

Final Report on Winnipeg Bicycle Traffic Counts

June 27, 2007

Purpose and Background

In April, 2007 members of the advocacy group, Bike to the Future, began to discuss the idea of counting the number of bicycle commuters traveling at key locations during rush hour in Winnipeg. We were concerned that there is little data documenting the extent of bicycle traffic in the city, and what there is comes from a city telephone survey done in 2004 and from the 2001 Census. These sources are useful, but they do not document the actual volume of cycling traffic at given locations. This type of information could be useful from several points of view. It could identify areas where improved cycling facilities are needed, it could show how a lack of appropriate facilities can have an effect on the volume of bicycle traffic, and it could provide baseline information that could be used to assess the impact of improvements to cycling infrastructure over time. In addition, if the survey could be done repeatedly at the same locations over several months, it would provide a sense of how weather conditions and time of year affect cycling volume.

Following from this, two members of Bike to the Future decided to launch into such a survey as volunteers, hoping to obtain some preliminary information that would provide a bit of preliminary information and would provide the basis for a larger, more systematic survey in the future.

Methods

The focus of the first round of the survey was on the morning rush hour, 7 – 9 AM, at two of the major bridges across the Assiniboine River, separating downtown Winnipeg from the southern sector of the city. These were the Osborne St. Bridge and the Midtown or Donald St. Bridge. Two volunteers posted themselves by the bridges and kept track of the number of bicycles traveling in either direction, on the main roadway and also on the adjacent sidewalks. A form was used to allow them to make check marks within five-minute time periods. The date of observation was April 2, a Monday morning, chosen as an early spring date and because it was convenient for the volunteers.

A second round of counting was planned for a month later, and other members of Bike to the Future were invited to participate. Two dates were targeted for the second round of counts – Monday, April 30, and Tuesday, May 1. The focus was again on rush hour, although people were encouraged to choose either morning or afternoon rush hour, depending on their preference and convenience. Similarly, volunteers were asked to select locations that they would find convenient to survey, based on the general idea of identifying choke points on the major routes between the downtown and the rest of the city, such as bridges and underpasses. 13 volunteers participated in the second round of counts at 14 locations, with some people doing more than one count. Both original locations were included in the second round, as were a number of other locations around the downtown area. Most major routes from the south, east and west were included in the survey, but only one route to the north (Main St at Higgins) was included. A form to use

for keeping track of the cyclists was distributed to all volunteers, along with some general directions. Volunteers completed and returned the forms to the survey coordinator by email or in person. Most counts were done on April 30 and May 1, but a few were done a week earlier or later.

A third round of counts was carried out during the week of June 4. Again members of Bike to the Future were invited to volunteer, depending on their time and interest. The third round covered many, but not all, of the locations covered in the second round, and included some new locations, especially several in the west end and north end of the city, such as St. Matthews, Ellice, Sargent and the Slaw Rebchuk bridge. In addition, several locations were surveyed during both the morning and afternoon of the same day, or on successive days at the same time of day, providing more points of comparison as will be seen below. A total of 10 volunteers were involved, surveying 13 locations at 21 different times.

Results from the First Round of the Survey

As noted, the initial round of counts took place on Monday morning, April 2, at two locations: the Osborne Bridge and the Midtown (Donald) Bridge. The temperature that morning was -3 degrees with wind and very light snow flurries. Between 7:00 and 9:00 a.m. 39 cyclists were counted crossing Osborne bridge and 8 cyclists were counted crossing Midtown bridge. 75% of the cyclists were headed north, into downtown, and 25% were headed south, out of downtown. The peak of traffic occurred between 8:15 and 8:45 when there was about one cyclist every 1.5 minutes on the two bridges combined.

A lot of cyclists used the sidewalks - 6 of the 8 cyclists on Midtown bridge road on the sidewalk, while 17 of the 39 cyclists on Osborne bridge road on the sidewalk. Those who rode on the sidewalks traveled in both directions, regardless of the direction of the adjacent traffic in the roadway.

