





Participating Agencies

-  City of Barrie
-  City of Brantford
-  City of Guelph
-  City of Hamilton
-  City of Kawartha Lakes
-  City of Peterborough
-  City of Toronto
-  County of Dufferin
-  County of Peterborough
-  County of Simcoe
-  County of Wellington
-  GO Transit
-  Ministry of Transportation Ontario
-  Regional Municipality of Durham
-  Regional Municipality of Halton
-  Regional Municipality of Niagara
-  Region of Peel
-  Regional Municipality of Waterloo
-  York Region
-  Toronto Transit Commission
-  Town of Orangeville

TRANSPORTATION TOMORROW SURVEY

Ongoing Effort to Study Urban Travel

The Ministry of Transportation, eighteen municipal governments, GO Transit, and the TTC joined forces recently to conduct a comprehensive survey of travel patterns called the Transportation Tomorrow Survey (TTS). This survey consists of telephone interviews of a randomly selected sample of households in the Greater Toronto Area (GTA) and surrounding areas.

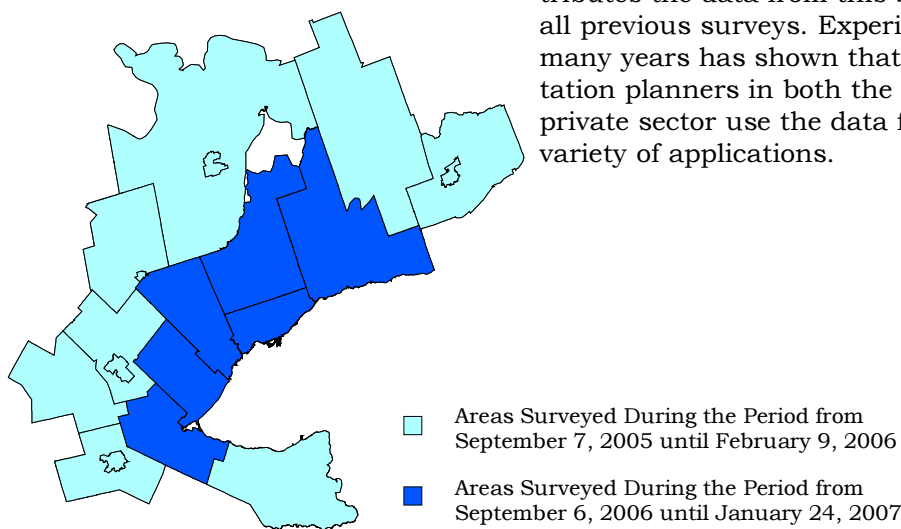
The purpose of the survey is to collect information on the travel habits of residents and provide a database for long-range planning and improvement of transportation facilities. Similar surveys were conducted in 1986, 1991, 1996 and 2001. In addition to trip information for each household member (i.e., trip origin, destination, time, purpose, method of travel) survey participants were asked about age, gender, employment status, size of household and number of motor vehicles.

The survey conducted interviews by telephone for approximately 150,000 randomly selected families. Participants were asked questions about trips on a particular day for household members over 11 years of age as well as questions to provide the demographic characteristics of the household. All information collected is kept in the strictest confidence and cannot be traced to an individual household.

The 2006 Survey was designed to further update the previous studies. Like the 1996 and 2001 surveys, it gathered travel information from areas external to the GTA. This provides the third TTS snapshot of travel in most areas and starts to create a transportation database, similar to that for the GTA, which can be used for time series analysis including projections of travel needs. The TTS surveys are timed to coincide with the Canadian Census so that general relationships can be made regarding transportation and household characteristics.

The Data Management Group at the University of Toronto stores and distributes the data from this survey and all previous surveys. Experience over many years has shown that transportation planners in both the public and private sector use the data for a wide variety of applications.

