with jaywalking. This is anticipated to impact 75 students (the number of students typically seen being picked up in this area) and it is assumed that at this school, the population is approximately 300 students. In this example, an imaginary STIR team of six members evaluated this measure.

The evaluation on the next page shows that:

- There is generally consensus amongst the team members that the measure is moderate in terms of **impact**. 75 students affected at this school is a moderate number; it is lower than 50 percent of the student body, but this number is more than just a small number of students at this school.
- There is disagreement amongst the team members regarding **need**. Half the team members of the team voting rate this measure at the highest possible need, while three gave it a much lower need ranking, indicating they believe that this should be a low priority.
- There is also disagreement in terms of the evaluation of **resistance**. The majority of members indicate that they believe that this measure is likely to generate opposition, while two members disagree with this.

It would be valuable for this team to discuss the reasons why there was not consensus and after that discussion, consider re-voting, so that a consensus might be achieved before continuing (note that a consensus is not absolutely essential).

Measure Description: **Elimination of Parking on 1st Street**



Number of students anticipated to benefit from the measure 75

