CITY OF GUELPH 2016-2017
ACTIVE TRANSPORTATION
DATA COLLECTION REPORT

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Kendra Cheeseman*, Nicole Jeffrey**, & Courtney Primeau*1
*Research Assistant
**Project Manager


1 Lead authorship is equal.
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INTRODUCTION

In this report, we present the results of analyses of the 2016 and 2017 Active Transportation data collection efforts by the City of Guelph’s Sustainable Transportation Program. This program tracked active transportation (i.e., the number of people wheeling and walking) at various times and sites throughout the city. Results in this report will help inform the City of Guelph’s future policy and planning design decisions.

Research Goals

The goals of the current research were to:

1. Count the number of people wheeling and walking (i.e., using active transportation) at various sites throughout the City of Guelph at specific points in time; and

2. Examine how factors such as year, infrastructure, and weather may have impacted the number of people using active transportation.

Background

Active transportation includes “any form of human-powered transportation”, such as walking, running, jogging, cycling, rollerblading, skateboarding, using mobility assistance devices, and canoeing or kayaking (City of Guelph, 2017; Public Health Agency of Canada, 2017). Active transportation has a number of benefits to both individuals and communities, including health benefits, financial savings on gas and parking, increasing social interactions, reducing road congestion, and reducing greenhouse gas emissions from transportation (City of Guelph, 2017; Public Health Agency of Canada, 2017). Given that the population of Guelph is projected to grow into the year 2031 and beyond, active transportation is one way that the City of Guelph can ensure “efficient movement of people and goods around the city” (City of Guelph, 2017).

For the current research, we used active transportation data that the City of Guelph’s Sustainable Transportation Program collected at 39 sites throughout the city (see Figure 1). The program used moveable count equipment at the different sites throughout 2016 and 2017 that counted the number of people (a) biking using on-road facilities and (b) walking and wheeling (i.e., biking, skateboarding, rollerblading, etc.) on shared trails. This research will help the City of Guelph make informed policy and infrastructure design decisions.
Figure 1. Map of the 39 Active Transportation Count Sites by Type of Counter and by Year of Data Collection

See an interactive Google Map with all of the count sites and ward boundaries, and the urban-suburban boundary.

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METHODS

The City of Guelph’s Sustainable Transportation Program collected active transportation data using two types of EcoCounter equipment. First, they used a Tube Counter to count the number of people biking on-road. This device includes a set of two pneumatic tubes stretched across the area where cyclists are expected to ride, and it counts each time a bike passes across the tubes (see Figure 2). Second, they used a Pyro Box to count the number of people walking or wheeling (i.e., biking, skateboarding, rollerblading, etc.) on multi-use routes. This device emits an infrared beam that detects body heat and is calibrated to count people passing within five meters of the counter (see Figure 3).

Figure 2. Tube Counter Installation
The Sustainable Transportation Program staff rotated the counters among different sites in the City of Guelph during May to October of 2016 and June to November of 2017. On average, the counters collected 2 weeks of 24-hour data in 15-minute intervals at each site. Most sites were only counted in one year. A few sites from 2016 were counted again in 2017 to begin exploring trends over time. In total, 21 sites were counted in 2016 and 18 sites were counted in 2017 (see Appendix A for the count sites and schedules).
The City of Guelph’s Sustainable Transportation Program staff provided us with four Microsoft Excel datasets:

1. 2016 off-road site counts of people walking and wheeling on multi-use paths
2. 2016 on-road site counts of people biking
3. 2017 off-road site counts of people walking and wheeling on multi-use paths
4. 2017 on-road site counts of people biking

They also provided:

- Maps of the city’s wards, road types, and cycling network; and
- Classification of data collection sites by type of infrastructure and by type of location (i.e., urban or suburban; see Appendix B).

We used the following 2016 and 2017 weather data for Guelph from Environment Canada and the Government of Canada Climate Service:

- 2016 and 2017 temperature highs and lows per month
- 2017 number of days with precipitation per month (not available for 2016)
- 2017 total levels of precipitation per month (not available for 2016)
- 2017 average daily levels of precipitation per month (not available for 2016)

Data Preparation

We combined the four datasets into one Microsoft Excel file and removed any data that Sustainable Transportation Program staff identified as unreliable or unneeded. Unreliable data included counts recorded during the equipment relocations, counts collected when the equipment malfunctioned (tubes came out of pavement or infrared beams were obstructed), and irregular counts or outliers (which eliminated some data collection sites entirely). For on-road counts where data was collected from each

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2 One data collection site (Woodlawn Road West Multi-Use Path near Silvercreek - North Side) was identified as unreliable and re-counted; however, the unreliable data was erroneously used in this research. See the Results and Discussion section for more information.
direction of travel, we combined the counts for each time stamp. For off-road counts, the
infrared technology was able to detect direction, and for all analyses we combined the
counts recorded in both directions. Finally, we organized and grouped the data into
categories relevant to each analysis (e.g., by holiday/special event, type of roadway,
day of week).

Data Analysis
We used sum and “sum if” formulas in Microsoft Excel to calculate the total counts
relevant to each analysis. We also calculated averages where relevant, rounded to the
nearest whole number. All per-site average charts in the Results and Discussion section
account for the fact that a different number of sites were counted across some
comparison categories. They account for this because we divided the total active
transportation count of each comparison category by the number of sites measured for
that category. These per-site average charts offer a more equal comparison than the
total count charts. Similarly, all per-day average charts account for the fact that a
different number of days were counted across some comparison categories. They
account for this because we divided the total active transportation count of each
comparison category by the number of days measured for that category. Again, these
per-day average charts offer a more equal comparison than the total count charts.

