

ACRONYMS

ACRONYM	DEFINITION
AAA	All Ages and Abilities
APBP	Association of Pedestrian & Bicycle Professionals
B.C.	British Columbia
CPTED	Crime Prevention Through Environmental Design
CROW	CROW refers to the Dutch <i>Design Manual for Bicycle Traffic</i> (2016). CROW is the Dutch abbreviation of the <i>Information and Technology Centre for Transport and Infrastructure</i> .
FHWA	Federal Highway Association
GBA+	Gender-Based Analysis Plus
MOTI	Ministry of Transportation and Infrastructure
MUP	Multi-Use Pathway
MUTCDC	Manual on Uniform Traffic Control Devices Canada
MVA	Motor Vehicle Act
NACTO	National Association of City Transportation Officials
TAC	Transportation Association of Canada
TWSI	Tactile Walking Surface Indicator

GLOSSARY

TERM	DEFINITION
Absolute Minimum Width	The lowest end of a design domain value for a bicycle facility component (e.g. lane, buffer), beyond which a bicycle facility component would be rendered unsafe and unusable. The absolute minimum should only be used for short distances, when reasonable consideration has been given to local context, and if maintenance equipment is able to fit within this width.
Active Transportation Facility	Features such as sidewalks, bicycle lanes, multi-use pathways, and pedestrian bridges that both promote and enhance active transportation.
Advisory Bicycle Lane	Advisory bicycle lanes are bicycle-priority areas within a shared street environment, where people cycling have priority within dedicated lanes but where motorists may legally enter the bicycle lanes to pass oncoming motor vehicles.
All Ages and Abilities (AAA)	Active transportation facilities that are considered safe and comfortable for people of all ages and abilities. A range of bicycle facility types may be considered to be AAA facilities, depending on their design and the surrounding context.
Ancillary Zone	A flexible space located on street within the roadway that is not designated for motor vehicle through traffic, but that supports the primary functions of either the roadway or the sidewalk. Uses can include on-street motor vehicle or bicycle parking, bicycle facilities, docked bike share stands, loading zones, transit stops, taxi or ride hailing zones, curb extensions, parklets, or patios. This space also includes the concrete gutter and, depending on the street design, may be used for snow storage. See Chapter C3 for design guidance.
Bicycle	A type of 'cycle' (see definition of cycle below).
Bicycle Accessible Shoulder	Bicycle accessible shoulders are paved spaces on the right side of rural roads and highways, and along certain urban streets, that can be used by people riding bicycles as well as by other street users.
Bicycle Facility	A roadway, part of a roadway, or off-street pathway intended for the use of bicycles and sometimes skateboards, in-line skates, scooters, or other active modes, either exclusively or shared with vehicular traffic or pedestrians.
Bicycle Lane	A lane intended for the exclusive use of bicycles and sometimes skateboards, in-line skates, scooters, or other active modes, within a roadway used by motorized vehicles.
Bicycle Pathway	A bicycle facility, physically separated from roadways, where motor vehicle traffic, except maintenance vehicles, is excluded.
Bicycle Rider Spectrum	A method of categorizing people's willingness to use a bicycle for transportation, first developed by the City of Portland. The general population is classified into a 'bicycle rider spectrum' made up of the following four groups of bicycle riders, ordered by their level of stress and risk tolerance from high to low: 'strong and fearless,' 'enthused and confident,' 'interested but concerned,' and 'no way, no how.' Market research has shown that the percentage of people who fall into each category will differ slightly in different municipalities.
Bicycle Through Zone	The Bicycle Through Zone exists on streets with bicycle facilities. On some streets, the Bicycle Through Zone takes the place of the Ancillary Zone, but not always. However, an Ancillary Zone with on-street parking may still be provided adjacent to a Bicycle Through Zone. See Section D for design guidance
Bioswale	Bioswales (also known as biofilters, infiltration swales, grassed swales, or in-line bioretention) are vegetated open channels designed to attenuate and treat stormwater run-off for a defined water volume. Bioswales convey larger stormwater volumes from a source to a discharge point, similar to an open ditch. However, unlike ditches, they intentionally promote slowing, cleansing, and infiltration along the way. A sloped base to facilitate this water movement distinguishes bioswales from rain gardens.
Clear Zone	The roadside area immediately adjacent to the outer travelled lane, clear of hazards, which may be used safely by errant vehicles.

TERM	DEFINITION
Comfort Zone	A designated zone with a shared street environment that provides a clear pathway for pedestrians, separated from mixed motor vehicle traffic. The Comfort Zone is the shared street equivalent of the Pedestrian Through Zone.
Complete Street	A street designed and operated to enable safe and efficient access for all street users, including people walking, cycling, and using other active modes, in addition to transit and motor vehicle users. Complete streets are designed to integrate all transportation modes while responding to local context and considering the needs of people of all ages and abilities.
Constrained Limit Width	The lower end of a design domain value for a bicycle facility component (e.g. lane, buffer), for use when providing the desired width is not feasible. The constrained limit width is likely to offer inferior operational performance and user experience as compared to the desired width, but it may be less costly to construct, and it provides design flexibility.
Continuous Tree Trenches	A system of street trees connected by an underground infiltration system, allowing the roots of neighbouring trees to interconnect and share resources.
Control Vehicle	The largest and least maneuverable user or vehicle that will infrequently use the street. The control vehicle should be accommodated but not prioritized in street design. It may need to operate at lower speeds and take wide or multi-point turns.
Crash Cushion	A device that prevents an errant vehicle from impacting fixed object hazards by gradually decelerating the vehicle to a safe stop or by redirecting the vehicle away from the hazard.
Crime Prevention Through Environmental Design (CPTED)	A multi-disciplinary approach for reducing crime through urban and environmental design and the management and use of built environments. For more information, visit: www.cpted.net/
Cross-Ride	<p>Cross-rides (also known as elephant's feet and cross-bikes) are the bicycle equivalent of a crosswalk. They are intended to alert all street users of a bicycle crossing. Cross-rides consist of a series of white squares laid out in parallel lines across a street. They can be enhanced by adding the bicycle symbol and/or applying a green surface treatment.</p> <p>Cross-rides are not currently defined in the B.C. MVA, meaning that they have no legal status and have limited application on MOTI facilities. However, municipalities may enact bylaws that define cross-rides and permit them on municipal streets.</p>
Crosswalk	<p>As defined in the B.C. MVA:</p> <p>(a) a portion of the roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by signs or by lines or other markings on the surface, or</p> <p>(b) the portion of a highway at an intersection that is included within the connection of the lateral lines of the sidewalks on the opposite sides of the highway, or within the extension of the lateral lines of the sidewalk on one side of the highway, measured from the curbs, or in the absence of curbs, from the edges of the roadway.</p>
Cul-de-sac	A dead-end street that is only connected to other streets on one end.
Curbside Activity	Uses of the street immediately adjacent to the curb that can have an impact on the function and design of bicycle and pedestrian facilities, and which may present challenges to people with disabilities. Curbside activities include motor vehicle parking, loading, and transit stops.
Cut throughs	A pathway that runs between two properties to connect two segments of a pedestrian facility, bicycle route, or off-street pathway that are separated by development or open space. They are typically paved or a hard surface. Cut-through pathways make neighbourhoods more walkable and bikeable by shortening distances and providing important connections to destinations.
Cycle	A device having any number of wheels that is propelled by human power and on which a person may ride and includes a motor assisted cycle, but does not include a skateboard, roller skates or in-line roller skates;
Daylighting	The removal of sightline obstructions such as vegetation, parked motor vehicles, or other physical objects near intersections and conflict points along bicycle facilities in order to facilitate increased visibility between bicyclists and other street users.

TERM	DEFINITION
Design Domain	A geometric design concept used in the TAC Geometric Design Guide for Canadian Roads that includes a range that has a relationship with the fitness-for-purpose of the design element. For example, design domain is used to provide a range of values for bicycle facility components, such as the width of a bicycle lane. The TAC Geometric Design Guide for Canadian Roads includes four levels within the design domain: practical lower limit, recommended lower limit, recommended upper limit, and practical upper limit. For the purposes of the Design Guide, the primary focus is on those levels that TAC identifies to be part of the recommended lower Limit (referred to as constrained limit in the Design Guide) or recommended higher limit (referred to as desirable in the Design Guide).
Design Guide	The B.C. Active Transportation Design Guide (this document).
Design Speed	A speed selected for purposes of design and correlation of the geometric features of a road.
Design User	The target user or user group for which a bicycle facility is designed. For example, a design professional may want to design a facility that serves the 'interested but concerned' segment of the population (see Bicycle Rider Spectrum) or a AAA facility (see All Ages and Abilities (AAA) Bicycle Facility).
Design Vehicle	The vehicle whose dimensions and speed potential are used to dictate the minimum design requirements for a given street or facility. When designing a bicycle facility, the bicycle is used as the design vehicle. Bicycles are not uniform in size or operating style, so variations in bicycle design must be considered.
Desire Lines	A desire line (or desire path) is a path created by erosion from human or animal traffic. The desire line typically represents the most direct or easily navigated route between two destination.
Desired Width	The recommended design domain value for a bicycle facility component (e.g. lane, buffer) that is likely to provide optimum operational performance and user experience. Design professionals are encouraged to design bicycle facilities using the desired width whenever feasible.
Detectable Warning Surface	A surface that is detectable underfoot or by a cane. Detectable warning surfaces can alert and/or guide people with blindness or low vision. tactile walking surface indicators (TWSI) are recommended by the CSA as the standardized detectable warning surface treatment. Changes in surface material, such as providing a strip of softscape (e.g. grass) or textured surface material next to hardscape (e.g. concrete) can also function as a detectable warning surface.
Dooring	When a bicyclist collides with the door of a parked motor vehicle that has been opened suddenly into the path of the bicyclist. Bicycle facilities should be designed to minimize the risk of dooring by removing motor vehicle parking adjacent to bicycle facilities or separating the parking from the bicycle facility using a painted and/or physical buffer.
Frontage (Service) Road	A roadway contiguous to a through roadway so designed as to intercept, collect and distribute traffic desiring to cross, enter or leave the through roadway and to furnish access to property.
Frontage Zone	This is the area adjacent to properties, such as building entrances, front yards, stoops, vending, café seating, and building-related utilities. This area may be part of the public right-of way, or private, if a building setback is present. The Frontage Zone predominantly applies to an urban street context as it is typically private front yard space in a local or suburban context. See Chapter C ₃ for design guidance.
Furnishing Zone	The space that provides physical separation between the sidewalk and the bicycle lane.
Gender-Based Analysis Plus (GBA+)	GBA+ is an analytical process used to assess how diverse groups of women, men and non-binary people may experience policies, programs and initiatives. The 'plus' in GBA+ acknowledges that GBA goes beyond biological (sex) and socio-cultural (gender) differences. GBA+ is the process by which a policy, program, initiative or service can be examined for its impacts on various groups. GBA+ provides a snapshot that captures the realities of diverse groups of women, men and non-binary people affected by a particular issue at a specific time. This means that analysts, researchers, evaluators, and decision-makers are able to continually improve their work and attain better results for Canadians by being more responsive to their specific needs and circumstances. For more information, visit: https://cfc-swc.gc.ca/gba-acis/index-en.html
Geometric Design	The selection of the visible dimensions of the elements of a roadway.
Grade Separation	Vertical separation of two intersecting roadways or a roadway and a railway.

