

## Item 4 – Multi-Modal Transportation Guidelines

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## 1.0 Introduction

The goals of Dalhousie University’s Multi-Modal Transportation Guidelines are to:

- Ensure that multi-modal transportation infrastructure is incorporated into new and existing development,
- Help provide a well-defined, comfortable and accessible environment for users, and
- Promote sustainability, local procurement, lifecycle awareness, and conservation of energy and water resources in the design process.

Dalhousie University adheres to the Halifax Regional Municipality’s Land Use by-laws. Dalhousie follows HRM’s land use by-law classification of *Class A*, *Class B*, and *Enhanced bicycle parking*.

The Dalhousie University Multi-Modal Transportation Guidelines aim to address the needs of persons with *disabilities*, as they pertain to multi-modal transportation and *site* access. The Guidelines have been developed through a lens of *universal design* principles to ensure that an environment can be accessed, understood, and used by all people regardless of age, size, ability, or *disability*.

Active transportation and pedestrian paths, routes, and laneways should meet widths that are safe and *accessible*. Refer to Dalhousie *Div 32 – Exterior Environment and Natural Landscape Policy and Guidelines*, and resources such as ‘Guide for Inclusive Cycling’ (Wheels for Wellbeing) in conjunction with this Guideline.

The Guideline applies to campus exterior, transportation, new construction, renovation, and maintenance projects owned or leased by Dalhousie University. This document is to be read in conjunction with Dalhousie University’s Facilities Management Design Guidelines.

### Compliance and Enforcement

Dalhousie University Design Guidelines provide assistance to consultants during the planning and design phases of the University’s expansion and renovations. The Guidelines do not relieve a consultant from any professional responsibility, duty, or due diligence to design elegant, functional, efficient, and low maintenance *facilities*.

*Facility* owners have preferred materials and requirements that make the task of maintaining *facilities* less costly. Dalhousie understands this is a balance between capital and operating cost. The Guidelines are not intended to be the only acceptable solution. Dalhousie expects consultants to bring modern and innovative ideas, materials, and methods to the University. If these Guidelines do not allow these new ideas, then the consultant is to make a request in writing to the Dalhousie Project Manager for an exception to the guidelines. Necessary reasoning and/or calculations shall accompany the request. The exception request will be reviewed internally and either rejected or accepted. The consultant will document this rationale

and/or justification for each exception in the Basis of Design. The University Guidelines may be updated subsequently.

These documents provide design guidelines only, and are not intended for use, in whole or in part, as a specification. Do not copy the guidelines verbatim in specifications or in notes on drawings. Refer questions and comments regarding the content and use of these documents to the Dalhousie University Project Manager. The Guidelines are intended to be read in conjunction with the local codes and regulations, and in no way are to be considered as a code replacement. The codes and regulations represent the minimum acceptable standard. Where the technical design requirements differ from the building codes and other applicable codes and standards, the more stringent of the codes shall be applied.

### **Maintaining the Standards/Guidelines**

The Design Guidelines are created and maintained by Dalhousie's Facilities Management Department. Any enquiries about the Guidelines should be directed to Facilities Management, Director of Projects, Central Services Building. Dalhousie encourages design specialists and other interested parties to provide their input and suggestions based on their experience.

## 1.1 Glossary and Defined Terms

### Graphic Conventions

Dimensions that are not marked maximum or minimum are absolute, unless otherwise indicated.

### Functional Document Terminology

Within the context of these guidelines, the following functional statements will apply:

**Shall** denotes a mandatory specification or requirement.

**Should** denotes an advisory specification or recommendation.

### Defined Terms

The following definitions are provided for clarification. The defined terms are indicated throughout the document in *italic* font.

**Access aisle:** An *accessible* pedestrian space between *elements*, such as parking spaces and seating, that provides clearances appropriate for the use of the *elements*.

**Accessible:** A *site, facility, device, environment, or service* that a person can approach with ease, enter, operate, participate in, and/or use safely and/or independently and with dignity by people who experience disabilities

**Accessible route:** A continuous unobstructed path connecting all *accessible elements* and spaces of a building or *facility*. Exterior *accessible* routes may include parking access aisles, curb ramps, crosswalks at vehicular routes, walks, ramps, and platform lifts.

