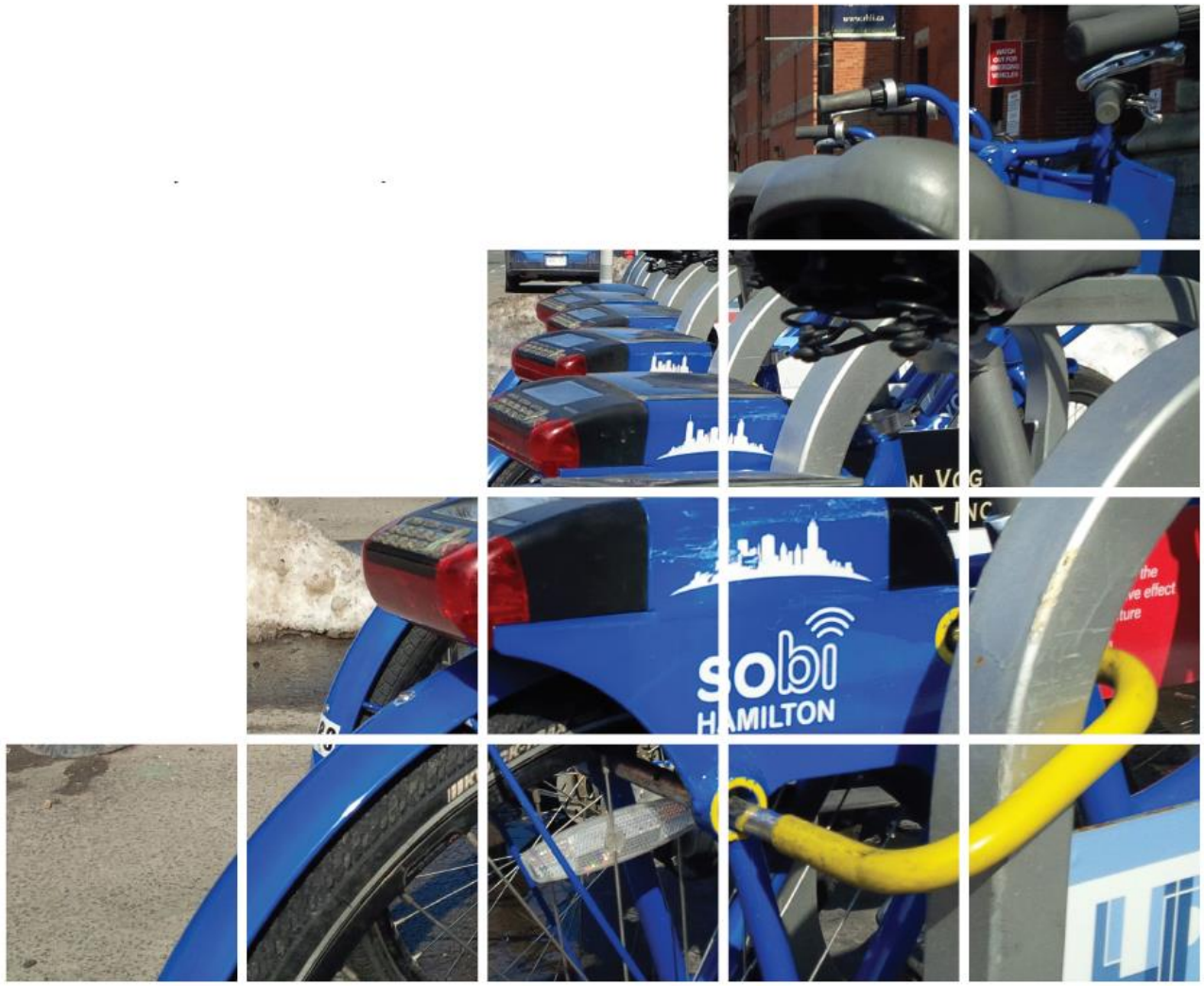
SOBI HAMILTON

Bike Share Analytics Report

April 2016



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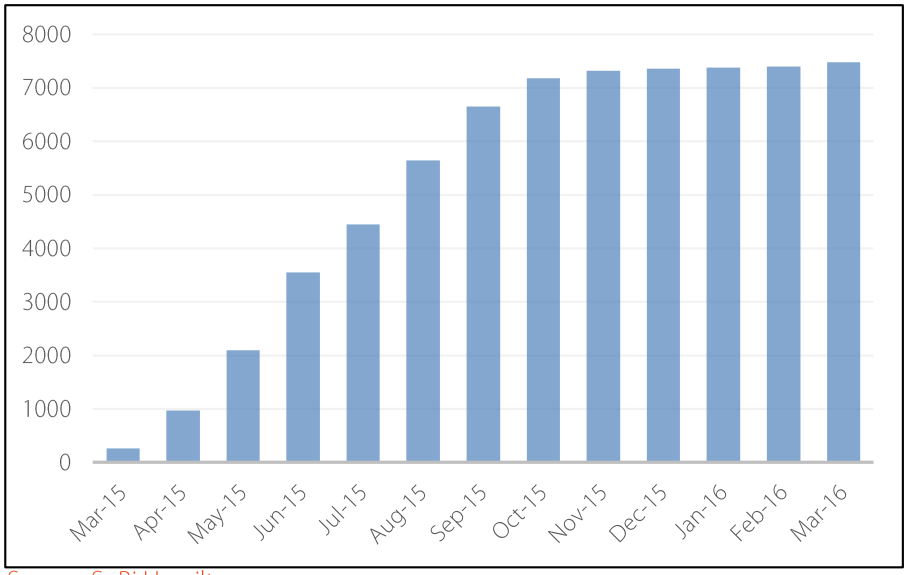
1.0 Introduction

SoBi Hamilton is a bike share system located in Hamilton, Ontario that was launched in partnership with the City of Hamilton in 2015. The system began in a test phase in January 2015 with 100 hub stations and 200 bikes. In Spring 2015, the full system was launched with 750 bikes. By July 2015, there were over 4,000 active members and as of March 2016, there were 7,476 active members (Figure 1). In total, 9,300 people used SoBi from January to December 2015. This total figure includes all people who subscribed to the service in 2015, including active members and those who closed their memberships and are no longer active members (Figure 2).

During the planning phase of the bike share system in 2013, Civicplan produced a report that compared the feasibility of the proposed Hamilton bike share to other systems in operation. As part of the report, a suggested system service area was identified to help with planning. With the system now in operation for a year, there is the opportunity to review if the suggested service area is similar to the actual use of the system.

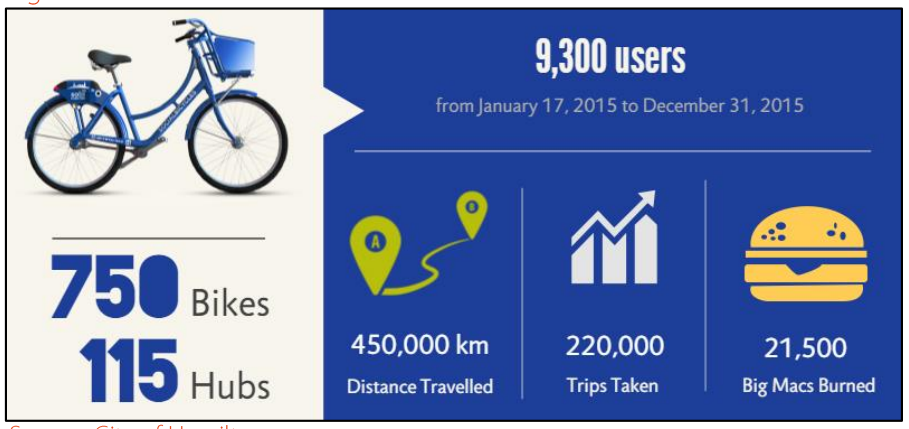
Over the course of the first year, data was collected including user trips, hub activity, as well as through a user survey. This report summarizes select data from the SoBi Hamilton system and user survey to help inform a better understand of the system and to assist with future planning.

Figure 1: Active SoBi Members March 2015-March 2016



Source: SoBi Hamilton

Figure 2: Selected SoBi Statistics



Source: City of Hamilton

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2.0 User Survey Results

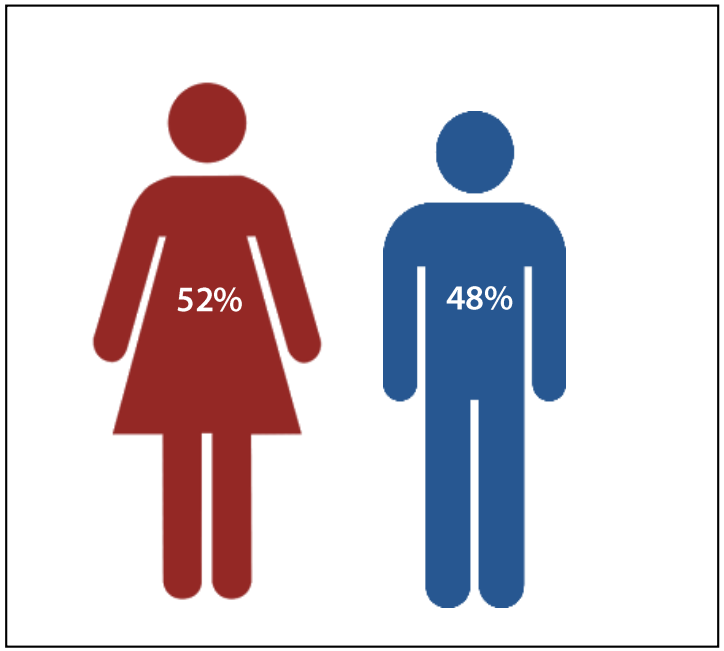
2.1 Survey Notes

SoBi Hamilton surveyed its users in September and October 2015 to better understand who is using the system, how it is used, and how SoBi fits within the city's overall transportation system. In total, 592 responses to the survey were received. However, not all respondents answered every question. It should be noted that respondents were self-selected and therefore do not necessarily represent the entire SoBi Hamilton membership.

