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Item No. 15.1.7
Regional Council
June 20, 2023

TO: Mayor Savage and Members of Regional Council

SUBMITTED BY: Original Signed

Cathie O'Toole, Chief Administrative Officer

DATE: June 15, 2023

SUBJECT: **Regulation of Electric Kick-scooters and Shared Micromobility Services**

ORIGIN

Action #88 of Halifax's Integrated Mobility Plan (IMP): Complete a bicycle share feasibility study by 2019.

LEGISLATIVE AUTHORITY

***Motor Vehicle Act*, RSNS 1989, c 293**
305B The council of a municipality may make by-laws
(a) regulating the use of electric kick-scooters on sidewalks, shared-use sidewalks, municipal highways, bicycle lanes, trails or in other public areas in the municipality that are not public highways;

(b) prescribing the maximum allowable speed for the operation of electric kick-scooters, including prescribing different maximum speeds for different areas, roads or paths, or types of road or path;

(c) regulating the use of privately owned and rented electric kick-scooters;

(d) restricting the operation of electric kick-scooters during certain times of the year;

(e) restricting the operation of electric kick-scooters when certain weather conditions are occurring or are expected to occur;

(f) regulating the parking, docking or storage of electric kick-scooters;

(g) creating offences and prescribing penalties for the violation of by-laws made under this Section.

***Halifax Regional Municipality Charter*, SNS 2008, c 39**
188(1) The Council may make by-laws, for municipal purposes respecting …

(c) persons, activities and things in, on or near a public place or place that is open to the public;
(d) nuisances, activities and things that, in the opinion of the Council, may be or may cause nuisances …
(e) transport and transport systems;
(f) businesses, business activities and persons engaged in business;

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191 Without limiting the generality of Section 188 but notwithstanding the Motor Vehicle Act, the Council may, by by-law, regulate vending, any class of vending, mobile vendors and the placement of vending machines on the streets of the Municipality;

319(4) The Council may, by by-law, … (b) prohibit any person from using any vehicle or apparatus on a sidewalk in the Municipality;

324(2) The Council may, by by-law, regulate encroachments upon, under or over streets, including stipulating the period of time an encroachment may remain and the entering into of agreements, including terms and conditions, for particular encroachments.

RECOMMENDATION

It is recommended that Halifax Regional Council:

1. suspend the rules of procedure under Schedule 7, the Transportation Standing Committee Terms of Reference, of Administrative Order One, the Procedures of the Council Administrative Order;
2. adopt By-law M-300, the *Micromobility By-law*, to enable the use of electric kick-scooters in the Halifax Regional Municipality, as set out in Attachment B to this report;
3. adopt the amendments to Administrative Order 15, the *License, Permits and Processing Fees* Administrative Order, as set out in Attachment C to this report;
4. direct the Chief Administrative Officer to implement a shared micromobility pilot project as per the proposed implementation approach described in the Discussion section of this report;
5. direct the Chief Administrative Officer to prepare amendments to By-law M-300 (“Part B”) to develop new regulations and supporting implementation tools to regulate the shared micromobility pilot project and return to Council for approval; and
6. direct the Chief Administrative Officer to add up to four new staff positions to enforce the by-law and administer the shared micromobility pilot project.

EXECUTIVE SUMMARY

This report seeks Council direction on several aspects related to enabling the use of electric kick-scooters (e-scooters) on HRM streets as well as regulating businesses that provide short-term rentals of e-scooters and bicycles.

First, the report seeks Council direction on enabling e-scooter use in HRM and, if so, proposes the rules that e-scooter users must follow. Part A of the proposed By-law M-300 details rules on the places where e-scooter use would be permitted and excluded as well as speed limits and other factors to promote safe use for all users of the street. For example, the use of e-scooters on sidewalks would be prohibited.

Second, the report seeks Council direction on establishing a regulated approach for businesses operating short-term rental of e-scooters as well as bicycles. If supported by Council, the terms of this approach (e.g., enforcement, encroachments, permitting, parking/storage, and other factors) would be brought back to Council for consideration as Part B of the proposed By-law M-300.

This report recommends that HRM issue a request for proposals to licence a limited number of private companies to provide bike and e-scooter share services for a two-year pilot project. These private operators would deploy a micromobility system intended to focus on serving short trips of less than 30 minutes. The recommended approach is informed by HRM’s Shared Micromobility Readiness Study and the experiences of comparable jurisdictions in Canada.

System goals would include connectivity, public health and safety, accessibility, and environmental sustainability. While the system would focus on the Regional Centre, there would be an objective to provide service to a range of HRM community types, including those with high equity concerns. The proposed two-year pilot project would be evaluated based on the vision, principles, and goals of the Readiness Study.

Finally, the report acknowledges that HRM should consider up to four new positions to oversee the pilot project and to enforce the by-law. An important objective of regulating e-scooters and other shared micromobility vehicles in HRM is that it is not detrimental to the mobility of all HRM residents, particularly people with disabilities. To help meet this goal, the proposed approach includes:

- Allowance to hire additional enforcement officers and supporting equipment
- Clear expectations and penalties for private operators of shared micromobility services
- Fines for by-law infractions
- Self-enforcement technologies as well as engagement material to prevent sidewalk riding
- Collection of data to effectively monitor and measure the regulatory impacts to understand if HRM's policy outcomes are being advanced through the pilot approach

Assessing the impact of e-scooters and shared micromobility services will be part of evaluating the proposed pilot project.

BACKGROUND

Enabling the Use of Electric Kick-scooters (e-scooters) in HRM

The Nova Scotia Motor Vehicle Act (MVA) defines the types of vehicles and devices that can be used on public streets and sidewalks and sets out conditions for how they may be used. This includes bicycles and power-assisted bicycles. In fall 2021 HRM and the Province formed a collaborative Regulatory Priority Table through the Joint Project for Regulatory Modernization to consider enabling e-scooters on municipal roads.

The Province amended the Motor Vehicle Act in 2022 to authorize the use of electric kick-scooters (e-scooters). The Provincial amendments define e-scooters as "a vehicle that is operated in a standing position and has:

i. two wheels placed along the same longitudinal axis, a steerable wheel placed at the front of the vehicle and non-steerable wheel at the rear,
ii. wheels with a diameter of not less than one hundred and eighty-five millimetres and not greater than four hundred and thirty millimetres,
iii. a platform for standing between the two wheels,
iv. a steering handlebar that acts directly on the steerable wheel, and
v. an electric motor not exceeding five hundred watts that provides a maximum speed of thirty-two kilometres per hour."

The amendments also include a minimum age of 14 to use e-scooters, a maximum permitted speed of 32 km/h, helmet requirements, and other operational restrictions. Municipalities within Nova Scotia have the discretion to set a lower speed limit and decide if e-scooters will be permitted on roads, sidewalks, or shared pathways.

Shared Micromobility (Bike Share and E-Scooter Share)

Shared micromobility is an umbrella term for light, single-occupant vehicles that are operated as a fleet and are available for the public to use. Most systems today are bike share (both pedal and electric assist) and e-scooter share services.

Figures 1 & 2: (left) Mobi bike share in Vancouver with helmet lending; (right) Hybrid bike share and e-scooter rider (image credit: Alta Planning & Design)

Shared micromobility services represent additions to mobility options offered by cities. These services expand active transportation mobility options, provide first/last mile connections to frequent transit service, significantly increase the potential for multimodal trips, and are space and greenhouse gas-efficient transportation. Public bike share is not intended to compete with bike rental companies, which are intended for those interested in using a bicycle continuously for longer periods of time. The pricing models for shared micromobility services focus on moving riders to nearby destinations quickly and conveniently.

The origin of shared micromobility goes back to bike-sharing operations in European cities in the 1990s. In North America, there were several bike share operations implemented by community-based non-profit groups in the 1990s and 2000s. The sector began expanding significantly in North America when municipal governments decided to implement their own bike share systems (e.g., Bike Share Toronto and CitiBike in New York) and when the private sector started implementing dockless bikeshare and e-scooter share in the mid-2010s. The sector is in a constant state of evolution and in many jurisdictions, the systems play important roles in local transportation networks.

The types of systems in Canadian jurisdictions vary in ownership and operating models, technology, and mix of vehicle types and fleet size. Toronto, Montreal, Hamilton, and Vancouver have bikeshare systems that are owned by the municipality and operated by third parties. Kelowna, Calgary, and Edmonton are examples of jurisdictions where delivery of shared micromobility services is by the private sector. Other more recent and soon-to-be implemented systems are in Windsor, Region of Waterloo, and several municipalities in British Columbia under a new pilot project.

In 2019 HRM initiated the *Shared Micromobility Readiness Study*. Alta Planning and Design was contracted to lead this work and a steering committee composed of HRM staff from various business units provided input to the study. Based on public, stakeholder and steering committee input, the Readiness Study focussed on the implementation of bike share systems and recommended a bikeshare system that was municipally owned but operated by a separate organization. The study also developed a vision, guiding principles, and goals for shared micromobility and had recommendations for addressing social equity objectives.

Other inputs that informed the recommendations in this report include:

- November 2020 TSC information report, *Third Party Docked and Dockless Bike and Scooter Share*
- National Association of City Transportation Officials (NACTO) and Transportation Association of Canada (TAC) guidance, member forums, and learning events
- Staff participation on the HRM-Province E-scooters/Traffic Safety Act Regulatory Table
- Interviews with peer cities
- Meetings with private bike and e-scooter share operators

A local business, HFX E-scooters, has been operating a small fleet of dockless e-scooters on the Halifax peninsula since 2019. One additional local operator, Move Scooter Rentals, entered the market in 2022. Neither of these operators has a formal relationship with HRM but could choose to respond to a future request for proposals issued by HRM, pending Council approval of the recommended implementation approach described in the Discussion section of this report.

Opportunity for HRM

Shared micromobility has the potential to advance several HRM objectives, including those of the IMP. The opportunities include:

- Provide new mobility options to support IMP mode share targets
  - 37% of micromobility trips replace car trips[1]
- Help address HRM social equity goals
- Contribute to first/last mile solutions for transit riders
  - 63% of riders reported they use shared micromobility to connect to transit[1]
  - 18% of all shared micromobility trips were for connecting to transit[1]
- Support HaliFACT objectives related to decarbonizing transportation
  - North American micromobility trips in 2021 offset 24,500 tons CO2 emissions by replacing auto trips[1]
- Support Halifax's 2022-27 Economic Strategy Objectives
  - Shared micromobility in North America employs at least 9000 people (1 job per 26 vehicles)[1]
- Bike share and e-scooter vendors believe HRM has strong market potential
- Maximize the use of HRM's AAA cycling infrastructure
- Support economic development

Market Potential in HRM

There is evidence of the market potential for shared micromobility in HRM. Ridership data from other cities suggests 90% of micromobility trips are less than 3.5km. Data for HRM for 2019[2] shows that trips less than 3.5km account for 33% of driving trips originating in the Regional Centre. As per the Readiness Study's demand analysis, the areas of highest potential demand for micromobility trips in HRM are within the Regional Centre, so the 33% represents a significant opportunity to shift short trips from cars to bicycle or e-scooter trips – potentially one out of every three car trips.

The introduction of e-bikes into bikeshare fleets extends the maximum utility of these systems to approximately 8km. In 2019[2], 66% of driving trips originating in the Regional Centre were less than 8km.

How Shared Micromobility Systems Work

Shared Micromobility systems are typically structured to offer automated rental of bicycles and e-scooters for short periods, typically 30 minutes or less. Smartphone-based apps allow riders to locate and unlock vehicles and pay for the service. Apps are also typically used to educate riders on the proper use and parking of vehicles. Onboard technology on some shared e-scooters allows operators to alert riders and automatically reduce speeds in "slow-ride" zones and disable vehicles in "no-ride" zones, as well as monitor battery levels and functionality, among other capabilities. In the past few years, electric assist bike (e-bike) share equipment has become more user-friendly for a wider audience. When available as part of a shared system, e-bikes are ridden more frequently than regular pedal bikes.

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[1] North American Bikeshare & Scooter Share Association (NABSA). (2022). 3rd Annual Shared Micromobility State of the Industry Report. *UC Berkeley: Transportation Sustainability Research Center*. http://dx.doi.org/10.7922/G2HD7T0P Retrieved from https://escholarship.org/uc/item/3pg7g10q

[2] Data extracted from Streetlight Insight™ representing 2019 (January 1 to December 31) vehicle trips originating in the Regional Centre at any time of day

There are three typical bike share parking/storage types:

- "Dock-based" equipment: Modular docking stations and kiosks powered by solar power and wireless communication. Stations can be installed quickly or moved, as needed
- "Dockless" smart-bike equipment: Bicycles are typically locked to themselves using a ring lock on the back wheel. They are parked in a service area and there are rules about where they can be left
- "Lock-to" smart-bike equipment, often referred to as a hybrid system: Bicycles are parked within a service area and locked to a fixed object or designated rack

Most e-scooter systems are dockless or hybrid, sometimes using pavement markings and/or flexible bollards to define suitable locations for scooters to be parked. San Francisco has a lock-to e-scooter system, and the Region of Waterloo requested a lock-to system for both shared bicycles and e-scooters in their recent RFP. Docks for e-scooters are an emerging topic, but they have not yet been implemented on a large scale.

Nova Scotia's Traffic Safety and Motor Vehicle Acts require people riding bicycles and e-scooters to wear helmets.

While the requirement for helmet use adds complexity and potentially cost to the service, other jurisdictions have experience making helmets available to all riders and private operators have stated they have solutions to address the requirement.

The impact of this requirement and other potential regulatory impacts will be assessed during the pilot project.

See Attachment A for more information on shared micromobility and helmet laws.

Regulating Shared Micromobility in HRM

A review of the existing regulatory framework provided in the November 2020 Transportation Standing Committee Information Report, *Third Party Docked and Dockless Bike and Scooter Share* identified several areas that would need to be addressed in municipal regulations. These include:

- Permitting businesses to operate shared micromobility services in the right-of-way. The existing HRM By-Law C-501, Respecting Vending on Municipal Lands covers businesses such as food vendors but does not envision short-term shared micromobility rental businesses
- Installation of designated "hubs" for parking shared bikes and e-scooters. The existing Streets By-law S-300 has provisions to enable installation of docking stations and the Encroachment By-law E-200 has provisions for licensing the hubs
- Enforcing obstructions in the right-of-way. This could be addressed in the Nuisances and Smoking By-law N-300 or Streets By-law S-300

While in some cases the operation of shared micromobility services could be covered in existing regulations, in other cases (specifically permitting vending in the right-of-way) it could not. The 2020 information report suggested a new standalone by-law to regulate Shared Micromobility, which would have benefits such as:

- Enable system-wide rules more effectively than simultaneously amending multiple existing by-laws
- Consolidate all the regulations in one place
- Reduce red tape by streamlining HRM's administrative and regulatory processes

As a result, a "Part B" of the proposed By-law M-300 would address gaps in existing by-laws and likely encompass the encroachments, enforcement and any other components that would need to be regulated.

Jurisdictions that Restrict or Prohibit E-Scooters

Not all cities interested in shared micromobility have embraced e-scooters, with some cities deciding not to enable e-scooter systems, or significantly restrict them until they fully understand all the risks and how best to mitigate them.

In May 2021, Toronto Council unanimously voted not to opt-in to Ontario's e-scooter pilot. Shared and privately owned e-scooters are prohibited on public streets, bike lanes, and sidewalks, a decision driven by the city's Vision Zero Road Safety Plan and feedback from the accessibility community, residents, businesses, and peer cities. City officials concluded that significant accessibility, safety, enforcement, insurance, and liability issues remain unresolved.

Chicago, Copenhagen, and New York City (Manhattan) have restricted the use of shared e-scooters in their downtowns, while Amsterdam, Edinburgh, Honolulu, Philadelphia, and Sydney, AU all prohibit the use of e-scooters.

E-Scooter Related Accessibility Concerns and Industry Response

Based on local stakeholder engagement and experience from other jurisdictions, the key concerns related to shared e-scooter systems from an accessibility perspective are:

- Potential for conflicts with people walking and rolling, especially if people ride e-scooters on sidewalks
- Improperly parked e-scooters that create an inaccessible and hazardous path of travel for people walking and rolling, especially for people with low and no vision
- E-scooter riders travelling at unsafe speeds

The CNIB does not support the introduction of shared e-scooters in Canadian municipalities due to the risks they create for pedestrians who are blind or partially sighted. However, for municipalities that choose to implement shared micromobility systems that include e-scooters, CNIB has several recommendations to mitigate risk to pedestrians with sight loss.

The recommended approach for HRM would require a mix of strategies to address accessibility concerns. See Attachment A for more information on accessibility concerns and how they can be addressed.

System Ownership and Operation Models

Bike share systems in North America are owned by a public agency, private company, or non-profit. Shared e-scooters systems are almost exclusively privately owned and operated.

The system owner has greater decision-making authority on how and where the system operates though they would need to comply with municipal regulations. Privately owned systems are run with a focus on the system as a business rather than providing a service. The business models of private operators have typically focused on shared e-scooters as they generate significantly more trips/vehicle/day than conventional bicycles and even e-bikes. However, some operators do provide bicycles and e-bikes as part of their fleets, though usually in smaller numbers than e-scooters.

System operators are responsible for the day-to-day management of a system, including:

- Maintaining equipment
- Bike redistribution (& helmets if provided)
- Removing or relocating improperly parked bikes/e-scooters
- Marketing, education, and PR
- Customer service (call centre, website, etc.)
- Funding and fundraising (sponsorships, user fees)

See Attachment A for more information about the system ownership and operation models explored in the Readiness Study.

DISCUSSION

The following section describes:

1) The proposed rules for the operation of e-scooters on HRM streets
2) The proposed approach to regulating shared micromobility operators in HRM

Proposed Rules for the Operation of E-scooters on HRM Streets

The proposed By-law M-300 would both enable the use of e-scooters on HRM streets and regulate any shared bicycle or e-scooter services that may operate in the Municipality. Part A of By-law M-300 specifically authorizes the use of e-scooters on Municipal streets while Part B, to be added at a later date, would regulate the operation of shared micromobility services in HRM. By-law M-300 is specific to e-scooters at this time but will be updated as micromobility technology and popularity change.