Results from the Second Round of the Survey

The second round of counts took place at 14 locations, most during morning rush hour, and some during afternoon rush hour. At three locations, both morning and afternoon rush hours were counted. Most of the locations were ringed around the downtown area, but two were farther away, at Pembina and Jubilee, and at Jubilee & Lilac/Riverside. These outlying locations were chosen to document traffic on Pembina at a critical bottleneck (the Jubilee underpass) and to document an alternative to the Pembina route (Riverside-Lilac) that may be affected by the improvements to roads and trails currently being planned as part of the Winsmart project. More than 1300 cyclists were counted at 13 locations in the morning, and 874 cyclists were counted at four locations in the afternoon. During the morning rush hour about 2/3 of the cyclists were traveling into downtown, and 1/3 were traveling out, and during the afternoon rush hour these proportions were reversed.

Table 1
Actual Counts of Bicycle Traffic at Survey Locations, April 19 - May 2, 2007
Morning and/or Afternoon Rush Hour – 2 hour time periods*

Location	Morning Rush Hour			Afternoon Rush Hour		
	Date	Count	Sidewalk %	Date	Count	Sidewalk %
Maryland bridge	May 1	214	41.4%	May 1	270	61.4%
Osborne bridge	Apr 30	173	37.0%	May 1	256	45.7%
Main St at Mayfair	---	---	---	May 1	236	62.3%
Omand foot bridge (across the Assiniboine River)	May 1	141	100.0%	---	---	---
Waterfront Drive (North of Provencher)	May 2	98	52.2%	---	---	---
Pembina at Jubilee	May 1	113	55.8%	---	---	---
Esplanade Riel	Apr 30	115	83.5%	---	---	---
Main St. underpass	May 1	111	68.5%	---	---	---
Wellington at Borebank	Apr 23	77	0.0%	---	---	---
Jubilee/Lilac/Riverside	May 1	82	86.9%	---	---	---
Raglan Road	Apr 19	50	36.0%	---	---	---
Portage Ave underpass	May 1	66	69.7%	---	---	---
Louise bridge	May 1	63	95.2%	---	---	---
Donald (Midtown) bridge	Apr 30	47	50.0%	Apr 30	51	60.3%
Total		1,350	60.1%		813	57.0%

* In some cases counts were made for longer or shorter time periods. Where the counts were longer, only the counts for the prime two hours were used. Where they were shorter the total actual count is used.

It can be seen that the three locations with the highest traffic counts were the Maryland Bridge, the Osborne Bridge and Main Street at Mayfair, just south of the Main Street bridge across the Assiniboine River. During the May 1 afternoon rush hour a total of about 760 cyclists were counted at these three locations.

As the table shows, the majority of cyclists at these locations were riding on the sidewalks rather than in the street. The differences among the locations are interesting. A majority of cyclists crossing Osborne and Maryland bridges, at least in the morning, used the street, as did the majority riding on Raglan Road and on Wellington. The Osborne and Maryland bridges are relatively wide and provide more room for cyclists than other locations with less space or more difficult conditions for cyclists, such as Midtown Bridge, the Jubilee underpass, the Fort Garry Bridge and the Main St. underpass at Higgins. Esplanade Riel is a special case where a wide pedestrian/cycling bridge parallels the bridges for motor vehicles and provides an attractive alternative. Quieter streets, such as Raglan Road, also seem to encourage cyclists to ride in the street. A number of the volunteers noted that cyclists often change from the road to the sidewalk as they approach a bridge or underpass, or that they move from the sidewalk to the street when they get past the point of heavy traffic.

