Aurora Bike Share Feasibility Study

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Executive Summary

Shared micromobility devices encompass all shared-use fleets of small, fully, or partially human-powered vehicles that could be rented through a mobile app or kiosk by residents or visitors of a municipality. Some examples include manual bikes, e-bikes, and e-scooters. Communities across North America have begun to implement shared micromobility programs to promote cycling as a viable and valued travel option and contribute to broader climate, health, and economic goals. The Project Team has developed this Aurora Bike Share Feasibility Study to provide details about how a bike share program could operate within Aurora.

The primary purpose of a bike share program in the Town of Aurora is to provide its residents, workers, and visitors with a feasible mode that meets various travel demands while encouraging a healthy lifestyle. This program aligns with the overall Vision and supporting Objectives of the Town of Aurora's Active Transportation Master Plan as it would play key roles in:

- Improving accessibility to major destinations, employment, and community services in the Town for people who may not have access to or may prefer not to use a private automobile;
- Offering transit users with a solution to make the first and / or last mile of a transit trip;
- Encouraging locals and visitors to explore the Town through recreational and tourist activities; and
- Increasing the number of cyclists in the Town, with elements of equity integrated into the program structure to encourage the "Interested but Concerned" population and underserved communities to uptake cycling, which in turn supports future investments into active transportation.

This Aurora Bike Share Feasibility Study first begins with a review of best practices in the planning and implementation of a bike share program, including a review of case studies from three comparable Canadian municipalities that currently operate shared micromobility programs. This review was further guided by The Bikeshare Planning Guide (2018) by the Institute for Transportation & Development Policy (ITDP), state of the industry reports (2021 and 2022) from the North American Bikeshare & Scootershare Association (NABSA), and the National Association of City Transportation Officials (NACTO) Bike Share Station Siting Guide (2016). Key takeaways in bike share program best practices to help inform recommendations for the Town of Aurora include:

- Integration with existing and planned infrastructure;
- Strategies for operating, funding, and monitoring the program; and

- General public and key stakeholder engagement.

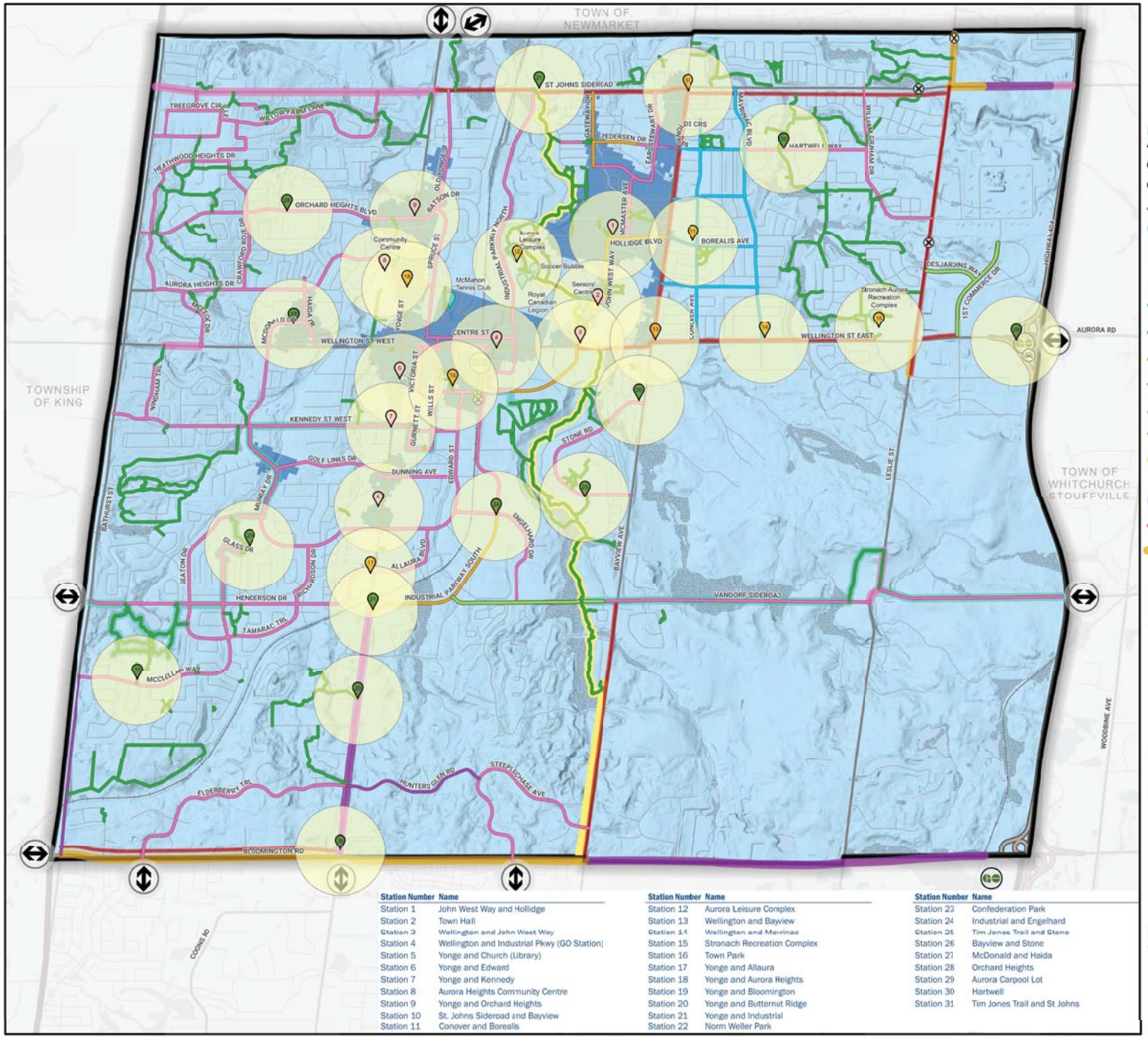
These recommendations are further supported by a detailed evaluation of potential bike share station locations. The results of the 2018 York Region Bike Share Feasibility Study were used as a starting point to identify locations with the best potential for bike share stations within the Town based on the 36 spatial indicators. The final map surface dataset from the 2018 York Region Bike Share Feasibility Study was transformed in six steps to provide relevant suitability scoring for each of the initial 20 candidate locations for bike share stations. These candidate locations were further reviewed and based on feedback from Town Staff, **the final recommendation was developed, which includes a total of 31 station locations divided into the three phases: Phase 1 (1 – 2 years); Phase 2 (3 – 5 years); and Phase 3 (5+ years)**. These are shown on the map at the end of the Executive Summary.

This study also outlines an implementation plan with a preferred business model, estimated costs, and potential funding strategies to support the Town in establishing a viable, sustainable bike share program to provide additional mobility choices to residents and visitors today and into the future. It is recommended that **the Town of Aurora pursue a partnership with one or multiple private bike share providers to provide bike share services for little to no cost to the Town**. The cost of provisioning the vehicle fleet, system operations, maintenance, and customer interface would be the responsibility of the private bike share provider(s) in exchange for the right to operate on Town property. The Town would be responsible for enforcing permits and other regulatory schemes. It is anticipated that some Town Staff time may be needed to provide oversight and regulate operator(s). **Under this model, the bike share program would be privately owned and operated with regulation from the Town, which minimizes the financial risk to the Town as all capital and operating costs (including any potential cost overruns) are borne by the private sector**.

High-level details of the recommended bike share program for the Town of Aurora are outlined below:

Item	Recommendation
Fleet Size	To be determined in collaboration with selected operator(s)
Fleet Composition	Combination of standard bikes and e-bikes
Service Area	See map at the end of the Executive Summary
Number of Stations	A total of 31 stations for three phases: – Phase 1 (1-2 years): 9 stations – Phase 2 (3-5 years): 9 stations

Item	Recommendation
	– Phase 3 (5+ years): 13 stations
Service Period	Year-round operation
Parking Management	Docking stations
Equipment Standards	Responsibility of the operator(s) to ensure fleet meets Provincial safety requirements and suits local context
Insurance Requirements	Proof of Commercial General Liability Insurance in Province of Ontario, motor vehicle liability insurance, and WSIB coverage
Financial Contributions from the Town of Aurora	Some staff time anticipated to work with and regulate operator(s)
Financial Contributions Required of Private Operators	All capital and operating costs, annual licensing fee or application fee, and providing reimbursements for the Town for any costs (plus penalty) incurred by the Town for violation of agreement or repair / maintenance of Town property.
Cost Overruns	Responsibility of the operator(s)
Operations Plan	Responsibility of the operator(s) and provide Town Staff with direct contact
User Interface and Payment Systems	Responsibility of the operator(s)
Costs	Operator(s) retain right to set pricing and user fees in consultation with Town Staff
Data Reporting Standards	Operator(s) must give Town Staff access to fleet management portal and real-time data feeds with usage reporting on a regular basis (e.g. monthly)
Repair and Maintenance	Responsibility of the operator(s) with reporting to Town Staff on a regular basis (e.g. monthly)
Rebalancing	Responsibility of the operator(s) to rebalance every 24 hours and respond to pedestrian obstructions and safety concerns within several hours; otherwise, may face penalty if Town Staff are required to remove fleet vehicles.
User Education	Responsibility of the operator(s)