As described in the Background section, the Province amended the Motor Vehicle Act in 2022 to enable municipalities to regulate e-scooters. The Provincial amendments include a minimum age of 14 to use e-scooters, a maximum permitted speed of 32 km/h, helmet requirements and other operational restrictions. Municipalities within Nova Scotia have the discretion to set a lower speed limit and decide if e-scooters will be permitted on roads, sidewalks, or shared sidewalks. The language regarding speed, parking, and where operation of e-scooters is permitted from the proposed By-law Respecting Micromobility is included below:

4.(1) Except where permitted by this By-law, the operation of an electric kick-scooter in the Municipality is prohibited.

(2) The operation of an electric kick-scooter shall only be permitted on:

(a) roadways having a speed limit of 50 kilometers per hour or less;

(b) bicycle lanes on any roadway; and

(c) multi-use pathways within streets.

(3) Where permitted under subsection (2), no person shall operate an electric kick-scooter:

(a) at a speed in excess of 25 kilometers per hour on a roadway or bicycle lane;

(b) at a speed in excess of 15 kilometers per hour on a multi-use pathway;

(c) on a sidewalk; or

(d) subject to subsection (4), in a park.

(4) The Executive Director responsible for Parks & Recreation may designate parks permitting the use and operation of an electric kick-scooter.

5. No person shall park, dock, store or leave an electric kick-scooter on a highway, roadway, sidewalk, trail, path, walkway, exhibition ground or multi-use pathway in such a manner that obstructs the flow of pedestrian, cyclist or vehicular traffic.

6. The traffic authority may erect signs fixing the maximum allowable speed of electric kick-scooters where the operation of electric kick-scooters is permitted by by-law.

HRM Parks and Recreation will be considering its own language around the use of e-scooters within HRM parks. E-scooters could be operated in selected parks where posted signage indicates the activity is allowed, or permission is given by the Executive Director of Parks and Recreation. An example of what is under consideration would be where a multi-use pathway (MUP) extends through a park.

Halifax Regional Police (HRP) and RCMP have authority, and the proposed additional municipal by-law officers would have the authority to enforce the proposed municipal By-law's regulations. Additionally, Parking Enforcement staff would be prepared to enforce any infractions related to incorrect storage of vehicles. Section 11 of the proposed By-law M-300 regulates a fine for a variety of infractions, including speeding, riding on the sidewalk or incorrect storage. This report recommends hiring at least one or two new enforcement officers and the potential purchase of related vehicles/equipment to support the enforcement of these rules. Staff will reach out to Province with respect to requesting special constable status in relation to enforcement. The Special Constable program is administered by the Province of Nova Scotia. Special Constable appointments are discretionary and the issuance is based on a justifiable operational need in relation to enforcement.

Staff would work with Corporate Communications to ensure by-law updates are communicated through multiple channels which may include the municipal website, social media, public service announcements, etc. The communications strategy will be aligned with ongoing efforts associated with road safety.

Proposed Implementation and Regulation of Shared Micromobility Services

The following sections describe a recommended approach to implementing shared bicycle and e-scooter services in some HRM communities as a two-year pilot project and the recommended approach to regulating shared micromobility services in HRM.

Recommended Implementation Approach

Privately Owned and Operated Two-Year Pilot Project

Staff considered three approaches for implementing shared micromobility services in HRM:

1. Licence one or a limited number of private owners and operators for a combined bike share/e-scooter share system as a 2-year pilot with target to launch in 2024. Licensees would be selected through a request for proposals process. This option could have low to no costs for HRM – see the Financial Implications section for more detail. **This is the recommended approach.**
2. Establish a municipally owned and third-party operated bike share system with target to launch in 2026 and enable and regulate the operation of a privately owned and operated shared e-scooter system as a 2-year pilot with target to launch in 2024. From the Readiness Study, start-up costs for a 1,500-bike system could range from $3.75 million to $9.8 million. The annual operating/revenue gap is estimated at $1,275,000. Estimated costs and revenues for the e-scooter component of the system would be the same as the recommended approach.
3. Establish a municipally owned and third-party operated bike share system with target to launch in 2026 and defer a decision on a privately owned and operated shared e-scooter system for 2 years. The estimated start-up costs and annual operating/revenue gap would be the same as approach #2 described above.

The key benefits of pursuing the recommended approach include:

- Service could launch more quickly compared to other approaches
- Cost to HRM is limited to staff time and additional parking infrastructure and could potentially be cost/revenue neutral or even generate revenue depending on terms of the agreement with the selected licensees and system ridership
- By offering one or a limited number of licences, the municipality will seek commitments from operators to address specific goals such as:
    - A meaningful number of e-assist bikes as part of the shared fleet

  - Adaptive vehicles as part of the shared fleet
  - Equitable access to and distribution of service (e.g., service in specific communities)
  - Pilot services to suburban communities to assess their potential use
  - Other goals that Council may specify
- Shared micromobility operators have the expertise to implement systems that do not currently exist within HRM operations

The recommended approach would provide an opportunity to test a privately owned and operated system against HRM's shared micromobility vision, goals, and principles. Following a review of the pilot project, other alternatives, including a municipally owned or leased bike share system with privately owned and operated e-scooters would be assessed.

Recommended Vision, Principles, and Goals

This section describes the vision, principles and goals developed as part of the Readiness Study. These are intended to guide the implementation and evaluation of a pilot shared micromobility system in HRM. The following proposed vision statement about the future of micromobility in HRM, along with five principles and associated goals, was developed by the project Steering Committee and shared with the public for feedback in 2019.

Vision

Shared micromobility in Halifax Regional Municipality will provide mobility options to connect people of all ages, abilities, and incomes to each other and to everyday destinations. It will be an environmentally sustainable travel option to safely support active lifestyles. The system will be affordable and easy to use for both residents and visitors.

Principles and Goals

Connect People and Places

- Improve mobility for all community members, regardless of age, ability, or income
- Integrate with other modes, such as transit
- Improve connections to places to work, play, live, and learn
- Enable a year-round system

Strengthen Public Health and Safety

- Support active lifestyles for people of all ages and abilities
- Support HRM goals for transportation safety (e.g., 'Healthy' pillar of IMP)

Advance Environmental Sustainability

- Reduce the environmental footprint of travel by reducing motor vehicle trips
- Enable a system that is resilient and adaptable to future change

Make It Accessible

- Make it affordable for people to get around the city
- Manage parking of micromobility vehicles to maintain safe and accessible streets and sidewalks

Ensure a High-quality Public Experience

- Create a convenient, comfortable, and easy-to-use system for residents and visitors alike
- Ensure operators provide proactive and responsive customer service
- Make a system that is flexible and responsive to special events and visitors
- Ensure cost-effective and responsible public spending

Recommended Approach to Developing a Service Area

Guided by HRM's IMP (Action #71), Social Policy, and Diversity & Inclusion Framework, as well as stakeholder and public input, the Readiness Study steering committee identified equitable access to shared micromobility as a key goal. In completing the Market Analysis component of the project, the project team considered both equity and potential demand for shared micromobility services as equal inputs. This analysis included mapping of the Canadian Index of Multiple Deprivation, which identifies communities with high equity concerns at the dissemination area census level. Communities with relatively high concentrations of African Nova Scotians were also mapped.

Equity programming will be an important part of any future system to encourage ridership that reflects HRM demographics and provides transportation to people who have been historically marginalized.

The Readiness Study's demand analysis produced a heatmap of "hotspots," or places where shared micromobility ridership is expected to be high. The demand analysis scored several indicators and then added them together to make a composite map. The indicators include:

- Where people live, work, study, shop, take transit, and cycle
- Key destinations and amenities such as parks, libraries, community centers, and university campuses

The heatmap combined with the equity mapping (see Figure A-2 in Attachment A) would inform a service area for shared micromobility services. Some areas with equity concerns overlap with areas of high potential demand, while there may be other areas where equity is a more prominent consideration when developing a service area. The Readiness Study recommends an initial service area that includes areas with high potential demand and areas with high equity needs, with a plan for phased expansion of the service area over several years.

Recommended Micromobility Vehicle Parking/Storage Type

As per the Readiness Study, a hybrid/lock-to system is the recommended bike-share system type for HRM. A hybrid system allows users to retrieve and return bikes at designated stations or anywhere within the system's service area by locking them to any standard bike rack. In addition to meeting project principles and goals, a hybrid system provides order in the public right-of-way, which is hard to achieve with a dockless model. A hybrid system is compatible with narrow streets where space for large docks is limited. For suburban communities that may be included in the service area, where bike parking is typically less available, staff recommend maintaining flexibility to consider dockless parking of shared bicycles.

A dockless system with a focus on designated parking hubs is the recommended system type for the e-scooter component of the pilot, particularly in busier areas with multiple demands on space (e.g., downtown locations). The designated hubs could be delineated with paint and bollards and located on or off-street within the right-of-way, or on other HRM property or private property. Parking hubs that help facilitate mixed mode trips with Transit would be explored. In addition to the hubs, preferred e-scooter parking spaces could also be defined virtually in-app. Financial incentives could be offered to riders to park in the hubs or preferred spaces.

Figure 3: Lock-to/hybrid bike share system in Hamilton, ON (image credit: Global News)

Figure 4 (left): E-scooters in designated "Share and Go" parking zone in Calgary, AB (image credit: City of Calgary)

Recommended Approach to Managing Fleet Size

Staff expect there would be an agreed-upon minimum and maximum number of bicycles and e-scooters in the total shared fleet. Fleet size would be determined, in part, by the number of vehicles required to provide convenient access across the service area. There would be flexibility to make changes to fleet size as needed and staff expect the fleet size to evolve as the pilot project progresses.

Informed by the Readiness Study and the experience of other jurisdictions, an initial target number of bicycles and e-scooters would be identified for the pilot project RFP. The Readiness Study recommended phasing in 1,500 bicycles to provide coverage in the Regional Centre, other areas of high anticipated demand, and some equity focus areas. A new system in the comparably-sized Region of Waterloo, ON provides useful insights for HRM – their Shared Micromobility Feasibility Study identified 850 bicycles and 425 e-scooters as an appropriate number of vehicles for their service area and population. The Region awarded a contract in April 2023 and the winning proponent will be rolling out 500 e-bikes and 500 e-scooters over several weeks. Starting small and gradually growing the fleet size is in keeping with the advice received from other Canadian jurisdictions with shared micromobility experience.

Recommended Pricing and Payment Approach

The price of privately-operated shared micromobility services is typically determined by the operator, but the Municipality has a role to play in ensuring pricing structure and payment options advance HRM goals

for the service. System goals related to pricing and payment would be stated, and operator responses evaluated, through the RFP process.

While operators would retain the right to set/change pricing and user fees, consultation with the Municipality prior to any change would be required. The pricing structure should incentivize short trips to help maximize the daily number of trips per vehicle. Charging premium fares based on trip origin/destination or time of day would not be permitted. Offering several categories of system memberships (e.g., corporate, student, low-income) would be encouraged to incentivize regular ridership.

Payment options should include debit, credit, or other methods, and a cash payment option would be encouraged to reduce barriers to use.

To encourage operators to provide discounted pricing and payment options, some jurisdictions report success in using incentives (e.g., fleet size increase) for operators that increase sign-ups and ridership for users with lower incomes.

HRM Resources for Enforcement and Operations

The proposed approach to shared micromobility aims to devolve most operational and enforcement responsibilities to the businesses that receive permission to operate. For example, shared micromobility services have features that promote "self-enforcement" such as speed limiters, detection of sidewalk riding, and end-of-trip parking protocols. As well, the operators would have staff and resources to remove improperly parked and inoperable vehicles.

However, especially in the pilot phase, HRM would need to plan and budget for some compliance and operational functions. This includes police resources and by-law officers to enforce "rules of the road," enforcement and operations staff to respond to improperly parked vehicles, 311 staff to field public comments, right-of-way staff to establish encroachments for parking hubs, and others. There are currently not sufficient resources with Halifax Regional Police or HRM's existing by-law enforcement function to enforce e-scooter use.

To support enforcement of the terms of the proposed By-law M-300, this report identifies the need to hire one or two new enforcement officers and potentially purchase related equipment (e.g., e-bike, truck).

Key Components of New Regulations to Regulate Shared Micromobility Services

New municipal regulations (e.g., the proposed Part B of By-law M-300) will be required to enable and regulate the operation of shared micromobility services in HRM. NACTO offers best practices for regulating permit-based shared micromobility systems, and recommending regulations or policies for city permits or operator agreements. NACTO's best practice publication provides specific guidance on a range of considerations that will guide the development of Part B. The considerations include:

- General permit provisions, e.g., require legal permission to operate in public ROW, reserve right to terminate permit, limit number of companies and vehicles deployed
- Enforcing permit terms, e.g., reserve the right to suspend, revoke, and modify permits, and fine operators for failure to comply with permit terms
- Scope & operations oversight, e.g., fleet management, vehicle maintenance, customer service, pricing
- Mobility data & user privacy (e.g., require operators to provide trip data & implement a privacy policy)
- Shared micromobility parking (e.g., on-street and sidewalk options)
- Restrict or limit access (e.g., restrict access or limit speeds in defined areas)

As part of the process to draft new regulations staff will conduct a Regulatory Impact Assessment (RIA) to ensure HRM's Charter of Governing Principles for Regulation Administrative Order (AO) is applied. The RIA considers the potential impact of a new regulation that, "will impose new restrictions on a business,

industry, community or citizen."[3] This may also include a business impact assessment and engagement with HRM's business stakeholders.

Key Next Steps of the Recommended Approach

- Pending adoption of By-law M-300 (Part A), begin enforcement and fill one or two new FTE by-law officer positions and procure supporting equipment as required
- Prepare Part B of HRM by-law M-300 to regulate shared micromobility services and update existing by-laws as required
- Identify the lead business unit and fill one or two new FTE positions to lead the implementation and oversee the two-year pilot project
- Conduct a Regulatory Impact Assessment (RIA)
- A service provider or providers would be selected via a Request for Proposals (RFP) Process. The RFP would stipulate HRM priorities such as:
    - Equitable distribution of the service
    - Expected vehicle types and fleet size
    - Programming to ensure equitable access to the service (e.g., payment method and special pricing for low-income residents)
    - Technology and strategies to manage vehicle speeds and safe parking
    - Vehicle parking/storage type (e.g., lock-to/hybrid system for bike share)
    - Access to helmets for all riders
    - Redistribution of vehicles
    - Customer service
    - Data sharing
- Following selection of the preferred operator(s) and licensing, HRM staff would work with the operator(s) to prepare for system launch, with a target to launch in 2024
- Coordinate and work with HRM business units to facilitate implementation (e.g., identifying space in ROW or on Municipal property for parking hubs, integration with Transit, enforcement readiness, communications and promotion, and customer service)

FINANCIAL IMPLICATIONS

The cost implications to HRM are largely related to additional staff resources for compliance and to oversee the pilot project, which would include contract administration, data analysis, monitoring, and evaluation of the pilot project. There are expected one-time capital costs, which include e-scooter parking hubs and additional bike parking. There would also be costs for materials to support compliance. At this time, the second compliance officer, the second pilot project staff person, the truck and e-bikes are potential costs and will be confirmed as implementation proceeds. The known and potential costs are identified in Table 1, which displays the range of costs that may be incurred from the pilot project.

[3] https://www.halifax.ca/sites/default/files/documents/city-hall/legislation-by-laws/AO-2017-002-ADM.pdf

Table 1: Estimated Costs of Pilot Project

	2023/24	2024/25	2025/26
Capital Costs*			
Additional bicycle parking and e-scooter parking hubs	$ -	$ 150,000	$ 15,000
Truck purchase and operation (potential)	-	100,000	-
One to two e-bikes for enforcement (potential)	-	5,500 - 11,000	-
Total capital costs	**-**	**150,000 - 261,000**	**15,000**
Operating costs			
Compliance Officers (1-2 FTEs)	-	90,000 - 180,000	90,000 - 180,000
Staff for Pilot Project (1-2 FTEs)	70,000	120,000 - 220,000	120,000 - 220,000
Truck rental (potential)	6,000	-	-
Vehicle repair & maintenance (potential)	-	500 - 2,500	500 - 2,500
Total operating costs	**70,000 - 76000**	**210,000 - 402,500**	**210,000 - 402,500**
Total costs (estimate)	**$70,000 - $76000**	**$360,000 - $663,500**	**$225,000 - $417,500**
Average tax bill impact	$0.25 - $0.27	$0.49 - $1.62	$-

*Capital costs are assumed to be funded from operating for the purpose of tax bill impact calculation.
Note: Year 3 does not have anticipated tax rate implications because the majority of costs take place in Year 2.

Some or all of these costs could be offset by revenues, which could lead to a reduction in the estimated tax bill impacts identified in the table above. The pilot project would generate licence fees, per-vehicle fees, and per-ride fees that would go to HRM. The revenues collected will depend on fee structure agreements made with private companies. There would likely be revenue from fines as well which would further offset the costs outlined above.

The approved 2023/24 operating budget does not include costs associated with the pilot project. Therefore, approval would result in budget pressure this fiscal year of approximately $76,000. If approved, costs associated with the pilot project will be included in future years proposed operating and capital budgets.

RISK CONSIDERATION

The Background and Discussion sections identify risks and how they can be managed. These include:

- Risk to vulnerable road users related to the operation of e-scooters on sidewalks and multi-use pathways and improper parking of dockless e-scooters such that they create a hazard on sidewalks. This risk will be mitigated by contractually requiring the latest technological solutions, combined with education and enforcement, from the successful proponent(s). Mitigation of risk to e-scooter riders includes maintaining riding surfaces in a state of good repair to prevent e-scooter crashes. Mitigation of risk to all riders of shared micromobility services includes continuing to build out a network of dedicated AT infrastructure designed for people of all ages and abilities as per the IMP.
- Existing helmet laws may add cost/complexity and/or limit system success by limiting system ridership. This risk will be mitigated, in part, by requiring the successful proponents to provide a solution that makes helmets accessible for all riders. Several private operators interested in the

Halifax market have told staff that solutions are possible and have been implemented in other jurisdictions.