We conducted some analyses across all the data and some within each data collection
site. Specifically, we examined:

- Total active transportation count comparisons across:
  - Year (2016 and 2017)
  - Types of location (urban and suburban)
  - Time of day
  - Day of week
  - Time of year (month)
  - Types of roadway
  - Types of infrastructure
RESULTS AND DISCUSSION

In the following sections, we provide the results for each of the comparisons listed above. We present most of the results in chart-form and, where possible, make qualitative observations about patterns and the potential impacts of the different conditions on the number of people using active transportation. The charts provide a visual comparison of the active transportation counts across different conditions or categories that may have affected the use of active transportation. All results were influenced by the sampling method and should be interpreted with caution. For example, each year, location type, time of year, roadway type, infrastructure type, and ward included a different number of data collection sites in the comparison. Where possible, we have provided comparisons averaged across the number of sites sampled to reduce this bias. However, some comparisons may have also been influenced by differences in the number of days and/or time periods sampled and different site characteristics and we were unable to control for these factors.

The count equipment at one data collection site (Woodlawn Road West Multi-Use Path near Silvercreek - North Side) was improperly positioned and counts were higher than they should have been. Although the site was re-counted, we erroneously used the unreliable data in the analyses in this report. Readers should interpret the results of all overall analyses with this error in mind. We also used the unreliable data for the site-specific analyses at this site but we have left these analyses in the report because they illustrate the counts that we used in the overall analyses.

Total Active Transportation Count Comparisons (Across Sites)

In this section, we report the results of the total active transportation count comparisons across all data collection sites.
Total Counts by Year

Figure 4 shows the per-site average active transportation counts across the two years: 4,140 in 2016 and 2,476 in 2017. Figure 4 accounts for the fact that there were more sites counted in 2016 (21) than in 2017 (18). Remaining variability may be due to characteristics of the sites counted in 2016 versus 2017 or differences in the number of 24-hour days that were counted each year.

Figure 5 shows that the total count of people using active transportation was higher in 2016 (86,940) than in 2017 (44,565). It also shows the number of count sites each year, but the total active transportation counts do not account for this. The total active transportation count across both years was 131,305.

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3 As noted in the Data Analysis section above, we calculated all per-site average counts by dividing the total active transportation count of each comparison category (in this case, the years 2016 and 2017) by the number of sites measured for each category.
Figure 4. Per-Site Average Active Transportation Counts by Year

Figure 5. Total Active Transportation Counts by Year
Total Counts by Type of Location

Figure 6 shows that the per-site average urban active transportation counts were higher than the suburban counts in both 2016 and 2017 (urban and suburban are defined in Appendix B). Figure 6 accounts for the fact that there were more suburban sites counted in both 2016 and 2017. Remaining variability suggests that some difference in the counts may be due to characteristics of the sites counted in 2016 compared to those counted in 2017.

Figure 7 shows that the total count of people using active transportation was higher in suburban locations than urban locations in both 2016 and 2017; however, this figure does not account for the fact that more suburban locations were counted both years.
Figure 6. Per-Site Average Active Transportation Counts by Type of Location and by Year

Figure 7. Total Active Transportation Counts by Type of Location and by Year
Total Counts by Day of Week

In both 2016 and 2017, the per-day average count of people using active transportation was slightly higher on weekdays (Monday through Friday) than on weekends (Saturday and Sunday; see Figure 8). Figure 8 accounts for the fact that there are more weekdays (5) than weekend days (2) in a week\(^4\). The similarity between the per-day average weekday and weekend counts may suggest a balance between commuter travellers (likely more common on weekdays) and recreational travellers (likely more common on weekends).

Figure 9 shows the total active transportation counts on weekdays and weekends across the two years; however, it does not account for the number of weekdays versus weekend days in a week.

\(^4\) As noted in the Data Analysis section above, we calculated all per-day average counts by dividing the total active transportation count of each comparison category (in this case, weekdays and weekends) by the number of days measured for each category.
Figure 8. Per-Day Average Active Transportation Counts by Day of the Week and by Year

Figure 9. Total Active Transportation Counts by Day of the Week and by Year
Total Counts by Time of Year (Month)

Figure 10 shows the per-site average active transportation counts across the months during which data were collected in each year. As sites were often monitored for about 2 to 4 weeks, these data provide only a sample of the monthly breakdowns. In 2016, the per-site average active transportation counts were highest in the summer months of June and July. In 2017, the per-site average active transportation counts were highest in the months of August and October. Figure 10 accounts for the fact that there were more sites measured during certain months. Results may suggest that more people use active transportation during warmer months. Because data were only available for the months of May through November, we could not make seasonal comparisons. Moreover, differences in peak months across the two years may be partly because of differences in the number of days that were sampled in each month across the two years, and because the Sustainable Transportation Program staff changed the data collection sites between the two years.

Figure 11 shows the total active transportation counts each month across the two years; however, unlike Figure 10, it does not account for differences in the number of collection sites each month.

Figures 12 and 13 show the total active transportation counts by month in 2016 and 2017, respectively, and include the number of data collection sites each month.
Figure 10. Per-Site Average Active Transportation Counts by Month and by Year

![Bar chart showing the average active transportation counts by month and year.](chart10.png)

Figure 11. Total Active Transportation Counts by Month and by Year

![Bar chart showing the total active transportation counts by month and year.](chart11.png)
Figure 12. Total Active Transportation Counts by Month, 2016

![Graph showing active transportation counts by month in 2016.]

Figure 13. Total Active Transportation Counts by Month, 2017

![Graph showing active transportation counts by month in 2017.]