TERM	DEFINITION
Highway	<p>Synonymous with roadway but generally limited to higher-speed roadways in rural areas. However, in the B.C. MVA, 'highway' includes:</p> <p>(a) every highway within the meaning of the Transportation Act,</p> <p>(b) every road, street, lane or right of way designed or intended for or used by the general public for the passage of vehicles, and</p> <p>(c) every private place or passageway to which the public, for the purpose of the parking or servicing of vehicles, has access or is invited, but does not include an industrial road.</p>
Horizontal Illumination	Measured at grade and is key for enabling bicycle users to see the surface condition, pavement markings, obstacles, and the direction of the bicycle facility.
Illuminance	The density of luminous flux incident on a surface (e.g. the amount or intensity of light received by a surface), measured in lux.
Illumination	A qualitative or general term designating the act of lighting or the state of being lit.
Luminaire	A complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply.
Luminous Flux	The amount of light produced by a light source, measured in lumens.
Motor Vehicle	A vehicle, not run on rails, that is designed to be self-propelled or propelled by electric power obtained from overhead trolley wires but does not include mobile equipment or a motor assisted cycle.
Multi-Use Pathway (MUP)	A path with multiple users of different types (e.g., pedestrians, bicycles, and similar user types); MUPs may be shared (all users share the same pathway space, with or without a marked centre line) or may be separated (e.g., the pathway is separated into parallel travelled ways, e.g., one exclusively for pedestrians and one exclusively for bicycles, skateboards, and other active transportation users).
Neighbourhood Bikeway	Neighbourhood bikeways (also known as bicycle boulevards, bicycle priority streets, local street bikeways, and neighbourhood greenways) are streets with low motor vehicle volumes and speeds that have been enhanced to varying degrees to prioritize bicycle traffic. Bicycle boulevards should include signage and pavement markings and can also include a range of traffic calming and diversion measures to facilitate through movement by bicycles, while reducing motor vehicle volumes and speeds as necessary.
New Mobility	A broad term that covers new and emerging forms of transportation, including autonomous vehicles, electric motor vehicles, mobility as a service, shared mobility, electric bicycles, and small, one-person electric vehicles.
Operating Speed	<p>The 85th percentile speed of vehicles at a time when traffic volumes are low and drivers are free to choose the speed at which they travel.</p>
Pedestrian	A person walking, including people using mobility aids such as canes, walkers, manual wheelchairs, electric wheelchairs, and mobility scooters.
Pedestrian Through Zone	This is the most important area of the street for safe, accessible, and efficient movement of pedestrians. The width of this zone depends on the street context and the volume of pedestrian activity anticipated for the corridor or block. This area should be entirely free of permanent and temporary objects. See Chapter C.2 for design guidance.
Phytoremediation	The use of living green plants for in situ removal, degradation, or containment of contaminants in soils, sludges, sediments, surface water, and groundwater.
Posted Speed	A speed limitation introduced for reason of safety, economy, traffic control and government regulatory policy aimed at encouraging drivers to travel at an appropriate speed for surrounding conditions.

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Motor Assisted Cycle	<p>According to the B.C. MVA, a device:</p> <p>(a) to which pedals or hand cranks are attached that will allow for the cycle to be propelled by human power,</p> <p>(b) on which a person may ride,</p> <p>(c) to which is attached a motor of a prescribed type that has an output not exceeding the prescribed output, and</p> <p>(d) that meets the other criteria prescribed under section 182.1 (3) of the MVA.</p>
Protected Bicycle Lane	A protected bicycle lane is a dedicated bicycle facility for the exclusive use of people cycling that is physically separated from motor vehicles and pedestrians by vertical and horizontal elements.
Public Realm	The collection of outdoor spaces between buildings that is publicly accessible, comprising streets, squares, courtyards, pathways, parks, and open spaces.
Road	Synonymous with road/roadway, but generally used in contexts that prioritize motor vehicle travel, such as highways. Streets and roads are generally classified based on their typical functional and operational characteristics.
Roadway	<p>According to the B.C. MVA:</p> <p>The portion of the highway that is improved, designed or ordinarily used for vehicular traffic, but does not include the shoulder, and if a highway includes two or more separate roadways. The term 'roadway' refers to any one roadway separately and not to all of them collectively.</p>
Shared Lane	Designated shared-use lanes (also referred to as marked wide curb lanes) are lanes on a street designed to allow sufficient width for a motor vehicle to safely overtake a bicyclist, without crossing over into the adjacent or oncoming motor vehicle lane. Shared lanes are located on streets with higher motor vehicle volumes and speeds (as opposed to bicycle boulevards).
Shared Mobility	Systems that allow people to access a network of shared vehicles that have been spread across a community or portion of a community, as opposed to privately owned vehicles or vehicle rental companies based in a single location. Shared mobility systems currently include shared motor vehicles, shared bicycles/electric bicycles (including docked and dockless systems), and shared electric kick scooters.
Shared Street	A shared space is a street designed to be shared by pedestrians, cyclists, and slow-moving motorists, with no physical separation of modes and typically an emphasis on use as a livable public space.
Shorelining	A form of navigation used by people with visual impairments that involves following a wall, curb, or other contrasting surface to the one a person is walking on in order to maintain a specific orientation while travelling through environments.
Shoulder	That part of a roadway contiguous with the travelled way intended for emergency stopping, and/or lateral support of the roadway structure. It may also be configured to be accessible for bicycle travel.
Shy Distance	The space between vehicles or pedestrians as they pass each other or vertical objects, such as bollards or fence posts. Adequate shy distance must be provided along bicycle facilities in order to ensure the safe operation of a bicycle. The amount of shy distance required for safety tends to increase with speed.
Small, One-Person Electric Vehicles	A category of electric vehicles that includes electric kick scooters (e-scooters), electric skateboards, hoverboards, segways, self-balancing electric unicycles, and other emerging modes. At the time of writing, these vehicles are not permitted on public roadways or sidewalks in British Columbia (legality issues are discussed further below). However, these vehicles have been observed in operation in communities across the province.
Sidewalk	A travelled way intended for pedestrian use, following an alignment generally parallel to that of the adjacent roadway.
Street	Synonymous with road/roadway but generally limited to lower speed roads in urban areas and implies multimodal use. Streets and roads are generally classified based on their typical functional and operational characteristics.
Street Buffer Zone	The space that provides physical separation between the bicycle lane and motor vehicle lane.

TERM	DEFINITION
Tactile Attention Indicators	A tactile walking surface indicator comprising truncated domes that alert people of an impending change in elevation, conflicts with other transportation modes, and other potential hazards.
Tactile Direction Indicators	A tactile walking surface indicator that uses elongated, flat-topped bars to facilitate wayfinding in open areas. The elongated bars indicate the travel direction.
Tactile Walking Surface Indicators (TWSI)	A warning treatment that alerts the pedestrian to the presence of a street crossing through a tactile surface and/or contrasting colour. TWSIs may also enhance the sidewalk-crosswalk interface by guiding pedestrians with visual or other disabilities to and from the crosswalk with directional grooves. Examples of TWSI materials include tactile dome pads or directional tiles.
Traffic Control Device	A sign, signal, line, metre, marking, space, barrier or device placed or erected by authority of the minister responsible for the administration of the B.C. Transportation Act, the council of a municipality or the governing body of a Treaty First Nation or a person authorized by any of them to exercise that authority.
Traffic Control Signal	A traffic control device, whether manually, electrically or mechanically operated, by which traffic is directed to stop and to proceed.
Traffic Zone	A street zone that accommodates users travelling through a road or accessing destinations along the road. Traffic Zone uses can include motor vehicle through traffic, transit, goods movement, and bicycle travel. The Traffic Zone can be divided into multiple lanes that are shared by multiple users or dedicated to certain vehicles (such as exclusive transit lanes). Medians and refuge areas can also be included within this zone.
Uniformity Ratio	A term used in lighting design that describes the ratio of maximum to minimum illumination levels. Lighting uniformity is the human perception of how evenly illumination is distributed.
Universal Design	The design of products, environments, programs, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. 'Universal design' shall not exclude assistive devices for a particular group.
Vehicle	A device in, on, or by which a person or thing is, or may be, transported or drawn on a highway, but does not include a device designed to be moved by human power, a device used exclusively on stationary rails or tracks, mobile equipment, or a motor assisted cycle.
Vertical Illumination	Measured 1.5 metres above grade and allows bicycle users to see other people walking and cycling, street signs, and vertical obstacles such as tree branches.
Walkshed	The acceptable walking range around a specific location. A walkshed is typically displayed as a walking area measured by walking time or distance from a specific point on a map.
Warrant	A criterion that identifies a potential need for a physical feature, such as a traffic barrier, extra lane, or other item.

REFERENCES

- AASHTO. 2012. *Guide for the Development of Bicycle Facilities*. Washington, DC: American Association of State Highway and Transportation Officials.
- AC Transit. 'Multimodal Corridor Guidelines.' AC Transit. 2018.
- Alta Planning + Design. 2011. *Capital Regional District Pedestrian and Cycling Master Plan Design Guidelines*. Capital Region District.
- Anderson, T., F. Bredal, M. Weinreich, N. Jensen, M. Riisgaard-Dam, and Malene Kofod Nielsen. 2012. *Collection of Cycle Concepts 2012*. Holstebro: Cycling Embassy of Denmark.
- Appleyard, Bruce, and Lindsey Cox. 2006. 'At Home in the Zone: Creating Livable Streets in the U.S.' *Journal of the American Planning Association* 30-35.
- Association of Pedestrian and Bicycle Professionals. 'Bicycle Parking Guidelines 2nd Edition.' *Association of Pedestrian and Bicycle Professionals*. 2010.
- . 'Navigating without Curbs – Accessibility on Shared Streets.' *Association of Pedestrian & Bicycle Professionals*. 2019.
- British Columbia Ministry of Transportation and Highways. 'Pedestrian Crossing Control Manual for British Columbia.' *Province of British Columbia*. 1994.
- . 'Manual of Standard Traffic Signs & Pavement Markings.' *Province of British Columbia*. 2000.
- British Columbia Ministry of Transportation and Infrastructure. 'British Columbia's Bicycle Traffic Control Guidelines – Draft.' *Province of British Columbia*. 2012.
- . 'Electrical and Traffic Engineering Manual.' *Province of British Columbia*. 2013. http://www.th.gov.bc.ca/publications/eng_publications/electrical/electrical_and_traffic_eng/Electrical_Signing_Design_Manual/tableofcontents.htm
- . 'Overview of B.C. Highway Functional Classification.' *Province of British Columbia*. 2014. https://www2.gov.bc.ca/assets/gov/driving-and-transportation/transportation-infrastructure/planning/inventories/bc_numbered_hwy_functional_classes.pdf
- . '2016 Standard Specifications for Highway Construction.' *Province of British Columbia*. 2016.
- . 'Bridge Standards and Procedures Manual.' *Province of British Columbia*. 2016.
- . 'BC Supplement to TAC Geometric Design Guide 2019 – 3rd Edition.' *Province of British Columbia*. 2019.
- BC Transit. 'Infrastructure Design Guidelines.' *BC Transit*. 2010.
- . 'BC Transit Infrastructure Design Summary.' *BC Transit*. 2018.
- Bell, PJ. 'Coming to A Stop – All Ages and Abilities Bicycle Parking in New and Existing Development.' *City of Vancouver*. 2015.
- . 'Whose (Bike) Lane Is It? – A Study of Bicycle Lane Usage in Vancouver.' *University of British Columbia*. 2016.
- Bell, PJ, Peter Lipscombe, Michael Meyer, and Tess Munro. 'Life Behind the Scenes – Neighbourhood Laneway Infill Strategy for the West End.' *University of British Columbia*. 2016.