Bike Share Station Candidate Locations

Town of Aurora Active Transportation Master Plan

2024-02-12

Potential Station Locations

- Phase 1: 1-2 years
- Phase 2: 3-5 years
- Phase 3: 5+ years
- 500 m Station Buffer

York Region 2018 Bike Feasibility Score (Normalized)

100
50
0

Town Cycling Network

- Multi-Use Path
- Bike Lane
- Paved Shoulder
- Signed Route
- Shared Roadway (Currently Unsigned)

Trail System

- Multi-Use Trail
- Lake-to-Lake Route

Trail Features

- Existing Grade Separated Crossing

Regional Cycling Network

- Multi-Use Path
- Bike Lane
- Paved Shoulder
- Shared Route (Unsigned)

Base Features

- Highway / Expressway
- Arterial / Collector Road
- Local Road
- Rail Line
- Watercourse
- Waterbody
- Wetland
- Municipal Boundary

Destinations

- Town Hall
- Community / Recreation Centre
- Library
- Carpool Lot & GO Bus Stop
- GO Transit Station
- Municipal Connection to Existing Cycling Facility

N

0 0.75 1.5 KM

Station Number	Name
Station 1	John West Way and Hollidge
Station 2	Town Hall
Station 3	Wellington and John West Way
Station 4	Wellington and Industrial Pkwy (GO Station)
Station 5	Yonge and Church (Library)
Station 6	Yonge and Edward
Station 7	Yonge and Kennedy
Station 8	Aurora Heights Community Centre
Station 9	Yonge and Orchard Heights
Station 10	St. Johns Sideroad and Bayview
Station 11	Conover and Borealis

Station Number	Name
Station 12	Aurora Leisure Complex
Station 13	Wellington and Bayview
Station 14	Wellington and Mavrinac
Station 15	Stronach Recreation Complex
Station 16	Town Park
Station 17	Yonge and Allaura
Station 18	Yonge and Aurora Heights
Station 19	Yonge and Bloomington
Station 20	Yonge and Butternut Ridge
Station 21	Yonge and Industrial
Station 22	Norm Weller Park

Station Number	Name
Station 23	Confederation Park
Station 24	Industrial and Engelhard
Station 25	Tim Jones Trail and Stone
Station 26	Bayview and Stone
Station 27	McDonald and Haida
Station 28	Orchard Heights
Station 29	Aurora Carpool Lot
Station 30	Hartwell
Station 31	Tim Jones Trail and St Johns

Notes:
Data obtained through Land Information Ontario (LIO) GeoHub, Town of Aurora and York Region Open Data Portal.

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1.0 Introduction

Shared micromobility devices encompass all shared-use fleets of small, fully, or partially human-powered vehicles that could be rented through a mobile app or kiosk by residents or visitors of a municipality. Some examples include manual bikes, e-bikes, and e-scooters. These devices improve accessibility to travel by offering a practical alternative to private single-occupant automobile trips, extending the reach of transit users for the first and last mile of a transit trip while also providing new mobility options for recreational trips and tourism in a community. Planning a shared micromobility program for a municipality requires careful consideration of the local context and key challenges, some of which include integration with active transportation infrastructure and public transit, space constraints, safety concerns with mixing micromobility devices with pedestrians and persons with disabilities, and political and financial support.

The Project Team has developed this Bike Share Feasibility Study to provide additional details about how a bike share program could operate within Aurora. The purpose of this paper is to provide recommendations for the Town based on a review of best practices in the planning and implementation of a bike share program, including a review of case studies from three comparable Canadian municipalities that currently operate shared micromobility programs. These recommendations are further supported by a detailed evaluation of potential bike share station locations, providing the Town with a list of optimum locations based on best practices in the siting of bike share facilities. This Study also outlines an implementation plan with a preferred business model, estimated costs, and potential funding strategies to support the Town in establishing a viable, sustainable bike share program to provide additional mobility choices to residents and visitors today and into the future.

2.0 Best Practices in Bike Share from Comparable Canadian Municipalities

Communities across North America have begun to implement shared micromobility programs to promote cycling as a viable and valued travel option and contribute to broader climate, health, and economic goals. When developing a bike share program for Aurora, it is beneficial to consider how comparable municipalities in Canada have developed similar programs and what lessons can be learned to be adapted for Aurora.

In identifying Case Study communities, the Project Team looked for Canadian municipalities that have a similar four-seasons climate with cold winters and similar scale in terms of population and land use with expanding urban communities. Based on these criteria, the Project Team reviewed documentation related to current micromobility programs from the following three Canadian municipalities:

1. Region of Waterloo, Ontario: bike share pilot (ended in 2019), e-bike and e-scooter pilot
2. City of Hamilton, Ontario: bike share
3. City of Kelowna, British Columbia: e-bike and e-scooter pilot

Sections 2.1 to 2.3 provide a summary of the key elements of each municipality's micromobility program, followed by Section 2.4 which outlines best practices and lessons learned to help inform the planning and implementation of a bike share program for Aurora. Note that this review was further guided by The Bikeshare Planning Guide (2018) by the Institute for Transportation & Development Policy (ITDP) and state of the industry reports (2021 and 2022) from the North American Bikeshare & Scootershare Association (NABSA).

2.1 Region of Waterloo, Ontario

2.1.1 Bike Share Pilot (Ended in 2019)

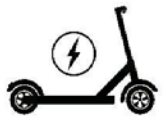
Physical System	• 400 shared bikes • Docking stations marked using painted box, partial box or flag, or other material
Operations and User Interface	• Users access bikes through mobile app • Hybrid docking model, which allows users to either lock a bike to a docking station or in a designated area away from a docking station
Operating Model	• Owned by Region of Waterloo and operated by Drop Mobility, a private organization • Pilot ran from May to November 2019 as a joint effort between the Region and its three cities
Program Impacts	• 1,573 unique users • Over 4,600 total trips made by shared bikes • 21% of shared bike trips replaced driving

X 400

2.1.2 E-Bike and E-Scooter Pilot (ongoing)

Physical System	• 500 shared e-bikes and 500 shared e-scooters • Planned to expand to 150 stations across Region of Waterloo, starting with stations in downtown areas of Cambridge, Kitchener, and Waterloo and near transit stations and university campuses
Operations and User Interface	• Users access bikes through Neuron's mobile app • Hybrid docking model, which allows users to either lock a bike to a docking station or in a designated area away from a docking station
Operating Model	• Owned by the Region of Waterloo and operated by Neuron Mobility, a private organization • Pilot running from April to October 2023 as a joint effort between the Region and its three largest communities
Program Impacts	• Not publicly available yet

X 500 (each)



2.2 City of Hamilton, Ontario

Physical System (As of May 2020)	• 900 shared bikes • 130 docking stations on the street, in the boulevard, or in open spaces • Stations located to a recommended density of every 300 m
Operations and User Interface	• Users access bikes through SoBi app or using RFID Member Card • Hybrid docking model, which allows users to either lock a bike to a docking station or in a designated area away from a docking station with an incentive for the next user to return an out-of-station bike • Everyone Rides Initiative (ERI), which provides improved access to bikes, subsidized user passes, cycling education, and outreach to remove barriers to cycling and create a welcoming culture for all cyclists; funded by Ontario Trillium Foundation
Operating Model	• Owned by City of Hamilton and operated by Hamilton Bike Share Inc., a local not-for-profit organization • Operator shares anonymous user data with City to better inform infrastructure improvements based on travel patterns • Program initiation in 2014 funded by Metrolinx Quick Wins grant • Current operations fully funded by user revenues, sponsorship, donations, grants, and City of Hamilton contributions
Program Impacts (As of May 2020)	• 26,800 active members • ERI includes ~500 of the active members and connections to 10 social service organizations who provide access to cycling to their clients • ~1.7 million trips made by shared bikes • ~13.7 million total kilometres travelled by shared bikes • 918,760 kg of carbon emissions reduced

X 900

2.3 City of Kelowna, British Columbia

Physical System	• 700 shared e-scooters and 300 shared e-bikes • Dockless
Operations and User Interface	• Users access e-scooters and e-bikes through Lime app • Dockless model, which allows users to park in "furniture zone" of road or on the side of the road in places without paid parking; cannot block pedestrian infrastructure, building or parking accesses, and transit stops or create accessibility issues for pedestrians • Laws for users, such as only one adult at a time on a device while wearing a helmet, ensuring they are not intoxicated, and only riding where cycling is allowed; safety information and requirements communicated through Lime app • Lime Access program supports lower income users with 70% discount
Operating Model	• Owned by City of Kelowna and operated by Lime, a private organization • Regulated through City's Micromobility Permit • Operator shares anonymous user data with City to monitor compliance with Micromobility Permit, help track and correct inappropriate use of devices, and better inform infrastructure improvements based on travel patterns • Initiated in April 2021 and funded by Provincial e-scooter pilot program (April 2021 - April 2024); operator pays annual permit fee to offset City management tasks
Program Impacts (As of June 2023)	• Over 600,000 trips made by shared e-bikes or e-scooters • Over 1 million kilometres travelled by shared e-bikes or e-scooters • Service area covers 70% of residents with 60% of trips occurring outside of downtown • 48% of shared e-scooter trips replaced driving

X 700

X 300

2.4 Key Takeaways in Bike Share Program Best Practices

This section outlines key takeaways in bike share program best practices to help inform the planning and implementation of a bike share program for Aurora:

Integration with Existing and Planned Infrastructure

Provide or plan to provide high-quality active transportation infrastructure throughout the municipality to increase public acceptance of cycling and the bike share program as well as improve user safety. Micromobility systems provide the highest level of value when they are supporting mode shift for users who are currently using an automobile. These users are frequently defined as the "Interested but Concerned" population who require a comfortable, convenient experience to shift towards active travel modes. The implementation plan from the Active Transportation Master Plan will support the Town in adhering to this best practice.