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5 In all charts with two vertical axes (i.e., values listed along the left and right), the horizontal gridlines correspond to the left vertical axis values. All “number of sites” values were whole numbers.
Total Counts by Type of Roadway

In 2016, the per-site average active transportation count was higher on arterial roadways than local roadways (as defined in Appendix B; see Figure 14). No data collection sites were located on collector roadways in 2016. In 2017, the per-site average active transportation count was highest on local roadways, followed by arterial and collector roadways (see Figure 14). Figure 14 accounts for any differences in the number of sites counted on each type of roadway. Because counts were higher on collector roadways in 2016 but on local roadways in 2017, characteristics of the count sites other than type of roadway may have been more important in impacting active transportation.

Figure 15 shows the total active transportation counts in 2016 and 2017 for each type of roadway; however, it does not account for differences in the number of data collection sites.
Figure 14. Per-Site Average Active Transportation Counts by Type of Roadway and by Year

Figure 15. Total Active Transportation Counts by Type of Roadway and by Year
Total Counts by Type of Infrastructure

Here, we present the results of the active transportation counts across 11 different types of infrastructure, as defined in Appendix B. We provide figure labels in Table 1. In 2016, the per-site average active transportation count was highest on off-road paved trails (see Figure 16). In 2017, the per-site average active transportation count was highest on off-road pedestrian connections (see Figure 16). Figure 16 accounts for any differences in the number of sites counted across the types of infrastructure. Thus, this figure may suggest that more people used off-road paved trails and off-road pedestrian connections for active transportation.

Figure 17 shows the total active transportation counts in 2016 and 2017 for each type of infrastructure; however, it does not account for differences in the number of data collection sites.
Figure 16. Per-Site Average Active Transportation Counts by Type of Infrastructure and by Year

Figure 17. Total Active Transportation Counts by Type of Infrastructure and by Year
Table 1. Legend for Figures 16 and 17

<table>
<thead>
<tr>
<th>Type of Infrastructure</th>
<th>Number of Sites</th>
<th>Figure Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared-use lane</td>
<td>2016: 1, 2017: 3</td>
<td>A</td>
</tr>
<tr>
<td>On-road (boulevard) multi-use path</td>
<td>2016: 2, 2017: 1</td>
<td>B</td>
</tr>
<tr>
<td>Eastbound multi-use path; Westbound on-road bike lane</td>
<td>2016: 0, 2017: 1</td>
<td>C</td>
</tr>
<tr>
<td>On-road bike lane</td>
<td>2016: 7, 2017: 3</td>
<td>D</td>
</tr>
<tr>
<td>On-road painted buffered bike lane</td>
<td>2016: 0, 2017: 2</td>
<td>E</td>
</tr>
<tr>
<td>On-road cycle track</td>
<td>2016: 1, 2017: 0</td>
<td>F</td>
</tr>
<tr>
<td>Off-road paved trail</td>
<td>2016: 2, 2017: 0</td>
<td>H</td>
</tr>
<tr>
<td>Worn path in boulevard</td>
<td>2016: 1, 2017: 0</td>
<td>I</td>
</tr>
<tr>
<td>Pedestrian bridge</td>
<td>2016: 0, 2017: 1</td>
<td>J</td>
</tr>
<tr>
<td>Off-road pedestrian connection</td>
<td>2016: 0, 2017: 1</td>
<td>K</td>
</tr>
</tbody>
</table>
Total Counts by City Ward

Here, we present the results of the active transportation counts across the six City of Guelph Wards (as defined in Appendix B). In both 2016 and 2017, the per-site average count of people who used active transportation was highest in Wards 2 and 5 (see Figure 18). Figure 18 accounts for any differences in the number of sites counted across the Wards. Thus, this figure suggests that characteristics of Wards 2 and 5 may have had some impact on active transportation. Ward 2 includes several recreational trails and parks, including Pollinators Park and Riverside Park. Ward 5 is located in the Southeastern core of the City of Guelph and its high count may be due to the density of the built up urban area, as well as those using cycling to commute to the University of Guelph.

Figure 19 shows the total active transportation counts in each ward across the two years. Figures 20 and 21 show the total active transportation counts by Ward in 2016 and 2017, respectively, and include the number of data collection sites in each Ward. However, unlike Figure 18, Figures 19 through 21 do not account for differences in the number of collection sites in each ward.
Figure 18. Per-Site Average Active Transportation Counts by City of Guelph Ward and by Year

Figure 19. Total Active Transportation Counts by City of Guelph Ward and by Year
**Figure 20. Total Active Transportation Counts by City of Guelph Ward, 2016**

![Graph showing total active transportation counts by City of Guelph Ward in 2016.](image)

**Figure 21. Total Active Transportation Counts by City of Guelph Ward, 2017**

![Graph showing total active transportation counts by City of Guelph Ward in 2017.](image)
Total Counts during Holidays and Special Events

To obtain the counts for each holiday and special event, we included only the data collection sites that were counted on those particular dates. In both 2016 and 2017, the per-day average count of people using active transportation was highest on Canada Day (July 1; see Figure 22). Figure 22 accounts for the fact that Orientation Week at the University of Guelph included multiple days each year (September 3-11, 2016 and September 2-10, 2017), whereas all other holidays and special events included only one day each year. This is why in all cases except Orientation Week, the per-day count shown in Figure 22 is the same as the total count shown in Figure 23—which shows the total active transportation counts across the two years and does not account for differences in the number of days included in each holiday or special event. In 2016, the Canada Day data collection site was in proximity to the Riverside Park Rotary Canada Day fair and fireworks. Some additional variation between holidays and special events may have been due to differences in sites counted on each holiday or special event.
Figure 22. Per-Day Average Active Transportation Counts by Holiday/Special Event and by Year

Figure 23. Total Active Transportation Counts by Holiday/Special Event and by Year
Total Counts by Weather Patterns

In both 2016 and 2017, the total active transportation counts were generally higher during months with higher maximum and minimum temperatures (see Figures 24 and 25). However, some differences may be because of differences in the number of data collection sites counted for each month.