**Braille:** A system of raised dots that people who are blind can read with their fingers. The basis of the *braille* system is a *braille* cell. A full *braille* cell is comprised of six dots, arranged in two parallel rows of three dots. Each dot, or combination of dots, represents a letter of the alphabet, a number, or a punctuation mark. Together, they can be used to express words, sentences, equations, musical notation, and more.

**Class A:** *Class A* parking is a *facility* which secures the entire bicycle in a protected environment, such as a bicycle room, locker, or cage. *Class A* parking shall have a minimum door opening of 0.6m, and no less than 1.8m long, 1.2m high, with an aisle of 1.5m.

**Class B:** *Class B* parking refers to bicycle racks, including wall mounted varieties. They must be a minimum of 0.6m wide, 1.8m long, have a minimum overhead clearance of 2.0m, and be located a minimum of 0.6m from any wall or other obstruction.

**Clear:** Unobstructed.

**Curb ramp:** A short *ramp* cutting through a curb or built up to a curb. *Curb ramps* shall be provided where the *accessible* path of travel intersects or crosses a curb.

**Disability:** includes a physical, mental, intellectual, learning, or sensory impairment, including an episodic *disability*, that, in interaction with a barrier, hinders an individual's full and effective participation in society.

**Element:** An architectural component of a space or *site* (e.g., *curb ramp*, bicycle parking, or seating).

**Enhanced Bicycle Spaces:** Bicycle parking spaces which provide *facilities* in excess of the other classifications in terms of quantity or class, including showers and clothes lockers that follow LEED Standards for active transportation.

**Facility or Facilities:** All or any portion of buildings, structures, site *improvements*, parking lots, parks, roads, *elements*, and pedestrian routes or vehicular ways located on a *site*.

**Mobility Device:** Refers to a range of assistive equipment used by persons with disabilities to assist with mobility. Example: crutches, canes, manual or powered wheelchairs, scooters, and walkers.

**Multi-modal Transportation:** Transportation involving more than one mode. It includes pedestrian, public transportation, bicycle, and wheeled mobility among others. Multimodal access supports the needs of all users whether they choose to walk, bike, use assistive equipment, use transit or drive.

**Obstruction:** can include furnishings, equipment, street furniture, vegetation, plantings, guy wires, tree braces and supports, tree branches, waste and recycling receptacles, the underside of stairways, *signage*, payment and vending machines, pylons, bollards, columns and pillars, queuing lines, light posts, fire hydrants, etc. that inhibit the path of travel or protrude into the path of travel that can become hazardous.

**Ramp:** A walking surface which has a running *slope* greater than 1:20 (5%).

**Signage:** Displayed verbal, symbolic, *tactile*, and pictorial information.

**Site:** A parcel of land bounded by a property line or a designated portion of a public right-of-way.

**Site improvement:** Landscaping, paving for pedestrian and vehicular ways, outdoor lighting, recreational *facilities* added to a *site*.

**Slope:** The *slope* that is parallel to the direction of travel. See *cross slope*.

**Tactile:** Describes an object or *element* that can be perceived using the sense of touch.

**Tactile Walking Surface Indicator:** A standardized surface feature built into or applied to walking surfaces or other elements to guide a person on a designated path of travel. They provide information about the direction of travel and may warn persons with a visual impairment of hazards on a circulation path.

**Universal Design:** Is the design of products and environments to be usable by all persons, to the greatest extent possible, without the need for adaptation or specialized design.

**Wheel Stops:** Wheel stops, also known as parking blocks, are the small barriers used at the end of parking spaces to assist attentive drivers with parking their vehicles.

**Wayfinding:** Encompasses all the ways in which people orient themselves in physical space and navigate from place to place.

## 2.0 Vehicular Access

### 2.1 Access

- Vehicular Access *Facilities* will be within easy access to building entrances. This includes limiting physical barriers, such as stairs, slopes, and inaccessible doors.
- Multi-level vehicular parking structures shall be *accessible* via an elevator and/or *ramp*.
- Provide covered, ground level parking wherever possible.