2.2 Gender and Age

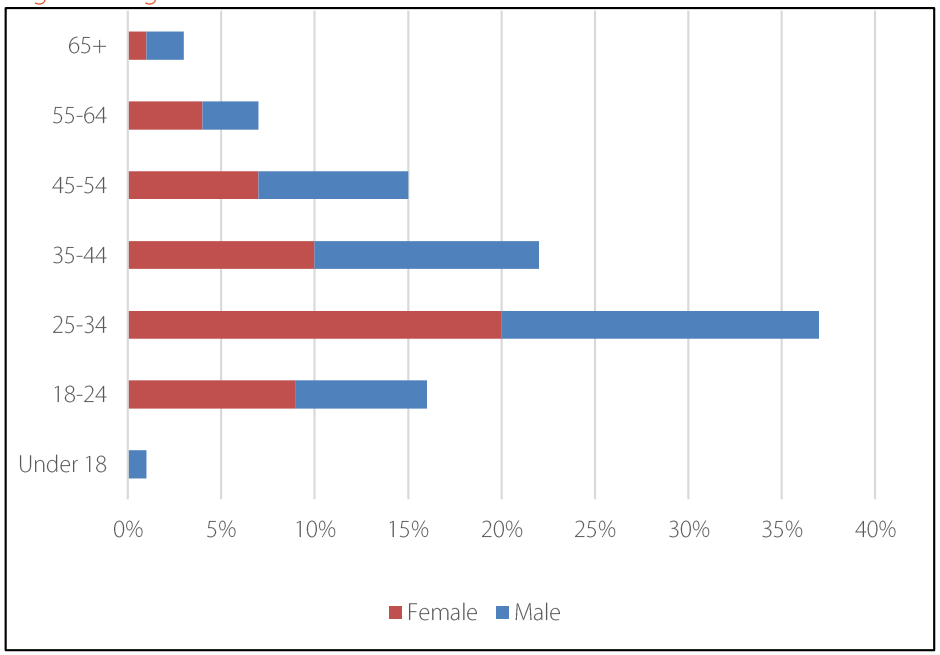
Of the respondents to the SoBi survey, 52 percent were women, while 48 percent were men (Figure 3). The majority of respondents were under the age of 34 (53%) (Figure 4). The largest single age category was respondents between 25-34 years of age (37%).