Plan stations near areas of highest demand based on key origin and destination points in a municipality, operational feasibility, availability of supporting amenities, and safety (such as areas with good lighting, high pedestrian traffic, and traffic calming measures). For instance, one of the limitations of the Region of Waterloo's pilot bike share program was that bike share users had difficulty finding bike parking at key locations, such as transit stations where personal bikes occupied most of the bike racks.

Integrate the bike share program with public transit. Some examples of this include locating bike share stations at or near key existing or planned transit hubs and stations, streamlining user information and payment systems (e.g. through in-app trip planning and bundled passes), and co-marketing or co-promoting shared micromobility. In the case of the pilot bike share program in the Region of Waterloo, some users identified that paying the full price for transit service and bike share would have made a trip too expensive; thus, such users could be incentivized with discounts to use bike share for the first-mile or last-mile of a transit trip, which would make it more practical for people to choose sustainable

Choose physical system elements to suit the local context and needs of the municipality. Physical elements can include:

- Type of system (e.g. hybrid bike share systems have become more common as they offer typical docking stations that may be more intuitive for the general public to navigate while also providing the flexibility to start or end a trip outside of a docking station);
- Service area (e.g. typically 500 metre radius around a docking station or the jurisdictional boundary of a municipality for a dockless system while also considering population and key destinations); and
- Type of vehicles (e.g. important to ensure that vehicles are robust, low-maintenance, secure, identifiable, and include storage; some options include manual bikes, e-bikes, e-scooters, pedal assist e-bikes, and adaptive bikes for those with accessibility needs).

These decisions should be guided by engagement with the public, discussions between municipal staff, and material availability to ensure that the program aligns with community needs and generates public use and support. While this study will provide recommendations for program details, it should not take the place of engagement with the community about the potential pilot system. An example of the importance of engaging the community to better understand their needs can be found in the first bike share system launched in the Region of Waterloo: based on performance metrics and feedback, it was found that the public would have preferred more bikes to be available at launch and a greater service area. Some operational constraints may not be easily overcome based on program budget and availability of operators, but it is important to understand the needs of the community to communicate the program's intent and potential growth to garner support as the program matures.

Strategies for Operating, Funding, and Monitoring the Program

Choose an appropriate operating model considering asset ownership and revenue flow between the municipality, operator(s), and other key stakeholders. The three main contracting structures include:

1. Publicly owned and operated;
2. Privately owned and operated; and
3. Public owned and privately operated.

The third type of contracting structure in which the system is owned by the municipality and is operated by a private entity through a contract or permit is the most used. The type of operating model suitable for a bike share program should be informed by input from the municipality, the public, and other key stakeholders as well as feasibility analyses.

Aim to diversify funding streams and create private sector partnerships to ensure financial sustainability of the program. Funding streams can include government funding (e.g. grants, transportation budget), sponsorship, private investments (e.g. partnership with private land owners, donations, fundraising), advertising, and user revenue. This can be used to offset capital and operating costs, deal with seasonal changes in user revenue, and plan for expansions.

Establish a regulatory regime before the launch of the program to ensure that suppliers and operators are meeting the municipality's needs. Regulations and policies may focus on:

- Effectively managing public space (e.g. cap fleet size, response to parking complaints)
- Fostering equity and accessibility (e.g. flexible payment options, transit integration)
- Improving planning and enforcement (e.g. data sharing, user surveys)
- Protecting users (e.g. provide users with clear safety information, equipment standards, sidewalk riding detection)

The success of such a strategy requires reliable, real-time, and historical data from operators and municipal staff who can interpret that data and assess fines and penalties if performance targets are not being met. It is also important to gather public feedback and collect user data to identify and address issues that may arise.

An example of the importance of implementing a regulatory regime with clear performance targets can be found in the first bike share system launched in the Region of Waterloo: at the end of the pilot program, feedback indicated that the operator should have offered robust customer service, anticipated mobile app issues, ensured consistent communication with the municipality and users, and offered a variety of methods to access service to those unfamiliar with a mobile app.

A well-defined regulatory regime can support the municipality in improving the performance of operators to ensure that users have access to a high-quality, reliable bike share program.

Another way that regulation can be used is to maximize the likelihood of users following the rules so that they can safely share the road with other travellers, particularly when operating a new technology. For example, the City of Kelowna passed laws and regulations with the new rollout of e-scooters in response to public concerns, such as restricting the use of a device to one user at a time, requiring each user to show proof of age (18 years or older) and wear a helmet, and suspending service in the downtown area late at night to avoid intoxicated riding.

Develop a communications plan and marketing strategies to establish a program identity and keep the public educated and engaged. A clear, consistent identity for the bike share program should be presented with education and outreach initiatives to keep the public informed on the safe use of the system and to attract new users. The program identity should consist of a simple name and logo that positively connects to a municipality's identity complimented by an aesthetic system design with consistent colour schemes and messaging.

The purpose and format of education and outreach efforts depend on the needs of the local community and may focus on how to operate a micromobility device safely, navigate new technology, and share the road. For example, the City of Kelowna's program includes multiple strategies to educate users on safety, such as communications through the Lime app or printed information on vehicles, the E-Scooter Safety Education Campaign, and the planned deployment of street teams downtown to educate the public on how to ride safely and courteously during busy months.

Track performance metrics related to program goals with real-time user data and public feedback. This may be a requirement in the contract and permit of a system to ensure operator compliance, such as the pilot program in City of Kelowna which requires the operator to provide a live feed of device location and status, as well as conduct random parking audits.

User data is critical in measuring program performance, identifying common travel patterns, gathering feedback from users and the public to inform further expansions, and developing appropriate strategies to respond to changes, such as future policies or regulations. Some performance metrics include:

- **Climate** (e.g. reduction in greenhouse gas emissions)
- **Health** (e.g. improving air quality, increase in physical activity)
- **Economy** (e.g. time and cost savings versus other modes, increase in local economic activity)
- **Safety** (e.g. decrease in killed or seriously injured collisions)
- **Access** (e.g. number of people living near bike share station)

General Public and Key Stakeholder Engagement

Engage the public and key stakeholders at all stages to continue to build an identity and gather public support for the program. For example, when choosing candidate docking station locations, the City of Hamilton referred to international best practices according to the ITDP, consulted with City departments, and underwent an extensive public engagement process with a variety of tools and techniques to gather public input and understand local needs. The program continues to gather public support by showcasing ERI user stories, organizing group rides as part of key public events in the City, and encouraging people to reach out to local businesses and Ward councillors to get funding for desired new stations. Furthermore, make it clear to the public at launch why certain stations were prioritized and what expansion plans are to continue engaging people in neighbourhoods that may not currently have stations.

A focus on equity is key to attracting new riders who may currently choose not to cycle. Such barriers to cycling could be:

- Financial: not able to pay for membership, no access to credit card, not able to make deposit to sign up
- Physical: not able to ride typical bike due to accessibility needs
- Psychological: lack of knowledge on navigating new technology, perceiving cycling as unsafe due to lack of skills, experience, or sense of belonging in cycling community

Providing elements in the bike share program to suit the needs of the local community, such as the ERI in Hamilton, would help the program to realize its intended benefits and gather support for future expansions. Key components to consider include:

- Geographic equity (e.g. policies to provide stations in low-density, low-income areas)
- Social equity (e.g. discount program or alternative payment options for low-income users)
- Cultural acceptance (e.g. targeted education and outreach for underserved groups, equitable hiring)

3.0 Candidate Locations of Pilot Bike Share Stations in Auora

This section outlines a detailed evaluation and recommendations of potential bike share station locations for the Town of Aurora to prioritize as they pilot a bike share program. These are based on the Vision Statement and supporting Objectives of the Town of Aurora's Active Transportation Master Plan, key takeaways from the National Association of City Transportation Officials (NACTO) Bike Share Station Siting Guide (2016) and The Bikeshare Planning Guide (2018) by ITDP, and bike share program best practices presented in Section 2.4.