In 2017, the total active transportation count was highest in August, followed by October and July; however, these were also months that generally had:

1. More days with precipitation (see Figure 26);
2. Higher total precipitation levels (see Figure 27); and
3. Higher average daily precipitation levels (see Figure 28).

This pattern suggests that rain may be less important than temperature and other monthly characteristics in impacting active transportation. Precipitation data was not available for 2016.
Figure 24. Total Active Transportation Counts by Month and Temperature, 2016

Figure 25. Total Active Transportation Counts by Month and Temperature, 2017
Figure 26. Total Active Transportation Counts by Month and Number of Days with Precipitation, 2017

Figure 27. Total Active Transportation Counts by Month and Total Monthly Precipitation (mm), 2017
Figure 28. Total Active Transportation Counts by Month and Average Daily Precipitation (mm), 2017
Site-Specific Active Transportation Count Comparisons

In this section, we report the results of the site-specific active transportation count analyses.

2016 Total Day of Week Counts by Site

Here we present the results of the active transportation counts by day of week at each data collection site in 2016—first for on-road sites that provided counts of people who biked, and then for off-road sites that provided counts of people who walked or wheeled. Each bar in the figures below represents the daily total count at that site for the full period data was collected (see Appendix A for each site’s data collection period).

**On-Road (Bike) Counts**

**Figure 29. Woodlawn Road West Multi-Use Path near Silvercreek**

At Woodlawn Road West and East, weekday counts were higher than weekend counts. This suggests that these routes are used more frequently by commuters and less frequently by recreational cyclists.
At Wilson Street, the Sustainable Transportation Program staff only collected one week of data, beginning partially through the Thursday. This likely explains the low count on Thursday.
Talbot Street did not have a consistent pattern. This may be due to the fact that the count equipment was tampered with on a number of occasions during the count period, and there was a national holiday affecting the weekday/weekend counts as well. This is a residential street in close proximity to the University of Guelph and is likely often used to avoid the steep and busy Gordon Street hill.

At Gordon Street South of Stone, there were issues with the count equipment, resulting in lower counts than are thought to exist there.
Off-Road (Walk or Wheel) Counts

Figure 39. Woodlawn Road West Multi-Use Path near Silvercreek - North Side

Figure 40. Woodlawn Road West near Hanlon Expressway - North Side Footpath

Figure 41. Riverside Park North of Speedvale Avenue

Figure 42. TransCanada Trail at George Street

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6 Equipment at this site was improperly positioned and counts were invalid. These data should be disregarded.

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The Woodlawn Road West near Hanlon Expressway - North Side Footpath site was a pre-count of people using the footpath along Woodlawn Road on the north side. There was no multi-use path at the time of the data collection. As expected, the weekend counts are lower, as fewer people work on weekends in this area.

TransCanada Trail showed a relatively consistent count pattern all week.

**Figure 43. Spurline Trail**

**Figure 44. Royal City Park near McCrae**

**Figure 45. Royal Recreational Trail at Municipal Street**

**Figure 46. Silvercreek Trail South of College**
Spurline Trail had exceptionally high counts for Friday, likely because of Canada Day and festivity-goers using the trails.

The pattern at Royal City Park (weekend counts were higher than weekday counts) suggests that it is more often used for recreation than commuting.

Silvercreek Trail had much lower counts on weekends than on weekdays. This could suggest that it is used mostly by commuters or that there was an issue with the counters over the weekend (especially since staff were less likely to respond and fix the counters over weekends).

Preservation Park had higher weekday counts. There was an unusually high number of counts along Old Hanlon Trail on Fridays, which could be attributed to an animal or person lingering in front of the counter for a long time. Tuesdays, Thursdays, and Saturdays had many more travellers than the other days (excluding Fridays).
Figure 49. Gosling Gardens Trail

Gosling Gardens Trails counts were lower during the last few days of the week, possibly due to tampering or shift in the equipment. Upon retrieval, the counter was not in its original orientation. Generally, the high number of weekday counts along off-road trails through the parks could be attributed to commuter traffic, routine dog-walkers, or recreational trail users.

2017 Day of Week Counts by Site

Here we present the results of the active transportation counts by day of week at each count site in 2017—first for on-road sites that provided counts of people who biked and then for off-road sites that provided counts of people who walked or wheeled. Each bar in the figures below represents the daily total count at that site for the full period data was collected (see Appendix A for each site’s data collection period).
Woodlawn Road Multi-Use Path had higher counts during the week than the weekend, suggesting that it may often be used for commuting purposes rather than recreational cycling. Similar to 2016, the days with the highest counts were Tuesdays and Wednesdays.
Eastview Road East near Summit Ridge Drive counts were completed as pre-counts to the installation of a multi-use path. Generally, the weekends were busier than weekdays, which suggests this route is often used for recreational purposes.

As with all sites, the equipment at Watson Parkway was moved on Thursdays, which may explain the slight drop in registered counts. The larger drop on weekends suggests that this route is more frequently used for commuting than for recreational purposes.

The high Thursday and Friday counts registered at Wyndham Street North (a downtown site) were likely due to increased nightlife, especially with a student crowd.

