



BRITISH
COLUMBIA

B.C. Community ROAD SAFETY TOOLKIT



Module 3:
Implementation Tools and Strategies

Module 3: Implementation Tools and Strategies



Disclaimer: This toolkit is designed to consolidate and disseminate knowledge about proven and promising road safety designs, strategies, and devices, rather than to provide technical knowledge. A strong effort was made to find and incorporate the most valid and reliable research about the various strategies in the toolkit. However, the nature of road safety research is such that knowledge on road safety continues to change, and therefore any claims drawn from the research should be approached with a critical mind. Local road authorities wishing to implement any designs, strategies, and devices in this toolkit should do so under the guidance of trained and professionally-certified engineers and experts.

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Table of Contents

4	BC Community Road Safety Toolkit Module 3: Implementation Tools and Strategies
5	Strategic Planning and Evaluation
6	Road Safety Strategic Action Plans
12	Road Safety Performance Measures and Performance Indicators
16	Ensuring Safe Roadways
17	Road Safety Audits
19	In-Service Road Safety Reviews
22	Heavy Vehicle Safety
26	Communication, Consultation, and Engagement
27	Developing a Communications Plan
32	Community Consultation
36	Community Engagement
38	Funding and Cost-saving
39	Funding Sources
40	Integrating Safety into the Planning of New Developments
44	Cost and Space-saving Measures
47	Promoting Active Transport
48	Safe Routes to Schools
51	Accommodating Small-wheeled Transport
53	Appendix A: Additional Resources for Improving Road Safety

Resource Kit

55	Strategic Planning and Evaluation
55	Road Safety Performance Measures and Performance Indicators
55	Ensuring Safe Roadways
55	Road Safety Audits
55	In-Service Road Safety Reviews
55	Heavy Vehicle Safety
55	Communication, Consultation, and Engagement
55	Community Engagement
56	Funding and Cost-saving
56	Funding Sources
56	Cost and Space-saving Measures
57	Promoting Active Transport
57	Safe Routes to Schools
57	Accommodating Small-wheeled Transport
57	Appendix A: Additional Resources for Improving Road Safety
58	Acknowledgements

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Implementation Tools and Strategies

This is the third module of the three-part BC Community Road Safety Toolkit. The third module introduces a series of implementation tools and strategies to help local road authorities plan their road safety activities and efforts more effectively.

The aim is to aid local road authorities in thinking about how specific road safety efforts fit within the 'big picture' of existing policies and programs, the community's attitudes and expectations, future plans for communities, provincial and national funding sources, and data and information.

This module should be read and used alongside *Module 1 – Protecting People Walking and Cycling* and *Module 2 – Safe Roadway Designs to Protect All Road Users*, as it will help local road authorities to implement the roadway designs in more effective ways.

This module is divided into 5 sections, each of which contains several individual discussions.

The 5 sections are:

- Strategic Planning and Evaluation;
- Ensuring Safe Roadways;
- Communication, Consultation, and Engagement;
- Funding and Cost-saving; and
- Promoting Active Transport.

In addition, Appendix A contains additional resources that local road authorities may find useful.



Strategic Planning and Evaluation



Road Safety Strategic Action Plans

Road authorities that develop strategic action plans are more likely to succeed in improving road safety outcomes. A road safety action plan contains the blueprint for addressing motor vehicle crash fatalities and serious injuries.

The end result of developing a road safety strategy is a Planning Document, which can be part of the local road authority's transportation master plan. However, the Planning Document should be separate from other elements of the transportation master plan, as this will help ensure that safety concerns remain prominent among other competing priorities.

An effective Planning Document includes the following elements:

- 1** Vision and Mission;
- 2** Targets and Timeframe;
- 3** Partners and Stakeholders;
- 4** Management Audit and Network Screening;
- 5** Emphasis Areas;
- 6** Strategies;
- 7** Action Plans;
- 8** Funding; and
- 9** Monitoring and Evaluation Plan.

Vision and Mission

The vision and mission of the road safety plan states the overarching objectives of the local road authority and its partners. For example, the vision may be to create continuous improvement in road safety year-over-year, and the mission may be to achieve this through collaboration and evidence-based decision making.



Targets and Time Frame

Targets

The local road authority should set targets and a timeframe. This will help focus efforts and keep track of progress. Targets can be defined either as final goals, interim goals, or comparative goals.

- **Final targets:** local road authorities should decide on a final target they wish to reach. Many jurisdictions, including British Columbia, have “Vision Zero” as their final target. Vision Zero seeks to completely eliminate motor vehicle crash deaths and serious injuries.
- **Interim targets:** local road authorities can aim to reduce motor vehicle crash deaths and injuries by a certain level before a particular date. Such targets are more meaningful if they are expressed as absolute percentage reductions in deaths and serious injuries from a baseline year.
- **Comparative targets:** local road authorities can also aim to outperform other jurisdictions by having fewer deaths and injuries. This type of goal is more meaningful if expressed as a rate, and can be based on distance driven, number of licensed drivers, population size, etc. For example, British Columbia aims to have the safest roads in North America, measured in road deaths per 100,000 population, by the year 2020.

To set targets, the road agency should:

- Obtain enough knowledge about the current number and rate of crashes, deaths, and injuries, and establish a baseline; and
- Develop a plan for acquiring the data needed to measure ongoing progress. See the section entitled “Road Safety Performance Measures and Performance Indicators” (page 12).

Timeframes

Developing a thoughtful time frame to achieve the targets is vital because road safety measures and programs take time to plan, budget, and implement. Aligning time frames with provincial or federal targets encourages consistency across jurisdictions and improves opportunities for comparing results against past performance.

Local road authorities may consider the following elements when setting timeframes:

- Level of resources, including level and availability of expertise, and funding;
- The level of improvements needed to achieve road authority’s goals; and
- The rate of change in road safety outcomes historically.

Partners and Stakeholders

Local road authorities have direct influence over how their infrastructure gets built, but road safety is a multi-disciplinary area and requires partnership among many different organizations and stakeholders.

The partners most often involved in the development of road safety plans within

British Columbia include:

- Royal Canadian Mounted Police (RCMP) or local police forces;
- The Insurance Corporation of British Columbia (ICBC);
- The Ministry of Transportation and Infrastructure;
- Regional Health Authorities; and
- Local school districts.

Other agencies that are active in road safety in British Columbia include:

- BC Emergency Health Service and BC Ambulance Service;
- Fire services;
- Neighbouring municipalities;
- Regional Districts; and
- First Nations communities.
- WorkSafeBC

All key agencies should play a role in developing the road safety plan and Planning Document. But, a wider group of stakeholders should be consulted in the development of the road safety plan, where necessary.

These stakeholder groups may include:

- BC Trucking Association;
- BC Cycling Coalition;
- Groups representing older adults, and those representing people with medical needs;
- Commercial Vehicle Safety and Enforcement;
- Media outlets;
- Advocacy groups against impaired driving, distracted driving, etc.; and
- Other organizations as necessary.

Management Audit and Network Screening

It is necessary to determine what the “current state of road safety” is in the local road authority when developing the action plan. This can be done through a management audit and network screening.

Management Audit

The management audit assesses how road safety is being managed in the local road authority.

This is achieved by:

- Identifying each department whose activities relate to, or impact, road safety, and describing their mandates and roles. The departments may include:
 - ◆ *Urban and Community Planning;*
 - ◆ *Traffic/Transportation Planning;*
 - ◆ *Engineering and Public Works;*
 - ◆ *Infrastructure;*
 - ◆ *Road Safety;*
 - ◆ *Road Maintenance;*
 - ◆ *Police; and*
 - ◆ *Other departments that may be relevant for particular municipalities.*
- Reviewing the strategic plans of these departments along with their existing policies, processes, and priorities;
- Determining the ways that public complaints are managed and ensuring that complaints are adequately addressed; and
- Locating departments that produce useful and good quality data (e.g., crashes, average travel speeds, inventory of roadway infrastructure, travel patterns, etc.).

Network Screening

Network screening refers to the ranking of locations in the road system based on crash history. This helps set priorities and focus efforts. Injury or crash rates are compared to what is considered typical for other locations with similar characteristics. Sites with higher-than-expected casualty rates then become the focus of in-service reviews (page 19) and improvement programs.

The following types of data are commonly used in network screening:

- Crash claims data;
- Police data;
- Travel speeds;
- Traffic volumes;
- Public complaints; and
- Health data.

As part of a network screening exercise, patterns in the local road authority’s jurisdiction also emerge, such as common crash types, the role of weather and lighting conditions, and road user demographics, to name a few. These analyses can help highlight areas of emphasis for a municipal road safety plan.

Emphasis Areas

The Planning Document may identify a certain number of emphasis areas, which are specific and pressing problems identified through the network screening analysis.

Common emphasis areas in British Columbia are:

- Intersections;
- Driver speeds;
- School zones;
- Pedestrian safety;
- Cyclist safety;
- Commercial vehicle traffic; and
- Weather conditions.

Crash death or injury reduction targets can be established for each of these emphasis areas as part of the Planning Document's targets and timeframes.

Strategies

For each of the identified emphasis areas, strategies are developed. These should cover as many approaches as possible: road design improvements, traffic engineering, education and enforcement, and beyond, in order to achieve maximum impact.

Some examples of strategies are:

- Designing roads for lower driver speeds;
- Improving infrastructure for pedestrians and cyclists; and
- Prioritizing the use of low-cost interventions to ensure all available opportunities are used.

Action Plans

In an action plan, specific activities are identified that can be budgeted and evaluated, along with the locations where the activities will take place.

Continuing from the three previous examples under "Strategies", specific actions may include:

- Lower speed limits in downtown areas and residential roads;
- Build raised crossings in highly pedestrianized areas; and
- Install low-cost interventions such as leading pedestrian intervals and prohibiting right-turns on red.

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Funding

To act on the strategies and the Action Plan, financial resources are needed. Securing funding may require reallocating existing funds, but more likely it will require requesting new funding from the municipal council. Ideally, revenues from enforcement activities directly fund road safety improvements. Grants can also be obtained from Insurance Corporation of British Columbia (ICBC) or other agencies, if selected criteria are met. Further information on funding sources is provided in the section on funding sources (page 39). A business case consisting of safety benefits and anticipated costs will typically need to be prepared.