Figure 3: Gender of Respondents



Percentages based on 587 responses

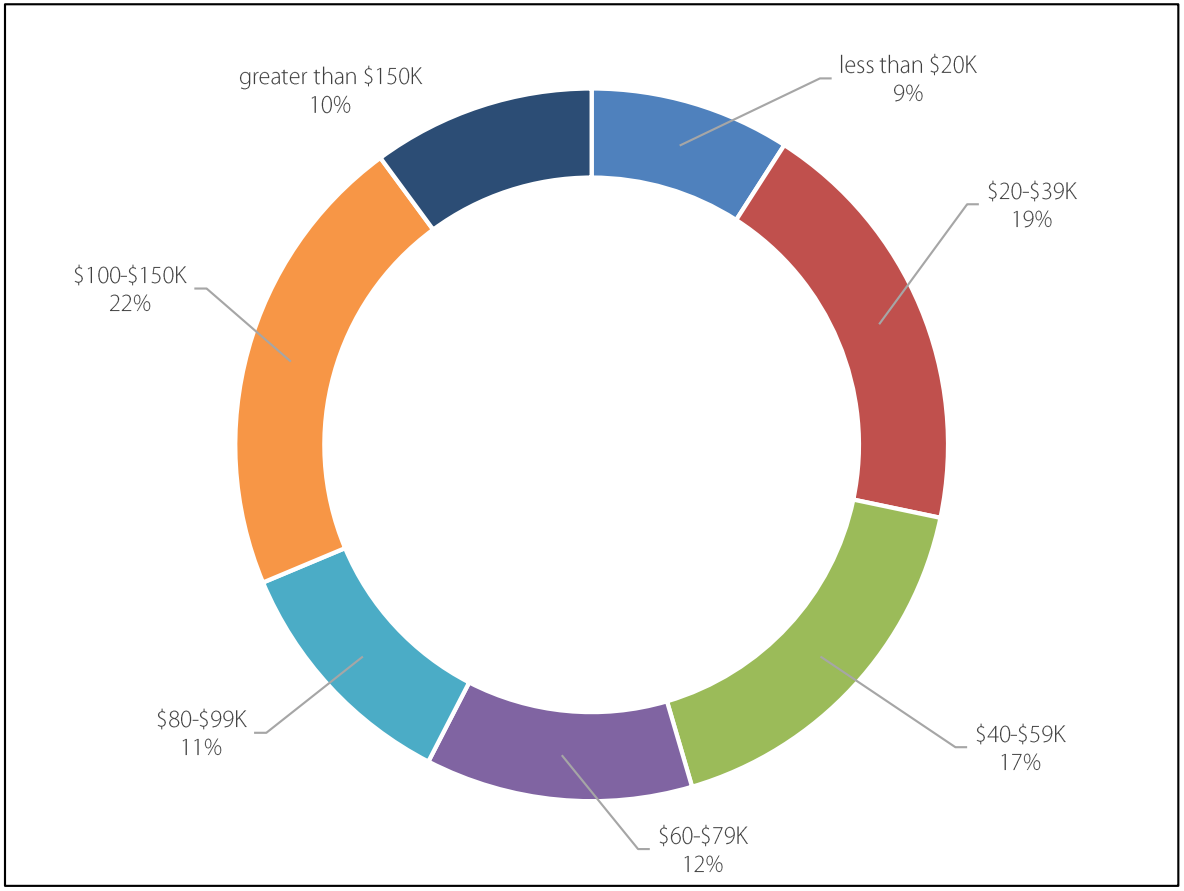
Figure 4: Age and Gender of



Percentages based on 588 responses

2.3 Income and Education

Figure 5: Estimated Annual Household Income

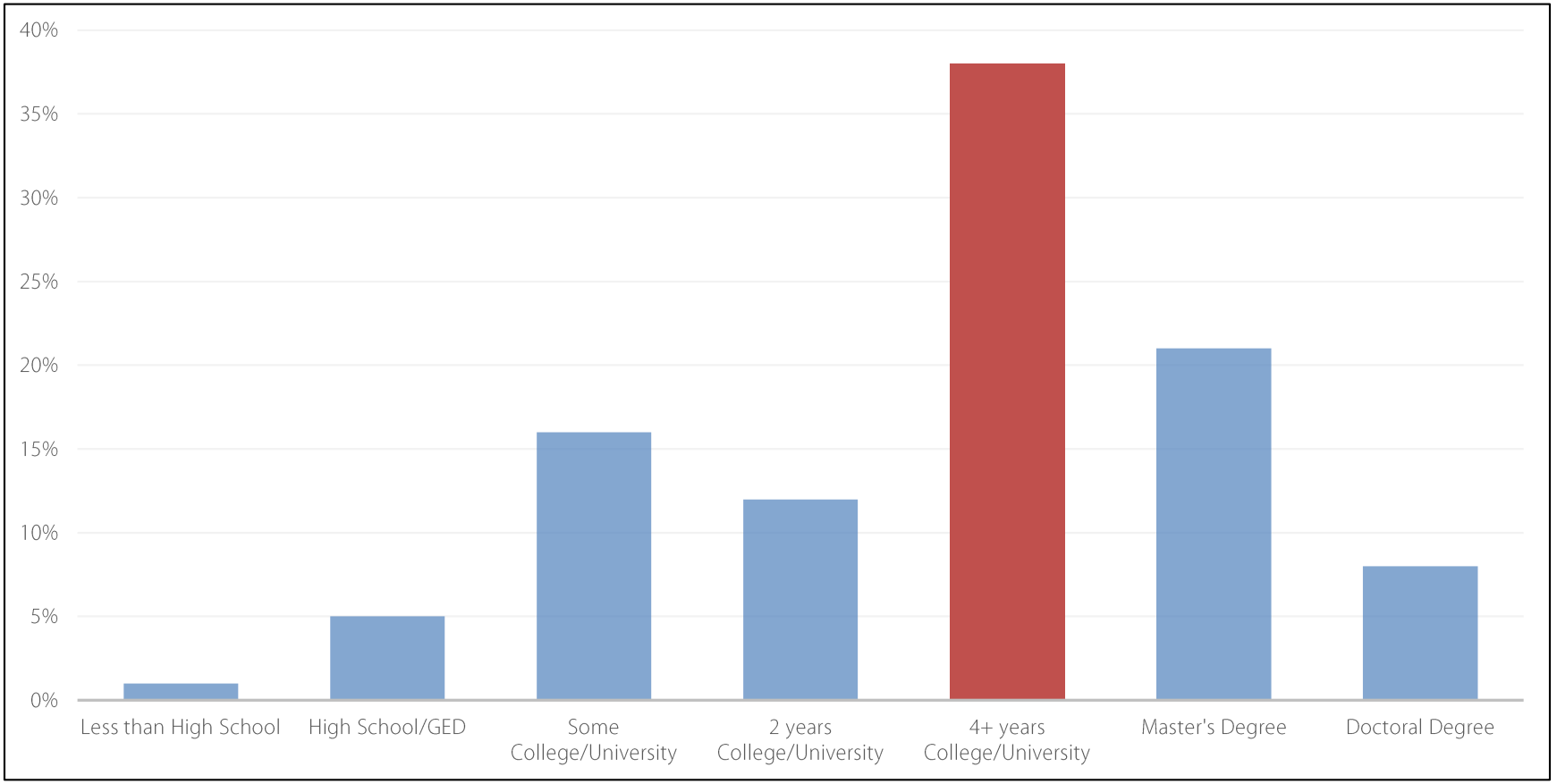


Percentages based on 570 responses

Figure 5 displays the estimated annual household incomes for survey respondents. The largest single segment is between $100,000 to $150,000 (22%), this is followed closely by $20,000 to $39,000 (19%), and $40,000 to $59,000 (17%).

Survey respondents tended to have high levels of education. Over 38 percent of respondents have at least 4 years of post-secondary. 21 percent have a Master's degree and 16 percent have at least some College or University education. While education levels were high, the vast majority of respondents to the survey were not currently students (79%)

Figure 6: Respondent Level of Education

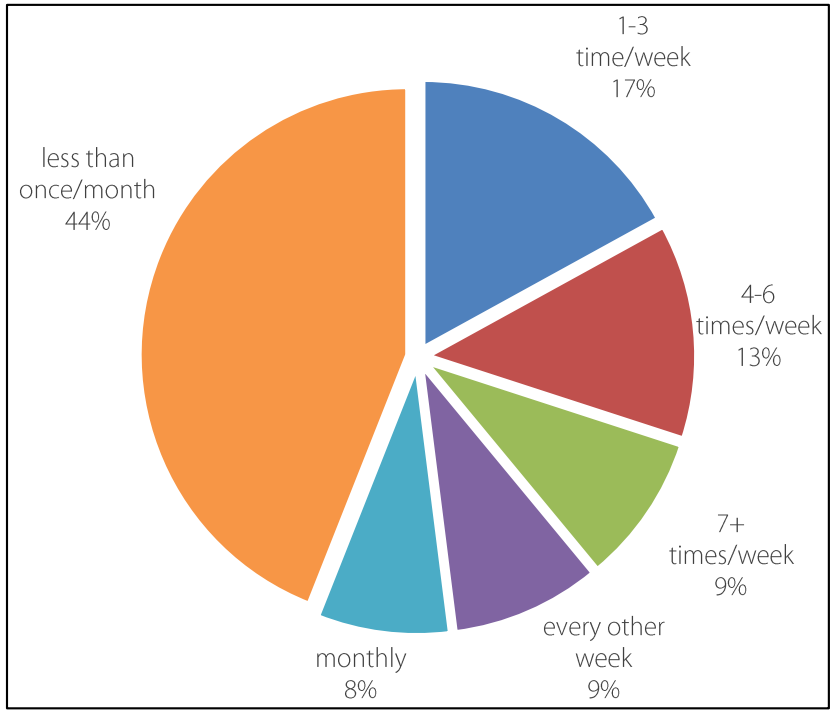


Percentages based on 580 respondents

2.4 Cycling Habits

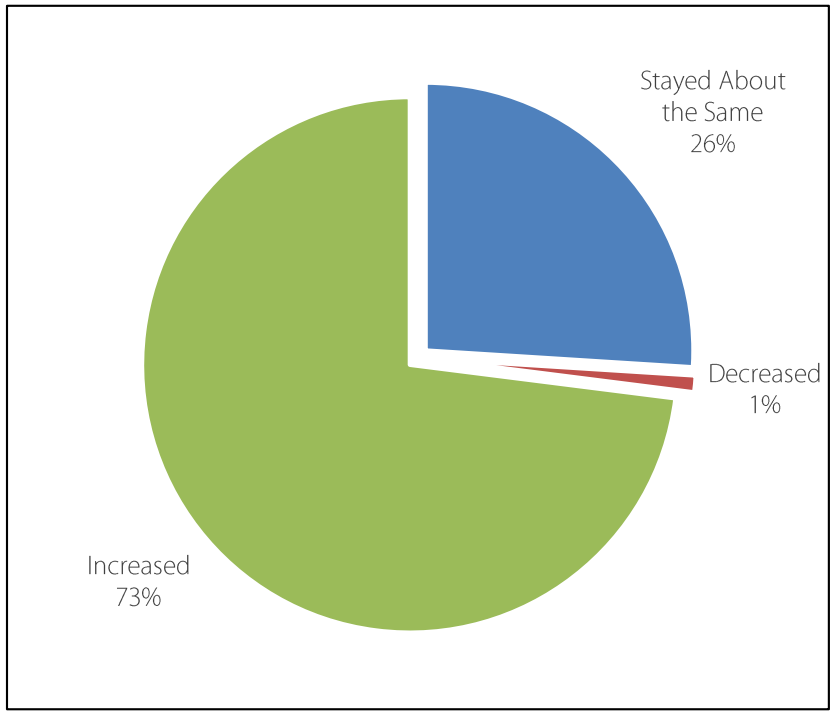
Respondents were asked about their cycling habits and whether SoBi use has changed these habits. Also, respondents were asked about bike ownership, and 66 percent indicated that they did own a bicycle. Figure 7 below illustrates the cycling frequency of respondents prior to using SoBi. More than half of respondents indicated that they rode a bike monthly or less than once a month. Respondents were then asked to indicate any change in the amount of biking they do since subscribing to SoBi. While it is not surprising that a subscription to SoBi is followed by a marked increase in cycling among respondents (73%), just over a quarter (26%) indicated that their cycling habits have stayed the same, and only one percent indicated that they have decreased (Figure 8).

Figure 7: Frequency of cycling use before SoBi



Percentages based on 586 respondents

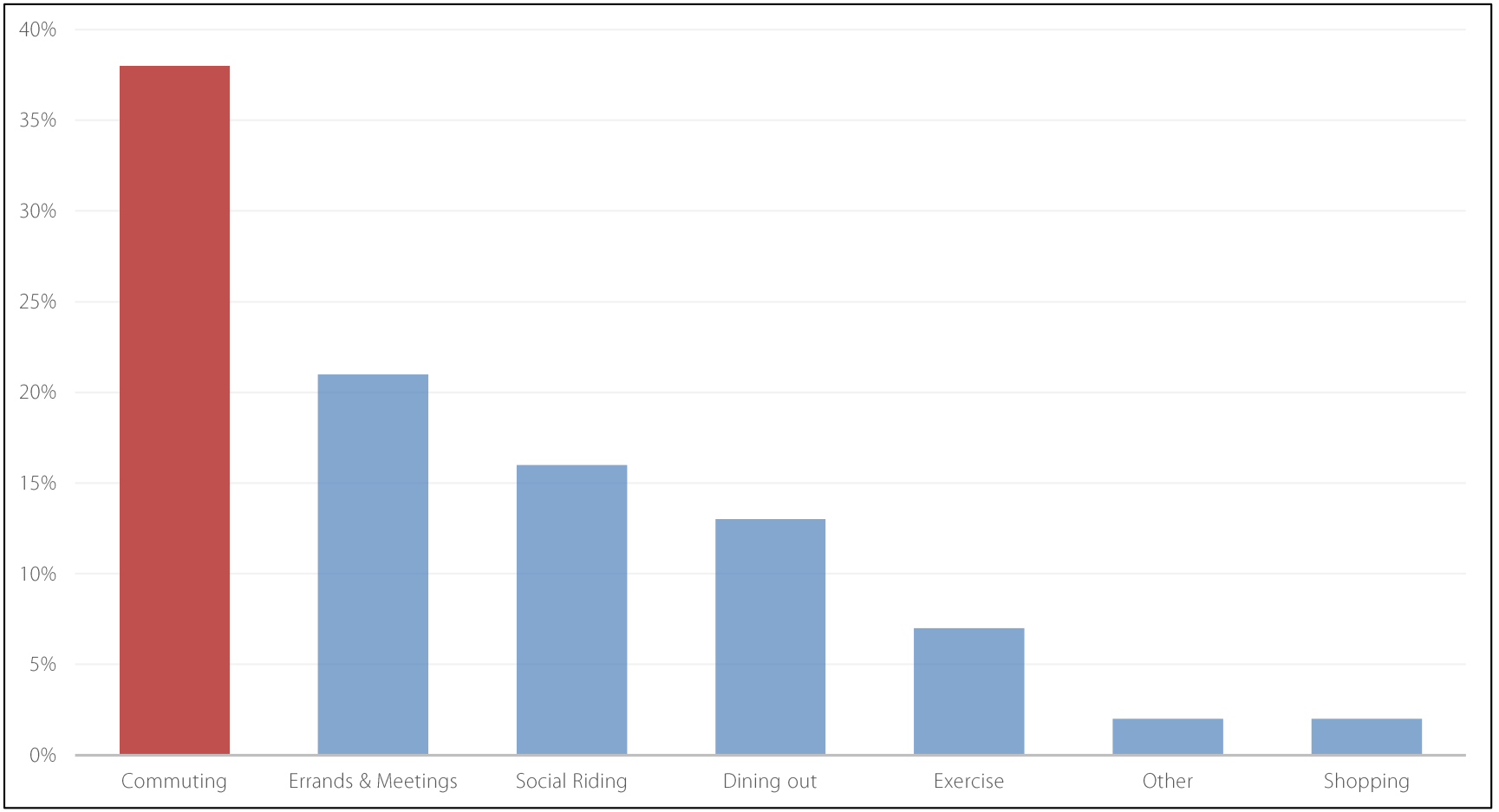
Figure 8: Frequency of cycling use with SoBi subscription