3.1 Purpose of Bike Share in Aurora

The primary purpose of a bike share program in the Town of Aurora is to provide its residents, workers, and visitors with a feasible mode that meets various travel demands while encouraging a healthy lifestyle. This program would play key roles in:

- Improving accessibility to major destinations, employment, and community services in the Town for people who may not have access to or may prefer not to use a private automobile;
- Offering transit users with a solution to make the first and / or last mile of a transit trip;
- Encouraging locals and visitors to explore the Town through recreational and tourist activities; and
- Increasing the number of cyclists in the Town, with elements of equity integrated into the program structure to encourage the "Interested but Concerned" population and underserved communities to uptake cycling, which in turn supports future investments into active transportation.

The primary purpose and roles of a bike share program in the Town align with the overall Vision and supporting Objectives of the Town of Aurora's Active Transportation Master Plan, namely:

- Provide and Support a Variety of Transportation Options;
- Support Community Health;
- Improve Connectivity;
- Coordinate with Existing and Future Infrastructure Projects;
- Prioritize Safety and Accessibility; and
- Increase Sustainability.

3.2 Best Practices and Guidelines for Service Area and Bike Share Station Placement

Two key aspects of planning a station-based bike share program includes determining the:

1. Service area, which is the physical area within which users can rent and return a shared bike; and
2. Placement of each station within the streetscape.

Best practices on these aspects were reviewed from The Bikeshare Planning Guide (2018) by ITDP and the NACTO Bike Share Station Siting Guide (2016) to support the Town in choosing priority locations for bike share stations and planning for how each station could be integrated into the existing infrastructure.

Figure 1: Collector Road in Aurora (Source: WSP)

1 Choosing the service area depends on considerations of a variety of factors, including demand, land use, and cost. It is recommended to base the service area in high-density parts of a municipality with mixed land uses to create convenient connections between a significant set of origin and destination points to potentially attract more people to use bike share. To ensure reliable coverage, a municipality should aim for a generally uniform density of bike share stations, commonly targeting to place a station within a 300 m to 500 m diameter buffer of each other.

At the same time, it is important to consider capturing lower-density areas, where underserved populations may rely on active modes of travel and transit and would greatly benefit from improved connectivity to the transportation system via bike share. Therefore, a few stations may be placed outside of the dense coverage areas based on land use, existing infrastructure, and community needs.

Regardless of the chosen station density, all stations within the service area should be within a reasonable walking distance (e.g. within 3 to 5 minutes of walking) of each other and of key origins and destinations to provide users with a convenient and reliable way to travel from / to anywhere in the municipality.

2 The placement of a bike share station within the streetscape should follow these key principles:

- **Accessible and Convenient**: allow pedestrians and cyclists to easily find and use the station, regardless of time of day or season of the year; typically locate in areas with high cycling demand (e.g. along existing cycling facility, at transit hub, at mixed-use development nodes)
- **Designed for Safety**: improve personal safety by locating in areas with high foot traffic, traffic calming measures to slow down motorists, and good lighting (which can also attract and retain sponsors and advertisers)
- **Operationally Feasible**: ensure ease of access for operations, maintenance, and servicing (e.g. e-bike charging, rebalancing, adequate sun exposure if station relies on solar power)
- **Enhancing the Pedestrian Realm**: enhance the quality of the surrounding pedestrian environment without blocking the flow of pedestrians
- **Part of the Streetscape Hierarchy**: should not block major, permanent elements (e.g. fire hydrant, transit stop) but can be prioritized over moveable objects (e.g. drive rails, standard bike racks)

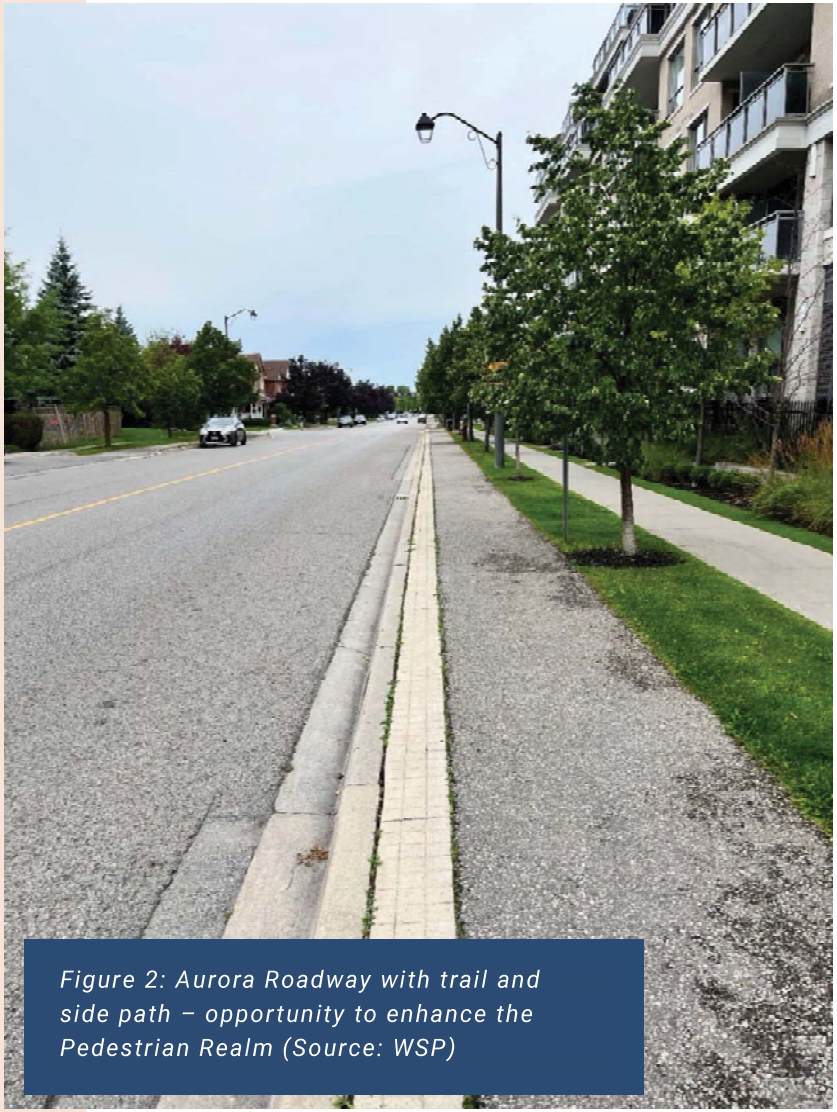


Figure 2: Aurora Roadway with trail and side path – opportunity to enhance the Pedestrian Realm (Source: WSP)

3.3 Methodology of Selecting Pilot Bike Share Stations in Aurora

The results of the 2018 York Region Bike Share Feasibility Study were used as a starting point for the Town of Aurora's Bike Share Feasibility analysis to identify locations most suitable for bike share stations. Beginning with a long list of 20 potential station locations, the Project Team evaluated candidate locations against spatial analysis results to develop a data-driven approach to the phased implementation of a bike share system within Aurora. The final list of candidate bike share station locations and phasing was determined based on feedback from Town Staff.

York Region Bike Share Feasibility Study

In June of 2018, York Region engaged WSP to develop a Bike Share Feasibility Analysis that would build on previous modelling work completed for the Toronto Parking Authority and Metrolinx. This work and methodology were documented in detail in the City of Toronto Feasibility Study (2015) and furthered in the Greater Toronto and Hamilton Area Feasibility Study (2016). The purpose of these studies was to identify the most promising areas for bike share service deployment and ultimately improve opportunities for active transportation, enhanced transit access as well as broaden transportation choice.

WSP developed an analysis framework to identify areas of high Bike Share suitability throughout all local municipalities within York Region. The framework was based on indicators like population density, economic generators, cycling conditions, points of interest, transportation mode choice and availability of cycling infrastructure. The Project Team leveraged GIS, interactive mapping and consultation tools, as well as geo-statistical methods on 36 spatial datasets to determine areas of high potential for Bike Share station locations.

To determine suitable areas or "hot spots" for bike share station locations, the 36 indicators were compared and analyzed on a common scale. The Project Team used a variety of geo-spatial tools to normalize and combine the data for each of the 36 indicators. The result was a final map surface which contained a bike share suitability score ranging from 0-100, where 100 is the highest score possible — denoting, in relative terms, the best potential location for a future bike share station within the study area.

Methodology

The final map surface dataset from the 2018 York Region Bike Share Feasibility Study was transformed in six steps to provide relevant suitability scoring for each of the initial 20- bike share station candidate locations using the methodology below:

1. The final map surface was isolated to the Town of Aurora's municipal boundary to create a new map surface dataset that only contained the suitability scores within Aurora.