- Ben-Joseph, Eran. 'Changing the Residential Street'. *Journal of American Planning Association*. Vol 61, No. 4. 1995. <http://web.mit.edu/ejb/www/doc/JAPAv61n4.pdf>
- Biddulph, Mike. 2001. *Home Zones: A Planning and Design Handbook*. Bristol: The Policy Press.
- . 2007. *Introduction to Residential Layout*. Burlington: Butterworth-Heinemann.
- Broom, Nathan, Eric Anderson, Vince Caristo, Ryan Dodge, Jennifer Donlon-Wyant, Sarah Figliozzi, Elco Gauw, Dan Jatres, David Loutzenheiser, Heath Maddox, Brian Patterson, Cara Seiderman. 'Essentials of Bike Parking.' *Association of Pedestrian and Bicycle Professionals*. 2015.
- Canadian Standards Association (CSA Group). CSA B651-18: *Accessible design for the built environment*. 2018. https://store.csagroup.org/ccrz__ProductDetails?sku=2702123
- Capital Regional District. 'Capital Region Local Government Electric Vehicle (EV) + Electric Bike (E-Bike) Infrastructure Planning Guide.' *Capital Regional District*. 2018. https://www.crd.bc.ca/docs/default-source/climate-action-pdf/reports/infrastructure-planning-guide_capital-region-ev-ebike-infrastructure-project-nov-2018.pdf?sfvrsn=d767c5ca_2
- Chan, Kenneth. 'Laneway BBQ Party Coming to Gastown this Saturday.' *Daily Hive*. 2017. <https://dailyhive.com/vancouver/laneway-backyard-bbq-gastown-2017>
- Chartier, G., Eichenbaum, T., Jacobson, M. et al. 2017. *Canadian Roundabout Design Guide*. Ottawa, ON: Transportation Association of Canada.
- Chiu, M., Clayton, C., Millen, G. et al. 2017. *Geometric Design Guide for Canadian Roads*. Ottawa, ON: Transportation Association of Canada.
- Chow, R., J. Mah, R. Duckworth, B Bielkiewicz, J Aoro, G Dunn, D Ekkelenkamp, Brian Latte, H Putz, and Paul Shaflik. 2003. *Highway Lighting Guide*. Edmonton: Alberta Transportation.
- City of Boston. 2013. 'Boston Complete Streets – Design Guidelines.' *City of Boston*. 2013.
- City of Calgary. 2016. *Centre City Cycle Track Pilot*. Final Report, Calgary: City of Calgary.
- City of Cambridge. 2013. 'Bicycle Parking Guide.' *City of Cambridge*. 2013.
- City of Copenhagen. 2013. *Focus on Cycling: Copenhagen Guidelines for the Design of Road Projects*. Copenhagen: City of Copenhagen.
- City of Maple Ridge. 'Strategic Transportation Plan.' *City of Maple Ridge*. 2014. <https://www.mapleridge.ca/DocumentCenter/View/3400/Final-Report--October-16-2014?bidId=>
- City of Toronto. 'Electric Bikes – Proposed Policies and By-laws.' *City of Toronto*. 2013. <https://www.toronto.ca/legdocs/mmis/2014/pw/bgrd/backgroundfile-65205.pdf>
- City of Trail. 'Arts and Culture.' *City of Trail*. Accessed May 13, 2019. <http://www.trail.ca/en/play/arts-and-culture.asp>
- City of Vancouver. 'Report – Naming of West End Lanes and New Temporary City Hall Plaza.' *City of Vancouver*. 2017. <https://council.vancouver.ca/20171128/documents/other1.pdf>
- . 'Transportation Design Guidelines: All Ages and Abilities Cycling Routes.' 2017. *City of Vancouver*. Accessed May 30, 2019. <https://vancouver.ca/files/cov/design-guidelines-for-all-ages-and-abilities-cycling-routes.pdf>
- . 'Accessible Street Design.' *City of Vancouver*. Accessed May 21, 2019. <https://vancouver.ca/files/cov/AccessibleStreetDesign.pdf>

- . 'Bike Rack Design Contest Summary.' 2019. *City of Vancouver*.
- . 'Engineering Design Manual (1st ed.)' *City of Vancouver*. 2018. Accessed May 28, 2019. <https://bids.vancouver.ca/bidopp/RFA/Documents/PS20181461-CityofVancouver-EngineeringDesignManualFirstEdition2018.PDF>
- City of Victoria. 'Bicycle Parking Strategy.' *City of Victoria*. 2011.
- . 'Downtown Public Realm Plan & Streetscape Standards.' *City of Victoria*. 2017.
- . 'Fan Tan Alley.' *City of Victoria*. Accessed May 13, 2019. <https://www.tourismvictoria.com/see-do/activities-attractions/attractions/fan-tan-alley>
- Complete Streets for Canada. 'Canada's Complete Streets Hub.' *Clean Air Partnership*. Accessed May 13, 2019. <https://www.completestreetsforcanada.ca/>
- Clayden, Andy, Keith McKoy, and Andy Wild. 2007. 'Improving Residential Liveability in the UK: Home Zones and Alternative Approaches.' *Journal of Urban Design* 55-71.
- Collarte, Natalia. 2014. *The American Woonerf: Creating Livable and Attractive Shared Streets*. Thesis: In partial fulfillment of the requirements for the degree of Master of Arts in Urban and Environmental Policy and Planning, Boston: Tufts University.
- CROW. 2016. *Design Manual for Bicycle Traffic*. Utrecht: CROW.
- Dickman, D., Falbo, N., Durrant, S. et al. 2016. *Small Town and Rural Multimodal Networks*. Washington, DC: Federal Highway Administration.
- Dill, Jennifer. 2015. *Four Types of Cyclists: A National Look*. Webinar, Portland: Portland State University.
- Dill, Jennifer, Nathan McNeil, Joseph Broach, and Liang Ma. 2014. 'Bicycle boulevards and changes in physical activity and active transportation: Findings from a natural experiment.' *Preventative Medicine* 74-78.
- Donahey, Thomas J, and Dennis Burkheimer. 1996. 'Prewetting with Salt Brine.' *Semisequicentennial Transportation Conference Proceedings*. Ames: Iowa State University.
- Federal Highway Administration (FHWA). *Separated Bike Lane Planning and Design Guide*. 2015. Washington, DC: Federal Highway Administration.
- . 'Achieving Multimodal Networks – Applying Design Flexibility & Reducing Conflicts.' U.S. *Department of Transportation*. 2016. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/fhwahep16055.pdf
- . *Incorporating On-Road Bicycle Networks into Resurfacing Projects*. 2016. Washington, DC: Federal Highway Administration.
- . 'Accessible Shared Streets – Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities.' *U.S. Department of Transportation*. 2017.
- . 'FHWA Guidebook for Measuring Multimodal Network Connectivity.' *U.S. Department of Transportation*. 2018. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_connectivity/fhwahep18032.pdf
- . 'Bikeway Selection Guide.' *U.S. Department of Transportation*. 2019. https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwas18077.pdf

- Felton, Ryan. 'E-Scooter Ride-Share Industry Leaves Injuries and Angered Cities in its Path.' *Consumer Reports, Inc.* 2019. <https://www.consumerreports.org/product-safety/e-scooter-ride-share-industry-leaves-injuries-and-angered-cities-in-its-path/>
- Fisher, Cara. 2014. *Cycling Through Winter*. Ottawa, ON: Canadian Institute of Planners.
- Fitzpatrick, K., Carlson, P., Brewer, M., and Wooldridge, M. 2000. 'Design Factors That Affect Driver Speed on Suburban Streets,' *Transportation Research Record: Journal of the Transportation Research Board* No. 1751. Washington, DC: Transportation Research Board of the National Academies, pp. 18—25.
- Frank, Lawrence D., Meghan Winters, Brian Patterson, Cora L. Craig. 'Promoting Physical Activity through Healthy Community Design.' *The Vancouver Foundation*. 2009. <http://atl.sites.olt.ubc.ca/files/2011/07/VanFdnStudy.pdf>
- Frohnwieser, Anna, Richard Hopf, and Elisabeth Obserzaucher. 'Human Walking Behavior: The Effect of Pedestrian Flow and Personal Space Invasions on Walking Speed and Direction.' *Human Ethology Bulletin* 28(3), 20-28. 2013.
- Geller, Roger. 2009. *Four Types of Cyclists*. White Paper, Portland Bureau of Transportation: Portland.
- Gibbs, Margaret, Sany Zein, and Carl Shaflik. 'Illumination of Isolated Rural Intersections.' *Transportation Association of Canada*. 2001.
- Gilpin, J, N Falbo, M Repsch, and A Zimmerman. 2015. *Lessons Learned: Evolution of the Protected Intersection*. White Paper, Portland: Alta Planning + Design.
- Gilpin, J, N. Falbo, and M. Williams. 2017. *Lessons Learned: Advisory Bike Lanes in North America*. White Paper, Alta Planning + Design.
- Global Designing Cities Initiative. 'Shared Streets.' *National Association of City Transportation Officials*. Accessed May 13, 2019. <https://globaldesigningcities.org/publication/global-street-design-guide/streets/shared-streets/>
- Goldberg, Stephanie. 'Isn't it time you paid Grandma a visit?' *Vancouver Public Space Network*. 2017. <http://vancouverpublicspace.ca/2017/07/27/isnt-it-time-you-paid-grandma-a-visit/>
- Green, Sylvia. 'Designing streets for a new kind of delivery vehicle.' *Spacing*. 2019. <http://spacing.ca/vancouver/2019/02/25/designing-streets-for-a-new-kind-of-delivery-vehicle/>
- Hall, Edward. 'The Hidden Dimension.' *Random House Inc.* 1966.
- Harris, M Anne, Conor Reynolds, Meghan Winters, Mary Chipman, Peter Cripton, Michael Cusimano, and Kay Teschke. 2011. 'The Bicyclists' Injuries and the Cycling Environment study: a protocol to tackle methodological issues facing studies of bicycling safety.' *Injury Prevention*.
- Harris, M Anne, Conor Reynolds, Meghan Winters, Peter Cripton, Hui Shen, Mary Chipman, Michael Cusimano, et al. 2013. 'Comparing the effects of infrastructure on bicycling injury at intersections and non-intersections using a case-crossover design.' *Injury Prevention* 303-310.
- Institute for Transportation and Development Policy. 'The Bikeshare Planning Guide.' *Institute for Transportation and Development Policy*. 2018.
- Insurance Corporation of British Columbia. 'Vehicle registration – Low-powered vehicles.' *Insurance Corporation of British Columbia*. Accessed May 21, 2019. <https://www.icbc.com/vehicle-registration/specialty-vehicles/Low-powered-vehicles/Pages/Default.aspx>

- . 'Vehicle registration – Motorized scooters and skateboards.' *Insurance Corporation of British Columbia*. Accessed May 21, 2019. <https://www.icbc.com/vehicle-registration/specialty-vehicles/Low-powered-vehicles/Pages/Motorized-scooters-and-skateboards.aspx>
- Jackson, James. 'Waterloo's electric scooter program proved popular and is set to return next spring.' *Metroland Media Group Ltd*. 2018. <https://www.therecord.com/news-story/9062314-waterloo-s-electric-scooter-program-proved-popular-and-is-set-to-return-next-spring/>
- Jaffe, Eric. '6 Places Where Cars, Bikes, and Pedestrians All Share the Road as Equals.' *The Atlantic Monthly Group*. 2015. <https://www.citylab.com/solutions/2015/03/6-places-where-cars-bikes-and-pedestrians-all-share-the-road-as-equals/388351/>
- Karim, Dewan. 'Narrower Lanes, Safer Streets.' *Canadian Institute of Transportation Engineers*. 2015.
- Komorowski, Bartek. 2017. 'Paradigm Shift: Enabling Winter Cycling through Better Design and Maintenance.' *Winter Cities Shake-Up Conference*. https://etouches-appfiles.s3.amazonaws.com/html_file_uploads/ocde09bf510ec37a0f8264694a1d7c1b_011_BartekKomorowski.pdf?response-content-disposition=inline%3Bfilename%3D%22011_Bartek%20Komorowski.pdf%22&response-content-type=application%2Fpdf&AWSAccessKeyI
- Kraay, Joop. 1986. 'Woonerf and other Experiments in the Netherlands.' *Built Environment* 12: 20-29.
- Lopez, D S, D B Sunjaya, S Chan, S Dobbins, and R A Dicker. 2012. 'Using Trauma Center Data to Identify Missed Bicycle Injuries and Their Associated Costs. *Journal of Trauma and Acute Care Surgery*. *Journal of Trauma and Acute Care Surgery* 73 (6): 1602-1606.
- Lusk, Anne, Peter Furth, Patrick Morency, Luis Miranda-Moreno, Walter Willett, and Jack Dennerlein. 2011. 'Risk of injury for bicycling on cycle tracks versus in the street.' *Injury Prevention* 131-135.
- MassDOT. 2015. *Separated Bike Lane Planning & Design Guide*. Boston, MA: Massachusetts Department of Transportation.
- McLean, D., G. Smallwood, and K Cvetkovic. 2006. *Guide for the Design of Roadway Lighting*. Ottawa, ON: Transportation Association of Canada.
- MnDOT. 2015. *Traffic Engineering Manual*. Roseville, MN: Minnesota Department of Transportation.
- Monsere, Chris, Jennifer Dill, Nathan McNeil, Kelly Clifton, Nick Foster, Tara Goddard, Matt Berkow, et al. 2014. *Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the U.S.* Final Report, Portland: Portland State University.
- Montufar, Jeannette, Garreth Rempel, and Sarah Klassen. 'Pedestrian Walking Speed for Traffic Operations in Canada.' *Transportation Association of Canada*. 2013.
- Montufar, Jeannette, Keenan Patmore, and Geni Bahar. 'Pedestrian Crossing Control Guide – Third Edition.' *Transportation Association of Canada*. 2018.
- MTO. 2013. *Ontario Traffic Manual: Book 18 - Cycling Facilities*. St Catherine's, ON: Ministry of Transportation of Ontario.
- National Association of City Transportation Officials. 'Case Study – Bell Street Park Shared Street, Seattle.' *National Association of City Transportation Officials*. Accessed May 13, 2019. <https://nacto.org/case-study/bell-street-park-seattle/>
- . 'Don't Give Up at the Intersection – Designing All Ages and Abilities Bicycle Crossings.' *National Association of City Transportation Officials*. 2019.