- The shared micromobility industry is subject to sudden changes, including the emergence and closing of private bike share and e-scooter vendors, which could have implications for the long-term sustainability and reliability of services in HRM. This is a tradeoff associated with privately owned systems versus publicly owned systems. This risk will be mitigated by ensuring the procurement process considers the history and performance of proponents.
- Robust ridership is not guaranteed for any new system. This risk will be mitigated through careful planning, procurement, implementation, and phasing of a system for HRM, as described in the Discussion section of this report. HRM is attracting interest from various private operators due to what they see as a strong potential market for shared micromobility services.

COMMUNITY ENGAGEMENT

Alta Planning & Design led public and stakeholder engagement for the Readiness Study. An online survey was posted on the Shape Your City website from December 2, 2019, to December 23, 2019, to gather feedback and suggestions regarding the proposed vision, principles, and goals. The survey also asked respondents about demographic and commuting information as well as their level of interest in micromobility should a service launch in HRM. Over 1,100 people responded to the survey.

Most survey respondents, 90%, supported the project's proposed vision statement and accompanying principles.

In response to the survey question about interest in a possible future micromobility service in HRM, 37% of survey respondents indicated they would use both shared bicycles and e-scooters, 26% indicated they would use only bike share, 11% would use only e-scooters, and 26% indicated they wouldn't use either service.

Readiness Study engagement included focus group sessions with various stakeholders, including representatives from:

- Cycling, walking, and rolling advocates
- Local cycling industry
- Private operators
- Provincial departments (e.g., NS Public Works)
- Halifax Regional Police
- Accessibility organizations (e.g., CNIB, HRM Office of Diversity and Inclusion)
- Local institutions (e.g., Dalhousie University)
- Business improvement associations
- HRM advisory committees (i.e., Accessibility, Active Transportation)

Since completing the Readiness Study, staff have continued discussions with CNIB staff and HRM cycling, walking, rolling, and accessibility advocates, business improvement associations, and private e-scooter operators.

Comments from the survey and stakeholder sessions focused on several themes, including:

- Safety and accessibility for vulnerable road users, including the need to continue building dedicated active transportation infrastructure for all ages and abilities, and concerns about potential conflicts of e-scooter riders share space with people walking and rolling
- Service area and operations, including convenient access to micromobility vehicles, service to communities outside of the Regional Centre, and the question of a year-round system versus seasonal
- Climate and environment, including the opportunity for micromobility services to reduce reliance on cars for transportation as a way to address the climate crisis

- Equity and affordability: social equity was frequently mentioned in terms of service affordability, service coverage, accessibility to people without credit cards, adaptive vehicles, and prioritizing the needs of pedestrians and people with disabilities
- Clarity of rules, including the importance of clarity on where e-scooters and other micromobility devices can operate and with what requirements
- Public finance and process, including concern about allowing a private operator to provide what may function as a public service, and some concern about long-term costs to the municipality
- Public realm, including concerns about the impact of parking areas for micromobility devices, with specific concern about the possibility of devices impeding the free flow of sidewalks

The *What We Heard* summary report of public and stakeholder input from the Readiness Study is available on the Shape Your City project page: www.shapeyourcityhalifax.ca/shared-micromobility

Additional engagement to confirm community interest in the service and identify service area(s) and locations for parking hubs is recommended as part of implementing the two-year pilot project.

ENVIRONMENTAL IMPLICATIONS

This project is supportive of the sustainability objectives of the municipality as it aims to make sustainable, low-carbon transportation options more convenient and accessible for everyday transportation purposes.

ALTERNATIVES

Regional Council may choose to modify or not approve some or all components of the recommendation.

That Halifax Regional Council:

1. refuse to enable the use of electric kick-scooters in the Municipality.
2. refuse to proceed with implementation of shared micromobility services in HRM, or to delay a decision.
3. establish a municipally owned and third-party operated bike share system with a target to launch in 2026 and enable and regulate the operation of a privately owned and operated shared e-scooter system as a 2-year pilot with a target to launch in 2024, as described in the Discussion section of this report (approach #2).
4. establish a municipally owned and third-party operated bike share system with a target to launch in 2026 and defer a decision on a privately owned and operated shared e-scooter system for 2 years, as described in the Discussion section of this report (approach #3).

ATTACHMENTS

ATTACHMENT A: Shared Micromobility Additional Information
ATTACHMENT B: Proposed By-law M-300 Respecting Micromobility
ATTACHMENT C: Amendments to Administrative Order 15
ATTACHMENT D: Shared Micromobility Readiness Study

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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ATTACHMENT A: Shared Micromobility Additional Information

Shared Micromobility and Helmet Laws

It is unclear and challenging to isolate the impact helmet laws have on the success of a shared micromobility system[1]. The Readiness Study team studied approaches to shared micromobility from other jurisdictions with helmet laws. These approaches include:

- Require the system to provide helmets (Vancouver)
- Require the user to acknowledge they must be wearing a helmet (Kelowna, Calgary)
- Remove helmet regulations (Mexico City, Tel Aviv- Yafo, Spokane)

Vancouver's Mobi bike share system provides helmets with every bicycle, which adds a significant operating expense and requires an adequate sanitization program. Many private vendors have also promoted helmet use by providing free or discounted helmets to the community in which they operate. Jurisdictions that removed helmet requirements still encourage helmet use but saw the requirement as an impediment to operating a successful system.

Some e-scooter operators have developed solutions to provide helmets on their vehicles.

E-scooter Related Accessibility Concerns and Industry Response

The CNIB is one of the accessibility stakeholders consulted during development of the Readiness Study and this report. A 2020 CNIB policy brief does not support the introduction of shared e-scooters in Canadian municipalities due to the risks they create for pedestrians who are blind or partially sighted. For municipalities that choose to implement shared micromobility systems that include e-scooters, CNIB has several recommendations to mitigate risk to pedestrians with sight loss. These include:

1. Riders should follow the same rules of the road as cyclists.
2. E-scooters should only be parked in designated areas which are clearly marked and are cane detectible.
3. People with sight loss must be able to safely navigate around designated e-scooter parking.
4. Identify e-scooters so they can easily be reported by vulnerable road users.
5. System operators must respond promptly to improperly parked e-scooters.
6. Municipalities should establish appropriate mechanisms to discourage unsafe practices such as excessive speed or careless parking of e-scooters.

Some cities prohibit e-scooters due, in part, to the same accessibility concerns identified by the CNIB and other local stakeholders, while some cities require e-scooter and app features, education, enforcement, and customer service to address accessibility concerns. For example, the Region of Waterloo, in their recent RFP, requires that system contact information and a unique vehicle ID on each e-scooter should be accessible, including information provided in braille, so that people with sight loss can easily report an improperly parked vehicle. The RFP also outlines penalties per occurrence for non-compliance of licence requirements regarding parking, and no-ride or slow-ride zones, among others.

The large e-scooter companies who deploy their own proprietary shared e-scooters, bicycles, and e-bikes are addressing accessibility concerns through a combination of on-vehicle and in-app features, as well as education and various parking strategies. These include:

Geofencing

- E-scooters tracked with GPS and when riders enter a designated geo-zone, vehicles slow down or stop, and riders are notified by a vehicle sound and an in-app notification.

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[1] Fishman, E. (2016). "Bikeshare: A Review of Recent Literature". Transport Reviews, 36:1, 92-113, DOI: 10.1080/01441647.2015.1033036

- Most Canadian cities have set scooters to a maximum of 20 km/h and slow down zones for highly pedestrianized areas are generally set at 15 km/h (Bird Canada)

Sidewalk Riding Detection

- Additional data (e.g., wheel speed, turning history, on-board camera images) are combined. with GPS data for more precise vehicle location information and position.
- On-board analysis results in vehicles slowing down in approximately 0.5 seconds.

E-scooter Parking Strategies

- In-app rider education
- Patrols by operator staff
- “Preferred Parking” areas with incentives (located in-app with instructions for how to locate and park with financial incentive to encourage good parking)
- Some cities provide supplemental designated parking areas (e.g., painted box with flexible bollards, portable mat with e-scooter parking graphic).
- “Lock-to” parking requirement, e.g., San Francisco, Region of Waterloo
- Riders must upload an end-of-ride photo of their properly parked e-scooter.
- Geo-fencing for no-parking zones
- Warnings, fines, suspensions issued to riders by operator for improper parking.

System Ownership and Operation Models

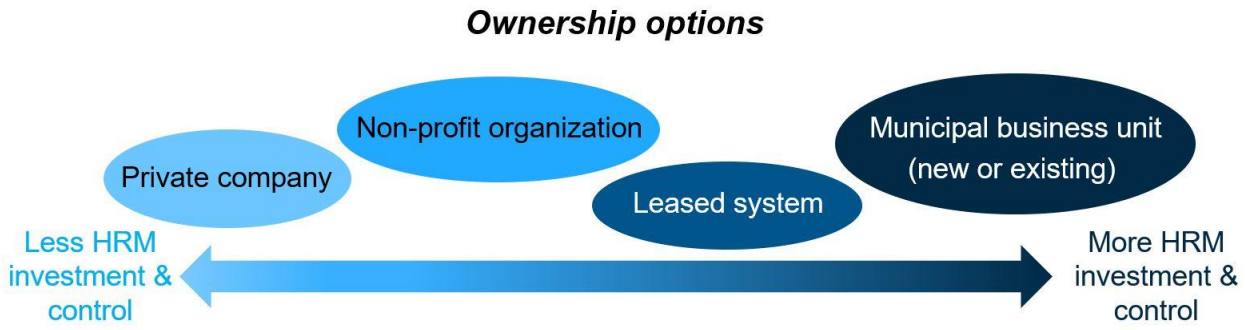
Bike share systems in North America are owned by a public agency, private company, or non-profit. Shared e-scooters systems are almost exclusively privately owned and operated.

The Readiness Study considered three bike share ownership options for HRM:

- Municipal business unit (new or existing)
  - Municipally owned or leased equipment
- Private company
- Non-profit organization

The system owner has greater decision-making authority on how and where the system operates. Privately owned systems are run with a focus on the system as a business rather than providing a service. Examples of areas that would benefit from public or non-profit control include system pricing, equity programming, station locations, and long-term system sustainability.

Figure A-1: Bike Share Ownership Options



The Readiness Study recommended a municipal business unit or a non-profit organization own a future HRM bike share system as these ownership models would meet the greatest number of goals. The steering committee also identified a desire to have some control over the system, related to interest in the system providing a public service.

With an HRM owned or leased system, the municipality's responsibilities would include:

- Own or lease equipment
- Contract management
- Funding
- Regulation
- Enabling/supporting the system, e.g., hub siting in the right-of-way, communications and PR, community engagement

System operators are responsible for the day-to-day management responsibilities of a system. The Readiness Study considered several bike share operator options, including:

- Operated by a municipal business unit
- Private, for-profit
- Private, non-profit
- One of multiple permitted companies operating in HRM

The Readiness Study recommended operation by a private company or a non-profit organization. Responsibilities of the system operator would include:

- Day-to-day management of the system
- Maintaining equipment
- Bike redistribution (& helmets if provided)
- Removing or relocating improperly parked bikes
- Marketing, education, and PR
- Customer service (call centre, website, etc.)
- Funding and fundraising (sponsorships, user fees)

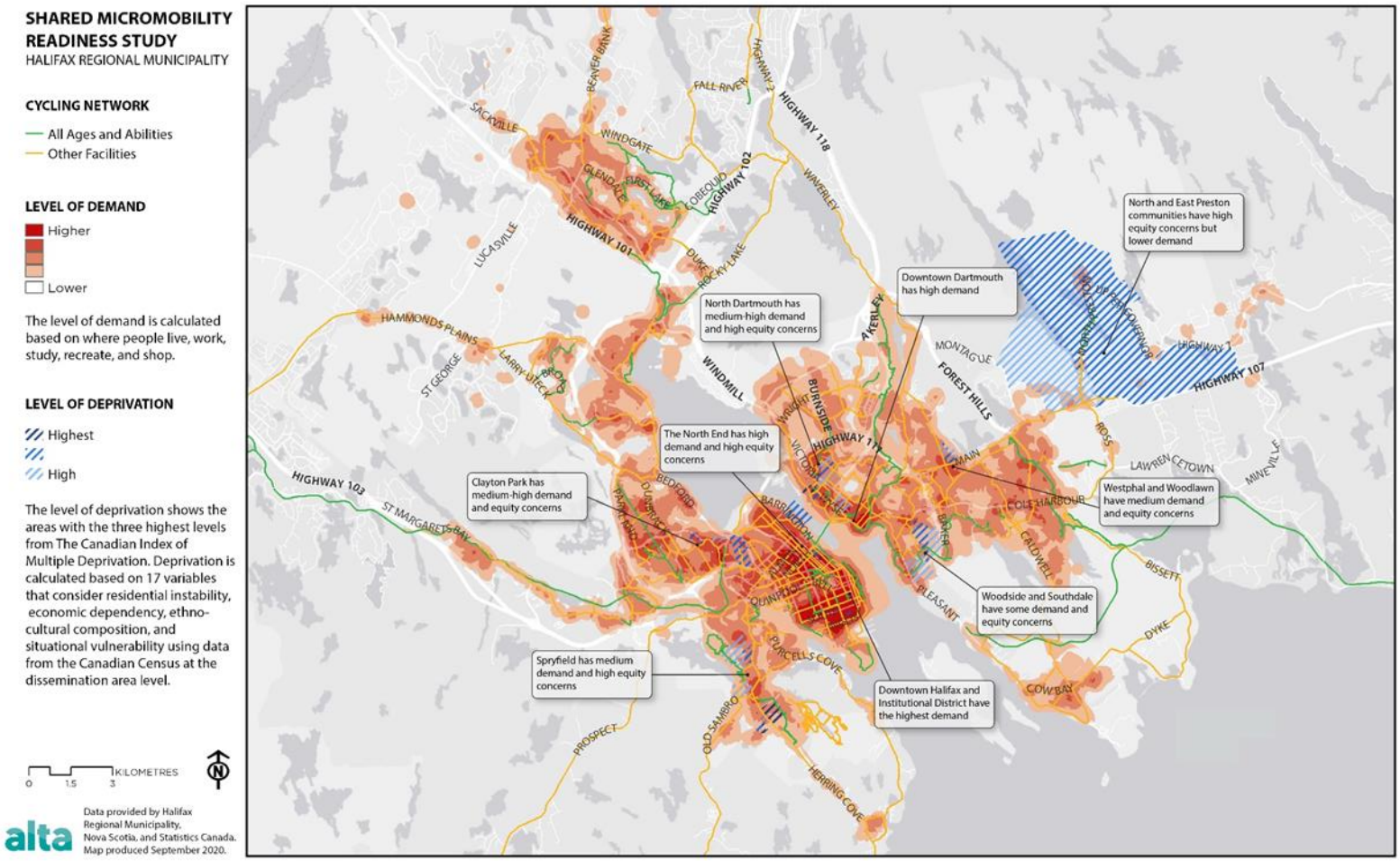


Figure A-2: Demand and Equity Analysis Map

Attachment B
(By-law)

HALIFAX REGIONAL MUNICIPALITY
BY-LAW M-300
RESPECTING MICROMOBILITY

BE IT ENACTED by the Council of the Halifax Regional Municipality under the authority of section 305B of the *Motor Vehicle Act*, RSNS 1989, c 293 and section 188 of the *Halifax Regional Municipality*, SNS 2008, c 39, as follows:

Short Title

1. This By-law shall be known as By-law M-300, the *Micromobility By-law*.

Interpretation

2. In this By-law,

(a) "bicycle lane" means a marked lane on a roadway designated by a traffic sign for the use by bicyclists;

(b) "CAO" means the Chief Administrative Officer of the Halifax Regional Municipality;

(c) "electric kick-scooter" means a vehicle that is operated in a standing position and has

(i) two wheels placed along the same longitudinal axis, a steerable wheel placed at the front of the vehicle and non-steerable wheel at the rear,

(ii) wheels with a diameter of not less than one hundred and eighty-five millimetres and not greater than four hundred and thirty millimetres,

(iii) a platform for standing between the two wheels,

(iv) a steering handlebar that acts directly on the steerable wheel, and

(v) an electric motor not exceeding five hundred watts that provides a maximum speed of thirty-two kilometres per hour;

(d) "Executive Director" means the position determined by the CAO to be the head of a department of the Municipality, and who is accountable to the CAO under section 36 of the *Halifax Regional Municipality Charter;*

(e) "multi-use pathway" means any three to four metre wide paved or crusher dust trail that forms part of a network intended for walking, bicycling, or other active modes of transportation owned by the Municipality;

(f) "Municipality" means the Halifax Regional Municipality;

(g) "owner" means a business offering a shared transport service in which an electric kick-scooter is made available to use or operate for short-term rental in the Municipality;

(h) "park" means any land, owned, leased, or controlled by the Municipality, designated or used as parkland, including gardens, playgrounds, sports fields and beach areas;

(i) “roadway” means that portion of a street or highway between the curb lines or the travelled portion of a street designed for vehicular travel;

(j) “sidewalk” means that portion of a street between the curb line and adjacent property line or any part of a street especially set aside for pedestrian travel and separated from the roadway;

(k) “street” means all public streets, roads, lanes, sidewalks, thoroughfares, bridges and squares, and all curbs, gutters, culverts and retaining walls in connection therewith and without restricting the generality of the foregoing includes the full right of way width; and

(l) “traffic authority” means the traffic authority appointed by Halifax Regional Council pursuant to section 321(2) of the *Halifax Regional Municipality Charter*.

Application

3. This By-law applies to the use and operation of electric-kick scooters in the Municipality.

4.(1) Except where permitted by this By-law, the operation of an electric kick-scooter in the Municipality is prohibited.

(2) The operation of an electric kick-scooter shall only be permitted on:

(a) roadways having a speed limit of 50 kilometers per hour or less;

(b) bicycle lanes on any roadway; and

(c) multi-use pathways within streets.

