Bike Share Preliminary Analysis - Part One

July 2019

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FOURSQUARE ITP

London CANADA

This report accompanies *Bike Share System for London: Update and Next Steps* (August 12th, 2019 meeting of the Civic Works Committee (CWC).

It contains background details and preliminary analysis to develop a comprehensive business case for a bike share system in London. It should be read alongside the CWC report.

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SECTION A
Bike Share Guiding Principles

Guiding Principles: The Business Case will be guided by four key principles: financial sustainability; mobility and access; environment and health; and community building.

Key Project Outcome: The Business Case will include Expected Case, Best Case and Worst Case scenarios to ensure that Municipal Council has a good understanding how a Bike Share system could roll out in London in the following areas:

1. Environmental Considerations
2. Social Considerations
3. Financial Considerations
4. Sensitivity Analysis
5. Risk Analysis and Mitigation

Guiding Principles	Focus
1: Financial Sustainability Create a system that is financially sustainable, transparently operated, and accountable.	• Ensure that public funds are utilized in an efficient and transparent manner that maximizes the return on investment
	• Ensure system is viable for the long term by planning for future maintenance and state-of-good-repair needs
	• Encourage private sector and/or social enterprise participation in service delivery in a manner that respects and supports all other Bike Share Goals
	• Share updates as the project develops to ensure transparency with decision-makers and the public
2: Mobility and Access Increase the ability of Londoners to access their daily needs via the current and ever-growing cycling network.	• Integrate with London Transit (including the BRT network)
	• Coordinate with large employee and student centres such as Western University, Fanshawe College, hospital campuses, business areas

Guiding Principles	Focus
	• Make all sustainable mobility options (walking, cycling, transit) more convenient and connected
	• Reduce pressure on parking resources by reducing driving within the city
	• Provide bicycles to households that wish to have access to commuter bicycles that do not have to be stored, locked up or subject to the threat of theft
	• Use the bike share system to improve and facilitate access to public facilities and services
3: Environment and Health Address the effects of personal transportation on climate change by providing a new option for getting around London.	• Reduce vehicle trips, resulting in less congestion and automobile-related air pollution and greenhouse gas (GHG) emissions reduction
	• Reduce vehicle kilometres travelled (vkt)
	• Improve public health by incorporating physical activity into increased mobility options
4: Community Building Leverage the bike share system and accompanying cycling usage as a tool to promote livability, and attract or retain residents, businesses and visitors.	• Facilitate biking as an appealing way for Londoners and visitors to get around London
	• Grow the local cycling culture
	• Attract and retain new businesses and residents looking for a city with robust walking and cycling options
	• Provide visitors in London's core with a viable and comfortable option for getting around

Guiding Principles	Focus
	• Support existing and future cycling infrastructure and programs (as detailed in the 2016 Cycling Master Plan)
	• Support and strengthen the local economy by improving access to London's central employment areas, major institutions, and "main street" commercial areas
	• Encourage the quality of life of London residents by supporting the bicycle as a fun and convenient transportation mode

SECTION B
Bike Share Programs Reviewed

Interviews were held with municipal staff in these communities:

Location - System
Hamilton ON - SoBi
Toronto ON – Bike Share Toronto
Kingston ON – Drop Bike
Kelowna, BC – Drop Bike
Howard County, MD – Howard County Bikeshare
Boulder, CO – Boulder B-Cycle
Topeka, KS – Topeka Metro Bikes
Calgary, AB - Lime
Victoria, BC – U-Bicycle

To note that City of London staff has direct experience with bike share services in other communities as well as

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Memorandum

To/Attention	Allison Miller, City of London	**Date**	July 3, 2019
From	Zibby Petch, Vikram Hardatt	**Project No**	118299
cc	Andrew Zalewski, Foursquare ITP		
Subject	**Bike Share Staff & Stakeholder Workshop Summary (April 8, 2019)**		

Introduction

The City of London is preparing a business case for a potential public bike share system. To successfully plan for and launch a bike share system, it is necessary to engage with City staff and stakeholders to discuss bike share, review progress of the business case to date, and gather feedback. In order for bike share to launch successfully, it is critical that the appropriate staff and stakeholders are consulted to incorporate their requirements into the process.

The City of London hosted two workshops on April 8th, 2019, together with IBI Group and Foursquare ITP. The first workshop was held for City staff and the second workshop was held for community stakeholders. A list of workshop attendees is in Appendix A. This memo summarizes the workshops and identifies key discussion and input gathered from both groups.

Presentation Summary

Similar material was presented at both workshops providing an overview and examples of what bike share is; the challenges, myths, and realities of bike share; the results of the market analysis and online public engagement; discussion about the potential bike share scenarios; and a discussion about the next steps of the project and the future involvement of each stakeholder. During the workshop, an online audience interaction tool (PollEverywhere) was used to collect responses from the workshop participants and display their answers to the rest of the group. Answers from the PollEverywhere tool and comments received during the workshop and outlined in each section of this memo.

Introduction & Purpose

The City of London introduced the strategic and policy context for the bike share business case, the purpose of the workshop, and the project's guiding principles.

Bike Share Overview & Examples

Foursquare ITP introduced the concept of bike share, indicating that it is a form of shared public transportation intended for short trips, and is a flexible, one-way, point-to-point service. There are 18 bike share programs in Canada, in communities varying in size; and over 100 programs in North America. There is a wide variety of bike share program types and models.

Implementing bike share can accomplish the following:

- Introduce a new mode of transportation;
- Provide first/last mile connections to transit;
- Strengthen mobility options within the city's downtown;
- Connect the city and student population;
- Promote public health; and
- Provide a leisure and recreational amenity.

When preparing a business case for a bike share system, it is important to identify the goals, objectives, and measures for bike share. It is critical to integrate a municipality's priorities when determining the feasibility of bike share as each community has different needs and priorities. The goals, objectives, and measures influence the geography and scope of the system. The system geography and scope determines the funding model, technology, operating model, and ownership model used for the bike share system.

There are three forms of bike share technology: dock-based, hybrid, and dock-less. Dock-based systems have infrastructure integrated in to the station whereas in the hybrid and dock-less systems the infrastructure is integrated into the bicycle. Hybrid systems have physical stations, however the stations are typically branded bike racks that the bike share bikes lock up to free-of-charge. In hybrid systems, there may be an option for bikes to lock outside of a station for a small convenience fee. Dock-less systems do not have any stations and the bikes can be parked anywhere within the service area. Dock-less systems can use geofencing to create virtual "stations" but do not have any branded bike share parking infrastructure.

There are emerging technologies in the bike share industry such as e-bikes and e-scooters that present similar planning concerns but have distinct challenges from traditional bike share systems. As of April 2019, e-scooters are illegal on Ontario roads under the Highway Traffic Act, and will not be considered as a

service offering in the business case for bike share, but will be monitored to determine if there are changes in legislation to allow e-scooters.

Generally speaking, there are four sources of funding for bike share:

- Public funding including municipal/provincial funding, bonusing (e.g. Section 37), or a dedicated revenue stream;
- Sponsorship and advertising including in-kind contributions (e.g. physical space);
- Direct private investment (i.e. venture capital investment); and
- User revenue from memberships varying in cost based on per trip, day, monthly, or annual membership types and costs anywhere from $1 – $3 per trip or $50 – $150 per year.

Ownership and Governance Models

There are various bike share ownership and governance models as seen in Exhibit 1.

Exhibit 1: Ownership & Governance Models

MODEL	DESCRIPTION	EXAMPLE
Public	City, public authority, or regional owner. Operations can be contracted out to a third party.	Toronto Bike Share
Non-Profit	Existing non-profit or dedicated non-profit program. Similar to public model.	Waterloo (Former Community Access Bike Share); Boulder, CO
Private (exclusive)	Private organization owns and operates the program with exclusive access to public right-of-way.	CitiBike (NYC)
Private (non-exclusive)	Private firm owns and operates bike share. Multiple firms may be active in same market.	Dropbike, Lime, Spin (e.g. Seattle)

Operating Models

There are various operating models as seen in Exhibit 2. The distinction between directly operated and turn-key increasingly blurred.

Exhibit 2: Bike Share Operating Models

MODEL	DESCRIPTION	EXAMPLE
Directly Operated	System owner responsible for operations	BIXI (Montréal)
Contracted Operations	System owner pays a third party to operate the system. Vendor typically provides support infrastructure like maintenance facility and IT platform.	Toronto Bike Share (Shift Transit); Howard County Bikeshare (Corps Logistics)
Contracted Turn-Key	Vendor provides equipment and operations services, often in exchange for revenue guarantee, infrastructure investment, or fee	Kingston DropBike, Zagster (multiple cities)

Questions/Comments Received

1. Staff raised the possible implications of outdoor advertising on bike share stations. Staff should look to the existing street furniture contract as an example.
2. There has been over $2 billion of venture capitalist funding for bike share over the last two years.
    - Some companies are willing to lose money on bike share in order to gain market share and data which could be beneficial for municipalities in the short term.
3. A question received during the staff workshop asked if a municipality can prescribe where the bikes should go in either private models.
    - The municipality can prescribe where the bikes should go, but there is the challenge of enforcing this on private companies.
4. A question received during the staff workshop asked if lines between different operating models are increasingly blurred, then how would a municipality implement a system when there is much uncertainty within the industry?
5. There is literature about scooters that talks about the negative aspects of this new form of micro-mobility.
    - The City of London is tackling the program at the right time. Kick-style e-scooters are currently not allowed on roads and therefore not within the scope of this business case.
6. There was discussion about liability insurance, and whether other municipalities see an increase in incidents.

- Other municipalities have taken this into account during the procurement process (i.e. bike share operator must maintain liability insurance).

7. There was discussion about how bike share will affect snow plowing operations.
    - As a result of bike share, there may need to be changes to standards about snow plowing and Council needs to be aware of the associated costs.
    - Bike share usage varies and systems can be seasonal if necessary.

Challenges – Myths and Reality

Key Challenges

1. Few bike share programs sustain themselves solely on user revenue.
    - Private programs likely still lose money and are subsidized through private funding.
2. Successful programs have to pull together various funding sources to sustain operations.
3. The bike share vendor and operator market is quickly changing.
4. Launching bike share with suitable scale, proximity to high-demand locations, and stable/quality equipment is key to ensuring long-term success.

Addressing Frequently Stated Concerns

A variety of frequently stated concerns were reviewed:

1. “Bike share cannot succeed here because we don’t have adequate cycling infrastructure.”
    - In cities like San Antonio and Chattanooga, bike share led to better bike infrastructure.
    - London has better cycling infrastructure than many US peers with bike share.
2. “How can bike share work in a place with our climate?”
    - There are several examples of systems in similar or harsher climates (Montreal, Toronto, Hamilton, Minneapolis, Madison…)
3. “Does bike share expose our organization to additional liability if someone is injured?”

- Low injury rate – two deaths in 10 years.
- Operator holds insurance. Indemnifies City of liability.

4. "What if all the bicycles are stolen?"
   - Theft/loss rates rarely exceed 1%-2% per year
5. "How do we protect the public ROW?"
   - Geofencing; requiring users to return bikes to stations.
6. "What about cyclist behaviour?"
   - Education and outreach; bike share bicycles are bulkier and slower than a typical bicycle which can reduce instances of risky manoeuvres.
7. "Will bike share actually attract new users?"
   - Bike share attracts new users to cycling; a share of riders own bicycles at home but still use bike share for specific types of trips (e.g. work-related).
8. "Bike share won't integrate effectively with transit"
   - Bike share systems often closely complement transit as a first/last mile mode. A few systems have experimented with integrated payment.
9. "Will new micro-mobility options supplant bike share in a few years?"
   - Industry is still trying to understand the impact of micromobility services on bike share. Unclear whether services like e-scooters are sustainable or a fad.

PollEverywhere Results

Workshop participants were invited to identify key challenges to bike share through an online repository. Responses are summarized below in Exhibit 3.

Exhibit 3: Summary of Key Challenges noted by Workshop Participants

Key Challenges identified by staff	Key Challenges identified by stakeholders
Current cycling culture	Current cycling culture
Overcoming preconceived myths (e.g., too dangerous to bike in London)	Tailoring programs to meet a variety of needs..... how do we get it down to 3 or 4 packages?
Establishing a real marketplace of users	What is the student population between April through October?

Dealing with the 1% that goes wrong and the media	Finding suitable hub locations
Theft or leaving bikes in poor locations	Student's auxiliary fees include a bus pass, bike share would be an additional transit cost
Data protection and managing reputational liabilities.	Finance. For London Transit, bike congestion at transit stops.
Developing a flexible and resilient business case given levels of uncertainty in many key elements.	Uptake without current protected cycle tracks connecting destinations and neighbourhoods
Change winter level of maintenance	Securing strong operations and snow removal budgets
Accessibility	No available bikes or too many bikes at one place
Driver behaviour	Identifying key locations
Infrastructure conditions	Plan to bike but there is none available
Community response	Lower income families that do not have a vehicle could not afford this
Neighbourhood penetration	
Clearly articulating benefits vs risks of system	
Urban sprawl causing service concerns	

Questions/Comments Received

1. There is a poor driving culture in London.
    - Bike share increases the amount of people on bikes, which make drivers more aware about cyclists.
2. Theft
    - For private dockless systems it may be an issue, as private operators are typically not spending a lot on operations and rebalancing.
3. What about battery-powered e-assist bikes?
    - These will not be the main type of bike. However, if they are introduced, batteries can be swapped out overnight or when a

battery is running low. E-bikes can be used at a different cost to the user.

4. There is a concern about dockless bikes on the sidewalks, blocking the right-of-way and bikes not in hubs.
    - The program can use financial incentives, education, and outreach to avoid these issues and improve system reliability.
5. What about kick-style e-scooters?
    - Have been around for a year, but there are already concerns about long-term viability. This form of micro-mobility is not within the scope of this business case.

Market Analysis & Outreach Feedback

Based on experiences in other municipalities, there are generally five elements that influence bike share demand:

- Population and demographics;
- Trip characteristics;
- Tourism;
- Infrastructure; and
- Land use.

A propensity analysis was completed to illustrate the relative demand for bike share across London. Overall, there are numerous strengths that the support bike share such as a large student population, walkable downtown and vibrant retail corridors, extensive pathway network, and a relatively high walking, cycling, and transit mode share. However, a low land-use density and de-centralized development patterns do not support bike share use. Detailed results of the market and propensity analysis can be seen in the Market Share & Propensity Analysis Memo.

Online Public Feedback (as of April 2019)

The City initiated public engagement around bike share through the Get Involved London platform, and the preliminary results of engagement were discussed (to April 2019):

- 495+ respondents
- More than 50% have used bike share before
    - Canadian examples such as: Toronto; Montreal; Hamilton; and Ottawa.

    - North America & beyond such as: New York City; Washington; Paris; London; and China.
- Most (83%) suggested they would use bike share
    - 51% once a week or more frequently
- Neighbourhoods of interest include:
    - Downtown
    - Byron/Springbank Park
    - Old East
    - Old South
    - Western/University Heights

Questions/Comments Received

- There is a need to seek the feedback of employers.
- Bike share should exist throughout the city, in all of the top five neighbourhoods listed in the online survey, along TVP, where there is existing cycling infrastructure, and in locations one would typically drive, but not want to find parking.
- What if there was a set of bikes only for City of London employees at City Hall?
    - Noted that there is a concern about theft if there was a “City of London” fleet as people target police bikes for theft.

Scenario Exercise

Three scenarios were reviewed to illustrate how the City of London might launch a bike share system. An overview of each scenario was provided followed by discussion questions.

- Scenario 1 is a publicly funded program where the City of London owns the bike share program (bikes and stations) but may contract operations to a third-party vendor.
- Scenario 2 is a private program where a private firm sets up and operates a bike share program. There would be limited municipal involvement beyond providing a permit to the company, therefore limiting the amount of public investment.
- Scenario 3 is a hybrid of the previous two scenarios, where a public-private partnership (P3) is established. Both partners share a degree of risk and municipal involvement can vary substantially from guaranteeing

exclusive access to the public right-of-way to funding parts of the operation and capital costs.

Scenario Discussion: Staff Workshop

- Need to consider equity across wards regarding bike share implementation to ensure support across the city.
- Consider operations and usage of bike share in the winter time.
    - There is a possibility of not offering winter service initially. However, there are many examples of successful bike share systems with harsh winter conditions (e.g. Montreal, Quebec; Helsinki, Finland).
    - May require Council direction to provide additional funding for winter maintenance of the bike share system.

Scenario Discussion: Stakeholder Workshop

- Are there any other stakeholders to engage?
    - Student residence buildings
    - Current cycling advocates (note: Vancouver bike share is staffed by former bike advocates)
    - Western University
        - Western Active Transportation Society (WATS)
        - Purple Bikes (non-profit cycling co-operative on campus)
- Tourism London
    - Tourists can potentially be 10-15% of ridership base, but account for 40-50% of revenue.
    - Tourism London can promote bike share through neighbourhood spotlights, highlight hubs that are near the Thames Valley Parkway, Downtown, and VIA Rail station.
    - Tourism London can work with hotels in London to promote bike share. They have worked with bike shops in the past to offer rentals.
    - Tourism London can distribute a survey about bike share, but haven't collected any data about bike share in the past.
- St. Joseph's Health Care London
    - City staff to send online public feedback survey to St. Joseph's hospital staff to determine potential usage at their sites.

- There is a concern about using bike share to travel long distances between hospital sites.
- The key issue that St. Joseph's is facing is not having enough parking for patients.

- Downtown London BIA
  - Bike share is targeted to new riders and it requires safe and protected bike infrastructure in order to work.
  - Progress in both bike share and cycling infrastructure will benefit all cyclists.
- Fanshawe College
  - Is there a possibility to have customized bike infrastructure to support bike share? (i.e. custom bike racks).
    - There is a certain level of customization available.
  - Fanshawe is interested in conducting a survey in the summer and fall.
  - Fanshawe is interested in sheltered bike parking infrastructure.
- London Transit Commission (LTC)
  - Will need a strategy to reduce any chances of bike share blocking pedestrian areas around transit stations.
  - LTC might consider a corporate pass program.
  - Bike share is seen as an avenue for collaboration between the City and LTC, as it is a first-last mile solution for transit.
- Middlesex-London Heath Unit
  - Happy to contribute to the promotion of the program.
  - Health Unit is changing office locations. There is an opportunity to target staff who are moving locations and to change modes and try bike share to get to work or for recreation.
  - Health Unit can support an equity program as clients include vulnerable populations/children.
- London Police Service
  - Concerned with a bike theft problem in Downtown London. Will need to monitor how bike share may impact bike theft.
- Western University

- Interested in a partnership similar to McMaster University and the City of Hamilton regarding bike share (i.e. allowing stations on campus)
- Should bike share stations be at residences outside of campus? Requires input from users.
- City to follow up with Western to identify contacts at the University Colleges to engage with them about bike share.