Only one counter was used at Wilson Street due to the road being closed for construction. The cycling route was narrowed and the counter was placed in a high traffic area. Sidewalk cycling is common along this street and may have occurred even during the closure. As per other sites, the counters were relocated on Thursday which may explain the drop in numbers.

The inconsistent pattern at Wellington Street West of Hanlon Parkway may have been due to missing connections along this route, especially to the West End neighbourhoods. Infrastructure is such that more confident cyclists are likely to travel here by bike.
The south side of York Road is a separated multi-use path, while the north side is an on-road bike lane. The westbound counts at the College Avenue East site are consistently higher than the eastbound counts. It could be used primarily by commuters as a means to connect with the University of Guelph Arboretum trails, which would also explain the decrease in Saturday trips.
Although Downey Road was counted in early November, resulting in a lower number of overall counts registered, it was counted for 15 days, which included 3 Thursdays. This likely explains the spike in Thursday counts.

**Off-Road (Walk or Wheel) Counts**

Figure 60. Hydro Corridor located at Woodlawn Road West at Edinburgh

![Graph showing Off-Road Counts for Hydro Corridor](image)

Figure 61. Riverside Park North of Speedvale

![Graph showing Off-Road Counts for Riverside Park](image)

Figure 62. Margaret Greene Park

![Graph showing Off-Road Counts for Margaret Greene Park](image)

Figure 63. Downtown Trail South of Macdonell

![Graph showing Off-Road Counts for Downtown Trail](image)

The Riverside Park North of Speedvale site was captured during the Canada Day festivities at Riverside Park, which likely explains the nearly doubled Saturday count.

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No factors could be identified at Silvercreek Park Dam to account for the spike in Sunday counts, although historical data suggests the weather was very favourable.

Royal Recreational Trail counts included the Labour Day holiday, which likely accounts for the high Monday count. Data at Harvard Street comprised two sites combined and displayed as one: Grierson Drive leading into Chancellors Way and the cut through...
leading from Shakespeare Arms into Research Lane. This combination was due to an error in data collection and reporting.

2016 Total Hourly Counts by Site

Here we present the results of the active transportation counts by time of day at each count site in 2016—first for on-road sites that provided counts of people who biked and then for off-road sites that provided counts of people who walked or wheeled. Each bar in the figures below represents the total hourly count at that site for the full period data was collected (see Appendix A for each site’s data collection period).

**On-Road (Bike) Counts**

Figure 68. Woodlawn Road West Multi-Use Path near Silvercreek

Figure 69. Woodlawn Road East near Inverness

Woodlawn Road West showed a distinct commuter profile with a morning and afternoon peak, and a low during the regular working hours and evening hours. Woodlawn Road East showed more of a steady stream of cyclists, with a peak between 3:00 p.m. and 4:00 p.m.
Woolwich Street near Powell counts showed fairly consistent use with a notable peak in the afternoon. Waterloo at Yorkshire bike counts showed trips growing between 8:00 a.m. and 3:00 p.m. and peaking in the late afternoon between 3:00 p.m. and 6:00 p.m. This route is used regularly by cyclists throughout the day.

Wilson Street counts showed a sharp rise in number of trips corresponding to the morning arrival to work and shops opening. The trip counts remained relatively stable and high throughout the day and tapered off into the evening. This suggests that people...
are biking to downtown via Wilson Street for work and to visit the shops and entertainment offered downtown.

**Figure 74. Talbot Street**

**Figure 75. Stone Road West of Gordon**

**Figure 76. Gordon Street North of Stone**

**Figure 77. Gordon Street South of Stone**

Talbot Street showed a commuter profile with a morning and afternoon peak in trips. Stone Road West of Gordon (near the Movati Athletic Centre) showed a general growth in number of trips as the day goes on, peaking between 4:00 p.m. and 5:00 p.m.
Gordon Street North of Stone showed a typical commuter pattern with a morning peak between 8:00 a.m. and 10:00 a.m. and an afternoon peak between 4:00 p.m. and 6:00 p.m. Gordon Street South of Stone showed a commuter profile, with a strong 8:00 a.m. peak and a more dispersed afternoon and evening with a peak between 3:00 p.m. and 5:00 p.m. Gordon Street showed a distinct peak between 4:00 p.m. and 6:00 p.m. with a smaller peak around 8:00 a.m. to 9:00 a.m. The counts between 4:00 p.m. and 6:00 p.m. are double those from 8:00 a.m. to 10:00 a.m., suggesting that commuter trips may be supplemented by afternoon recreational or discretionary trips.

**Off-Road (Walk or Wheel) Counts**

*Figure 78. Woodlawn Road West Multi-Use Path near Silvercreek - North Side*

*Figure 79. Woodlawn Road West near Hanlon Expressway - North Side Footpath*

Woodlawn Road West near Hanlon Expressway - North Side Footpath showed three distinct peaks at 9:00 a.m., 12:00 p.m., and 4:00 p.m., which may coincide with work and lunch hours. This site was collected along a footpath in the boulevard with no dedicated sidewalk or path facilities. Similar to Woodlawn Road West Multi-Use Path near Silvercreek - North Side, this area is likely used mostly by commuters.

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7 Equipment at this site was improperly positioned and counts were invalid. These data should be disregarded.
Riverside Park North showed a typical trail profile with no distinct peak hour and steady trip counts over the duration of the day. The overall counts were likely higher than typical, as these counts were collected during the week of Canada Day festivities at Riverside Park.

Trans-Canada Trail counts were typically steady with a peak at the lunch hour, suggesting that some employees may use the trails during the lunch break. Generally,
the profile is typical of recreational trails elsewhere with no strong peak pattern in the morning or afternoon.

