



Greater Toronto Area
CORDON COUNT PROGRAM
TRANSPORTATION TRENDS 1991 - 2006
Executive Summary

1.0 INTRODUCTION

Background on the GTA Cordon Count Program:

- Invaluable source of data on commuting behaviours and travel patterns in the GTA
- Information on persons and vehicles for various modes of transportation
- Over 1000 counting stations
- Specific details on vehicle type and occupants per vehicle
- Synchronized with other data collection programs, such as the Statistics Canada Census and the Transportation Tomorrow Survey (TTS)

Coordinated by:

The Transportation Research and Data Management Group

Contributions by:

Ministry of Transportation, Ontario
Regional Municipality of Durham
Regional Municipality of Halton
Regional Municipality of Peel
Regional Municipality of York
City of Toronto
Toronto Transit Commission
GO Transit

The Greater Toronto Area (GTA) Cordon Count Program has been established to collect data and monitor changes in commuting behaviour and travel patterns across the GTA. The trends and patterns developed through the Cordon Count Program are a valuable tool in planning and decision-making.

The City of Toronto implemented the program in 1975. Similar counting programs were later initiated by the other Regional governments with the aim of assisting in the systematic identification of transportation trends in the GTA. The value of the Cordon Count Program is evident from the fact that data has been collected over the past thirty years, making it one of the pre-eminent data collection programs in North America for understanding commuter and business response to changes in the socio-economic fabric of society.

Historically, counts are conducted during May and early June (prior to the end of the school year) on weekdays (except Fridays). Therefore, the data is as representative of the typical day as possible. Efforts have also been taken to ensure that schedules for the Cordon Count Program are synchronized with other data collection programs, such as the Statistics Canada Census and the Transportation Tomorrow Survey (TTS).

The Cordon Count Program involves counts at over one thousand counting stations across the entire GTA. Counting stations are established at key travel locations throughout the GTA. A series of stations are used to form a screenline. A screenline is a pre-determined imaginary line spanning a

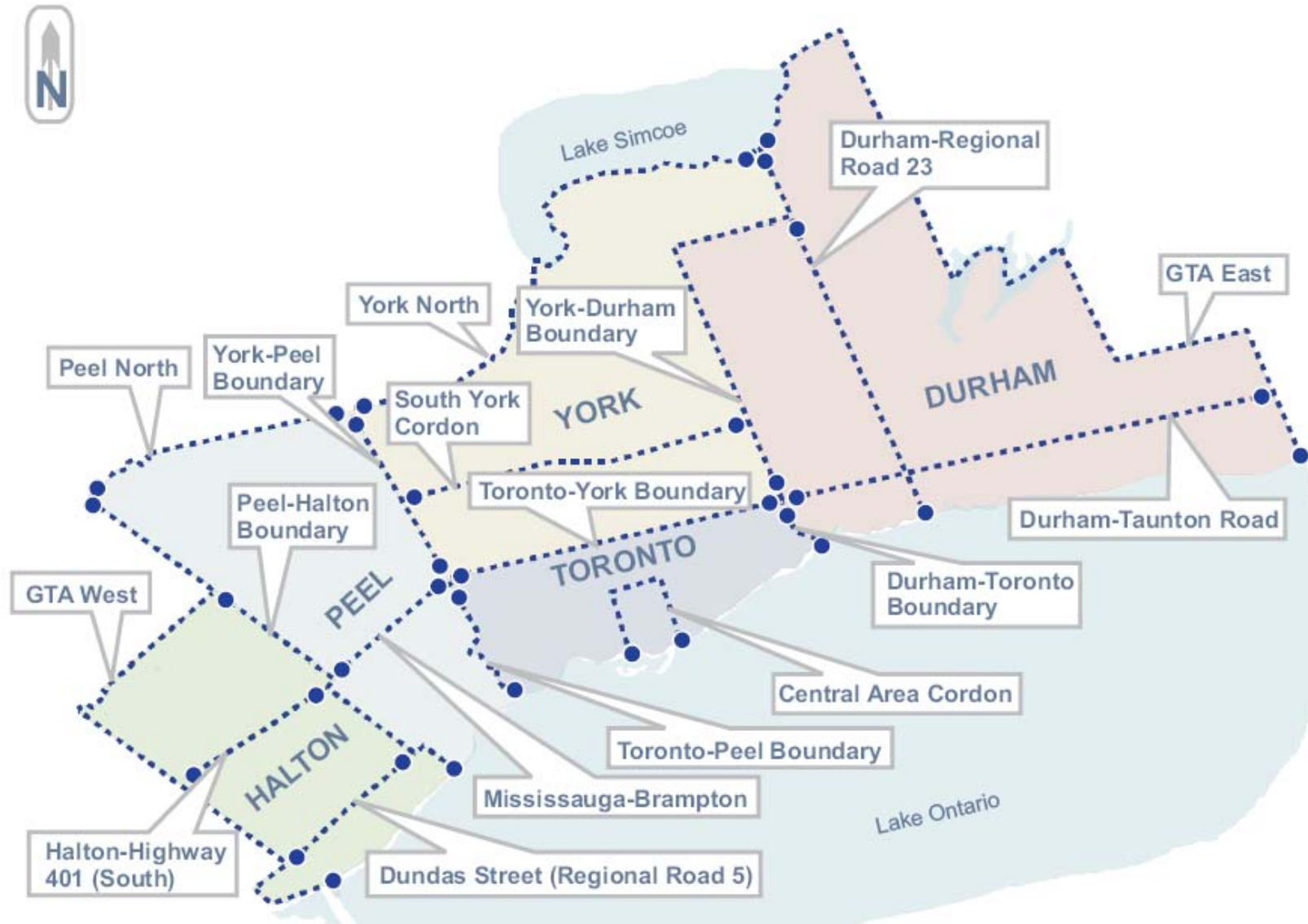
major road, municipal boundary, a man-made boundary (such a railway) or a natural boundary (such as a river). A cordon is a set of screenlines enclosing an area. The screenlines included in the analysis are shown on the following page.