Monitoring and Evaluation

A plan for measuring the success of the safety plan should be put in place prior to implementing any of the actions. Dedicating staff to this purpose will help to monitor and evaluate the effectiveness of safety measures, and help to advance progress on the safety plan.



Road Safety Performance Measures and Performance Indicators



What Are Key Performance Measures and Key Performance Indicators?

Key Performance Measures (KPMs) and Key Performance Indicators (KPIs) are two different approaches to measuring road safety. While KPMs examine road safety outcomes such as the number or rates of crashes, deaths, and injuries, KPIs look at the conditions that create or reduce risks to road users, such as infrastructure or behaviour.

Some examples of KPIs would be the percentages of all licenced motor vehicles with different crash safety ratings, or the proportion of high-speed roads that meet good design standards. KPIs can also be used to measure road user experience. For example, a KPI could look at the percentage of households in a specific area that are located within a certain distance of a protected bicycle lane network. This can help measure people's level access to safe non-motorized forms of transportation.

Finally, KPMs and KPIs can be used to measure the effectiveness of improvements to the local road system.

Why Have KPM and KPI Frameworks?

It is vital to measure road safety in terms of KPMs in order to track progress in reducing, and ultimately eliminating, crash deaths and serious injuries. This approach to measuring road safety is also important for understanding the nature of serious crashes and helping develop ways to address them.

However, focusing only on road safety outcomes has inherent limitations. Perhaps the greatest limitation is that road safety authorities are only able to assess risk after enough casualty data has been collected and analyzed. This leads to a reactive approach to addressing safety issues; in the meantime, people get hurt or killed before improvements are implemented.

A KPI framework based on sound research will help road authorities develop a proactive strategy that prevents serious crashes before they happen. In this way, it will complement the more traditional approach to measuring road safety that looks at deaths and injuries only.

Choosing Performance Measures and Indicators

Using several performance measures and indicators can provide valuable information for decision-making, but care should be given to ensure that the chosen measures are well-suited for a local road authority's objectives.

The United States Federal Highway Administration proposes a way for communities to set KPIs based on their goals and priorities. The six goals and priorities in this approach are the following:

- **Safety:** reduce and eliminate traffic crashes and crash trauma;
- **Connectivity:** increase the directness of travel routes;
- **Economy:** enhance a community's productivity and employment opportunities;
- **Equity:** ensure all socio-economic and demographic groups benefit from transport infrastructure;
- **Health:** improve the opportunities for people to engage in active transport; and
- **Livability:** ensure that comfort is addressed for people living adjacent to transport infrastructure.

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Obtaining Data for Performance Measures and Indicators

Performance measures and indicators require adequate data. Local road authorities may be interested in the following two broad forms of data:

- To track KPMs, data on motor vehicle crash fatalities and serious injuries; and
- To develop and track KPIs, data related to road network conditions and road user habits and behaviours.

The following table contains British Columbia data sources relevant to KPMs at the municipal level:

Dataset	Description	Data Location
Traffic Accident System (TAS)	<ul style="list-style-type: none"> ■ Contains data on motor vehicle fatalities gathered through police reports, and managed by the Insurance Corporation of British Columbia (ICBC). Includes data on road users, road conditions, and contributing factors. Data is available by Traffic Enforcement Section operating in various municipalities. 	<i>Data may be requested from ICBC and local police departments</i>
Insurance Corporation of British Columbia Crash Data (ICBC)	<ul style="list-style-type: none"> ■ Contains data reported through Insurance Corporation of British Columbia claims. It includes fatalities, injuries, and property damage collisions of any collision involving a vehicle insured by ICBC. The dataset includes crash location, mode (pedestrian, cycling or vehicle), description of incident, severity (fatal, injury, property damage), and crash configuration. 	<ul style="list-style-type: none"> ◆ <i>Data may be requested from ICBC</i> ◆ <i>Municipalities generally receive their own data from the ICBC</i>
Ambulance Data – managed by BC Emergency Health Services (BCHES)	<ul style="list-style-type: none"> ■ Contains data on patient crash location, as ambulance collect global positioning system (GPS) data. Data also includes hospital drop-off location. 	<i>Data may be requested from BC Emergency Health Services</i>
Hospital Emergency Department Data – managed by local health authorities	<ul style="list-style-type: none"> ■ Contains data on patient arrival to hospital emergency departments due to a traffic-related injury. Data fields vary from hospital to hospital, but in general provides demographic information (age, gender, etc.), mode of transportation, and patient disposition (severity of injury: fatal, serious or minor). Some hospitals also collect patient self-reported crash details and location. ■ Hospital data includes collisions with motor vehicles, but also includes collisions not involving motor vehicles such as for example cyclist-to-pedestrian crashes, cyclist-to-cyclist crashes, single cyclist falls, among others which would not be captured in the ICBC claims data. ■ Additionally, hospitals also have a “falls” injury category, where injuries related to pedestrian or cycling falls could be registered instead of the traffic related category. 	<i>Data may be requested from the appropriate health authority (e.g., Vancouver Coastal Health, Fraser Health, etc.)</i>

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Local road authorities may require different types of data to develop and track KPIs. The table below identifies some common forms of data relevant to KPIs, and how they can be used. For each of these areas of data, local road authorities should measure the location, quantity, and quality/condition.

Type of Data Collected	Purpose
Bicycle facilities inventory <i>(e.g., length of painted bike lanes, protected bike lanes, secure bike storage sites)</i>	Measure level of service for bicyclists
Pedestrian facilities inventory <i>(e.g., crossing opportunities per km², average pedestrian crossing signal time, kilometres of pedestrian pathways)</i>	Measure level of service for pedestrians
Transit routes, stops, and schedules	Level of service for public transit users
Intersection features <i>(e.g., protected left-turn phases, prohibitions on right-turn-on-red, number of intersections with reduced number of access points)</i>	Provide indicators of intersection safety and potential to further improve safety at intersections

Local road authorities may also consider combining many of the above-listed types of data with data that measures “exposure,” such as population or road usage. This will enable comparison of vehicle crash and injury rates with other municipalities and jurisdictions, and with other periods of time. The following table outlines types of exposure data and their potential uses:

Type of Data	Potential Uses	Typical Data Gathering Method
Vehicle volume <i>(average annual daily traffic) at select locations</i>	<ul style="list-style-type: none"> Calculate deaths, injuries and crashes per volume of motor vehicle traffic within the municipality, an area or specific location Understand patterns of traffic peak periods versus low volume periods 	<i>Automated vehicle counters</i>
Pedestrian and/or bicyclist volume	<ul style="list-style-type: none"> Calculate the number of pedestrian or bicycle trips per a certain size of population within the municipality or an area within the municipality Understand patterns of pedestrian and cyclist peak periods versus low volume periods 	<i>Automated pedestrian and cyclist counters</i>
Population	<ul style="list-style-type: none"> Calculate the crash rate for a certain size of population (e.g., per 10,000 people), for different modes of transport Calculate the rate of pedestrian and bicycle trips for a certain size of population within the municipality or an area within the municipality 	<i>BC Stats demographic data for municipalities</i>

Ensuring Safe Roadways



Road Safety Audits

A road safety audit is an independent review of a proposed or planned road, intersection, or other piece of roadway infrastructure. The purpose of a road safety audit is to identify and resolve potential road safety hazards within a road or intersection design that could lead to serious crashes. This is done by systematically checking the safety of road transportation projects, based on sound road safety engineering principles and undertaken from the road users' perspectives. A road safety audit is not a check of compliance with design standards or domains.

An effective road safety audit considers the following elements:

- The safety of all road users, including vulnerable road users like pedestrian and cyclists, under all operating conditions;
- Safety issues in adjacent areas that could arise from the planned construction project; and
- Mitigation measures that may eliminate or reduce potential safety problems are considered fully

Resources for Road Safety Audits

In Canada, the guidelines for completing a road safety audit are found in the Transportation Association of Canada's "Canadian Road Safety Audit Guide: A Book in the Canadian Road Safety Engineering Handbook (CRASH), 2001."

Scope of the Audit

An audit preferably encompasses all stages of the development of a new road or piece of roadway infrastructure. An effective road safety audit will include the earliest stages of the proposed project to ensure that potential safety concerns are identified and addressed in a timely manner.

These stages include:

- Planning Stage;
- Preliminary Design Stage;
- Detailed Design Stage; and
- Pre-opening Stage.

To ensure that the road safety audit remains independent and is not compromised by political, operational, and budgetary considerations, it should consider only those matters which have an adverse effect on road safety. For example, a road safety audit should leave aside questions of traffic flow and congestion, except where these may negatively affect safety.

Audit Team

A road safety audit should be carried out by specialist consultants or firms that are qualified and experienced in completing road safety audits. Local road authorities may either keep a list of qualified consultants or firms that can conduct road safety audits, or issue a request for proposals to complete the audit.

In addition to trained consultants, a road safety audit team may include individuals from the following areas:

- Engineering;
- Enforcement;
- Emergency services;
- Transit services;
- Maintenance and public works; and
- Bicycle and pedestrian advocacy groups.

Insurance Corporation of British Columbia (ICBC) Road Improvement Program

To promote the widespread use of design-stage road safety audits at the local municipal level, ICBC operates the Municipal Road Safety Audit Program as a part of its Road Improvement Program. Audits are conducted by members of ICBC's Road Safety Audit Team at no cost to municipalities that successfully apply for them.

The types of projects audited by the ICBC Road Improvement program include:

- New road construction projects;
- Development-driven projects;
- Major reconstruction projects;
- Widening projects;
- Traffic calming projects; and
- Rehabilitation and retrofit projects.

In-Service Road Safety Reviews

In-service road safety reviews are detailed engineering studies of existing roadway infrastructure. The purpose of these reviews is to identify cost-effective measures to improve road safety for all road users.

The reviews are conducted after the roadway has been in use and there is safety for a long enough period that there is operational data available to inform the review. This is the key difference between road safety audits (page 17), as an audit is completed during various stages of the planning, design, and construction of a roadway.