2. The scoring within Aurora's map surface dataset was normalized to reflect a 0-100 scoring range.

3. The suitability scores within a 50-metre radius surrounding each of the 20 bike share station candidate locations were extracted from the normalized dataset to create 50-metre radius map surfaces specific to each station.

4. Preliminary suitability scores for each station were determined through a weighted average calculation where the suitability scores within each map surface were weighted against the area they occupied in the 50-metre radius.

5. A proximity penalty was applied to the preliminary scoring for each station, where a station received a 10% reduction in its score if it was within 400 metres of another station, or a 20% reduction if it was within 400 metres of two stations.

6. A remoteness penalty was lastly applied to arrive at the final suitability score. A station received a 20% reduction to its score if it was not within an 800-metre radius of another station.

These suitability scores provided the foundation for the initial 20 candidate locations. These locations were further reviewed and based on feedback from Town Staff, the final recommendation was developed, which includes a total of 31 station locations divided into the three phases below:

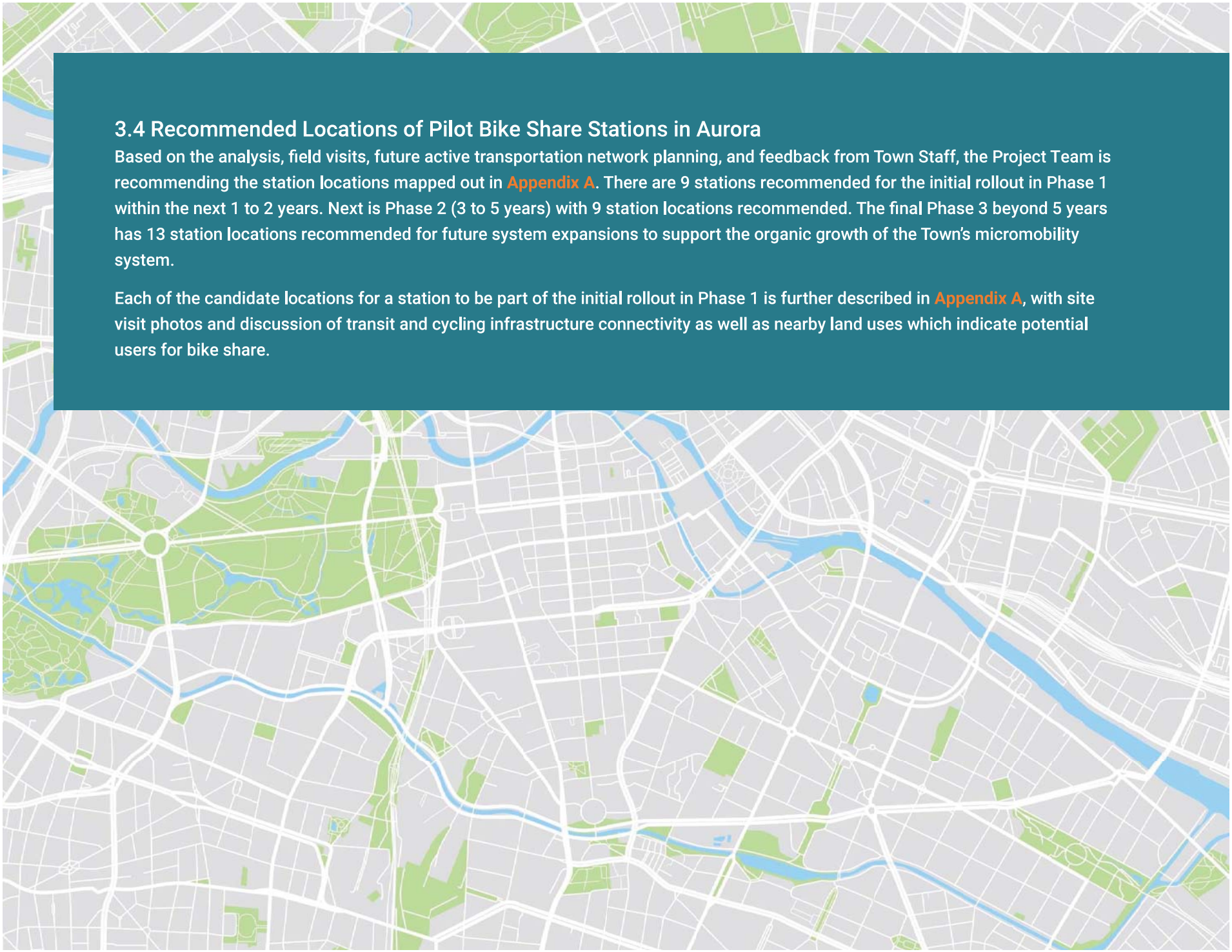
1. Phase 1: 1-2 years
2. Phase 2: 3-5 years
3. Phase 3: 5+ years

This approach aligns with the recommendations in The Bikeshare Planning Guide (section 4.1.1.a) – Field approach, where the Project Team conducted field visits to identify potential station locations and then refined those recommendations through desktop analysis and feedback from Town Staff.

3.4 Recommended Locations of Pilot Bike Share Stations in Aurora

Based on the analysis, field visits, future active transportation network planning, and feedback from Town Staff, the Project Team is recommending the station locations mapped out in Appendix A. There are 9 stations recommended for the initial rollout in Phase 1 within the next 1 to 2 years. Next is Phase 2 (3 to 5 years) with 9 station locations recommended. The final Phase 3 beyond 5 years has 13 station locations recommended for future system expansions to support the organic growth of the Town's micromobility system.

Each of the candidate locations for a station to be part of the initial rollout in Phase 1 is further described in Appendix A, with site visit photos and discussion of transit and cycling infrastructure connectivity as well as nearby land uses which indicate potential users for bike share.



4.0 Recommended Business Model and Financial Model for Aurora

4.1 Recommended Business Model for Aurora

The bike share program for the Town of Aurora will include an implementation plan that outlines a feasible business model, estimates of expected costs, and potential funding strategies for the Town to explore. This will support the initial rollout and future expansions of the bike share program so that it continues to serve residents and visitors of the Town in the long term.

Recommendations on each element of a business model appropriate for the Town of Aurora's bike share program are outlined below. These were informed by detailed research into each element, a summary of which is provided in Appendix B.

Organizational structure

The Town should pursue a partnership with one or multiple private bike share providers. The cost of provisioning the vehicle fleet, system operations, maintenance, and customer interface would be the responsibility of the private bike share provider(s) in exchange for the right to operate on Town property. The Town would be responsible for enforcing permits and other regulatory schemes and it is anticipated that some Town Staff time may be needed to provide oversight and regulate operator(s).

Asset ownership

It is recommended that the private bike share provider(s) selected by the Town own all physical assets (e.g. vehicle fleet, stations, and other physical materials) and system for delivering the bike share program (e.g. IT system, vehicles to support rebalancing etc.).

Enforcement

The Town should develop a regulatory regime with policies and regulations that apply to supplier(s), operator(s), and / or users to ensure that the program is delivered and used in line with the Town's goals. This should include developing a permit application process to assess and choose the qualified bike share service provider(s).

Furthermore, the Town should enforce system-wide delivery standards through a contract by outlining performance metrics for program delivery, requirements for the operator(s) to demonstrate how each metric is met, and certain penalties for non-compliance. In addition, if new technology is deemed appropriate to be incorporated into the vehicle fleet (e.g. e-bike), the Town should amend by-laws to allow for these devices to be operated on public space and to educate users on how to safely operate the devices and share the road space.

Contracting structure

It is recommended for the Town to pursue a bike share program that is privately owned and operated. This minimizes the financial risk to the Town as all capital and operating costs (including any potential cost overruns) are borne by the private sector. The fleet size would depend on the operator(s) selected, which could be incorporated into the evaluation criteria that the Town uses to select suitable provider(s) through the procurement process.

4.2 Recommended Financial Model for Aurora

A financial model was developed to predict and maximize the long-term financial sustainability of a bike share program. This model includes capital costs, operating costs, and revenue streams. This section outlines high-level details of each component to inform a detailed financial analysis that the Town should undertake with the most recently available data and methods to verify costs for the local context at a later planning stage.

Capital Costs and Operating Costs

Capital costs for a station-based system include the following four key components:

This cost can vary immensely depending on the level of security and advanced technology for the chosen vehicle fleet. Characteristics that may increase the unit cost of a bike include special locking mechanisms, speciality bikes with proprietary parts, GPS tracking, pedal-assist, charging infrastructure, other smart onboard technology, rebalancing, etc.

This is typically the most significant capital cost. High-tech terminals are typical for medium to large stations where most users are expected, whereas non-interactive terminals are provided with signage and static information for small stations. Note that increasing the number of docking spaces at a station can help to reduce costs for rebalancing vehicles.

Software

A municipality may contract the operator(s) who would own, provide, and manage the IT software.

Control Centre, Depot, and Maintenance and Redistribution of Units

This includes the centre from which the bike share program is managed, depots where bikes are stored and serviced, and mobile units to address maintenance and repair requests as well as rebalance between stations. This may be provided through an agreement between the municipality and the operator(s) or through partnerships with community organizations.