The Cordon Count Program collects information on trips made by persons and vehicles, in addition to various modes of transportation, such as cars, buses, taxis, GO Trains, subways, streetcars, and bikes. Specific details on vehicle type and number of occupants per vehicle are gathered in order to capture a complete set of data regarding individual person and vehicular movements in the GTA.

This report serves as a compendium to the 2003 GTA Cordon Count Report (defining trends between 1991 and 2001), which can be downloaded from the University of Toronto Data Management Group website.

This report summarizes the transportation trends observed from 1991 to 2006 (15 year period) based on the data collected by the Cordon Count Program. The executive summary is focused towards addressing the overall trends, transit usage, commercial vehicle movement, HOV usage and auto occupancy, and peaking characteristics across the screenlines. For a detailed analysis of these and additional topics, refer to the full technical report.

THE SCREENLINES



2.0 GROWTH IN TRAVEL HAS BEEN STRONG

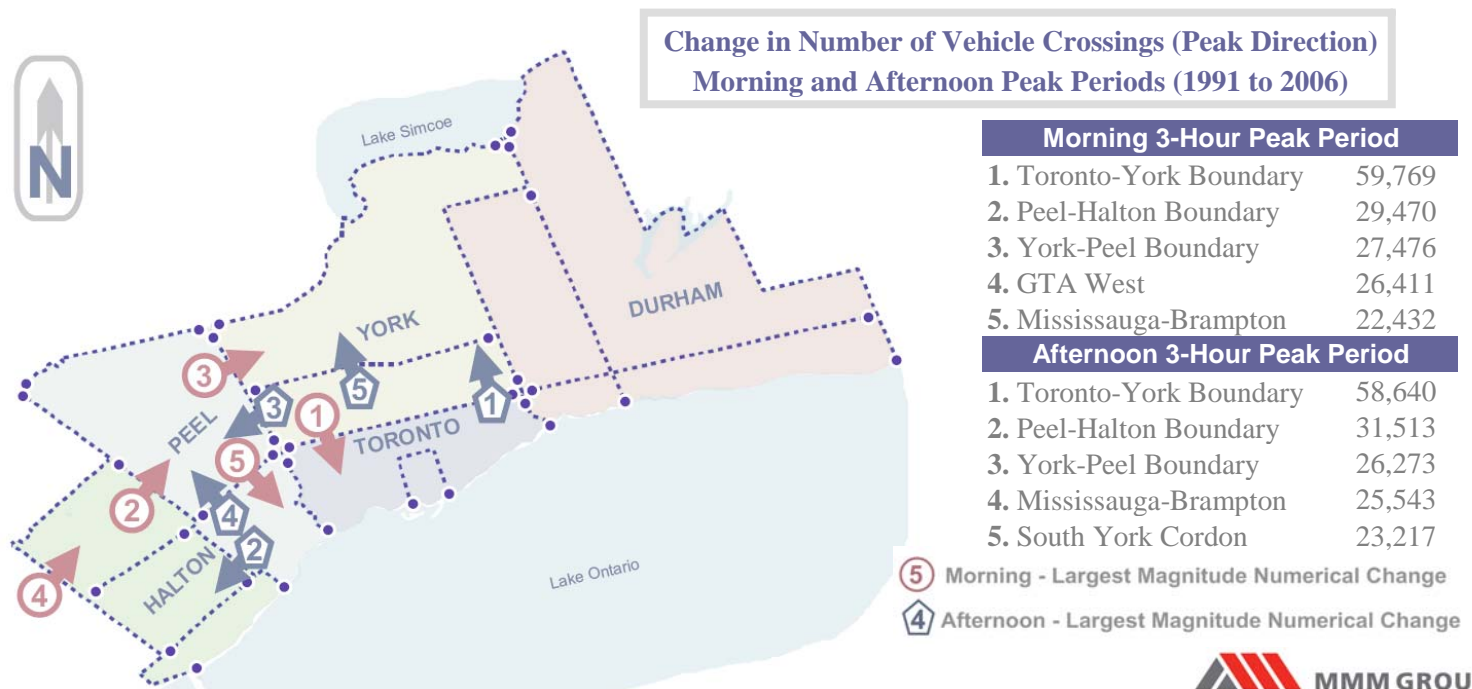
- 39% growth in vehicular trips crossing screenlines from 1991 to 2006
- 23% growth in person trips crossing screenlines
- Higher numerical growth in vehicular trips than person trips crossing screenlines
- The Central Area Cordon has experienced a decrease in the number of trips crossing in both directions
- Growth has been strongest in the north and west

There has been a significant growth in travel across the regions between 1991 and 2006. Strong transportation growth is indicative of a growing population, employment base and a healthy economy.

The growth in vehicle trips between the '905' regions has been particularly strong. This growth has been fueled by rapid expansion in population as well as new employment centres that have located in the '905' region. Additionally, new high speed and major transportation infrastructure such as Highway 407 that straddles the '905' region has contributed to this growth. As a result, reverse commuting and cross commuting patterns have become more predominant than was observed in 1991. The Central Area Cordon has actually recorded a slight decrease in vehicular

trips in the peak direction (inbound), which is testament to the fact that new employment has been locating outside the traditional downtown, in areas which are relatively more accessible by a high speed road network. Total transit ridership from and to the Central Area Cordon was relatively stable from 2001 to 2006.

Growth in person trips crossing the screenlines has been lower than vehicle trips, which suggests that the GTA has been experiencing declining auto occupancy rates. The screenlines with the highest growth in the number of vehicle crossings in the peak direction during the morning and afternoon peak period between 1991 and 2006 are summarized below.