- . 2017. *Designing for All Ages & Abilities: Contextual Guidance for High-Comfort Bicycle Facilities*. New York: National Association of City Transportation Officials.
- . 2016. *Global Street Design Guide*. New York: National Association of City Transportation Officials. <https://globaldesigningcities.org/publication/global-street-design-guide/>
- . 2011. *Urban Bikeway Design Guide*. New York: National Association of City Transportation Officials.
- National Disability Authority. 'What is Universal Design.' *National Disability Authority*. Accessed May 13, 2019. <http://universaldesign.ie/What-is-Universal-Design/>
- . 'Building for Everyone: A Universal Design Approach.' *National Disability Authority*. Accessed May 15, 2019. <http://universaldesign.ie/Built-Environment/Building-for-Everyone/#figBfE9Planning>
- Porter, A., Stewart, W., Ramsay, B. et al. 2007. *Roadside Design Guide*. Edmonton: Alberta Transportation.
- Portland Bureau of Transportation. 'TRN-10.09 - Bicycle Rack Permit.' *The City of Portland*. 2015. <https://www.portlandoregon.gov/citycode/article/43223>
- Portland Bureau of Transportation. 2015. *Portland's Neighbourhood Greenways Assessment Report*. Portland, OR.
- Province of British Columbia. 'Design Exception Process.' *Province of British Columbia*. 2018. <https://www2.gov.bc.ca/assets/gov/driving-and-transportation/transportation-infrastructure/engineering-standards-and-guidelines/technical-circulars/2018/to5-18.pdf>
- . 'Annotated Bibliography on Universal Design.' *Province of British Columbia*. Accessed May 13, 2019. http://housing.gov.bc.ca/pub/htmldocs/pub_universaldesign/glossary.htm
- . 'B.C. Community Road Safety Toolkit – Introduction to the BC Community Road Safety Toolkit.' 2018. *Province of British Columbia*. Accessed May 21, 2019. <https://www2.gov.bc.ca/assets/gov/driving-and-transportation/driving/publications/resource-kit-community-road-safety-toolkit-introduction.pdf>
- . 'B.C. Community Road Safety Toolkit – Module 1: Protecting people walking and cycling.' *Province of British Columbia*. 2018. Accessed May 21, 2019. https://www2.gov.bc.ca/assets/gov/driving-and-transportation/driving/publications/community_road_safety_toolkit_module1.pdf
- . 'B.C. Community Road Safety Toolkit – Module 2: Safe Roadway Designs to Protect All Road Users.' *Province of British Columbia*. 2018. Accessed May 21, 2019. <https://www2.gov.bc.ca/assets/gov/driving-and-transportation/driving/publications/resource-kit-community-road-safety-toolkit-module2.pdf>
- . 'B.C. Community Road Safety Toolkit – Module 3: Implementation Tools and Strategies.' *Province of British Columbia*. 2018. Accessed May 21, 2019. <https://www2.gov.bc.ca/assets/gov/driving-and-transportation/driving/publications/resource-kit-community-road-safety-toolkit-module3.pdf>
- . 'Motor Vehicle Act [RSBC 1996] Chapter 318.' *Province of British Columbia*. Accessed May 21, 2019. http://www.bclaws.ca/civix/document/id/complete/statreg/96318_00
- . 'Motor Vehicle Act – Motor Vehicle Regulations.' *Province of British Columbia*. Accessed May 21, 2019. http://www.bclaws.ca/civix/document/id/complete/statreg/26_58_01
- Quimby, Allan, and James Castle. 'A Review of Simplified Street Schemes.' *Transportation for London*. 2006. <http://content.tfl.gov.uk/review-of-simplified-streetscape-schemes.pdf>

- Reardon, Mitchell. 'Is Vancouver Ready to Grow from Laneways to Living Lanes?' *Spacing*. 2016. <http://spacing.ca/vancouver/2016/10/03/vancouver-ready-grow-laneways-living-lanes/>
- . 'Inside Out: Getting Ready for Laneway Living Rooms.' *Vancouver Public Space Network*. 2017. <http://vancouverpublicspace.ca/2017/06/28/inside-out-getting-ready-for-laneway-living-rooms/>
- . 'Alleys, Laneways and Life Between Buildings.' *Spacing*. 2018. <http://spacing.ca/vancouver/2018/06/04/alleys-laneways-life-buildings/>
- Regnier, Sheri. 'Events to Incorporate Trail's Iconic Covered Stairs.' *Black Press Media*. 2015. <https://www.trailtimes.ca/community/events-to-incorporate-trails-iconic-covered-stairs/>
- Richardson, D., McLaughlin, D., Kowpak, D. et al. 2014. *Traffic Signal Guidelines for Bicycles*. Edited by G Noxon. Ottawa, ON: Transportation Association of Canada.
- Rick Hansen Foundation. 'Accessibility Matters.' *Rick Hansen Foundation*. Accessed May 13, 2019. <https://www.rickhansen.com/become-accessible>.
- Ronald L. Mace Universal Design Institute. 'About UDI'. Ronald L. Mace Universal Design Institute. <http://udinstitute.org/aboutudi.php> (accessed May 13, 2019).
- Schepers, Paul, and Karin Klein Wolt. 2012. 'Single-bicycle crash types and characteristics.' *Cycling Research International* 2: 119-135.
- Schmitt, Angie. 'Is It Time to Redefine the Bike Lane.' *Streetsblog USA*. 2018. <https://usa.streetsblog.org/2018/08/23/is-it-time-to-redefine-the-bike-lane/>
- Skene, M., and M. Jacobson. 2012. *Bikeway Traffic Control Guidelines for Canada*. 2nd. Ottawa, ON: Transportation Association of Canada.
- Solomon, Hart, Brian Malone, Jaime Garcia, Giovanni Bottesini, Sovandary Hoeun, and Gene Chartier. 'Canadian Guide to Traffic Calming – Second Edition.' *Transportation Association of Canada*. 2018.
- Stutts, J C, and W Hunter. 1999. *Injuries to Pedestrians and Bicyclists: An Analysis Based on Hospital Emergency Department Data*. Washington, DC: Federal Highway Administration.
- Tefft, Brian. 'Impact Speed and a Pedestrian's Risk of Severe Injury or Death.' *American Automobile Association*. 2011. <https://aaafoundation.org/impact-speed-pedestrians-risk-severe-injury-death/>
- Teschke, Kay, M Anne Harris, Conor C.O. Reynolds, Meghan Winters, Shelina Babul, Mary Chipman, Michael D Cusimano, et al. 2012. 'Route Infrastructure and the Risk of Injuries to Bicyclists: A Case-Crossover Study.' *American Journal of Public Health* (American Public Health Association) 102 (12): 2336-2343.
- Teschke, Kay, Theresa Frendo, Hui Shen, Anne Harris, Conor C. Reynolds, Peter A. Cripton, Jeff Brubacher, Michael D. Cusimano, Steven M. Friedman, Garth Hunte, Melody Monroe, Lee Vernich, Shelina Babul, Mary Chipman, and Meghan Winters. 'Bicycling Crash Circumstances Vary by Route Type: A Cross-Sectional Analysis.' *BMC Public Health*, 14:1205: 1471-2458. 2014.
- Teschke, Kay, Hui Shen, Anne Chinn, Liliana Quintero, Felita Ong, and James Wei. 2018. 'Traffic Circles – Impact on motor vehicle, cyclist-MV, & pedestrian-MV crashes with injuries.' Paper presented at *2018 Conference of the Canadian Association of Road Safety Professionals*, Victoria, BC, June 10-13, 2018.
- Town of Banff. 'Shared Street.' *Town of Banff*. 2019. <http://banff.ca/index.aspx?NID=969>

- . 'Request for Direction – Bear Street Shared Street Concept.' *Town of Banff*. 2019. <http://banff.ca/DocumentCenter/View/6301>
- Traffic Operations and Management Standing Committee. 2014. *Manual of Uniform Traffic Control Devices for Canada (MUTCDC)*. 5th. Ottawa, ON: Transportation Association of Canada.
- TransLink. 'Bus Infrastructure Design Guidelines.' *TransLink*. 2018.
- Transport Canada. 2016. 'Grade Crossings.' *Grade Crossings Regulations: what you need to know*. https://www.tc.gc.ca/media/documents/railsafety/GradeCrossingsCanada_EN_2016_PRE_ACCESSIBLE.pdf
- . 2014. *Grade Crossings Standards*. Ottawa: Transport Canada.
- . 2018. *Safety Measures for Cyclists and Pedestrians around Heavy Vehicles*. Ottawa: Transport Canada.
- Transport for London. 2014. *London Cycling Design Standards*. London: Transport for London.
- United Nations. 'Conventions on the Rights of Persons with Disabilities and Optional Protocol.' *United Nations*. Accessed May 13, 2019. <https://www.un.org/disabilities/documents/convention/convoptprot-e.pdf>
- United Way. 'Storm the Stairs.' *United Way*. 2019. <http://uwtraildistrict.org/event/storm-the-stairs-2/>
- Universal Design Network of Canada. 'About Us.' *Universal Design Network of Canada*. Accessed May 13, 2019. <https://universaldesign.ca/>
- University of British Columbia. 'Vancouver Campus Plan – Part 3: Design Guidelines.' *University of British Columbia*. 2010. https://planning.ubc.ca/sites/planning.ubc.ca/files/images/VCPUdate2018_Part3.pdf
- Urban Racks. 'Urban Racks Bicycle Parking Guidelines.' *Urban Bicycle Parking Systems Inc*. 2014.
- Van Veen, Dick and Justin Goulding. 'University of Victoria – Bicycle Strategy: Integrating Bicycles and Conflict Management.' *Mobycon*. 2017.
- Vélo Québec. 2010. *Planning and Design for Pedestrians and Cyclists*. Montreal: Vélo Québec.
- Victoria Transport Policy Institute. 2016. 'Glossary.' *On-line TDM Encyclopedia*. Victoria Transport Policy Institute, August 25, 2016. <https://www.vtppi.org/tdm/tdm61.htm> (accessed December 19, 2018).
- Walker, L., M. Tresidder, and M. Birk. 2009. *Fundamentals of Bicycle Boulevard Planning & Design*. Portland: Portland State University.
- Wheels for Wellbeing. 'A guide to inclusive cycling – First edition.' *Wheels for Wellbeing*. 2017.
- Willis, Sean, Dean Cooper, Ryan Martinson, Aasha Williams-Blanco, Penny Dunford, Dena Ghoneim, Jenelle Anderson, Rhonda Shewchuk, Heather Dean, and Megan Straker. 'Trails in Alberta Highway Rights-of-Way Policies, Guidelines, and Standards.' *Government of Alberta*. 2015. <http://www.transportation.alberta.ca/Content/docType233/Production/Trails-HWY-ROW-apr2015-f.pdf>
- Wisconsin Transportation Information Center. 2005. *Using Salt and Sand for Winter Road Maintenance*. Bulletin, Madison: Wisconsin Transportation Information Center, WI.
- Winters, Meghan, Kay Teschke, Michael Grant, Eleanor Setton, and Michael Brauer. 2010. 'How Far Out of the Way Will We Travel?: Built Environment Influences on Route Selection for Bicycle and Car Travel.' *Transportation Research Record* 1-10.

Winters, Meghan and Kay Teschke. 'Designing Cities for Cycling.' Poster Presentation, *ProWalk ProBike Conference*, Seattle, WA, September 2-5, 2008.