Percentages based on 587 respondents

The survey also asked about user's primary use of SoBi. 77 percent indicated they used it for transportation, (e.g. to reach a specific destination), while 23 percent indicated they used it for recreational purposes (e.g. to go for a bike ride). Respondents were then asked to indicate more specifically the types of trips they take. Figure 9 below displays the different responses. Commuting was the single largest category type for SoBi trips (38%), followed by errands and meetings (21%), social riding (16%), and dining out (13%).

Figure 9: Types of SoBi Trips by Category

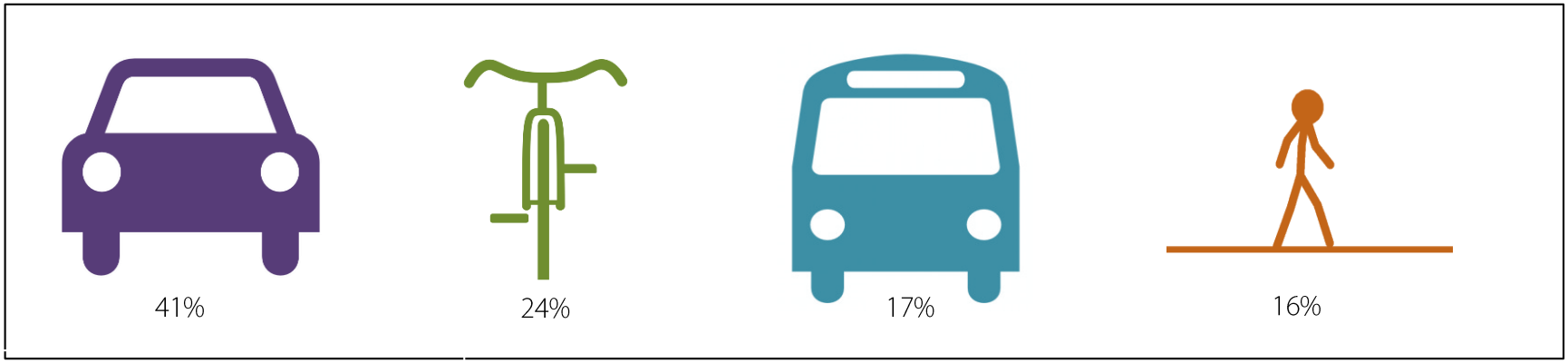


Percentages based on 590 respondents

2.5 SoBi and Other Modes of Transportation

Survey respondents were asked to provide some additional detail about their use of various modes of transportation and how SoBi subscription has affected this use. Figure 10 below details the identified primary mode of transportation for respondents. The largest segment of respondents indicated that driving a vehicle was their primary mode of transportation, while almost a quarter (24%) of respondents indicated cycling as their primary mode. This was followed by transit (17%) and walking (16%). An additional two percent of respondents indicated they were primarily passengers in a vehicle, while one percent indicated other modes of transportation.

Figure 10: Primary Mode of Transportation for SoBi Users



Percentages based on 580 respondents

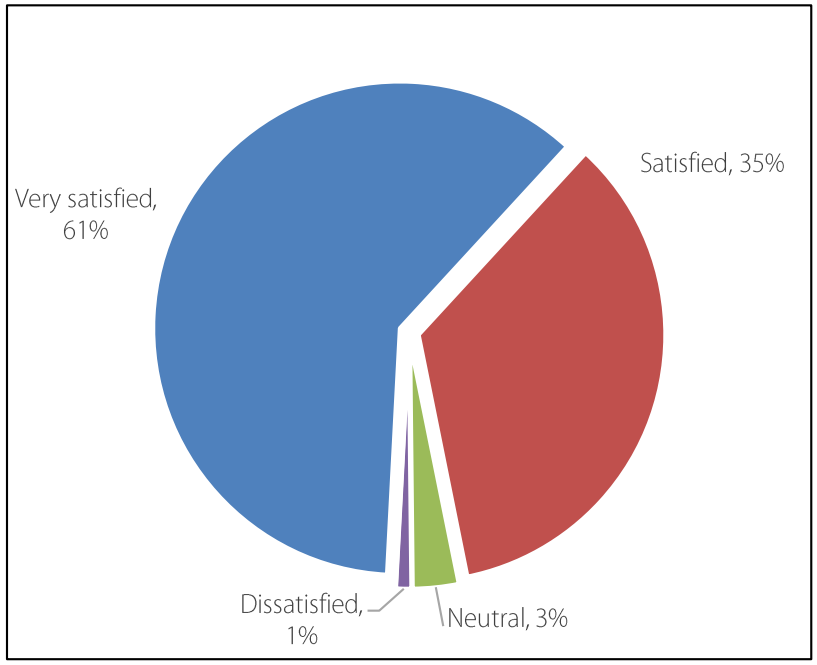
Respondents were then asked to indicate any change in their use of different modes of transportation since beginning a subscription with SoBi. In terms of driving, 64 percent of respondents indicated that their driving habits have remained the same, with 34 percent noting a decrease in driving, and only two percent noting an increase. Finally, SoBi seems to have had a limited impact on public transit use, with almost half of respondents (49%) indicating that their transit use has stayed the same, 23 percent indicating a reduction in use, and six percent indicating an increased level of use. Another 23 percent indicated they do not take transit.

2.6 Satisfaction

The vast majority of respondents (96%) indicated they were very satisfied (61%), or satisfied (35%), with SoBi (see Figure 11). While three percent of respondents indicated they were neutral about SoBi, only one percent indicated they were dissatisfied, and no one indicated they were very dissatisfied.

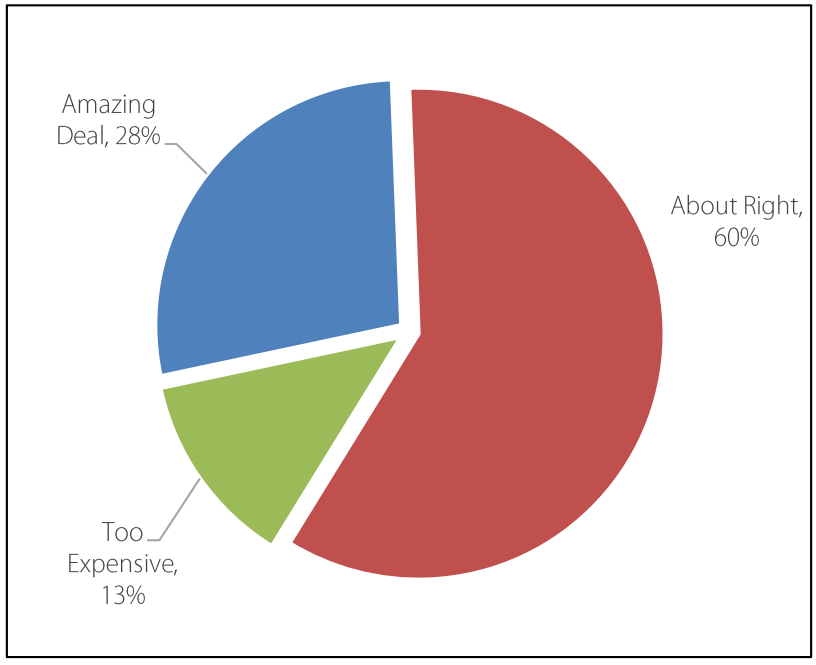
As well as being asked about their overall satisfaction with SoBi, respondents were asked to indicate their impressions of the cost of a full year subscription to the service. Figure 12 below displays the results of this question. Almost 90 percent of respondents indicated that the SoBi annual subscription fee was either "about right" (60%) or an "amazing deal" (28%). Only 13 percent indicated that the current fee is too expensive.