Operating costs for a station-based system include the following components:

This is the relocation of bikes from stations at or close to capacity to nearby stations that are nearly empty. This is the most significant operating cost. Onboard GPS technology and machine learning have been used in other jurisdictions to help accurately predict demand and reduce the challenges of rebalancing. Offering price incentives to users to park at another station can also help to rebalance bikes.

Staffing roles can include administration, maintenance, rebalancing, and customer service. It is recommended for the Town to hire at least two full-time staff (or contractors) to manage the bike share program and do community outreach and education. The cost of staffing will largely depend on local cost of employment.

This includes repair and preventive activities for the bikes and stations (e.g. sweeping around stations, fixing faulty brakes for bikes, fixing electrical equipment for station terminals, etc.) and may be conducted at depots or using mobile units. Maintenance to ensure high-quality, safe service is essential to building a reliable positive image of the bike share program for the public. The Town should outline maintenance standards in a service-level agreement or permit with the operator(s).

Marketing and Customer Information

This can range from printed material to municipal-wide campaigns using a variety of outlets, including social media. This is critical within the first 6 months of the start of the program and when expansions or service changes are planned. Membership campaigns to attract new users can also add to this cost. The Town should work with the operator(s) to provide oversight for marketing and providing customer information.

Insurance

Referencing anti-theft, accidents, and vandalism specifically, it is important for the Town to include a conditions-of-use document and proof of accident and anti-theft insurance in the contract or permit requirements when choosing the qualified operator(s). Deposits or liability holds may be put on a user's credit card to encourage them to properly use and return the bike, but this may pose some financial barriers to low-income users. Outreach efforts to build a respectable image for the bike share program is the most effective strategy to avoid vandalism of the bikes or station properties.

Revenue Streams

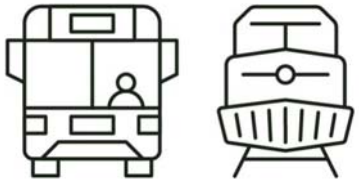
Several government funding options the Town should explore are outlined below. It is generally recommended that the Town pay the operator(s) based on service-level agreements for transparency and some level of control over program performance.

Investing in Canada Infrastructure Program

The Government of Canada provides over $33 billion of funding to support the development of inclusive, resilient communities that reduce air and water pollution, provide clean resources, and create growing economies to improve the overall quality of life for Canadians. It is delivered through bilateral agreements with provinces and territories and includes a “Green Infrastructure” category for projects that reduce greenhouse gas emissions, contribute to cleaner air, and allow communities to effectively adapt to the impacts of climate change.

The Green Municipal Fund

This is a $1.6 billion program funded by the Government of Canada and the Federation of Canadian Municipalities. It supports local governments in effectively shifting to sustainable practices with funding, resources, and training. Capital projects that improve the quality of air, water, and land as well as reduce greenhouse gas emissions are eligible.



The Public Transit Infrastructure Fund

This is a $3.4 billion program funded by the Government of Canada that provides short-term funding to support municipal investments in supporting the use and expansion of transit. This program committed $4 million starting in 2017 to expand the Toronto Bike Share system. Integration of a bike share program with transit is essential for the success of both systems and thus funding for public transit could be leveraged.

Other revenue streams to offset capital and operating costs include:

User Revenues

This can include a subscription fee for regular users or a usage fee for less frequent users with different cost options based on circumstances. The pricing structure for users should be developed with extensive public consultation so that it is suited to the needs of the local community, including those who may face financial barriers, so that it attracts regular, long-term users.

Operator(s) Fees

These are annual permit fees or permit review fees paid by the operator(s) to the Town to be allowed to operate the program on public land and to cover staff time to review and approve permit applications. This can also include non-compliance fees that the operator would be required to pay the Town based on service-level agreements.

Sponsorship and Advertising

This would involve the bike share provider(s) partnering with a private entity to place their logo and advertisements on terminal boards or bikes. However, the Town must ensure this aligns with the municipal-wide image built for the bike share program.

5.0 Other Supportive Measures – E-Bikes for Town Staff

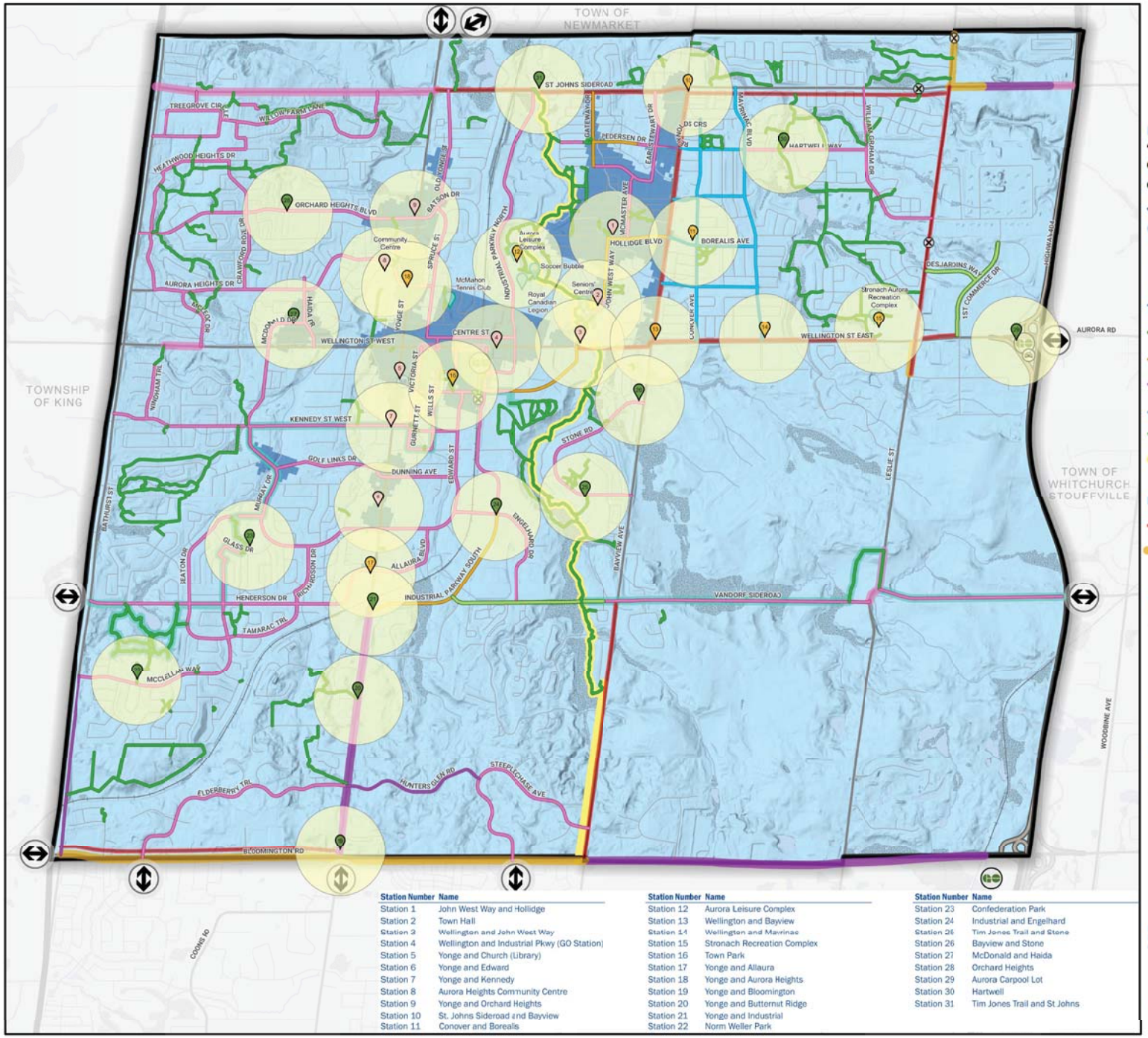
In addition to launching a bike share program for the public, the Town of Aurora should also consider procuring a small fleet of e-bikes for the use of bylaw officers and other Town Staff. This would have several benefits, such as:

- Enhancing the mobility and efficiency of bylaw officers, especially in areas where parking is limited or traffic is congested.
- Reducing the greenhouse gas emissions and fuel costs associated with operating conventional vehicles.
- Demonstrating the Town's commitment to sustainable transportation and promoting a culture of active living among its employees.
- Expanding the awareness and acceptance of micromobility and e-bikes among the residents and businesses of Aurora, as they see Town Staff using them for their daily tasks.

By procuring e-bikes for Town Staff, the Town of Aurora would not only improve its own operations, but also set an example for the community and encourage more people to adopt this mode of transportation.