2006 TTS Survey Area



Transit Use Increases in the GTA & Hamilton

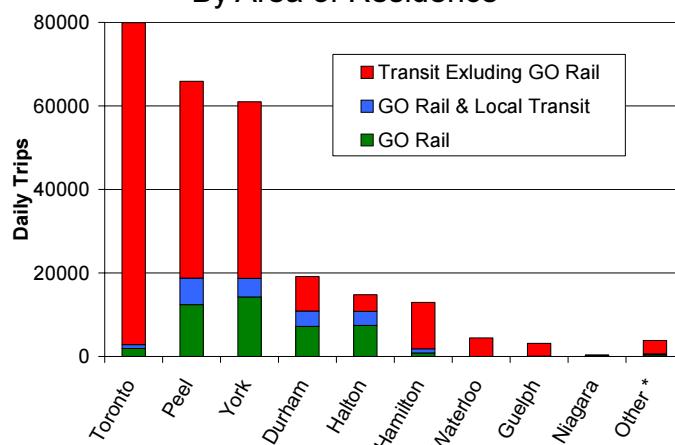
Interviewing procedures in the TTS Surveys record transit trips in considerable detail. The method of access and egress to the transit service is recorded for every transit trip. For bus and streetcar service, the name or number of the route or routes taken during the trip is recorded. For GO Rail and Subway, the boarding and alighting stations are recorded.

One category of transit use is trips that make use of one or more GO rail lines without using any other form of public transit. A second category consists of those trips that use both GO Rail plus another form of public transit to provide access to the GO Rail service at one or both ends of the trip. GO Rail use in these two categories increased by 70% from 1996 to 2006. A third category consists of those trips that use any form of public transit, other than GO Rail. Between 1996 and 2006 the total number of daily trips made by public transit, excluding GO Rail, in the GTA/H increased by 16%. Absolute growth in the number of weekday trips made by transit was highest in Toronto while percentage growth was highest in York Region. There was little change in daily transit use in areas outside the GTA/H that participated in both the 1996 and 2006 surveys.

The use of both GO Rail and other transit grew faster than the population in all six of the jurisdictions that make up the GTA/H. The greatest increase is in GO Rail use, and the most dramatic in percentage terms, has been by the residents of York. Despite rapid growth in riders on GO Rail, the average frequency of GO Rail use by the residents of York remains below the levels reported in the other Regions in the GTA/H. The proximity of the TTC subway system for trips into Toronto by residents of York Region is a possible explanation. Outside the GTA/H, with the exception of Guelph, transit use has grown at a slower rate than has the population.

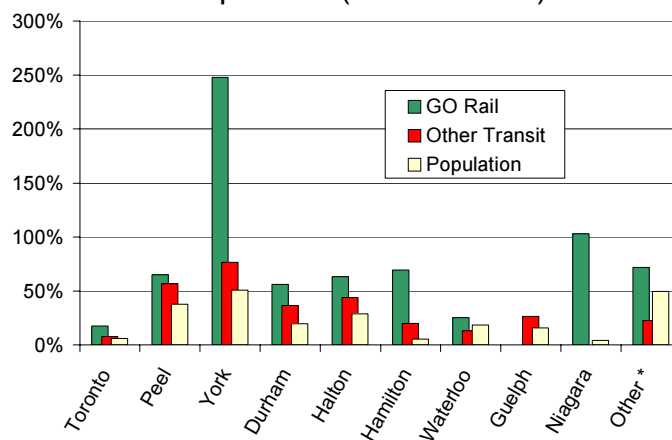
The average frequency of transit use remains three times higher for residents of Toronto relative to the residents of other areas in the GTA/H. Outside the GTA/H the TTS shows the residents of Guelph to be the most frequent transit users but it should be noted that the average rates for many of the other jurisdictions, including Waterloo, Niagara, Durham & Halton include large areas of rural population not well served by transit. A significant majority of the transit trips made by the residents of Halton include the use of GO Rail. It is also interesting to note that the growth in local transit use in Halton has a significant component using local transit for access to GO Rail. The importance to local transit of GO Rail access is similar in Durham.

Growth in Transit Use (1996 to 2006)
By Area of Residence

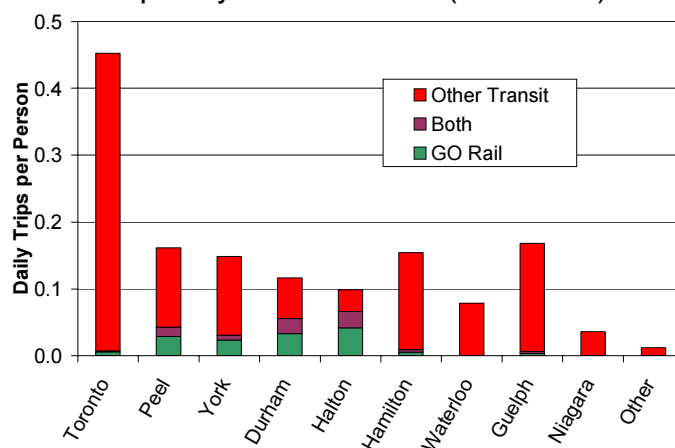


* Other includes the jurisdictions that participated in the 1996 TTS but for which less than 8,000 daily transit trips were recorded - Wellington County, Orangeville, Simcoe County, Barrie, Kawartha Lakes & Peterborough