Figure 11: Satisfaction with SoBi



Percentages based on 588 respondents

Figure 12: Satisfaction with Subscription Fee



Percentages based on 589 respondents

3.0 SoBi Travel Data

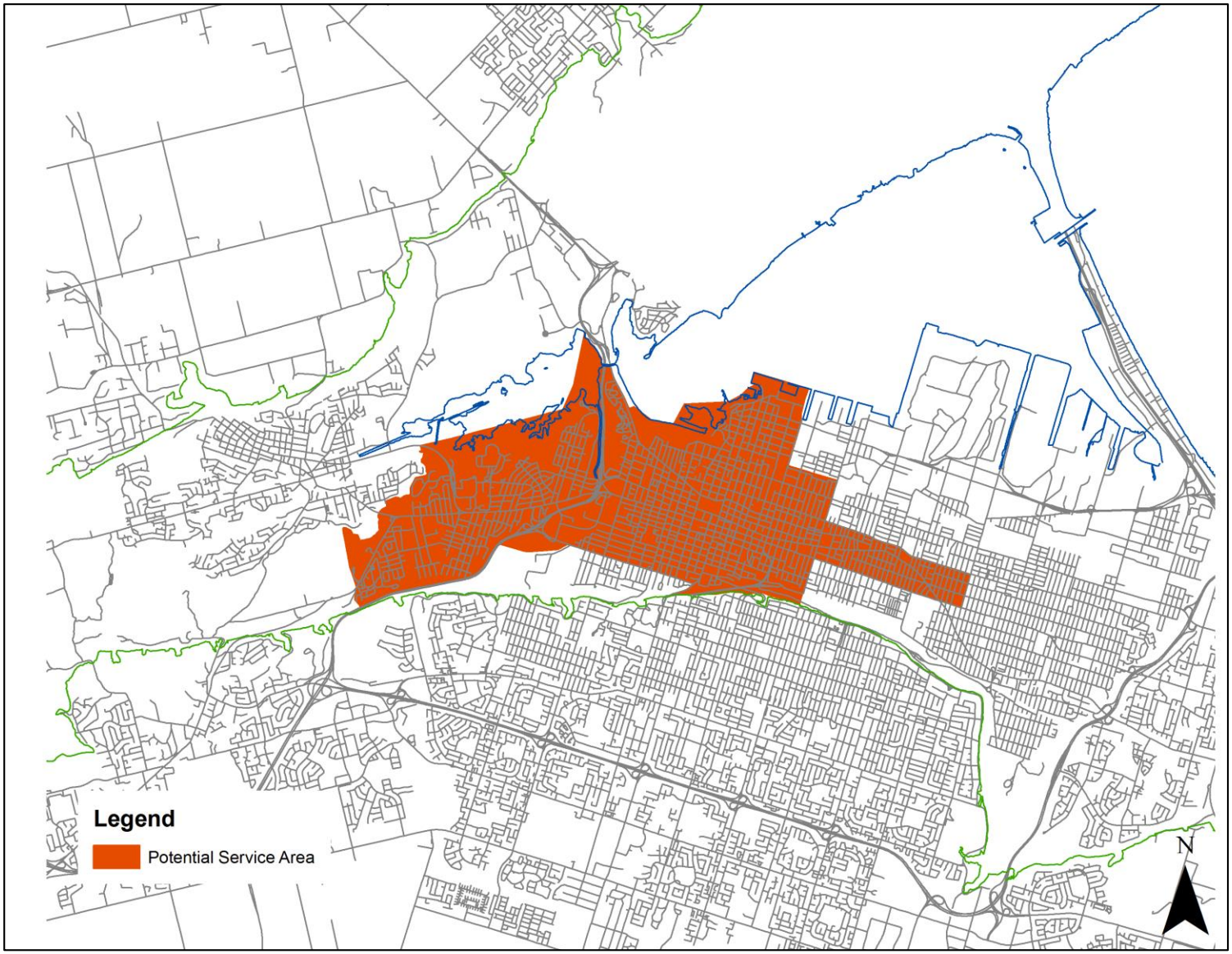
3.1 Defining the Potential Service Area

In 2013, prior to the launch of the Hamilton Bike Share system, Civicplan conducted an assessment of the proposed system based on a number of metrics to determine how the proposed network compared to other systems in operation. As part of the assessment a potential core service area was defined for the purpose of conducting the analysis. The core area was defined based on the rates of non-vehicular commuting in Census Tracts (CTs) across the city. Two thresholds were used to set the core area:

1. CTs where commuting by transit, walking and cycling was at least 25 percent of the total (the city average is approximately 15%)
2. Of those CTs that met the first threshold, the level of walking and cycling alone was at least 10 percent (the city average is approximately 6%)

The rationale for the thresholds was to determine the current Hamilton geography of alternative transportation. In other words, what areas of the city are already the most conducive to using non-vehicular forms of transportation to commute to work. This is not to say that people who currently commute by car would not switch to cycling if a bike share system were available. Further, this does not mean that other areas of Hamilton would not generate potential demand for a bike share system. Instead, the thresholds were used to determine a conservative estimate of the potential service area for the purpose of the case study comparison. Figure 13 shows the approximate geographic extent of Hamilton's CTs that meet the thresholds listed above. The figure shows a service area that roughly extends from Osler Drive and the neighborhoods surrounding McMaster University in the west to Ottawa Street in the east. North-south, this service area extends from Cootes Paradise and the west harbourfront to just below the Niagara Escarpment, tapering to the areas between King and Main Streets closer to Ottawa Street.

Figure 13: Potential Hamilton Bike Share Service Area



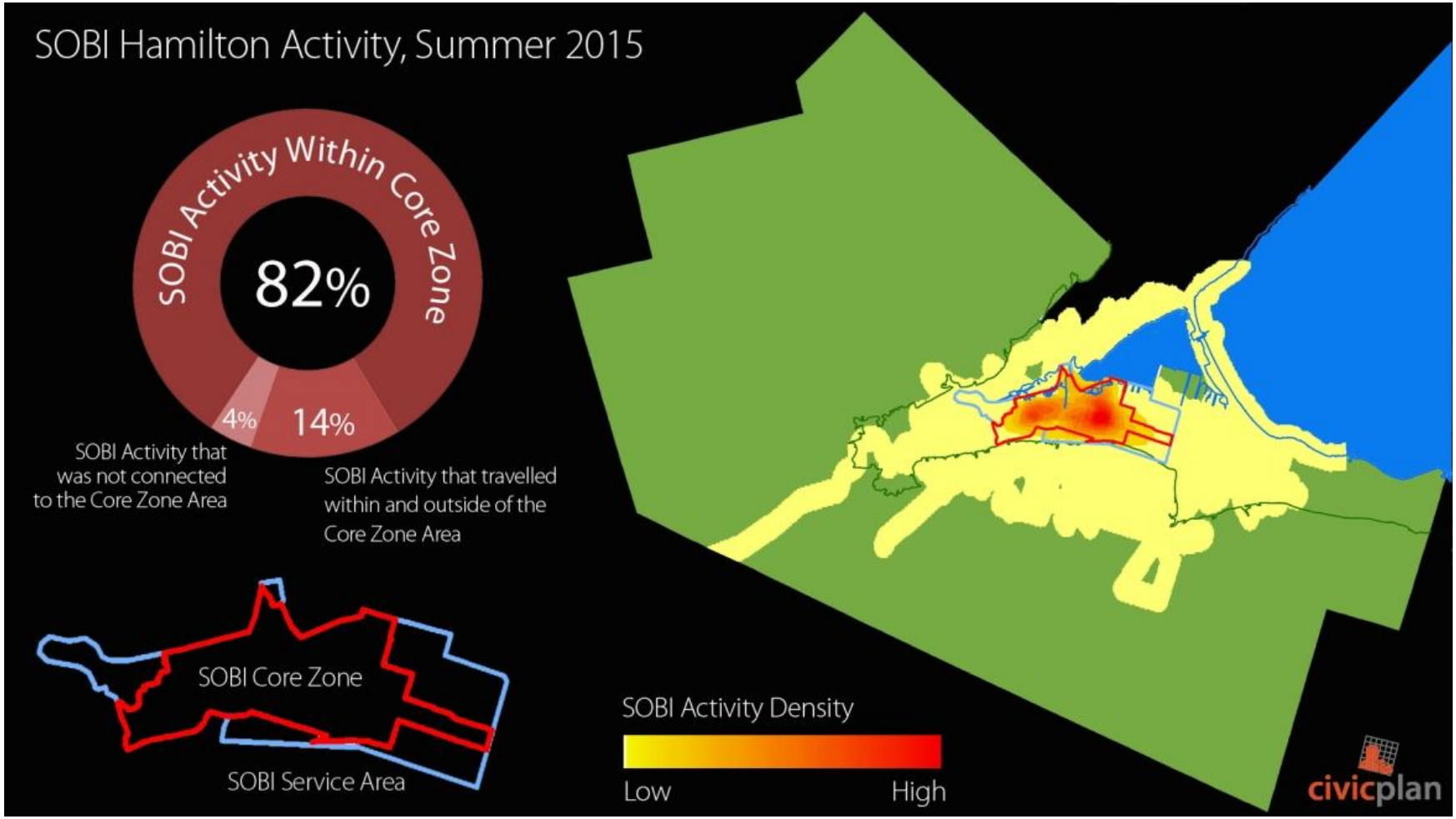
Source: Civicplan

3.2 Potential Service Area Comparison

With more than a year of the Hamilton Bike Share system in operation, data is now available on travel patterns to determine the areas of high bike share activity and how that compares to the Core Zone that was used in the 2013 Bike Share Assessment.