Appendices

Appendix A



Station Number	Name
Station 1	John West Way and Hollidge
Station 2	Town Hall
Station 3	Wellington and John West Way
Station 4	Wellington and Industrial Pkwy (GO Station)
Station 5	Yonge and Church (Library)
Station 6	Yonge and Edward
Station 7	Yonge and Kennedy
Station 8	Aurora Heights Community Centre
Station 9	Yonge and Orchard Heights
Station 10	St. Johns Sideroad and Bayview
Station 11	Conover and Borealis
Station 12	Aurora Leisure Complex
Station 13	Wellington and Bayview
Station 14	Wellington and Mavrinac
Station 15	Stronach Recreation Complex
Station 16	Town Park
Station 17	Yonge and Allaura
Station 18	Yonge and Aurora Heights
Station 19	Yonge and Bloomington
Station 20	Yonge and Butternut Ridge
Station 21	Yonge and Industrial
Station 22	Norm Weller Park
Station 23	Confederation Park
Station 24	Industrial and Engelhard
Station 25	Tim Jones Trail and Stone
Station 26	Bayview and Stone
Station 27	McDonald and Haida
Station 28	Orchard Heights
Station 29	Aurora Carpool Lot
Station 30	Hartwell
Station 31	Tim Jones Trail and St Johns

Bike Share Station Candidate Locations

Town of Aurora Active Transportation Master Plan

2024-02-12

Potential Station Locations

- Phase 1: 1-2 years
- Phase 2: 3-5 years
- Phase 3: 5+ years
- 500 m Station Buffer

York Region 2018 Bike Feasibility Score (Normalized)

100 / 50 / 0

Town Cycling Network

- Multi-Use Path
- Bike Lane
- Paved Shoulder
- Signed Route
- Shared Roadway (Currently Unsigned)

Trail System

- Multi-Use Trail
- Lake-to-Lake Route

Trail Features

- Existing Grade Separated Crossing

Regional Cycling Network

- Multi-Use Path
- Bike Lane
- Paved Shoulder
- Shared Route (Unsigned)

Base Features

- Highway / Expressway
- Arterial / Collector Road
- Local Road
- Rail Line
- Watercourse
- Waterbody
- Wetland
- Municipal Boundary

Destinations

- Town Hall
- Community / Recreation Centre
- Library
- Carpool Lot & GO Bus Stop
- GO Transit Station
- Municipal Connection to Existing Cycling Facility

N

0 0.75 1.5 KM

Notes:
Data obtained through Land Information Ontario (LIO) GeoHub, Town of Aurora and York Region Open Data Portal.

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WSP

John West Way and Hollidge – Station #1

Figure 1: Southwest corner of John West Way and Hollidge Boulevard intersection (Source: WSP)

Figure 2: North side of John West Way and Hollidge Boulevard intersection (Source: WSP)

Figure 3: Hollidge Boulevard corridor, facing east from John West Way intersection (Source: WSP)

Transit Connectivity	— YRT bus stops at John West Way and Hollidge Boulevard intersection
Cycling Infrastructure Connectivity	— Bike lanes: Hollidge Boulevard — Shared roadway: John West Way, McMaster Avenue
Nearby Land Uses	— Immediately adjacent to Taylor Park, which provides recreation opportunities — Residential and commercial employment/service areas in adjacent blocks — Adequate space within public realm adjacent to park or along Hollidge Boulevard corridor to place station without impeding access or pedestrian flow

Town Hall – Station #2

Figure 4: Along south edge of Aurora Town Hall (Source: WSP)

Figure 5: Near front entrance of Aurora Town Hall (Source: WSP)

Transit Connectivity	— YRT bus stops along John West Way within a 1-minute walk
Cycling Infrastructure Connectivity	— Shared roadway: John West Way — Off-road multi-use trail: Tim Jones Trail connection to the west
Nearby Land Uses	— At Aurora Town Hall, common point of community gatherings — Aurora Seniors Association centre to the south — Public recreation facilities (e.g. Queen's Diamond Jubilee Park, nearby parks with access through Tim Jones Trail) — Residential and commercial employment/service areas in adjacent blocks — Adequate space along entrance and south edge of Aurora Town Hall to place station without impeding access or pedestrian flow

Wellington and John West Way – Station #3

Figure 6: Northeast corner of Wellington Street East and John West Way Intersection (Source: WSP)

Transit Connectivity	— YRT bus stops at Wellington Street East and John West Way intersection
Cycling Infrastructure Connectivity	— Shared roadway: John West Way — Bike lanes: Mary Street — In-boulevard shared pathway: Wellington Street East (east side of intersection) — Off-road multi-use trail: Tim Jones Trail connection to Wellington Street East
Nearby Land Uses	— Residential, commercial employment/service, and industrial areas in adjacent blocks — St. Maximilian Kolbe Catholic High School (less than 250 m or a 3-minute walk to the west) — Public recreation facilities nearby (e.g. nearby parks with access through Tim Jones Trail) — Adequate space within public realm at northwest corner of intersection to place station without impeding access or pedestrian flow

Wellington and Industrial Pkwy (GO Station) – Station #4

Figure 7: Northeast corner of the Aurora GO Station platform (Source: WSP)

Transit Connectivity	— At Aurora GO Station (Barrie Line) — York Regional Transit (YRT) bus stops at Wellington Street and Berczy Street intersection (less than 60 m or a 1-minute walk to the west)
Cycling Infrastructure Connectivity	— Shared roadway: Industrial Parkway, Wellington Street, and Centre Street — In-boulevard multi-use Trail along Wellington Street, connected by bike lanes on John West Way. — At-grade road crossing of the rail line at Wellington Street and at Centre Street
Nearby Land Uses	— Immediately adjacent to transit hub, which provides regional public transit service by Metrolinx GO Transit, parking, washrooms, and wayfinding — Residential, commercial employment/service, and industrial areas in adjacent blocks — Adequate space within public realm to place station at northeast end of Aurora GO Station platform without impeding access or pedestrian flow

Yonge and Church (Library) – Station #5

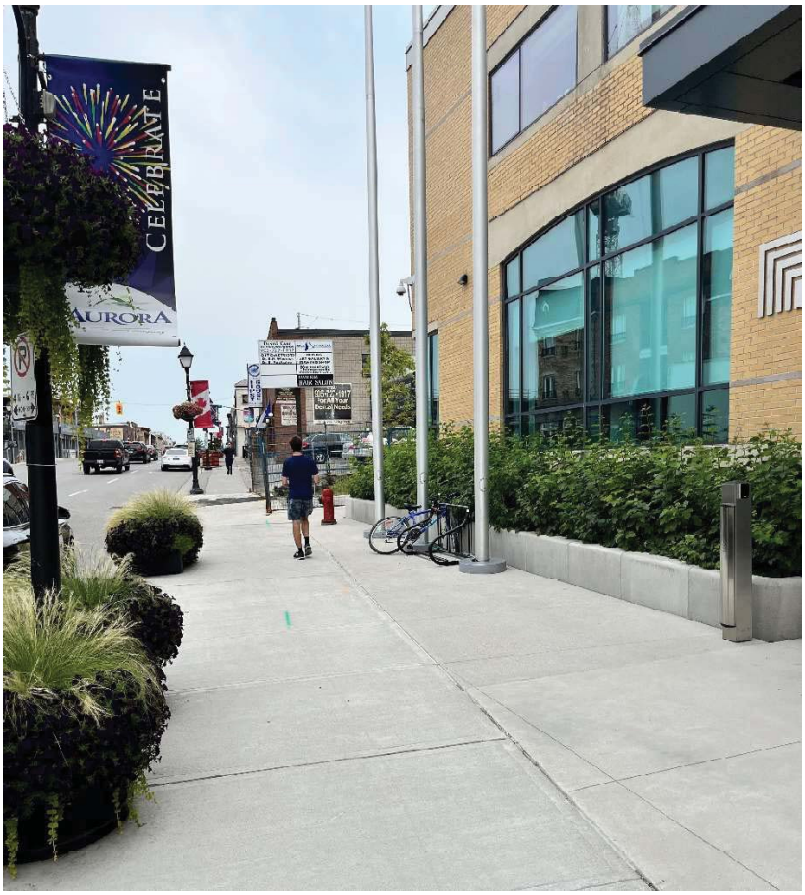

Figure 8: Entrance to Aurora Public Library, facing north on Yonge Street (Source: WSP)

Transit Connectivity	— YRT bus stops at Yonge Street and Church Street intersection (less than 60 m or a 1-minute walk to the south)
Cycling Infrastructure Connectivity	— No existing facilities
Nearby Land Uses	— Immediately adjacent to public library, which attracts different age groups and may be used to host community events and programs — Near Aurora Public School (less than 200 m or a 3-minute walk to the east) — Residential and commercial employment/service areas in adjacent blocks — Adequate space within public realm at front entrance of Aurora Public Library to place station without impeding access or pedestrian flow

Yonge and Edward – Station #6

Figure 9: Southwest corner of Yonge Street and Murray Drive / Edward Street intersection (Source: WSP)

Transit Connectivity	— YRT bus stops at Yonge Street and Murray Drive / Edward Street intersection
Cycling Infrastructure Connectivity	— Shared roadway: Murray Drive / Edward Street
Nearby Land Uses	— Residential, commercial employment/service, park, and school areas in adjacent blocks — Adequate space within public realm at southwest corner of intersection to place station without impeding access or pedestrian flow

Yonge and Kennedy – Station #7

Figure 10: Intersection of Yonge and Kennedy, looking east. Preferred station location would be on southeast corner (Source: Google Maps).

