

The background of the entire page is a close-up, slightly blurred photograph of several bicycle wheels. The wheels are arranged in a way that creates a sense of depth and repetition. Some of the wheels have small, rectangular white labels attached to them with string or tape. The labels have handwritten text in black ink, including "700c x 15 front", "25", "700c x 19 front", and "20". The overall color palette is muted, with greys, blues, and greens, except for the bright yellow and white text boxes.

# Transportation Demand Management Plan for Sustainable Commuting

2020-2030 | VERSION 2 (UPDATED IN 2022)



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# Acknowledgements

Prepared by the Office of Sustainability with engagement from students, faculty, staff, government, transportation consultants, non-profit organizations and DalTRAC. Between 2019 and 2022, focus groups, surveys, reporting frameworks, literature and plan reviews, and a new University Strategic Plan provided revised content for the plan. These processes engaged over 1000 people on and off campus.

## Land Acknowledgment

Dalhousie sits on the unceded territory of the Mi'kmaq people and recognizes the interconnectedness of all our relationships—to the environment and to each other—for generations to come.

We recognize that African Nova Scotians are a distinct people whose histories, legacies and contributions have enriched that part of Mi'kma'ki known as Nova Scotia for over 400 years.



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Dalhousie University's Transportation Demand Management (TDM) plan highlights progress made to date, as well as challenges, opportunities, and strategic directions for the next decade. This document supports and adheres to the vision and principles identified in the Dalhousie University Sustainability Plan. The plan is primarily focused on, but not limited to, transportation demand management solutions for the campus environment. TDM policy directives are found in the university sustainability policy.

Dalhousie recognizes and reports on the United Nations Sustainable Development Goals through reporting frameworks. This plan addresses Goal 3 Good Health and Well-Being, Goal 7 Affordable and Clean Energy, Goal 11 Sustainable Cities and Communities, Goal 13 Climate Change, and connects to all of the other 13 goals.