Changes in Transit Use Relative
to Population (1996 to 2006)

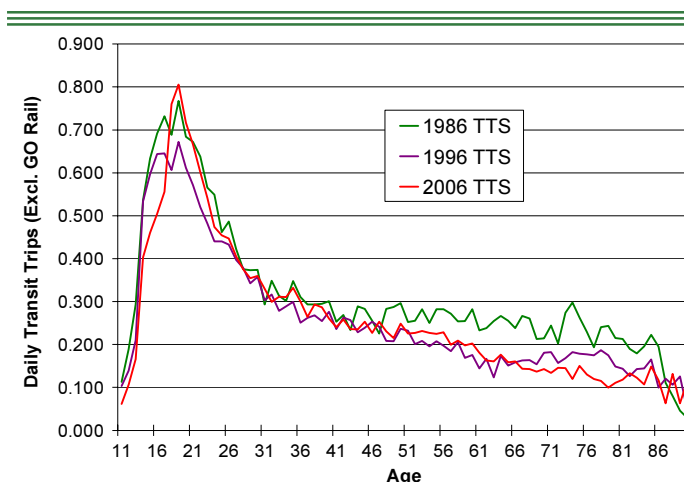


Frequency of Transit Use (2006 TTS)



Frequency of Transit Use by GTAH Residents

Analysis of the socio-demographic characteristics of transit users is possible using TTS data. The data show there is a significant relationship between a person's age and the frequency of transit use. There has been relatively little change in that relationship since 1986. The most frequent transit users are between the age of 18 and 20. Transit use then declines continuously with age dropping to about one third of the frequency by age 40. Since 1986, the average frequency of transit use has gone down for people between 14 and 17 years of age as it has for those 44 and older. In the age range from 18 to 25, frequency of transit use was down in 1996 but has since returned to 1986 levels. There has been no significant change in the age range from 26 to 43.



Trends in Individual's Choice of Travel Mode

The City of Toronto, with its extensive transit system, presents a different set of transportation alternatives compared to other areas in the Greater Toronto Area plus Hamilton (GTAH) or outside the GTAH. Travel in the morning peak period (6:00 a.m. to 9:00 a.m.) for residents of various areas demonstrates the different choices made by residents of the City of Toronto.

Collectively, the residents of the Regions of Durham, Halton, Peel and York and of the City of Hamilton (rest of GTAH) demonstrate an increasing tendency to use GO Rail in the morning peak period. Automobile travel during the morning peak increased after 1986 with a corresponding reduction in the use of local transit. From 1996 to 2006, the relative use of these modes has remained remarkably stable.

Outside the GTAH, the comparisons of modes chosen for the morning peak are problematic. The TTS surveys in various years covered different areas. Data in the above tables are only for those areas outside the GTAH that were common on both 1996 and 2006. The 1986 TTS did not include any outside jurisdictions.

The importance of auto passengers in the movement of people in the survey area is evident. Outside of the City of Toronto, traveling as an auto passenger in the morning peak is as frequent as all forms of transit and is more frequent outside the GTAH. It is important to note that travel for persons under the age of 11 are not included in these numbers. TTS has never collected travel by children in this age group.

Choice of Travel Mode For Trips Made by Residents During the Morning Peak

1986 TTS			1996 TTS			2006 TTS		
Toronto	Rest of GTAH	Outside GTAH	Toronto	Rest of GTAH	Outside GTAH	Toronto	Rest of GTAH	Outside GTAH
47.4%	62.5%	n/a	47.9%	64.8%	66.2%	47.7%	64.8%	68.5%
9.4%	11.7%	n/a	11.5%	12.8%	12.4%	12.0%	13.7%	12.6%
32.2%	13.0%	n/a	28.3%	10.5%	11.7%	28.2%	10.2%	11.0%
0.5%	2.4%	n/a	0.7%	2.7%	0.2%	0.7%	3.4%	0.1%
9.6%	9.5%	n/a	10.2%	8.5%	8.7%	9.9%	7.4%	6.9%
0.5%	0.6%	n/a	0.9%	0.6%	0.5%	1.0%	0.3%	0.6%
0.4%	0.3%	n/a	0.5%	0.3%	0.3%	0.4%	0.2%	0.3%
Auto Driver			Auto Driver			Auto Driver		
Auto Pass.			Auto Pass.			Auto Pass.		
Transit excl. GO			Transit excl. GO			Transit excl. GO		
GO rail			GO rail			GO rail		
Walk			Walk			Walk		
Cycle			Cycle			Cycle		
Other			Other			Other		