Winters, Meghan and Kay Teschke. 2010. 'Route Preferences Among Adults in the Near Market for Bicycling: Findings of the Cycling in Cities Study.' *American Journal of Health Promotion* 25-1.

Woodward, Sonia. 'Universal Design 101.' *Rick Hansen Foundation*. 2017. <https://www.rickhansen.com/news-stories/blog/universal-design-101>

World Health Organization. 'Deafness and hearing loss.' *World Health Organization*. Accessed May 13, 2019. <https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss>

APPENDIX A: PROJECT PARTICIPANTS

The British Columbia Active Transportation Design Guide (Design Guide) was developed under the direction of the British Columbia Ministry of Transportation and Infrastructure (MOTI) with support by Urban Systems. Accessibility guidance was provided by Universal design (UAD). Signal guidance was provided by P.K. Consulting, LLC.

PROVINCE OF BRITISH COLUMBIA

The following provincial government staff participated in the creation of the Design Guide:

Engineering

Ian Pilkington, Chief Engineer

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Universal Design

Stan Leyenhorst, Universal Access Design

Graphic Design

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Donna Liu, Urban Systems

Gustavo Manzano, Urban Systems

WEBINAR AND ON-LINE SURVEY PARTICIPANTS

Stakeholders from across the province were invited to participate in the development of the Design Guide through the participation of webinar and an on-line survey. The following organizations participated in webinars and/or completed the on-line survey regarding the Design Guide:

BC Cycling Coalition
BC Ferries
BC Randonneurs Cycling Club
BC Recreation and Parks Association
Bikemaps.org
Capital Regional District
City of Coquitlam
City of Courtenay
City of Delta
City of Kamloops
City of Kelowna
City of Maple Ridge
City of Nelson
City of New Westminster
City of North Vancouver
City of Penticton
City of Powell River
City of Richmond
City of Surrey
City of Vancouver
City of Vernon
City of Victoria
Columbia Shuswap Regional District
Comox Valley Regional District
Cowichan Valley Regional District
District of Central Saanich
District of Kitimat
District of New Hazelton
District of North Saanich
District of North Vancouver
District of Oak Bay
District of Saanich
District of Sooke
District of Sparwood
District of Squamish
District of Summerland
District of West Vancouver
Engineers and Geoscientists BC
Greater Nanaimo Cycling Coalition
Greater Victoria Cycling Coalition
HUB Cycling
Islands Trust
Municipality of North Cowichan
New Westminster & Burnaby Walkers' Caucus
Regional District of Central Kootenay
Regional District of Central Okanagan
Regional District of Nanaimo
Resort Municipality of Whistler
Shuswap Trail Alliance
Spinal Cord Injury BC
Strathcona Regional District
Town of Comox
Town of Sidney
TransLink
Township of Spallumcheen
University of British Columbia
Village of Pemberton
Walk Metro Vancouver
Walk On Victoria
Whistler Cycling Club
Wolverine Nordic and Mountain Society










APPENDIX B: SIGNAGE AND PAVEMENT MARKINGS







There are two primary sources of signage in British Columbia. The Ministry of Transportation and Infrastructure (MOTI) oversees the B.C. Provincial Sign Program and maintains the *Catalogue of Standard Traffic Signs and Supplemental Traffic Signs*, which apply on all roadways under provincial jurisdiction. Meanwhile, the *TAC Manual of Uniform Traffic Control Devices for Canada (MUTCDC)* provides national guidance for the use of traffic control devices, including signage and pavement markings. TAC MUTCDC signage is typically used on roadways that are under local and regional government jurisdiction. Other sources of signage and pavement markings include the *TAC Bikeway Traffic Control Guidelines for Canada* and the *TAC Pedestrian Crossing Control Guide*.











The TAC guidance and the B.C. Provincial Sign Program use different sign codes: for example, the sign code for a Stop sign is MUTCDC RA-1 (using TAC guidance) or B.C. R-001 Series (using the B.C. Provincial Sign Program). There is overlap between the two systems, but there are also signs that are unique to each system. There are also some signs that have similar meanings but different designs – some with minor differences and some more noticeable. Where two different codes exist for the same sign, each code has been referenced in the Design Guide. If the sign appears in only one guide, that code has been referenced. Design professionals are encouraged to review each signage system and consider the jurisdiction and the most appropriate sign for each application.



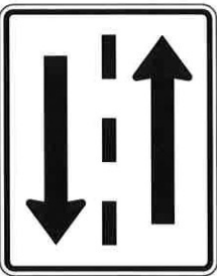
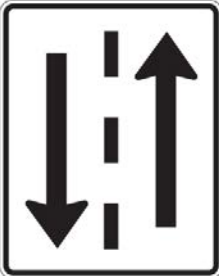


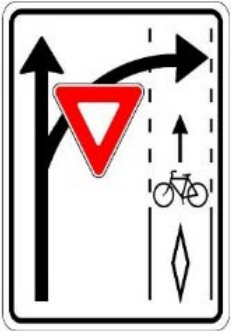

Please note that the information provided in this section is based on the TAC guidelines and the B.C. Provincial Sign Program, as indicated above. All pavement markings and signage should reflect the most current edition of each of the reference documents. Design professionals are reminded that the traffic control devices included in Appendix B are not an exhaustive list of traffic control devices. A more exhaustive list of available traffic control devices that includes signage, pavement marking, and signals can be found in the documents referenced above.




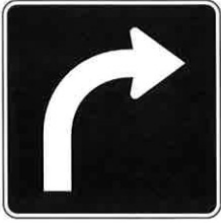
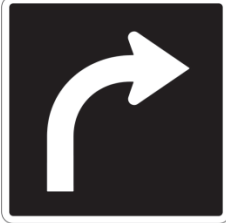


SIGNAGE











REGULATORY SIGNS			
MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 RA-1	 R-001 Series		<p>Stop Sign</p> <p>The Stop sign indicates to cyclists that they must stop before entering the intersection and must not proceed until it is safe to do so.</p>
 RA-2	 R-002 Series		<p>Yield Sign</p> <p>The Yield sign indicates to drivers that they must yield the right-of-way before entering the intersection or roundabout, and must not proceed until it is safe to do so.</p>
 RA-3R, RA-3L	 PS-005 Series		<p>School Crosswalk Sign</p> <p>The School Crosswalk sign is used to indicate the location of a school crosswalk. The sign is placed on either side of the crosswalk using the right and left version so that the pedestrian symbols are walking toward the centre of the road.</p>
 RA-4R, RA-4L	 PS-003 Series		<p>Pedestrian Crosswalk Sign</p> <p>The Pedestrian Crosswalk sign is used to indicate the location of a school crosswalk. The sign is placed on either side of the crosswalk using the right and left version so that the pedestrian symbols are walking toward the centre of the road.</p>
 RA-5	N/A		<p>Special Crosswalk Overhead Sign</p> <p>The Special Crosswalk Overhead sign indicates the location of a special crosswalk. This sign must be installed over the road.</p>




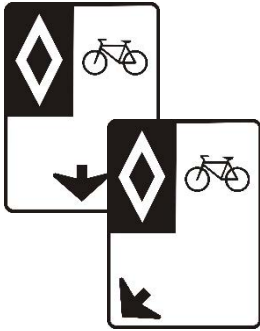

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 <p data-bbox="152 915 201 940">RA-8</p>	<p data-bbox="427 915 467 940">N/A</p>		<p data-bbox="971 338 1349 363">In-Street School Crosswalk Sign</p> <p data-bbox="971 390 1442 533">The In-Street School Crosswalk sign may be used to increase the conspicuity of key pedestrian crosswalks in a school area. The In-Street School Crosswalk sign shall not be used at crosswalk locations that are controlled by a stop sign or a traffic signal.</p> <p data-bbox="971 560 1463 632">The In-Street School Crosswalk sign shall be placed on the roadway centre line or on a median island if present.</p>
 <p data-bbox="152 1146 212 1171">RB-9S</p>	 <p data-bbox="427 1146 537 1171">R-009 Tabs</p>		<p data-bbox="971 961 1263 987">Except Bicycles Tab Sign</p> <p data-bbox="971 1014 1463 1085">Used with Turn Control signs, Entry Prohibited signs and other regulatory signs where bicycles are exempt from the specific regulation.</p>
 <p data-bbox="152 1465 212 1491">RB-10</p>	 <p data-bbox="427 1465 565 1491">R-017-2 Series</p>		<p data-bbox="971 1192 1349 1218">Through Traffic Prohibited Sign</p> <p data-bbox="971 1245 1430 1316">The Through Traffic Prohibited sign indicates to drivers that they are not permitted to proceed straight ahead.</p>
 <p data-bbox="152 1774 212 1799">RB-11L</p>	 <p data-bbox="427 1774 565 1799">R-015-L Series</p>		<p data-bbox="971 1507 1273 1533">Left Turn Prohibited Sign</p> <p data-bbox="971 1560 1435 1606">The Left Turn Prohibited sign indicates to drivers that they are not permitted to turn left.</p>




MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 RB-11R	 R-015-R Series		<p>Right Turn Prohibited Sign</p> <p>The Right Turn Prohibited sign indicates to drivers that they are not permitted to turn right.</p>
 RB-14R	 R-016-1R Series		<p>Turn Right Sign</p> <p>The Turn Right sign indicates to drivers that they are required to turn right only.</p>
 RB-17R	 R-117-R		<p>Right Turn on Traffic Signal Prohibited Sign</p> <p>The Right Turn on Traffic Signal Prohibited sign indicates to drivers that during the red traffic signal indication, they are not permitted to turn right.</p>
 RB-17L	 R-117-L Series		<p>Left Turn on Traffic Signal Prohibited Sign</p> <p>The Left Turn on Traffic Signal Prohibited sign indicates to drivers that during the red traffic signal indication, they are not permitted to turn left.</p>
 RB-21	 R-008-1LR Series		<p>One-Way Sign</p> <p>The One-Way sign indicates to drivers that traffic is allowed to travel only in the direction of the arrow, on the road or section of road.</p>



MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 RB-23	 R-009-1 Series		<p>Entry Prohibited Sign</p> <p>The Entry Prohibited sign indicates to drivers that vehicular traffic is not permitted to enter the road at the location of the sign.</p>
 RB-24	 R-010 Series		<p>Two-Way Traffic Sign</p> <p>The Two-way Traffic sign indicates to drivers that the section of road that they are travelling on is a two-way road. This sign is recommended on roadways with advisory bicycle lanes.</p>
 RB-25	 R-014-R Series		<p>Keep Right Sign</p> <p>The Keep Right sign indicates that traffic is required to pass on the right of obstructions, such as medians, islands or underpass piers.</p>
 RB-37	N/A	 Custom – City of Vancouver	<p>Turning Vehicles Yield to Bicycles Sign</p> <p>The Turning Vehicles Yield to Bicycles sign may be used at conflict zones where motorists are required to cross a cyclist facility and are required to yield to the cyclist. The sign should incorporate the type of cycling facility present in the conflict zone (e.g. dashed bicycle lane lines, green paint, direction of travel etc.)</p> <p>Customized versions of the RB-37 sign with a supplemental 'Yield to Bicycles' tab have been developed by other municipalities (e.g., City of Vancouver) for improved visibility and readability.</p>





MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 <p>RB-38</p>	<p>N/A</p>	 <p>R10-15 alt.</p> <p><i>Custom (MassDOT)</i></p>	<p>Turning Vehicles Yield to Bicycles and Pedestrians Sign</p> <p>The Turning Vehicles Yield to Bicycles and Pedestrians sign may be used where motorists are required to cross or share a facility used by cyclists and/or pedestrians and are required to yield to the cyclists or pedestrians.</p> <p>Customized versions of the RB-38 sign have been illustrated in other guidelines. For example, the R10-15 alt. sign shown in the MassDOT guide.</p>
 <p>RB-39</p>	<p>N/A</p>		<p>Yield to Pedestrians Sign</p> <p>The Yield to Pedestrians sign may be used where cyclists are required to cross or share a facility used by pedestrians and are required to yield to pedestrians.</p>
 <p>RB-41R</p>	 <p>R-082-R1 Series</p>		<p>Right Turn Only Lane Sign</p> <p>The Right Turn Only Lane sign indicates to drivers approaching an intersection in the designated lane that they must only turn right from the designated lane at the intersection.</p>
 <p>RB-51</p>	 <p>P-001 Series</p>		<p>Parking Prohibited Sign</p> <p>The Parking Prohibited sign indicates that parking is prohibited at all times on all days, in the direction(s) of the arrow(s).</p>








MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
			<p>Stopping Prohibited Sign</p> <p>The Stopping Prohibited sign indicates that stopping is prohibited at all times on all days, in the direction(s) indicated by the arrow(s).</p>
<p>RE</p>   <p>RB-66</p>	<p>P</p>   <p>PS-012 Series</p>		<p>Pedestrian Prohibited Sign</p> <p>The Pedestrian Prohibited sign indicates that pedestrians are prohibited in a specific area.</p>
  <p>RB-79 RB-79T</p>	 <p>B-R-101-2</p>  <p>B-R-101-2 Series, B-R-101 Tabs</p>		<p>Dismount and Walk Sign</p> <p>The Dismount and Walk sign indicates to people cycling to dismount and walk their bicycle through a specific area.</p> <p>The Dismount and Walk tab may be used to enhance the compliance of the sign.</p>

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 <p>RB-85</p> <p>RB-85</p>	<p>N/A</p>		<p>Motorcycles Prohibited Sign</p> <p>The Motorcycles Prohibited sign indicates that motorcycles are prohibited in a specific area</p>
 <p>RB-88</p> <p>RB-88</p>	 <p>R-122-1 Series</p>		<p>Automobiles Prohibited Sign</p> <p>The Automobiles Prohibited sign indicates that automobiles are prohibited in a specific area</p>
 <p>RB-90, RB-91</p>	<p>N/A</p>		<p>Reserved Bicycle Lane Sign</p> <p>The Reserved Bicycle Lane sign indicates that a lane is reserved for the exclusive use of bicycles. Reserved Bicycle Lane signs should be mounted either directly above (RB-90) or adjacent to (RB-91) the reserved lane.</p> <p>Reserved Bicycle Lane signs should be installed at a minimum of one sign between each intersection, with the first sign installed a maximum of 15 metres past the end of the curb radius. Signs should be installed at 200 metre intervals after the first signs.</p>
 <p>RB-92</p>	<p>N/A</p>		<p>Reserved Bicycle Lane Ends Sign</p> <p>The reserved Bicycle Lane Ends sign must be installed at the end of the reserved lane denoting the end of the bicycle lane.</p>

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 <p>RB-82</p>	N/A		<p>Reserved Bicycle Lane Begins Sign</p> <p>The reserved Bicycle Lane Begins sign must be installed at the beginning of the reserved lane denoting the start of the bicycle lane.</p>
N/A	N/A	 <p>Custom Sign</p>	<p>Custom Reserved Bi-directional Bicycle Lane Sign</p> <p>Custom signage for bi-directional protected bicycle lanes, such as the custom Reserved Bi-directional Bicycle Lane sign used by the City of Edmonton, may be used to further clarify the facility for cyclists and motorists.</p>
 <p>RB-93</p>	N/A		<p>Shared Pathway Sign</p> <p>The Shared Pathway sign indicates that both cyclists and pedestrians are permitted to use the path.</p>







MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 <p data-bbox="159 730 228 758">RB-94L</p>	 <p data-bbox="428 491 586 518">B-G-003-1 Series</p>  <p data-bbox="428 667 597 695">B-G-003-1R Series</p>  <p data-bbox="428 869 597 896">B-G-003-1L Series</p>  <p data-bbox="428 1121 597 1148">B-G-003-2L Series</p>  <p data-bbox="428 1394 602 1421">B-G-003-2 R Series</p>		<p data-bbox="971 338 1295 365">Pathway Organization Sign</p> <p data-bbox="971 390 1458 464">The Pathway Organization sign indicates to cyclists and pedestrians how to share a path on which there is a designated area provided for each.</p>
 <p data-bbox="152 1394 222 1421">RB-94R</p>	 <p data-bbox="428 1822 565 1850">R-025-R Series</p>		<p data-bbox="971 1438 1143 1465">Stop Line Sign</p> <p data-bbox="971 1486 1442 1560">The Stop Line sign indicates the point at which drivers approaching a traffic control device must stop their vehicles.</p>
 <p data-bbox="152 1822 207 1850">RC-4R</p>			

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
N/A	N/A		<p>Advisory Bicycle Lane Sign</p> <p>The custom Advisory Bicycle Lane sign is used where motorists are required to share the center travel lane and pass one another by temporarily pulling into the advisory bicycle lane. Motorists must yield to people cycling in advisory bicycle lanes when a sidewalk is present for people walking.</p>
N/A	N/A		<p>Multi-Use Crossing Sign</p> <p>The custom Multi-Use Crossing sign is used to indicate the location of a multi-use crosswalk.</p>
N/A	N/A		<p>Bicycle Signal Sign</p> <p>The custom Bicycle Signal sign is used to inform people on bicycles and motorists of a bicycle signal.</p>
N/A	N/A		<p>Bicycles Use Pedestrian Signal Sign</p> <p>The custom Bicycles Use Pedestrian Signal sign is used to inform people on bicycles and motorists that people cycling are to follow the pedestrian signals instead of the motor vehicle signals.</p>







MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
N/A	N/A	  	<p>Shared Street Signage</p> <p>The custom Shared Street signs have been used by municipalities to demarcate the entrance to a shared street where motorists need to travel at the speed of people walking.</p>
TC-68	B-C-002 Series	 	<p>Bicycle Lane Closed Sign</p> <p>The Bicycle Lane Closed sign is used to warn cyclists that a bicycle lane is temporarily closed.</p>
TC-70	B-C-004-1A Series	 	<p>Bicycle Lane Detour Marker Sign</p> <p>Bicycle Lane Detour Marker signs are used to direct people cycling to follow an alternative route when a work zone requires bicycle lane closure.</p> <p>Marker signs should be installed whenever a Bicycle Lane Closed sign is temporarily installed.</p>











MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 TC-71	 B-C-004-2 Series		<p>Bicycle Detour Ends Sign</p> <p>Bicycle Detour Ends sign may be installed to denote the end of the detour.</p>
WARNING SIGNS			
 WB-3	 W-020 Series		<p>Two-Way Traffic Ahead Sign</p> <p>Used to warn all road users on a one-way street that they are approaching a section with two-way traffic.</p>
 WB-4	 W-012 Series		<p>Signal Ahead Sign</p> <p>The Signal Ahead sign is used to indicate the presence of a traffic control signal ahead. This sign may be used when the signals are not visible for a distance of 120m.</p>
 WC-2	 PS-002 Series		<p>Pedestrian Crosswalk Ahead Sign</p> <p>Install the Pedestrian Crosswalk Ahead sign when the visibility of the crosswalk area is limited. This sign must be installed 50-150 metres in advance of pedestrian crosswalks.</p>
 WC-16	 PS-004 Series		<p>School Crosswalk Ahead Sign</p> <p>Used in advance of a school crossing when no School Area signs are present.</p>

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 <p>WC-20</p>  <p>WC-20S</p>	<p>N/A</p>		<p>Shared-Use Lane Single File Sign</p> <p>Used to warn motorists and cyclists that cyclists are allowed full use of the lane ahead and to warn motorists that the lane is too narrow for side-by-side operation. Shared-use lane markings should be used to mark the location where cyclists should position themselves within the lane.</p> <p>Single File Supplementary Tab Sign</p> <p>The Single File supplementary tab sign (WC-20S) must be used to convey the meaning of this sign.</p>
 <p>WC-44</p>	<p>N/A</p>		<p>Bicycle Trail Crossing Side Street Sign</p> <p>The Bicycle Trail Crossing Side Street sign indicates to drivers that a bicycle path, which runs parallel and in close proximity to the through road, intersects a crossroad such that insufficient distance is available on the crossroad between the bicycle trail crossing and the through road for proper siting of the WC-7 sign.</p>
 <p>WC-44T</p>	<p>N/A</p>		<p>Trail Crossing Tab Sign</p> <p>The temporary Trail Crossing Tab sign is used for educational purposes after the WC-44 sign is installed.</p>
 <p>WA-36L</p>	<p>W-054-L Series</p>		<p>Object Marker (Left)</p> <p>The Object Marker (Left) is used to mark obstructions on the left side of the road or bikeway.</p>

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 WA-36R	W-054-R Series		<p>Object Marker (Right)</p> <p>The Object Marker (Right) is used to mark obstructions on the right side of the road or bikeway.</p>
 WA-36	W-054-D Series		<p>Object Marker</p> <p>The Object Marker is used to mark obstructions adjacent to or within the road or bikeway, such as bridge piers and traffic islands.</p>
 WA-9	W-062 Series		<p>Chevron Alignment Sign</p> <p>The Chevron Alignment signs may be used to provide additional guidance to drivers where there is a change in the horizontal alignment of the road.</p>
 WA-8	W-014 Series		<p>Checkerboard Sign</p> <p>The Checkerboard sign indicates the termination of a road.</p>

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 WA-8R	 W-015 Series		<p>Checkerboard Sign</p> <p>The Checkerboard signs indicate an abrupt change of alignment at a turn or a curve. The black arrow indicates the direction taken by the curve or turn.</p>
 WA-2R	 W-002-R Series		<p>Single Curve Sign</p> <p>The Single Curve sign indicates that there is a single curve in the road ahead.</p>
 WA-50	 W-108-2 Series		<p>Neighbourhood Speed Hump Sign</p> <p>The Neighbourhood Street Hump sign indicates a vertical deflection of the road surface, including measures such as a speed hump, raised crosswalk or raised intersection.</p>
 WC-43	N/A		<p>Contraflow Bicycle Lane Crossing Sign</p> <p>The Contraflow Bicycle Lane Crossing sign indicates to drivers that they are approaching a road with one-way vehicular traffic and two-way bicycle traffic.</p>
 WC-46	 W-129-2 Series		<p>Pedestrian and Bicycle Crossing Ahead Sign</p> <p>The Pedestrian and Bicycle Crossing Ahead sign indicates to drivers that they are approaching a location where a multi-use path crosses the road.</p> <p>The WC-7S Crossing Supplementary tab sign must be used to convey the meaning of the Bicycle Crossing Ahead sign.</p>





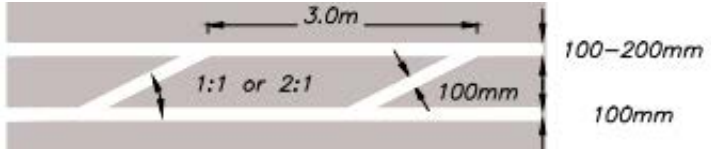
MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 WC-7R	 W-129-1 Series		<p>Bicycle Crossing Ahead Sign</p> <p>The Bicycle Crossing Ahead sign indicates to drivers that they are approaching a location where a bicycle path crosses the road.</p>
 WC-7S	 W-129 Tab		<p>Crossing Supplementary Tab</p> <p>The Crossing Supplementary tab sign must be used to convey the meaning of the Bicycle Crossing Ahead sign.</p>
 WC-19	 W-132-1 Series		<p>Share the Road Sign</p> <p>Used to warn drivers that they are to provide adequate driving space for cyclists and other vehicles on the road.</p> <p>Share the Road Supplementary Tab Sign</p> <p>The Share the Road supplementary tab sign (WC-19S) must be used to convey the meaning of this sign.</p>
 WC-19S	 W-132-1 Tab		
 WB-10	N/A		<p>Reserved Bicycle Lane Ahead Sign</p> <p>The Reserved Bicycle Lane Ahead sign may be used to warn drivers that they are approaching a reserved bicycle lane.</p>

MUTCDC SIGN CODE	B.C. SIGN CODE	CUSTOM SIGNS	DESCRIPTION
 <p>WC-48</p>  <p>WC-48S</p>  <p>WC-49</p> <p>WC-48 WC-48S WC-49</p>	 <p>W-130 Series</p>		<p>Advance Warning of Bicycle Signs</p> <p>Used to indicate to drivers in advance of a confined structure that there is a high probability of encountering a bicycle user in the area. Refer to the MUTCDC for application considerations.</p>
INFORMATION SIGNS			
 <p>IB-23</p>	 <p>B-G-001 Series</p>	    <p>Custom - City of Vancouver</p>	<p>Bicycle Route Marker Sign</p> <p>The Bicycle Route Marker sign provides route guidance for cyclists and indicates the streets, highways and separate facilities that form part of a bicycle route system. Arrows can be added to the Bicycle Route Marker sign to provide wayfinding guidance on bicycle routes.</p> <p>Bicycle symbols can be added to side-mounted or overhead street name blades to indicate bicycle corridors.</p>