#### 2.1.1 Access from parking lots and structures

- Designated *accessible* parking spaces shall have a *clear* path of travel to *accessible* pathways and sidewalks.
- *Accessible* parking spaces will not require someone to navigate through the vehicular path of travel to access sidewalks and the *accessible* path of travel;
- Where a parking lot or parking structure is designed to serve multiple buildings or *accessible* entrances, distribute *accessible* parking spaces to provide users with options for more convenient locations; and
- Provide an *accessible* route, no greater than 30m distance, from the *accessible* passenger loading zone leading to an *accessible* entrance of any adjacent *facility*. Where this is not achievable, provide a bench or seat along the path of travel for rest periods.

#### 2.1.2 Accessible Parking

- Provide *access aisles* a minimum of 2000mm adjacent to the designated parking stall of 2600mm;
- *Accessible* routes from parking *access aisles* shall not cross behind vehicles or lead into the vehicular path of travel; and
- Where adjoining pathways and sidewalks, install *wheel stops* to ensure maneuvering clearance is maintained in the *access aisle* (refer to Figure 1).

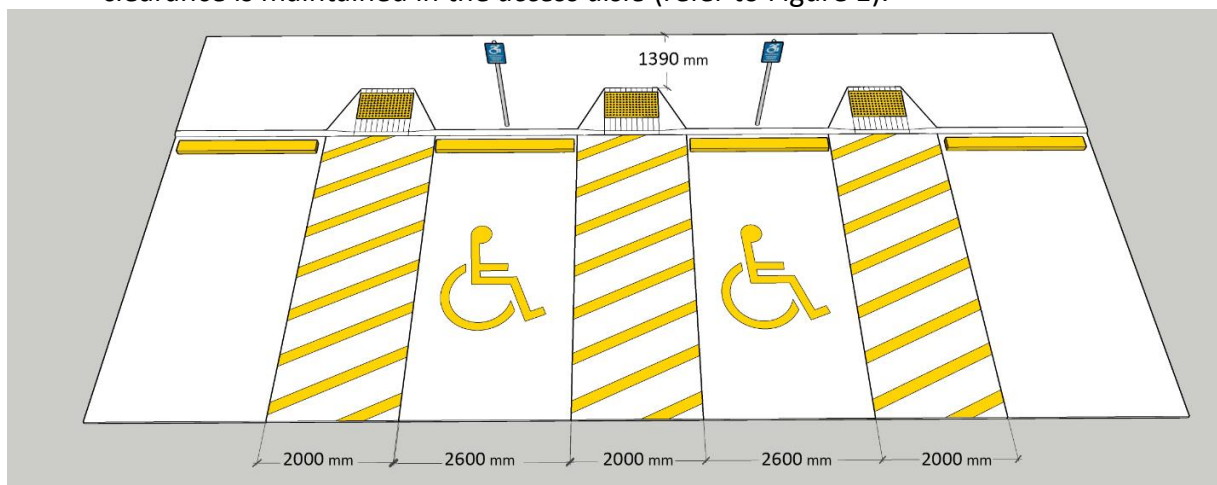




Figure 1

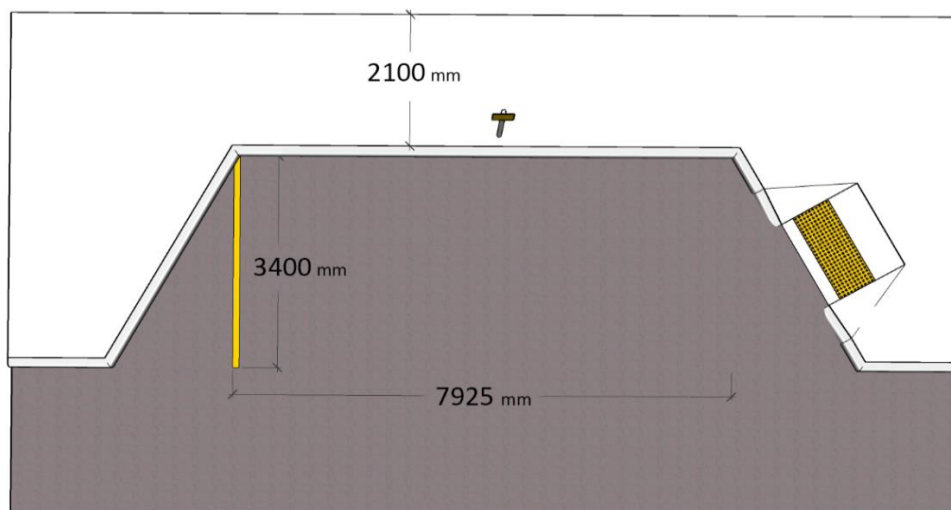
## 2.2 Passenger Vehicle Loading

### 2.2.1 Accessible Transit Stops

- Where Dalhousie has influence over transit stop location and construction:
- Public transit stops shall have a direct *accessible* pathway connection to adjacent buildings *accessible* entrances and campus pathway systems;
- Locate the passenger loading zone away from any traffic flow and design the transit stop so that people are not required to enter adjacent vehicular routes or bicycle lanes; and
- Where the pedestrian route and/or bus loading zone *access aisle* is not separated by a curb, provide a *tactile walking surface indicator* or other warning feature, such as bollards.

### 2.2.2 Accessible Vehicle Passenger Pick-Up and Drop-Off Zones

- *Accessible* passenger pick-up and drop-off zones shall be located adjacent to a building's *accessible* entrance;
- Vertical *signage* and pavement markings shall be used to clearly indicate the International Symbol of Access and have text that states "Passenger Pick-Up and Drop-Off Only, No Parking";