Results from the Third Round of the Survey

As shown in Table 2, 13 locations were also surveyed during the third round, although these locations were somewhat different from those surveyed during the second round. In addition, some of the locations were surveyed more than once. The multiple counts for a given location allow for comparisons between morning and afternoon counts, and between different days of the week, under different weather conditions. In total, 1,120 cyclists were counted during 14 morning counts, and 885 cyclists were counted during 7 afternoon counts. Almost all the counts were done at locations where traffic travels into or out from the downtown area. The exception to this was the count on the Fort Garry (Bishop Grandin) Bridge. This location is significant because of its proximity to the University of Manitoba and because of the planned development of the pathway system known as the Bishop Grandin Greenway. This development project will include rehabilitation of the Fort Garry bridge.

Table 2
Actual Counts of Bicycle Traffic at Survey Locations, May 9 and June 4-7, 2007
Morning and/or Afternoon Rush Hour – 2 hour time periods*

Location	Morning Rush Hour			Afternoon Rush Hour		
	Date	Count	Sidewalk %	Date	Count	Sidewalk %
Maryland bridge				June 6	189	67.2%
Osborne bridge	June 4	262	39.7%	June 5	309	47.6%
Omand foot bridge (across the Assiniboine River)	May 9	212	100.0%			
Fort Garry bridge				June 4	129	91.5%
Raglan Rd. at Portage Ave.*	June 4	77	53.2%			
Louise bridge	June 5	90	88.9%			
Donald (Midtown) bridge	June 4	68	44.1%			
Donald (Midtown) bridge	June 5	70	45.7%			
Slaw Rebchuk bridge	June 5	65	69.2%			
St. Matthews at Arlington**	June 4	55	18.2%	June 4	72	22.2%
Arlington at St. Matthews**	June 4	48	14.6%	June 4	58	43.1%
Arlington at Ellice***	June 5	44	n.a.	June 5	49	n.a.
Ellice at Arlington***	June 5	42	33.3%	June 5	79	57.0%
Sargent at Arlington	June 6	40	45.0%			
Main St. underpass*	June 7	40	85.0%			
Logan at Isabel****	June 5	7	n.a.			
Total	14	1,120	59.4%	7	885	57.2%

* All counts are for two hours except for the Main St. underpass which was for 90 minutes and Raglan Rd which was for 98 minutes.

** Bicycles turning from Arlington onto St. Matthews or vice versa were included in both counts.

*** Counts for Arlington and Ellice on June 5 only counted each bicycle once, based on whichever was the last street taken.

**** Counts for Logan do not include 9 bicycles that turned onto or off of the Slaw Rebchuk Bridge.

During the third round of the survey the weather varied considerably. Monday (June 4) was pleasant, approximately 15° in the morning, warming to 18° or higher in the afternoon, sunny and windy. Tuesday (June 5) was cooler, at about 7° in the morning, partly cloudy with light wind, but warming again to about 18° in the afternoon. Conditions deteriorated on Wednesday (June 6), with moderate-to-heavy rain during the afternoon rush hour. Rain was also reported on Thursday morning (June 7). The counts that were done in rainy conditions are clearly lower than would have been expected otherwise. The afternoon count on the Maryland/Sherbrook bridges fell from 270 cyclists during the second round to 189 during the third round. The count at the Main St. underpass also fell in the third round, and again this is attributable to rainy conditions.

One of the counts included in Table 2 actually took place on May 9 at the Omand Creek foot bridge. Although this date is closer in time to the second round of the survey, the weather conditions were much more like late spring or summer than they had been for the rest of the second round counts. Therefore it was felt this would be more typical of June conditions than early May conditions.

As in the previous counts, a majority of cyclists were traveling on the sidewalks rather than in the streets, with the highest proportions on the sidewalks at the Louise Bridge and the Main St. underpass, and the lowest proportions on quieter streets such as St. Matthews Ave. and Ellice Ave. As in the second round, the Osborne Bridge again had a relatively high proportion of cyclists in the streets, compared to other bridges. On the other hand, a majority of cyclists on the Midtown Bridge took the street rather than the sidewalk, which was the opposite of what happened in the second round of the survey. One possible explanation for this could be increased pedestrian traffic on the narrow sidewalks on this bridge, making it more difficult for cyclists to take the sidewalk.