Mobility Hubs and Bike Share Equity Programs in Hamilton, ON

Mobility Hubs

IBI Group provided an example of how bike share provides first and last mile connections at major transit nodes. For example, at the West Harbour GO station or Hamilton GO Centre in Hamilton, GO transit riders often take bike share or park their own bicycles at the transit station and take the train to their destination.

Bike Share Equity Programs

In Hamilton, the Everyone Rides Initiative (ERI) launched in 2017. The ERI is committed to equity in cycling and removes the barriers that prevent people from accessing bikes and cycling as an option for transportation. The ERI program:

- Provides additional bikes and hubs in priority neighbourhoods
- Offers three levels of subsidized memberships
- Provides education about bike share and how to ride
- Conducts outreach to promote and gain confidence in riding

Next Steps (Post-Workshops)

Phase 1

- Consider and incorporate feedback from workshops
- Confirm geographic scope of system
- Develop criteria for locating docking stations or racks
- Identify system infrastructure requirements
- Prepare business case and present to Committee/Council

Phase 2

- Pending Council direction, proceed to RFP process

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Appendix A – Workshop Attendee List

Staff Representative	Department
Don Purchase	Roadside Operations
Brian Tschirsow	Neighbourhood, Children and Fire Services
Justin Adema	City Planning
Laurie Green	Financial Business Support
Pat Tiller	Roadside Operations
James McCloskey	Information Technology Services
Britt O'Hagan	City Planning
Ryan Nemis	City Planning
Kerri Killen	City Planning
Andrew Giesen	Transportation Planning & Design
Peter Kavcic	Transportation Planning & Design
Gregg Barrett	City Planning

Stakeholder Representative	Organization
Jahmoyia Smith	Fanshawe College
Ivan Walker	Fanshawe College
Michelle Cong	Fanshawe College
Laura Pendlebury	Western University
Melissa De Luca	Tourism London
Andrew Sercombe	Downtown London
Michael Pottruff	London Police Service
Tara MacDaniel	Middlesex-London Heath Unit
David Cole	St. Joseph's Health Care London
Ben Goodge	London Transit Commission

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Memorandum

To/Attention	Allison Miller, City of London	**Date**	June 20, 2019
From	Zibby Petch, Vikram Hardatt	**Project No**	118299
cc	Andrew Zalewski, Foursquare ITP		
Subject	**Market Share & Propensity Analysis**		

Introduction

The City of London is completing a feasibility study and preparing a business case for a potential public bike share system. To successfully plan for and launch a bike share system, it is necessary to determine where bike share is likely to succeed, understand key bike trip generators, target user groups, and gather and analyze preliminary feedback from the public.

This memo provides an overview of the market study conducted to find areas that could best support bike share service in London. The market study consists of a qualitative review and propensity (quantitative) analysis to identify a Phase I Service Area.

Target Users

Based on the experience of other bike share systems in cities that share similarities to London, it is possible to identify likely target users for bike share.

Bike share users are a diverse group, but typically include:

- Daily riders that utilize bike share as part of their daily transportation, for a variety of trips such as errands, work, or school. In London, this group is likely to overlap significantly with the existing cycling community. However, bike share also attracts new cyclists. For example, Hamilton's SoBi system 2017 user survey reported that:
    - 17% of users have replaced automobile trips with SoBi trips.
    - 44% of users use their private vehicle less often or much less often because of SoBi. Casual riders (primarily residents), that want to have occasional access primarily for recreational trips to downtown and nearby multi-use pathways.

- One-time riders that are visitors/tourists that are looking to explore London by bike for recreational trips. For example, in Toronto, there have been 110,000 casual riders (24 or 72-hour pass) meant for visitors since 2011. In Boulder, CO, there were approximately 12,500 24 hour pass users in 2017. In Victoria, BC, it is estimated that the majority of users are visitors.
- Students and staff on and around post-secondary institutions form a key portion of bike share users in many municipalities. In London, it is anticipated that the Western University and downtown Fanshawe College campuses will be major hubs in the bike share system, including significant trips between campus and downtown.

Due to the size, land use patterns, and built form of London, successfully attracting all target user groups is critical for the system's success. The biggest opportunities for generating ridership are from residents, employers, and students. Bike share will have to fit into people's daily commutes and travel patterns. The tourist and recreation market are smaller drivers of ridership but have the potential to be financially lucrative.

Key Bike Trip Generators

The City of London has some key bike trip generators that will heavily influence the distribution of any potential bike share network.

Downtown

Residents travelling to or within Downtown London are the most likely to consider trips by bicycle, based on current trip patterns, and this trend is expected to carry over to bike share trips. Generally speaking, trips of 5 kilometres (km) or less are considered to be feasible bike trips. Downtown London generates approximately 13,400 daily trips on the average weekday. The area extending 5 km from downtown generates approximately 37,100 daily trips into downtown on the average weekday.

The National Association of City Transportation Officials (NACTO) determined that the average trip length for casual riders is 4.8 km using a station-based bike share system. For dockless systems, NACTO estimates that the average trip length ranges between 2.4 km and 4.8 km.[1] London has a walkable downtown area which is a destination for many Londoners and residents of surrounding municipalities. These casual riders can use bike share as a way to explore London using an active mode of transportation. Downtown London and the Thames Valley Parkway are well positioned to support this type of ridership. A

[1] National Association of City Transportation Officials (https://nacto.org/bike-share-statistics-2017/)

map of the existing cycling trips taken in London as well as a summary of total trips within and to the downtown core is included in Appendix A.

Thames Valley Parkway

London's Thames Valley Parkway is a multi-use pathway network along the Thames River that could attract bike share users. It allows users to easily connect to and from downtown. Residents, students, and visitors alike could use bike share to access the city's network of shared-use paths, especially those that are fully separated from vehicular traffic and provide recreational value. A map of the existing cycling network in London, including the Thames Valley Parkway, is included in Appendix A.

Institutions of Higher Education

Western University and the downtown Fanshawe College campus are likely to be major trip generators for bike share.

Western's campus is adjacent to the Thames Valley Parkway and within cycling distance of downtown. Western's campus is approximately 4.5 km^2 and bike share can provide a convenient and quick way for students to travel around campus. Bike share would help connect students and staff at Western to downtown London and the Thames Valley Parkway, further integrating Western into the urban fabric of London.

The downtown Fanshawe College campus consists of three buildings located in the heart of downtown and has approximately 2,500 students. The Fanshawe downtown campus is in close proximity to existing cycling infrastructure. Bike share can provide students and staff with a convenient way to travel around downtown and the surrounding area for commuting and recreational activities.

Bike share provides students access to a bike without the need to own, store, and maintain a bike. The important role of post-secondary institutions to bike share schemes was highlighted through peer reviews, including systems in Hamilton, Kingston, Kelowna, Howard County, MD, Boulder, CO, and Topeka, KS. A map of the post-secondary institutions in London is included in Appendix A.

Connections to Transit

Public transit and bike share complement one another. In Toronto, for example, Union Station is the busiest bike share location in the entire city. A bike share system in London can provide residents a first/last mile connection to the City's proposed BRT system, as well as conventional and current express bus service. The system would extend the reach of high-frequency transit service and serve the types of short trips poorly suited for fixed-route bus service.

Other Shared Mobility

Carsharing, provided by Vrtucar, is currently available in London. Bike share in other communities supports car share by providing a transportation option to get to and from parked car share vehicles, similar to how bike share supports the first and last mile transit connection. Car share provides access to a vehicle without the expense of owning and maintaining a car. There is also likely to be overlap in the target markets of car share users and potential bike share users, as these are often used by households with 0-1 cars. A map of these car share locations is included in Appendix A.

Bike Share Propensity Analysis

Drawing on the key bike trip generators and land-use factors, a propensity analysis was conducted to quantitatively explore demand for bike share in London. The propensity analysis considered nine measures which typically correlate with bike share use, and are drawn from experiences with other bike share systems:

- Population density;
- Population density of younger adults (20 – 35 years old);
- Existing active transportation trips (by bike or walking);
- Existing transit trips;
- Zero car households;
- Density of cycling infrastructure;
- Proximity to proposed bus rapid transit (BRT) stations;
- Community centres; and
- Post-Secondary Institutions.

The propensity analysis concluded that downtown, Old East, and Richmond Row-West Woodfield-Talbot Street have the highest bike share propensity. The dense street grid, multi-family housing, and existing active transportation mode share contribute to the greatest potential for a bike share system.

The propensity analysis also concluded that there are some challenges to bike share in London as the city has decentralized development patterns with several nodes of higher density and commercial development that are somewhat isolated from each other by bike. Additionally, the predominant built form throughout the city is lower-density single family homes. There are few areas with densities of over 4,000 people per square kilometre.

See **Appendix B** for the full propensity analysis.

Online Public Feedback

To coincide with the Business Case development, City staff sought community feedback through the City's Get Involved website. It was promoted at the City's 2019 London Home Show display, through social media, and a London Hydro insert.

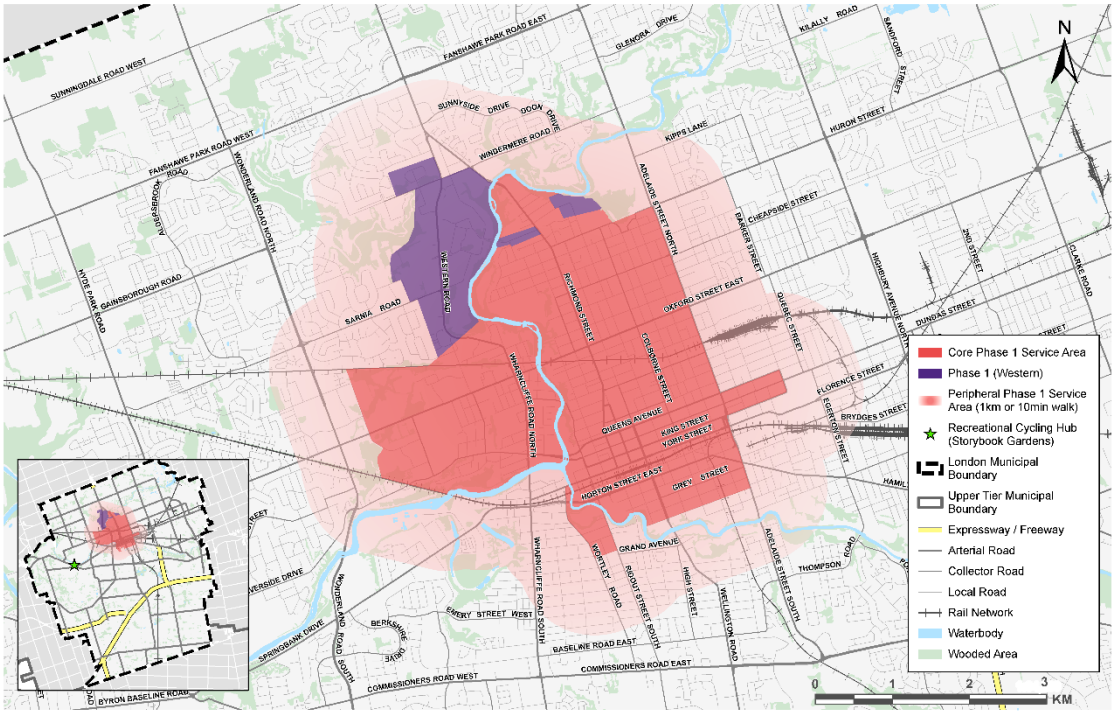
Between late January and late March, 526 responses were received. Results included:

- Of the 98 per cent who answered the question, 82 per cent said they would use bike share in London at least once a month, once a week, or several times a week. Sixteen per cent indicated they would not use bike share.
- Of the 87 per cent who answered the question, 40 per cent indicated they would use it for commuting to/from work, 61 per cent to run errands, and 76 per cent for recreation.
- Of the 88 per cent who answered the question, 71 per cent indicated they would use bike share in the downtown. Other popular potential service areas included 17 per cent in Byron/Springbank Park, 17 per cent in Western/University Heights area, 12 per cent in Old South, and 11 per cent in Old East.

Core Phase I Service Area

Building upon the qualitative review, propensity analysis and public feedback, a preliminary Phase I Service Area for bike share has been identified and is illustrated in Exhibit 1. A full-size version of this map is also included in Appendix C.

Exhibit 1: Bike Share Service Area



The Phase I service area is intended to facilitate a range of trips including:

- Improving transportation options within Downtown London to enable residents to complete short trips such as running errands, or commuting to and from work without a car;
- Improving transportation options for students and staff at Western University and the downtown Fanshawe College campus, providing a convenient, affordable, active options to travel downtown, to and from student housing, or around campus;
- Providing recreational amenity for visitors and residents to explore downtown, the Thames Valley Parkway, and parks adjacent to the Thames River; and
- Providing a first and last-mile solution for transit users to connect to transit stations or stops.

Conclusions

The market review demonstrates the potential initial size and shape of a bike share system in London. Based on public feedback, the location of existing multi-modal transportation infrastructure, and the propensity analysis, Downtown London and surrounding neighbourhoods show the greatest promise for a successful bike share system, and a preliminary Core Phase I Service area has been identified to serve these areas.

While Downtown London and adjacent neighbourhoods represent the area with the greatest potential demand for bike share, bike share could grow to other neighbourhoods in future phases. There are opportunities to extend bike share to commercial areas including locations such as the Masonville mall area in the future. These areas would face additional challenges such as the need for additional re-balancing by bike share operators and potentially lower ridership. However, the type of bike share system chosen will determine the feasibility of expanding the system.

Like other municipalities, there are challenges that may impact the system's success. Population densities downtown are lower than many other communities with bike share systems. London has an extensive multi-use pathway system, but on-street bicycle infrastructure, and in particular separated cycling facilities, are still being expanded within the core. London's bicycle community is relatively small, and this may impact residents' familiarity with the concept of bike share. However, London's bike share business case will put forward recommendations for technology, infrastructure, and policy recommendations to address the market's challenges as these are common challenges other communities face and overcome.

Recommendations

- Launch a privately-operated, hybrid bike share system with City investment in station infrastructure within the identified preliminary Core Phase I Service area