Conducting In-service Road Safety Reviews

In-service road safety reviews follow a systematic method to evaluate numerous characteristics of a specific location. Each of these evaluations includes detailed information about the features of the roadway that may be contributing to crash risk.

The in-service road safety review should include the following elements:

- **Physical characteristics:** the review should assess the design, geometry, and condition of a specific location. Relevant factors that should be assessed include:
 - ◆ *Appropriateness of type of traffic control (e.g., signalized intersection, four-way stop, etc.);*
 - ◆ *Sight distances;*
 - ◆ *Horizontal and vertical curves;*
 - ◆ *Grade;*
 - ◆ *Adequacy and condition of pedestrian facilities;*
 - ◆ *Road surface conditions;*
 - ◆ *Roadside furniture;*
 - ◆ *Drainage;*
 - ◆ *Lighting; and*
 - ◆ *Other factors as appropriate.*

- **Traffic characteristics:** the review should also describe traffic patterns and characteristics, including:
 - ◆ *Vehicle volumes;*
 - ◆ *Queuing patterns;*
 - ◆ *Delays;*
 - ◆ *Vehicle speeds;*
 - ◆ *Effect of on-street parking;*
 - ◆ *Road user composition (e.g., volume of pedestrians, cyclists, children, heavy vehicles, etc.); and*
 - ◆ *Other factors as appropriate.*



Traffic Conflict Analysis

Traditional road safety analysis has often depended on the use of recorded crashes. However, the sole reliance on crash data for safety analysis has a major shortcoming, which is that it leads to a reactive approach to addressing road safety problems.

A complementary and more proactive approach that is coming into favour is to record and analyze “traffic conflicts” which are defined as “observable situations in which two or more road users approach each other in space and time to such an extent that there is a risk of collision if their movements remained unchanged”. Traffic conflict analysis involves observing, recording, and evaluating the frequency and severity of traffic conflicts at a location by a team of trained observers. The purpose of the analysis is to investigate the relationship between road user manoeuvres and the road characteristics in detail.

Traffic conflicts happen more frequently than crashes, allowing for sufficient data to be collected more quickly. Before-and-after safety studies based on traffic conflicts can therefore be conducted over shorter periods than would otherwise be the case. In addition, this approach can help prevent more deaths, injuries, and property damages because traffic conflicts most often do not result in a crash.

However, this method has some shortcomings, including the cost of training observers, guaranteeing accuracy of observations, identifying conflicts, and being able to collect conflict data for an adequate period of time.

Another method of conflict analysis involves the automation of traffic conflict observation using video data. In recent years, computer vision software has been developed to perform automated traffic conflict analysis and measure traffic conflicts accurately. Within British Columbia, the University of British Columbia (UBC) works with computer programs and software that conduct automated conflict analysis.

Resources for In-service Road Safety Reviews

In Canada, the guidelines for in-service road safety reviews are set out in the Transportation Association of Canada’s document entitled “Canadian Guide to In Service Safety Reviews: A Book in the Canadian Road Safety Engineering Handbook (CRaSH), 2004.” This document is a practical guide for conducting reviews on existing roads, based on current experience in Canada and internationally. This publication provides guidelines on how to upgrade the operational and physical characteristics of existing roads to be more compatible with current safety knowledge.

Examples of In-service Road Safety Reviews

Below are some examples of in-service road safety reviews that are publicly available:

- In-service safety reviews report for five intersections in the City of Kamloops, British Columbia, entitled [*Safer City Initiative: Intersection Safety Master Plan Kamloops, British Columbia*](#).

Heavy Vehicle Safety

Many communities in British Columbia experience road safety problems related to commercial vehicles, with heavy vehicles being a particularly strong concern.



Heavy Vehicle Safety Considerations for Road Geometric Design and Traffic Operations

A crash involving a heavy vehicle is more likely to be severe due to the vehicle's larger size and mass. Heavy vehicles also have physical characteristics that introduce particular challenges. Trucks are wider and longer and need more space to turn than passenger cars. They more easily encroach on adjacent travel lanes, shoulders, and occasionally on sidewalks when executing right-turns. Therefore, adequate roadway design is important to accommodate them, especially at intersections, roundabouts, and curves. Some roadway designs may be considered in order to safely accommodate heavy vehicles, such as auxiliary turn lanes, mountable truck aprons in roundabouts, and truck bypass lanes.

The operating characteristics of heavy vehicles are also different from passenger cars, which may affect traffic operations. From a stopped position, trucks accelerate significantly slower than passenger cars and require a longer time to brake. Truck deceleration may also require additional braking distance, especially on downhill slopes.

Designating Heavy Vehicle Routes

Local road authorities can designate routes that truck drivers can use when travelling through or within a municipality. A truck route restricts heavy vehicle traffic to certain roads, circumstances, and/or times of day.

The purpose of the heavy vehicle route is to designate a series of roads that:

- Provide adequate roadway design features to accommodate heavy vehicles;
- Have sufficient capacity for the anticipated volume, size, and weight of vehicles; and
- Support local and regional businesses.

An effective heavy vehicle route will:

- Help trucks avoid inappropriate residential streets;
- Reduce traffic congestion throughout the municipality and the region; and
- Provide benefits to the municipality's economy.

Route Planning with Relevant Stakeholders

Heavy vehicle traffic is an issue that affects a wide range of stakeholders and community members, and it is important to conduct Community Consultations (page 32) and Community Engagement activities (page 36) when planning a route.

Designating Heavy Vehicle Routes continued

All relevant stakeholders should be involved in consultation and engagement, including:

- Local trucking businesses;
- Businesses that rely directly on deliveries by heavy trucks;
- Law enforcement;
- Emergency management;
- Interest groups;
- The Ministry of Transportation and Infrastructure;
- School officials;
- Public works officials; and
- Other stakeholders, where relevant.

Trucking, by its nature, is a region-wide and inter-jurisdictional issue. Each local road authority should therefore consider working cooperatively with nearby municipalities to identify common problems and ensure consistency of bylaws and route characteristics that address these problems.

Planning a Heavy Vehicle Route

Planning a safe heavy vehicle route begins with a clear definition of the safety problem, and ends with the development of a workable solution. In developing the plan, local road authorities may consider forming a planning committee responsible for this task.

The committee should work to identify the network of roadway segments where trucks typically travel, and determine which segments do and do not have safety problems.

Following from this, an inventory of roadway characteristics could be developed to help determine which roadways can safely serve as heavy vehicle routes. Important roadway characteristics to consider are:

- Adjacent land uses, including locations of schools;
- Roadway classification or type;
- Roads with special constraints;
- Bridge locations;
- Steepness of the roads;
- Number of lanes; and
- Traffic volumes at different times of day.

Planning efforts should also anticipate future development and access needs. With this inventory, local road authorities will have a basis for identifying a series of roads that are safe for heavy vehicles, and which provide an adequate degree of connectedness.

Communicating the Heavy Vehicle Route

It is essential that a local road authority's heavy vehicle route is effectively communicated to trucking companies and drivers.

This can be achieved in the following ways:

■ Signage

- ◆ *Appropriate signage using a consistent and identifiable format;*
- ◆ *Signage that provides more comprehensive information, rather than simple directional signs; and*
- ◆ *Highly readable and well-positioned road signs (see Module 1 – Protecting People Walking and Cycling) with adequate levels of reflectivity.*

■ Outreach and Education

- ◆ *Publish informative brochures and maps, both online and in print; and*
- ◆ *Distribute these materials to local trucking companies, businesses, and truck rest stops in the area.*

An effective heavy vehicle route relies on widespread knowledge about the route. Local businesses and other services that regularly interact with heavy vehicle drivers, such as gas stations, are important for transferring route knowledge to the drivers.

Heavy Vehicle Bylaws

Enforcement is necessary to ensure heavy vehicles drivers use only the designated routes. Local road authorities should enact a bylaw that restricts heavy vehicle traffic to these routes.

Elements of the bylaw should include the following:

- Definition of the types of vehicles to which the bylaw applies, based on weight and dimensions;
- The types of trips that are affected by the bylaw;
- A definition of “heavy vehicle route” and its purpose; and
- All streets and times of day where the bylaw applies.

For an example of a heavy vehicle bylaw, refer to the [City of Chilliwack's Highway and Traffic Bylaw](#).

Other Possible Considerations

- Some municipalities, for example the City of Burnaby, require trucking companies to apply for oversize load permits if a vehicle exceeds certain dimensions or characteristics;
- Local road authorities should ensure they have clear guidelines about the types of trucks allowed on city streets of various types;
- Local road authorities may also consider restricting heavy vehicle traffic on certain roads to off-peak hours; and
- To improve the spread of information on heavy vehicle routes, local road authorities in a cluster of municipalities can consolidate information and website links about their routes in a single document.

For an example, see [TransLink's Keeping Metro Vancouver Moving Truck Route Reference Guide November 2009](#).

Communication, Consultation, and Engagement



Developing a Communications Plan

A Communications Plan details the overall approach to communications and identifies the activities required to establish and maintain an ongoing relationship with a road safety project's stakeholders. From this plan, specific communications activities will be developed throughout the course of the project.

Principles for a Communications Plan

Some common principles for developing a Communications Plan include:

- **Tailoring:** tailor the messages, timing, and identify the best medium for each audience;
- **Clarity:** craft clear, consistent, and compelling messages. A common mistake is to attempt to include too many messages, which leaves the receiver unclear about the purpose of the message;
- **Get feedback:** before implementing the Communications Plan, test the message through focus-groups, obtain feedback from stakeholders, and integrate their feedback when possible; and
- **Monitoring and Evaluation:** measure the response and ensure the message has been received by the target audience.

Details of a Communications Plan

The details to be set out in a Communications Plan include:

Project Background and Situational Analysis

- The project location, history and rationale, schedule, and project personnel.

Key Community and Communication Issues and/or Opportunities

- The likely obstacles and resources that will be encountered in communication activities.

Objectives

- Outlines the specifics of what the Communications Plan aims to achieve.

Key Target Groups/Stakeholders

- All priority audiences; and
- The key influencers for the project.

Communication Strategy

- The overall communication approach for this project; and
- The guiding communication principles.