Development of a Computer Support System

The development of the systems and software components for the 2006 survey began in 2004. The goal of the development was to modernize the software used to carry out a large number of telephone interviews and to take into account current practices that would increase the ability of the system to be reliable, durable and accommodate changes in scale.

Development of the computer software provided critical support in the completion of 150,000 tel-

ephone interviews. An important application of computer support was in the development of scheduling procedures for repeat calls, which enhance the ability of interviewers to make contact with a household. For example, any interviewer could respond to a household's request to be called at a particular and more convenient time. It also allowed for the development of strategies to complete interviews at households with answering machines or voice mail.

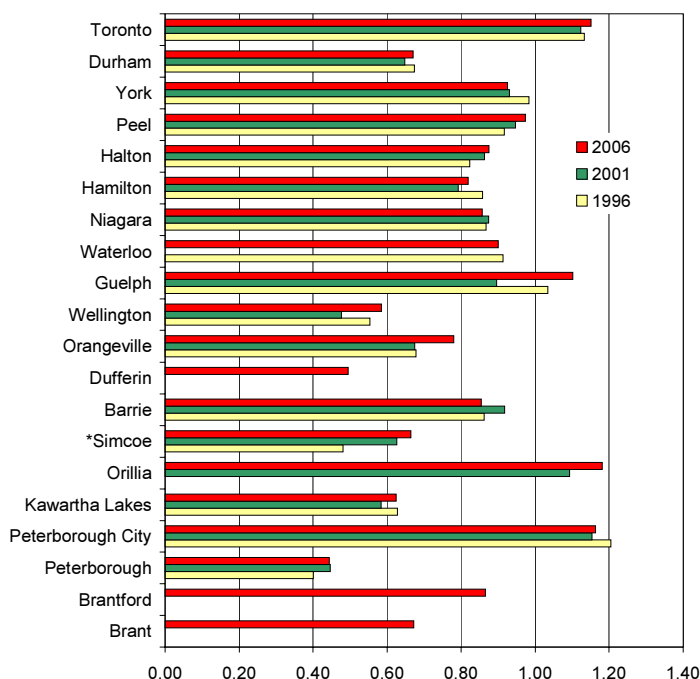
Some Measures of Self-Containment

Employment in an area represents the number of opportunities for a worker to satisfy a trip to work within that area. Employed labour force represents the number of workers residing in an area and seeking a work destination. A ratio of employment to employed labour force for any given area represents a measure of the opportunities for workers to satisfy their work destinations within their area of residence. Data from the 1996, 2001 and 2006 surveys indicate the changes in this ratio have been variable. The Cities of Guelph, Orillia, Peterborough and Toronto have more employment opportunities than do employed persons while most of the other

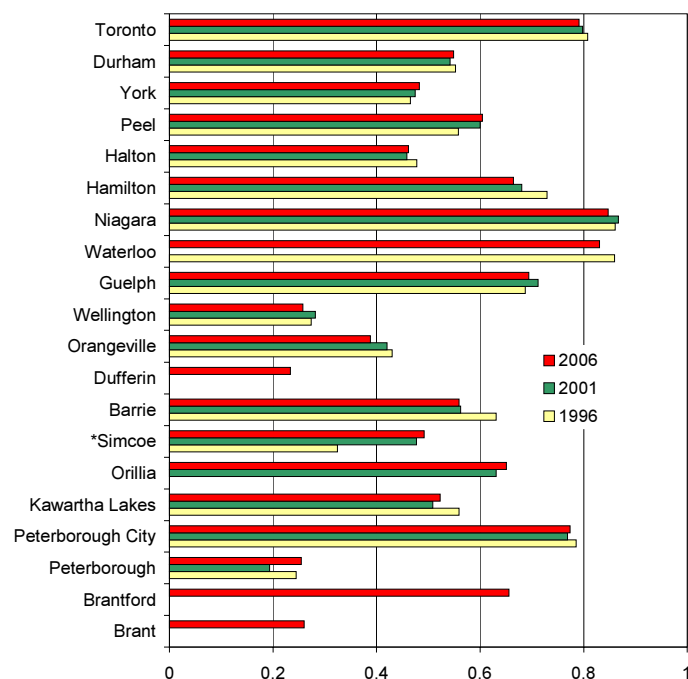
areas have a ratio less than 1.0.