Appendices

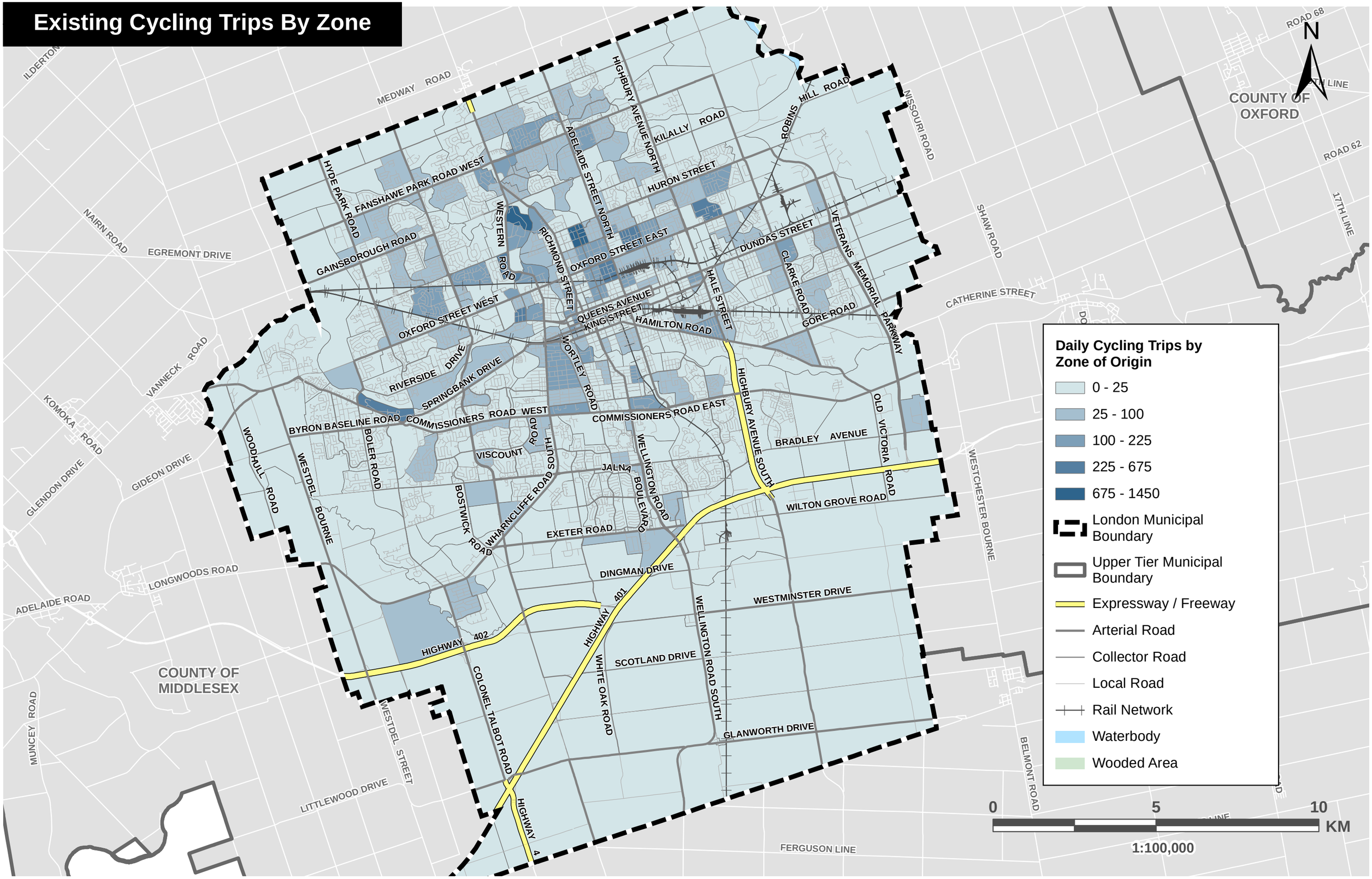
Appendix A – Bike Share Base Maps

Appendix B – Propensity Analysis

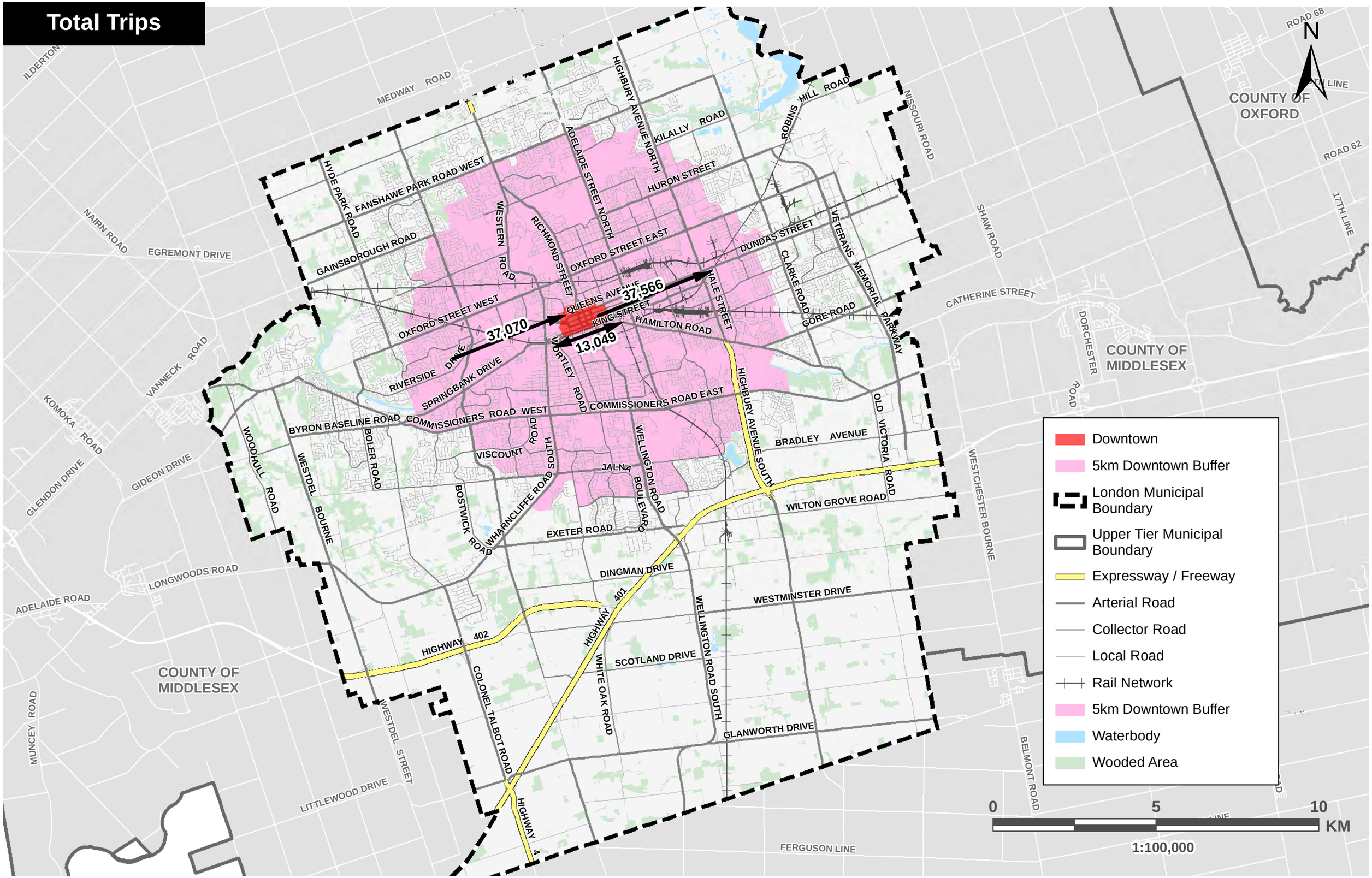
Appendix C – Bike Share Service Area

Appendix A – Bike Share Base Maps

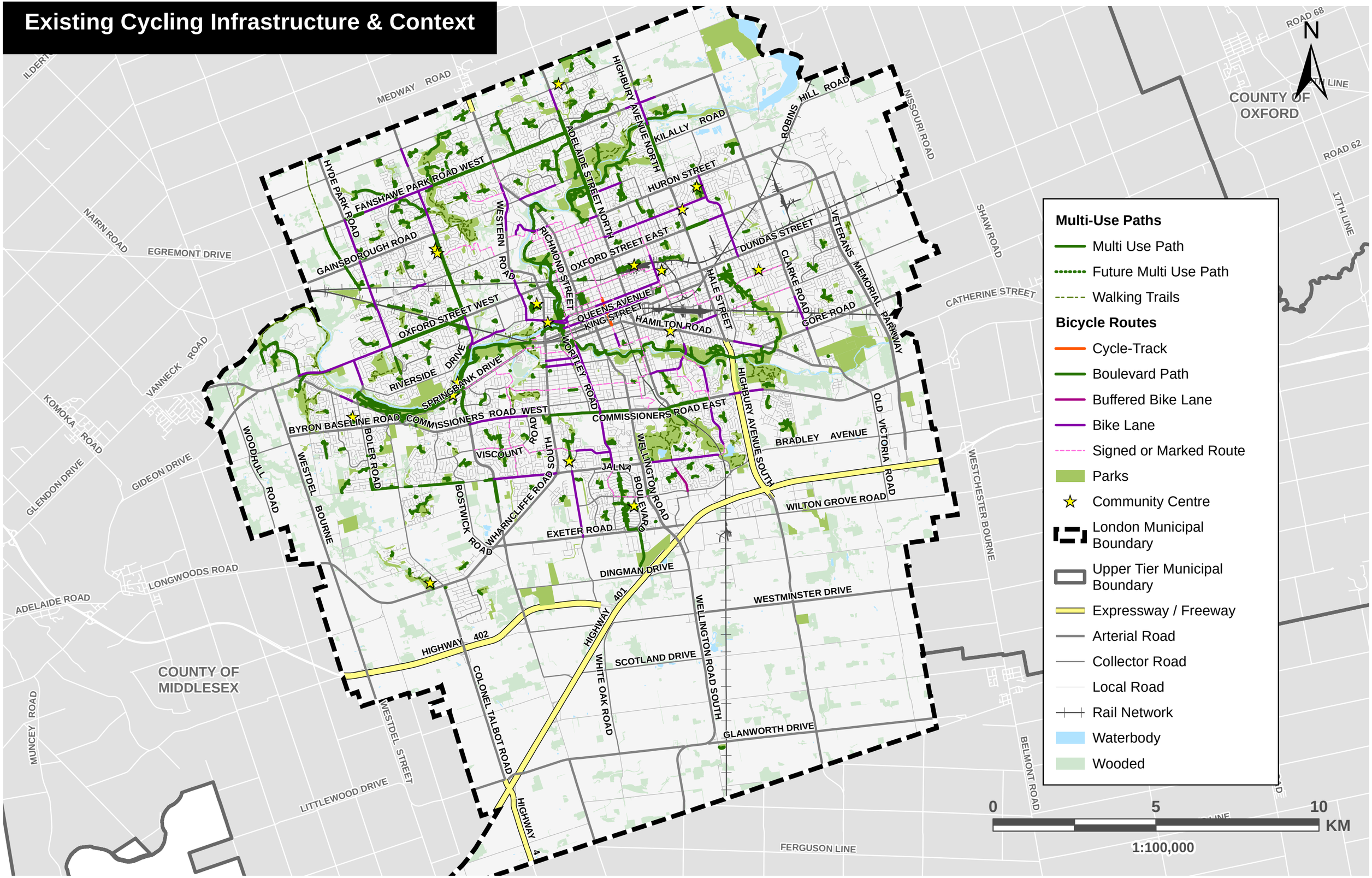
Existing Cycling Trips By Zone



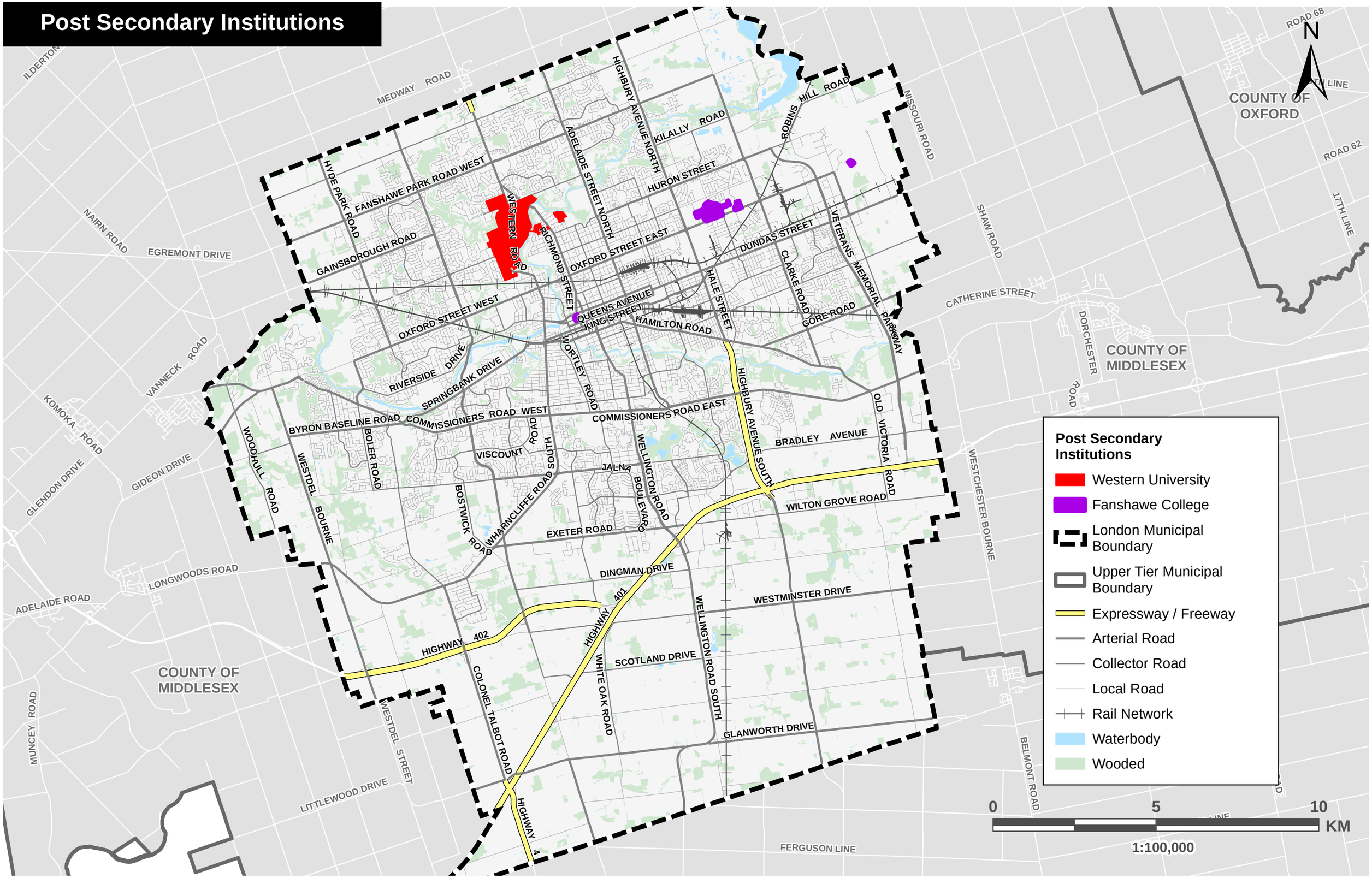
Total Trips


N
37,566
37,070
13,049
Downtown
5km Downtown Buffer
London Municipal Boundary
Upper Tier Municipal Boundary
Expressway / Freeway
Arterial Road
Collector Road
Local Road
Rail Network
5km Downtown Buffer
Waterbody
Wooded Area
0
5
10
KM
1:100,000
COUNTY OF OXFORD
COUNTY OF MIDDLESEX
COUNTY OF MIDDLESEX
MEDWAY ROAD
HIGHBURY AVENUE NORTH
KILALLY ROAD
ROBINS HILL ROAD
NISSOURI ROAD
HYDE PARK ROAD
FANSHAWE PARK ROAD WEST
HURON STREET
ADELAIDE STREET NORTH
WESTERN ROAD
RICHMOND STREET
NAIRN ROAD
EGREMONT DRIVE
GAINSBOROUGH ROAD
OXFORD STREET EAST
DUNDAS STREET
VETERANS MEMORIAL PARKWAY
CLARKE ROAD
SHAW ROAD
CATHERINE STREET
DORCHESTER ROAD
ROAD 68
ROAD 62
17TH LINE
OXFORD STREET WEST
QUEENS AVENUE
KING STREET
HALE STREET
HAMILTON ROAD
GORE ROAD
VANNECK ROAD
RIVERSIDE DRIVE
SPRINGBANK DRIVE
WORTLEY ROAD
HIGHBURY AVENUE SOUTH
KOMOKA ROAD
BYRON BASELINE ROAD
COMMISSIONERS ROAD WEST
COMMISSIONERS ROAD EAST
BRADLEY AVENUE
OLD VICTORIA ROAD
WESTCHESTER BOURNE
GLENDON DRIVE
GIDEON DRIVE
WOODHULL ROAD
WESTDEL BOURNE
BOLER ROAD
VISCOUNT ROAD SOUTH
JALNA BOULEVARD
WELLINGTON ROAD
BOSTWICK ROAD
WHARNCLIFFE ROAD SOUTH
EXETER ROAD
WILTON GROVE ROAD
DINGMAN DRIVE
WESTMINSTER DRIVE
LONGWOODS ROAD
ADELAIDE ROAD
HIGHWAY 401
HIGHWAY 402
WHITE OAK ROAD
WELLINGTON ROAD SOUTH
SCOTLAND DRIVE
GLANWORTH DRIVE
COLONEL TALBOT ROAD
WESTDEL STREET
MUNCEY ROAD
LITTLEWOOD DRIVE
HIGHWAY 4
FERGUSON LINE
BELMONT ROAD

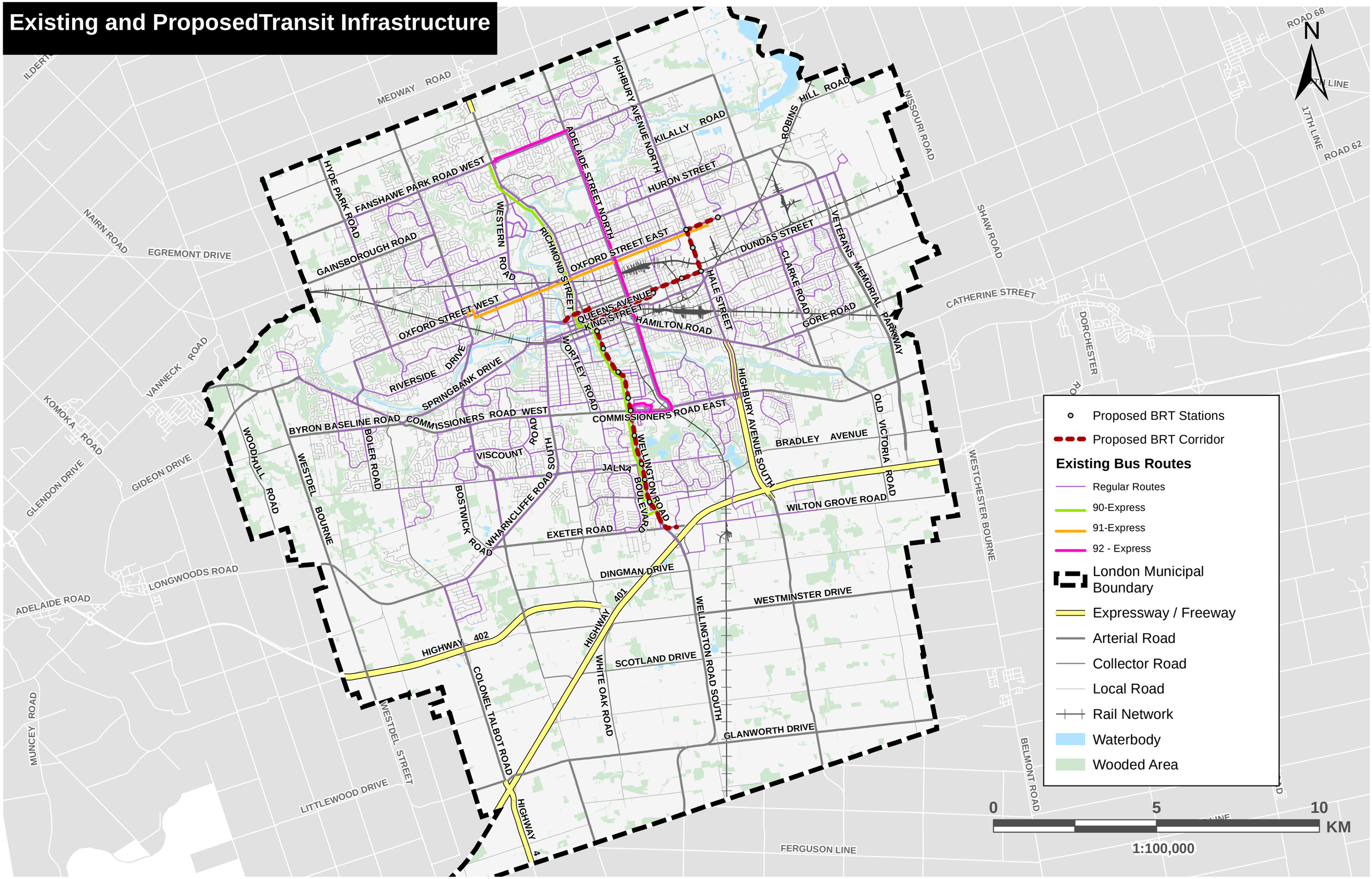
Existing Cycling Infrastructure & Context