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Details of a Communications Plan continued

Key Messages

- The primary key messages for this project. These could be:
 - ◆ *Information to drivers of a specific road construction project;*
 - ◆ *Advice to drivers and other road users to adjust and adapt their commute in response to a road project;*
 - ◆ *A message focused on specific road user behaviour, such as “put the phone away”, or “wear a helmet”; or*
 - ◆ *Encourage cyclists and drivers to share the road with one another;*
- Secondary messages relevant to the project; and
- Any requirements to tailor the messages for specific audiences.

Communication Tools and Tactics

- The key communication activities proposed for this project (e.g., media relations, stakeholder relations/consultation, events, advertising, website, and internal communications);
- Required support materials (e.g., fact sheets, question and answer sheets, video footage, etc.);
- The individual or team responsible for developing and implementing communication activities;
- Timelines; and
- How the results of the Communications Plan be monitored and evaluated.

Budget

- The expected total cost of planned communication activities; and
- Funding sources for the project.



Methods for Communicating Project Information

During the development of the Communications Plan, local road authorities should carefully consider how a project will be communicated to the stakeholders. There are many methods for effective communication but consideration must be given to the balance between the priority for certain stakeholders and groups to receive information and the overall consultation resources, including budgetary resources.

Some common communication methods, along with their advantages and relevant considerations are shown in the following table:

Method	Advantages	Considerations
Brochures and fact sheets	<ul style="list-style-type: none"> Can reach a large audience with detailed information about the project 	<p><i>Must have good distribution networks to get to the target audience</i></p>
Newspaper advertisements	<ul style="list-style-type: none"> Can reach large target audiences with detailed information Can be used to ask for feedback from the public 	<ul style="list-style-type: none"> ◆ Can be costly ◆ Some groups, such as younger people, have low readership of papers
Websites	<ul style="list-style-type: none"> Wide usage by some target groups. Information is highly accessible Saves on costs of printing 	<p><i>Some users will not have access</i></p>
Television	<ul style="list-style-type: none"> Very large audience. Good visual and audio techniques for explaining technical information 	<ul style="list-style-type: none"> ◆ High-cost ◆ Some groups may have low rates of viewership
Radio	<ul style="list-style-type: none"> Good for targeting drivers while driving 	<p><i>Only suitable for short messages</i></p>
Meetings	<ul style="list-style-type: none"> Excellent for obtaining feedback from stakeholders 	<p><i>May be time consuming, putting constraints on resources and acting as a barrier for some individuals to participate</i></p>
Workshops	<ul style="list-style-type: none"> Very good for feedback from stakeholders and public Detailed information can be provided to attendees 	<p><i>Challenge is getting key people/groups to attend</i></p>
Email lists	<ul style="list-style-type: none"> Low cost and can be effective if mailing list is accurate 	<p><i>No guarantee the information will be read</i></p>
Frequently Asked Questions	<ul style="list-style-type: none"> A question /answer format provides an easy-to-read document that can be used by project staff for answering questions from stakeholders and the public 	<p><i>Must have good distribution networks to get to target audience</i></p>

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Stakeholders

All local road authorities have a diverse range of stakeholders, which could include:

- Elected officials;
- Ministry of Transportation and Infrastructure;
- Local police;
- Royal Canadian Mounted Police (RCMP);
- School districts;
- Municipal public works;
- Municipal urban planning department;
- Groups for people with disabilities;
- Religious groups;
- Businesses;
- Media;
- Community groups;
- Road user groups (e.g., cyclists); and
- Commercial vehicle/public transport operators.

A starting point for the planning process is identifying of key stakeholders and decision makers and their potential concerns. What will be the issues that will affect them the most? What issues will be the most controversial?

In the example below of stakeholders and issue identification, the stakeholders and their issues have been identified in the planning process to help in preparing for the stakeholder consultation phase.

Stakeholder	Geographic Area of Interest	Level of Issues	Issue
Businesses	<ul style="list-style-type: none">■ Retail area	◆ High	Road works and footpath works will affect customer access
Schools	<ul style="list-style-type: none">■ Road to which the school has frontage	◆ Medium	School vehicle parking access will be closed in June
Hospital	<ul style="list-style-type: none">■ Roads which provide access to the hospital	◆ Low	Side entrance will have limited access
Police	<ul style="list-style-type: none">■ City area	◆ High	Major traffic disruption to 3 key intersections

Anticipating Potential Issues of a Communications Plan

To assist with the project's issue identification, consider the following questions:

- What is the probable level of difficulty in addressing the problems/issues?
- How important are the potential impacts to the public?
- What is the potential for public outrage related to the project?
- How much do major stakeholders care about the problem/opportunity to be addressed and the decision to be made?
- What degree of participation does the public appear to want?

Local knowledge is powerful and the stakeholders can help identify issues and solutions at an early stage in the project planning. It is, therefore, important to:

- Conduct interviews with stakeholders who represent a range of anticipated perspectives to determine how they perceive the issue;
- Determine if any potentially-affected stakeholders are not likely to be represented by an existing group;
- Ask key stakeholders who else they think should be involved; and
- Identify any groups/individuals that may be difficult to reach and strive for inclusive participation, for example those impeded by language barriers.



Community Consultation

Communities in British Columbia are made up of diverse groups, each with their own lifestyles and needs. Roadway construction projects and road safety initiatives may impact these groups in various ways. Community consultation enhances decision-making by giving all groups and stakeholders an opportunity to express their perspectives, which will help in identifying critical issues early-on and in promoting a better understanding of the project. Consultation also helps form a more balanced understanding of challenges and opportunities that may arise because of a project.



Adopting a Community Consultation Policy

As a first step to community consultation, it is recommended that the local road authority adopt a Community Consultation Policy, stating that community consultation and engagement will be undertaken for all significant projects or initiatives which may affect local communities and stakeholders.

By adopting a Community Consultation Policy, the municipality shows a commitment to seeking the views, opinions and knowledge of the community and stakeholders to guide decision-making.

The basic steps outlined in the policy include:

- 1 Informing:** making sure that those affected by a project are aware of the facts;
- 2 Consulting:** collecting input, feedback, or advice before any part of the project or decision is pursued; and
- 3 Engagement:** collaborating with either specific stakeholder groups or the community to work out what needs to be done and to develop solutions and appropriate actions.

The policy should contain the principles which the municipality will adopt in the consultation process.

Common principles include:

- **Integrity:** be open and honest about the scope and purpose of the work;
- **Inclusion:** seek a diverse range of perspectives and address barriers to people's participation, in particular barriers for those who are disadvantaged, hard to reach, or have special needs;
- **Deliberation:** ensure sufficient and credible information is available to allow people to discuss choices, and ensure there is adequate space and time for people to consider options and decisions; and
- **Influence:** communities and stakeholders should have a say in how they participate. Policies and services should reflect the stakeholders' involvement. Their impact on the project should be apparent.

Planning for the consultation, including budget and timeline constraints, must be factored in for the length of the project. Planning must also take into account how to communicate and provide feedback, how to ensure each stakeholder or community group will be informed of the process, and how to measure outcomes and actions.



A Framework for Community Consultation

After adopting a Community Consultation Policy, the community consultation framework should take a phased approach.

The phases of an effective community consultation process are:

■ Phase 1: Planning

- ◆ *Identify key decision makers;*
- ◆ *List objectives and required outcomes;*
- ◆ *Determine key stakeholders and community groups; and*
- ◆ *Seek and obtain preliminary information from the community or stakeholders to assist with developing the project.*

■ Phase 2: Develop a Communications Plan (page 27)

- ◆ *Identify and describe the key activities required to establish and maintain relationships with the project's stakeholders;*
- ◆ *Develop a formal method for obtaining and reviewing feedback; and*
- ◆ *Develop measurable objectives and schedules.*

■ Phase 3: Launch

- ◆ *Conduct a high-profile media launch to provide the project with valuable media coverage and help provide further information to the community and stakeholders;*
- ◆ *To enhance coverage, plan for the use of numerous communication tools, including:*
 - *A news release to ensure the media get the detail of the project correct;*
 - *A Question and Answer Sheet to assist members of the media in asking insightful questions; and*
 - *Create either a static or dynamic display with attractive visuals to give the proposed project more exposure and attention.*

■ Phase 4: Implement Communications Plan

- ◆ *Hold workshops with key stakeholders to gather perspectives, identify issues and concerns, and cultivate a unified understanding of the project;*
- ◆ *Run advertisements about the project in local newspapers. The advertisements should invite feedback from the public; and*
- ◆ *Mail leaflets or conduct a mailbox drop to businesses and residents in the affected areas inviting them to workshops and other planned activities. Ensure there is time and resources set aside to gather and record their feedback.*

Phase 5: Monitor and Evaluate

- ◆ *Conduct interviews with stakeholders on their opinions of the communication activities; and*
- ◆ *Collect information on the level of exposure of the project within the community (e.g., website hits, feedback forms from the public, or amount of media coverage the project received).*

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Example

An example of a community consultation would be conducting a survey of schools within an area to obtain student travel information to assist with developing a comprehensive school road safety plan. The local road authority informs the school principal and staff about the proposed project and seeks initial feedback.

Resources to conduct the survey may include:

- The school's support in completing the survey, using students to collect the information;
- Support from high school or local college or university students to conduct the survey; and
- Local government resources in the form of funding or assistance with distributing and collecting surveys. Local community centres may be a location for this activity.

A school-based survey could include the following data collection:

- Number of students at the school;
- Number of students using different modes of travel to and from school (e.g., public transit, car, walking, cycling);
- Locations of students' homes;
- Parking areas in and around schools;
- The design and layout of accesses and exits at drop off/pick up zones;
- Traffic volumes on roads in the school vicinity;
- Number and locations of local crossings and crossing guards;
- Numbers of students (and others) using the existing crossings;
- Key locations around the schools where pedestrians cross; and
- A map of surrounding speed limit zones.



Community Engagement

Community engagement encompasses a wide variety of activities designed to develop and enhance public participation in improving road safety. Community engagement can help create a sense of community ownership of road safety solutions, a desire to be involved in decision-making, capacity-building, and an awareness of how personal behaviour affects road safety.