Employees may not choose local employment opportunities and the proportion of work trips made within the area of residence on a typical weekday is a measure of workers making this choice. In general, fewer workers are choosing local opportunities in 2006 than was the case in 1996. Workers in the Cities of Peterborough and Toronto and the Regions of Niagara, and Waterloo show a stronger than average propensity to work locally. Given the lower ratio of employment to employed labour force in Durham Region, it appears that a large proportion of workers are choosing to work locally.

Ratio of Employment to Employed Labour Force



Proportion of Work Trips Made Within the Area of Residence



* Simcoe County was only partially surveyed in 1996.

Transportation Tomorrow Survey Data Comparison with 2006 Cordon Counts

2006 TTS data, as in the past, was compared to 2006 Cordon Count Survey data for validation purposes. The Cordon Count survey is a series of traffic counts conducted by the Ministry of Transportation Ontario, the City of Toronto and the Regional Municipalities of Durham, Halton, Peel and York. The Cordon Count survey collects categorized vehicle and person counts during the months

of May and June. The data are collected using manual and automatic counters at various stations along regional screenlines and cordons of interest to the municipalities.

For validation, the derived TTS count of auto-driver trips was compared to data from the Cordon Count for private automobiles crossing Inter-Regional boundaries. Comparisons were made using morning peak period data and also a 13 hour time period from 6 a.m. to 7 p.m..

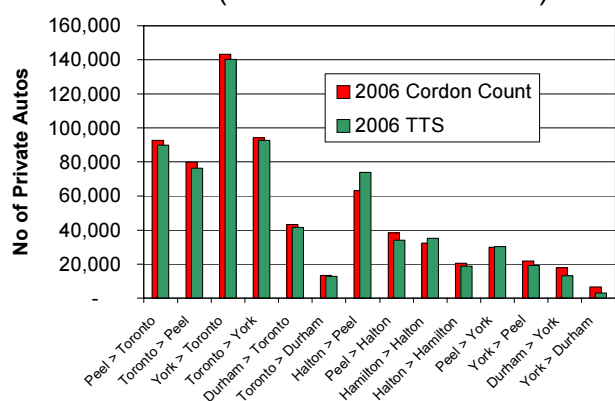
In the morning peak period, TTS data compared very favourably to the Cordon Count data especially for the high volume crossings along the City of Toronto's boundaries. There vehicle numbers differed by at most 5% between the two datasets. For crossings with much smaller volumes for example the York - Durham boundary the fit was not as good but overall totals showed the TTS data to be 2% less than the Cordon Count information, which is a very good match of two distinct data resources.

Some of the differences in these data should be mentioned here. TTS data represents the average daily trips seen over a four-month period while the Cordon Count data is more of a snapshot of what is happening at a particular location over the course of one specific day. Also, TTS data is collected in the fall of the year while Cordon Count data is collected in the spring.

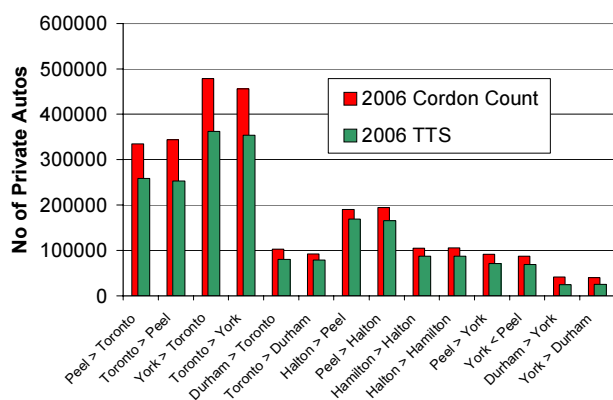
Over the 13-hour period, again we see the City of Toronto boundaries having the highest traffic volumes. For this 13-hour period, the fit of the two datasets is not as close as it is during the peak period. Data from the Cordon Count is consistently higher than the TTS numbers across all boundaries being significantly higher along the high volume Toronto boundaries as well as all of York Region's boundaries. Total cross boundary traffic generated from the TTS data is 22% lower than those seen in the Cordon Count.