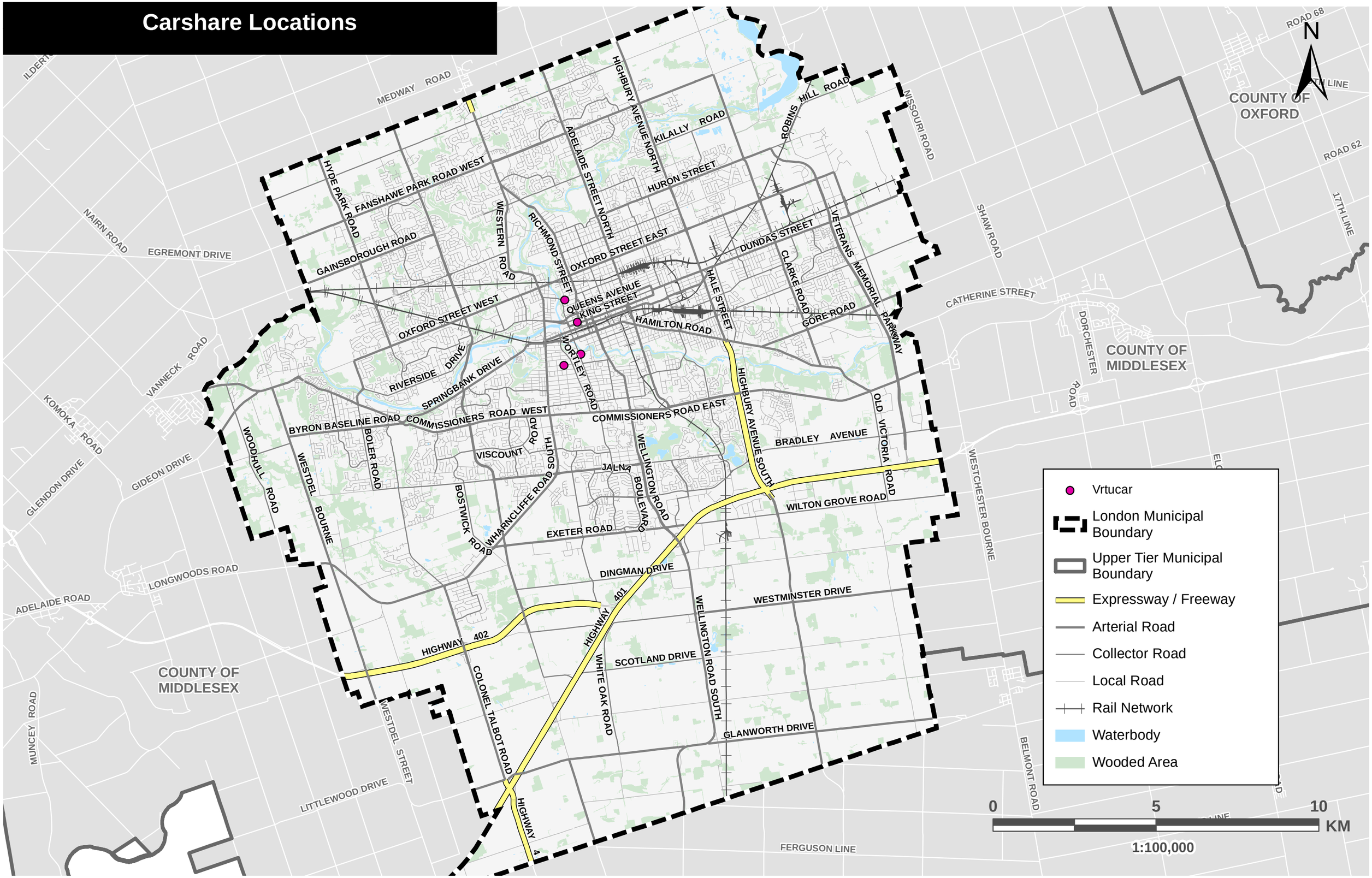
Post Secondary Institutions



Existing and ProposedTransit Infrastructure



Carshare Locations



Appendix B – Propensity Analysis

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ibigroup.com

Memorandum

To/Attention	Allison Miller, City of London	**Date**	July 18, 2019
From	Andrew Zalewski, Foursquare ITP	**Project No**	118299
cc	Zibby Petch, Vikram Hardatt, IBI Group		
Subject	**Propensity Analysis**		

This memorandum explains the methodology and gives the findings for bike share propensity for London, Ontario.

Methodology

The propensity analysis is done to find areas that could best support bike share service in London. The results of the propensity analysis show the relative likelihood of bike share ridership demand. As the analysis is relative, a score in one community does not necessarily correlate with the same score in another. For example, a high-scoring area in London may be merely a moderate scoring area in Toronto.

The analysis is organized by a grid of 500-meter x 500-meter cells clipped to London's boundary. The size of the cell corresponds roughly to a coverage area of a bike share station (5 to 10-minute walk).

Table 1 outlines the data and measures used to create the propensity map. Most of these factors relate to high bike share demand, including population density, existing mode share for bike/walk/transit, availability of bike infrastructure, and concentration of retail activity. The team created several iterative maps to understand the impact of weighting and eventually arrived at the following factors and weighting that best reflected the nature of demand in London.

Allison Miller, City of London – July 18, 2019

Exhibit 1: Data used in propensity analysis

Data	Source	Weighting
Average people per square kilometre by dissemination area	Statistics Canada	2
Average young people (20 – 35 years old) per square kilometre	Statistics Canada	1
Average trips by bike or walking	City of London Household Travel Survey 2016	2.5
Average trips by transit		0.5
Average number of zero car households	City of London Household Travel Survey 2016	1
Metres of bike infrastructure within one kilometre	City of London	0.5
Distance from nearest proposed bus rapid transit (BRT) station	City of London	0.5
Community center within a square	City of London	0.5
Institutions of Higher Learning	City of London	0.5

The propensity analysis uses a proportional scaling, where each factor is normalized into a score between 0 and 1. For example, if a population density of 1000 people per square kilometer equaled a score of 0.2, 2000 people per square kilometer would be scored a 0.4. The analysis constrains outliers at the top of each sample range so that values over a particular percentile rank (99% for most measures), receive a score of 1. A weighting factor was applied to the factors considered stronger predictors of bike share demand.

Findings

Figure 1 shows a map of the results of the bike share propensity analysis.

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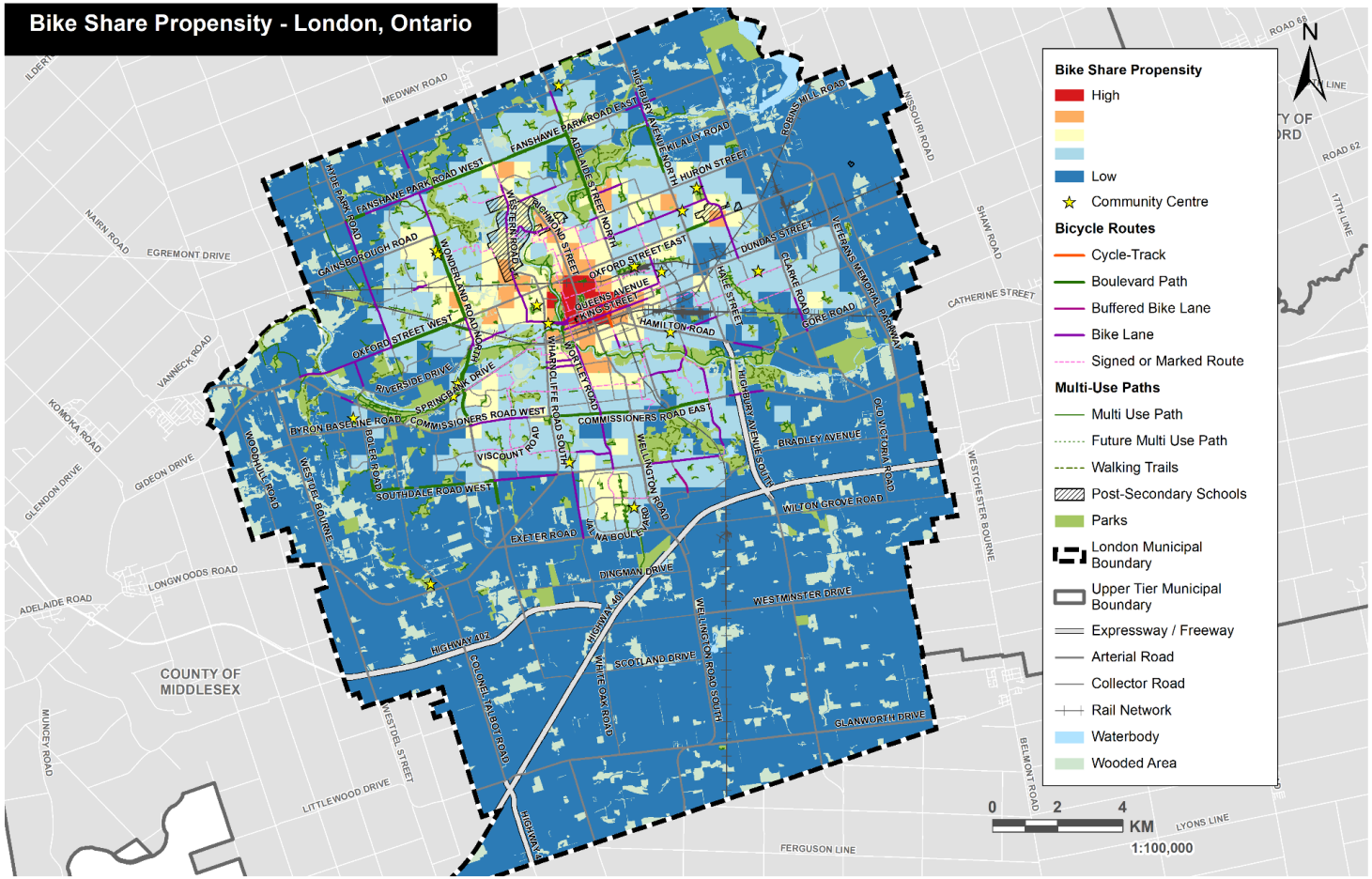
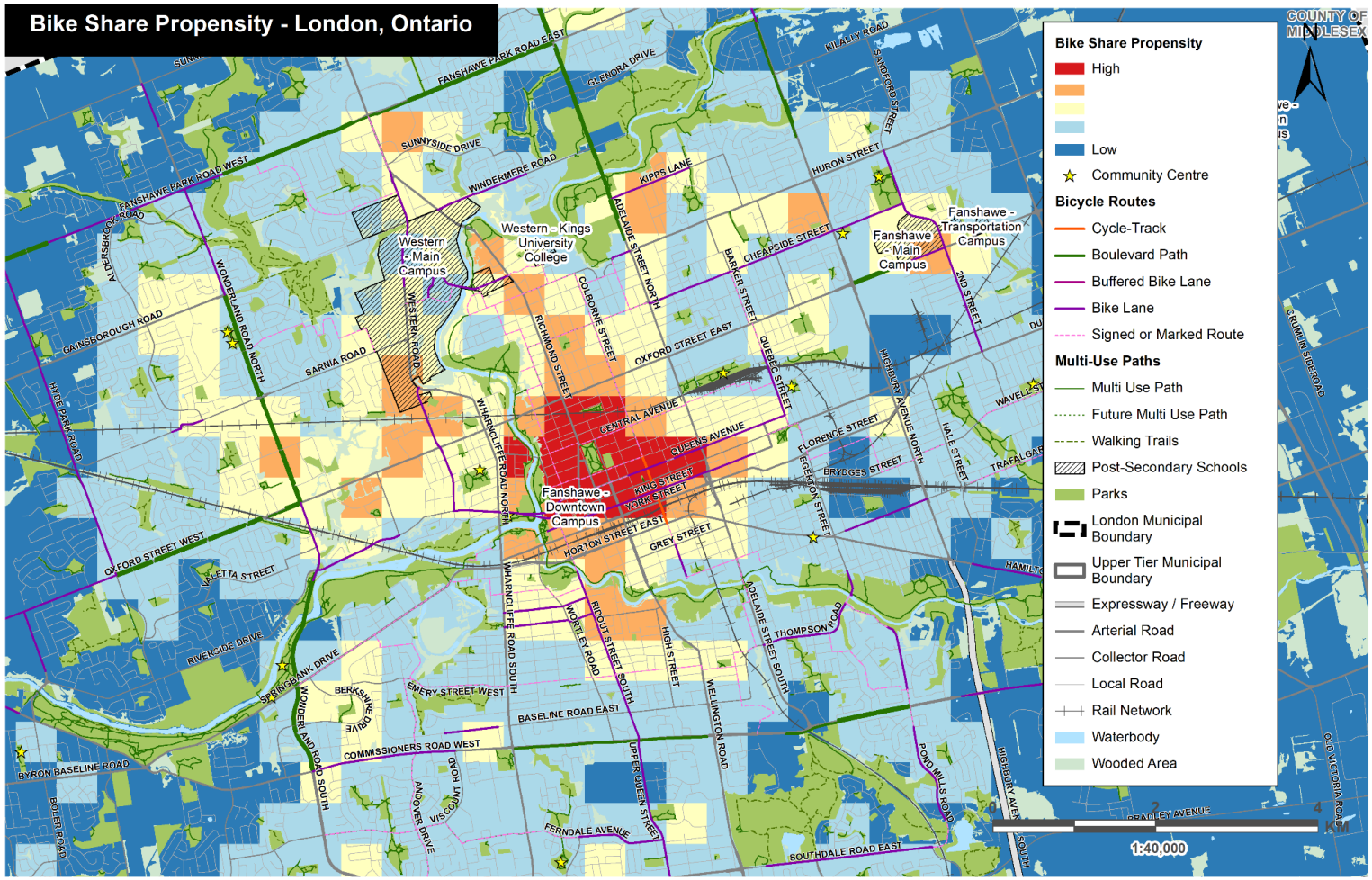
ibigroup.com

Exhibit 2: Results of Bike Share Propensity Analysis for London, Ontario



Allison Miller, City of London – July 18, 2019

Exhibit 3: Results of Bike Share Propensity Analysis for Downtown London, Ontario



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ibigroup.com

The area of highest bike share propensity is concentrated in Downtown London. Here a dense street grid, multi-family housing, and existing reliance on active modes of transportation contribute to the greatest potential for a bike share system. The other highest scoring areas are located in areas just adjacent to the Downtown core.

High

- Downtown London
- Old East Village
- Area around Victoria Park and Richmond Row

Moderate-high propensity areas in London generally surround the high scoring areas, although there are some pockets outside of the Downtown core.

Moderate High

- Richmond Street corridor between Downtown and Masonville
- Old South, notably along south bank of the Thames River
- Western University and University Heights
- West London, near the intersection of Wonderland Rd N. and Oxford Street

The propensity analysis identifies a few challenges that bike share in London may face.

- The city has decentralized development patterns, with several nodes of higher density housing and commercial development. These nodes translate into higher propensity areas but are somewhat isolated from one another. For example, the area near Wonderland Road N. and Oxford Street is an auto-oriented neighbourhood, but high-density housing and a concentration of young adults and zero-car households drive up results. The surrounding land-uses may not be conducive to high rates of cycling.
- Even in the historic core of London, lower-density single family homes are the predominant development type. Few areas feature densities of over 4000 people per square kilometer.

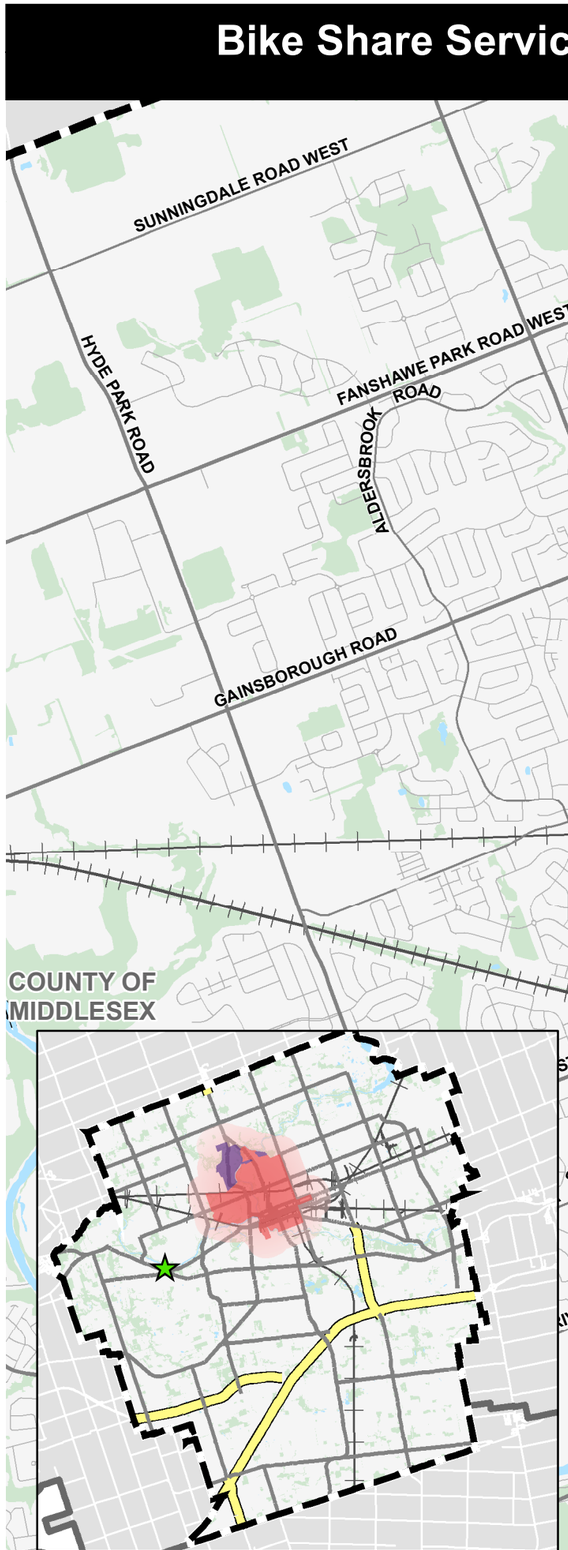
Note that the propensity analysis is just one data point in developing a market analysis for bike share. There are several factors that influence bike share demand that are challenging to measure in a quantitative fashion. These range from the local bicycle culture, to land use, and even topography. While the

factors above all correlate to higher bike share ridership, unique variables often determine the busiest bike share locations in a given city. For example, in

Washington D.C. the busiest bike share station is at Dupont Circle, a mixed-use neighbourhood that is neither in the heart of the central business district nor the most densely populated residential area in the city. The station succeeds because it includes both a large concentration of jobs and housing which results in all-day demand. The station is also located along a bike route that connects uphill neighbourhoods to the Washington Metro. Many riders use bike share to travel downhill to access transit.