(3) Where permitted under subsection (2), no person shall operate an electric kick-scooter:

(a) at a speed in excess of 25 kilometers per hour on a roadway or bicycle lane;

(b) at a speed in excess of 15 kilometers per hour on a multi-use pathway;

(c) on a sidewalk; or

(d) subject to subsection (4), in a park.

(4) The Executive Director responsible for Parks & Recreation may designate parks permitting the use and operation of an electric kick-scooter.

5. No person shall park, dock, store or leave an electric kick-scooter on a highway, roadway, sidewalk, trail, path, walkway, exhibition ground or multi-use pathway in such a manner that obstructs the flow of pedestrian, cyclist or vehicular traffic.

6. The traffic authority may erect signs fixing the maximum allowable speed of electric kick-scooters where the operation of electric kick-scooters is permitted by by-law.

Abandonment Prohibited

7. No owner shall permit an electric kick-scooter to be abandoned upon any municipal property.

Information Required on Electric Kick-Scooters

8. The owner of an electric kick-scooter shall permanently affix an electric kick-scooter with the following information:

(1) the name of the owner or business or both; and

(2) a valid published telephone number and address for returning the electric kick-scooter to the owner.

Impoundment

9.(1) Any municipal employee or agent may retrieve and impound any electric kick-scooter abandoned on municipal property.

(2) Within 48 hours, the Municipality shall inform the owner that the electric kick-scooter has been impounded.

(3) An impound fee in the amount set by Administrative Order 15, *Respecting License, Permit and Processing Fees* shall apply to each electric kick-scooter impounded pursuant to subsection (1).

(4) The Municipality shall release impounded electric kick-scooters on the payment of the impound fee pursuant to subsection 9(3).

10.(1) The Municipality may sell or otherwise dispose of any impounded electric kick-scooters not retrieved by the owner within 7 working days following the date of notice.

(2) Notice is deemed to have been served on the third day after it was sent.

(3) All expenses incurred by the Municipality in seizing, removing, impounding, storing and disposing of the electric kick-scooter may be charged and recovered as a debt due from the owner.

Penalties

11. A person who contravenes any section of this By-law is liable upon summary conviction to a penalty of not less than fifty dollars ($50).

Done and passed this day of , 2023.

_____
MAYOR

_____
MUNICIPAL CLERK

I, Iain MacLean, Municipal Clerk of the Halifax Regional Municipality, hereby certify that the above-noted By-law was passed at a meeting of Halifax Regional Council held on , 2023.

_____
Iain MacLean, Municipal Clerk

Attachment C
(Amending Administrative Order)

HALIFAX REGIONAL MUNICIPALITY
ADMINISTRATIVE ORDER NUMBER 15
Respecting License, Permit and Processing Fees

BE IT RESOLVED by the Council of the Halifax Regional Municipality that Schedule A of Administrative Order 15, the License, Permits and Processing Fees Administrative Order, is amended as follows:

1. Adding the following section immediately after section 26:

27.

By-law #	Short Title	Section	Fee
By-law M-300	Micromobility By-law	9(3)	$75.00

Done and passed in Council this day of , 2023.

MAYOR

MUNICIPAL CLERK

SHARED MICROMOBILITY READINESS STUDY

HALIFAX

alta

JULY 2021

Created for

Halifax Regional Municipality

HALIFAX

Created by

Alta Planning + Design, Canada - Inc.

alta

CONTENTS

EXECUTIVE SUMMARY

Study Purpose

The Shared Micromobility Readiness Study supports the work of Halifax Regional Municipality (HRM) to implement a future shared bike/e-bike/e-scooter system. Each of these modes is a form of "shared micromobility". A shared micromobility system provides on demand vehicles for people to use to travel throughout a city. Shared micromobility systems provide benefits for active transportation mobility options, provide first/last mile connections to frequent transit service, significantly increase the potential for multimodal trips, and are space- and greenhouse gas-efficient transportation.

HRM initially identified interest in studying bike share feasibility during the development of the Active Transportation Priorities Plan 2014-19 and the Integrated Mobility Plan (Action 88). This Shared Micromobility Readiness Study was authored by Alta Planning + Design, Canada and builds upon these previous plans. The study provides background information on shared micromobility systems from across North America and considers opportunities, needs, barriers, and risks to the implementation of a system in HRM, including legislative and financial considerations.

This study includes a focus on the type of bike share most appropriate for HRM, locations identified as high equity and demand areas, bike share cost estimates, and system ownership and operation recommendations.

Figure i. A hybrid bike share station from Hamilton, Ontario (Image: Hamilton Bike Share).

Study Process

The study process involved working with the project steering committee, comprised of HRM staff from across the organization's departments, to provide feedback and insight into different departmental concerns or opportunities for collaboration towards the implementation of a shared micromobility system. The committee shared ideas for principles and goals of a shared micromobility system, which were also reviewed through a public survey. Principles and goals helped to define and direct decision-making during the study.

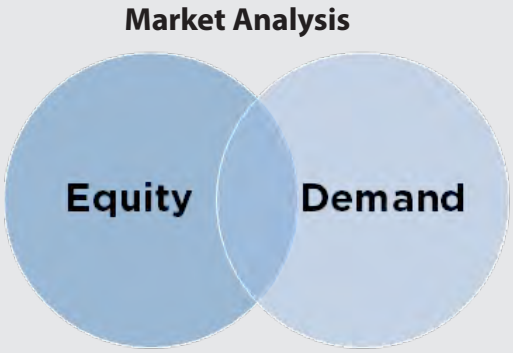


Figure ii. The study's Market Analysis investigates areas with high equity needs and potential high demand for shared micromobility.

The project team interviewed other Canadian cities with shared micromobility systems to better understand common experiences related to shared micromobility. These interviews were supplemented with structured discussions with private system vendors and operators, as well as additional interviews with stakeholders in HRM.

Alta created a market analysis map to study demand for a future shared micromobility system. This analysis investigates areas identified as equity priority areas and also studies "hotspots" that are concentrations of places where people live, work, and play. These hotspots are likely to be places where people begin or end shared micromobility trips.

Alta developed recommendations for pursuing shared micromobility as explained in the following section.

Bike Share Recommendations

Bike share systems can be implemented through a variety of ownership and operations arrangements. These involve the municipality, private system vendors (who sell equipment), and private system operators (day-to-day system management). In some communities, non-profit organizations sometimes lead day-to-day system management. Based on the feedback from the public and the steering committee, as well as the current shared micromobility market, Alta recommends a **hybrid system** for a future bike share system in HRM. Hybrid systems have bikes that are unlocked and returned at a station with bike corrals branded for the system. They can also be unlocked and returned to other available bike parking in the community, such as existing bike racks.

Figure iii. A hybrid bike share system with custom docks.

Alta recommends conducting further community engagement before finalizing a recommended service area. However, the study's Market Analysis examined demand and equity considerations to identify areas that may have robust system ridership. These locations include the Regional Centre, as well as some areas outside of the Regional Centre. Based on best practice, **Alta estimates that approximately 1,500 bike share bikes are needed** to provide an acceptable level of service for this area. HRM may decide to purchase increasing numbers of bikes over multiple years, to better spread out purchase costs and to develop capacity for system operations.

E-Scooter Recommendations

Based on steering committee input, Alta recommends that HRM prioritize establishing a bike share system in the municipality, compared to prioritizing an e-scooter system (electric scooters). If the Province releases regulations enabling e-scooters, HRM should consider permitting a privately owned and operated e-scooter system. Private operator permit fees would be used to fund the system oversight and municipal management.

Bike Share Cost Estimates

Alta recommends that the municipality procure a bike share system to achieve long-term system sustainability as opposed to leasing a system or permitting a privately owned system to operate in HRM. Based on the research completed during this study, **the cost to procure a system would be $4.5-$10 million for 1,500 bicycles. The on-going costs for a system would be an estimated $1.2 million per year for a 1,500 bike system.**

Table i. Estimated System Operating Cost and Revenue for a Bike Share System with 1,500 bikes

COSTS	
Operating Costs ($2,000/bike/year) + equity programming and staff	$3,500,000
REVENUE PROJECTIONS	
Farebox Recovery Rate	35%
Estimated User-Fees	$1,225,000
Sponsorship Opportunities	$250,000 +
Advertising ($500/bike/year)	$750,000
Revenue Sub-total	$2,225,000
FINANCIAL GAP	
Annual Need	**$1,275,000**

The study identified additional programming and needs that may be considered as part of implementing a shared micromobility system, such as the need for additional bike parking and programming to support equity initiatives such as discounted memberships, educational programs, and bicycle types that accommodate different needs, such as cargo, recumbent, tricycles, and handcycles. Shared micromobility may not be appropriate in all contexts in HRM, such as in rural areas. The study identified different opportunities to support active transportation with similar benefits to shared micromobility for people in rural areas of HRM.

Next Steps

Immediate next steps will help HRM continue to develop a strong foundation for shared micromobility in the municipality. These next steps include:

- Seek direction from Council on provision of a shared micromobility system and approach to implementation, including funding
- Public engagement and consultation on service area (see pg. 43-44)
- Determine service area based on available funding, feedback from community, and the market analysis results (see pg. 45)

CHAPTER 1. WHAT IS SHARED MICROMOBILITY?

SHARED MICROMOBILITY OVERVIEW

Shared micromobiility is an umbrella term for light, single occupant vehicles that are operated as a fleet and can be accessed by the public. The most common forms of shared micromobility in contemporary systems are bike share and e-scooter share services (electric scooters). Contemporary systems frequently include electric-assist bicycles in addition to traditional pedal bikes. Other examples of micromobility vehicles include electric skateboards, hoverboards, Segways, larger electric scooters, and even neighborhood electric vehicles (NEV-vehicles similar to a conventional golf cart). Although these examples are less common than bike share and e-scooter share, they are occasionally available as shared micromobility programs. As new technologies and vehicle types develop, other types of micromobility vehicles will likely become more common. This study focuses on bike and scooter share services.

Shared micromobility services have expanded across the world. Their technologies, missions, and ownership structures have rapidly developed in the past five to ten years. In 2019, 136 million trips were taken via shared micromobility in the U.S., a 60% increase over the number of trips taken in 2018.[1] Shared micromobility services changed significantly in 2018, with the widespread launch of scooter share systems in approximately 100 U.S. cities. Scooters accounted for 38.5 million trips in 2018. In Canada, shared micromobility systems have begun operating in Vancouver, Kelowna, Calgary, Edmonton, the Region of Waterloo, Hamilton, London, Windsor, Ottawa, and Montreal. These systems have been implemented and are operated differently in each city. Common differences include ownership and management of the system, type of vehicles, and whether the system was initially launched as a pilot project.

BICYCLES

Bike share systems are typically structured to operate like automated bike rental for short periods. The structure encourages short, on-demand trips in which bikes are checked out, ridden for a short period of time (typically 30 minutes or less) and either returned to any station in the system or parked at the final destination. Most systems employ a pricing schedule that encourages short, frequent trips and discourages bikes being in use for long periods of time. Some systems provide for unlimited, short trips for casual (24 hour) users or annual/monthly members—so-called "buffet" style of pricing—while others charge for each trip or each hour or minute of use—so-called "a la carte" pricing. For either pricing model, the focus is getting to nearby destinations quickly and conveniently. Public bike share is not intended to compete with bike rental companies, which are intended for those interested in using a bicycle continuously for longer periods of time.

Bike Share System Types

The three bike share technology types are:

- "Dock-based" equipment: Modular docking stations and kiosks powered by solar power and wireless communication. Stations can be installed quickly or moved, as needed.
- "Dockless" smart-bike equipment: Bicycles are typically locked to themselves using a ring lock on the back wheel. They are parked anywhere in a service area.
- "Lock-to" smart-bike equipment, often referred to as a hybrid system: Bicycles are parked within a service area and locked to a fixed object or designated rack.

Figure 1. Top: Dock-based bike share, Middle: Dockless bike share, Bottom: Lock-to/hybrid bike share (Bottom image credit: Hamilton Bike Share)

Electric-assist bicycles

In the past few years, electric assist bike (e-bike) share equipment has become more user friendly for a wider audience. Benefits of e-bikes include increased trip distances, including in hilly areas, thereby encouraging more users. Recharging the bikes' batteries can be challenging for operators.

Companies that provide dock-based, dockless and lock-to hybrid systems all have electric-assist models that can be integrated into a current or future bike share program. All models require the rider to pedal the bicycle in order to get an "assist" from the electric motor. The top speed for an e-bike is typically 25 km/h at which time the regulator cuts off any additional power. Though commercially available for private bicycles, no bike share models offer a throttle-based e-bike. E-bike charging stations are a developing technology, designed to provide vehicles with charging capabilities through solar panels or the existing electricity grid. Current implementation is limited, but quickly developing. Montreal and Toronto have added e-bikes to their bike share fleets in the past few years.

E-bikes have become very popular in jurisdictions where they are offered. In New York City, each e-bike is used on average for 15 rides per day, compared to 5 rides per day for shared pedal bikes in the New York City system.[2]

Figure 2. Electric assist bike share (e-bikes)

E-SCOOTERS

Scooter share systems first appeared in California in 2017 as a new and unique micromobility transportation option. They are used for short, one- or two-way trips. The service utilizes app-based technology to offer short-term rentals of electric-powered scooters (aka "e-scooters"). Operation of the system functions much like that of a dockless bike share system described above, in which users park at their destination within a defined geographic service area. E-scooters differ from bikes in that they require little physical effort on behalf of the user. Unlike bikes, operators may pick up units every night, charge them, and redeploy the next day.

In 2018, the first scooter share program was initiated in Canada, in Waterloo. In 2019 Kelowna, Calgary, Edmonton, and Montreal also initiated programs. The scope of these programs in BC and Ontario were limited, as provincial regulations prohibit the use of scooters on public roads. The programs in Alberta and Quebec required provincial approval of interim regulations to allow the use of scooters on public roads. As of 2020, systems have also started throughout Ontario as part of a provincial pilot program.

Benefits of e-scooter systems include broad appeal to a wide user base, their ability to customize short-term trips and close the gap between transit and destinations, and potential to reduce automobile trips. At the same time, the deployment of e-scooter programs around the U.S. has revealed several areas where more consideration and work are needed to integrate e-scooters safely and smoothly into a community's transportation system.

Concerns about scooters include use or parking on sidewalks and paths, which can have a negative impact on pedestrian safety and accessibility. At the same time, there has been concern that e-scooters do not belong on high speed, high volume roadways without separation between e-scooters and other traffic.

Figure 3. Top and bottom: E-scooters

Combined Bikeshare and E-scooter Systems

London, Ontario recently issued two separate RFPs for bikeshare and e-scooter systems and received interest from one company to provide both modal services. Although not currently recommended for Halifax (see Ch 3), other communities have sometimes released a combined bikeshare/e-scooter RFP or released two separate RFPs and enter into a partnership with one vendor to provide both services.

BEST PRACTICE GUIDELINES

NACTO GUIDELINES FOR REGULATING SHARED MICROMOBILITY

The NACTO Guidelines for Regulating Shared Micromobility offer best practices for regulating permit-based systems. NACTO recommends regulations or policies for city permits or operator agreements. A discussion guide provides commentary on questions and emerging issues in shared micromobility. A state of the practice summary provides real examples of regulatory requirements from select cities. The NACTO best practice guidance is organized into six chapters that provide specific guidance on a range of considerations, summarized below.

Regulating Shared Micromobility – Shared micromobility definitions and a discussion on the city's regulation authority and possible methods, such as permits or pilot projects.

General Terms and Conditions – General provisions such as permit number, length, and enforceability, as well as requirements around insurance, bonds, and fees.

Scope & Operations Insight – Considerations for regulating fleet size, removal, and adjustment. Recommendations also discuss maintenance, provisions for customer service, staffing and workforce development, and service pricing.

Public Engagement – This chapter recommends options for requiring operators to lead or contribute to public engagement via staffing, events, outreach materials, campaigns, pricing and discount programs.

Mobility Data & User Privacy – This chapter outlines provisions for cities to receive data, including the type, the ability to share the data, and reporting frequency.

Infrastructure – This chapter provides recommendations on parking for shared micromobility vehicles within the right-of-way, as well as requirements for operators to support the development of high-quality facilities for use by shared micromobility vehicles, and considerations around geo-fencing and restricting or limiting access to specific areas.

The Appendix identifies how four Canadian cities compare to the NACTO guidelines.

INSTITUTE OF TRANSPORTATION DEVELOPMENT POLICY BIKE SHARE PLANNING GUIDE

The 2018 Edition of the ITDP Bike Share Planning Guide includes thorough information on the background, planning, and design of bike share systems. The guide focuses on dock-based bike share systems, but also includes guidance on regulating dockless systems. As part of the guide's development, ITDP reviewed metrics from existing bike share systems around the world to identify key metrics that support the planning and designing of a bike share system, as well as the evaluation of a system. Chapter 4 examines the ITDP guide in relation to a potential bike share system in Halifax.

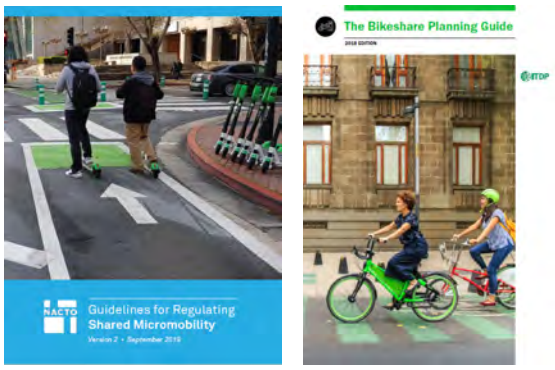


Figure 4. NACTO and ITDP reports (Image credit: NACTO, ITDP)

CONSULTATION WITH OTHER MUNICIPALITIES

The project team interviewed staff from four Canadian municipalities to understand their experiences with shared micromobility: Vancouver, Kelowna, Calgary, and Hamilton. These cities were selected to represent all system types: dock-based (Vancouver), hybrid (Hamilton), and dockless (Kelowna and Calgary). It also provided a range of operation types such as publicly owned, privately operated (Vancouver), publicly owned and third-party operated (Hamilton), and privately owned and operated (Kelowna and Calgary).