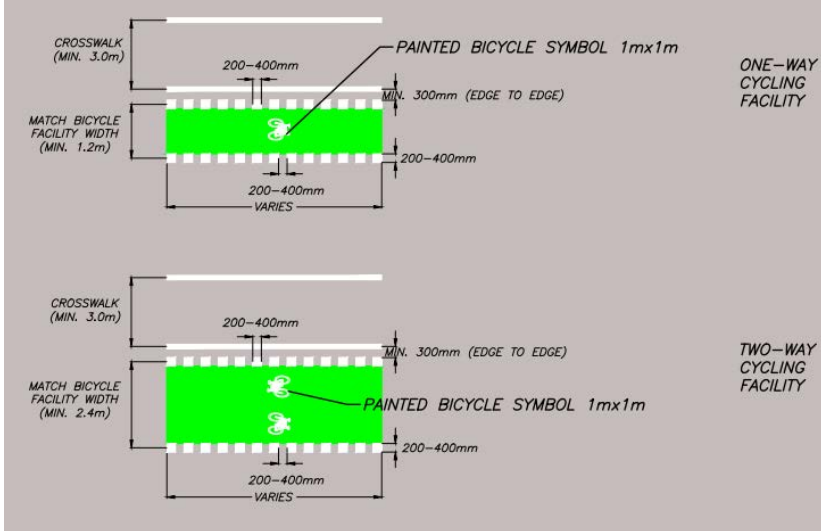

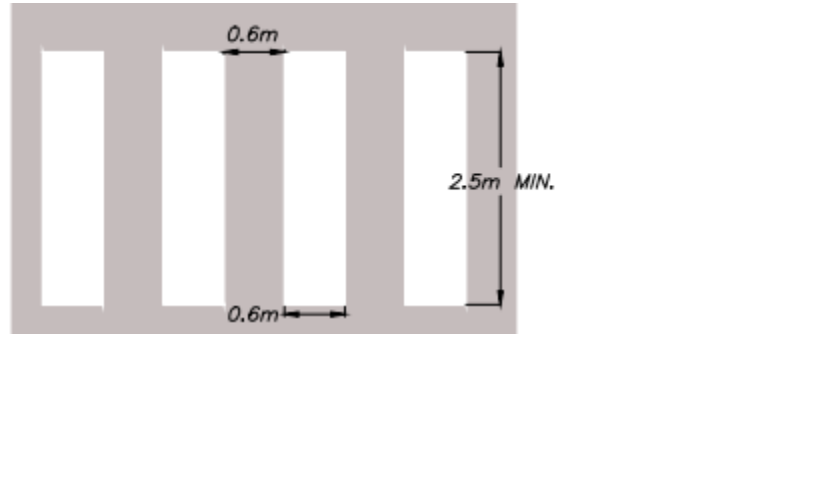

PAVEMENT MARKINGS

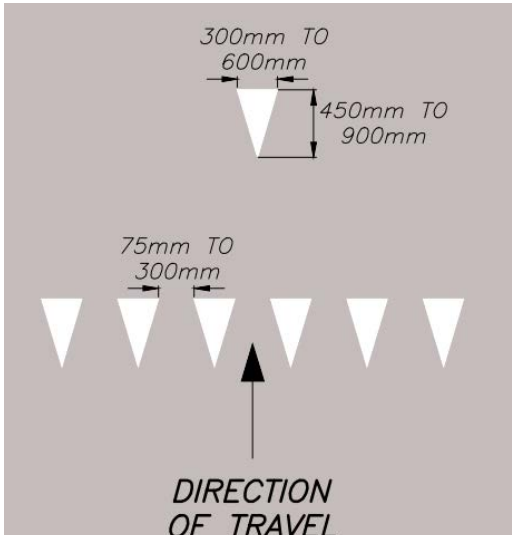
Pavement markings are an important element of the traffic control system for all road users. As stated in the TAC MUTCDC, they serve a variety of functions, including defining lanes, separating opposing traffic flows, passing controls, lane usage and designation, pedestrian crosswalks, stop lines, parking areas and symbol and word messages. Under favourable conditions, pavement markings convey information to the motorist, people walking, and people cycling without diverting their attention from the road or bikeway. However, they have limitations: they may be entirely covered by snow; they may not be clearly visible when wet; and they may have limited durability.

Pavement markings for bicycle and pedestrian facilities fall into three categories: longitudinal, transverse and symbol markings. The principles for the design of pavement markings are outlined in Division C1 of the TAC MUTCDC. *Pavement markings must be uniform in design position and application. Pavement markings should be designed in accordance with the design standards in Division C1 of the TAC MUTCDC as well as the MOTI Manual of Standard Traffic Signs and Pavement Markings.* Design professionals are reminded that the pavement markings included in **Appendix B** are not an exhaustive list. A more exhaustive list of available traffic control devices that includes pavement markings, signage, and signals can be found in the documents listed in the introduction of **Appendix B** above.

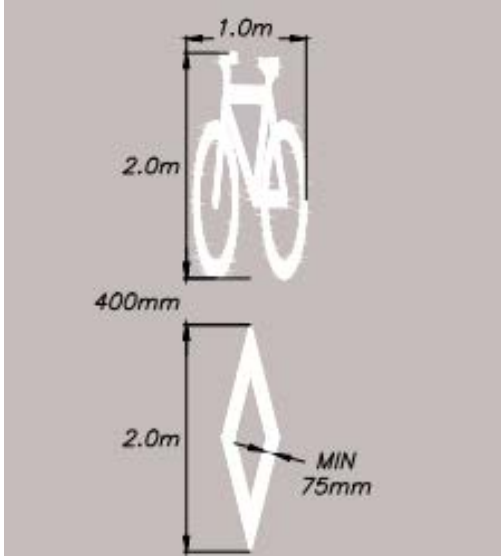
LONGITUDINAL		
The longitudinal pavement marking widths shown in the figures indicate the desired widths. Acceptable ranges are noted in the table below.		
Name	Dimensions	Description
Bicycle Lane (Solid)		Delineates the edge of a travel lane dedicated for bicycle use where travel is permitted in the same direction on both sides of the line.
Bicycle Lane (Dashed)		Permits motor vehicles to cross the bicycle lane to perform a turning movement.
Bicycle Lane Guidelines (Dashed)		Delineates the edge of bicycle travel lanes through intersections where cross-ride markings have not been installed.
Contra-Flow Lane		Separates bicycles and moving vehicles travelling in the opposite direction.
Buffered Bicycle Lane		Creates greater separation for bicycles and moving vehicles travelling in the same direction. When the width of buffer is < 300mm, the inner line can be omitted. When the width of the buffer is ≤ 600mm the diagonal hatching is optional.

TRANSVERSE		
Name	Dimensions	Description
<p>Combined Cross-ride / Elephant's Feet at Twin Parallel Line Multi-Use Crossing</p>		<p>Used to define a combined crossing area for people cycling and walking at multi-use pathways. These markings are not sufficient by themselves and shall always be used in conjunction with crosswalk signs or signals.</p> <p>Note: The use of enhanced green pavement markings should not be used at multi-use crossings (combined cross-rides and crosswalks). The use of green should only be used for dedicated cycling facilities (see below).</p>
<p>Combined Cross-ride / Elephant's Feet at Zebra Multi-Use Crossing</p>		<p>Used to define a combined crossing area for people cycling and walking at multi-use pathways that cross where a zebra crosswalk would be installed.</p> <p>Note: The use of enhanced green pavement markings should not be used at multi-use crossings (combined cross-rides and crosswalks). The use of green should only be used for dedicated cycling facilities (see below).</p>
<p>Cross-ride / Elephant's Feet and Crosswalk at Protected Bicycle Lane or Multi-Use Pathway Crossing</p>		<p>Used to define a street crossing area for people walking and people cycling at a protected bicycle lane or separated multi-use pathway.</p>

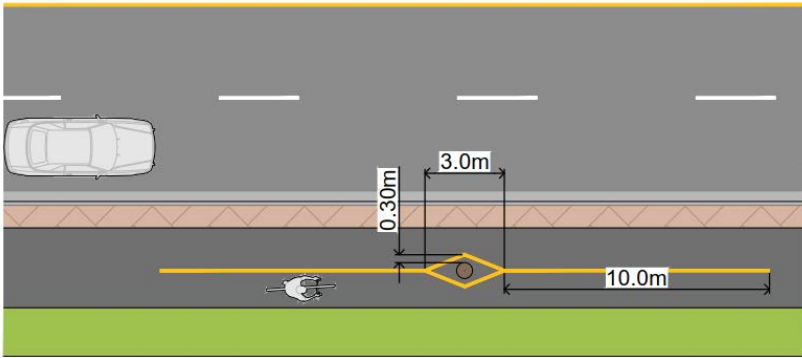
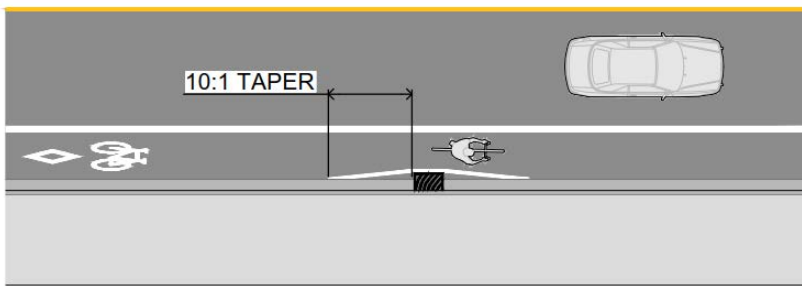
Name	Dimensions	Description
Enhanced Cross-ride / Elephant's Feet at Bicycle Pathway or Multi-Use Pathway Crossing – With Green Conflict Pavement Marking	 <p>The diagrams illustrate the dimensions for enhanced pavement markings at bicycle pathway crossings. The top diagram is for a ONE-WAY CYCLING FACILITY, showing a crosswalk (MIN. 3.0m) with a match bicycle facility width (MIN. 1.2m). It features a green painted bicycle symbol (1m x 1m) with a 200-400mm width and a 200-400mm height. The distance between the crosswalk and the facility is 200-400mm, and the distance between the facility and the next crosswalk is also 200-400mm. The bottom diagram is for a TWO-WAY CYCLING FACILITY, showing a crosswalk (MIN. 3.0m) with a match bicycle facility width (MIN. 2.4m). It features two green painted bicycle symbols (1m x 1m) with a 200-400mm width and a 200-400mm height. The distance between the crosswalk and the facility is 200-400mm, and the distance between the facility and the next crosswalk is also 200-400mm. A minimum spacing of 300mm (edge to edge) is indicated between the crosswalk and the facility.</p>	Enhanced pavement markings with green colour used to define an area for people walking and people cycling in protected bicycle lanes or separated bicycle pathways to cross intersections, laneways, and driveways. When the protected bicycle lane crosses an intersection with pedestrian facilities, the required spacing between the crosswalk and cross-ride is given.
Twin Parallel Line Crosswalk	 <p>The diagram shows a twin parallel line crosswalk with two parallel lines, each 200-300mm wide. The total width of the crosswalk is 2.5m MIN.</p>	Used to define a crossing area for people walking at intersections with traffic control, such as traffic signals or stop control. Twin parallel line crosswalks can be combined with elephant's feet markings to indicate a shared-use crossing.
Zebra Crosswalk	 <p>The diagram shows a zebra crosswalk with three vertical bars, each 0.6m wide. The total width of the crosswalk is 2.5m MIN.</p>	Used to define a crossing area for people walking at uncontrolled intersections where heightened visibility is desired and at all mid-block crossings. Zebra crosswalk markings offer greater conspicuity than twin parallel line crosswalk markings and shall be used at all school crosswalk locations. Zebra crosswalk markings may be considered at locations with large numbers or percentages of older pedestrians or locations with high activity of pedestrians with mobility or visual impairments.
Stop Bar	 <p>The diagram shows a stop bar with a width of 300-600mm.</p>	Used to define the location for people on bicycles to stop.