Appendix C – Bike Share Service Area

Bike Share Service Area



N

Core Phase 1 Service Area
Phase 1 (Western)
Peripheral Phase 1 Service Area (1km or 10min walk)
Recreational Cycling Hub (Storybook Gardens)
London Municipal Boundary
Upper Tier Municipal Boundary
Expressway / Freeway
Arterial Road
Collector Road
Local Road
Rail Network
Waterbody
Wooded Area

0 1 2 3 KM
1:35,000

SECTION E

Get Involved Contribution Summary (January-March 2019)

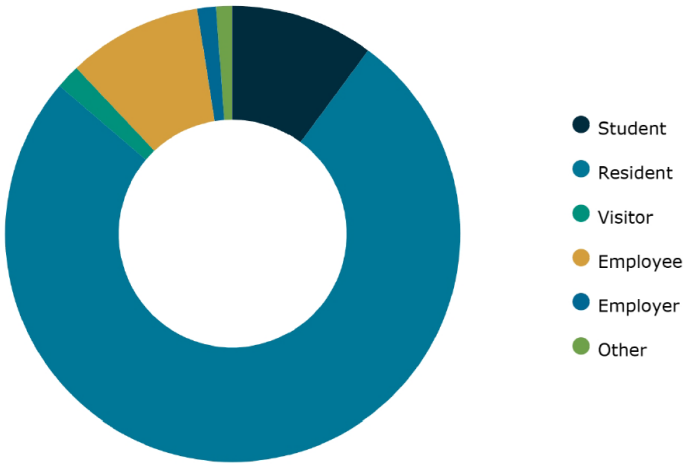
Open

We are Looking for Your Preliminary Feedback
Bike Share in London

495	526
Contributors	Contributions

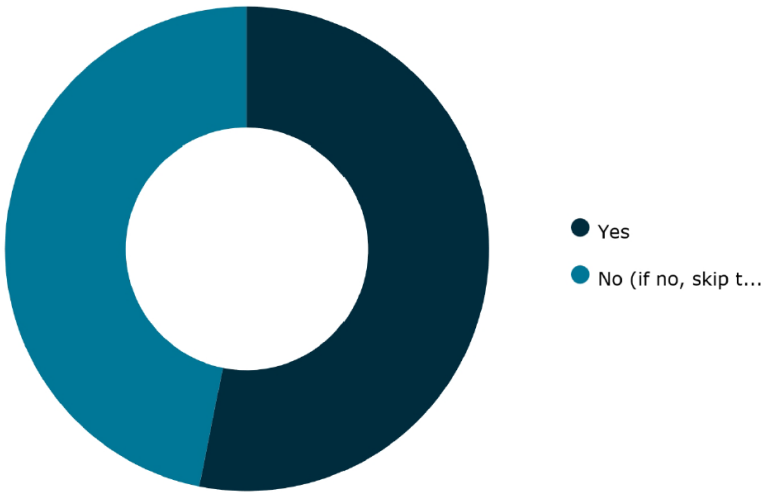
Contribution Summary

1. 1. Are you providing your feedback from the perspective of a:
Radio Buttons | Skipped: 3 | Answered: 523 (99.4%)



Answer choices	Percent	Count
Student	10.13%	53
Resident	76.10%	398
Visitor	1.72%	9
Employee	9.56%	50
Employer	1.34%	7
Other	1.15%	6
Total	**100.00%**	**523**

2. 2. Have you used bike share elsewhere? Required
Radio Buttons | Skipped: 0 | Answered: 526 (100%)



Answer choices	Percent	Count
Yes	53.04%	279
No (if no, skip to question #6)	46.77%	246
Total	**100.00%**	**526**

3. 3. Where? (list locations)
Short Text | Skipped: 250 | Answered: 276 (52.5%)

Toronto
Contribution 276 of 276 | 23 March, 2019

Toronto, Warsaw, different cities in Europe
Contribution 275 of 276 | 21 March, 2019

everywhere
Contribution 274 of 276 | 17 March, 2019

Montreal
Contribution 273 of 276 | 16 March, 2019

Chicago, San Diego, Philadelphia, Toronto, Michigan, Mackinaw Island
Contribution 272 of 276 | 13 March, 2019

Prague, Paris, Amsterdam
Contribution 271 of 276 | 12 March, 2019

toronto
Contribution 270 of 276 | 5 March, 2019

Montreal, Ottawa, Toronto
Contribution 269 of 276 | 4 March, 2019

Proudfoot and wonderland
Contribution 268 of 276 | 3 March, 2019

Ottawa
Contribution 267 of 276 | 3 March, 2019

Toronto
Contribution 266 of 276 | 1 March, 2019

montreal
Contribution 265 of 276 | 28 February, 2019

London, England
Contribution 264 of 276 | 28 February, 2019

China
Contribution 263 of 276 | 28 February, 2019

Hamilton
Contribution 262 of 276 | 28 February, 2019

toronto
Contribution 261 of 276 | 28 February, 2019

Toronto
Contribution 260 of 276 | 27 February, 2019

Hamilton and Toronto
Contribution 259 of 276 | 27 February, 2019

Toronto, Chicago
Contribution 258 of 276 | 27 February, 2019

Montreal
Contribution 257 of 276 | 27 February, 2019

Showing 20 latest contributions only. Please see the data results for all contributions to this question.

4. 4. Tell us about your experience
Long Text | Skipped: 268 | Answered: 258 (49%)

Was very convenient
Contribution 258 of 258 | 23 March, 2019

Great way to navigate through the city.
Contribution 257 of 258 | 21 March, 2019

good
Contribution 256 of 258 | 17 March, 2019

easy checking in and out. very affordable comfartable bikes
Contribution 255 of 258 | 16 March, 2019

Each location uses different technology, apps, etc. Some systems designed for 'commuters in the core' with short time periods for rental and high price surges if you go over the allotted time. Others more cater to tourists where they want you to take th...
Contribution 254 of 258 | 13 March, 2019

Easiest to use when theres a one pass for all transportation modes. This makes convenient and easy accessible for everyone. Also renting fee per hour or part of the day should be possible.
Contribution 253 of 258 | 12 March, 2019

Easy to check in and you can leave the bike at another place. Also, there is bicycle infrastructure there. There is not much bicycle infrastructure in London
Contribution 252 of 258 | 5 March, 2019

Such a great way to explore the city, especially when the stations are conveniently located near where you're going. One of my friends in Montreal gave up using his own bike for daily commutes because it was easier to hop on a bikeshare to work than lug h...
Contribution 251 of 258 | 4 March, 2019

I really enjoyed being able to rent and drop off at the next location and not be tied to the bike every day was great
Contribution 250 of 258 | 28 February, 2019

Two different locations, two different days. (1) Near Hyde Park: too few bikes: one empty station, another broken station. Frustrating. (2) Near a big RR station, took it to a different part of London. Easy, simple, convenient.
Contribution 249 of 258 | 28 February, 2019

I loved it! I could go grocery shopping, to work, and all I needed was a pass. Even when I moved to another city I didn't have to worry about transportation of, or fiscal ability to purchase a whole bike, when I wasn't there indefinitely.
Contribution 248 of 258 | 28 February, 2019

Easy, available for use near McMaster I dont remember the cost
Contribution 247 of 258 | 28 February, 2019

Everything was great and convenient. I can't tell you how many bikes I've had stolen in London over the years. I'd rather rent.
Contribution 246 of 258 | 28 February, 2019

Great experience, was a quick and cost effective way of getting around the city when I needed it.
Contribution 245 of 258 | 27 February, 2019

Hamilton's Sobi Bike Share program is incredible. Checking out bikes was done easily through your smartphone. The bike would unlock with a U-lock sort of contraption and you could ride it and lock it up wherever your ride finished. It was very convenient ...
Contribution 244 of 258 | 27 February, 2019

Loved it!!
Contribution 243 of 258 | 27 February, 2019

Was really easy and cheap. Bikes needed some maintenance but it was easy to swap out because they had lots of stations. Was a really great way to get around the city
Contribution 242 of 258 | 27 February, 2019

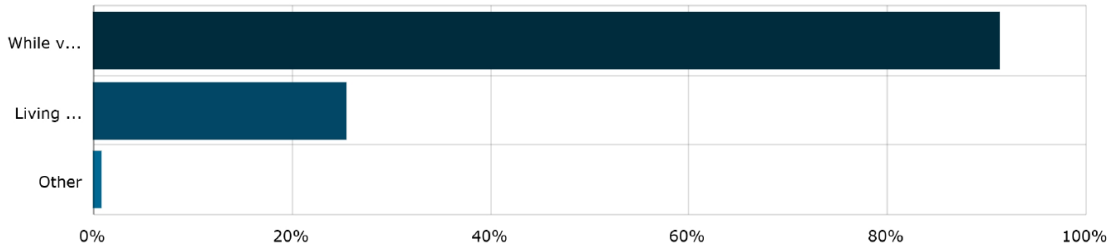
It was a great way to get around the city as opposed to using the bus.
Contribution 241 of 258 | 27 February, 2019

Very convenient and easy to use
Contribution 240 of 258 | 27 February, 2019

It was 15+ years ago but very easy to use and free
Contribution 239 of 258 | 27 February, 2019

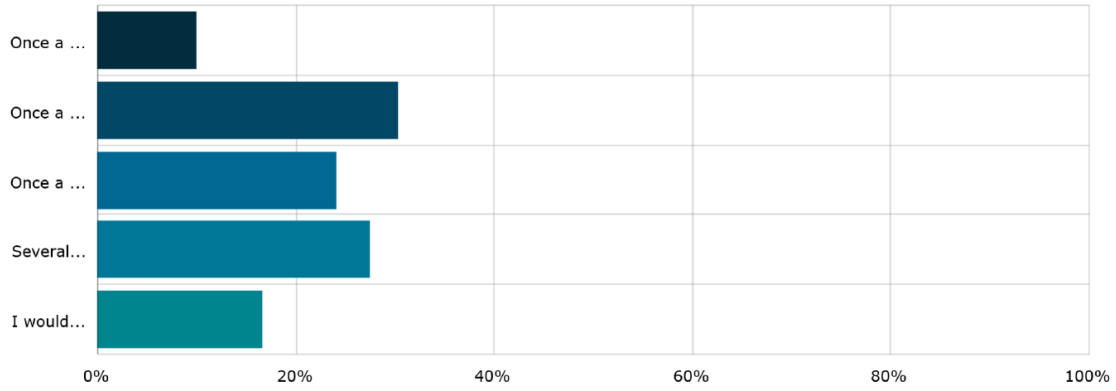
Showing 20 latest contributions only. Please see the data results for all contributions to this question.

5. 5. Did you use bike share:
Multiple Checkbox | Skipped: 250 | Answered: 276 (52.5%)



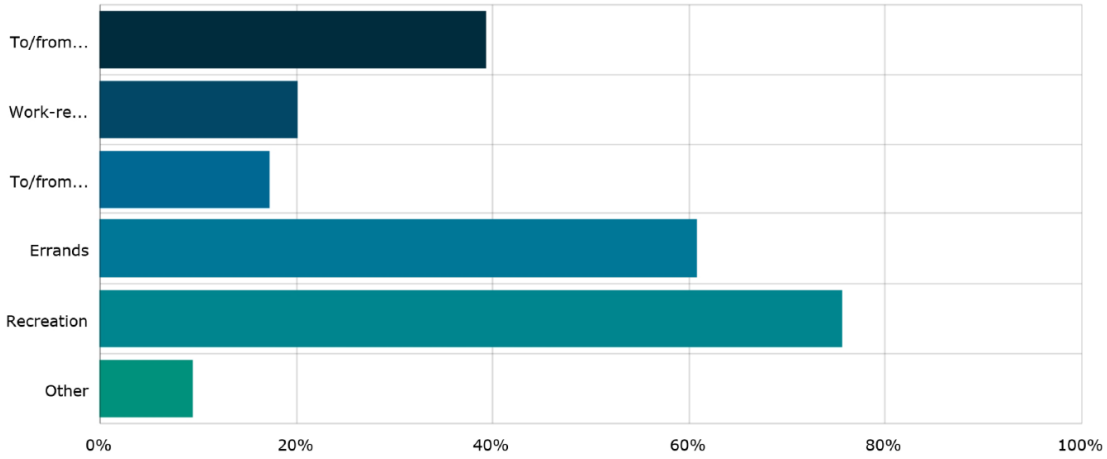
Answer choices	Percent	Count
While visiting another city	91.30%	252
Living in a city with a bike share program	25.36%	70
Other	0.72%	2

6. 6. How often would you see yourself using bike share in London?
Multiple Checkbox | Skipped: 10 | Answered: 516 (98.1%)



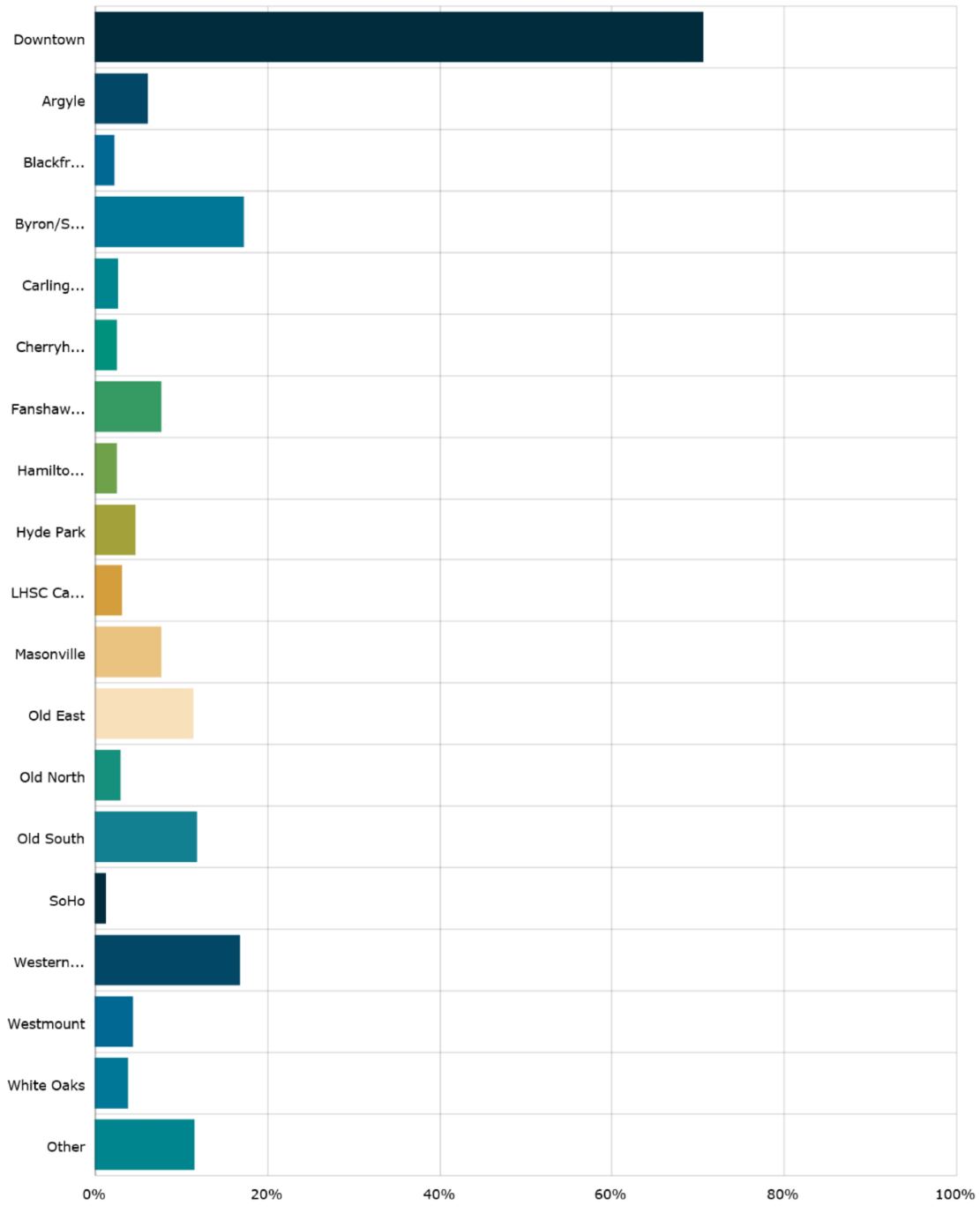
Answer choices	Percent	Count
Once a year	9.88%	51
Once a month	30.23%	156
Once a week	24.03%	124
Several times a week	27.33%	141
I wouldn't use bike share	16.47%	85

7. 7. What would you use bike share for? (Check all that apply)
Multiple Checkbox | Skipped: 67 | Answered: 459 (87.3%)



Answer choices	Percent	Count
To/from work	39.22%	180
Work-related trips	20.04%	92
To/from school	17.21%	79
Errands	60.78%	279
Recreation	75.60%	347
Other	9.37%	43

8. 8. Looking at the list below, which potential service areas would you use bike share in?
Multiple Checkbox | Skipped: 65 | Answered: 461 (87.6%)



Answer choices	Percent	Count
Downtown	70.50%	325
Argyle	6.07%	28
Blackfriars/Kensington	2.17%	10
Byron/Springbank Park	17.14%	79
Carling/Kipps Lane	2.60%	12
Cherryhill/Proudfoot	2.39%	11
Fanshawe College (main campus)	7.59%	35
Hamilton Road	2.39%	11
Hyde Park	4.56%	21
LHSC Campus	3.04%	14
Masonville	7.59%	35
Old East	11.28%	52
Old North	2.82%	13
Old South	11.71%	54
SoHo	1.08%	5
Western/University Heights	16.70%	77
Westmount	4.34%	20
White Oaks	3.69%	17
Other	11.50%	53

9. 9. For the Guiding Principles for this project (shown top right), do you:
Radio Buttons | Skipped: 27 | Answered: 499 (94.9%)

Answer choices	Percent	Count
Agree	74.15%	370
Disagree	9.02%	45
Don't Know	16.83%	84
Total	**100.00%**	**499**

10. 10. Please provide your comments about the Guiding Principles for this project (shown top right).
Long Text | Skipped: 275 | Answered: 251 (47.7%)

I would love to see our city more bike friendly. I would love to bike safely as a family. Might do well to include family friendly options too. I think it would improve the air quality and health in our city. The plan doesn't mention anything about the...
Contribution 251 of 251 | 28 March, 2019

As a very comfortable and experienced Cyclist our current infrastructure will not support a bike share program. A few bike lanes will not support this project and until a network of dedicated space that allows true movement through the core and outlying ...
Contribution 250 of 251 | 19 March, 2019

Financial - agree with. Program should stand on its own merit but don't overstate ridership which is typically done on programs like this. Easy to ramp up program if ridership is good, but sunk costs we are stuck with. Mobility and access is accurate...
Contribution 249 of 251 | 13 March, 2019

People will steal these bikes or wreck them. This will become very costly
Contribution 248 of 251 | 9 March, 2019

Bicycle theft needs to be addressed first. This is the cart before the horse.
Contribution 247 of 251 | 6 March, 2019

The problem in London is that there is not enough bicycle infrastructure here to make the use of bike share viable. For those of us who cycle here, we have our own bikes. For people who visit, this place is not very bicycle friendly. You need to create th...
Contribution 246 of 251 | 5 March, 2019

Able to rent a bike, to cycle along the TVP and other branches, would be great.
Contribution 245 of 251 | 4 March, 2019

Bring this to our city quickly. Fossil fuels are killing everyone
Contribution 244 of 251 | 3 March, 2019

Though I am not familiar with whether the BRT will be completed soon, I agree with the Guiding Principles of the project. When I began this year, I rode my bicycle every day to school and home, as it was convenient and I felt that I was helping to reduce ...
Contribution 243 of 251 | 1 March, 2019

Most important: you carefully didn't provide simple, clear options for "I don't think that London should have a bike share" or "I don't think that this is a City government priority, at all" or "this should be 100% handled by private industry". The only ...
Contribution 242 of 251 | 28 February, 2019

I hope it's implemented sooner than the compost! Also dislike that you can't select more than one area of London.
Contribution 241 of 251 | 28 February, 2019

I wouldnt use it in London as I have my own bike but I think it would be great for the downtown core and our students at western and fanshawe
Contribution 240 of 251 | 28 February, 2019

I've seen bike sharing in other cities and thought it was a terrific idea.
Contribution 239 of 251 | 27 February, 2019

We need to find alternative solutions to driving in London. This is an interesting idea!
Contribution 238 of 251 | 27 February, 2019

I think that the Guiding Principle of 'Community Building' is completely underrated. It's great that you guys have it there though of course! Hamilton's Sobi Bike program was huge in terms of the city's growth over the past 5 years and in London it can on...
Contribution 237 of 251 | 27 February, 2019

Please bring this program to London. We spend so much money to improve roads for cars. Im reallt tired of living in a city that privileges cars so much over bikes and other forms of non-polluting transportation.
Contribution 236 of 251 | 27 February, 2019

I cant open the pdf
Contribution 235 of 251 | 27 February, 2019

Bike lanes will be needed on Oxford St and Richmond St and there needs to be stricter policing of vehicles not respecting bike laws/using bike lanes as turning lanes etc. Also, there's a huge bike theft problem in London. This needs to be considered as we...
Contribution 234 of 251 | 27 February, 2019

I think there is a piece missing from this one - Leverage the bikeshare system and accompanying cycling usage as a tool to promote livability, and attract or retain residents, businesses and visitors. Should add stronger and more definitive language about...
Contribution 233 of 251 | 27 February, 2019

Consider using left over bikes from police auctions and refurbishing them. We need to reduce our consumption footprint in this world and not just buy new all the time.
Contribution 232 of 251 | 27 February, 2019

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Memorandum

To/Attention	Allison Miller, City of London	**Date**	July 23, 2019
From	Zibby Petch (IBI Group), Vikram Hardatt (IBI Group), Andrew Zalewski (Foursquare ITP)	**Project No**	118299
Subject	**Bike Share Background Details and Preliminary Analysis – Executive Summary**		

Overview

The City of London has prepared a business case to launch a public bike share system. This memo provides a summary of the technical work completed throughout the project, including a peer review of existing bike share systems, market share and propensity analysis, stakeholder workshops and online public consultation, and the business case findings and key recommendations.