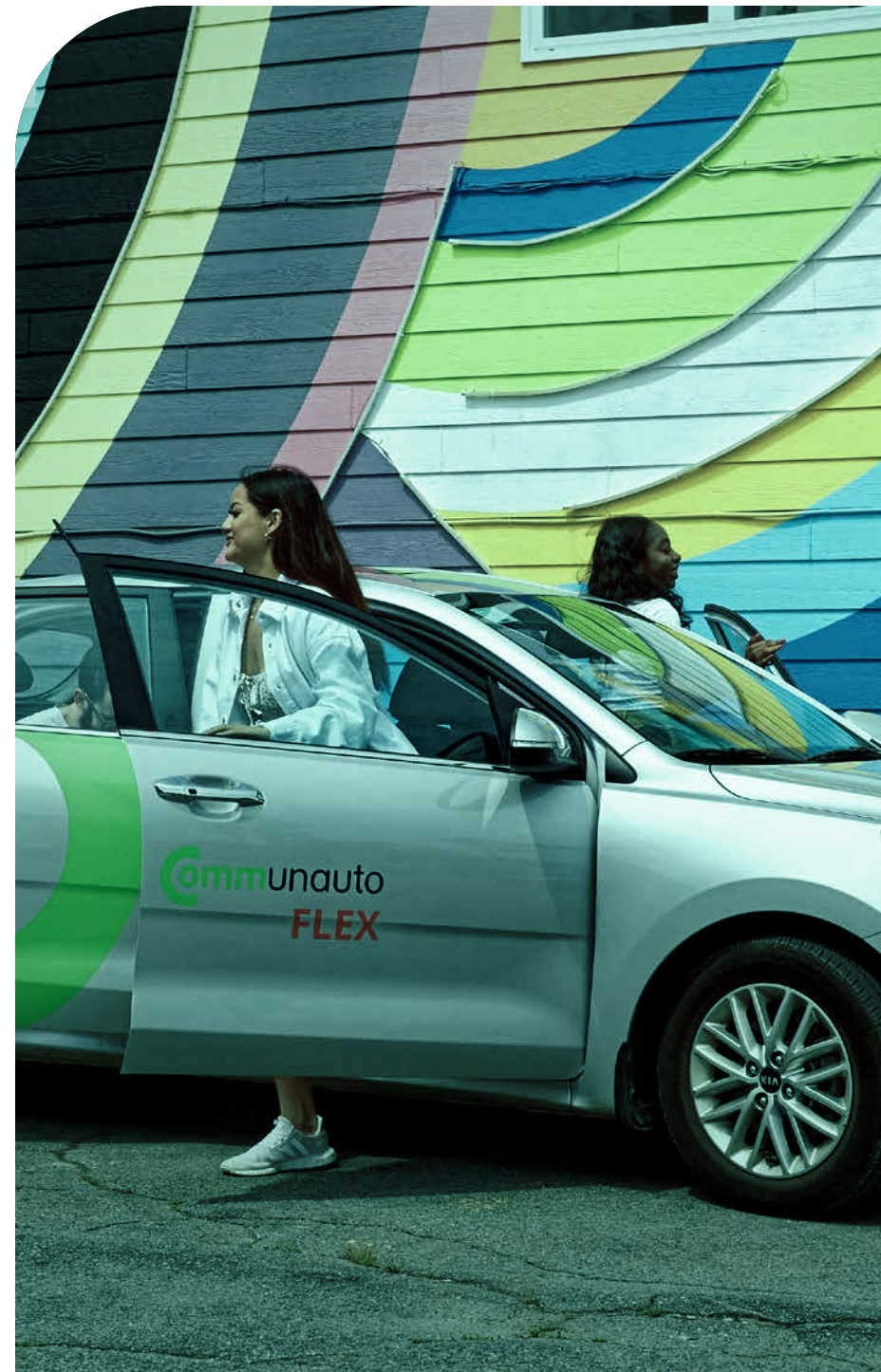


## Executive Summary

Transportation Demand Management (TDM) focuses on the efficient use of moving people and goods through modes such as remote work, walking, cycling, vehicle sharing, public transit, and shifting peak vehicle periods. The deployment of TDM strategies is an approach to improving sustainable transportation goals. Several factors shape action including our ambition to meet sustainable development goals, government and university policy and incentives, partner supports and services, and resource availability. In this plan, we highlight current TDM activities, project ideas, and opportunities for the next 5-10 years. This report builds on the last decade of action.

On campus, implementing a well-planned TDM program means improved air quality from a reduction in auto-related emissions; a reduction in traffic congestion; improved travel options for students, faculty, staff and visitors; and an overall improved quality of life on campus. Some of the core TDM strategies include carpooling, transit, cycling, and walking, as well as teleworking and remote work/study options. Parking management, workplace car sharing services available at Dalhousie, marketing and promotions, incentives, and subsidies are among the strategies to improve TDM effectiveness. Greening fleet strategies include sharing, right sizing, and switching to low and zero emission vehicles while making sustainable purchasing decisions. A focus on improving accessibility in transportation design, programs and infrastructure is key.

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# 1.0 Current Context

## 1.1 Transportation Demand Management (TDM)

TDM focuses on the efficient use of moving people and goods through modes such as remote work, walking, cycling, vehicle sharing, public transit, and shifting peak vehicle periods.<sup>1</sup> TDM, or mobility management, has several goals including reduction of noise and air pollution caused from congestion,<sup>2</sup> minimizing greenhouse gases through fossil fuel combustion reduction,<sup>3</sup> mitigating infrastructure costs,<sup>4</sup> and providing programs that better support equity of service and quality of life.<sup>5</sup>

The deployment of TDM strategies is an approach to reaching sustainable transportation goals. The interactive impacts of using certain TDM strategies together have demonstrated more success in achieving certain goals than on their own, such as transit subsidies and parking constraints.<sup>6,7</sup> Investments in TDM strategies is a cost-effective approach for supporting transportation solutions when compared to the life-cycle costs of vehicle management systems<sup>8</sup> that are not inclusive of expenses such as land value, market rates, and pollution.