3.0 INCREASED GO TRANSIT RIDERSHIP AND OTHER TRANSIT TRENDS

- Transit accounted for approximately 22% of person trips crossing screenlines during the morning peak period
- The Central Area Cordon has experienced the highest numerical growth in GO Rail ridership
- Ridership has grown, but transit mode share has decreased from 1991
- The share of GO Rail and GO Bus passengers in the overall number of transit trips has increased
- As a share of total transit trips, GO Rail ridership has increased from approximately 23% in 1991 to nearly 35% in 2006 for the morning peak period in both directions

Transit trips accounted for approximately 415,000 (22%) of person trips crossing screenlines during the morning peak period in 2006. Although Transit ridership has increased since 1991, the transit mode share has declined from 28% to 22% in 2006. In the same time period, GO Transit mode share has increased markedly, with a 71% growth in GO Rail and 313% growth in GO Bus ridership. Person trips by mode across the screenlines are shown below.

**Person Crossings by Mode (Both Directions)
Morning Peak Period (1991 to 2006)**

	1991	2006	% Chg
Auto Driver	802,500	1,269,764	58%
Auto Passenger	148,253	132,497	-11%
GO Bus	2,648	10,946	313%
GO Rail	85,288	145,908	71%
School Bus	6,783	35,477	423%
Other Transit	277,499	258,205	-7%

Over the past fifteen years GO Rail service has expanded to serve Oshawa, Hamilton, and Newmarket/Bradford, and increased train frequencies were introduced. Some of the highest growth in GO Rail ridership has been recorded on screenlines measuring travel to these new stations.

The five screenlines with the highest numerical growth from 1991 to 2006 in person crossings by GO Rail in the morning 3-hour peak period in the peak direction are shown below.

Central Area Cordon	+23,773
Toronto-Peel Boundary	+11,955
Toronto-York Boundary	+7,442
Peel-Halton Boundary	+5,254
Durham-Toronto Boundary	+3,517

It should be noted that although there was a decline in Other Transit trips, it does not reflect a completely accurate picture because most local transit agencies tend to operate within the municipalities and are not fully captured by these screenlines; additionally, GO Bus and School Bus were not specific categories for some agencies in 1991 and were instead included in Other Transit. This partly contributes to the significant increases in GO Bus ridership observed between 1991 and 2006.

A further review of transit trends observed in the 1995 and 2001 Cordon Count data was conducted. The highest increase has been experienced in TTC streetcar ridership. TTC streetcars have experienced a nearly 23% increase in ridership between 1991 and 2006. The increase in TTC ridership can be mainly attributed to increasing vehicular congestion and introduction of major transit infrastructure like the Spadina Streetcar and Sheppard Subway.

4.0 COMMERCIAL TRAFFIC HAS GROWN SUBSTANTIALLY

- Commercial traffic has grown 55% from 1991 to 2006 in the total count period
- The GTA West screenline has experienced the highest numerical growth
- The York-Peel Boundary screenline had the highest percentage growth
- The GTA East screenline has the highest percentage of commercial vehicle trips in 2006 (15% in the total count period and 11% during the combined morning and afternoon peak periods)
- The Central Area Cordon is the only screenline with a decrease in commercial traffic

From 1991 to 2006, commercial vehicle traffic has grown by nearly 55% over the total count period, across all screenlines combined. This was greater than the rate of growth in overall traffic.

Commercial vehicle traffic has grown significantly in the off-peak periods more than the growth during the combined morning and afternoon peak periods. This may be due to commercial vehicles staggering their delivery times in order to avoid traffic congestion and to deliver goods in a more timely fashion, as well as greater dispersion origins and destinations.

The only screenline that showed a decrease for both the total count period and the combined peak period was the Central Area Cordon. The Central Area Cordon experienced a decrease of 11% during both the combined morning and afternoon peak period and the total count period. A number of reasons could be responsible for this drop, such as the spatial location choices being made by warehouses, manufacturers and suppliers.