The interviews focused on regulations, system features, and the city's operating agreements with vendors. Some communities emphasized piloting shared micromobility services before increasing the system's scope. Others emphasized the need to invest in a system similar to a transit system, which requires subsidy and on-going investment. Staff highlighted a willingness to work and be flexible with vendors and operators to accommodate a system's success. Some staff emphasized the importance of working with an experienced vendor and operator to ensure that the system equipment and other elements are implemented smoothly.

Permit-based systems with dockless bikes were not sustainable for the communities interviewed. The systems' private operators chose to deploy e-scooters instead of bikes. Despite this change, the city staff interviewed were pleased with their programs' high e-scooter ridership.

A complete summary of the staff responses and how these systems aligned with the NACTO Guidelines for Regulating Shared Micromobility are available in the Appendix.

Mobi Bike Share (Vancouver)

System Launched: 2016

System Type: Dock-based

Ownership and Operations: City-owned, private operator

Current Fleet Size: 150 stations with 1,500 bikes

Equity Program: Vancity Community Pass - $20 annual membership pass

Figure 5. A person using Mobi bike share

SoBi Bike Share (Hamilton)

System Launched: 2015

System Type: Hybrid

Ownership and Operations: City-owned, private and third-party non-profit operator

Current Fleet Size: 850 bikes

Equity Program: Everybody Rides Initiative provides discounted membership plans, additional bikes in equity areas, and adaptive bicycles options

Figure 6. Bike share in Hamilton (image credit: Hamilton Bike Share)

Bikeshare Permit Program (Kelowna)

System Launched: 2019

System Type: Dockless

Ownership and Operations: Multiple private permitted operators (currently five operators)

Current Fleet Size: 50 e-bikes, 700 e-scooters, and 25 electric mopeds

Equity Program: No

Shared Mobility Pilot (Calgary)

System Launched: 2018-2020

System Type: Dockless

Ownership and Operations: Multiple private permitted operators (three operators)

Current Fleet Size: 2,300 e-scooters (2020), 1.500 e-scooters and 500 e-bikes (2019)

Equity Program: No

Figure 7. Lime e-scooters (image credit: Lime Calgary)

CHAPTER 2. WHAT COULD SHARED MICROMOBILITY MEAN FOR HRM?

VISION, PRINCIPLES, AND GOALS FOR SHARED MICROMOBILITY IN HRM

The vision, principles, and goals will guide the implementation of a shared micromobility service in HRM. The vision, principles, and goals below were developed based on discussion with the project steering committee, review of high-level policy direction in HRM policy documents, and lessons learned from other communities' experiences with shared micromobility. Steering committee members represented many business units, including Transportation and Public Works, Planning and Development, Parks and Recreation, Transit, Legal Services, and the Office of the CAO. Staff from the Office of Diversity and Inclusion also advised the project team.

VISION

Shared micromobility in Halifax Regional Municipality will provide mobility options to connect people of all ages, abilities, and incomes to each other and to everyday destinations. It will be an environmentally sustainable travel option to safely support active lifestyles. The system will be affordable and easy to use for both residents and visitors.

Figure 8. Hybrid bike share, e-scooters, and dockless bike share

PRINCIPLES AND GOALS

The project steering committee identified the following principles, each with a number of related goals. These principles and goals were used throughout the project to aid decision making.

Connect People and Places:

- Improve mobility for all community members, regardless of age, ability, or income
- Integrate with other modes, such as transit
- Improve connections to places to work, play, live, and learn
- Enable a year-round system

Strengthen Public Health and Safety:

- Support active lifestyles for people of all ages and abilities
- Support HRM goals for transportation safety (e.g., 'Healthy' pillar of IMP)

Advance Environmental Sustainability:

- Reduce the environmental footprint of travel by reducing motor vehicle trips
- Enable a system that is resilient and adaptable to future change

Make It Accessible:

- Make it affordable for people to get around the city
- Manage parking of micromobility vehicles to maintain safe and accessible streets and sidewalks

Ensure a High-quality Public Experience:

- Create a convenient, comfortable, and easy-to-use system for residents and visitors alike
- Ensure operators provide proactive and responsive customer service
- Make a system that is flexible and responsive to special events and visitors
- Ensure cost effective and responsible public spending

HRM POLICY AND LITERATURE REVIEW

The project team completed a scan of pertinent Halifax documents, municipal by-laws, and Nova Scotia provincial legislation to analyze potential gaps and barriers to implementing shared micromobility services. The following documents were included in this review. They are categorized below by type of document. Page 20 summarizes gaps and barriers to bringing shared micromobility services to Halifax, based on a review of pertinent documents.

Provincial Acts and Documents

- Traffic Safety Act (2018)
- Motor Vehicle Act (2016)
- HRM Charter (2008)

HRM Studies and Documents

- Halifax Transit Policies & Guidelines (2019)
- Integrated Mobility Plan (2017)
- Active Transportation Priorities Plan 2014-2019 (2014)

By-Laws

- E-200: Respecting encroachments upon, under or over a street
- P-600: Respecting municipal parks
- N-300: Respecting nuisances and smoking
- S-300: Respecting streets
- C-501: Respecting vending on municipal lands

Other Relevant Documents

- Urban Halifax Institutional District Bikeways Plan (2012)

RELEVANT HRM BY-LAWS, LEGISLATION, PLANS, AND POLICIES

Opportunities and barriers contained in relevant HRM by-laws and other legislation were included in a Background Report that helped inform this study. The following gaps and barriers may negatively impact future shared micromobility services in HRM. Alta proposes recommendations, where necessary, to anticipate these impacts. Opportunities, barriers, and risks are considered in more detail on page 27.

PARKS BY-LAW (P-600)

The Parks by-law includes definitions regarding types of vehicles that are permitted for use in HRM parks such as the definition for 'personal transporters'. These definitions could be restrictive to potential shared micromobility vehicle types.

Recommendation

Some HRM parks provide key connections for active transportation and HRM should consider allowing shared micromobility vehicles to use these connections. Use may need to be limited or restricted in wilderness parks and on singletrack trails.

INTEGRATED MOBILITY PLAN

In September 2020, Regional Council approved new Winter Service Standards for protected bicycle lanes, local street bikeways and multi-use pathways in support of year-round use of the IMP's all ages and abilities cycling network. The IMP included Action 88 to complete a bicycle share feasibility study.

TRAFFIC SAFETY ACT

E-scooter Legality

The forthcoming regulations to accompany the new provincial Traffic Safety Act will help to provide clarity on whether e-scooters are considered legal to use on public roadways in the province.

Helmets

The provincial Traffic Safety Act and Motor Vehicle Acts require people riding bicycles or using other personal transporters or recreational apparatus on a road to wear helmets. It is unclear and challenging to isolate the impact helmet laws have on the success of a shared micromobility system.[3] As part of the Background Report, the project team studied approaches to shared micromobility from other jurisdictions with helmet laws. These approaches include:

- Require the system to provide helmets (Vancouver)
- Require the user to acknowledge they must be wearing a helmet (Kelowna, Calgary)
- Remove helmet regulations (Mexico City, Tel Aviv-Yafo, Spokane)

The Vancouver model, in which helmets are provided with every vehicle, is expensive to operate and requires an adequate sanitization program. Many private vendors have also promoted helmet use by providing free or discounted helmets to the community in which they operate. Cities that removed helmet requirements still encourage helmet use, but saw the requirement as an impediment to operating a successful system.

Enforcement of the Traffic Safety Act, and Motor Vehicle Act until the Traffic Safety Act is released, is undertaken in HRM by the Halifax Regional Police.

Recommendation

This study does not recommend additional resources for enforcement of helmet compliance as part of implementing a shared micromobility system.

Figure 9. Mobi bike share in Vancouver with helmet lending

HALIFAX TRANSIT

Halifax Transit has existing policies and guidelines that state that bicycles can only be transported on buses by using bus racks and that bicycles must be stowed on bike racks on ferries. Personal transporters and e-scooters are not permitted on buses or ferries.

Recommendation

Shared micromobility vehicles should not be transported on Halifax Transit vehicles. The rider should instead park the vehicle at a transit stop or terminal and unlock a new vehicle, if needed, at the other end of their transit trip. This prioritizes limited space on Halifax Transit vehicles for personal bicycles, and ensures local turnover of shared micromobility vehicles throughout the system. Halifax Transit may consider permitting people to bring their personal e-scooters on Halifax Transit vehicles to enable multi-modal trips.

WHAT WE HEARD FROM RESIDENTS

The project team heard residents' ideas related to shared micromobility via an online survey offered through Shape Your City. Stakeholders from a variety of organizations, companies, and public agencies also shared ideas through small group interviews held at the beginning of the project. Main findings from this work are summarized here.

SHAPE YOUR CITY SURVEY

An online survey was posted on the Shape Your city website from December 2, 2019 to December 23, 2019 to gather feedback and suggestions regarding the vision, principles, and goals to guide a shared micromobility system. The survey also asked respondents about demographic and commuting information. Over 1,100 people responded to the survey.

Key Trends

Survey respondents discussed a number of topics, which are summarized below.

Safety

- Respondents want to feel safer when biking, walking, and riding e-scooters, regardless of whether they use their own vehicle or a shared one
- Respondents discussed a need for more low-stress infrastructure, such as bike lanes, paths, and sidewalks, to feel safer when walking or using shared micromobility
- Respondents also talked about the need to create a city that works for people with and without disabilities
- While some wanted to continue mandatory helmet requirements, others felt helmets should not be required
- Walking safety was a concern, especially related to e-scooters on sidewalks and the potential for conflicts with pedestrians, including people using wheelchairs
- The potential of shared electric vehicles (e.g., e-bikes, e-scooters) was regarded positively by some, negatively by others. Positive responses were reported more often

Operations

- Reliability of finding micromobility vehicles was frequently mentioned
- People expressed differing opinions related to who should own and operate the system. Some felt HRM should leave decision-making to private operators. Others felt HRM or a non-profit should operate shared micromobility services

Climate

- Respondents frequently mentioned the need for transportation in HRM to address the climate crisis
- Respondents were interested in the potential to expand transportation options that do not rely on driving cars
- While some saw the potential of shared micromobility options to positively contribute to the municipality's climate-focused goals, other saw more potential in investing money and resources to develop infrastructure for micromobility

Equity

- Social equity was frequently mentioned in terms of service affordability, adaptive vehicles, and prioritizing the needs of pedestrians and people with disabilities
- Some called for bike share / scooter share that is free to use. Others were concerned that affordability would not be possible
- Many said that these transportation options should be available outside of downtown. Transit expansion was regarded as a way to complement the potential for shared micromobility

Vision, Principles, and Goals

The majority of people who took the survey, 90%, agree with the project's draft vision statement and accompanying principles. On average, across the five principles, 85% of people described them as "important", 10% described them as "neutral", and 4% described them as having "low importance". The principle "connect people and places" received the most "important" answer choices.

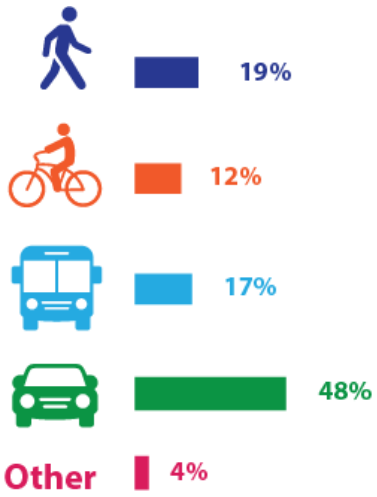


Figure 10. Primary mode of transportation of survey respondents

CURRENT AND POTENTIAL TRANSPORTATION OPTIONS

Survey respondents were asked the mode of transportation they currently use. The most common response was by car (as a driver or a passenger), but cycling and walking made up 18.5% and 12%, respectively.

Survey respondents were asked which types of shared micromobility services they would use, if these transportation options were available in Halifax. People taking the survey were divided in terms of which form of transportation they would use: bike share, scooter share, both, or neither. No answer choice received the majority of responses. However, "both" was selected most frequently (426 responses or 37%). Generally, there was a preference for bike share over scooter share. More respondents selected "neither" form of transportation over "scooter share". Scooter share was selected the least (121 responses or 11%).

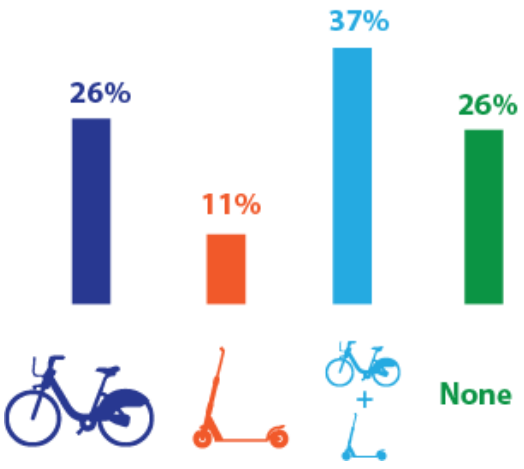


Figure 11. Type of shared micromobility service respondents would use

STAKEHOLDER ENGAGEMENT

The project team engaged a large cross-section of different stakeholders in order to get a broad understanding of the implications of a shared micromobility system. Stakeholders include representatives from the following groups:

- Cycling advocates
- Local cycling industry
- Private operators
- Provincial departments (e.g., Transportation and Infrastructure Renewal, Department of Health and Wellness)
- Halifax Regional Police
- Accessibility organizations (e.g. CNIB, HRM Office of Diversity and Inclusion)
- Local institutions (e.g. Dalhousie University)
- Business improvement districts
- HRM advisory committees (i.e., Accessibility, Active Transportation)

Key Themes

The key themes from engagement with stakeholders include:

Safety

- There was widespread concern about potential conflicts between shared micromobility users and pedestrians on sidewalks. Most people suggested that micromobility vehicles should not be permitted on sidewalks or in high pedestrian volume areas
- Some participants noted that the speed of shared bikes or e-scooters can be limited based on a geographic area
- Others indicated that operating e-scooters on sidewalks may be preferable until such time that a larger active transportation network is completed
- Most participants acknowledged that the mandatory helmet law in Nova Scotia was a major barrier to operating a shared micromobility system and indicated that any system would have to recognize that law. Many participants indicated that it is not enough for operators to have their users acknowledge that a helmet is required.
- Some participants identified potential liability for those injured from shared micromobility system as an issue that will need to be addressed
- Education was described as an important tool to increase safety for bike share or e-scooter share users, pedestrians, and drivers

Clarity of Rules

- Provincial staff indicated that e-scooters will be enabled as a vehicle type under the new Traffic Safety Act, but the provincial regulations for shared micromobility devices have not yet been developed

  Note: Until provincial regulations under the Traffic Safety Act are developed, the Nova Scotia Motor Vehicle Act (MVA) regulations are still in effect. HRM is seeking clarity from the Province regarding the legality of operating e-scooters on roads and/or sidewalks under the MVA

- Many participants expressed the importance of obtaining clarity on where e-scooters and other micromobility devices can operate and with what requirements
- Some participants expressed a desire for legislation and by-laws to include definitions of micromobility devices that are broad enough to allow for innovation and future types of shared micromobility vehicles

Affordability, Equity, and Accessibility

- Participants indicated that the system should be affordable to people with low incomes, and accessible to those without credit cards
- Some participants expressed a desire to have a wider range of shared vehicle types. Doing so could encourage use by people with a wide range of abilities and ages. Examples of vehicles discussed during interviews included cargo bikes, tricycles, tandem bikes, recumbent bikes, hand-powered bikes, and three-wheeled scooters
- Some participants were concerned about the accessibility of vendors' mobile apps, particularly with respect to people with low vision
- Some participants expressed a desire to explore how the system might reduce barriers to physical activity, particularly for children going to and from school
- Some of the operators indicated that some municipalities have used dynamic or incentive-based permitting to address specific concerns, such as allowing fleet increases if an operator provides service to an underserved or priority equity area

Environment

- Some participants were concerned about the lifecycle costs of micromobility devices and their long-term greenhouse gas impacts
- Some participants were concerned about the long-term impact of micromobility devices that are discarded into the harbour, such as impacts from battery leakage
- Many participants questioned whether e-bikes and e-scooters would have a negative impact on active transportation goals by replacing cycling, walking, or rolling trips
- There was common desire among most participants to integrate shared micromobility with other modes, such as transit

Service Area and Time of Operation

- Some participants expressed a desire to provide shared micromobility service in areas outside the Regional Centre, such as Spryfield and Clayton Park
- There was widespread concern about operating a system in winter from the public sector, advocates, and industry/operators. Those in favour of a year-round system noted that the system could include winterized vehicles (e.g., wider tires).
- Many participants questioned whether there should be a larger network of active transportation facilities in place before proceeding with a shared micromobility system. Uncertainty surrounding where to permit e-scooter riding added to these concerns
- A minority of participants felt that the system would be used primarily by visitors. Most felt that residents would be the main user group.

Public Finances and Process

- Some participants shared concerns about allowing a private operator to provide what may function as a public service. Participants raised concerns including limited service coverage, cost, and ability to terminate the system without warning.
- There were some concerns about costs to the municipality, particularly long-term costs from a potentially bad contract, enforcement costs, or costs to operate a procured system
- Some participants indicated that the permitting process could limit the number of scooter operators and the size of each operator's fleet in order to reduce the possibility of over-saturating the market

Public Realm

- Many participants were concerned with the impact of parking areas for micromobility devices, with specific concern about the possibility of devices impeding the free flow of sidewalks
- Some participants indicated that there are technological solutions to address orderly parking. These approaches include requiring users to take a photo after parking the vehicle or using geo-fencing to enforce parking in acceptable locations.
- Some participants discussed the need for a coordinated launch of any shared micromobility system. A smooth launch could help provide members of the public with a positive first impression,

OPPORTUNITIES, BARRIERS, AND RISKS

Opportunities, barriers, and risks to implementing and sustaining shared micromobility were considered throughout this study. Priority gaps and barriers related to HRM by-laws and legislation are discussed earlier in this section, for example. Priority opportunities, barriers, and risks are summarized below.