Spurline Trail had steadily high counts all day, with no distinct peak patterns, suggesting it is primarily used for recreation uses. The numbers may be inflated because these total counts per hour period reflect counts collected on Canada Day in 2016, which drew out large numbers of trail users to access Riverside Park for the festivities.

Royal City Park near McCrae counts showed a slight peak in the evening between 6:00 p.m. and 8:00 p.m. and steady counts throughout the earlier part of the day. This section of trail is consistently used all day by recreational and commuter users alike.

Royal Recreation Trail counts surprisingly showed a commuter profile with two distinct peaks between 8:00 a.m. and 10:00 a.m. and again between 4:00 p.m. and 8:00 p.m.

Silvercreek Trail South of College had a very high peak at noon. This is likely attributed to lunch time trail users from the nearby College Heights and Centennial College high schools using the trails at lunch to go to Stone Road Mall or elsewhere. The second peak at 3:00 p.m. corresponds to the hour when school gets out (2:30-2:45 p.m.).
Preservation Park had an evening peak typical of dog-walking parks and trails, and a relatively stable daytime count pattern similar to other recreational trails.

Old Hanlon Trail is likely mostly used for recreation, given the high counts during the daytime between typical commuter hours.

Gosling Gardens Trail had high variability. This site experienced some disruption with the count equipment that may explain the variability. This site did not show patterns similar to commuter routes or recreational trails as the others have above.
2017 Total Hourly Counts by Site

Here we present the results of the active transportation counts by time of day at each count site in 2017—first for on-road sites that provided counts of people who biked and then for off-road sites that provided counts of people who walked or wheeled. Each bar in the figures below represents the total hourly count at that site for the full period data was collected (see Appendix A for each site’s data collection period).

**On-Road (Bike) Counts**

Figure 89. Woodlawn Road Multi-Use Path

The presence of cyclists every hour in a 24-hour timeframe on the Woodlawn Road Multi-Use Path, with a distinctive peak at 5:00 p.m., points to the commuter profile of this area. Many of the employment centres along this route necessitate shift work, likely resulting in the presence of cyclists at all hours of the day.

Eastview Road East near Summit Ridge Drive saw a somewhat equal distribution of riders throughout the day, with spikes at 10:00 a.m. and 6:00 p.m. This may suggest that this route is used both for commuting and recreational purposes by those travelling within or through the east end of Guelph.
Watson Parkway saw a relatively equal distribution of cyclists over the course of the day, suggesting that this route is used for a multitude of purposes; commuting and recreational riding included.

Both Wyndham Street North at Cork and Wilson Street are located within Guelph’s downtown and saw cyclists at all hours of the day, with peaks being in the late afternoon and evening.
The varied pattern on Wilson Street, with cyclists recorded at all hours of the day, was likely due to the nightlife that exists within the core. Mid-afternoon peaks also suggest many users access the downtown mid-day to visit shops, dine out, and run errands.

Wellington Street West saw evening spikes, possibly suggesting that commuters are using this route either to enter or exit Guelph on the way home from work.

**Figure 95. York Road by York Road Park**

The cycling activity on York Road suggests a largely commuter profile, with peaks at 4:00 p.m. and 5:00 pm.

**Figure 96. College Avenue East by Victoria**

College Avenue East by Victoria saw spikes and drops in bike counts that likely correspond with the class start times at the University of Guelph.

cesinstitute.ca
Figure 97. Stone Road East by East Ring Road

Stone Road East by East Ring Road bike counts somewhat mirror those visible on College Avenue East, and are likely correlated with class times, commuting activities, and the lunch hour at the University of Guelph.

Downey Road saw expectedly low counts, likely because this site was counted in November at the end of the cycling season. Distribution suggests evening commuters and recreational riders.

Off-Road (Walk) Counts

Figure 99. Hydro Corridor located at Woodlawn Road West at Edinburgh

Figure 100. Riverside Park North of Speedvale
Hydro Corridor located at Woodlawn Road West at Edinburgh is a largely recreational trail and saw very low user counts in the early daytime hours. Visitors walking dogs or exercising often use this trail. The site captures a hydro corridor, so it is also possible workers were entering and exiting for maintenance purposes.

Riverside Park North of Speedvale had a somewhat equal distribution of users, with slight peaks during the morning and evening hours, suggesting that this trail is consistently used by commuters and for recreational purposes.

Margaret Greene Park saw patterns that reflect mainly recreational uses, with peaks visible at 9:00 a.m., 11:00 a.m., and 4:00 p.m. Given that the site activity was monitored throughout the month of July, it is likely that children are travelling to and from summer camps or are visiting the park with caregivers. The lack of overnight activity makes sense since this park is located in a residential neighbourhood.

The distribution of users across the day at Downtown Trail South of Macdonell suggests residents are entering and exiting the downtown core throughout the day, as well as using the route to access Guelph Central Station. Sustainable Transportation staff could not find an explanation for the spikes in counts that occurred every other hour.
Royal City Park near Dublin Street is located between downtown Guelph and the University of Guelph neighbourhoods and, thus, it is unsurprising that activity was registered at all hours of the day in this site. The somewhat equal daytime distribution suggests that the park is used both for commuting and recreational purposes.

Silvercreek Park Dam saw a highpoint at 7:00 p.m., possibly suggesting that this route is often used in the evenings to access the sports fields at Silvercreek Park.
The midday peaks in activity at Royal Recreational Trail at Municipal are likely due to the sports fields and other athletic complexes located in close proximity to Centennial Park.

The data at Harvard Street to Stone Road Properties Pathways come from two sites combined and displayed as one: Grierson Drive leading into Chancellors Way and the cut through leading from Shakespeare Arms into Research Lane. This combination was due to an error in data collection and reporting.