Selecting the appropriate level of community participation is important. The table below shows the various levels of engagement and their corresponding aims and methods:

	Inform	Consult	Engage
Aim	<ul style="list-style-type: none"> One way communication about project 	Actively seek feedback and opinions	<i>Engage stakeholders and individuals in supporting project</i>
Methods	<ul style="list-style-type: none"> Newspaper advertisement, flyer, website 	Meetings, seek public feedback in newspaper	<i>Workshops, stakeholders distributing materials</i>

All engagement activities should inform the community about road safety issues and possible solutions. Almost all engagement activities will have some level of consultation, and most will include active participation and engagement with stakeholders.

Each community engagement project is different and a starting point for the planning process is identifying key stakeholders and decision-makers and their possible concerns. What will be the issues that will affect them the most? What issues will be the most controversial?



B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Examples

Speed Watch volunteers monitor speeds throughout the area by using portable radar equipment and electronic signboards. The Insurance Corporation of British Columbia (ICBC) sponsors and supports the program. The information gathered by volunteers is used to determine if an area requires additional enforcement

The Speed Watch Program also assists in addressing specific traffic problems through:

- Increased awareness by law enforcement;
 - Public and community education;
 - Neighbourhood action; and
 - Traffic calming measures.
- Speed Watch is a proactive solution to improve the safety and quality of life for everyone in the community.

Speed Watch is a proactive solution to improve the safety and quality of life for everyone in the community.

Cell Watch

Cell Watch is an educational initiative aimed at reducing distracted driving in communities throughout British Columbia. Working together with ICBC road safety team and police, volunteers set up “Leave the Phone Alone” sandwich boards and conduct road-side observations of drivers and their behaviours. Information is used to help ICBC and police better understand the issue at a local level and to develop initiatives to reduce distracted driving.

The following link provides additional information on both the Speed Watch and the Cell Watch programs:

[Speed Watch and the Cell Watch](#)

Pace Car

The Pace Car program is a locally delivered, nation-wide program that focuses on raising awareness around speed reduction in the community, especially in school zones and areas with dense pedestrian traffic. The Pace Car program involves seeking out community members to sign up as Pace Car drivers. Participants will sign the Pace Car Supporters Pledge and proudly display the official Pace Car emblems on their car window.

The following link provides information about the Pace Car Program managed by Parachute, which is a not-for-profit organization that works to reduce preventable injuries:

[Pace Car](#)

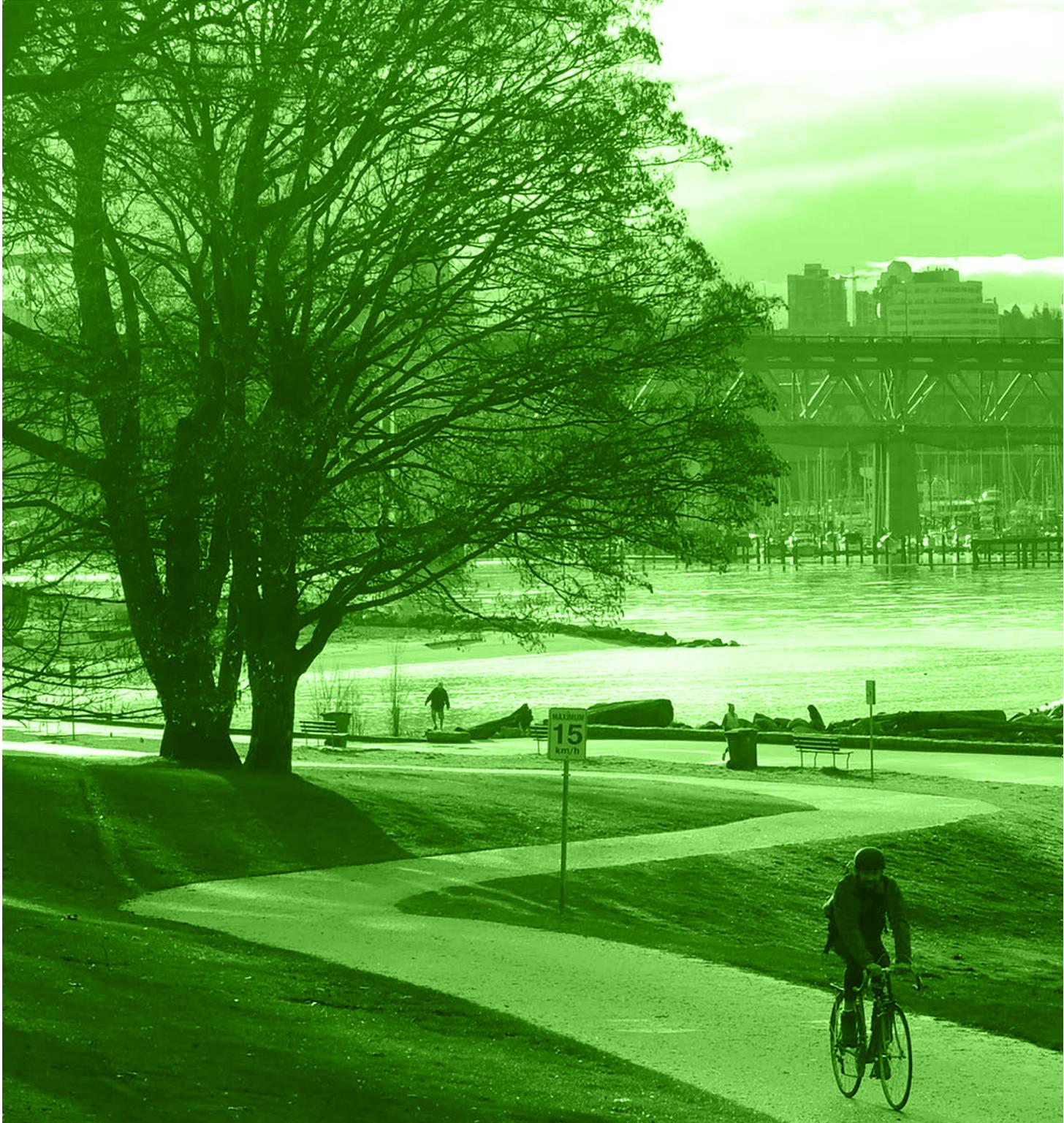
Campaign 911

Campaign 911 is a Canada-wide campaign to encourage and empower the Canadian public to report suspected impaired driving by calling 911. Impaired driving is the number one criminal cause of death in Canada, and yet, every impaired driving crash is preventable. By calling 911 and reporting suspected impaired drivers to police, all Canadians can play a role in keeping our roads and waterways safe.

The following link to Mothers Against Drunk Driving (MADD), a not-for-profit organization seeking to stop impaired driving, provides information on Campaign 911:

[Campaign 911](#)

Funding and Cost-saving



B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Funding Sources

The 2015 BC Communities Road Safety Survey indicated that municipalities were highly interested in identifying funding resources.

The following list is based on a review of web-based information for relevant funding sources available to British Columbia municipalities at the Federal, Provincial, and Regional levels. Web-links are provided for each funding program along with a brief description.

The type and amount of funding indicated was based on the information provided at the time that this module was created. Readers are encouraged to check the validity of the information and whether program funding is still available by contacting the funding source directly, as it is likely that program details will occasionally change.

National Level

Funding Agency	Program Name	Program Details
Federal Government	<ul style="list-style-type: none"> Gas Tax Fund 	<i>\$2.1 billion Annual Fund across Canada. BC allocation is approximately \$266 million (estimated for 2017-2018). Provided to municipalities to support a broad range of local infrastructure projects including bridges, road improvements, transit, and active transport.</i>
Federal Government	<ul style="list-style-type: none"> New Building Canada Fund – Small Communities 	<i>\$10 billion fund (over 10 years) across Canada and includes \$1 billion over 10 years for small communities less than 100,000 population. \$109 million allocated in 2016 to BC. The program is administered by the BC Ministry of Transportation and Infrastructure. Provided to municipal/regional or provincial agencies to support a broad range of infrastructure projects including highways and major roads and transit-related improvements.</i>
Federation of Canadian Municipalities (FCM)	<ul style="list-style-type: none"> Related to above-noted Federal program 	<i>An advocate group of member municipalities across Canada that advances the local interests and federal funding program applications of municipalities.</i>

Provincial Level

Funding Agency	Program Name	Program Details
Ministry of Transportation and Infrastructure	<ul style="list-style-type: none"> Community Safety Enhancement Cycling Infrastructure Fund 	<i>\$5 million funding in 2016 from the British Columbia Government towards pedestrian, cyclist, and motorcyclist safety-related improvements on provincial highways and roads in communities across British Columbia.</i>
Insurance Corporation of British Columbia (ICBC)	<ul style="list-style-type: none"> ICBC Road Improvement Program 	<i>\$8 million funding in 2016 for an annual program provided to the municipalities across British Columbia towards road safety-related projects and safety studies.</i>

Integrating Safety into the Planning of New Developments

As communities in British Columbia continue to develop and grow, road system safety can be improved by ensuring road safety considerations are included into the design and planning of future developments.

This may be done in the following ways:

- 1 Applying safety improvements to address roadway “blackspots” (i.e., crash-prone locations) after safety problems have been identified;
- 2 Introducing multi-disciplinary programs (i.e., integrating engineering, enforcement, and education activities); and
- 3 Including road safety as a key aspect of decision-making when considering and evaluating potential road construction projects.



Safety-conscious Planning

Local road authorities may consider adopting the practice of “Safety-conscious Planning” when pursuing all new developments. The purpose of safety-conscious planning is to place road safety considerations at the core of transport planning.

The basic principles of safety-conscious planning are to:

- 1** Reduce the potential for crashes by reducing motor vehicle travel;
- 2** Reduce the risk of crashes occurring for travel that does take place; and
- 3** Reduce the consequences for crashes that do occur by reducing vehicle speeds.

There is no single activity that will achieve the desired level of safety in a road network.