As in the second round around two thirds of the cyclists were heading in towards downtown in the morning (69%) and out from downtown in the afternoon (65%).

Trends from April to June

The third round of the survey provided a number of repeat counts for specific locations which give an indication of how cycling traffic increases during the spring as the weather improves and people's transportation modes change. In order to make good comparisons for different dates and weather conditions comparisons should be made for the same time of day (morning or evening rush hour) and for the same day of the week if possible. Figure A shows the trends at three locations during the morning rush hour for the three rounds of the survey. For two locations, the Osborne and Midtown bridges, counts were done during all three rounds on Monday mornings. At the third location, the Louise Bridge, counts were done on Tuesday mornings during the second and third rounds of counting. All of these show large percentage increases in bicycle traffic, especially between the first and second rounds of the survey.

Figure B is similar to Figure A, but looks at the afternoon counts on the Osborne and Maryland bridges, during the second and third rounds of the survey. This shows that while the Osborne count increased substantially, the Maryland count decreased. The difference between these two comparisons is clearly the result of rainy conditions on June

6 on the Maryland Bridge. The volunteer at this location observed a number of cars carrying bikes on the roof during the afternoon rush hour.

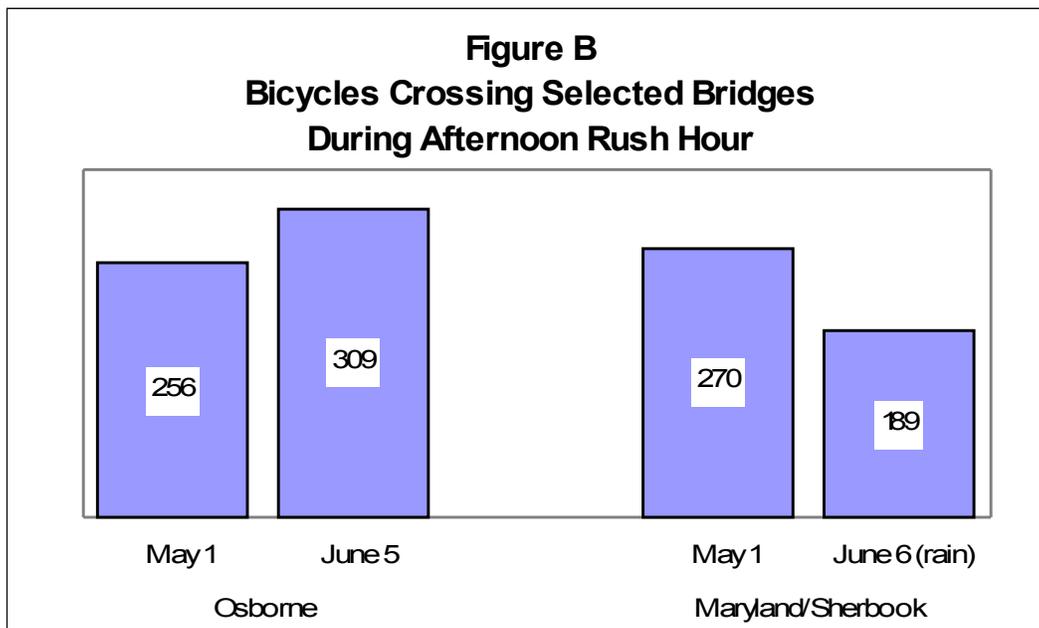
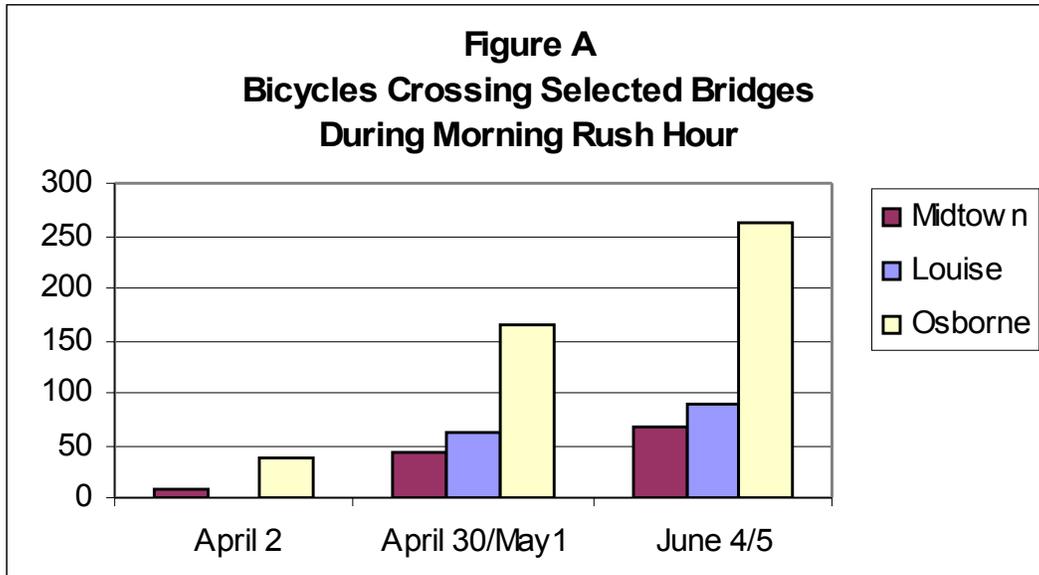