GENERAL DISCUSSION AND CONCLUSIONS

This report provides the results of comparisons of different conditions that may have impacted the number of people who used active transportation in the City of Guelph in 2016 and 2017. It is part of a long-term effort to understand active transportation travel patterns and behaviours throughout the city. These results may be used to inform future policy and planning design decisions by the City of Guelph. For example, they may inform changes to the types of infrastructure or prioritization of projects to implement the active transportation or cycling networks.

Limitations

Readers should interpret our results in the context of the following limitations:

- The count program varied significantly between 2016 and 2017. Staff turnover, project timelines, and a number of other factors resulted in significantly different programs between these two years.

- As noted above, all results were influenced by the sampling method. For example, each year, location type, time of year, roadway type, infrastructure type, and ward included a different number of sites in the comparison. While we have provided comparisons averaged across the number of sites sampled to reduce this bias where possible, we did not account for other sampling biases (e.g., differences in the number of days and/or time periods sampled and different site characteristics).

- Due to limitations in the data (e.g., short data collection timeframes and unequal comparisons), we were unable to make statistical comparisons to determine relationships between counts and the various conditions. We did not conduct...
correlational analyses to determine if each factor was statistically related to the count differences.

- During the 2017 data collection season, the Sustainable Transportation program staff discovered that calibration of the on-road (bike) counter was incorrect at College Avenue East by Victoria. The counters were set to be less sensitive as they were previously located on an arterial roadway, and this setting was not corrected following the counters being relocated to College Avenue East by Victoria.

- As previously stated, the count equipment at one data collection site (Woodlawn Road West Multi-Use Path near Silvercreek - North Side) was improperly positioned and counts were higher than they should have been. Although the site was re-counted, we erroneously used the invalid data in the analyses in this report.

Future data collection could be improved by developing a consistent sampling plan that includes the same sites across years, consistent times and dates at each data collection site, and a wider range of months throughout the year.
REFERENCES


## APPENDIX A: COUNT SITES AND SCHEDULES

Table 2. Sites and Schedules for 2016 and 2017 Active Transportation Counters

<table>
<thead>
<tr>
<th>Number</th>
<th>Year</th>
<th>Site</th>
<th>Infrastructure Type (count type)</th>
<th>Count Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2016</td>
<td>Woodlawn Road West Multi-Use Path near Silvercreek</td>
<td>On-road (boulevard) multi-use path (on-road bike)</td>
<td>May 26 – June 09</td>
</tr>
<tr>
<td>2</td>
<td>2016</td>
<td>Woodlawn Road East near Inverness</td>
<td>On-road bike lane (on-road bike)</td>
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<tr>
<td>3</td>
<td>2016</td>
<td>Woolwich Street near Powell</td>
<td>On-road bike lane (on-road bike)</td>
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<td>4</td>
<td>2016</td>
<td>Waterloo at Yorkshire</td>
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<td>July 07 – July 21</td>
</tr>
<tr>
<td>5</td>
<td>2016</td>
<td>Wilson Street</td>
<td>On-road bike lane (on-road bike)</td>
<td>May 06 – May 12</td>
</tr>
<tr>
<td>6</td>
<td>2016</td>
<td>23 Gordon Street</td>
<td>On-road bike lane (on-road bike)</td>
<td>May 12 – May 26</td>
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<tr>
<td>7</td>
<td>2016</td>
<td>Talbot Street</td>
<td>Shared-use lane (on-road bike)</td>
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<tr>
<td>8</td>
<td>2016</td>
<td>Stone Road West of Gordon</td>
<td>On-road cycle track (on-road bike)</td>
<td>August 04 – August 18</td>
</tr>
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<td>Number</td>
<td>Year</td>
<td>Site</td>
<td>Infrastructure Type (count type)</td>
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<td>2016</td>
<td>Gordon Street North of Stone</td>
<td>On-road bike lane (on-road bike)</td>
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<tr>
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<td>2016</td>
<td>Gordon Street South of Stone</td>
<td>On-road bike lane (on-road bike)</td>
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</tr>
<tr>
<td>11</td>
<td>2016</td>
<td>Woodlawn Road West Multi-Use Path near Silvercreek - North Side</td>
<td>On-road (boulevard) multi-use path (off-road wheel and walk)</td>
<td>May 26 – June 09</td>
</tr>
<tr>
<td>12</td>
<td>2016</td>
<td>Woodlawn Road West near Hanlon Expressway - North Side Footpath</td>
<td>Worn path in boulevard (off-road wheel and walk)</td>
<td>July 21 – August 04</td>
</tr>
<tr>
<td>13</td>
<td>2016</td>
<td>Riverside Park north of Speedvale Avenue</td>
<td>Off-road unpaved trail (off-road wheel and walk)</td>
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<tr>
<td>14</td>
<td>2016</td>
<td>TransCanada Trail at George Street</td>
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<td>2016</td>
<td>Royal Recreational Trail at Municipal Street</td>
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<td>18</td>
<td>2016</td>
<td>Silvercreek Trail South of College</td>
<td>Off-road unpaved trail (off-road wheel and walk)</td>
<td>September 01 – September 15</td>
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<td>19</td>
<td>2016</td>
<td>Preservation Park</td>
<td>Off-road unpaved trail (off-road wheel and walk)</td>
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<td>20</td>
<td>2016</td>
<td>Old Hanlon Trail</td>
<td>Off-road paved trail (off-road wheel and walk)</td>
<td>September 15 – October 03</td>
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<tr>
<td>21</td>
<td>2016</td>
<td>Gosling Gardens Trail</td>
<td>Off-road unpaved trail (off-road wheel and walk)</td>
<td>October 17 – October 28</td>
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<td>22</td>
<td>2017</td>
<td>Woodlawn Road Multi-Use Path</td>
<td>On-road (boulevard) multi-use path (on-road bike)</td>
<td>July 6 – July 20</td>
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<td>23</td>
<td>2017</td>
<td>Eastview Road East near Summit Ridge Drive</td>
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<td>Watson Parkway</td>
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<td>Wyndham Street North at Cork</td>
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<td>26</td>
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<td>Wilson Street</td>
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<td>Wellington Street West of Hanlon Parkway</td>
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<td>28</td>
<td>2017</td>
<td>York Road by York Road Park</td>
<td>Eastbound multi-use path; Westbound on-road bike lane (on-road bike)</td>
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<td>2017</td>
<td>College Avenue East by Victoria</td>
<td>Shared-use lane (on-road bike)</td>
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<td>30</td>
<td>2017</td>
<td>Stone Road East by East Ring Road</td>
<td>On-road painted buffered bike lane (on-road bike)</td>
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<td>Downey Road</td>
<td>On-road painted buffered bike lane (on-road bike)</td>
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<td>32</td>
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<td>Hydro Corridor located at Woodlawn Road West at Edinburgh</td>
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<td>Downtown Trail South of Macdonell</td>
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<td>36</td>
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<td>Royal City Park near Dublin Street</td>
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<td>August 17 – August 31</td>
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<td>37</td>
<td>2017</td>
<td>Silvercreek Park Dam</td>
<td>Pedestrian bridge (off-road wheel and walk)</td>
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<td>38</td>
<td>2017</td>
<td>Royal Recreational Trial at Municipal</td>
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<td>August 31 – September 15</td>
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<tr>
<td>39</td>
<td>2017</td>
<td>Harvard Street to Stone Road Properties Pathways</td>
<td>Off-road pedestrian connection (off-road wheel and walk)</td>
<td>September 29 – November 03</td>
</tr>
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</table>