- Provide a rolled curb the length of the *accessible* vehicle drop-off/pick-up zone where there is a difference in level between the vehicle roadway and the passenger loading area;
- Where below a structure, ensure overhead clearance is 3000 mm minimum; and
- Provide a vehicle pull-up space that is 7925 mm long by 3400 mm wide minimum that is located adjacent and parallel to the *access aisle* (refer to Figure 2)



**Figure 2**

## 2.3 Electric Vehicle Charging Stations

Refer to Facilities Management *Div 26 – Electrical Guidelines* for additional Guidelines.

Electric Vehicle (EV) Charging Unit

- EV Charging Units shall be located where maneuverability to approach and interact with the Unit can be maintained. Allow a minimum 2100mm turning diameter adjacent to the unit, that will not be obstructed by other parked vehicles; and
- Ensure EV charging unit use is simple and intuitive, contrasts visually with surrounding surfaces, and provides clear instructions on use.

Electric Vehicle (EV) Parking Spaces

- Option A: Place an EV charging unit in the *access aisle* between an *accessible* parking space and a non-*accessible* space to allow flexibility for users;
- Option B: In the instance of re-surfacing parking lots, widen the designated EV charging unit space to meet *accessible* parking requirements identified in Section 2.1.2. This will allow anyone to park in the space including a user with accessibility needs; and
- Clearance from the pavement to the underside of any overhead structure shall be at least 3000 mm.

## 3.0 Multi-Modal Transportation

### 3.1 Bicycles

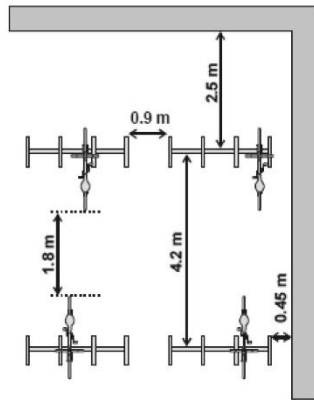
#### 3.1.1 Bicycle Parking Accessible Features, Siting and Performance Requirements

- Dalhousie University adheres to HRM’s Land Use By-law for the quantity, location, illumination, and visibility of bicycle parking spaces.
- Both indoor and outdoor bicycling parking is recommended for new buildings and preferable for existing buildings to accommodate long and short-term bicycle parking. Covered bicycling parking is preferred.
- Locate bicycle parking in highly visible, well-lit, *accessible*, and when possible, in weather protected locations.
- Bicycle racks, storage, and lockers shall be adjacent and connected to, but outside of, the *accessible* path of travel;
- Bicycle racks and stands shall be cane-detectable and shall contrast tonally with their surroundings for easier detection by people with low vision;