The five screenlines with the highest numerical growth in commercial traffic in both directions during the total count period, from 1991 to 2006, are:

GTA West	+27,863
Toronto-York Boundary	+21,385
York-Peel Boundary	+19,235
Mississauga-Brampton	+15,964
Peel-Halton Boundary	+13,589

The five screenlines with the highest percentage growth in commercial traffic in both directions during the total count period are:

York-Peel Boundary	+447%
York North	+124%
York-Durham Boundary	+109%
Halton-Highway 401	+105%
GTA West	+100%

The five screenlines with the highest percentage of commercial traffic (i.e. as a proportion of the total traffic stream) in both directions combined during the total count period in 2006 are:

GTA East	15%
GTA West	14%
York-Peel Boundary	13%
York-Durham Boundary	11%
York North	10%

5.0 AUTO TRIPS HAVE INCREASED AND AUTO OCCUPANCY HAS DECREASED

- Auto trips grew by 47% (451,500) during the morning peak period in both directions
- In 2006, auto accounted for 76% of person trips for the morning peak period in both directions, compared to 72% in 1991
- Average auto occupancy was 5% higher in the afternoon peak period than in the morning peak period
- Every screenline showed a decrease in auto occupancy between 1991 and 2006
- Auto drivers have increased by 58% and auto passengers have decreased by 11% from 1991 to 2006
- Other than in the City of Toronto (9% decrease from 1991 to 2006), changes in auto ownership rates have been minor

Auto trips in both directions across the screenlines have grown by nearly 451,500 (47%) during the morning peak period. Additionally, due to the growing popularity of the personal automobile, travel by auto in 2006 accounted for nearly 1,402,300 (76%) of the person trips crossing the screenlines, compared to 950,800 (72%) in 1991 for the morning peak period, in both directions.

On average, auto occupancy was 5% higher in the afternoon peak period (1.16) than in the morning peak period (1.10). A key trend is that every screenline showed a decrease in auto occupancy between 1991 and 2006 for the peak and off-peak directions in both the morning and afternoon peak periods. This decrease is reflected in a 58% increase in auto drivers and 11% decrease in auto passengers from 1991 to 2006 in both directions for the morning peak period. On average, auto occupancy has declined by 0.09 (8%) in the morning peak period and 0.11 (9%) in the afternoon peak period. This drop in auto occupancy could be a result of several factors including increasingly diverse commuting patterns and trip making behaviour.

Other than the City of Toronto (which has seen a 9% decrease from 1991 to 2006), changes in auto ownership rates in the GTA regions have been minor. None of the changes, other than that observed in the City of Toronto, are significant enough to hypothesize that people have changed their behavior towards auto ownership.

The five screenlines with the highest average auto

occupancy in the peak direction during the morning are shown below.

Durham-Taunton Road	1.15
Central Area Cordon	1.13
GTA East	1.12
GTA West	1.11
Durham-Regional Road 23	1.11

The five screenlines with the highest average auto occupancy in the afternoon peak direction are shown below.

GTA East	1.28
Durham-Taunton Road	1.25
Central Area Cordon	1.21
Dundas Street (Regional Road 5)	1.19
Durham-Regional Road 23	1.18

Determining the percentages of High Occupancy Vehicles (HOV) is very useful in planning the occupancy restrictions and locations for HOV lanes; politicians, planners, and decision makers are likely to benefit from a deeper understanding of how many vehicles may occupy a new HOV lane, in addition to the origin and destination of these vehicles.

The percentage of HOV 2+ for the 2006 morning peak direction ranged from 5.5% to 14.7%, and in the afternoon peak, it ranged from 8.7% to 24.0%. Trends noted in the Places to Grow - Growth Plan for the Greater Golden

5.0 CONTINUED...

- The percentage of HOV 2+ for the 2006 morning peak period peak direction ranged from 5.5% to 14.7%
- The percentage of HOV 2+ for the 2006 afternoon peak period peak direction ranged from 8.7% to 24.0%
- The Central Area Cordon showed the highest percentage of 2+ HOV vehicles (14.7%) during the morning peak period peak direction for 2006
- The GTA East screenline showed the highest percent of 2+ persons HOV vehicles (24%) during the afternoon peak period peak direction for 2006