Travel data for four months over the peak summer period was used for this comparison (June-September). This period captures a variety of bike share users including commuters, students, and tourists. Figure 14, illustrates the outcome of the SoBi data analysis from summer 2015. The analysis of the summer data showed that 82 percent of SoBi activity was within the Core Zone. Another 14 percent of activity travelled within and outside of the Core Zone while the remaining 4 percent was not connected to the Core Zone at all. This shows that the vast majority of bike share activity was within the areas that contained the Census Tracts from the original analysis. Further, almost all system activity, 96 percent, was in some way connect to the Core Zone area.

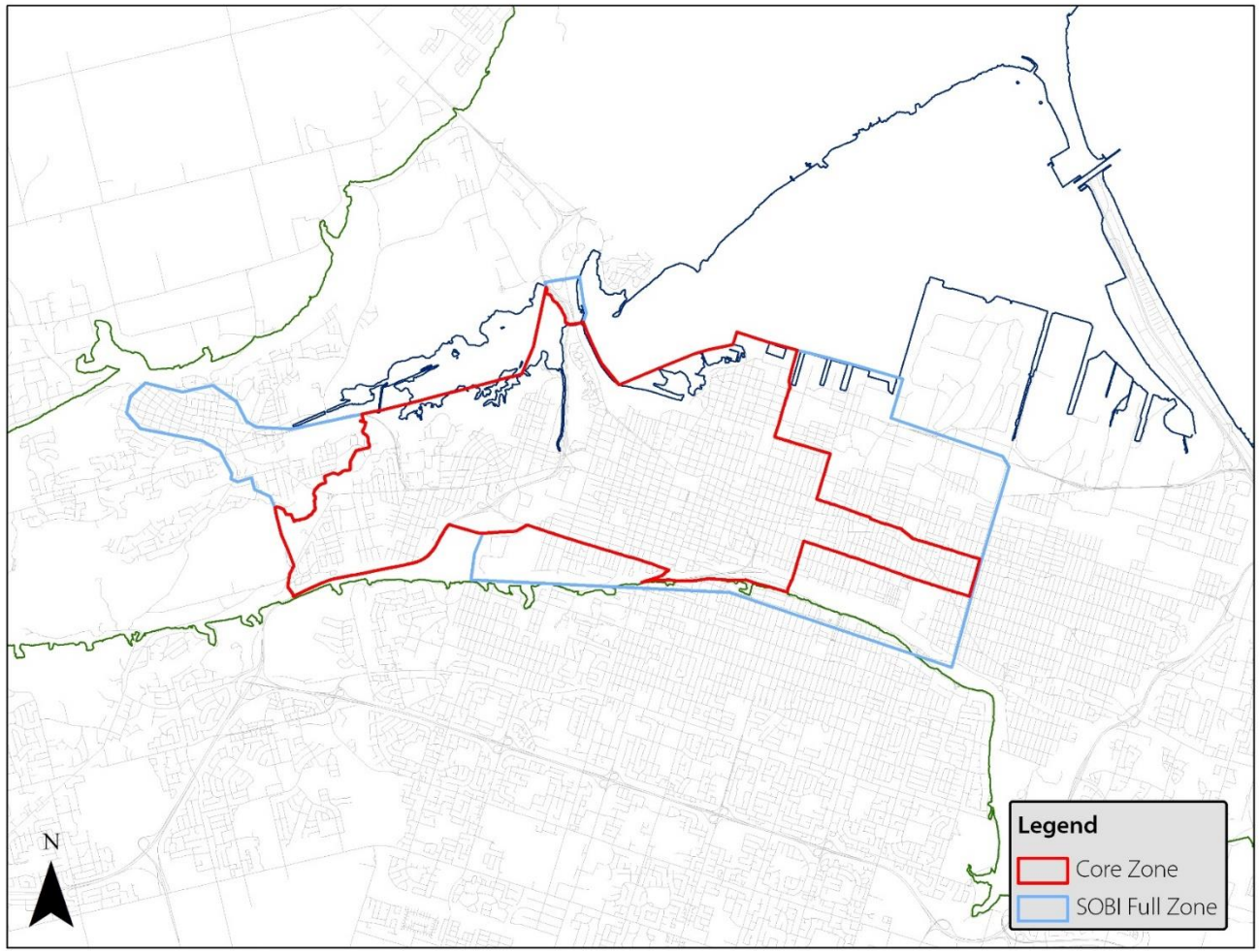
Figure 14: SoBi Hamilton Activity Summary, Summer 2015



Source: Social Bicycles GPX data for June-September 2015, Civicplan

For context, the Core Zone area is compared to the actual service area identified by SoBi (Figure 15). While the two zones overlap for the majority of their area, the actual service area stretches further to the west to include downtown Dundas, further south to capture Concession Street on the Escarpment, and expands the area served to the east of downtown up to Ottawa Street.

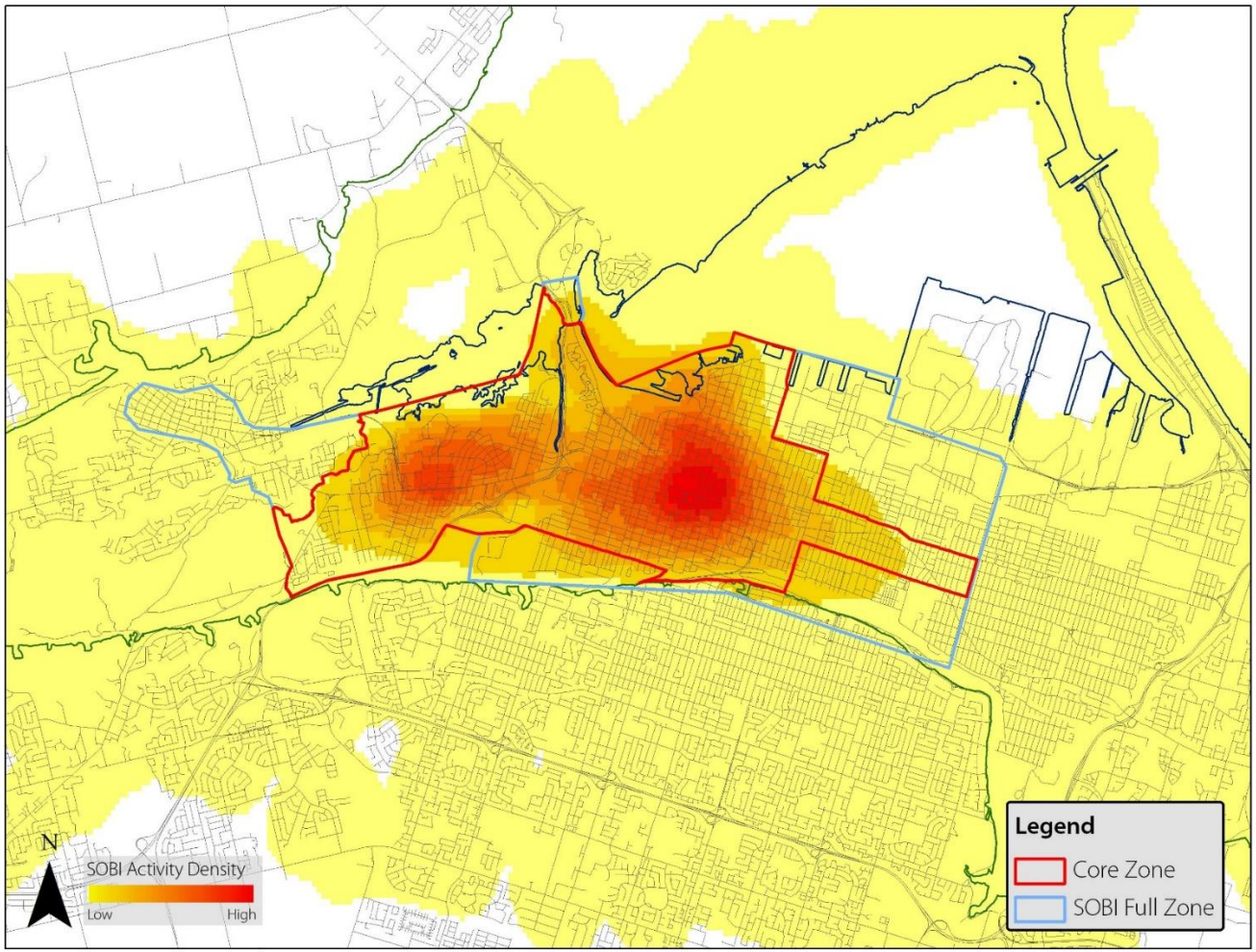
Figure 15: SoBi Activity Zones, Summer 2015



Source: SoBi Hamilton, Civicplan

Within the Core Zone, the density of activity was analyzed to see how it is spread throughout the identified area. The density analysis showed that the major "hot spots" are largely centred on two areas: Downtown Hamilton and McMaster University (Figure 16).