Transit Connectivity	— YRT bus stops at Yonge Street and Kennedy Street intersection
Cycling Infrastructure Connectivity	— Shared roadway: Kennedy Street
Nearby Land Uses	— Residential, commercial employment/service, park, and school areas in adjacent blocks — Adequate space within public realm at southeast corner of intersection to place station without impeding access or pedestrian flow

Aurora Heights Community Centre – Station #8

Figure 11: Near front entrance of Aurora Community Centre (Source: WSP)

Figure 12: Open space along east edge of Aurora Community Centre (Source: WSP)

Figure 13: Parking lot along southeast edge of Aurora Community Centre (Source: WSP)

Transit Connectivity	— YRT bus stops at Yonge Street and Aurora Heights Drive / Mark Street intersection (about 300 m or a 5-minute walk to the east)
Cycling Infrastructure Connectivity	— Shared roadway: Aurora Heights Drive — Off-road multi-use trail: Fleury & Machell Park Trail along east property edge
Nearby Land Uses	— At Aurora Community Centre, which is a popular location for recreation and community gatherings and provides parking and washrooms — Aurora Heights Public School and YMCA Before and After School Program facilities to the west — Public recreation facilities (e.g. Machell Park to the north and Fleury Park to the south) — Mixed-use commercial plazas along Yonge Street to the east — Residential neighbourhoods in adjacent blocks — Adequate space along entrances and east edge of Aurora Community Centre to place station without impeding access or pedestrian flow

Yonge and Orchard Heights – Station #9

Figure 14: Northwest corner of Yonge Street and Orchard Heights Boulevard / Batson Drive Intersection (Source: WSP)

Transit Connectivity	— YRT bus stops at Yonge Street and Orchard Heights Boulevard / Batson Drive intersection
Cycling Infrastructure Connectivity	— Shared roadway: Orchard Heights Boulevard / Batson Drive — Off-road multi-use trail: Fleury & Machell Park Trail connection to Orchard Heights Boulevard (less than 230 m or a 3-minute walk to the west)
Nearby Land Uses	— Mixed-use commercial plazas immediately to the northwest or south — Public recreation facilities at Machell Park (less than 230 m or a 3-minute walk to the west) — Residential neighbourhoods in adjacent blocks — Adequate space within public realm at northwest corner of intersection to place station without impeding access or pedestrian flow

Appendix B

Appendix B - Overview of Business Model

The business model of a bike share program includes the following elements:

- Organizational structure;
- Asset ownership;
- Contracting structure; and
- Enforcement.

The type of business model suitable for a bike share program should be informed by input from the municipality, the public, and other key stakeholders as well as feasibility analyses. The following sections provide further details on elements of the business model, which informed the recommended model for the Town of Aurora's bike share program.

Business Model of Bike Share Program: Organizational Structure

The organizational structure outlines the relationship between the various agencies involved in the planning, ownership, operations, management, financing, and oversight of the bike share program. There are two main types of organizational structures for a bike share program based on the responsibilities of the implementing agency (i.e. government agency):

- **Publicly procured**
  - Implementing agency responsible for planning, implementing, operating, and promoting typically with separate contracts
  - Government agency could include departments of transportation, urban development, environment, and parks and recreation; public transport agency; or regional planning authority
  - Challenging to expand across political boundaries and integrate with other transport systems
- **Permitted**
  - Implementing agency responsible for planning, implementing, enforcing permits or other regulatory schemes, coordinating system-wide promotion, and planning for expansion

- Key is monitoring performance of operator(s) through compliance checks based on defined service levels and make required changes

Each organizational structure can have a single operator or multiple operators that may be public or private entities. The most important and costly role of an operator is rebalancing vehicle capacities between stations or hubs. Other roles include maintenance of bike share vehicle fleet and stations (if applicable), customer service, and general brand management along with marketing and advertising.

- **Single operator**
  - Important for implementing agency to have clearly written contract and oversight
  - Benefits:
    - Long-term contract helps for goals of operator and implementing agency to align through revenue-sharing agreements and establishes commitment to financial sustainability
    - Implementing agency significantly involved in key decisions
    - Operator financially incentivized to meet quality service standards
  - Challenges:
    - Lack incentive to incorporate new technology or may take longer given multi-year contract
    - Enforcement, particularly in keeping other operators out
    - Providing limited consumer choices
- **Multiple operators**
  - Could have one operator managing existing, station-based program with other operators offering dockless program or could have multiple private operators offering dockless program

- Important for implementing agency to establish permit system to monitor base levels of performance while allowing private operators to innovate
- Benefits:
  - No upfront cost in bike share assets to implementing agency
  - Reduces time for planning and implementation
  - More likely to gain political support since it does not rely on public funding
  - Competition between operators encourages continuous service improvement
  - Offers range of choices to riders which helps to encourage cycling
- Challenges:
  - Requires more oversight capacity from implementing agency to ensure compliance, process and renew applications, and communicate policy changes
  - May be confusing for users to navigate multiple platforms

Business Model of Bike Share Program: Asset Ownership

Bike share program assets include the vehicle fleet; stations, docks, and terminals (not applicable for a dockless system); and IT system. Programs operated by a non-profit organization or a private dockless operator typically provide their own vehicle fleets in exchange for the government allowing them to operate using public spaces and public rights-of-way. Asset ownership ultimately determines the quality of the program assets and service; thus, it is important for the government entity to set clear permit requirements for baseline asset and service quality if the assets are owned by a private entity.

Business Model of Bike Share Program: Contracting Structure

The contracting structure of a bike share program is shaped by the operating structure and asset ownership and typically falls into two main categories:

- Program operated through public-private partnership; or
- Program operated by private sector.

Program Operated Through Public-Private Partnership

Bundling the provision of infrastructure and operations of the bike share program into one contract simplifies the implementing agency's role in managing contracts and incentivizes the contractor to supply high quality infrastructure to minimize maintenance costs down the line. Also, this setup can help to make a smoother program transition from design to operations.

On the other hand, an implementing agency may choose to sign separate contracts for each part of the program components, including bikes and stations (if applicable), software, operations, advertising, and marketing. This helps to implement each component within a shorter time frame with financing from smaller budgets, allows the implementing agency to select contractors that specialize in each of the requested services, and reduces the risk of relying on a single entity. In addition, the duration of each contract tied to the infrastructure components is usually based on the life span of the infrastructure; it should be noted that shorter durations (i.e. three to five years) offer greater flexibility to the implementing agency and opportunities for the operator(s) to innovate and incorporate new technologies.

Program Operated By Private Sector

The three main contracting structures for a privately-operated program without public-private partnerships are outlined below. For all structures, the implementing agency should have oversight of the entire program and lead contract management and performance monitoring.

Publicly Publicly owned and operated	• Government plans, implements, operates, and promotes program • Simplifies management of all components and prioritizes large-scale public goals • Government owns assets and takes on all financial risk • Stifles innovation due to lack of competition • Risk of lack of previous experience with micromobility and program continuity with changes in government

Privately owned and operated	• Private entity (single or multiple operators) owns assets and provides service with some government regulation (e.g. permit, code of conduct) • Implementing agency could generate revenue with permit fees • All financial risk lies with private operator(s) • Challenging to align public sector goals (e.g. widespread distribution) with private sector goals (e.g. profitability)
Public owned and privately operated	• Government owns assets and contracts private entity to operate • Requires public funding for implementation but all operational costs and logistics are handled by private contractor • Implementing agency has some control over key decisions without needing to assume financial risk for operations • Can incentivize efficient operations by offering part of the program's surplus to private entity • Shorter contracts require more government staff time for issuing tenders and managing contracts

Business Model of Bike Share Program: Enforcement

The implementing agency should ensure the operator(s) are running the system according to public goals by enforcing service level standards through a contract. Service level standards establish a baseline in the expected quality of infrastructure and operations of the bike share program (e.g. hardware and software, customer service, redistribution, marketing). Rewards and penalties are typically tied to meeting service level standards within a specified threshold to incentivize the operator(s) to increase revenue. These levels should be set realistically so that they can be monitored using easy, cost-effective methods and re-evaluated based on performance data from the initial years of operation. Furthermore, the operator(s) should be transparent and provide the implementing agency with all required real-time user data and how the program is meeting performance metrics.

The implementing agency could require the operator(s) to obtain permits to provide the service in the municipality and enforce system-wide standards using the following strategies:

- Require operator(s) to pay non-compliance fees if operational permit requirements are violated;

- Require operator(s) to pay for a percentage of government staff time if the government staff end up having to relocate or remove non-compliant bikes; and
- Temporarily freeze and eventually revoke permit if operator(s) fails to meet major permit requirements.