Higher Education institutions have a milieu of transportation values, demands, and needs. Hundreds and thousands of people visit campuses daily for a variety of activity—from public events to intensive research and teaching. The variety and completion of connecting services and infrastructure can vary dramatically based on municipal and private offerings surrounding the campuses. Institutions value walkable, accessible green campuses that provide places for connection, rejuvenation, recreation, recruitment, biodiversity, and civic purposes.<sup>9</sup>

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## 1.2 Management Drivers

All levels of government have a role in supporting transportation demand management from a social, health, economic, and environmental perspective. Federally, many departments focus on initiatives that support safer, more efficient, and less carbon intensive transportation. These range from Transport Canada's 2030 plan,<sup>10</sup> funded by Infrastructure Canada to the Cleaner Fuels Regulation managed through Environment and Climate Change Canada.<sup>11</sup>

The Province of Nova Scotia released a Sustainable Transportation Plan in 2013.<sup>12</sup> In addition to the TDM goals stated above the sustainable transportation plan outlines economic objectives of reducing transportation costs as energy costs increase and supporting access to employment and economic opportunities. In 2022, the government enacted the Environmental Goals and Climate Change Reduction Act (2022).<sup>13</sup> This identified the establishment of a Provincial Active Transportation Strategy by 2023 and complete core active transportation networks accessible for all ages and all abilities in 65% of provincial communities by 2030.<sup>14</sup>

The Nova Scotia Accessibility Act (2017) aims to support accessibility measures that are “preventing and removing barriers that disable people.”<sup>15</sup> Public transportation and transportation infrastructure are outlined as one of the key focuses in the Act.

In 2017, Halifax released an Integrated Mobility Plan, which outlined principles of complete communities and focused on moving people and goods rather than vehicles, managing congestion, and supporting integrative solutions.<sup>16</sup> A number of key performance indicators are highlighted and include mode share of transportation by regions and length as well as the connectivity of new bicycle routes, sidewalks and greenways. In 2021, the Municipality of the County of Colchester released the Community Energy and Emissions Plan.<sup>17</sup> A number of transportation strategies are highlighted, including the move to electric vehicles with fleet and transit, more walking trails and bike lanes, and the expansion of regional transit options. In 2021, Halifax passed a new Centre Plan.<sup>18</sup> This plan removes the requirements for universities to have a set number of parking spots.

All levels of government have strategies and incentives to increase the adoption of low emission vehicles such as hybrids and electric vehicles and improve related infrastructure. Addressing the social equity issue of forced labour and pollution as part of sustainable purchasing efforts are important in all commodity purchases, including vehicles.



Dalhousie's Halifax Campuses are in an urban environment in the downtown and accommodate over 90% of the Dalhousie population. Halifax is growing and the downtown area is densifying, including campus areas. The Agricultural Campus is situated in a more rural setting in a village located beside a town. At Dalhousie's Halifax and Agricultural Campuses students, faculty, staff, community members, and visitors use the facilities for teaching, research, conferences, recreational and artistic activity, and community events. Campus and community members commute to Dalhousie and within Dalhousie campuses via walking/running, rolling (e.g., wheelchair, scooter), cycling, skating, bussing, or driving (either as a driver or a passenger).

When someone leaves their residence to come to and eventually go from Dalhousie, the services they use and the infrastructure they cross is, in most cases, owned or managed by multiple entities. Transportation barriers along with other variables such as service availability, public attitude, time, and affordability can create compounding conditions. The university is most often the responsible owner of infrastructure and services for two-phases of a four-phase trip to and between campuses (Table 1).<sup>19</sup> With regard to accessibility challenges, winter is the least accessible season due to the need for snow removal from transportation routes (bike lanes, walkways, parking lots). The accessibility of municipal and campus sidewalks and walkways were characterized as narrow, uneven, and lacking accessible points of entry.<sup>20</sup>

Table 1. Transportation Trip Infrastructure Responsibility by Owner.