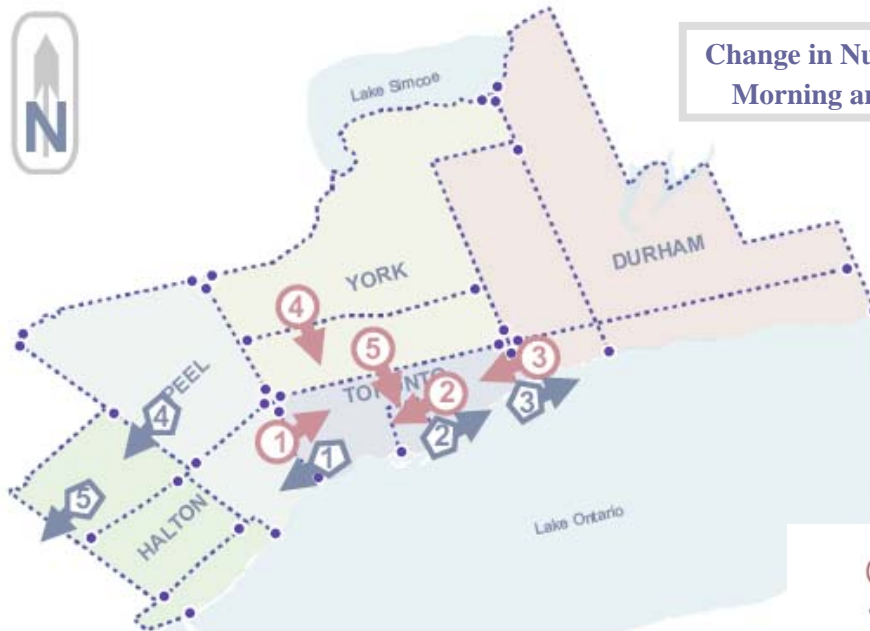
Horseshoe (2006) indicate that employment is generally decreasing in Toronto and increasing in the other GTA municipalities. The trends observed in the cordon count data along with forecasted employment growth indicate that success in terms of HOV usage stands to be gained by developing a consolidated GTA HOV network that not only focuses on the City of Toronto but also serves the increasing cross and reverse commuting taking place in the GTA.

The five screenlines with the highest percentage of 2+ HOV in the morning peak direction in 2006 are:

Central Area Cordon	14.7%
Durham-Taunton Road	13.3%
GTA East	11.4%
Durham-Regional Road 23	10.7%
GTA West	10.1%

The five screenlines with the highest percentage of 2+ HOV in the afternoon peak direction in 2006 are:

GTA East	24.0%
Central Area Cordon	20.9%
Durham-Taunton Road	20.6%
Durham-Regional Road 23	16.7%
Dundas Street (Regional Road 5)	16.2%



Change in Number of HOV 2+ Vehicles (Peak Direction) Morning and Afternoon Peak Periods (1991 to 2006)

Morning 3-Hour Peak Period	
1. Toronto-Peel Boundary	-5,388
2. Central Area Cordon	-5,362
3. Durham-Toronto Boundary	-2,130
4. South York Cordon	-1,681
5. Toronto-York Boundary	-1,676
Afternoon 3-Hour Peak Period	
1. Toronto-Peel Boundary	-7,273
2. Central Area Cordon	-5,281
3. York-Peel Boundary	2,470
4. Peel-Halton Boundary	-1,689
5. GTA West	1,630

- ⑤ Morning - Largest Magnitude Numerical Change
- ④ Afternoon - Largest Magnitude Numerical Change

6.0 PEAKING CHARACTERISTICS

- Traffic crossing screenlines in the east-west direction exhibited the lowest ratio of peak hour to peak period volumes for 2006
- Travel increased during the off-peak period
- Growth in traffic was evident across screenlines comprising the GTA outer boundary
- Times for morning and afternoon peak periods of travel have not changed substantially
- The ratio of peak period to total count period travel increased across 13 screenlines, and decreased across four

As a metropolitan region, the GTA continues to grow, the transportation infrastructure faces increasing pressure, and commuters respond by shifting their trip start times towards the “shoulders” of the traditional peak hour/peak period. A declining ratio is an indication of increasingly flexible work-hours and more conscious choices to avoid congestion.