Note: The dates provided in this table are approximate and some sites had missing counts for some segments of time within the dates listed.
APPENDIX B: LIST OF TERMS AND DEFINITIONS

This appendix outlines key terms and definitions that we used to classify the count sites and analyze the data.

Types of Location

- **Urban**: Any site within the City of Guelph’s “older built up area”, a part of the City mostly constructed before 1944 with a more compact neighbourhood design, more grid-like street layout, and higher population density compared to areas outside this zone (features consistent with an urban area).

- **Suburban**: Any site outside of the City of Guelph’s “older built up area”.

See Figure 1 above and an [interactive Google Map](#) with all of the count sites and the urban/suburban boundary.

Types of Roadway

- **Arterial**: Arterial roads are intended to move moderate to large volumes of traffic over moderate distances within the city, and to collect traffic and direct it to the provincial highway system. Arterial roads are designed for medium speed, having capacity for 2 to 6 lanes, usually undivided, with access generally restricted, wherever possible, to at-grade road intersections with other arterial and collector roads.

- **Collector**: Collector roads are intended to move low to moderate volumes of traffic within specific areas of the city and collect local traffic for distribution to the arterial or provincial highway system. Collector roads are designed for moderate speed, having capacity for 2 to 4 lanes, usually undivided. They are often used for bus routes.

- **Local**: Local roads will provide for low volumes of traffic and access to abutting private property. Local roads are designed for low speed, having capacity for two lanes of undivided traffic, with through traffic discouraged.

Types of Infrastructure

- **Shared-use lane**: This is a regular traffic lane that is wide enough for cars and bicycles to share (typically 4.0 meters).
- **On-road (boulevard) multi-use path:** Typically, a 3.0 meter paved path in the boulevard that replaces a sidewalk and allows cyclists to share the path with pedestrians; separated by boulevard and the curb from the roadway.

- **Eastbound multi-use path; Westbound on-road bike lane:** York Road between Wyndham Street and approximately Neeve Street has a multi-use boulevard path on the south (eastbound) side of the road, and a bike lane painted on the road on the north side (westbound lane).

- **On-road bike lane:** This is a travel lane reserved for exclusive use by people on bikes, typically adjacent to the curb, and is delineated by a painted line.

- **On-road painted buffered bike lane:** This is typically a standard on-road bike lane with the addition of a hatched 30-50 centimetres “buffer” of painted roadway to further separate car traffic from the bike lane.

- **On-road cycle track:** This is a slightly raised bike lane with a rolled curb. It is still within the paved road but has been raised approximately 3 inches above the other travel lanes.

- **Off-road unpaved trail:** Recreational trails through parks and open spaces that are not paved but may be treated with a granular surface or other material.

- **Off-road paved trail:** Recreational trails through parks and open spaces that are paved.

- **Worn path in boulevard:** Some sites were collected where there is currently no cycling or pedestrian facility except for a worn path, but the City has plans to build a facility at this site. It provides the “before” count as a basis of comparison to post-construction of a facility.

- **Pedestrian bridge:** A bridge intended only for pedestrians (no motorized vehicles are permitted). Examples include the Heffernan Street bridge, the Norwich Street bridge, and the Northumberland Street bridge.

- **Off-road pedestrian connection:** This refers to a connection between two streets that is not designated as a public street but is part of the public realm, for example, a sidewalk connection between two neighbourhoods.
City Wards

- **Ward boundaries**: The political boundaries assigned and formed by population size and gerrymandering laws with the goal of equal representation of different geographic areas in Guelph by having two elected City Councillors for each region. The City of Guelph has 6 wards. See Figure 1 above and an interactive Google Map with all of the count sites and the City of Guelph Wards.