Opportunities

- Utilize future projects to enhance equity and environmental sustainability
- The density of destinations in the Regional Centre of HRM is conducive to short trips via shared micromobility
- Private vendors interviewed during the study expressed enthusiasm for potential shared micromobility services in Halifax
- Stakeholders within HRM and from other organizations and agencies indicated support for the study's goals and research, as well as the potential for future collaboration
- The shared micromobility industry continues to evolve. For example, electric bikes have dramatically increased many communities' average daily ridership per bike.

Barriers and Risks

- Existing helmet laws may limit system success by limiting system ridership. Providing helmets adds cost and complexity to system delivery.
- Public funds are required to establish and maintain the system, even if owned and operated by others than HRM (see following chapter)
- The province of Nova Scotia has not yet determined the status of e-scooters within the future Traffic Safety Act
- The shared micromobility industry is subject to sudden changes including the emergence and closing of private bike share and e-scooter vendors
- Robust ridership is not guaranteed for any new shared micromobility system
- May impact existing bike rental businesses, although these impacts can be mitigated through system design (e.g., Vancouver's Mobi system is designed to discourage trips along the Seawall)

CHAPTER 3. RECOMMENDED APPROACH TO SHARED MICROMOBILITY IN HRM

RECOMMENDED SYSTEM TYPE

BIKE SHARE SYSTEM TYPE

Alta considered three types of bike share systems that might serve HRM: docked, hybrid, and dockless. Alta recommends a **hybrid system** as the preferred bike share system type for HRM. A hybrid system allows users to retrieve and return bikes at designated stations or anywhere within the system's service area by locking to any standard bike rack.

Figure 12. SoBi Hamilton is an example of a hybrid bike share system (image credit: Hamilton Bike Share)

Hybrid bikes, whether pedal bikes or e-bikes, are often called "smart bikes" due to their hardware and built-in software. User transactions can occur through the bike, online, by smartphone, or through programming to allow transactions at designated businesses or via text message. By contrast, dock-based systems use modular stations for parking and dockless systems are parked anywhere in a service area.

This recommendation is based on coordination with the project steering committee and an evaluation of bike share system types. The evaluation considers the goals developed for shared micromobility in HRM and compares them to bike share system types (Table 1, following page). In addition to meeting project principles and goals, a hybrid system provides order in the public right-of-way, which is hard to achieve with a dockless model. A hybrid system is compatible with narrow streets and existing bike parking. The "hubs" or locking stations used with hybrid systems typically use a smaller footprint than a dock-based model. This evaluation is based on findings from system types in other communities.

E-Scooter System Type

The implementation of e-scooters is dependent on the updates to provincial legislation. Based on project steering committee and public feedback, a bike share system is a priority over an e-scooter system. However, HRM may consider working with one or more operators to permit e-scooters within HRM. Most e-scooter systems are dockless or hybrid, sometimes using pavement marking to define suitable locations for scooters to be parked. Docks for e-scooters are an emerging topic, but they have not yet been implemented at a large scale.

Alta recommends that the system include electric assist bikes (e-bikes). E-bikes support the principles and goals of the program by supporting travel by bicycle further distances and providing an option that can enable bicycle travel for people with mobility challenges. They can also help riders overcome some of Halifax's steep grades. Other communities with e-bikes have experienced robust system ridership, supporting mode share goals. The decision-making framework for the evaluation of system types is included in Table 1.

Accomplishes goal	
Somewhat accomplishes goal	
Does not accomplish goal	
Not applicable to system type	

Table 1. System Type Evaluation

PRINCIPLE	GOALS	HYBRID SYSTEM	DOCKED SYSTEM	DOCKLESS SYSTEM
Connect People and Places	Improve mobility for all community members, regardless of age, ability, or income			
	Integrate with other modes, such as transit			
	Improve connections to places to work, play, live, and learn			
	Enable a year-round system			
Strengthen Public Health and Safety	Support active lifestyles for people of all ages and abilities			
	Support HRM goals for transportation safety (e.g., 'Healthy' pillar of IMP)			
Advance Environmental Sustainability	Reduce the environmental footprint of travel by reducing motor vehicle trips			
	Enable a system that is resilient and adaptable to future change			
Make It Accessible	Make it affordable for people to get around the city			
	Manage parking of micromobility vehicles to maintain safe and accessible streets and sidewalks			
Ensure a High-quality Public Experience	Create a convenient, comfortable, and easy-to-use system for residents and visitors alike			
	Make a system that is flexible and responsive to special events and visitors			
	Ensure cost effective and responsible public spending			
Overall				

Note: This table assumes typical ownership by type of system. Alta used this approach based on existing conditions from systems in other communities. Table 2 identifies tradeoffs by type of ownership.

RECOMMENDED SYSTEM OWNERSHIP AND OPERATIONS STRUCTURE

BACKGROUND

Steering committee members considered which entity should be responsible for ownership and operation of a future system in HRM. The system owner has greater decision-making authority on how and where the system operates. System operators are responsible for the day-to-day management responsibilities of the system. A decision comparison matrix evaluated each of this study's goals in relation to varying ownership models (Table 2, pg. 32).

The ownership options include:

- Municipal business unit (new or existing)
- Private company
- Non-profit organization

The operator options include:

- Leased by HRM and operated by a municipal business unit
- Leased by HRM and privately operated
- Privately operated
- One of multiple permitted companies operating in HRM
- Operated by a non-profit

Accomplishes goal	
Somewhat accomplishes goal	
Does not accomplish goal	
Not applicable to system type	

Table 2. System Ownership Evaluation

PRINCIPLE	GOALS	PUBLICLY OWNED	LEASED SYSTEM (PRIVATE OWNER)	NON-PROFIT OWNED	EXCLUSIVE PROVIDER (PRIVATE OWNER)	PERMITTED (PRIVATE OWNER)
Connect People and Places	Improve mobility for all community members, regardless of age, ability, or income					
	Integrate with other modes, such as transit					
	Improve connections to places to work, play, live, and learn					
	Enable a year-round system					
Strengthen Public Health and Safety	Support active lifestyles for people of all ages and abilities					
	Support HRM goals for transportation safety (e.g., 'Healthy' pillar of IMP)					
Advance Environmental Sustainability	Reduce the environmental footprint of travel by reducing motor vehicle trips					
	Enable a system that is resilient and adaptable to future change					
Make It Accessible	Make it affordable for people to get around the city					
	Manage parking of micromobility vehicles to maintain safe and accessible streets and sidewalks					
Ensure a High-quality Public Experience	Create a convenient, comfortable, and easy-to-use system for residents and visitors alike					
	Make a system that is flexible and responsive to special events and visitors					
	Ensure cost effective and responsible public spending					
Overall						

RECOMMENDATION

Bike Share Ownership Recommendation

Alta recommends a municipal business unit or a non-profit organization own a future bike share system. These could be new entities or existing ones. These ownership styles meet the greatest number of project goals.

Many goals are related to municipal control of system characteristics, such as service area, station location, and system operation. Instead of publicly owning the system, HRM may decide instead to lease the system. This model also met related shared micromobility goals. Opportunities to lease bike share vehicles and stations are subject to availability and interest from bike share vendors that offer leasing options.

Bike Share Operations Recommendation

Alta recommends operation by a private company or a non-profit organization for a future bike share system in HRM. This study included interviews with private companies within the bike share industry. These companies could be potential candidates for continued conversation regarding bike share operations. Chapter 4 discusses system implementation recommendations.

Scooter Share Recommendation

As of this writing, the province has not yet released the new regulations under the TSA that will enable and regulate e-scooters. Existing e-scooter systems throughout the world are privately owned and operated. Alta recommends private ownership and operations if the Province regulates e-scooters.

MARKET ANALYSIS

This Market Analysis uses demographic information and destinations to understand areas of HRM within the Urban Transit Service Boundary (UTSB) and outside of the UTSB. Areas included within the analysis that are located outside of the UTSB were selected based on historical and contemporary marginalization. The Market Analysis studies the location and concentration of destinations in HRM and the systemic inequities that have influenced where destinations are concentrated. This section describes each of the two components of the market analysis. This analysis will help define the optimal shared micromobility service area for HRM. Areas that score highly within the Market Analysis are good candidates for enhanced micromobility services. However, additional public consultation is needed outside of this project to discuss residents' mobility needs, visions, and ideas. This engagement will allow HRM to establish a shared mobility system service area that meet residents' needs.

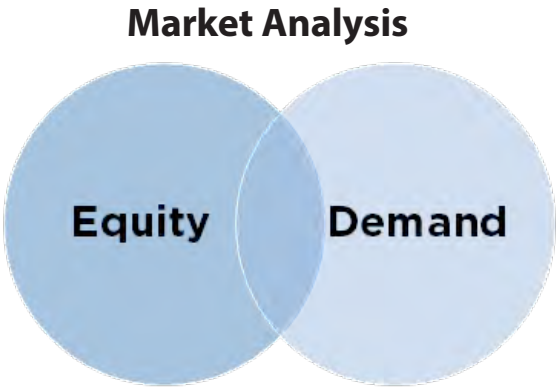
DEMAND ANALYSIS METHODOLOGY

The Demand Analysis is quantitative and incorporates data available from the Statistics Canada Census. The data is then analysed within a process developed by the project team to determine relative demand for shared micromobility.

The data inputs are based on:

- Residential density (where people live)[4]
- Employment density (where people work)[5]
- Transit (where people catch the bus and ferry)[6]
- Education (where people learn)[7]
- Play (where people gather and recreate)[8]
- Shop (where people shop)[9]

Areas with high potential demand were identified through a heat mapping exercise that allocated points based on where people live, work, take transit and recreate within HRM. A "heat map" was developed to determine locations of higher potential demand for shared micromobility. Colours on the accompanying map are set at threshold levels to indicate relative demand. The Demand Analysis will be used to identify the potential service areas of a shared micromobility system in future steps. These locations are estimated to generate the most users and trip origins and destinations.



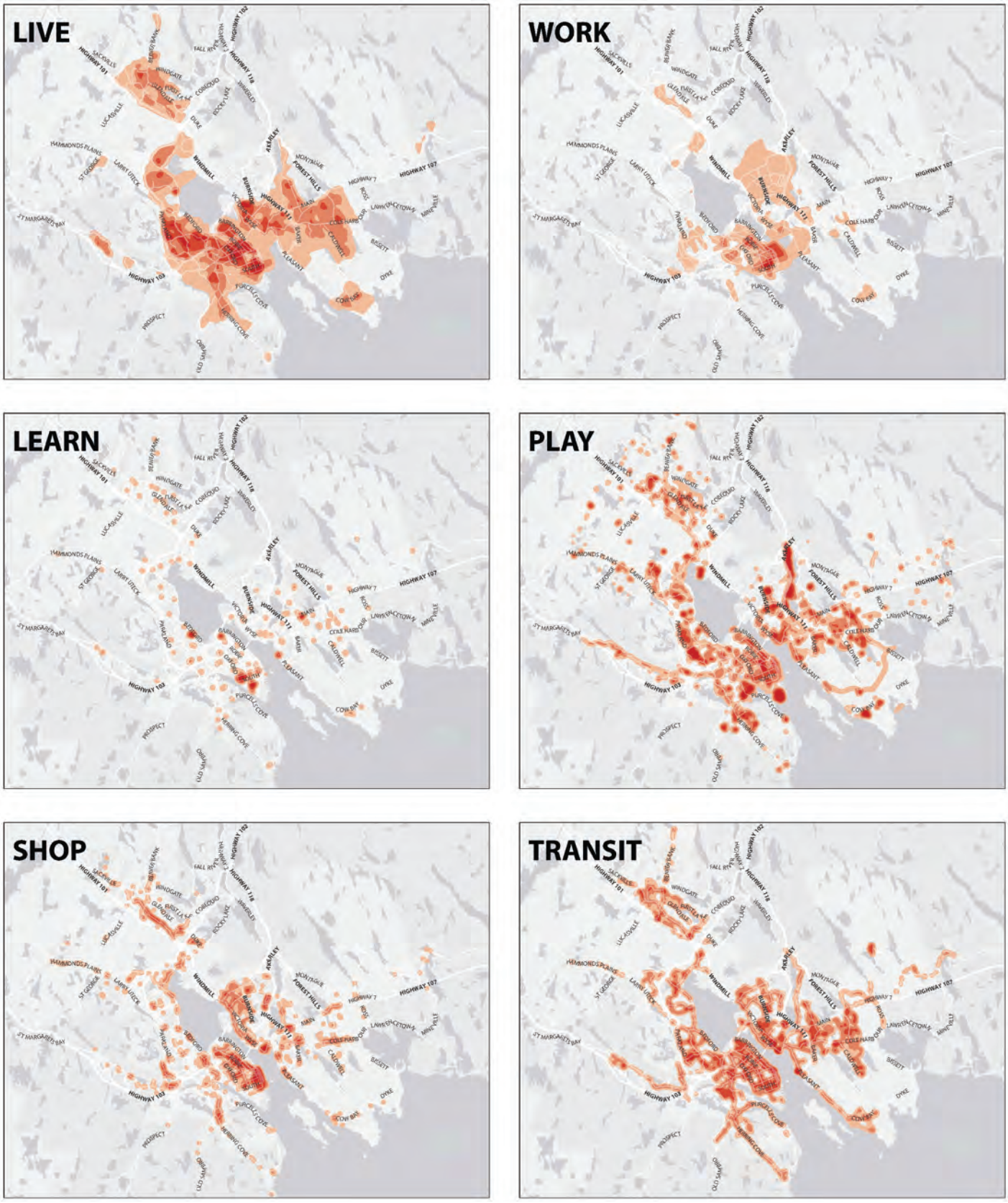


Figure 13. Demand heat maps by category

Key Barriers

The Market Analysis identifies potential high demand areas for shared micromobility service in HRM based on trip generators. However, actual system usage is dependent upon many factors, including barriers to using shared micromobility. The continued development of All Ages and Abilities (AAA) active transportation facilities (e.g. multi-use pathways, protected bike lanes, and local street bikeways) is crucial to encouraging residents and visitors to try bike share and e-scooters. The analysis presents ideal relative variations in potential demand levels to show "hotspots". The composite map on page 38 identifies AAA active transportation facilities to show overlap between provision of low stress infrastructure, marginalized areas, and concentrations of destinations. HRM continues efforts to create a network of AAA active transportation facilities to connect key origins and destinations. Shared micromobility station, hub, and/or vehicle placement should consider how to best utilize existing and planned AAA active transportation facilities.

EQUITY ANALYSIS

This section documents the identification of equity priority areas, as identified in the demand map on page 38. This study's steering committee identified equitable access to shared micromobility as a key goal. Communities facing high levels of deprivation should be included in plans to provide a high density of shared micromobility vehicles and parking facilities, such as hubs. Additionally, regularly redistributing shared micromobility vehicles within equity areas is important to allow for a continued supply of bikes and e-scooters.

Efforts to consider equity with the development of a new program or service are part of HRM's Strategic Plan 2021-25[10], which includes equity and inclusion as a Council Priority Outcome. The Diversity and Inclusion Framework[11] provides further guidance for HRM's goals and directions. Equity and inclusion are also identified in IMP Action #71 and HRM's new Social Policy.

Evaluation Criteria

There are several ways to identify different communities that face present and historic marginalization. Findings from within these criteria form the basis of identification of priority areas for equity concern.

Canadian Index of Multiple Deprivation[12]

The Canadian Index of Multiple Deprivation uses data to evaluate areas based on four dimensions of deprivation and marginalization. The four dimensions are residential instability, economic dependency, ethno-cultural composition, and situational vulnerability. The Index calculates a summary index score based on 17 variables within the four dimensions at the dissemination area census level. The 17 variables include data on household composition, education, household mobility, employment, race,

recent immigration, population receiving government transfer payments, and income. When calculated together, the result is an indexed score that represents the level of deprivation and marginalization within the dissemination area. The Index is intended to be used for policy and planning, research and analysis, and resource allocation.

African-Nova Scotian Population

Areas with high populations of African-Nova Scotians were identified to ensure that shared micromobility service areas include these communities. While African-Nova Scotian communities have existed in what is now Nova Scotia for over 400 years, these communities have been the target of longstanding prejudices that have resulted in significant social and economic impacts.[13] Both HRM and the Province of Nova Scotia are recognizing the history of prejudice, seeking justice, and investing in development of these communities.[14] Figure 3 illustrates where African-Nova Scotians live based on the 2018 Census of Canada data for Black people. The displacement of African-Nova Scotian residents and systemic limited investment to these communities should be considered as part of the decision-making process to move forward with potential shared micromobility programs.