Any long-term road safety strategy should therefore adopt a comprehensive approach that considers:

1 All stages of infrastructure delivery, including:

- ◆ *Planning;*
- ◆ *Design;*
- ◆ *Construction;*
- ◆ *Operations;*
- ◆ *Rehabilitation; and*
- ◆ *Maintenance.*

2 All subject areas, including:

- ◆ *Land use;*
- ◆ *Network planning;*
- ◆ *Road form;*
- ◆ *Intersections;*
- ◆ *Access management (see Module 1 – Protecting People Walking and Cycling); and*
- ◆ *Vulnerable non-motorized road users (i.e., pedestrians and cyclists).*

3 All levels of activity;

- ◆ *City-wide transportation plan; and*
- ◆ *Local area/neighbourhood road safety efforts.*

Safety-conscious Planning continued

The Netherlands Sustainable Safety Program recommends the following goals for satisfying the safety-conscious principles identified above. Many of the roadway designs in Module 1 – Protecting People Walking and Cycling and Module 2 – Safe Roadway Designs to Protect All Road Users of the BC Community Road Safety Toolkit can help to achieve these goals, which are summarized in the following table:

Minimize exposure to risk by:
<ul style="list-style-type: none">▪ Reducing the number of motor vehicle trips and promoting the safety of walking and cycling; and▪ Reducing the need to travel or reducing travel distance through, for example, promoting compact urban development.
If exposed, minimize the risk of having a crash through improving:
Functionality
<ul style="list-style-type: none">▪ Establish a functional road hierarchy (e.g., arterial roads are used for higher-speed through-trips, local roads are used only for lower-speed access-travel, and collector roads only facilitate safe movement between the arterial and local roads); and▪ Provide appropriate roadway design features to ensure each road functions as was intended.
Homogeneity:
<ul style="list-style-type: none">▪ Achieve homogeneity of traffic patterns such that travel modes are separated according to speed, mass, and direction by:<ul style="list-style-type: none">◆ <i>Separating different types of road users through space and time; and</i>◆ <i>Limit the intensity of conflicting movements.</i>
Predictability and Simplicity:
<ul style="list-style-type: none">▪ Improve the predictability of the driving task by eliminating unexpected hazards and occurrences, and by providing visual cues to drivers of what behavior is expected of them (e.g., lower speeds) through self-enforcing design features;▪ Simplify the road environment by:<ul style="list-style-type: none">◆ <i>Managing and reducing on-street parking, especially on busy streets with public transit and/or bicycle routes; and</i>◆ <i>Introducing effective access management policies to reduce high-risk left-turn maneuvers (see Module 2 – Safe Roadway Designs to Protect All Road Users) and/or sudden mid-block stops;</i>▪ Apply consistent signing, geometric standards (see Module 2 – Safe Roadway Designs to Protect All Road Users), and speed management techniques by:<ul style="list-style-type: none">◆ <i>Providing adequate visibility and sight lines to assist road users in the driving task; and</i>◆ <i>Providing adequate information to road users, including through signage.</i>
If crashes do occur, minimize their consequences through improving:
Forgivingness:
<ul style="list-style-type: none">▪ Promote effective speed management strategies; and▪ Provide efficient emergency response routes.

The BC Official Community Plans

In order to ensure that the above goals are acted upon, it is important to build them into official policy. One possible way of doing this is the BC Official Community Plans (OCP), which are long-term community development plans created by both municipalities and regional districts. An OCP provides the longer term vision for the community and is a statement of objectives and policies to guide decisions on planning and land use management. Local road authorities are encouraged to consider how an OCP can be integrated with other community strategies, including transportation plans, sustainability plans, and waste management plans. This helps communities to plan for sufficient funding in capital, operating, and maintenance budgets to meet explicit safety objectives and targets.

Commitments and strategies for improving road safety and accommodating pedestrians and cyclists should also be explicitly addressed in such plans.

In summary, as development planning decisions have a significant impact on road safety, it becomes critical to better understand these potential impacts in order to ensure that safety becomes an explicit planning consideration for all land use and transportation planners, and their associated projects.



Cost and Space-saving Measures

The BC Road Safety Strategy promotes the concept of “sustainable road safety”, which holds that all road safety partners must work to improve road safety in ways that are efficient, sustainable, and make use of existing resources where possible. Sustainable road safety can help local road authorities to overcome budgetary limits.

There are a variety of cost-saving strategies that can enable more safety improvements to be implemented. These measures may include one or more of the following policies:

- Space saving strategies;
- Interim designs; and
- Integration with other projects (i.e., “piggybacking”).



Space Saving Measures

On existing roads, space saving measures including road diets (see Module 1 – Protecting People Walking and Cycling), narrowed motor vehicle lanes, and reducing on-street parking (see Module 2 – Safe Roadway Designs to Protect All Road Users), can help enable improvements such as protected and connected bicycle lanes and wider and connected sidewalks. On new roads, the same strategies can be implemented from the very beginning of design and construction.

“Piggybacking” – Integrating Road Safety Improvements into Utility, Maintenance, and Upgrade Projects

In the context of road safety, piggybacking refers to integrating road safety improvements either into new construction projects for roads, intersections, and other infrastructure, or into routine maintenance or upgrade-projects. Construction, maintenance, and refurbishment projects provide opportunities to implement road safety projects more cost-effectively because time and financial resources are already being invested into the basic work of deconstruction, purchasing of new building materials, and rebuilding. Piggybacking is not a substitute for more proactive road safety improvements, but rather an approach for making the greatest use of new opportunities.

It is important to adopt policies to ensure that this strategy is integrated with longer-range planning and budget processes. This will help ensure that the necessary staff and funding is made available to make these improvements.

Interim Design Strategies

Another approach to creating road safety change and improvements in a shorter amount of time and with fewer resources is to adopt interim design strategies. This involves using low-cost materials and temporary structures in advance of the full implementation of improved roadway designs. For example, interim sidewalk extensions or bicycle lanes can be created using planters, bollards, or portable metal railings.

Using interim designs also has other advantages, including:

- Allowing local road authorities to test and optimize the placement and design of various measures, for example traffic calming designs, reduced crossing distances for pedestrians and cyclists, diversion of motor vehicle traffic from residential roads (see Module 1 – Protecting People Walking and Cycling), and smaller corner radii (see Module 2 – Safe Roadway Designs to Protect All Road Users);
- Facilitating Community Consultations (page 31) and greater Community Engagement (page 36) by allowing local residents to experience the envisioned roadway designs themselves, and to provide them with an opportunity to give feedback prior to the permanent construction; and
- Gaining “quick wins” that people can see by implementing road safety measures rapidly.

Interim measures may not be as durable as permanent constructions, and therefore on-going monitoring and maintenance is required to ensure that any deterioration does not become a hazard.

Interim Design Strategies continued

Some possible scenarios to be aware of are:

- Wooden or plastic posts may break, leaving only the base which can be a tripping hazard or a hazard to cyclists. The bases of posts should be white or yellow to increase their visibility at night; and
- Planters or jersey barriers can fall or be accidentally moved into sidewalks, bicycle lanes, or traffic lanes. They should be white or yellow and have high visibility markings on them.

It is important to ensure that interim measures do not become a substitute for permanent measures, as permanent structures will still offer the greatest degree of protection.

Developer Requirements and Incentives

It is possible to require that developers install public infrastructure such as adequate sidewalks, multi-use paths, bicycle parking, safe parking lot designs for pedestrians and cyclists (*see Module 1 – Protecting People Walking and Cycling*), and other measures as part of a new development. Encouraging developers to place greater emphasis on pedestrian and cyclist needs and safety may also increase the attractiveness of the developments themselves.

Additional Resources

- [Bicycle Safety Guide Implementation and Countermeasures Selection System](#)

Funding Agency	Program Name	Program Details
TransLink	<ul style="list-style-type: none"> ■ Major Road Network and Bicycle Improvements ■ Major Road Network- Operations/ Maintenance and Rehab Funding 	<ul style="list-style-type: none"> ◆ In 2015 TransLink provided \$6.3 million to municipalities for road, pedestrian, and cycling facilities improvements ◆ In 2015, approximately \$41 million of funding was provided to municipalities towards pothole replacement, repaving, traffic signal, street light and sign maintenance, snow removal, and street clearing
Northern Development Initiative Trust	<ul style="list-style-type: none"> ■ ICBC Road Improvement Program 	<p>This program provides grant and loan funding for municipalities, regional districts, First Nations communities, and registered non-profit organizations to support the construction of infrastructure throughout the region that directly diversifies the economy. Two programs may be relevant towards municipal road safety type improvements.</p> <ul style="list-style-type: none"> ◆ Economic Development Capacity Building – up to \$50,000 toward eligible projects; and ◆ Economic Diversification Infrastructure – up to \$250,000 toward eligible projects.
BCTransit	<ul style="list-style-type: none"> ■ Corporate Infrastructure Initiatives 	<p>Economic Development Capacity Building funding is provided annually to support public transit-related improvements in municipalities throughout British Columbia. In 2016, transit shelter installation cost sharing was being considered based on a 68.3% municipal share in Victoria and 53.3% elsewhere in the province.</p>

Promoting Active Transport



Safe Routes to Schools

With busy lifestyles and fears over safety, the number of students who get driven to school has increased over the years. Implementing safe routes to schools has the possibility to reverse this trend.

Safe routes to schools aim to increase the number of students using active transport to and from school. These routes typically include a number of roadway improvements combined with community and school projects to give students the skills to safely walk or cycle to school.

Walking and biking to school improves health outcomes, personal and social development, and provides cleaner air for the entire community. Having more physical activity prior to the start of school can also improve classroom dynamics and educational outcomes by improving students' concentration.

Who is Involved in Creating Safe Routes to Schools?

The implementation of safe routes to schools is ideally led by a diverse group that includes municipal governments, local health and transportation authorities, police, school districts and school staff representatives with decision making abilities, and parent advisory committee members. Including local government elected officials in these discussions helps to raise the program's profile, broadens understanding of the issues impeding students from using active transport, and ultimately supports funding requests towards the implementation of these programs.