The differences in the numbers for this longer time period suggest there is under-reporting of discretionary travel in TTS. Discretionary travel is more frequent in the off-peak and evening peak hours of travel. This phenomenon has been observed in all TTS surveys and should be factored into any use of TTS data for the analysis of off-peak or total daily travel.

**Morning Peak Period Count Comparison
3 Hours (6:00 a.m. to 9:00 a.m.)**



**13 Hour Count Comparison
(6:00 a.m. to 7:00 p.m.)**



Start Times Show Similar Patterns

The TTS collects start times for all trips made by a selected household on the survey date. Start time information gives us an idea of the temporal distribution of trips across a typical day.

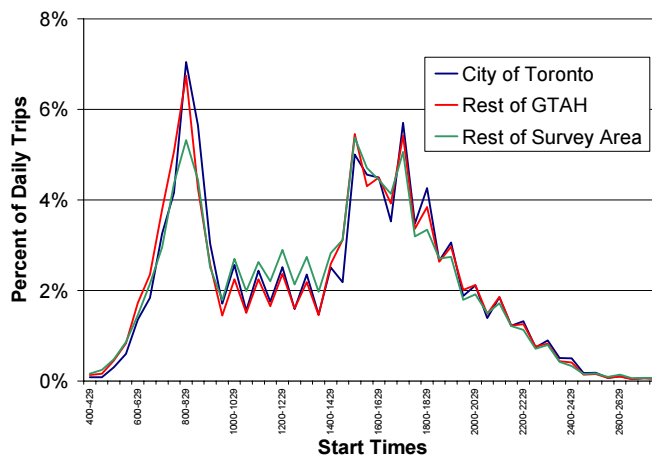
The TTS start time data was examined at different spatial aggregation levels. Examining the survey area as a whole or splitting the area up into three sub-areas representing the City of Toronto, the rest of the GTA & Hamilton, and the Survey Area outside the GTA, the curves for percentage of trips vs. start time remain similar.

The curves follow near identical patterns with trip starts in the morning rising to a sharp peak in the 8:00 a.m. to 8:29 a.m. time period with approximately 5.5 - 7% of all daily trips reporting a start time in that half hour segment. After that, there is a decrease and a lull in trip starts in the mid-morning to afternoon period followed by a peak period, which is slightly smaller but more sustained than that in the morning, occurring between 3:00 p.m. and 5:30 p.m.

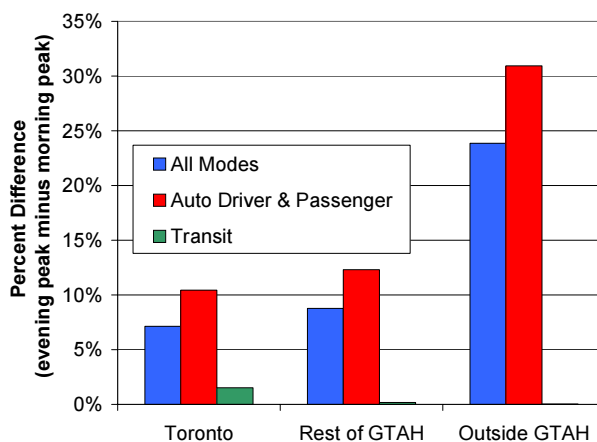
This more sustained peaking effect in the evening means that the total trips made in the evening three hour peak period is actually greater than the total trips made in the morning three hour peak period. This is particularly interesting given that we already anticipate under-reporting of discretionary trips to affect the evening peak period adversely to a much larger extent than the morning peak period.

Throughout the survey area, the number of trips made in the evening peak three hour period is greater than in the morning peak three hour period but this difference is much higher in the TTS areas outside the GTA. This difference is even more amplified when examining only persons who take the automobile as a driver or passenger but there is little or no difference (less than 2% in the City of Toronto) between the morning and evening peak numbers for trips using the transit mode. This could possibly be due to the auto mode as opposed to the transit mode being the preferred mode for discretionary trips.

Trip Start Times (2006 TTS)



Percent Difference between Morning and Evening Peak Periods



This Bulletin was prepared under direction of the staff at the Data Management Group. All opinions and observations are the responsibility of the DMG staff and are not intended to represent those of the funding agencies.

For further information please contact:
 Data Management Group
 Joint Program in Transportation
 University of Toronto
 Room 305, 35 St. George Street
 Toronto, ON M5S 1A4
info@jpint.utoronto.ca