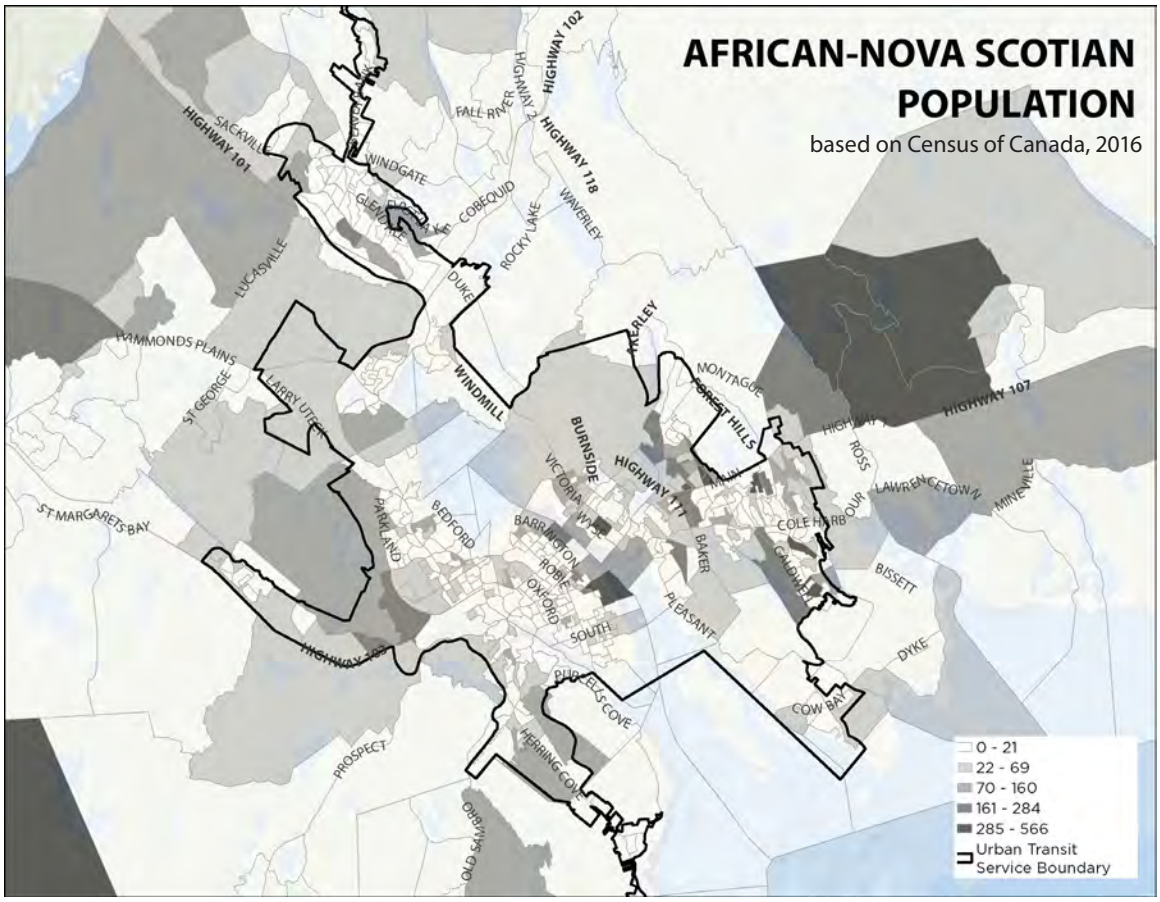


Figure 14. Areas where residents identify as African-Nova Scotian

SHARED MICROMOBILITY READINESS STUDY

HALIFAX REGIONAL MUNICIPALITY

CYCLING NETWORK

- All Ages and Abilities
- Other Facilities

LEVEL OF DEMAND

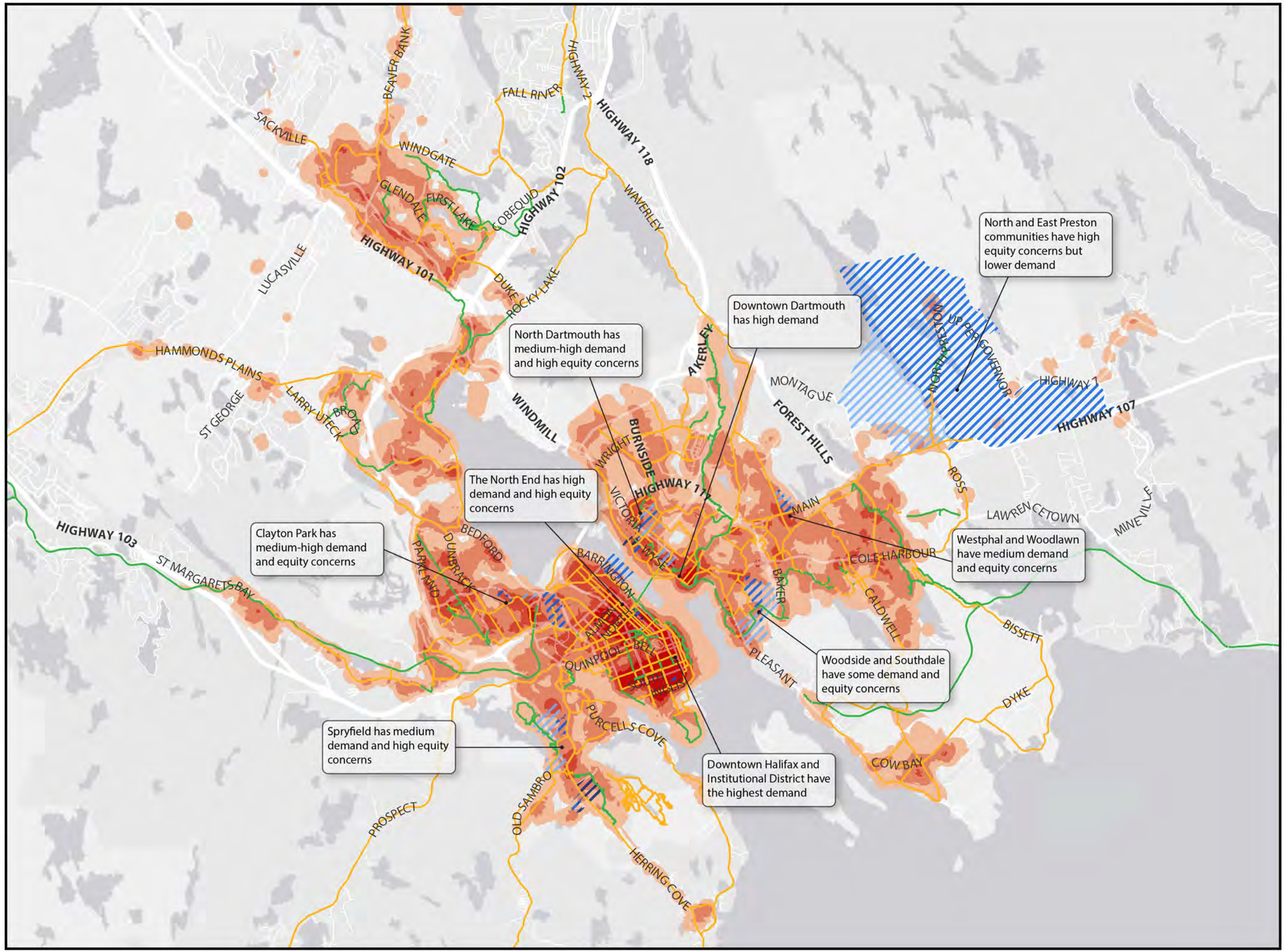
- Higher
- Lower

The level of demand is calculated based on where people live, work, study, recreate, and shop.

LEVEL OF DEPRIVATION

- Highest
- High

The level of deprivation shows the areas with the three highest levels from The Canadian Index of Multiple Deprivation. Deprivation is calculated based on 17 variables that consider residential instability, economic dependency, ethno-cultural composition, and situational vulnerability using data from the Canadian Census at the dissemination area level.



0 1.5 3 KILOMETRES

Data provided by Halifax Regional Municipality, Nova Scotia, and Statistics Canada.
Map produced September 2020.

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Equity Factors for Shared Micromobility System Planning

Several additional factors enable equitable access to shared micromobility. The following list is not exhaustive; future community outreach may result in additional local recommendations for advancing equity. HRM should include these factors within future shared micromobility services.

Access to Technology

Shared micromobility systems typically rely on smartphone access and a linked bank account, making access challenging or limited for people without smart phones or a bank account. As of 2018, 82.4% of people aged 15 years and over have a personal smartphone in the Atlantic provinces.[15] Shared micromobility systems should include access options that do not rely on a smartphone or programs that provide pre-paid cards or fares to check out a vehicle. Other programs use RFID cards and text messaging as other alternatives to smartphones.

Access for Persons with Disabilities

Adaptive shared micromobility programs have emerged recently to address the needs of those unable to use a conventional bike or scooter. For example, the Everyone Rides Initiative in Hamilton, ON has added three-wheeled and cargo bikes to the SoBi fleet. Through the initiative, further information and group rides are also offered.[16] The Adaptive MoGo program in Detroit also includes handcycle and recumbents in their fleet. These vehicles are reserved for two-hour periods.[17] The 2017 Canadian Survey on Disability found that 30.4% of Nova Scotians 15 years and over identify as having a disability.[18]

Language Considerations

The language knowledge necessary to register and use a shared micromobility system can be a barrier to use. As a result, marketing and service materials should be in multiple languages. In HRM, 2,205 people do not have knowledge of either English or French. An additional 340 people only have knowledge of French.[19] HRM may consider on-going monitoring to ensure that people are able to access shared micromobility service, or if providing material in additional languages would be supportive to certain groups of people using the service. The Diversity and Inclusion Framework includes French Language Services as part of its work to enhance diversity and inclusion in HRM.

Safety Factors for Site Selection

Site selection for shared micromobility placement (particularly in the case of docked systems) should consider the overall comfort and security of the surrounding environment. Locating docked stations in well-lit, highly visible areas can increase rider security and comfort. HRM should consider working with the Women's Safety Audit Team when selecting locations. Stations should also be located adjacent to the All Ages and Abilities active transportation facilities. Analysis of these factors as part of a study of New York City's Citi Bike program indicated that women are more likely to choose and utilize shared micromobility stations and cycling facilities located on lower-traffic streets or those with connectivity to low-stress All Ages and Abilities active transportation facilities.[20]

RURAL AREAS

A significant area of HRM is a rural context where destinations are further apart and there are only a few roads. HRM has made decisions to operate some services such as public transit in the rural areas differently than in the urban area due to the scale, feasibility, and ability to provide adequate services. Similar to the operation of public transit service, the quality of shared micromobility service falls as the service area expands, and resources must be distributed over a larger area with relatively low potential demand. With a larger service area, rebalancing and recharging shared micromobility vehicles would be costly. Communities outside of the UTSB should be evaluated on an individual basis as to whether service could be feasible. Some characteristics to consider when evaluating these communities include:

- Presence of AAA active transportation facilities
- Medium to high density of origins and destinations (e.g., homes, retail locations, civic services, institutions, workplaces)
- Multiple route options and minimum roadway network (i.e., more than one main road where destinations are congregated, especially if this street is stressful for active transportation)
- Access to Halifax Transit or rural transportation route

Many communities outside the UTSB do not meet the characteristics identified above, which are associated with successful shared micromobility service.

However, there are alternative services that HRM could consider that provide improved opportunities for people to use micromobility. These alternatives could include:

- Addition of long-term and short-term bicycle parking at transit stops and other community destinations
- Support towards a community bicycle "lending library", where bicycles are available and maintained for people to sign out and borrow. The Dal Bike Centre at Dalhousie University is an example that provides this service for students, faculty, and staff
- Provide a subsidy or rebate for people living in rural areas to purchase their own personal bicycle
- Dedicate funding for implementation of All Ages and Abilities active transportation infrastructure in historically marginalized communities

HRM staff or other stakeholders should explore these and additional ideas with residents of rural communities. Micromobility improvements prioritized by residents should be implemented at the same time as the launch of a shared micromobility system.

POTENTIAL USER PROFILES

Shared micromobility systems are most successful where there is a mix of land uses, medium to high density of homes and jobs, and where trip-making occurs throughout the day and night and on weekends. In HRM, the profile of a potential user of a bike or scooter share program might include people who meet the following trip characteristics:

- Local residents who live, work and recreate in the shared micromobility service area seeking another mobility option to get to work or go out to a restaurant. This can be especially critical for those who do not have access to a personal automobile or live near a bus line, and programs should identify ways to provide equitable access to the bikes and scooters in order to reach residents. There are approximately 301,060 people that live within the UTSB.
- Transit commuters traveling into downtown or elsewhere wanting to run errands or meet a friend for lunch. There are approximately 347,000 people that work within the UTSB.
- Visitors accessing sports, entertainment, hotels, and cultural attractions. Discover Halifax states that 5.3 million people stay overnight in Halifax every year[21].
- University and college students wanting to get between campuses or to off-campus destinations. There were 32,239 full-time students in 2019 at a campus in HRM. In addition to students, many staff work at these campuses and could use shared micromobility to travel to work on the campus[22].

Typical uses for shared micromobility systems include the ability to:

- Offer a "first or last mile" option between transit and work, school, or other similar destinations
- Extend the reach of transit into areas that are currently underserved by transit, particularly with electric-powered vehicles that extend trip distances
- Provide a transportation option for people visiting the city, to access popular neighbourhoods and attractions

DEVELOPING A SERVICE AREA

This study does not include development of a recommended service area. This decision was based on discussions between HRM staff and the project team. These discussions revealed a need for additional public consultation following this study's adoption. The next phase of public consultation would allow HRM to work with local communities to identify whether shared micromobility may benefit their community and how these services should be structured to be most effective.

After consulting with members of the public, HRM staff should develop a service area for shared micromobility. These boundaries should include areas with high potential demand as well as areas with high equity needs as identified in the Market Analysis.

Developing a service area for shared micromobility is similar to transit. As the service area expands, the reliability and frequency of the service decreases unless the level of resources increases (i.e., number of vehicles and staff) to manage the system. It is important to balance these two considerations, ensuring that the system provides service to areas where there is a high need for the service.

The service area should be large enough to include many different destinations and types of trips.

Station density is a key factor in addition to the service area's size. Current systems in other communities have found a correlation between the number of shared micromobility trips and the system's station density. In systems with higher station density, accessing the system becomes more convenient. Therefore, the system is more likely to provide a high quality service. NACTO has identified 300-400 metres, or about a five- minute walk, as the maximum distance someone is willing to walk to a station.[23] In many high potential demand areas, the station density should be increased to provide more station options closer to destinations and to provide a greater supply of vehicles.

If pursuing a hybrid system, as recommended in this study, stations could be slightly further apart because stations are augmented by existing bike racks located in the service area. Ensuring that there are bikes available throughout the service area (rebalancing) should be a key consideration for the system operator. HRM should increase the supply of bike parking to anticipate greater use by people using shared bikes and personal bikes.

The ITDP Bike Share Planning Guide includes metrics for how many bikes should be available in a service area based on population and service area size. ITDP includes targets based on the success of other bike share systems around the world.

Table 2. ITDP Targets

METRIC	ITDP TARGET
Bikes per 1,000 residents (in Service Area) Ensures that there are enough bicycles for the population so that bicycles are readily available	10-30 bikes per 1,000 residents
Bike density (bikes per square kilometre of Service Area) Supports thinking about bicycle coverage across the service area	Target is variable; examples include: Seattle has 37 bikes per km^2 Montreal has 28 bikes per km^2

Service areas for shared micromobility systems are not static. The service area can be expanded over time, as the system becomes established. Service areas are most commonly expanded to include new areas adjacent to the existing service area. Service area phasing and expansion should provide a quality service, with adequate station density in these expanded service areas that meet the NACTO and ITDP guidance.

Similar to initial service area development, the area expansions should balance both demand and equity needs. Phasing should also consider the existing and planned active transportation network, and coordinate expansion as new all ages and abilities facilities are implemented. Expanding to areas without all ages and abilities facilities will likely hinder the uptake, as there will not be a comfortable place for people to ride shared micromobility vehicles.

The map graphic below illustrates the planned system phasing implementation of Toronto Bike Share. The system expansion was planned for roll-out over five phases from the initial service area, which was centred around Downtown Toronto. The roll-out of these phases has changed over time as other priorities emerged, including the implementation of a satellite service area in Scarborough. The five phases have been rolled out over a six year period.

A satellite service area is an independent service area of the system that is not connected to the primary service area. In the case of Toronto, the intent was for trips to be made within the satellite service area, but some systems have satellite areas that are close enough to allow for trips between service areas.

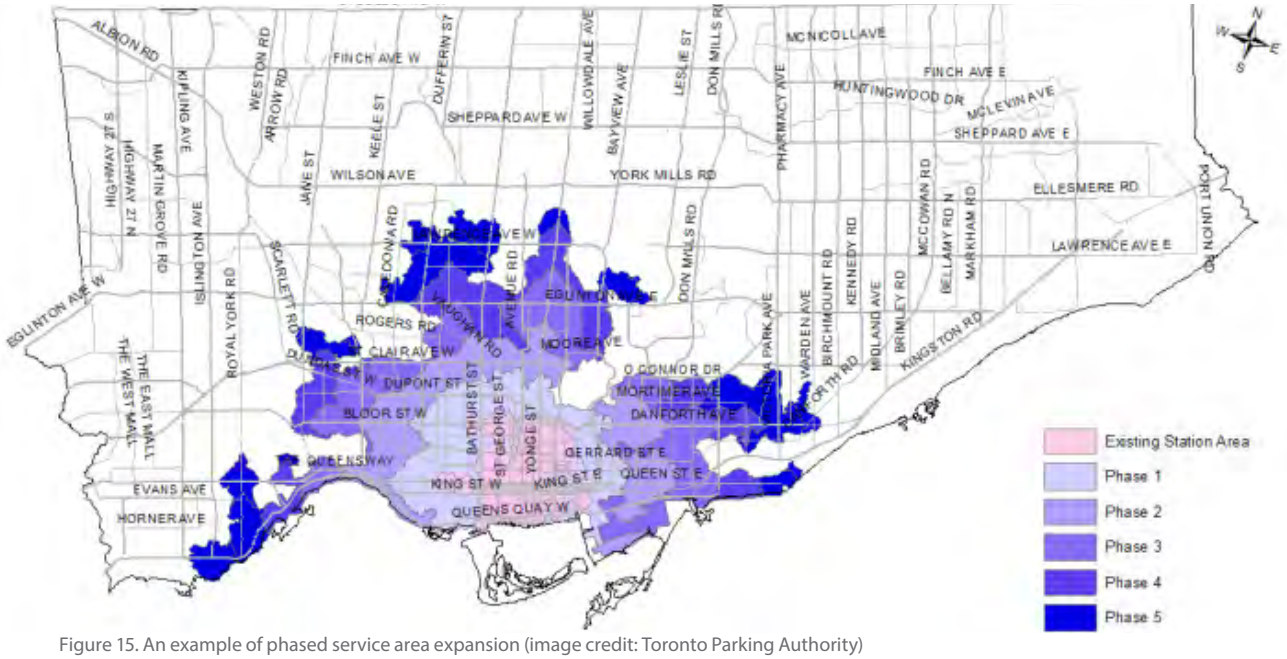

Figure 15. An example of phased service area expansion (image credit: Toronto Parking Authority)

SYSTEM COST ESTIMATE DEVELOPMENT

System cost estimates were created by conducting interviews with vendors to estimate potential bike share system costs. This methodology was selected to provide the most updated and relevant information to HRM staff. The project team interviewed a number of vendors to collect as many cost estimates as feasible during this phase of the project. These conversations are one step toward continued conversations with vendors. The interviews were conducted to gather information; they are not meant to favor certain vendors, select vendors, or purposefully exclude companies. It is assumed that HRM staff will continue these conversations and hear from additional vendors over time. **All the vendors interviewed believed that a bike share system was feasible and practical for HRM.** When asked what they look for in a new market, vendors discussed the population size, universities, and tourism as factors contributing to a system's feasibility.