Name	Dimensions	Description
Advance Yield (Shark's Teeth)		<p>Used in advance of marked or signed crossing to discourage the approaching vehicle from stopping too close to the crossing. Advance Yield markings also can be used to increase awareness that the approaching vehicle must yield to those in the crossing. Advance Yield pavement markings can be directed at either motor vehicle traffic or in bicycle facilities directed at people cycling.</p>

SYMBOLS

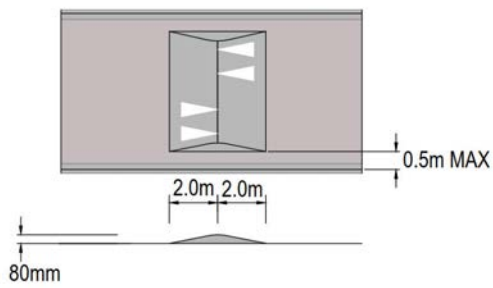
Name	Dimensions	Description
Bicycle Symbol Reserved Use Lane		<p>Pavement marking to indicate exclusive use of non-motorized vehicles. Symbols should be centred in the bicycle lane spaced at 75 m or as conditions dictate, and approximately 10 m downstream from an intersection or crosswalk. Directional arrow markings may also be used to identify the correct direction of cyclist movement in a bicycle lane.</p>

Name	Dimensions	Description
<p>Bicycle</p> <p>Shared Use Lane Symbol (Sharrow)</p>		<p>Pavement marking to indicate shared use of the roadway with people on bicycles and motorized vehicles.</p> <p>Symbols should be spaced at a minimum 75 m and approximately 10 m downstream from all intersections.</p> <p>Green backed sharrows should be used where protected bicycle lanes merge into a shared-use lane, and locations without physical protection where enhanced visibility is desired.</p>
<p>Bicycle Detection Symbol</p>		<p>Pavement marking to indicate location of bicycle actuation loop. Symbol should be placed at the most sensitive area of detection.</p>
<p>Non-Elongated Bicycle Symbol</p>		<p>Pavement marking used at conflict markings, bicycle pathway crossings, bicycle boxes or in two-stage turn boxes applications.</p>
<p>Custom Wayfinding Symbol</p>		<p>Wayfinding pavement marking to direct people on bicycles along bicycle routes.</p>
<p>Custom Multi-Use Wayfinding Symbol</p>		<p>Wayfinding pavement marking to direct people on bicycles and walking along multi-use pathways.</p>

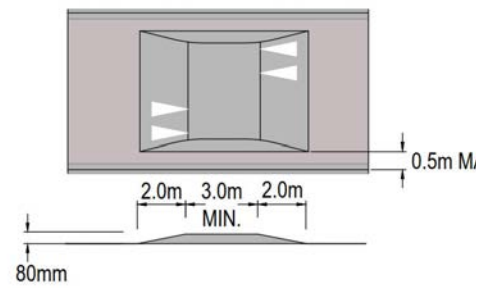
Name	Dimensions	Description
Hazard Pavement Marking for Obstructions within Pathway		Pavement marking to indicate an obstruction within the pathway. Typically used in advance of centre line bollards, hydro poles, light poles and other infrastructure.
Hazard Pavement Marking for Obstructions Curbside		Pavement marking to indicate an obstruction curbside adjacent to painted bicycle lanes. Typically used to demarcate infrastructure such as manhole lids, catch basin grates etc.

APPENDIX C: TYPES OF TRAFFIC CALMING DEVICES

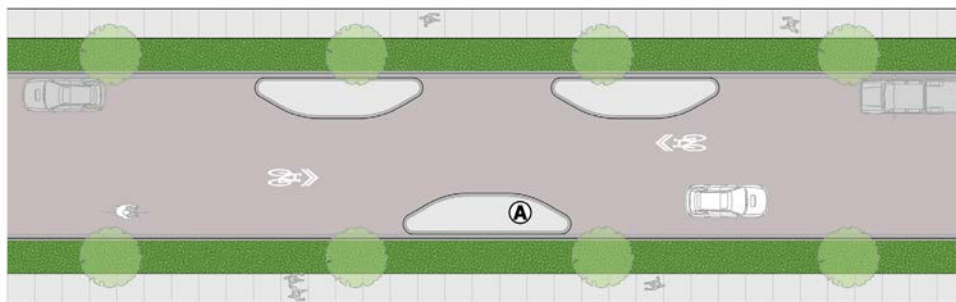
Speed Hump



Speed Table



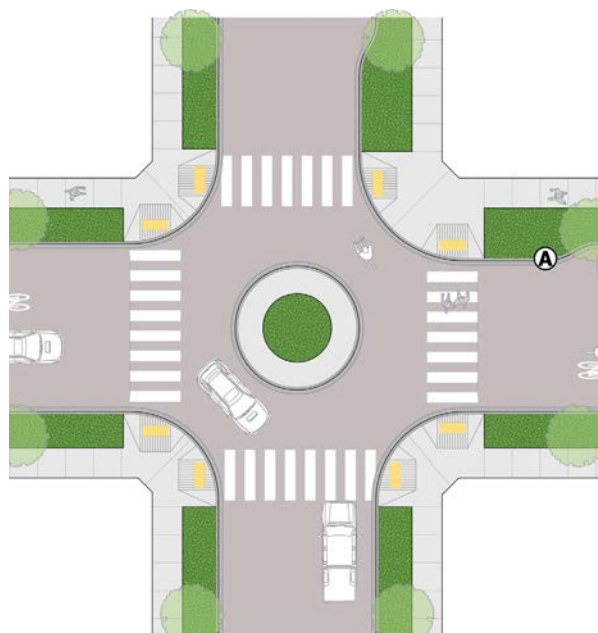
Chicane



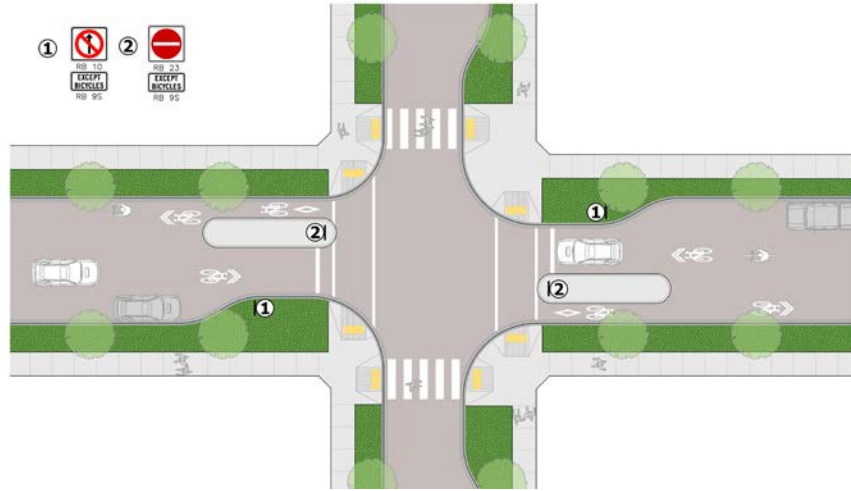
Raised Intersection



Traffic Circle



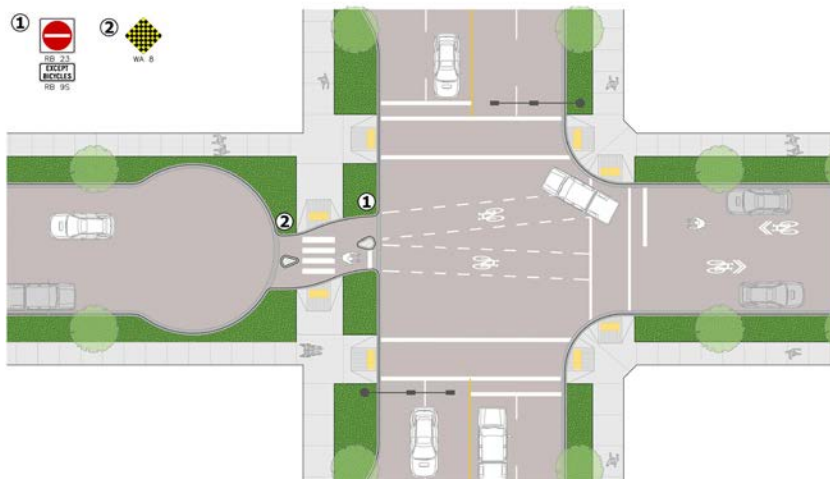
Directional Closure



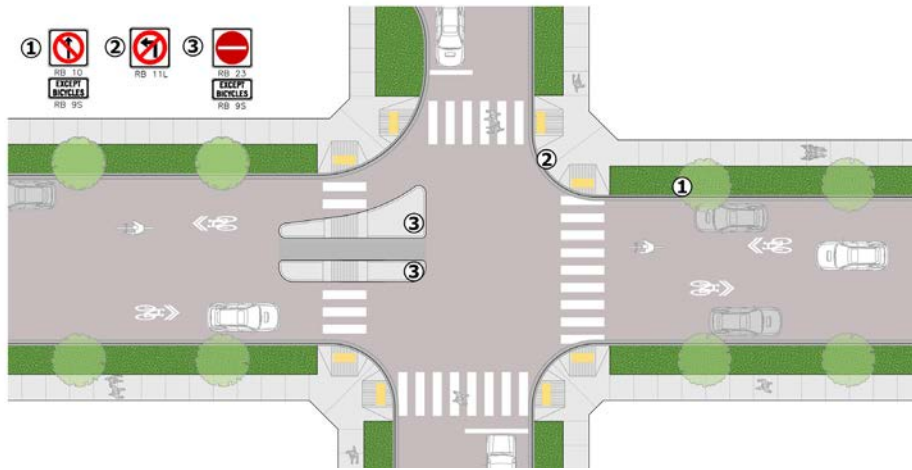
Diverter



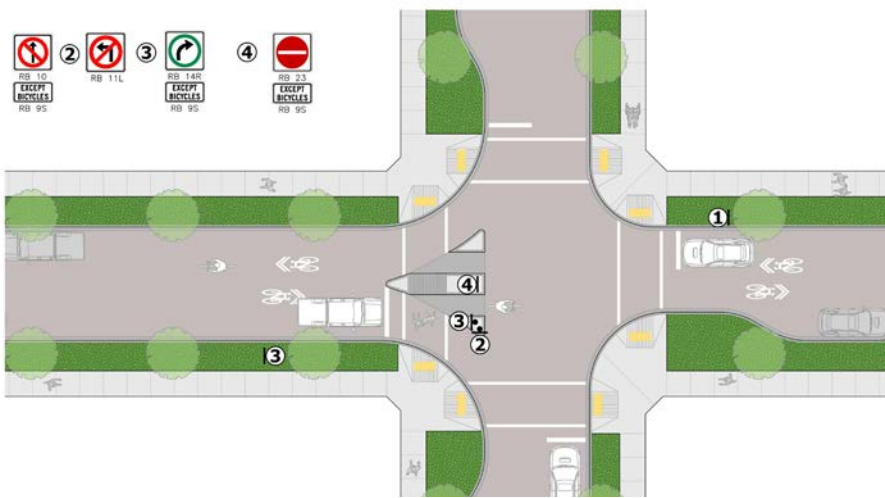
Full Closure



Intersection Channelization



Right-In / Right-Out Islands



Raised Median



About the B.C. Active Transportation Design Guide

The British Columbia Active Transportation Design Guide helps transform how we get around in a way that reduces pollution and leads to better health outcomes for people, while making our communities cleaner and more liveable. The Design Guide is a detailed planning and engineering reference that provides practical design and application guidance for active transportation infrastructure for jurisdictions of all sizes. It incorporates theory, recent research, design concepts, best practices, new methodologies, and innovations to maximize the benefits of investing in active transportation infrastructure.

The Province thanks everyone who participated in the shaping of this Design Guide and we look forward to working with all stakeholders across B.C. to design and build infrastructure using this information. Working together we can build the best B.C. possible and enable everyone to choose active transportation.