Peer Review

The project team conducted a peer review of 10 bike share systems across North America (refer to **Exhibit 1)**. The peer review included: 1) examples of Canadian bike share systems; and 2) examples of bike share systems in communities with similar characteristics to London in terms of size, demographics, and land-use patterns.

Exhibit 1: Bike Share Peer Review Summary

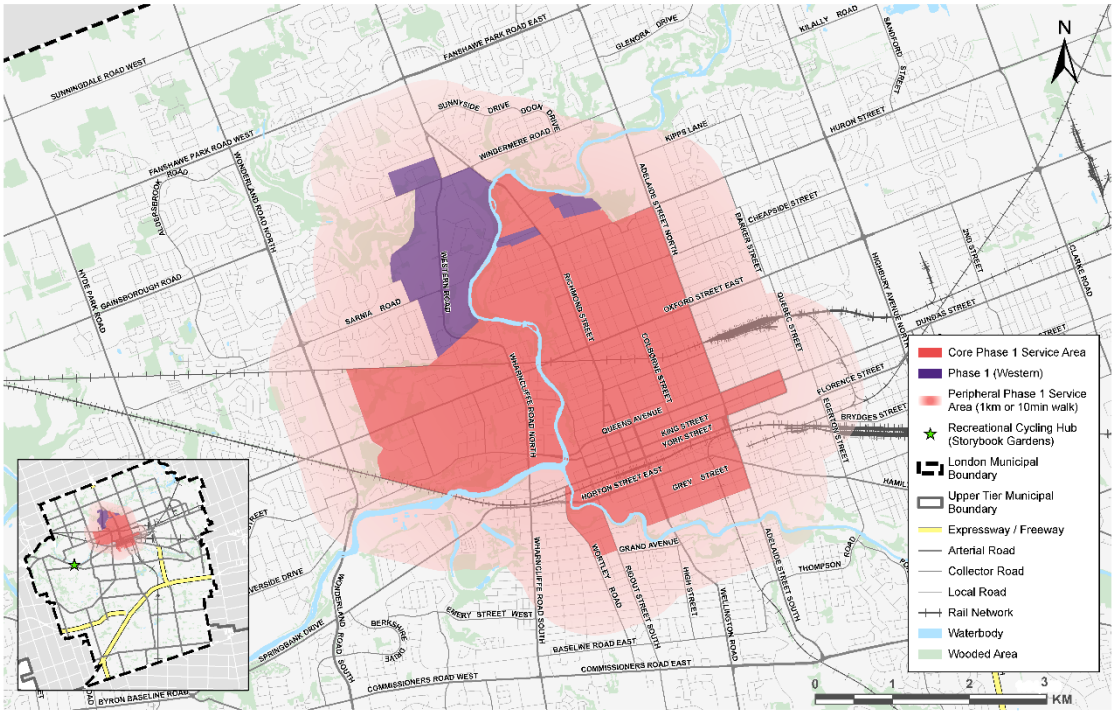
Location	Type of System	Ownership	Operator	Year Launched
Hamilton, ON	Hybrid	Public	Non-profit	2015
Toronto, ON	Docked	Public	Private	2011
Waterloo Region, ON	Dockless	Private	Private	2019
Kingston, ON	Dockless	Private	Private	2019
Calgary, AB	Dockless	Private	Private	2017
Kelowna, BC	Dockless	Private	Private	2018
Victoria, BC	Dockless	Private	Private	2018
Howard County, MD	Docked	Private	Private	2017
Boulder, CO	Docked	Private	Private	2011
Topeka, KS	Hybrid	Public	Public	2015

Peer review system operators and/or City representatives were contacted to review system challenges and successes, operating and capital costs (where available), and notable lessons learned to inform the business case for London.

Market Share & Propensity Analysis

A market share and propensity analysis was completed to identify the potential initial size of a bike share system in London. Based on public feedback, the location of existing infrastructure, and propensity analysis, Downtown London and surrounding areas show the greatest promise for a successful bike share system. A recommended Core Phase I Service area is shown in **Exhibit 2**.

Exhibit 2: Preliminary Core Phase I Service Area



For additional information on the market share and propensity analysis, see Bike Share Preliminary Analysis – Part One, **Section D**.

Stakeholder Workshops and Public Consultation

The City of London hosted two workshops on April 8th, 2019, together with IBI Group and Foursquare ITP, including one for City staff and one for community stakeholders. Both workshops generated feedback about how bike share might impact other City services and the broader community. Overall, each workshop indicated support for the program and some stakeholders indicated they would like to be further engaged to help plan, implement, and support the program.

To coincide with the Business Case development, City staff sought community feedback through the City's Get Involved website. It was promoted at the City's 2019 London Home Show display, via a London Hydro insert, and through social media. Between late January and late March, 526 responses were received. Key results included:

- Of the 98% who answered the question, 82% said they would use bike share in London at least once a month, once a week, or several times a week. 16% indicated they would not use bike share.
- Of the 87% who answered the question, 40% indicated they would use bike share for commuting to/from work, 61% to run errands, and 76% for recreation.
- Of the 88% who answered the question, 71% indicated they would use bike share in the downtown. Other popular potential areas included 17% in Byron/Springbank Park, 17% in Western/University Heights area, 12% in Old South, and 11% in Old East.

Business Case Analysis

Background

There are a wide range of ways that bike share systems are organized in North America. If the City of London chooses to move forward with bike share, it will need to formulate a business model that best meets local needs. There are four key components to any bike share business model:

- **Program Ownership and Governance:** Ownership refers to both the physical equipment and responsibility for decision-making. Until recently, most North American systems were owned by a municipality or a non-profit. Today, several private firms have started dockless bike share programs that operate without public financial support. Regardless of the ownership model, the City will need dedicated resources to oversee bike share operations and ensure operators comply with local rules and regulations.
- **Program Operations:** Operations and ownership are frequently decoupled from one-another in the bike share industry. While nearly all private and non-profit bike share systems operate their system directly, most publicly-owned systems contract out operations to a third-party vendor in exchange for a fixed-fee or revenue guarantee.
- **Funding Structure:** Bike share programs have limited access to provincial and federal funding. Most systems rely largely on user revenue, sponsorships, private donations, and advertising. Public and non-profit programs frequently require public funding for capital and operating, while private dockless systems operate without public assistance. Private dockless firms (e.g. Lime, DropBike, JUMP) have yet to demonstrate a sustainable business model but are backed by funding from venture capital and ridehailing firms.

- **Technology:** Bike share systems generally utilize three types of docking technologies: a dock-based station system, a dockless system, and a hybrid system. These options are described in more detail in the technical details below. All three docking technologies may utilize conventional or electric-assist bicycles.

Technical Details & Scenario Comparison

Capital costs for the three common docking technologies are shown in **Exhibit 3**. A dockless or hybrid system are the most likely options for London as docked-systems are increasingly uncommon in small and mid-size systems due to their cost and complexity. A dockless system can be easily adapted into a hybrid program by incorporating station infrastructure. The implementation costs will vary considerably for hybrid systems based on the design of stations.

Exhibit 3: Comparison of Three Common Bike Share Technology Types for a 300 Bicycle System

	Dock-Based System	Fully Dockless	Hybrid System
Description	Bicycles locked to mechanical docks at designated stations. All stations include a payment kiosk and signage.	Bicycles do not need to be locked to a fixed object. No station infrastructure.	Dockless bicycles combined with simple stations. Stations may vary from a bicycle rack to location with a payment kiosk and signage.
300 Bicycles	$ 380,000	$ 670,000	$ 670,000
60 Hubs/Stations	$ 2,630,000	$ 0	$ 850,000[1]
Total	**$ 3,010,000**	**$ 670,000**	**$ 1,520,000**
Pros	• Least prone to theft • Alleviates concerns over improperly parked bicycles.	• Low capital costs. • Flexible operations – trips can start or end anywhere in a service area	• Reduces likelihood of improperly parked bicycles due to use of stations. • Combines pros of dockless and docked.
Cons	• High capital costs. • More complex to operate due to need to manage dock/bicycle availability. • Trips limited to destinations near stations.	• Many dockless systems struggle with enforcing bike parking regulations; bicycles end up blocking the public right-of-way. • More susceptible to theft and vandalism.	• More expensive than a dockless system • Does not fully eliminate concerns over theft, vandalism, and improperly locked bicycles.

[1] Assumes that all stations/hubs include bicycle racks and signage. Twenty percent of station would feature a kiosk. Station costs can scale down or up based on the type of station investment. Eliminating kiosks would significantly reduce costs.

	Dock-Based System	Fully Dockless	Hybrid System
	• Mechanical stations are a point of failure.		

Implementation Scenarios

The study team forecasted the costs borne by the City of London under the three most likely operating scenarios: a City-owned bike share program, a fully privately owned and operated program, and a program that is privately operated but includes a public contribution in the form of station infrastructure.

Exhibit 4: Costs to City under three Operating Scenarios for a 300 Bicycle System[2]

	Publicly-Owned	Privately-Owned No public investment	Privately-Owned Public investment in stations
Technology Assumption	Hybrid System	Dockless System	Hybrid System
Annual Ridership	125,000	125,000	125,000
Capital Costs (City Costs)			
Bicycles (300)	$ 670,000	$ 0	$ 0
Stations/hubs (60)	$ 860,000	$ 0	$ 860,000
Total	**$ 1,530,000**	**$ 0**	**$ 860,000**
Annual Capital State of Good Costs[3]	$ 160,000	$ 0	$ 70,000
Annual O&M Costs (City Costs)			
City Administrative staff (1/3 FTE)	$ 35,000	< $35,000	< $35,000
Program Operations	$ 540,000	$ 0	$ 0
Program Marketing and Outreach	$ 15,000	$ 0	$ 0
Total	$ 590,000	< $35,000	< $35,000
Annual Revenue (City Revenue)			
User fees	$ 280,000	$ 0	$ 0
Advertising/Sponsorship	unknown	$ 0	$ 0
Total	$ 280,000	$ 0	$ 0
Net Subsidy[4] (City Costs)			
Total	$ 310,000	< $35,000	< $35,000
Operating Subsidy per Rider	$ 2.48	$ 0.28	$ 0.28
Pros and Cons			
Pros	• Maximizes City control over program	• Lowest cost to City	• City maintains some control over bicycle deployment.

[2] All figures are planning-level estimates and subject to change based on underlying assumptions and implementation details.
[3] Assumes City sets aside a fixed annual sum to replace equipment at end of useful life.
[4] City subsidy may be offset by usage fees (i.e. sponsorship, advertisings or grant opportunities)

	Publicly-Owned	Privately-Owned No public investment	Privately-Owned Public investment in stations
	• Feasible even with weak private-sector interest in operating bike share in London	• Absolves City of financial risk associated with funding and operating bikeshare.	• Station infrastructure could be used to generate advertising revenue.
Cons	• City takes on risk and responsibility for bike share. • Most costly scenario for City.	• City has little control over program deployment. • Lack of stations could result in bikes being improperly parked on sidewalks.	• City could be left with redundant station infrastructure if private operator folds.

See additional information in Bike Share Preliminary Analysis – Part One, **Section G**.

Key Recommendations & Findings

Building on the business case, it is recommended that the City of London:

- Implement a Request for Proposals (RFP) process to obtain pricing and a vendor that can implement a bike share system in London based on the following key parameters (assuming 300 bikes are required):

  i) all bikes, software and hardware to be provided by the vendor;
  ii) all operating and maintenance costs to deliver the bike share system to be provided by the vendor;
  iii) project duration for up to three years with two, one year options at the sole discretion of the City of London;
  iv) operate in the service areas delineated by the City of London through a licensing agreement;
  v) a one-time capital investment into bike sharing parking installations provided by the City of London (racks that are available to bike share users and other London cyclists);
  vi) work with City staff to develop an equity program for low-income Londoners and an employer membership program; and
  vii) allow an option whereby the vendor can propose an alternative program and costing arrangement.

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Memorandum

To/Attention	Allison Miller, City of London	**Date**	July 19, 2019
From	Zibby Petch, Vikram Hardatt	**Project No**	118299
cc	Andrew Zalewski, Foursquare ITP		
Subject	**Background Details and Preliminary Analysis to Inform a Comprehensive Business Case**		

Background

This memo outlines the background details and preliminary analysis to inform a comprehensive business case for a London, Ontario bike share program. The first section provides a general overview of bike share business models, while the second section provides technical details on the potential cost and structure of a London bike share system.

Each community exploring bike share must define its own model by considering strategic goals, financial constraints, and political realities. A number of key decisions have to be made before London can move forward with implementing bike share, most notably: ownership and program governance structure, operating model, equipment procurement and technology, and funding model. The final shape of the program will involve discussions with a broad group of stakeholders in government, the business community, and non-profits. The following memorandum provides more detail on the elements of a bike share business plan and highlights the pros and cons of various business models. The memorandum concludes with a discussion of next steps if London decides to move forward with a public bike sharing program.

Overview of Business Plan

There is great diversity in how bike share systems are organized and operated. A bike share program's business model can be divided into four key components:

- **Ownership and Governance**: Who owns the equipment, holds the financial risk, and is responsible for oversight and decision making?

- **Operations**: How are program operations structured? Is the program owner or a third-party responsible for operations?
- **Technology**: What type of bicycles and stations (if applicable) will be used? What method is used by riders to access the bicycles? What kind of technology is used to monitor the program?
- **Funding**: How are the system funding operations and capital costs? What is the program's funding needs?

This technical memo will outline the various options under each component of the business plan. The study team has chosen to pay special attention to the two most likely models for the City: A publicly owned but privately-operated program and a for-profit system regulated by the City

Governance and Ownership Model

One of the first steps in developing a bike share program is determining a basic governance and ownership structure. When we speak of governance and ownership we specifically refer to two things: (1) who owns the physical infrastructure of bike share and takes on the financial responsibility (and risk) for the program and (2) who ultimately makes decisions about the system, including its size, operating structure, and user costs. The ownership model of programs falls into one of three general categories: **For-Profit** (either fully private or part of a "sole-source" agreement), **Public**, and **Non-Profit**.

For-Profit Bike Share

A key decision for the City of London will be whether to pursue a **For-Profit-owned** bike share system regulated by the city or one that will be run by a **public** or **non-profit** entity. Until a few years ago, for-profit bike share programs were rare in North America. Nearly all of these older bike share systems required public or private funding to support operations and the private sector was primarily engaged in bike share through the sale of services and equipment to public or non-profit entities. Over the last three years, the bike share market has changed significantly due to an infusion of over $2 billion in venture-capital funding. Start-ups like Spin, Lime, and Drop Bike, are launching shared bicycle and scooter programs in cities across North America. Parallel to this, established firms in the mobility market like Uber and Lyft have acquired bike share firms (e.g. Social Bikes, the company supplying equipment for SoBi Hamilton) and are looking to bike share as part of a strategy to diversify their businesses into multi-modal mobility providers.

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Types of Private-Sector Systems

There are two methods other cities have approached engaging for-profit bike share firms:

- Setting up a regulatory and licensing framework that permits compliant firms, (possibly more than one) to operate bike share programs.
- Actively solicit a for-profit bike share operator through a sole-source agreement.

Under the first option, London would create the necessary regulatory structure to permit private firms to freely operate within the city. Several cities in North America have followed this model. In cases like Seattle, Dallas, San Francisco, and Washington D.C., multiple competing micro-mobility firms eventually established bike share or scooter share systems in the same market. Competitive bike share markets have seen a great deal of volatility as firms quickly enter and exit the market or change their approach (e.g. shift from bicycles to scooters). London, due to its smaller size and lower density, may struggle to attract a for-profit system without additional incentives.

Other cities have turned to sole-source agreement (sometimes referred to as a concession or franchise) as an alternative method to attract a for-profit bike share system. Under a sole-source, London could competitively solicit proposals from for-profit bike share firms. The winning bid(s) would be granted the right to operate in the public right-of-way, often with certain stipulations tied to the contract such as coverage or level of service requirements. To incentivize respondents, some cities grant the operator the exclusive right to operate bike share in the public right-of-way or include financial incentives like publicly-funded capital investments. Kingston, Ontario has entered into an agreement with Drop Bike that includes a City commitment to improving bicycle infrastructure in exchange for Drop Bike operating the system at no cost to the City. Such partnerships can be a fairly low-risk way of establishing a bike share program.