The number of bikes included in the cost estimates is based on an evaluation of the number of bikes needed to meet recommended Institute of Transportation Development and Policy (ITDP) metrics for planning a bike share system. ITDP recommends 10 to 30 bikes per 1,000 residents. **A system with 1,500 bikes in HRM represents a system that would be able to provide service to and between many communities and destinations that would make the system usable for many different types of trips. Based on the Market Analysis, a 1,500 bike system would provide coverage in areas with equity concerns as well as selected high potential demand areas.**

All the vendors interviewed believed that a bike share system was feasible and practical for HRM. Table 4 summarizes cost estimates developed from vendor input

Equity Programming Investment

Equity programming is essential to reinforce the proposed bike share system's equity goals. As previously stated, the proposed number of bikes reflects the goal of providing high levels of service within priority equity areas as well as other high potential demand areas within HRM. Station siting is one of the major drivers of bike share service equity. Additional funds should be reserved to create an equitable bike share program. Funds could cover subsidized memberships or bike share access, staff hiring, community partner organization support, marketing campaigns, and other programs.

A survey of bike share cities and operators found that grant and foundation funds most often cover bike share equity programs. However, funds are generally less than $100,000 and are limited in duration.[24] HRM staff should aim to exceed this funding amount. $250,000 is recommended as an initial investment in equity programming. The rationale for this amount is based on emphasizing equity as identified through the principles and goals for the system (e.g., mobility for all ages and abilities, affordability).

Municipal or Non-Profit Staff Time

As described on page 31, the project steering committee emphasized a preference for system ownership by the municipality (e.g., separate municipal commission, similar to the Bridge Commission and Halifax Water) or by a non-profit organization. This ownership structure would emphasize control over equity and service level outcomes. Even if bike share operations are managed by a private vendor, dedicated municipal or non-profit staff resources will be needed to achieve bike share system goals.

At least two full-time equivalent (FTE) staff people are recommended to focus on the program's success. A budget of approximately $250,000 per year is recommended for staff time. However, this amount will vary based on municipal salary ranges. This amount does not include time that current municipal staff spend on shared micromobility initiatives. However, this collaboration should continue. Potential roles for new staff include:

- A General Manager would provide system oversight, direct strategic planning, collaborate with HRM and other staff, and update the public regarding the system's evolution. This person should have a strong background in bike share operations, equity programming, and public administration.
- A second employee would support the General Manager in a financial management or strategic planning role. This employee could have slightly less experience than the General Manager, but should be well versed in bike share operations, with a focus on equitable outcomes.
- Additional part-time equivalent (PTE) or FTE roles may be filled on a seasonal basis to advance equity or other programming.

Additional staff resources for removing or relocating improperly parked vehicles is not anticipated, as that should be the responsibility of the system operator. Reports filed to 311 about vehicles should be forwarded automatically to the system operator to address.

Additional Bike Parking

Based on the experience of other hybrid bike share systems, it is recommended that HRM invest in additional bike parking corrals and bike racks. The additional bike parking will help manage bicycles parked outside of the formal bike share system stations, and provide additional bike parking locations for personal bicycles throughout the service area. Bike parking generally costs around $150 per rack. To provide a surplus of bike parking locations, it is recommended to add 1,000 additional bike parking racks. This would cost $150,000 plus installation costs.

SYSTEM COSTS

The following table summarizes cost estimates from the vendors interviewed by the project team. These figures are based on the vendors' estimates and are subject to change. The costs include both initial startup costs and on-going annual system costs. Additional conversations are needed to identify other costs outside of these items. Costs summarized on the facing page include $500,000 for equity programming and staff time, as described in the preceding sections. HRM would be responsible for these costs.

Table 3. System Cost Estimates by Sample Vendor

VENDOR	TOTAL COST ESTIMATE	NOTES*
Vendor A1 (HRM or non-profit operator)	$9.2-$11.2 million • Initial Cost: $7.8-$9.8 million On-going Costs: • IT licence and updates $315 bike/year • Spare parts $190 bike/year	The cost does not include day-to-day operational costs such as vehicle management and maintenance costs.
Vendor A2 (Vendor operates)	$10-$12 million • Initial Cost: $7.8-$9.8 million On-going Costs: $1500-$1900 bike/year	System operation cost includes cleaning, rebalancing, repair of equipment, IT system updates, staff to manage and maintain system, manage stations, collect fees, customer service, 24/7 IT hotline, marketing and sponsorship, monthly reports to technical representative on system performance, operations and maintenance presentations to stakeholders.
Vendor B	$4.35 million • Initial Cost: Did not specifically answer. $3.75 million estimated from $2,500/e-bike On-going Costs: Did not provide	The vendor did not provide an estimate for operations and maintenance, so this cost is not included in the estimate.
Vendor C1 (Bike share only)	$1.3-$1.5 million • Initial Cost: $0 On-going Costs: $800,000-$1,000,000/year	HRM would not own this system and the operations and maintenance of the system would be fully controlled by the vendor.
Vendor C2 (Bike and scooter share)	$650,000 • Initial Cost: $0 • Will operate 3 scooters for 1 bicycle (i.e., 1,200 scooters and 400 bikes)	HRM would not own this system and the operations and maintenance of the system would be fully controlled and cost covered by the vendor. Therefore, initial equipment purchase price is not included, since HRM would not own the bikes and scooters.
Vendor D	$6.98 million • Initial Cost: $6.29 million On-going Costs: • IT, licences, support $189,000/year	Operations and maintenance by an outside operator are not included in these costs.

** All total costs include the initial system cost, one year of any on-going costs that were provided, as well as $250,000 for equity programming, $250,000 for municipal staff time, and $150,000 for additional bicycle parking infrastructure*

SYSTEM REVENUE

Revenue analysis helps to identify how much revenue from ridership and other sources could be available to help offset system operational costs. Bike share operates similar to a transit system; system ridership will only cover a portion of system expenses.

Table 4. System Revenue by Potential Source

REVENUE SOURCE	ESTIMATED REVENUE	NOTES
Ridership: Fares, User Fees, and/or Memberships	35% of system operating costs	Most systems do not meet their operating costs through membership and user fees alone, although there are exceptions where they come close due to a variety of factors such as high bike utilization (trips per bike per day), which is influenced by system size, land use, demographics, climate, pricing structure, and other factors that impact use of bike share. The "farebox recovery" rate of contemporary mid-sized city bike share systems is around 35% of the system operating cost. This figure represents the expected revenue earned by system ridership. Bike share fares should align with transit fares, compare with other systems' fares, and offer rides of approximately 30 minutes. Reduced pricing should be available to low-income riders, seniors, people with disabilities, students, and veterans. This pricing should also align with transit pricing.
Advertising	$500/bike	Vendors interviewed during this study highlighted advertising as an important revenue source. One vendor estimated potential advertising revenue of $500/bike, based on experience in other communities. However, staff identified past experiences where advertising potential may have negatively influenced placement of other types of street furniture. Considering advertising revenue should be separate from, completed after, and not influence station siting.
Sponsorships	Title sponsors could contribute millions of dollars; other sponsors provide less funding	Sponsorships typically involve a longer-term relationship between a sponsor and the system, where the sponsor's logo or other messaging is added to bikes, stations, website, and in some cases the name of the system (e.g., Citi Bank for CitiBike in New York)
Grant Programs	Varies; Bike Share Toronto received $4 million in 2018 from the Public Transit Infrastructure Fund; the Everyone Rides Initiative in Hamilton received $274,500 from the Federation of Canadian Municipalities in 2017	Some federal, provincial, and third-party grant programs may be applicable and potential sources of funding for either the initial system investment, ongoing costs, system expansion, or other initiatives such as discounted memberships. Grant programs often have requirements around reporting such as anticipated greenhouse gas emissions reductions from the investment.


BUNK SANDWICHES

CHAPTER 4. IMPLEMENTATION AND NEXT STEPS

IMPLEMENTATION CONSIDERATIONS

This chapter highlights key considerations for HRM's next steps to continue planning and implementing a shared micromobility system.

FUNDING THE SYSTEM

The study's recommendation is to pursue a system ownership model where HRM can expect financial sustainability and a reliable mobility option for residents and visitors. This aligns with the vision and goals for a shared micromobility system developed through this study.

To achieve this recommendation, HRM must pursue a system that includes ongoing municipal funding and potentially an initial investment for the vehicles and system infrastructure as identified in Chapter 3. The following table illustrates the annual financial need based on high-level estimates for a 1,500 bike system.

Table 4. Estimated System Operating Cost and Revenue

COSTS	
Operating Costs ($2,000/bike/year) + equity programming and staff	$3,500,000
REVENUE PROJECTIONS	
Farebox Recovery Rate	35%
Estimated User-Fees	$1,225,000
Sponsorship Opportunities	$250,000 +
Advertising ($500/bike/year)	$750,000
Revenue Sub-total	$2,225,000
FINANCIAL GAP	
Annual Need	**$1,275,000**

RECOMMENDED SHARED MICROMOBILITY MODES

Bike share is currently the recommended shared micromobility mode for HRM to pursue. HRM should pursue a long-term (approximately five-year) agreement for the implementation of a system with a vendor, as it ensures a commitment from both parties for the long-term success of the system.

E-scooters may be implemented if there is clarity from the province in the Traffic Safety Act regulations permitting use of e-scooters on public roads in Nova Scotia. It is recommended that HRM establish a permit program to allow operator(s) to implement an e-scooter system.

Other shared micromobility vehicle types were not considered as part of this study. It is recommended that HRM staff develop a transparent process to evaluate proposals from other operators looking to bring other types of shared micromobility vehicles to the municipality moving forward. New vehicles types would first have to be enabled under the TSA regulations before HRM could consider permitting them. This could be added into the permit program to enable e-scooter system operations.

** Costs and revenue estimates have been used where vendors did not provide information. The estimates are based on industry standards where available.*

BIKE SHARE OWNERSHIP CONSIDERATIONS

Shared micromobility systems in North America are owned by a public agency, private company, or non-profit. Consultation with other municipalities included conversations regarding pros and cons of different ownership structures.

Alta recommends that the municipality or a non-profit organization own the future bike share system. System ownership impacts the level of control the municipality will have over the system's operations, including system sustainability. The steering committee identified a desire to have some control over the system, related to interest in the system providing a public service. It is important to note that ownership considerations noted here mainly apply to bike share systems. E-scooter systems are mainly privately owned across North America and around the world.

Privately owned systems are run with a focus on the system as a business rather than providing a service. Examples of areas that would benefit from public or non-profit control include system pricing, equity programming, station locations, and a long-term system. Control over these elements is unlikely in a privately owned system. Although examples of successful private ownership do exist, it is also common for privately owned systems to make significant promises, and then not be able to deliver that level of service or become unable to operate the system.

Municipal Ownership

Municipal ownership would likely entail ownership by an existing business unit, not the establishment of a new agency. System operations could be led by a private, public or non-profit operator.

Non-Profit Ownership

In this structure, an existing non-profit organization would own the system, such as an organization with similar goals as those outlined in this study. Otherwise, interested stakeholders could form a new bike share-specific organization that would own the system. Both approaches have been used in communities with bike share.

A non-profit owner would still require public funding and resources from HRM to succeed. The non-profit organization must also be able to raise private funds and maintain sponsor relationships.

OPERATIONS CONSIDERATIONS

Alta recommends bike share system operation by a private company or a non-profit organization. As part of developing any agreement with a shared micromobility operator, whether private or non-profit, staff should review the NACTO Guidelines for Regulating Shared Micromobility document to ensure that the agreement addresses the considerations. Some key considerations include:

- Limit number of companies operating
- Require operator to remain in good standing (fees, fines, reporting and other requirements)
- Require operator to remove inoperable or unsafe vehicles
- Require operator to have at least one local staff person
- Develop management plans to address fleet removals before severe weather events, and fleet relocations for special events
- Develop reporting to inform City on regular maintenance, rebalancing, and other operations duties and immediately report any incidents

- Ability to remotely lock vehicles
- Provide 24/7 customer service and report on customer service inquiries
- Include discount payment plans and a variety of payment options
- Develop and undertake outreach and promotion strategies and marketing
- Implement data privacy and security measures
- Require real-time vehicle location data to be publicly available and available in a standard format

PUBLIC ENGAGEMENT AND SERVICE AREA CONFIRMATION

As identified during the Market Analysis process, shared micromobility services should be prioritized in areas with high equity needs. At the same time, this study did not include engagement and consultation with these communities to explore the interest for shared micromobility. Engaging with these communities is a next step to build upon this study.

The considerations for how a study area is developed are summarized in the Developing a Service Area section. The complete service area can be implemented in phases to spread the financial cost of a system over a multi-year period and allow for the system to scale up. At the same time, an initial service area should include a variety of destinations and provide services to a variety of communities so that the system is not perceived as intended for only one community, but as a system for many of the municipality's communities.

Public engagement processes should use local and national best practices for structuring engagement and hearing from community members. HRM staff should ask questions about community assets and barriers that impact residents' desire to use active transportation and their interest in future shared micromobility services. Community engagement involving shared micromobility can be difficult because it requires asking residents to envision a service that they have not yet tried and which does not currently exist in the community.

Communities without All Ages and Abilities (AAA) Infrastructure

Some of the areas with high equity needs identified in the Market Analysis currently lack AAA active transportation infrastructure. A lack of safe and encouraging infrastructure may preclude some areas of HRM from the future shared micromobility service area. However, engagement with these communities is crucial to this study's equity goals and to understand where active transportation improvements, programs, and services could be implemented that will enhance mobility and quality of life. Examples of potential improvements to discuss with residents include the following, which were introduced on page 41:

- Roadways or paths that currently feel unsafe or uncomfortable for walking or biking
- Opportunities to increase access to bikes, such as a subsidy or free bicycle program
- Educational events for children and adults regarding safe bicycling, bicycle / transit integration, and other topics
- Opportunities to increase access to transit, such as shuttles or microtransit

NEXT STEPS

Immediate next steps will help HRM continue to develop a strong foundation for shared micromobility in the municipality. These next steps include:

- Seek direction from Council on provision of a shared micromobility system and approach to implementation, including funding
- Public engagement and consultation on service area (see pg. 43-44)
- Determine service area based on available funding, feedback from community, and the market analysis results (see pg. 45)

Three potential paths exist to establish and expand shared micromobility in HRM. These potential options are outlined in the graphic below. Successful bike share and e-scooter share programs iterate on their successes and challenges over time. For example, monitoring, evaluating, expanding, and marketing shared micromobility services are all iterative tasks. They may also be challenged by changes in the industry or changes for demand for these services. HRM should stay flexible in responding to these trends over time to create a resilient system that serves residents and visitors.

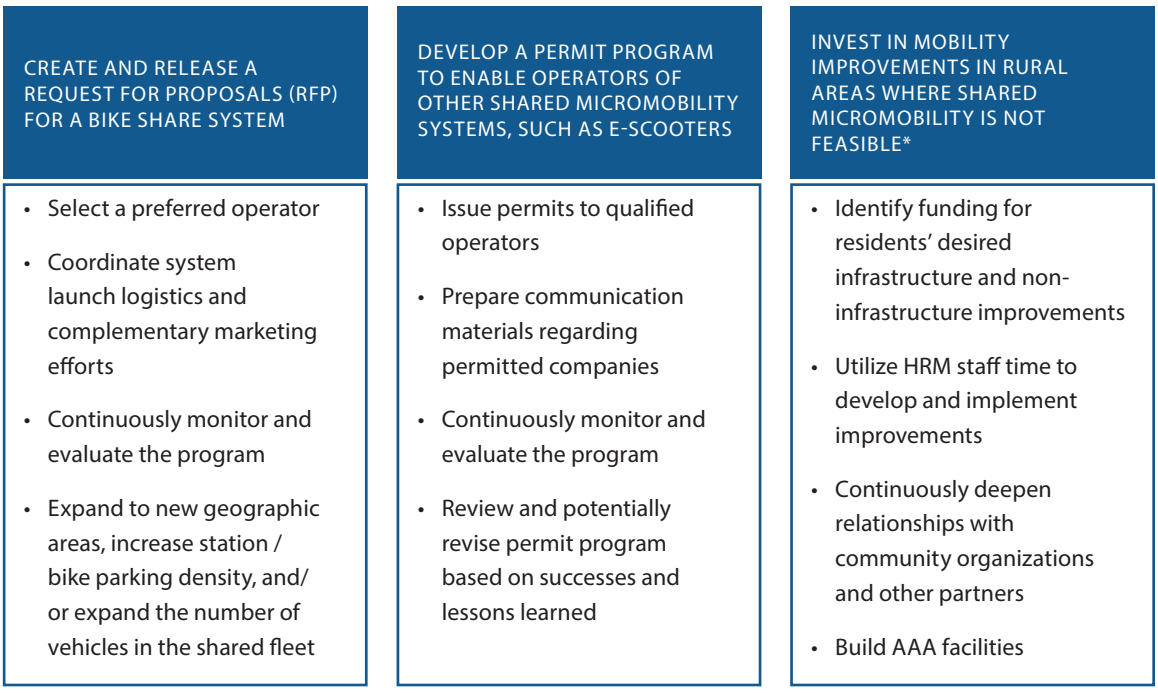

Figure 16. Three routes toward shared micromobility and expanded personal mobility options in HRM

*HRM has recognized the lack of a consistent process for implementing active transportation facilities in its rural communities and is currently developing a Rural Active Transportation Program, providing staff with a consistent and fair methodology to prioritize rural active transportation investments. This program is in development and will require Regional Council approval prior to implementation.


Art Gallery of Nova Scotia
1328
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TOW AWAY ZONE
TOW-AWAY ZONE

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7 This input included post-secondary educational institutions as well as public and private elementary and high schools.

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