Table 3 summarizes the available trend data from April – June. This shows that bicycle traffic increased very rapidly from April to May, and continued to increase, but not as quickly, from May to June. It can also be seen that the increases were greater for morning than for afternoon bicycle traffic. This suggests that the colder morning temperatures continue to discourage morning cycling later into the spring.

Table 3
Comparison of Bicycle Traffic Counts Over Time at Selected Locations in Winnipeg
April – June, 2007

Location	Time	Day	April 2	April 30- May 1	June 4-7	% change April-May	% change May-June
Osborne bridge	AM	Mon	39	173	262	343.6%	59.8%
Osborne bridge	PM	Tues	---	256	309		20.7%
Midtown bridge	AM	Mon	8	47	68	487.5%	58.1%
Omand foot bridge*	AM	Tues/Wed	---	141	212		50.4%
Louise bridge	AM	Tues	---	63	90		42.9%
Maryland bridge	PM	Tues/Wed	---	270	189		-30.0%
Main St underpass**	AM	Tues/Thurs	---	111	53		-52.0%
Totals			47	1048	1183		
Average change						379.0%	21.4%

* The second count at the Omand foot bridge took place May 9.

** The June 7 count at the Main St. underpass was estimated for a two hour period.

Differences between Morning and Afternoon Counts

A comparison of morning and afternoon counts done at the same location shows that afternoon counts are consistently higher. As Table 4 shows, afternoon counts are from 18% to 56% higher than morning counts at the same locations. This may be attributable to such factors as warmer afternoon temperatures that encourage cycling, after school cycling by children, afternoon shopping activity, or time of day preferences for those who aren't required to travel to a specific destination at a specific time.

Table 4
Comparison of Morning & Afternoon Counts

Location	Date & Time	Count	Date & Time	Count	change
Osborne bridge	April 30 - AM	173	May 1 – PM	256	48.0%
Osborne bridge	June 4 - AM	262	June 5 – PM	309	17.9%
Arlington - St Matthews	June 4 - AM	103	June 4 – PM	130	26.2%
Arlington - Ellice	June 5 - AM	86	June 5 – PM	128	48.8%
Total		615		823	
Average change					35.2%

Estimates of Total Bicycle Traffic

The information from the traffic survey can be used to estimate the total number of cyclists who commute in and out of downtown each day. While not all possible locations into and out of the downtown area have been surveyed, most of the key locations were included in at least one of the surveys. The various bridges, underpasses and other roads where the counts were done form a ring around the downtown, covering all but a few major routes. The locations are listed geographically below, in terms of their geographic relation to downtown.