Traffic crossing screenlines in the east-west direction exhibited the lowest ratio of peak hour to peak period volumes for 2006. The majority of this traffic was headed to the City of Toronto. However an increasing employment base in the regions surrounding the City of Toronto has resulted in cross-commuting patterns. These patterns have been further boosted due to the high speed and relatively reliable connection provided by Highway 407, which connects the ‘905’ municipalities.

Similar trends were observed in the afternoon peak period, where east-west travel again dominates. The only screenline capturing north-south vehicle crossings where the ratio of peak hour traffic to peak period traffic was relatively low is the Toronto-York Boundary. A prolonged “rush hour” in the afternoon peak period is expected in that location, given that York Region has three 400 series highways leading to the northern edge of the GTA and there is substantial development occurring in York Region.

The changing peak hour characteristics are highly influenced by development patterns across the GTA and resulting changes in travel distance. The phenomenon of increasing off-peak travel was likely the result of increasing peak

period congestion and changing land use patterns, including the geographic expansion of the developed area and dispersion of employment and retail. Traffic has also grown across the screenlines comprising the GTA outer boundary. The peak hour spreading observed across these screenlines is a function of commuter trips with a higher than average trip length as well as commercial traffic growth.

Times for the morning and afternoon peak periods of travel have not changed substantially. A slight trend to an earlier peaking time for morning travel was evident in the Regional Municipalities of Durham and Halton, suggesting commuters are travelling earlier to avoid congestion or travel longer distances. The screenlines that exhibited the greatest decrease in ratio of peak to non-peak travel tend to be those in more suburban locations, but the changes are fairly minor on a percentage basis.

In 1991, the ratio of peak period travel to travel over the total count period ranged from approximately 42% (Central Area Cordon) to 60% (South York Cordon). By 2006, the ratio ranged from 42% (Dundas Street) to 84% (York-Durham Boundary), though the high end of the range appears to be an outlier; the second highest ratio was 68% (South York Cordon). With or without the York-Durham outlier, the variation of the ranges has increased, based on standard deviations. The ratio of peak period to total count period travel increased across 13 screenlines, and decreased across four. The locations where decreases occurred were generally in the Peel and Halton. This indicates a trend to greater dispersion of travel periods in those regions.

GLOSSARY

'905' Region - The Regional Municipalities of Durham, Halton, Peel, and York

Afternoon Peak Period – The 3-hour p.m. peak period

Auto Occupancy – Average number of occupants in an automobile, including the driver

Commercial Traffic – Heavy trucks (a truck with more than two axles) and Medium trucks (truck with more than four tires touching the road but with only two axles). Light trucks are not included in this definition.

Home-Based Work (HBW) Trips – Trips with one terminal at work and the other at home, with no intermediate stop.

HOV (High-Occupancy Vehicle) – Automobiles with at least two occupants

Just-in-time delivery (JIT) – Goods arrive when needed, which helps reduce cost and the need for storage.

Major Roads – Includes Highways 400, 401, 403, 404, 407, 409, 410, and 427, the Queen Elizabeth Expressway, and the Gardiner Expressway.

Morning Peak Period – The 3-hour a.m. peak period

Off-Peak Period – The time of day occurring outside the peak period

Other Transit – includes all bus and subway service excluding GO Rail, GO Bus, and School Bus.

Peak-Hour Spreading (Peak Demand Spreading) - A reaction of drivers to road network conditions and increased congestion in the peak hours leading to the spread of trips over a longer time period.

Polycentric Development - A large centre surrounded by high density employment and population sub-centres.

Reverse Commuting – A trip in the direction opposite to the heaviest traffic flow.

Screenline - A series of stations used to form a screenline. A screenline is a pre-determined imaginary line spanning a major road, municipal boundary, a man-made boundary (such a railway) or a natural boundary (such as a river).

Stations - Counting stations established at key travel locations throughout the GTA.

Total Count Period – The total count period for which counts were undertaken.

Vehicles – All auto, taxi, truck, transit, and school bus vehicles traveling on the surface road network.

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