Trade-Offs of For-Profit Ownership

The opportunity to create a bike share program at little to no cost to the public may seem attractive, but London should be aware of some limitations with the private model. To properly enforce local regulations (or terms in a sole-source agreement) the City will need to invest resources in oversight and enforcement. Other communities have struggled to ensure for-profit firms meet regulatory requirements without proactive monitoring of bike share operations. As mentioned previously, there is a great deal of volatility in the bike share marketplace. It is unclear whether any for-profit bike share firms make a profit and some firms have abruptly left cities or overhauled their business models.

The firms active in the market today may not be around in a few years due to bankruptcy or consolidation. There are already a few high-profile examples of providers abandoning large numbers of bicycles when they close-up shop; for example, in Dallas the bike share firm Ofo scrapped hundreds of bicycles when it withdrew from the city.

Public or Non-Profit Programs

Many bike share systems, including most of the larger programs, are **publicly-owned**. Public ownership is especially common when the program depends on extensive public financial support. Under this model, the public entity purchases the bike share equipment and either directly operates the system or hands over equipment to a private vendor for operations.

Non-profit bike share systems function similarly to public programs, except that instead of being directly owned by a public entity, an existing or newly established non-profit organization owns the system and operates it for the public's benefit. Many early bike share programs in North America, as shown in Exhibit 1 below, were established by non-profits, and non-profits are still prominently represented among new bike share programs. The decision to establish a non-profit vs. a publicly owned system often comes down to local circumstances. Non-profits tend to appear in places where there was a strong non-governmental advocate for bike share. Some cities have pursued a non-profit model to insulate the program from political volatility.

Trade-Offs of Public or Non-Profit Ownership

Public and non-profit systems have a number of benefits. The City of London would be able to exert a greater deal of control over operations, the placement of stations, and quality of service if it directly owned the program or had a non-profit control it as an intermediary. In many markets where a private-firm simply would not be sustainable, a subsidized public or non-profit system is the only feasible way to run bike share. The greatest downside is that a public or non-profit system will place greater risk and responsibility on the City to operate bike share. Even independent non-profits may require public bail-outs to operate, and publicly owned systems often result in a long-term public financial commitment.

Exhibit 1: Ownership Structures among Bike Share Programs

Model	Description	Example
Public	City, public authority, or regional owner. Operations can be contracted out to a third party.	Toronto Bike Share

Model	Description	Example
Non-Profit	Existing non-profit or dedicated non-profit program. Similar to public model.	Waterloo (Former Community Access Bike Share); Boulder, CO; Bixi (Montreal)
Private Sole-Source	Private organization owns and operates the program through a sole-source agreement with City.	Divvy (Chicago), Citi Bike (New York), Dropbike (Kingston)
Private Other	Private firm owns and operates bike share. Multiple firms may be active in the same market.	Seattle (Jump, Lime, Spin); Washington D.C. (Hopr, Jump, Ridecell, Lime, Riide)

Operating Model

The next component of a bike share system's business plan is the operating model. There are two models for bike share operations: direct operations by the owner or contracted operations by a third-party vendor.

Direct Operations

Several North American bike share systems are directly operated, meaning that the system owner also operates the system. Directly operated systems are most common among non-profit owned systems like SoBi Hamilton, and for-profit systems like Citi Bike in New York or Drop Bike (several cities). If the City pursues a for-profit bike share system, it will likely be directly operated by its owner or a designated intermediary. There are limited instances of a for-profit owner contracting out operations to a third-party. Such arrangements are unusual – for example Spin's operations in Albuquerque are managed by Zagster, another micromobility firm active in the City. This arrangement might become more common as firms seek to cut costs and consolidate operating infrastructure.

Vendor Operations

An alternative is to outsource operations to a third-party vendor. The responsibility of the vendor can vary, but they typically include most of the day-to-day operating functions like maintenance, rebalancing of bicycles, and customer service. The benefit of contracted operations is that system owners with no prior bike share experience can quickly launch a system. Vendors help reduce the risk of rolling out a bike share system by bringing operating expertise to the program. They also typically carry the necessary liability insurance needed to operate a bike share program.

As with many aspects of business models for bike share, not all systems fall neatly within these two operating structures. For example, a system may

contract out only limited operating functions like maintenance, or it can be directly operated by the system owner and have a bike share vendor support start-up. Many bike share equipment providers can provide the IT platform (websites, apps, payment system) to a system regardless of who operates the program.

Selecting the Ideal Operating Model

As bike share is a quickly evolving industry, operating structures continue to evolve as well. The ideal operating model for London will depend on the selected owner of the system. If the City decides to attract an established for-profit operator, London will likely have limited involvement in shaping the operating model. If the City pursues a public or non-profit system, the City and its partners will have to determine its strategy for operating the program.

Exhibit 2: Direct Operations vs. Contracted Operations

Model	Pros	Cons	Examples
Directly Operated	• Provides the system owner greater control over system costs and delivery of bike share to the market. • The model can result in the lowest operating costs.	• Significantly increases the operational burden of bike share on the system owner. • Requires that the operating entity have a degree of bike share expertise.	Bixi (Montreal) Bixi (Montreal); Citi Bike (New York)
Contracted Operations	• Reduces the risk borne by the system owner. • Allows systems to rely on the expertise of vendors with North American-wide experience. • Minimizes owner staffing needs. • Insurance requirements and liability can be	• Owner removed from daily operations of the bike share system. • Vendor costs include profit-margins that can increase costs.	Toronto Bike Share; Capital Bike Share (Washington, DC)

	transferred to the vendor.		

Operating Vendor Contracting

In procuring a vendor, the system owner must strike a balance in the request for proposals (RFP) stage between providing lengthy requirements and allowing vendors the flexibility to propose innovations that may ultimately lower costs and streamline operations. As companies continue to innovate, RFP guidelines written today could become out of date in the near future. The following are some guidelines for the procurement process. This list is not intended to be an exhaustive inventory of what an RFP should include but instead highlights some key areas.

Vendor Responsibilities

In procuring vendor services, an RFP should require vendors to propose in detail what services they intend to provide, along with relevant qualifications. Some of the required functions a vendor should offer include:

- All functions associated with daily operations, such as field inspections, rebalancing of bicycles, performance tracking, and crisis management.
- Maintenance and support for all equipment.
- Management of back-end systems such as IT and payment platform.
- Development and maintenance of a website.
- Customer support call-center.
- Liability insurance coverage for the program.
- Equipment installation.
- Design and printing of maps, brochures, and marketing material.
- The owner may request that the vendor includes on its team someone with sponsorship development capabilities.

The RFP should permit vendors to suggest additional services beyond the ones listed above. Vendors should also be free to subcontract specific functions. The RFP process is an opportunity to push the technical envelope and explore

unique solutions for London; once a vendor is selected, the City will have less leverage to negotiate new technical solutions or features.

Contract Length

The ideal contract length depends on the ownership and operating model. Many systems that contract out operations to a third party, choose to utilize contracts with one-year terms but multiple options for renewal. The benefit is that the system owner can switch vendors or renegotiate contract terms fairly easily.

Contracts that require a significant investment by the operator, including sole-source agreements, typically have longer terms. In cases where the vendor is making a major capital investment in the program, they are likely looking for a contract that provides stability; cities have signed agreements of up to nine years as part of sole-source agreements.

Service Metrics

Vendor contracts should include service metrics that contractors are responsible for maintaining. Metrics allow the bike share administrator to ensure vendors are providing the necessary level of service. Generally, stricter metrics result in higher operating costs. Common service metrics include:

- **Rebalancing requirements:** Rebalancing of bicycles to ensure a supply of bicycles is available across the system. For example, Capital Bikeshare sets a service standard that no station may remain full or empty for more than 3 hours between 6 a.m. and midnight. Staff may fill or empty stations late at night in anticipation of rush hour demand. Other systems set less strict standards such as 12 hours. Less stringent rebalancing standards may lower the cost of operations.
- **Fleet Deployment:** A percentage of the system's fleet will be out of service at any one time. Deployment standards provide guidelines for what proportion of the fleet must be in active operations at any one time. Requirements may be reduced in the winter due to lower demand and fleet management strategies.
- **Inspection and Maintenance:** Contracts should stipulate how often bicycles are inspected. Operators should have standards for how often a station is visited each month by field inspectors, as well as how often bicycles are inspected and maintained. Capital Bikeshare requires that bicycles be inspected and maintained at least every 30 days. Maintenance schedules may vary depending on the intensity of use in the program.

- **Customer Service Standards:** Contracts should stipulate quality of service standards including call centre wait times and customer service satisfaction ratings. Standards may stipulate that telephone operators are available in more than one language.

Recommended Reporting Requirements

London, through its contract or permitting structure, should outline what data bike share operators are required to provide the City. The following is a list of the types of data commonly requested from operators:

- Membership
  - Annual Members (New, Expired, and Renewed)
  - Casual Members
  - Member residency information
- Ridership and Usage
  - Daily ridership (by member type)
  - System-wide or total ridership (by member type)
  - Station-level ridership (origin and termination) (by member type)
  - Ridership by day (preferably with average daily temperatures reported)
  - Trips per bicycle
- Operations and Maintenance
  - Rebalancing activity
  - Instances (and length of time) of full and empty stations
  - Any service disruptions or suspensions
  - Number of bicycles in the fleet and in service
  - Collision summary
  - Bicycle and station repairs

The City will have more latitude to dictate data sharing requirements under an arrangement where it owns the system and contracts out operations to a vendor. In any model where a third-party entity owns and operates bike share, the data sharing requirements typically need to be set as part of the sole-source agreement or operating permit.

Allison Miller, City of London – July 19, 2019

Technology

Bike share technology is rapidly changing as new companies continue to enter the North American bike share equipment market. Most early adopters of bike share have utilized “station-based” systems, including solar-powered stations with automated docks that secure bicycles. Users can typically track bicycle availability over a smartphone or online, and access bicycles through a payment device[1] or at a station kiosk. These systems have proven successful because of their durability and theft deterring design. One major downside of many dock-based bike share systems is that they are expensive to purchase and install.

An alternative to station-based systems are smart-bike systems that utilize simplified docks or no docks. These systems use “smart bikes” with built-in locking and communication equipment. Smart bike systems benefit from lower capital costs, simplified station site planning and installation, and greater flexibility. These systems have become much more prevalent in the last few years and are increasingly the more common solution for smaller bike share systems.

London should consider a procurement process that is open-ended enough to solicit a variety of technological solutions. The following is a list of recommended features:

- Durable bicycle design that can withstand heavy usage.
- A robust locking mechanism that allows bicycles to be locked at regular bicycle racks.
- Ability to create designated “stations” where trips must end or begin. These stations can be as simple as branded bicycle racks or a virtual perimeter.
- Option to lock up a bicycle during a rental without ending the trip.
- Ability to pair stations with a payment kiosk. Kiosks will make it easier for walk-up customers to access the system and do not have to be located at every station.
- Simple user interface at kiosks, on the web, and on smartphones.
- Easily replaceable parts and components.
- Clear track record of successful use of technologies in other communities.

[1] Most often riders can access the system through an RFID-enabled membership fob/card but other technologies are available such as system access over the phone or through a NFC enabled devise.

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Procurement

Today most bike share systems are closed proprietary systems that provide little flexibility to incorporate bicycles, IT systems, or other equipment from other vendors. While proprietary systems are unavoidable to some degree in the bike share marketplace, London could encourage in the RFP process technology that allows for future compatibility with third-party equipment. For example, the location of bicycles should be reported through a standardized format (known as GBSF) so that the system is compatible with several trip planning tools.

If London decides to procure its own equipment, the City should also consider decoupling vendor operations from bike share equipment vendor. While equipment and vendor services may be procured together under one contract, the program owner should carefully consider the implications of entering a contract that stipulates that the equipment vendor has an exclusive agreement with a particular operator. In that case, should an operating vendor prove to be performing unsatisfactory, London will have the maximum flexibility to select a new company to operate the system without impacting equipment procurement, maintenance, or operations. However, such a structure that decouples equipment and operations can introduce additional complexities and more administrative management.

Fundraising and Revenue Generation

Bike share programs rely on a diverse range of funding sources to support both capital and operating expenses. A bike share system in London most likely cannot rely solely on user revenue to support operations and capital. Instead, the program will require diverse funding sources that may include private contributions, advertising revenue, sponsorship agreements, and public funds. The following describes how bike share programs generate revenue. If the City pursues a for-profit operator, responsibility for securing funding and revenue will fall solely on the operator. In the case that a public or non-profit system is established, the City may play a larger financial role in supporting the program.

Fee Structure

Bike Share systems often divide users into two groups:

- Registered Users: Frequent riders of the program who hold a monthly or annual subscription.
- Casual Users: Infrequent riders who either hold a short-term subscription (e.g. day-pass, three-day pass) or pay-per-trip.

Programs tend to take two different approaches to structuring user fees and membership costs across these two groups.

Subscription Based Model

Many bike share systems in North America utilize a subscription model of pricing, where users purchase memberships that are valid for periods of time ranging from one day to one year. Once a membership is purchased, a user is afforded an unlimited number of trips at no extra cost as long as the trip is below a certain duration, typically between 30 to 60 minutes. Once that timeframe has concluded, riders incur usage overage charges. The benefit of this model is that it encourages a quick turnover of bicycles and ensures that bicycles are available for the largest number of users each day. This pricing structure also benefits regular users, as annual members become familiar with how the system works and are therefore less likely to take long trips that incur additional usage fees. This model leads to a disproportionate amount of revenue being generated by casual users, as their cost per trip tends to be higher due to the initial upfront cost of a short-term pass.

Trip or Time-Based Pricing

A common pricing structure is to charge users a price per trip (either as a flat per trip price or per minute) instead of a subscription. Per-trip pricing may attract users for whom a subscription would not make financial sense. A variation of this model is to allow subscribers a certain allotted number of free riding minutes each day that can be spread over multiple trips, instead of allowing unlimited trips under a certain length; this can be especially attractive if smart bike technology is selected for the program as the user may be able to lock the bicycle somewhere without a station while the “clock is still ticking.” Finally, to better moderate the distribution of bicycles throughout the system, variable pricing could be implemented to encourage riders to take trips against the peak flow or even uphill. Some bike share systems provide credits to users who return bicycles to high demand locations.

Exhibit 3: Pricing Structure of Sample Canadian Bike Share Systems

	SoBi Hamilton	U Bicycle Victoria, BC	Bixi Montreal	Toronto Bike Share	Drop Bike Kingston
Technology Type	Hybrid dockless/ station-based	Dockless	Dock-based	Dock-based	Dockless
Annual Membership	N/A	$150	$94; $59 when combined with OPUS transit pass	$99	n/a
Short Term Memberships	$0.09 per minute	$1 per 30 minutes or $15 for a day pass	$2.95 for 30 minutes; $5.25 for 24-hours. Discounts for	$15 for 24-hours or $3.25 for a single trip	$1 per hour

	SoBi Hamilton	U Bicycle Victoria, BC	Bixi Montreal	Toronto Bike Share	Drop Bike Kingston
			OPUS card holders		
Other Memberships	$15 for month	N/A	$34 for 30-day; 15% discount for Group users	N/A	N/A
No-Fee Period	N/A	30-minutes for day passes, 60 minutes for annual passes	First 60 minutes	30 minutes per day	N/A
Overage Fee Structure	Monthly subscribers pay $0.09 per minute after first 90 minutes	$1 per each additional half hour	$1.80 per first additional 15 minutes; $3 per every 15 minutes after.	$4 per additional half hour	N/A

Additional Pricing Options

London may also consider developing special subscription options to target particular user markets:

- **Student Passes:** Western University and Fanshawe College (Downtown Campus) are expected to be one of the main generators of bike share trips in the system. The bike share program could negotiate reduced or complimentary passes for students.
- **Corporate Pass Program:** The program could strive to sell discounted bulk passes to major employers. A strong corporate pass program will ensure a stable source of revenue and potentially grow the user base of bike share riders.
- **Developer / Housing Association Partnerships:** The bike share program could explore partnering with local developers to provide new residents discounted or complimentary passes. Such a program could be billed both as a residential amenity and a way to further promote bike share among residents.
- **Transit Pass Cards:** Some systems have integrated the local transit pass with bike share. Montreal has gone as far as making the service cheaper for users who pay with the local transit card, OPUS.

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Public Funding

There are limited opportunities for public financing of bike share systems in Ontario since the repeal of provincial cap and trade funding. The most common sources of public funding are through local and regional governments. Metrolinx provided capital funding to Toronto Bike Share for system expansion in 2016 and covered initial capital costs for the entire SoBi Hamilton system in 2014. Montreal's BIXI program has a five-year public funding commitment of $2.9 million per year. Municipalities in Ontario can take advantage of Section 37 of the Planning Act, which establishes a mechanism for developers to contribute funding to offset the impact of additional density. There are proposed changes to Section 37 of the Planning Act to be re-written to provide for a "Community Benefits Charge". However, until the proposed changes are implemented, Section 37 is still in effect.

Private Funding

Private funds can include a range of sources such as advertising, sponsorship agreements, and charitable donations.

Title and Presenting Sponsorship

Exclusive title sponsorship is a valuable, but rare, type of sponsorship revenue source. The sponsorship contract should last for multiple years, capturing the full value of brand exposure at program launch and over time. A title sponsor will likely require a certain degree of branding exclusivity, with stations and bicycles featuring a company logo or color scheme.

A title sponsor may agree to allow other sponsors on a limited basis. For example, in New York City, although Citibank is the overall system sponsor, MasterCard contributes sponsorship funds to be the official payment partner, and station payment consoles all feature the MasterCard logo.

Companies may also be attracted to title sponsorships as a philanthropic investment in their community, or as a means to increase brand exposure in the market. Early bike share systems approached sponsorships from a largely philanthropic perspective and philanthropic giving still represents a key source of funding for many bike share programs.

As mentioned above, however, title sponsorships are rare. A more common and more likely scenario for London is a presenting sponsor. In these systems, branding is already developed, e.g. the distinct brand and logo of BIXI in Montreal. A single sponsor (such as in Vancouver or Boston) or multiple sponsors (such as in Montreal) purchase the right for system-wide logo placement, typically on all bicycle fenders or at all stations, and may negotiate for other sponsorship elements.

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The success of sponsorship agreements across North America suggests that sponsorships are much more lucrative when sold as a marketing and brand exposure tool than simply a philanthropic investment in the community.

London may have to look beyond the largest local employers to find organizations with both the means to support a major sponsorship and enough interest in building brand awareness in the city. London has several example of Title and Presenting Sponsorship agreements, including the BMO Centre London, Western University's TD Stadium, Labatt Park, Budweiser Gardens, and the RBC Convention Centre. These sponsorships consists of consumer brands and financial institutions with a stake in the local market and desire to build and sustain brand awareness.