NORTH:	Slaw Rebchuk (Salter) Bridge Main St. underpass
EAST:	Louise Bridge Esplanade Riel
SOUTH:	Main St. / Queen Elizabeth Bridge Midtown Bridge Osborne Bridge Omand foot bridge (across the Assiniboine River) Maryland/Sherbrook bridges
WEST:	Portage Ave. underpass St. Matthews at Arlington Ellice at Arlington Sargent at Arlington

Counts from these locations when added together should represent most of the commuter traffic in and out of downtown. Some routes are missing, such as Wellington, Notre Dame and Sherbrook on the north/northwest, and the Disraeli freeway to the northeast. On the other hand, some cyclists may be counted twice, if they pass through the downtown area from one end of the city to another. Given that the range of cyclists tends to be short, usually within a 30 minute ride one way, this type of double counting is not likely to be large. Some of the survey locations have been omitted because of the likelihood of substantial double-counting, such as Raglan Road and the Pembina-Jubilee underpass.

Table 5 provides a summary of the estimated afternoon bicycle traffic at the above locations for three points in time. Where possible, actual counts have been used, but where there was no afternoon count at a given location two factors were used to estimate the counts. In these cases, either the April 30/May1 afternoon counts have been multiplied by 1.21 to estimate the June 4-8 afternoon counts, or the June 4-8 morning counts have been multiplied by 1.37 to arrive at the afternoon counts. (These multipliers are based on Tables 3 and 4.) Similarly, counts for April 2 were estimated using the appropriate multipliers. This results in an estimate of about 350 commuter cyclists at the beginning of April, 1,580 cyclists at the beginning of May, and 1,910 cyclists at the beginning of June.

Table 5
Estimated* Afternoon Bicycle Traffic for the Main Access Points In or Out of
Downtown Winnipeg, April, May and June 2007
(Clockwise starting in the north)

Location	Estimated Afternoon Bicycle Traffic		
	April 2	Apr 19-May 2	June 4-8
Main St & Higgins	34	150	182
Louise Bridge	19	85	103
Esplanade Riel	35	156	189
Main St (Q.E.) Bridge	45	197	239
Midtown Bridge	11	58	71
Osborne Bridge	53	256	309
Maryland/Sherbrook Bridges	61	270	328
Omand Foot Bridge across the Assiniboine River	43	191	232
Portage Ave Underpass	18	77	94
St. Matthews at Arlington	13	59	72
Ellice at Arlington	15	65	79
Sargent at Arlington	10	45	54
Arlington at Ellice	9	40	49
Slaw Rebchuk Bridge	16	72	88
Total	348	1,568	1,902
Estimated Total Number of Downtown Commuter Cyclists	871	3,919	4,754

* Actual two-hour counts were used where available. Counts of less than two hours were increased based on the proportion of two hours that were observed. Where no counts existed for the afternoons, morning counts were multiplied by 1.35. Where neither morning or afternoon counts were available for the April 30-May 1 period, the June 4-8 afternoon count was divided by 1.21 to estimate the April 30-May 1 count.

A study of the impact of improving bridge crossings for cycling in Portland developed a method for estimating the total daily bicycle traffic based on peak commuting traffic. This report states, “The City typically gathers hand count data as two-hour peak-period counts. Through examination of 24-hour videotapes and 24-hour tube counts at many of these same locations, the City has determined that this peak two-hour period is approximately one-fifth of average daily bicycle traffic.”¹ Based on this ratio and using the afternoon rush hour figures as the base, it would be estimated that total daily bicycle traffic in and out of downtown Winnipeg via the selected locations was about 1,740 at the beginning of April, 7,840 at the beginning of May, and 9,510 at the beginning of June.