Commute Phases/Mode	Walking/Rolling (W/R)	Personal – Single or Shared Motorized Vehicle			Bicycle	Public Transit	Vehicle Service
<b>Leaving a place of residence (students living in AC residence exception as Dal owns sidewalks)</b>	Sidewalk, some cases no sidewalk roadway or path	Driveway			Roadway, small chance of interaction with bike lane, shared path	Sidewalk, some cases no sidewalk roadway or path, some shelter or not	Driveway
<b>Moving to the Destination</b>	Sidewalk, some cases no sidewalk roadway or path	Road		Road	Roadway, small chance of interaction with bike lane, shared path	Bus service or no bus service (access-a-bus or published routes)	Taxi, private shuttle, Uber
<b>Arriving at place and/or accessing storage</b>	Sidewalk, some cases no sidewalk roadway, path	Park	Park	Park	Multi path, road and bike parking (outside – inside)	Sidewalk, some cases no sidewalk roadway or path	Sidewalk, some cases no sidewalk roadway or path
<b>Arriving at a Destination (e.g. building)</b>	Sidewalk, some cases no sidewalk roadway or path	W/R		W/R	Sidewalk, path	Sidewalk, some cases no sidewalk roadway or path	Sidewalk, some cases no sidewalk roadway or path

Key: grey – municipal responsibility; orange – property owner, e.g., university; blue – private company; green – provincial

The Office of Sustainability has collected commuter data for over a decade. The Dalhousie transportation planning lab, Dalhousie Transportation Collaboratory (DalTRAC), has been analyzing this data and producing a commuter survey report each year to help with planning and program development and evaluation. “Walking and public transit are the most common primary commute modes for Dalhousie’s three Halifax campuses.”<sup>21</sup> At the Agricultural Campus, public transport is not available, while commute distances can be further, resulting in more vehicle use (Figure 1 and Figure 2). From 2020-2022 due to the COVID-19 pandemic, work and study from home programs enabled commuter

shifts to remote work with nearly half of respondents no longer or rarely commuting to Dalhousie campuses. Several respondents also reported changing their primary commute modes, from transit to private vehicle use or walking.<sup>22</sup> This data, along with other sources, has helped to focus investment on initiatives over the last decade and will assist in future planning. In Fall of 2022, on-campus restrictions have been lifted. Hybrid work models are more common. Initial trending shows a 20% decrease in parking demand.