Figure 16: SoBi Activity Density, Summer 2015



Source: SoBi Hamilton, Civicplan

3.3 Top SoBi Hubs

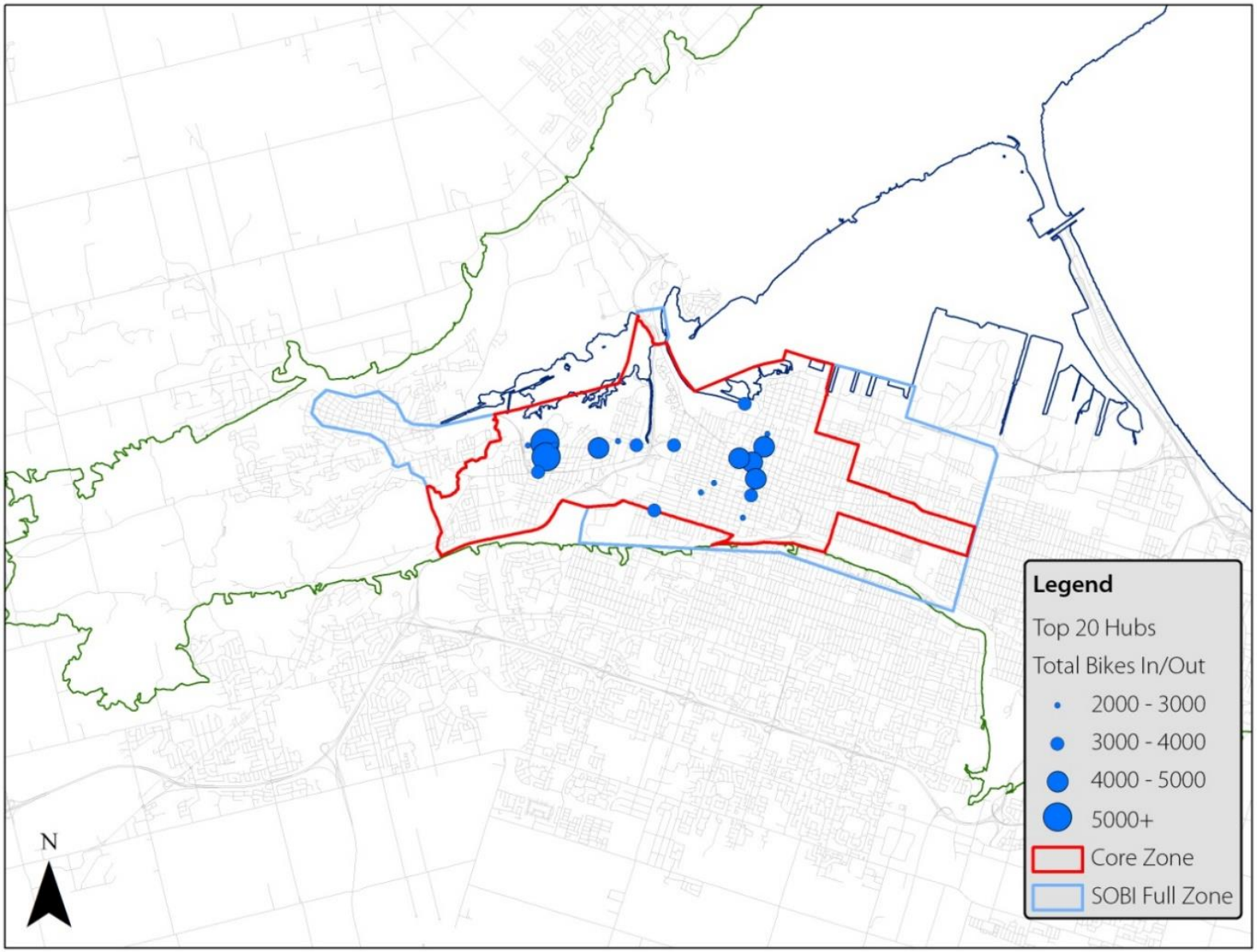
To look further at the location of peak activity, an analysis of the top SoBi hubs was conducted for the same period of time over summer 2015. Table 1 lists the top hubs based on the amount of in/out activity, and Figure 17 shows the top 20 hubs mapped by location. The analysis shows that the top hubs are consistent with the density analysis with hubs at McMaster University and McMaster Hospital leading the way, and hubs in the Downtown central business district also ranking high. Overall, the popular station hubs illustrate a link between McMaster and Downtown along the King Street corridor.

Table 1: SOBI Hamilton Top Hubs by In/Out Activity, Summer 2015

Hub Location	Total In/Out
McMaster Student Centre	7353
McMaster Health Sciences	5306
James North at Mulberry	4674
York at MacNab	4620
Gore Park	4602
Westdale Village	4386
Bay at York	4079
King at Dundurn	3873
Macklin at King	3841
McMaster Emerson	3736
Dundurn at Aberdeen	3654
Bayfront Park	3606
Hunter GO Centre	3346
Herkimer at Queen	2956
Longwood at King	2713
James at Colbourne	2655
James S at Charlton	2626
McMaster Mary Keyes	2440
Hunter at Hess	2419
Forsyth at Sterling	2399

Source: Social Bicycles hub data for June-September 2015

Figure 17: SoBi Hamilton Top Hubs, Summer 2015



Source: Social Bicycles GPX data for June-September 2015, Civicplan

3.4 SoBi Volume Comparisons

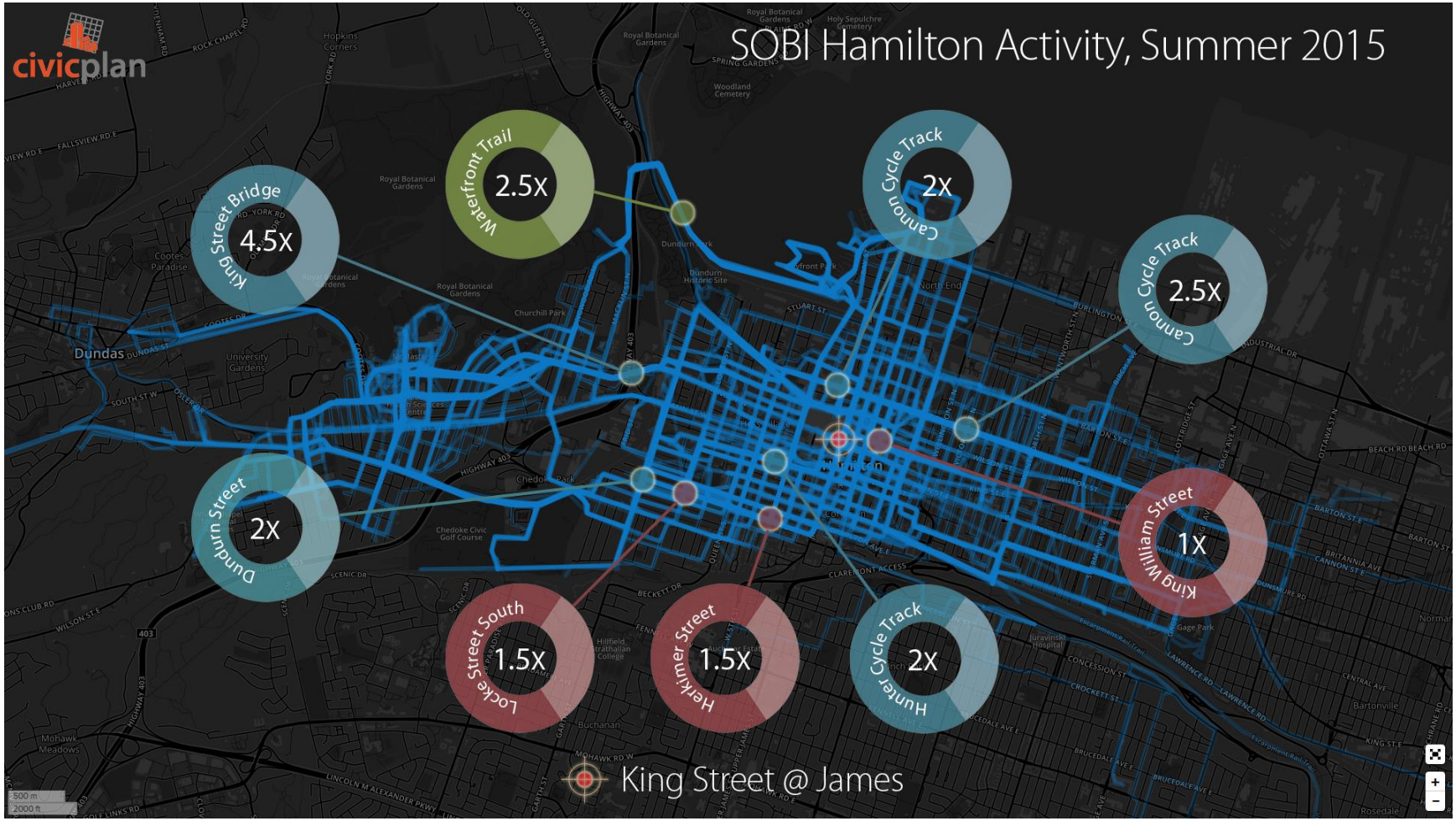
Another approach to observing the use of the SoBi Bike Share system is to look at the relative volume of activity in different locations. Figure 18 displays the level of SoBi activity from June-September 2015 at specific locations. SoBi activity on King Street at James was used as a baseline of comparison for eight other locations:

1. The Waterfront Trail on Hamilton Harbour
2. Cannon Street Cycle Track between MacNab and Park Street
3. Cannon Street Cycle Track at Victoria Avenue North
4. Hunter Street Cycle Track at Bay Street South
5. King Street West on the Bridge over Highway 403
6. Dundurn Street at Herkimer Street
7. Locke Street South at Charlton Avenue
8. Herkimer Street at Bay Street

King Street at James was selected as the baseline as it is a central location in the heart of downtown; it is a main arterial road; and it is part of the designated cycling network as a cautionary unsigned route which is the most basic level of the Hamilton cycling network. The comparison incorporated various types of routes on the cycling network to help determine the relative volume of activity in different locations.