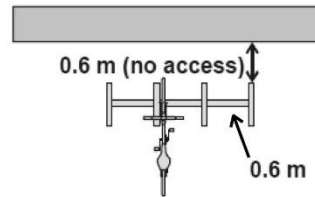


- Operating mechanisms, such as locks on bicycle lockers or storage lock-up areas, shall be located 900 mm to 1100 mm from the ground or floor;
- Operating mechanisms on bicycle lockers and storage lock-up areas shall be operable with a closed fist, not requiring pinching or twisting of the wrist;
- Bicycle rooms (indoor parking) will be accessibly located, preferably at-grade when garage *ramp* access is not available, so as not to inconvenience a rider with stairs and/or elevators. Ideally, *Class A* (see Glossary) parking will be in a monitored area and/or a limited access room;
- The installation of bike parking outdoors shall consider impacts on tree roots. Refer to Dalhousie’s *Div 32 Exterior Environment and Natural Landscape Design Guidelines* for details on tree protection; and
- Secure and convenient access will be provided to any indoor storage area. Storage areas will have street entry access directly from the outdoors. 24/7 programmed access via the DalCard system is to be implemented to maximize convenience and safety for regular users.

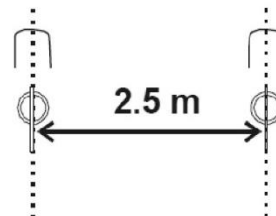
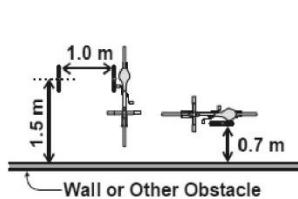
### 3.1.2 Siting for New Cycle Parking



Parking requiring an aisle



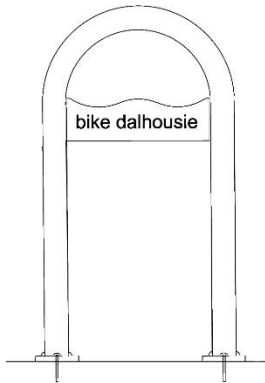
Parking adjacent to a wall



In-line parking

### 3.1.3 Rack Type

- All new racks installed on campus must be one of the following three options; or a custom design approved by the Office of Sustainability:



(a) Staple or Inverted 'U'  
(minimum height of 40")

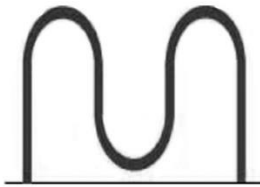


(b) Ring and Post

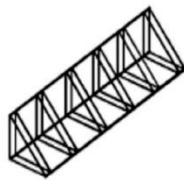


(c) 'Campus' Shape

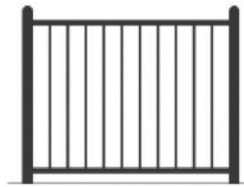
- Racks which Dalhousie University does not accept include the following:



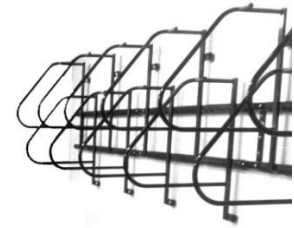
(a) "Wave" shape



(b) "Toast" shape



(c) "Comb" shape



(d) Wall mounted

- Wall mounted racks may be used in combination with other types of approved racks but cannot be used alone.

### 3.1.4 Rack Materials and Installation

- The use of local and recycled materials from local suppliers is preferred and encouraged;
- Flagged (ground-fixed) installation is acceptable with stainless steel connectors and locking nuts.
- Set cast-in posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured;
- When posts are set into voids in concrete, form, or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of bicycle racks and 3/4 inch (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill space between post and concrete with grout, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water;
- Where baseplate mounting is required, install steel tapered shims prior to anchoring in place. Fill gaps between baseplate and substrate greater than 3/8 inch with non-shrink, nonmetallic grout;
- When mounting rails, fasten to concrete to create a free-standing array with anchors at each rail end. Shim and level as required to maintain installation tolerances;
- Install bicycle racks to comply with the following maximum tolerances:

Location:	Plus or minus 1/2 inch
Height:	Plus or minus 1/4 inch
Alignment of Adjacent Units:	Plus or minus 1/2 inch in ten feet; and 1 inch over total length.
Plumb:	Plus or minus 1/4 inch
Level:	Plus or minus 1/4 inch

- Powder-coated (black) or stainless steel is required for all new bicycling parking installation on campus, to be determined on a project-by-project basis according to locational appropriateness. Bicycle parking structures shall be colour contrasted against their background and surroundings;
- Stainless steel will be free from blemishes. Standard-weight Schedule 40 steel pipe shall be used;
- Structural tubing shall be not less than 1/8" thick cold-formed round steel tubing;
- Anchors, fasteners, fittings, and hardware must be corrosion-resistant-coated or non-corrodible materials; commercial quality; tamperproof, vandal and theft resistant; concealed, recessed, and capped or plugged. Provide as required for bicycle rack assembly, mounting, and secure attachment;
- Non-shrink, nonmetallic, premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout shall be used;

- Erosion-resistant anchoring cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water at project *site* to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer for exterior applications;
- Examine areas with installer present, prior to and after installation, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected; and
- Space for non-standard cycles will be allocated at the end of each row of standard cycle parking stands. These areas will be a minimum of 1.5m wide in order to allow for dismounting from a wider bike.

### **3.1.5 Warranty and Quality Requirements**

- Protect finishes on exposed surfaces from damage by applying a temporary protective covering or wrapping before shipping; and
- Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight, or other causes.

## 4.0 Active Transportation Sanitary and Change Facilities

### 4.1 Active Transportation Shower Areas

- All fixtures and systems in Active Transportation Shower Areas will adhere to related *Dalhousie Design Guidelines*, specifically as they refer to sustainability and accessibility goals.
- At least one shower stall for every six spaces shall be provided for *enhanced bicycle spaces*. These *facilities* are to be shared with other active transportation users; and
- Active transportation sanitary and change facilities must provide at least 1 *accessible* shower stall and where provided an *accessible* toilet stall.

### 4.2 Active Transportation Change Lockers

- Lockers will be provided for day use multi-modal transportation participants. Users will supply their own locks. Lockers will be managed through a sign-up system through the Dalhousie Bike Room Administrator.
- One locker for each available bicycle parking space shall be provided for *enhanced bicycle spaces*. Additional lockers may also be provided.
- Lockers require ventilation and sufficient space to allow for the storage of clothes and equipment such as a pannier. Ideally, they should be long and deep enough to hang a skirt or shirt and wide enough to fit a pannier;
- Locker areas shall be offered in a variety of sizes that include both half-height and full-height lockers;
- Lockers shall have controls that are useable with a closed fist and do not require pinching, tight grasping, or twisting of the wrist to operate;
- Every locker room shall have at least 20% of coat hooks and shelves located at an *accessible* height:
  - *Accessible* coat hooks shall be installed at most 500 mm from the front edge of the locker and at a height between 900 mm and 1050 mm from the finished floor; and
  - *Accessible* shelves shall be mounted between 460 mm and 1050 mm from the finished floor; and
- Lockers will have *tactile* and *braille signage* to assist individuals to locate lockers with the use of numbers or letters.

## Acknowledgements

We would like to thank and recognize the resources and contributions of:

- Those with lived experience of *disability* who have shared their stories, experiences, and recommendations.
- Campus and community members providing expertise on natural environment and planning elements.
- The University of Toronto Facility Accessibility Design Standard – January 16, 2023
- Toronto Accessibility Design Guidelines 2021
- International best practices
- Level Playing Field Inc. of 800, 322 11th Avenue SW, Calgary, Alberta, T2R 0C5 (Tel: 403-472-4375), who contributed work related to physical assessments, stakeholder engagements, and universal design-focused content to the development of accessible Multi-Modal Transportation Guideline solutions.

## References

Dalhousie University Multi-Modal Transportation Guidelines adhere to:

- Halifax Regional Municipality's (HRM) Regional Centre Land Use Bylaw
- Making Connections: 2014-19 Halifax Active Transportation Priorities Plan
- Leadership in Energy and Environmental Design (LEED) v4.1, Section LT, P99-101
- Active Transportation Strategy for Truro, Bible Hill, and Colchester