Figure 1. Commuter Modal Percentages Halifax Campuses

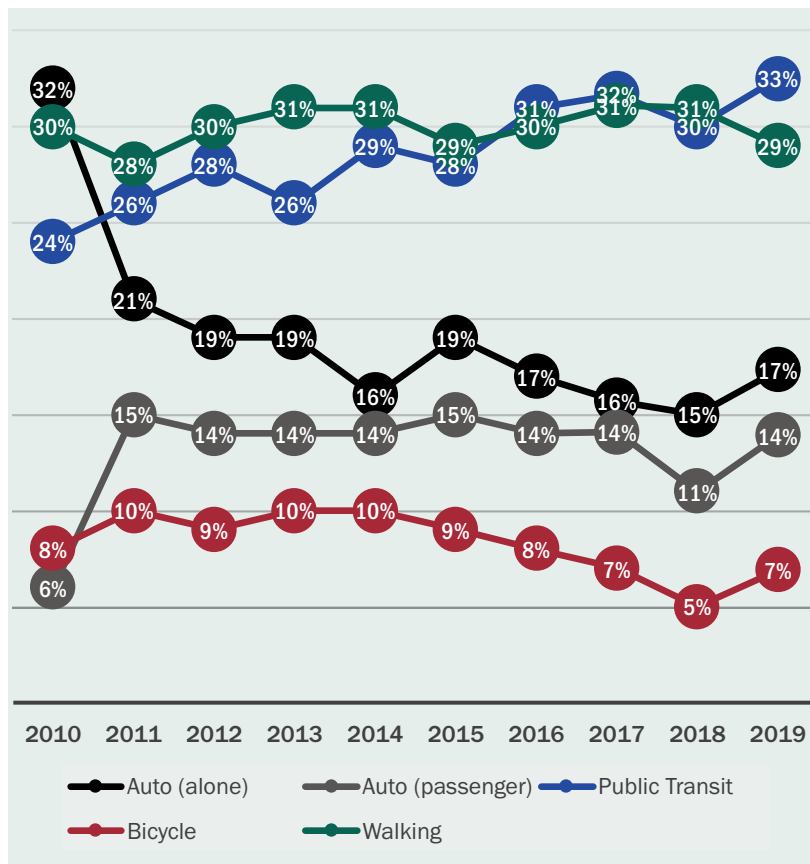
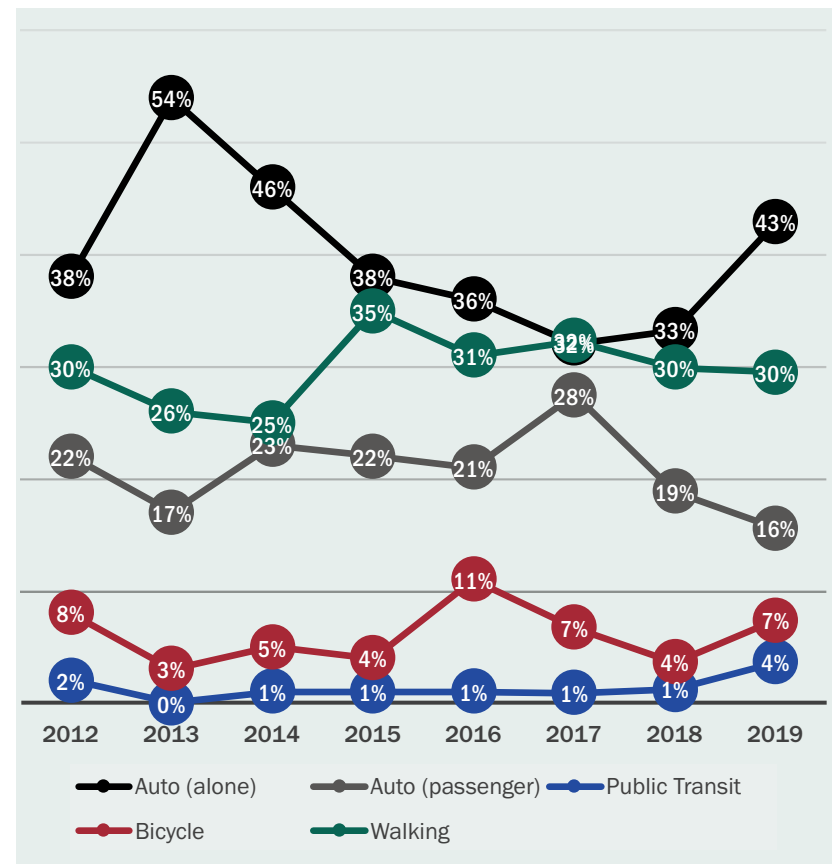


Figure 2. Commuter Modal Percentages Agricultural Campus





## 2.0 Plan Management and Development Timeline

At Dalhousie, several new programs, centres, reports, plans, and infrastructure have been developed over the last decade (Figure 3). Key initiatives include annual commuter and parking reports, ongoing TDM planning, addition of indoor and outdoor end-of-trip facilities, cycling corridors, employee and student transit passes, parking efficiency changes, a guaranteed ride home program, ongoing education and trip planning including a bike centre, and greening fleet. Dalhousie's vehicle parking supply consists of many surface lots and a few parkades. University campus master plans identify parking lots as key building sites. Multiple reports include recommendations such as pricing parking competitively and consolidating supply so land can be used appropriately.

Figure 3. Timeline information.