¹ Mia Birk and Roger Geller, “Bridging the Gaps: How the Quality and Quantity of a Connected Bikeway Network Correlates with Increasing Bicycle Use,” July 27, 2005, p. 13, presented at the Transportation Research Board Annual Meeting, January 22, 2006.

However, this includes traffic in both directions, and therefore would count commuters twice if they go back and forth during the day. If we divide these numbers by 2 we arrive at an estimate of the total number of *commuter cyclists in and out of downtown* per day, also shown in Table 5. This should be seen as only a part of the total number of cyclists in Winnipeg, since it does not include those who travel in other parts of the city or within limited neighbourhoods.

Conclusions

An incomplete survey of bicycle traffic shows that the number of cyclists commuting in or out of downtown Winnipeg reached nearly 5,000 in June of this year. The survey probably captured the bulk of downtown commuter traffic, but missed some of the bicycle traffic on routes to the north and northwest of downtown. In addition, people often use bicycles for short trips within their neighbourhoods or communities, and these trips were not captured by the survey. Therefore, the total number of cyclists in Winnipeg would be much higher. An estimate of this number can be made by using the results of a City of Winnipeg Public Works survey from the spring of 2004 in combination with Census data. The Public Works survey found that 2.8% of the city's commuters traveled by bicycle. Multiplying this number by the employed population results in an estimate of about 9,000 bicycle commuters in Winnipeg.

The survey gives us a sense of some of the factors affecting cycling behaviour. One of these factors is clearly the availability of bicycle lanes, paths or other bikeways. The locations favoured by cyclists are wider bridges or roadways, locations where there are wider roads or more lanes, foot bridges and, on busier routes, sidewalks. In fact, the majority of cyclists traveling on the bridges and underpasses included in this survey use sidewalks, especially where traffic is heavy and/or lanes are narrow. These findings are reinforced by studies in other cities showing that the number of cyclists increases substantially when facilities are improved. In Portland it was found that the number of cyclists doubled when bikeways were built or improved on bridges and on the routes leading to the bridges. (Birk and Geller 2005, cited above.) After years of systematic development of bicycle facilities in Portland, that city has 3.5% of workers commuting by bicycle, the highest percentage of any U.S. city.² A Minneapolis-St. Paul study found that cycling increased during the 1990s in areas of the city where cycling facilities were improved.³

Our survey results show that weather and time-of-day affects cycling. Not surprisingly, cooler temperatures and rainy weather discourage many cyclists. In addition, we found that cycling activity is greater during afternoon rush hour than during the mornings.

We also found that the majority of cyclists in the survey traveled on the sidewalks, although this varied according to the location and how "bicycle-friendly" it is. The fact that riding on the sidewalk is generally illegal does not seem to deter these cyclists, probably because there is tacit acceptance of the practice by police and the general public. This suggests that a combination of improved facilities for cyclists, improved

² James Mayer, "Portland Ranks First in Nation for Biking to Work," *The Oregonian*, June 14, 2007.

³ Gary Barnes, Kristen Thompson and Kevin Krizek, "A Longitudinal Analysis of the Effect of Bicycle Facilities on Commute Mode Share," Humphrey Institute of Public Affairs, University of Minnesota, July 28, 2005.

cycling education, and increased enforcement are required if the goal is to keep cyclists off the sidewalks. However, increased enforcement without improved facilities and educational efforts would probably discourage many cyclists from riding at all, and we would then lose the benefits cycling would otherwise provide, in the areas of health, economics, transportation, and the environment.

This survey was not complete and was carried out as a volunteer effort. Ideally it would be important to have information on cycling collected on a systematic basis and we would urge the City of Winnipeg to do so. We feel this is particularly important in connection with planned improvements to cycling facilities in the city, such as the rehabilitation of the Disraeli and Fort Garry bridges and the development of the Winsmart bicycle route.

Report prepared by Jeremy Hull.

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