Safe Infrastructure

The starting point is to identify the real and perceived problems along the various routes to school. Schools and local road authorities may begin by identifying busy roads with few safe places to cross, streets without sidewalks, and routes that are not suitable for cycling due to heavy motor vehicle traffic and lack of safe cycling facilities. These problems can be addressed with new infrastructure, including many of the measures contained in Module 1 – Protecting People Walking and Cycling and Module 2 – Safe Roadway Designs to Protect All Road Users of the BC Community Road Safety Toolkit. These improvements may be phased in over a number of years to suit the available budget:

Some possible measures to consider are:

- School Safety Zones around the school with traffic calming measures, reduced speed limits, and improved school zone/area signage;
- Safe crosswalks, and improved crosswalk signage and road markings;
- Raised crossings and in-street yield to pedestrian signs (*see Module 1 – Protecting People Walking and Cycling*) to encourage drivers to yield to young pedestrians;
- Reduced crossing distances for pedestrians and cyclists (*see Module 1 – Protecting People Walking and Cycling*); and
- Wider and connected sidewalks and protected and connected bicycle lanes (*see Module 1 – Protecting People Walking and Cycling*).

Safe Drop-off/Pick-up Zones

Planning safe drop-off/pick-up zones in schools is crucial for implementing safe routes to schools. Parents may be reluctant to allow their children to walk or cycle to school due to traffic congestion and the perceived danger during arrival and dismissal times. This can result in more parents preferring to drive their children to school, thus worsening the cycle of more traffic problems and less walking. Better-organized and safer road traffic conditions will ease parents' concerns and help break this cycle. Each school site is unique, resulting in unique drop off/pick up facilities and operations. An effective drop-off/pick-up zone will employ engineering, enforcement, education, and encouragement strategies.

Other Aspects of Safe Routes to Schools

In addition to improving infrastructure, successful safe routes to school programs may include other initiatives that involve the whole school community.

Some initiatives to consider are:

- A School Travel Plan, which is a living document that actively involves parents, students, and teachers in creating an action plan to improve safety;
- Classroom activities to raise awareness of school travel issues among students and parents, such as projects to be completed at home;
- Adequate and secure bicycle parking (*see Module 1 – Protecting People Walking and Cycling*);
- Pedestrian and cycling training to ensure young people learn the necessary skills to cross and use the road safely. This can be achieved at a relatively low cost through Bicycle Rodeos or by including this training as part of the physical education curriculum;
- Bicycle maintenance clinics to teach students how keep their bicycles roadworthy and safe;
- Volunteer crossing patrols to support students crossing busy roads and complex intersections;
- Walking School Buses or Bike Trains – parents, grandparents, or high school student volunteers share responsibility to lead scheduled 'walking buses' to pick up students along set routes to and from school. This addresses a common parental concern of children walking alone, and encourages social interaction for students; and
- Alterations to the school entrance or bell schedule to allow pedestrians and cyclists to arrive safely away from vehicles.



B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

Additional Resources

Green Communities Canada produced [Canadian School Travel Planning Pilot Test Final Report](#) in March 2010, a report summarizing the results of a Canadian pilot test for safe routes to schools. It identifies key lessons-learned from the pilot test.

The following websites provide practical information, case studies, tools and resources:

- [Safe Routes To School](#)
- [HasteBC](#)
- [British Columbia Automobile Association](#)

The following reports also provide practical information:

- [HasteBC – Bike Safety Toolkit](#)
- [Safe Routes To School – Information for Parents and Schools](#)

The Safe Routes to School National Partnership published a best practices guide for rural communities:

- [Safe Routes To School - Rural Communities: Best Practices and Promising Approaches for Safe Routes: 2015](#)



Accommodating Small-wheeled Transport

Permitting the use of skateboards, longboards, in-line skates, and scooters (henceforth, small-wheeled transport) may pose some dilemmas for local road authorities. On one hand, small-wheeled transport is an accessible form of active transport, which improves personal health and is environmental friendly. On the other hand, small-wheeled transport may pose a safety hazard. On the other hand, this mode of transport is not ideally suited either to sidewalks or to bicycle lanes.

The Motor Vehicle Act (MVA), in British Columbia, prohibits cyclists from riding on the sidewalk, except where they are explicitly authorized to do so, usually through a bylaw. At the same time, the MVA does not prohibit boarders, skaters, or scooter riders from using either the sidewalk or the road. Section 124 of the MVA explicitly allows municipalities to regulate people using skates, boards, and similar modes of transport.



The Problem with Small-wheeled Transport on Roads and Sidewalks

It is difficult to accommodate small-wheeled transport on sidewalks because fast-moving boarders may pose a danger to pedestrians as they attempt to weave around them. Mixing boarders and skaters with cyclists on roads and in cycling lanes, however, can introduce other dangers because boarders and skaters do not have strong brakes that allow them to stop quickly to avoid a crash. In addition, boarders and skaters often weave from side-to-side in order to control their speed – a behaviour that may be difficult for cyclists to predict as they try to pass them.

Managing Small-wheeled Transport through Bylaws

Some municipalities have passed bylaws permitting people to use different forms of small-wheeled transport on sidewalks. For example, the City of Kamloops, British Columbia passed a bylaw permitting people to ride boards, scooters, and in-line skates on sidewalks, provided that they do so without impeding, obstructing, or interfering with pedestrians. The bylaw requires them to behave with consideration of others using the sidewalk or pathway, meaning that they must travel slowly and yield to pedestrians.

The same bylaw designates a series of steep roads and sidewalk segments where small-wheeled transport is prohibited. The bylaw also prohibits small-wheeled transport within the downtown area. Other municipalities may consider limiting small-wheeled transport to relatively flat areas, and to areas that do not have a high volume of pedestrians or vehicles.

Some municipalities, such as the City of North Vancouver, British Columbia have prohibited the use of small-wheeled transport on roads with speed limits of 50 km/h or above, and after sunset and before sunrise. In addition, municipalities may require these road users to wear a helmet and other safety gear, such as kneepads, elbow pads, and wrist guards.

Education

Municipalities may consider educating small-wheeled transport users through workshops or other activities to increase knowledge and awareness. For example, the City of Vancouver, British Columbia in collaboration with a local skateboard shop, hosted a free clinic on safe longboarding techniques for children aged 11 to 16. Municipalities may consider hosting or facilitating safety workshops for both cycling and small-wheeled transport as part of a Safe Routes to School (page 48) initiative.

Additional Resources

The Victoria Transport Policy Institute developed the [Small Wheeled Transport Wheeled Luggage, Skating, Scooters, Hand Carts and Wagons Encyclopedia](#), which provides information on accommodating and facilitating small-wheeled transport.

Appendix A: Additional Resources for Improving Road Safety

This toolkit is not an exhaustive resource. There are other road safety guides that local road authorities can use to supplement or guide the knowledge provided in this toolkit.

Below is a list of good quality knowledge hyperlinked sources for road safety measures and strategies:

Organization	Document/Resource	Description
The National Association of City Transportation Officials (NACTO)	<ul style="list-style-type: none"> ▪ Urban Street Design Guide ▪ Urban Bikeway Design Guide ▪ Transit Street Design Guide 	Three documents providing road safety guidance in urban environments.
The Canadian Council of Motor Transport Administrators (CCMTA)	<ul style="list-style-type: none"> ▪ Countermeasures to Improve Pedestrian Safety in Canada 	A document providing further information on measures that protect pedestrians.
The United States Federal Highway Administration	<ul style="list-style-type: none"> ▪ Pedestrian and Cyclist Safety Guide and Countermeasures Selection Systems 	Further resources for measures and strategies to improve safety for pedestrians and cyclists.
The United States Federal Highway Administration	<ul style="list-style-type: none"> ▪ A Focused Approach to Safety Guidebook 	A toolbox containing technical resources on a wide variety of safety measures.
Austrroads	<ul style="list-style-type: none"> ▪ Road Safety Engineering Toolkit 	An online toolkit allowing users to search for measures that specifically address different crash types, safety deficiencies, and road users.
Austrroads	<ul style="list-style-type: none"> ▪ Achieving Safe System Speeds on Urban Arterial Roads: Compendium of Best Practice 	A document providing information on measures 27 engineering-based treatments for reducing driver speeds on urban arterial roads at intersections and mid-blocks. The document indicates costs and applicability. This document is available for purchase.
The World Resource Institute	<ul style="list-style-type: none"> ▪ Cities Safer by Design: Guidance and Examples to Promote Traffic Safety through Urban and Street Design 	A document focusing on urban design, traffic calming, arterial roads and junctions, pedestrian and public space, safe bicycle infrastructure, and safe transit stations and stops.
The World Health Organization (WHO)	<ul style="list-style-type: none"> ▪ Health Economic Assessment Tool for Pedestrians and Cyclists 	An online calculator allowing users to calculate the economic return in health benefits resulting from projects to increase rates of walking and cycling.
Alberta Ministry of Transportation	<ul style="list-style-type: none"> ▪ Methods of Reducing Collisions on Alberta's Roads 	A list of measures that are applicable across Canada.
Age-friendly BC	<ul style="list-style-type: none"> ▪ Age-friendly Communities 	A website providing information and resources related to age-friendly community planning to increase well-being for older adult populations.

Resources



Strategic Planning and Evaluation

Road Safety Performance Measures and Performance Indicators

References

- BC Stats. Population Estimates. Retrieved from: <http://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/population-estimates>

Ensuring Safe Roadways

Road Safety Audits

References

- Canadian Road Safety Audit Guide: A Book in the Canadian Road Safety Engineering Handbook (CRaSH), 2001. (2001). Ottawa: Transportation Association of Canada.