2008–2009	2010–2011	2012–2013	2014–2015	2016–2017	2018–2019	2020–2021
<ul style="list-style-type: none"> <li>▶ TDM focus groups</li> <li>▶ Established Institutional TDM committee</li> <li>▶ Study of Alternative Fuels Including biofuels</li> <li>▶ Student bus pass in existence before 2008</li> </ul>	<ul style="list-style-type: none"> <li>▶ First annual commuter survey</li> <li>▶ Bike Centre Creation</li> <li>▶ Bike Loan programs – AC and Halifax</li> <li>▶ TDM Plan released</li> <li>▶ First indoor bike room, facilities added in new buildings</li> <li>▶ Signed agreement with carsharing services, ongoing</li> </ul>	<ul style="list-style-type: none"> <li>▶ Employee Bus Pass Launched</li> <li>▶ Active Transportation design guidelines developed</li> <li>▶ Hundreds of outdoor bike parking spots added</li> <li>▶ Institutional Bikeways Plan and Commuter Study</li> <li>▶ Bike Fix-It Stands added</li> <li>▶ First EV station, more added throughout the years</li> </ul>	<ul style="list-style-type: none"> <li>▶ Report on Transportation Management Association</li> <li>▶ University Avenue cycling pilot partner</li> <li>▶ Guaranteed Ride Home program launched (GRH)</li> <li>▶ Parking efficiency changes (e.g., reserved spot to lot)</li> <li>▶ Bus Shelter study and changes</li> <li>▶ Summer student Transit pass added to regular term pass</li> </ul>	<ul style="list-style-type: none"> <li>▶ Safe commute educational program</li> <li>▶ TDM Action Plan released</li> <li>▶ Rated Bicycle Friendly organization</li> <li>▶ Yearly activities such as safe rides</li> <li>▶ Created and updated policies and guidelines related to ridesharing and greening fleet</li> </ul>	<ul style="list-style-type: none"> <li>▶ Implemented active transportation corridor on Sexton campus</li> <li>▶ End-of-Trip Guide created</li> <li>▶ Transportation audits and mode counts using new technology</li> <li>▶ Research on and presentation to NS government on EV stations and low speed electric vehicles</li> </ul>	<ul style="list-style-type: none"> <li>▶ Transportation and Accessibility report</li> <li>▶ Greening the Fleet study</li> <li>▶ Report on state of campus active transportation assets</li> </ul>
<b>ONGOING</b> Parking and commuter surveys, Transit passes, Ongoing research, Adding End-of-Trip facilities, GRH program, Education programs						

## 3.0 Vision, Principles and Scope

### Vision

Promote balanced, multi-modal transportation supports that provide choices for students, faculty, and staff, and influences the demand for a limited transportation supply. Transportation Demand Management (TDM) will provide information and education about travel options and offer incentives and programs to reduce Single Occupant Vehicle (SOV) trips.

### Principles

TDM is an essential component of an overall sustainable transportation solution for the campus. Accessibility and equity are an important part of TDM decision making along with environmental and life-cycle costs.

### Scope

This plan considers transportation demand management strategies including supporting remote work, active transportation, transit, and vehicle and parking efficiency.





## 4.0 Goals, Actions and Targets

Goals	Objectives	Actions	Targets
<ul style="list-style-type: none"> <li>▶ Increase modal share of sustainable commuting</li> </ul>	<ul style="list-style-type: none"> <li>▶ Expand current TDM programs to more campus commuters</li> <li>▶ Increase the number of sustainable commuting end-of-trip facilities and connecting corridors in priority areas on campus</li> <li>▶ Explore synergistic strategies such as parking efficiency and pricing with sustainable commuting incentives</li> <li>▶ Continue to partner to conduct campus research, implement education programs and work on joint initiatives</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continue to offer and expand participation of bus pass programs (student and employee); Guaranteed Ride Home Program, Bike loan, and other initiatives as developed</li> <li>▶ Install more long-term and short-term bike parking options on campus. Explore use of bike shelters, as artistic and functional space highlighting EDIA values</li> <li>▶ Continue to implement and support complete streets initiatives that enhance services for accessibility, pedestrians, and cyclists, while ensuring safe and acceptable spaces for loading and drop offs</li> <li>▶ Continue to participate in the campus and community sustainable commuting projects, research, and committees and pursue partnership and funding opportunities</li> <li>▶ Research and advise on parking solutions, such as parking share, that maximize land use efficiency, reduce congestion and have a positive synergist effect with TDM solutions</li> </ul>	<ul style="list-style-type: none"> <li>▶ 85% of commuting trips made by walking, cycling, transit, carpooling, or remote work by 2030</li> <li>▶ Increase participation rates in TDM programs</li> </ul>
<ul style="list-style-type: none"> <li>▶ Expand options to reduce and offset business and commuting travel</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increase the number of people using work-from-home strategies</li> <li>▶ Increase number of thoughtful carbon offsetting initiatives</li> </ul>	<ul style="list-style-type: none"> <li>▶ Finalize and promote policy, guidance, support, and programs for teleworking, remote, compressed, and peak shifting work/study/research hours</li> <li>▶ Explore select carbon-offset programs for all related commuter and business transportation. Programs should provide local and/or global benefits that are traceable and beneficial</li> <li>▶ Study campus housing and affordability options</li> </ul>	<ul style="list-style-type: none"> <li>▶ Established active hybrid and remote work/study/research initiative</li> <li>▶ Carbon offsetting options identified and promoted</li> <li>▶ Housing options provided and community research on affordable housing</li> </ul>