Exhibit 4: Example Sponsorship Agreements

Organization	Value	Extent
Toronto Bikeshare and Toronto Dominion	$750,000 per year for two years[2]	
BIXI (Montreal, QC) (Manulife and several supporting sponsors)	$2,989,661 in revenue in 2017[3]	540 stations
Greenville B-Cycle & Greenville Health System (Greenville, SC)	$60,000 (USD) per year	6 stations
Spartanburg B-Cycle (multiple philanthropic partners)	$455,000 (USD) in capital support	4 stations

Station or Bicycle Sponsorship

Station sponsorships are another very common type of sponsorship agreement. With a station sponsorship, an organization may agree to fund the capital costs and/or operating costs of a new bike share location. Some systems, instead of providing station sponsorships, allow organizations to sponsor bicycles.

[2] Agreement expired in 2017
[3] BIXI does not disclose amount coming from Manulife but other sources suggest it represents approximately 3/4s of the programs sponsorship revenue.

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Exhibit 5: Example of Station Sponsor Branding at Harvard University

Source: news.harvard.edu

Advertising

Advertising revenue varies greatly depending on the city and is subject to the same economics as other sources of on-street advertising. Outdoor advertisers typically price advertising space based on a number of factors such as traffic counts, the visibility of the location, and the demographic profile of the surrounding community. The most valuable ad space for a bike share system is on bike share stations and kiosks, and selling such space may require an exemption or changes to existing off-premise advertising restrictions in the City. While less lucrative, some systems also sell ad space on the bicycles themselves.

Business Case Analysis

As described above in the Background section, factors like cost, organizational structure, liability, and governance structure for bike share will vary based on the business model selected by the City. To help inform decision-making, the study outlines the background details and preliminary analysis to inform a comprehensive business case for bike share in London. This section highlights the capital and operating costs associated with the three most likely implementation scenarios for bike share in London:

- Publically-owned bike share program utilizing a hybrid dock-less / station style of equipment (similar to Hamilton, ON). City may directly operate the program or contract out operations to a third-party vendor. City would ultimately be responsible for program fundraising.
- Private dockless operator with limited public involvement. City would create a licensing program for bike share and merely provide

regulatory oversite. All operating and capital costs would be borne by the private firm.

- Private dockless with public funding commitment for infrastructure (i.e. public-private partnership). Similar to the above scenario, a private firm would operate bike share and fund all costs directly related to bike share operations and capital. The City would contribute additional funding to create fixed station locations, including infrastructure like bicycle racks, signage, and payment kiosks.

Key Assumptions

The study team made several assumptions on capital and operating costs in order to develop cost estimate. As costs within the bike share industry vary widely based on location and type of equipment, London should be mindful that even minor adjustments (e.g. eliminating payment kiosks) may have a big impact on costs. These costs are based on research conducted by Foursquare ITP and reflect typical costs in other peer bike share programs.

Capital

Capital costs are based on conservative cost estimates extrapolated from other North American bike share programs. The study-team assumes urban-grade equipment designed for high-intensity use. The following breaks down the cost assumptions utilized by type of equipment.

Exhibit 6: Capital Cost Assumptions by Technology Type (Figures rounded to nearest $10,000)

	Dockless	Dockless Hybrid	Dock Based
System Size	60 stations and 300 bicycles. Size based on assessment of ideal number of bicycles and stations needed to serve the initial service area identified in the market analysis		
	Conventional self-locking dockless bicycle.		Conventional dock-locking bicycle
Bicycle Costs	$2,200		$1,200
Station Assumption	No stations	Simplified stations with an average of 10 spaces for bicycles. 20% of stations include payment kiosks.	Dock-based station with an average of 10 mechanical docks. 100% of stations include kiosks.

		All stations include signage.	
Station Costs	N/A	$10,000 per station	$40,000 per station
Median Lifespan	7 years for bicycles; 11 years for station infrastructure		
Installation costs	N/A	$4,200 per station[4]	

Operating

The study team had to make several key assumptions on operating costs and revenue that will impact the forecasted net-cost of operating the program. Generally, the team relied on conservative assumptions to estimate the cost of the service. Operating costs were derived from 2017 City of Toronto figures and inflated to current year dollars[5]. Operating revenue was based on ridership rates from peer systems and user fees that are comparable to other Canadian bike share systems. London Transit fares were also used as a price-point comparison.

Operating Costs:

- All-year system
- $150/bicycle monthly operating costs
- No advertising and sponsorship revenue is assumed.

Operating Revenue:

- 75% of trips taken by registered users and 25% by casual users.
- Per trip overage fees of $2 per casual user and $0.05 per registered users.
- $2.50 per trip (casual users) or $100 per year (registered users)
- 1.5 trips per bicycle during the peak season (May to October). 0.75 trips per bicycle during the off-peak season.

[4] Installation costs include: $3,200 for base installation costs (100% of station); $3,500 for installing concrete pad (5% of stations); $250 for installation of flexible bollards (50% of stations); $10,000 for station hardwiring (5% of locations); $2,000 for additional titling and easements for stations on private property (5% of stations)

[5] https://www.toronto.ca/legdocs/mmis/2019/bu/bgrd/backgroundfile-123927.pdf

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Capital Costs by Type of Technology

The study team prepared capital costs that illustrate the different costs associated with the three common docking technologies. A dockless or hybrid system are the most likely options for London as docked-systems are increasingly uncommon in small and mid-size systems due to their cost and complexity. A dockless system can be easily adapted into a hybrid program by incorporating station infrastructure. The implementation costs will vary considerably for hybrid systems based on the design of stations.

Exhibit 7: Comparison of Three Common Bike Share Technology Types for a 300 Bicycle System

	Dock-Based System	Fully Dockless	Hybrid System
Description	Bicycles locked to mechanical docks at designated stations. All stations include a payment kiosk and signage.	Bicycles do not need to be locked to a fixed object. No station infrastructure.	Dockless bicycles combined with simple stations. Stations may vary from a bicycle rack to location with a payment kiosk and signage.
300 Bicycles	$ 380,000	$ 670,000	$ 670,000
60 Hubs/Stations	$ 2,630,000	$ 0	$ 850,000[6]
Total	**$ 3,010,000**	**$ 670,000**	**$ 1,520,000**
Pros	• Least prone to theft • Alleviates concerns over improperly parked bicycles.	• Low capital costs. • Flexible operations – trips can start or end anywhere in a service area	• Reduces likelihood of improperly parked bicycles due to use of stations. • Combines pros of dockless and docked.
Cons	• High capital costs. • More complex to operate due to need to manage dock/bicycle availability.	• Many dockless systems struggle with enforcing parking regulations; bicycle end up	• More expensive than a dockless system • Does not fully eliminate concerns over theft,

[6] Assumes that all stations/hubs include bicycle racks and signage. Twenty percent of station would feature a kiosk. Station costs can scale down or up based on the type of station investment. Eliminating kiosks would significantly reduce costs.

	Dock-Based System	Fully Dockless	Hybrid System
	• Trips limited to destinations near stations. • Mechanical stations are a point of failure.	blocking the public right-of-way. • More susceptible to theft and vandalism.	vandalism, and improperly locked bicycles.

Program Costs by Scenario

The study team prepared estimates for the public-fundraising need associated with three implementation scenarios: a publically owned system, a privately owned and funded system, and a private owned system that include public investments in station infrastructure.

The financial model predicts that a publicly owned program will recuperate just under 50% of its costs from user revenue. The remaining gap in funding could be filled through advertising, sponsorship revenue, or a public subsidy.

Under a privately-owned system, the system owner will be responsible for covering all capital and operating costs. In the case the program runs a deficit, the operator will have to find external funding through sources like private investment and advertising.

The last scenario, a privately-owned program with a pubic capital contribution, also assumes the private operator is responsible for all program operating costs. The City's only financial commitment will be through investing in station infrastructure and will represent largely a one-time cost.

Regardless of the operating model, the City should assume some administrative cost associated with bike share. Typical administrative functions include regular inspections to ensure the system is meeting agreed-upon standards, public outreach and engagement, and contract management.

The figures in Exhibit 8 represent anticipated average annual costs, revenue, and ridership across the three scenarios. The City should be prepared for first year operating revenue being 25 to 30 percent lower than these numbers. New systems take time to build-up ridership and membership levels.

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Exhibit 8: Three Operating Scenarios for a 300 Bicycle System – Costs Borne by the City of London Only

	Publicly-Owned	**Privately-Owned** No Public Investment	**Privately-Owned** Public investment in station infrastructure
Technology Assumption	Hybrid System	Dockless System	Hybrid System
Annual Ridership	125,000	125,000	125,000
Capital Costs (Cost to City of London)			
Bicycles (300)	$ 670,000	$ 0	$ 0
Stations/hubs (60)	$ 860,000	$ 0	$ 860,000
Total	**$ 1,530,000**	**$ 0**	**$ 860,000**
Annual Capital State of Good Costs[7]	$ 160,000	$ 0	$ 70,000
Annual O&M Costs (Cost to City of London)			
City Administrative staff (1/3 FTE)	$ 35,000	< $35,000	< $35,000
Program Operations	$ 540,000	$ 0	$ 0
Program Marketing and Outreach	$ 15,000	$ 0	$ 0
Total	$ 590,000	< $35,000	< $35,000
Annual Revenue (Revenue to City of London)			
User fees	$ 280,000	N/A	N/A
Advertising/Sponsorship	unknown	N/A	N/A
Total	$ 280,000	N/A	N/A
Net Subsidy[8]			
Total	$ 310,000	< $35,000	< $35,000
Operating Subsidy per Rider	$ 2.48	$ 0.28	$ 0.28
Pros and Cons			
Pros	• Maximizes City control over program • Feasible even with weak private-sector	• Lowest cost to City • Absolves City of financial risk associated with funding and	• City maintains some control over bicycle deployment. • Station infrastructure could

[7] Assumes City sets aside a fixed annual sum to replace equipment at end of useful life.
[8] Subsidy could be covered in part by sponsorship revenue and third-party funding.

	Publicly-Owned	Privately-Owned No Public Investment	Privately-Owned Public investment in station infrastructure
	interest in operating bike share in London	operating bike share.	be used to generate advertising revenue.
Cons	• City takes on risk and responsibility for bike share. • Most costly scenario for City.	• City has little control over program deployment. • Lack of stations could result in bikes being improperly parked on sidewalks.	• City could be left with redundant station infrastructure if private operator folds.

Program Risks

The study team has identified several risk factors that may impact bike share in London. None of these risks are insurmountable and dozens of communities in the US and Canada are able to successfully navigate these issues.

- **Operator Turnover:** The for-profit bike share industry is still in its infancy and it's unclear whether micromobility operators have a sustainable business model. The City always runs the risk of investing capital funds in a bike share program only to have the operator go bankrupt, exit the local market, or change its business model. The best way to prepare for operator turnover is to future-proof capital investments. For example, Hamilton's bike share stations also serve the dual purpose of providing bicycle parking, seating, and wayfinding information. The City should focus on investing in assets that serve multiple needs.
- **Investment in Out-Dated Technology:** The bike share/micromobility industry is quickly changing, with electric-assist bicycles and electric scooters becoming increasingly popular. New technologies are providing cities like London more options for how to implement a bike share program, but also make it more challenging to decide how to investment public dollars. There are a few strategies to help "future-proof" public investments in bike share. In the instance where the City owns physical bike share assets like bicycles, it's advisable to go with a well-established equipment vendor. These firms are more likely to implement improvements over time that are compatible with past

equipment. The City will also reduce its technological risk by investing in flexible equipment that can be repurposed for other needs - for example, a bike share station design that can accommodate different types of bicycles.

- **Data Sharing and Monitoring:** Regardless of business model, the City should establish standards for data sharing and data privacy that a bike share operator has to meet in order to do business within the City. The City will need reliable data from operators to enforce many potential operating standards, such as bicycle distribution and level-of-service.
- **User Safety:** User safety is a common concern among communities exploring whether to invest in bike share. One question that arose during public engagement around bike share was whether London has suitable bicycle infrastructure to make bike share feasible. While better cycling infrastructure is closely tied to higher bike share ridership, the state of London's bike infrastructure is not necessarily an impediment to a bike share's success. Many communities with bike share programs (notably in the United States) have fewer dedicated bicycling facilities than London. Bike share has an excellent track-record of safety, with only two user fatalities in the last ten years.
- **Right-of-Way Encroachment:** Other cities with dockless bike share have had to contend with bicycles being improperly parked, blocking the sidewalk and posing a hazard to pedestrians, notably people with disabilities. Strong and ongoing enforcement of bicycle parking regulations, as well as providing designated bike share parking, can help reduce encroachment issues.

Next Steps

Developing a bike share program takes time, and this study represents a step in the process. The following outlines some of the next steps needed to move forward with bike share.

- **Achieve Buy-In:** The most critical next step is to achieve buy-in by key stakeholders in the region. Regardless of who owns or operates the systems, the City and major institutions like Western University will be impacted by the program. Work has already begun on this step and will continue until key stakeholders are fully engaged.
- **Determine a Governance and Ownership Structure:** Whether or not London plans to own the bike share system will have a major impact on the program's next steps. A key decision facing the City is whether to pursue for-profit firms to operate bike share within London.

If so, a regulatory and permitting framework will need to be established.

- **Conduct Public Outreach:** Public engagement is important for a variety of reasons. It provides the community an opportunity to voice whether bike share fits within their mobility needs. Public engagement can also build excitement for bike share and bring additional community partners on board. Finally, public outreach can educate members of the public on bike share and its benefits. Public outreach has already begun and will continue to expand in the near future.
- **Release an RFP:** A formal request from proposals will help the City gauge interest among private bike-share systems to operate a program in London. RFP responses will help the City determine the final shape of bike share, including the level of City involvement and financial commitment in the program.

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Appendix A – Bike Share Station Typologies

Bike Share Station Typologies	
Landmark – Kiosk Station	
Type of Signage	Solar powered kiosk with instructions and ability to sign up for a bike share membership at the kiosk. Small advertising space available on the bike rack.
Station Size	10 - 25 racks
Estimated cost per station	$25,000 - $35,000
Neighbourhood Context	Major transportation hub (e.g. Hamilton West Harbour GO Station, Hamilton GO Centre, Waterfront Trail entrance)
Typical right-of-way location	Adjacent to a multi-use path; within transit station footprint or public space
Surface material	Concrete (preferred); asphalt; grass; paver stones
Example:	 Photo: IBI Group

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Destination – Large Sign Station	
Type of Signage	Large sign with instructions on how to sign up for a bike share membership and map of other stations nearby. Advertising available on one side of the sign and small advertising space available on the bike rack.
Station Size	10 - 20 racks
Estimated cost per station	$7,500 - $12,500
Neighbourhood Context	Major intersections, points of interest
Typical right-of-way location	Within “no stopping zones”; within the furniture zone adjacent to the sidewalk
Surface material	Concrete (preferred); asphalt; paver stones
Example:	 Photo: IBI Group  Photo: IBI Gro

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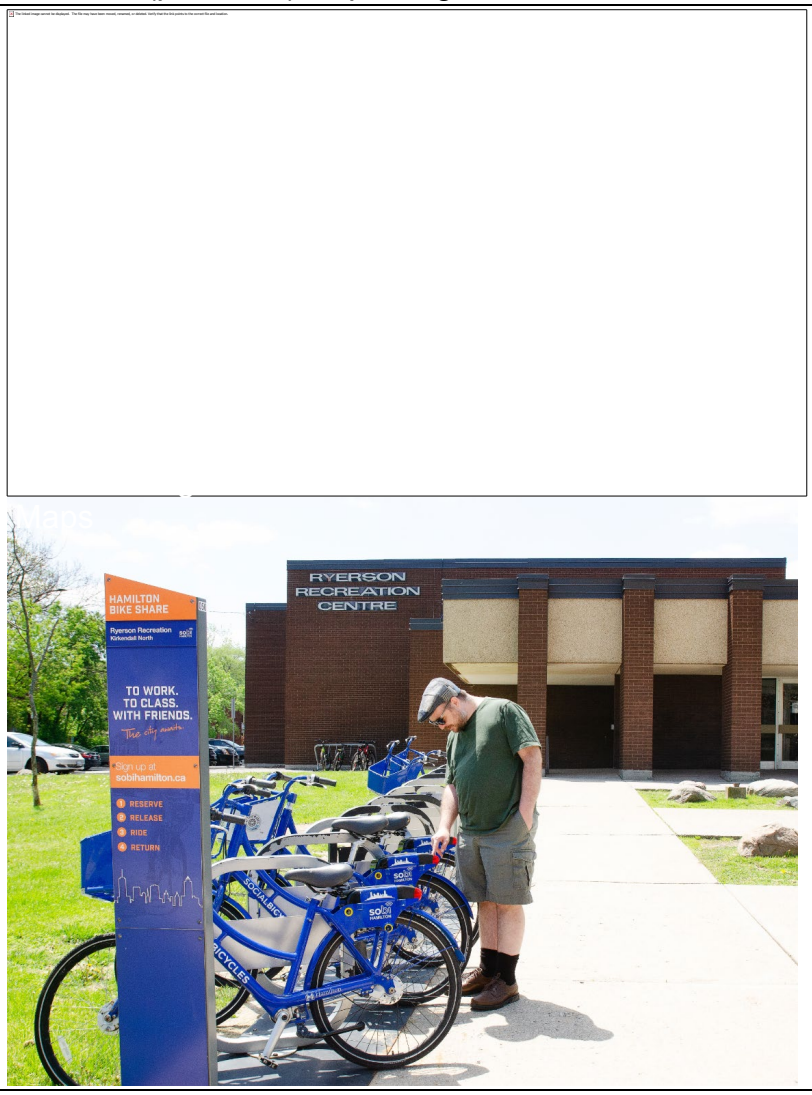
Neighbourhood – Small Sign Station	
Type of Signage	Small sign with instructions on how to sign up for a bike share membership and a small map of other stations nearby. Advertising available on one side of the sign and small advertising space available on the bike rack.
Station Size	10 - 15 racks
Estimated cost per station	$6,500 - $10,000
Neighbourhood Context	Residential areas, residential points of interest (e.g. recreation centre)
Typical right-of-way location	Within the right-of-way in “no stopping zones”; adjacent to the sidewalk; adjacent to multi-use paths.
Surface material	Concrete (preferred); asphalt; grass
Example:	

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Neighbourhood – Small Station (No Sign)	
Type of Signage	No signage explaining how to sign up or map of stations nearby. Small advertising space available on the bike rack. Alternate configuration: Use of paint to mark bike share parking area
Station Size	5 - 10 racks or 0 racks (dockless)
Estimated Cost	$1,000 - $5,000
Neighbourhood Context	Residential areas
Typical right-of-way location	Within the right-of-way in “no stopping zones”; adjacent to the sidewalk; adjacent to multi-use paths.
Surface material	Concrete (preferred); asphalt; grass
Example:	 Photo: University of British Columbia  Photo: Google Maps