In-Service Road Safety Reviews

References

- Canadian Guide to In Service Safety Reviews: A Book in the Canadian Road Safety Engineering Handbook (CRaSH), 2004. (2004). Ottawa: Transportation Association of Canada.
- City of Kamloops. Safer City Initiative: Intersection Safety Master Plan Kamloops, British Columbia. Retrieved from: <https://www.kamloops.ca/sites/default/files/docs/city-hall/intersectionmasterplan.pdf>

Heavy Vehicle Safety

References

- City of Burnaby. "Truck Routes." Retrieved from: <https://www.burnaby.ca/City-Services/Roads---Traffic/Truck-Routes.html>
- City of Chilliwack. Bylaw No. 3023 A Bylaw to Regulate the use of Highways. Retrieved from: <http://www.chilliwack.com/main/attachments/Files/363/BL%203023%20Highway%20and%20Traffic%20%28Consolidated%20-%20January%2031%2C%202011%29.pdf>
- Translink. Keeping Metro Vancouver Moving Truck Route Reference Guide November 2009. Retrieved from: http://www.fsd.bc.ca/_documents/Truck_Route_Reference_Guide.pdf

Communication, Consultation, and Engagement

Community Engagement

References

- Insurance Corporation of British Columbia (ICBC). Supporting Volunteers. Retrieved from: <http://www.icbc.com/road-safety/community/Pages/Support-volunteers.aspx>
- Parachute Canada. Pace Car. Retrieved from: <http://www.parachutecanada.org/programs/item/pace-car>
- Mothers Against Drunk Driving (MADD Canada). Campaign 911. Retrieved from: <http://madd.ca/pages/programs/awareness-campaigns/campaign-911/>

Funding and Cost-saving

Funding Sources

References

- Infrastructure Canada. The Federal Gas Tax Fund. Retrieved from: <http://www.infrastructure.gc.ca/plan/gtf-fte-eng.html>
- Infrastructure Canada. The 2014 New Building Canada Fund: Focusing on economic growth, job creation and productivity. Retrieved from: <http://www.infrastructure.gc.ca/plan/nbcf-nfcc-eng.html>
- Federation of Canadian Municipalities. Infrastructure. Retrieved from: <http://www.fcm.ca/home/issues/infrastructure.htm>
- BC Public Service. Safety improvements for B.C. communities. Retrieved from: <https://news.gov.bc.ca/stories/safety-improvements-for-bc-communities/>
- Insurance Corporation of British Columbia. Investing in road improvements. Retrieved from: <http://www.icbc.com/road-safety/community/pages/investing-in-road-improvements.aspx>

Cost and Space-saving Measures

References

- BikeSafe. Guide Implementation. Retrieved from: http://www.pedbikesafe.org/BIKESAFE/guide_implementation.cfm
- Translink. Road, Cycling and Pedestrian Improvements. Retrieved from: <http://www.translink.ca/en/plans-and-projects/roads-bridges-and-goods-movement-projects/major-road-network-and-bicycle-improvements.aspx>
- Translink. Road Network Operations & Maintenance. Retrieved from: <http://www.translink.ca/en/plans-and-projects/roads-bridges-and-goods-movement-projects/road-network-operations.aspx>
- Northern Development Initiative Trust. Funding Programs. Retrieved from: <http://www.northerndevelopment.bc.ca/apply-for-funding/>
- BC Transit. Corporate Infrastructure Initiatives. Retrieved from: <https://bctransit.com/whistler/transit-future/corporate-infrastructure-initiatives?d=1>

Promoting Active Transport

Safe Routes to Schools

References

- British Columbia Automobile Association (BCAA). School Zone Safety. Retrieved from: <https://www.bcaa.com/community/school-zone-safety>
- City of Kamloops. In-line Skates, Skateboards, and Scooter Bylaw No. 23-63. Retrieved from: <https://kamloops.civicweb.net/document/8243/23-63pdf?handle=01AEE33E69BA4EDBB99D4CC9CEDC1390>
- City of North Vancouver. "Skateboarding/Longboarding and Rollerblading Guidelines and Restrictions." Retrieved from: <http://www.cnv.org/Parks-Recreation-and-Culture/Recreation/City-Skate-Park/Skateboarding-Guidelines>
- City of Vancouver. "Sign Up Your Kids for a Free Longboarder Safety Clinic." Retrieved from: <http://vancouver.ca/news-calendar/free-longboarder-safety-clinic-for-kids.aspx>
- HasteBC. Toolkit. Retrieved from: <https://hastebc.org/toolkit/safety/bike-safety/>
- Safe Routes To School. Canadian School Travel Planning Pilot Test Final Report: March 2010. Retrieved from: https://web.archive.org/web/20160421045922/http://saferoutestoschool.ca/sites/default/files/STP%20Pilot%20Test%20National%20Summary%20Report_o.pdf

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

- Safe Routes to Schools. Information for parents and schools. Retrieved from: http://www.sustrans.org.uk/sites/default/files/documents/srs_safe_routes_fso1.pdf
- Safe Routes to Schools. Rural Communities: Best Practices and Promising Approaches for Safe Routes: 2015. Retrieved from: <http://saferoutespartnership.org/resources/toolkit/rural-communities-best-practices-srts>

Further Resources

- <http://www.saferoutestotoschool.ca/>
- <http://www.hastebc.org/>

Accommodating Small-wheeled Transport

References

- Victoria Transport Policy Institute. Small Wheeled Transport Wheeled Luggage, Skating, Scooters, Hand Carts and Wagons: 2014. Retrieved from: <http://www.vtpi.org/tdm/tdm90.htm>

Appendix A: Additional Resources for Improving Road Safety

References

- Age-friendly BC. Age-friendly Communities. Retrieved from: <https://www2.gov.bc.ca/gov/content/family-social-supports/seniors/about-seniorsbc/seniors-related-initiatives/age-friendly-bc>
- Alberta Ministry of Transportation. Methods of Reducing Collisions on Alberta's Roads. Retrieved from: <http://www.transportation.alberta.ca/PlanningTools/Documents/Morcoar/MORCOAR%20Phase%201%20Final%20Report.pdf>
- Austroads. Road Safety Engineering Toolkit. Retrieved from: <http://engtoolkit.com.au/>
- Austroads. Achieving Safe System Speeds on Urban Arterial Roads: Compendium of Best Practice. Retrieved from: <https://www.onlinepublications.austroads.com.au/items/AP-R514-16>
- Canadian Council of Motor Transport Administrators (CCMTA). Countermeasures to Improve Pedestrian Safety in Canada. Retrieved from: http://ccmta.ca/images/publications/pdf/CCMTA_Pedestrian_Report_Eng_FINAL.pdf
- National Association of City Transportation Officials (NACTO). Transit Street Design Guide. Retrieved from: <https://nacto.org/publication/transit-street-design-guide/transit-lanes-transitways/>
- National Association of City Transportation Officials (NACTO). Urban Bikeway Design Guide. Retrieved from: <https://nacto.org/publication/urban-bikeway-design-guide/>
- National Association of City Transportation Officials (NACTO). Urban Street Design Guide. Retrieved from: <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/>
- PEDBIKESAFE. Pedestrian and Cyclist Safety Guide and Countermeasures Selection Systems. Retrieved from: <http://www.pedbikesafe.org/>
- United States Federal Highway Administration. A Focused Approach to Safety Guidebook. Retrieved from: <https://safety.fhwa.dot.gov/fas/toolkit.cfm>
- World Health Organization (WHO). Health Economic Assessment Tool for Pedestrians and Cyclists. Retrieved from: <http://www.heatwalkingcycling.org/>
- World Resource Institute. Cities Safer by Design: Guidance and Examples to Promote Traffic Safety through Urban and Street Design. Retrieved from: https://www.wri.org/sites/default/files/CitiesSaferByDesign_final.pdf

Acknowledgements

The BC Community Road Safety toolkit would not have been possible without the work and dedication of the following individuals:

- Amanda Watson**, City of Vernon
- Barbara Thomas**, Municipality of North Cowichan
- Chuck Hutchinson**, BC Ministry of Transportation and Infrastructure
- David Hill**, Insurance Corporation of British Columbia
- Dotan Amit**, Ministry of Public Safety and Solicitor General
- Dragana Mitic**, City of North Vancouver
- Dr. Emily Newhouse**, Vancouver Coastal Health Authority
- Erin Anderson**, Ministry of Public Safety and Solicitor General
- Dr. Gordon Lovegrove**, University of British Columbia
- Heather Andreychuck**, City of Prince George
- Joy Sengupta**, BC Ministry of Transportation and Infrastructure
- Dr. Kay Teschke**, University of British Columbia
- Liliana Quintero**, City of Vancouver
- Mark Donnelly**, Trucking Safety Council of British Columbia
- Mark Ordeman**, WorkSafeBC
- Mavis Johnson**, Canadian Traffic Safety Institute
- Neil Arason**, Ministry of Public Safety and Solicitor General
- Patrick Glanc**, Ministry of Public Safety and Solicitor General
- Dr. Paul de Leur**, Insurance Corporation of British Columbia
- Raheem Dilgir**, TranSafe Consulting Ltd.
- Richard Campbell**, BC Cycling Association
- Ryan Khan**, Ministry of Public Safety and Solicitor General
- Steve Haywood**, BC Ministry of Transportation and Infrastructure
- Zahra Hussein**, Vancouver General Hospital

B.C. Community ROAD SAFETY TOOLKIT

Module 3: Implementation Tools and Strategies

In addition to the above list of individuals, many of whom also provided peer review, the following individuals contributed to the toolkit by peer reviewing some of its sections for quality and accuracy:

- Arno Schortinghuis**, BC Cycling Coalition
- Donna Chan**, City of Richmond
- Joanna Domarad**, City of Calgary
- Dr. John Morrall**, Canadian Highways Institute Ltd.
- Kliment Kuzmanovski**, City of Surrey
- Dr. Meghan Winters**, Simon Fraser University
- Megan Oakey**, Provincial Health Services Authority
- Mirjana Petrovic**, City of Surrey
- Richard Campbell**, BC Cycling Coalition
- Steve Chou**, City of Vancouver
- Toby Lewis**, City of Vancouver

Finally, the following individuals completed a full in-depth peer-review of the entire toolkit:

- Dotan Amit**, Ministry of Public Safety and Solicitor General
- Erin Anderson**, Ministry of Public Safety and Solicitor General
- Joy Sengupta**, BC Ministry of Transportation and Infrastructure
- Dr. Kay Teschke**, University of British Columbia
- Linda Phillips**, BC Ministry of Health
- Mavis Johnson**, Canadian Traffic Safety Institute
- Neil Arason**, Ministry of Public Safety and Solicitor General
- Dr. Paul de Leur**, Insurance Corporation of British Columbia
- Raheem Dilgir**, TranSafe Consulting Ltd.
- Ryan Khan**, Ministry of Public Safety and Solicitor General



February 2018