Goals	Objectives	Actions	Targets
<ul style="list-style-type: none"> <li>▶ Improve accessibility in transportation guidelines, supports, and infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>▶ Reduce number of existing accessibility barriers in campus infrastructure and programs</li> <li>▶ New projects meet and beat accessibility regulations and best practices</li> </ul>	<ul style="list-style-type: none"> <li>▶ Incorporate accessibility standards in building and active transportation design guidelines</li> <li>▶ Enhancing pathways (sidewalk, lanes, multi paths, roads)</li> <li>▶ Upgrading End-of-Trip and Ride-sharing Facilities (parking lots, bike racks, bike rooms)</li> <li>▶ Enhancing and promoting services to consider the last km travelled</li> <li>▶ Improving communications, educational and information</li> </ul>	<ul style="list-style-type: none"> <li>▶ Projects, programs, and information delivered that reduce barriers</li> <li>▶ Revised design guidelines</li> <li>▶ Best in class examples in new construction</li> </ul>
<ul style="list-style-type: none"> <li>▶ Increase sustainable choices for fleet</li> </ul>	<ul style="list-style-type: none"> <li>▶ Optimizing fleet management and right sizing to achieve efficiencies</li> <li>▶ Move fleet to low and zero emission vehicles and related infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continued support of workplace vehicle sharing services, and incentive programs</li> <li>▶ Exploration of centralized fleet management and campus vehicle sharing</li> <li>▶ Replacing end of life vehicles with either hybrid or electric vehicles or other low emitting technology while making decision in consideration of social equity and accessibility</li> </ul>	<ul style="list-style-type: none"> <li>▶ Reduce fleet GHGs by over 50% by 2030</li> </ul>





## 5.0 Implementation & Evaluation

The Office of Sustainability is involved in coordinating TDM programs and advising on infrastructure projects. Facilities Management is responsible for parking services and indoor and outdoor infrastructure owned by the university. Fleet ownership is currently decentralized to research groups and departments. Visitors, students, and employees commute in a variety of modes. Other governments and organizations, public and private, own connecting infrastructure and services such as sidewalks, bike lanes, boulevards around campus, transit systems, shuttles, and car and micro-mobility solutions.

Parking revenue does not pay for all related parking infrastructure at present. Programs and projects are paid for on a one-off basis through individual

business cases and project approvals. Some success has been achieved through this model however, it can have limitations for planned implementation, large capital and program expansion. New strategies will be examined such as a climate change revolving fund, a community-based action fund focused on university travel offsets, partnerships and grants, and transportation infrastructure levies.

Plan targets will be reported each year through the annual sustainability report. Targets will also be reported publicly through international rating programs (e.g., Sustainability Tracking Assessment Rating System—STARS) every one to three years.



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bike dalhou



**DALHOUSIE**  
UNIVERSITY

Office of Sustainability, Dalhousie University  
5th Floor, 1236 Henry Street, PO Box 15000  
Halifax, Nova Scotia, Canada B3H 4R2  
rethink@dal.ca

**[dal.ca/sustainability](https://dal.ca/sustainability)**

 /DalhousieOfficeOfSustainability  /RethinkDalhousie  
 @DalOfficeSust #DalhousieU  @sustainabilityatdal