The comparison in volume shows that the two cycle tracks, Cannon Street and Hunter Street had at least twice the volume of SoBi activity as compared to King Street (at James) just a few blocks away. Further west on King Street at the bridge over Highway 403 volumes were four and a half times the baseline. This is partially explained by the fact that King Street is one of the main routes connecting downtown and the west end with McMaster University. In addition, the recreational waterfront trail below Dundurn Castle showed 2.5 times the volumes and Dundurn Street registered two times the baseline. It should be noted that all of these locations have dedicated cycling infrastructure that separates cycling from traffic. By way of comparison, three additional locations were looked at that are part of the cycling network, but as on-street routes rather than separated bike lanes. In all three cases, King William Street, Locke Street South, and Herkimer Street, volumes were at or just above the baseline. Overall, this not only shows where volumes differ, but how more dedicated cycling infrastructure can contribute to SoBi volumes.

Figure 18: SOBI Hamilton Volume Comparison, Summer 2015

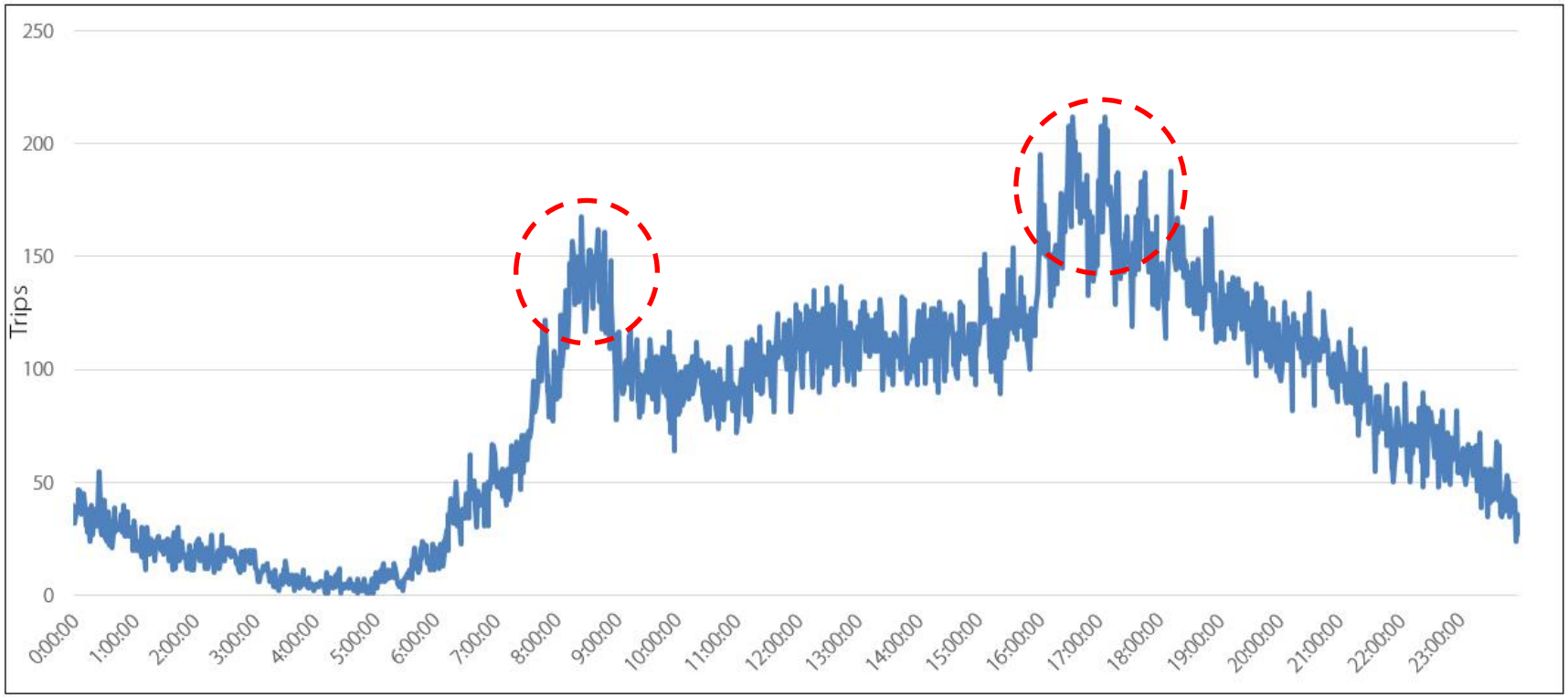


Source: Social Bicycles GPX data for June-September 2015, Civicplan

3.5 SoBi Time of Day Usage

Another useful analysis is to look at the time of day usage for SoBi trips for the same timeframe over summer 2015 (Figure 19). This information points to nature of usage throughout the day. Figure 19 illustrates every trip start time beginning just after midnight (0:00) continuing to the end of the day (23:59). The data shows that, while usage picks up over the course of the day before declining in the evening, there are two distinct peaks: Around 8-9am and between 4-6pm. This would suggest that SoBi trips are connected to the morning and afternoon commute times and would be consistent with the user survey that showed that commuting was the single largest category type for SoBi trips.

Figure 19: SoBi Time of Day Usage, Summer 2015



Source: Social Bicycles usage data for June-September 2015

3.6 SoBi Trip Duration and Distance

Trip duration and distance are other metrics useful for illustrating the nature of SoBi use. Table 2 below outlines the average trip duration and average trip distance for the most popular SoBi membership categories over summer 2015. Pay as you go membership had the highest average trip duration with just under 24 minutes and 2.72 km as an average trip distance. Annual and monthly members were under 20 minutes for average trip duration and around 2 km for average trip distance. McMaster members had the shortest average trip duration while still registering an average of 2 km for trip distance.

Table 2: Average SoBi Trip Duration and Distance, Summer 2015

Membership Category	Average trip duration	Average trip distance (km)
McMaster Member	12 min 33 sec	2
Pay As You Go	23 min 59 sec	2.72
Monthly Member	17 min 41 sec	2.19
Annual Member	14 min 30 sec	1.94

Source: Social Bicycles data for June-September 2015

4.0 Summary

The review of user analytics for SoBi Hamilton illustrates some interesting highlights and trends from the first year in operation. This report looks at two data sets: a user survey and ridership statistics for the summer 2015 period. Together, they begin to show the nature of SoBi riders in terms of who they are, why they choose SoBi, and where they ride. This information can help with future planning of the Hamilton bike share system. Some key highlights are listed below:

User Survey Highlights:

- 52 percent of survey respondents were women and the majority of respondents were under the age of 34.
- The largest single household income segment of respondents was between $100,000-$150,000, followed closely by $20,000-$39,000, and $40,000-$59,000.
- 95 percent of respondent had at least some post-secondary education, the largest segment being at least 4 years of College or University.
- Before SoBi, a majority of respondents said they typically cycled monthly or less than once a month, and after obtaining a SoBi subscription, 73 percent said they increased the amount of cycling they do.
- The largest segment of respondents, 38 percent, indicated that they use SoBi for commuting to work, followed by 21 percent for running errands or travelling to meetings. Social riding came in third.
- Driving a vehicle was the primary mode of transportation for the largest segment of respondents (41%), followed by cycling (24%). Public transit came third.
- 35 percent of respondents indicated that they have decreased their driving since beginning a subscription with SoBi.
- Respondents had a very high satisfaction rate with SoBi (96%), and almost 90 percent indicating that the cost of an annual membership was either about right or an amazing deal.

Summary Travel Data Highlights:

- Of almost all summer system activity, 96 percent, was in some way connect to the Core Zone area that was identified in the 2013 Bike Share Assessment. The Core Zone is slightly smaller than the actual SoBi service area which stretches further to the west to include downtown Dundas, further south to capture Concession Street on the Escarpment, and expands the area served to the east of downtown up to Ottawa Street.
    - 82 percent of summer SoBi activity was within the Core Zone.
    - 14 percent of activity travelled within and outside of the Core Zone.
    - Only 4 percent was not connected to the Core Zone at all.

- The major activity "hot spots" are largely centred on two areas: Downtown Hamilton and McMaster University.

- The top SoBi hubs are consistent with the "hot spots" with hubs at McMaster University and McMaster Hospital leading the way, and hubs in the Downtown central business district also ranking high.

- The popular station hubs illustrate the major SoBi network "corridor" which links McMaster and Downtown along King Street.

- SoBi volumes are different depending on where they are measured and on what type of cycling infrastructure they are located. King Street West at the bridge over Highway 403 recorded some of the highest Summer 2015 activity given it is one of the main routes connecting downtown and the west end with McMaster University.

- Areas with dedicated cycling infrastructure that separate cycling activity from traffic recorded up two twice the level of SoBi activity relative to adjacent areas with lower forms of cycling infrastructure (e.g. on-street signed routes or cautionary unsigned routes).

- Over the course of the day, there are two distinct peaks of SoBi usage: 8-9am and between 4-6pm. This illustrates how SoBi is being used a choice for local commuters, which is consistent with the user survey.

- Over summer 2015, pay as you go members had the highest average SoBi trip duration with just under 24 minutes and 2.72 km as an average trip distance.