TRANSPORTATION TOMORROW SURVEY

A Telephone Interview Survey on
Household Travel Behaviour in the
Greater Toronto Area Conducted in the
Fall of 1986

Data Validation

Prepared for the

Toronto Area Transportation Planning
Data Collection Steering Committee

Participating Agencies:

Go Transit
Metropolitan Toronto
Ontario Ministry of Transportation
Regional Municipalities of Durham, Halton, Hamilton-Wentworth, Peel, and York
Toronto Transit Commission

August 1988

This report was prepared for the Toronto Area Transportation Planning Data Collection Steering Committee by the members of the Transportation Tomorrow Survey Data Validation Team. The principal author was Jerry C.N. Ng with major input from all members of the Data Validation Team.

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PREFACE

Since November 1987, the Data Validation Team has been meeting on a regular basis to analyse and compare the Transportation Tomorrow Survey (TTS) data with other independent data sources such as Census Surveys and Cordon Count Programs. The team consists of representatives from the Ministry of Transportation, Regional Municipalities within the Greater Toronto Area, the Toronto Transit Commission and GO Transit. The purpose of the data validation exercise is to determine the quality of the data base, identify any required corrections, and to provide guidance on the use of the TTS results.

This report documents the Data Validation Team's findings and comments. It is intended to be used as a technical reference source for future work on the survey results. Furthermore, this report contains the views of the participants on how the current data base should be used for analyses and transportation planning.

ACKNOWLEDGEMENTS

The data validation exercise on the Transportation Tomorrow Survey has been a product of teamwork and co-operation among the numerous agencies involved in transportation planning within the Greater Toronto Area.

The following people served on the Data Validation Team:

Martin Seekings, Chairman	Metropolitan Toronto
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I. INTRODUCTION

Since November 1987, the Data Validation Team met on a regular basis to analyse and compare the Transportation Tomorrow Survey (TTS) data with other independent data sources such as Census Surveys and Cordon Count Programs. The team consisted of representatives from the Ministry of Transportation, Regional Municipalities within the Greater Toronto Area, the Toronto Transit Commission and GO Transit. The purpose of the data validation exercise was to determine the quality of the data base, identify any required corrections, and to provide guidance on the use of the TTS results.

This report summarizes the Data Validation Team's findings and comments. It is intended to be used as a technical reference source for future work on the TTS. It should be noted that the results presented here are based on Version 1.0 of the data base. A more detailed validation exercise is expected when an updated version of the data base is available. The user guide for Version 1.0 TTS data is attached in Appendix 1.

The validation exercise covered a wide range of topics. These include:

(1) Demographic characteristics,
(2) Trip productions,
(3) Respondent / Non-respondent[1] differences,
(4) Trip attractions,
(5) Screenline counts, and
(6) Transit assignments.

Major findings on these topics are summarized in the next chapter. Detailed discussions from individual agencies and referenced materials are provided in Appendices 3 to 9. The reader should refer to these appendices for a more detailed overview of the validation exercise.

Recommendations on the use of the data and further study needs are also included in the report.

[1] Throughout this report "non-respondent" refers to individuals whose trip making was reported by another member of the household.

II. MAJOR FINDINGS

SUMMARY

The validation exercise indicated that although there are small discrepancies between the Transportation Tomorrow Survey (TTS) results and other survey data such as Census and Labour Force Surveys, there is no indication of major problems in the data. For example, the TTS reported employed labour force in Metro Toronto is within 0.5% of the figure reported by the 1986 Labour Force Survey. The TTS data appears to be a good representative sample of trips in the Greater Toronto Area.

The greatest concern on the TTS is the under-reporting of off-peak trips. These trips are primarily non-work and non-school related trips. There are also differences in the trip rates between persons who directly reported their own travel information (respondents) and persons whose information was indirectly reported by another member of the household (non-respondents). It is expected that these differences in trip rates are the major contributor to the low TTS off-peak reported trips.

With respect to peak period travel, TTS reported trips match much more closely to the reported figures. Home-based work and school trips make up the bulk of peak period trips (especially for the AM peak), these were found to be among the most accurately reported trips. The comparisons of TTS peak period transit trips with TTC riderships and TTS auto trips with Cordon Count results indicated that there is no significant indication of under-reporting. Therefore, despite the under-reporting of off-peak trips, it appears that TTS data can be used with confidence for peak period transportation planning.

(1) Demographic Characteristics (Appendix 3)

The comparison of TTS estimates on selected household and personal characteristics with Census results suggests that the TTS sample is generally representative of the Greater Toronto Area population.

(a) Household and Population Sizes:

The expansion[2] of the survey sample was done on the basis of the number of households in the GTA according to the 1986 Census figures. A comparison of average household size and percentage distribution of households by size at the Census Metropolitan Area level was found to be consistent with the Census data.

Although the expansion of the TTS data resulted in an underestimation of the population, a 2.2% difference at the GTA level, the distribution of the population by age matches closely with the Census data.

(b) Employment and Participation Rates:

Labour force participation rates[3] at the 46 zone level (Planning Districts) were compared to the 1981 Census. The TTS results indicated a somewhat higher than expected growth in participation rate, from 48.1% to 54.7% for the whole GTA. This is partially due to the undercounting of people not in the work force (e.g. institutions such as retirement homes, orphanages were not surveyed) by the TTS.

The estimate of the total number of workers living in Metro Toronto from TTS matches the 1986 Labour Force Survey (1,179,600 and 1,174,300 respectively). Due to differences in the definition of full and part time workers between TTS and other surveys, direct comparison of results is not possible.

[2] The sample expansion procedure is described in Appendix 2.

[3] Participation rate is defined as 'employed labour force' divided by 'total population'.

(2) Trip Productions (Appendix 4)

Comparison of expanded TTS trips by trip purpose, time period and by mode were made with other independent sources such as the 1979 Metro Toronto Travel Survey (MTTS), TTC ridership surveys and Cordon Count Programs.

(a) Work Trip:

Trips to work can be divided into three categories; 1. Home to work, 2. Work to work (i.e. business trips) and 3. Other to work. Average employment trip rate based on category 1 was 0.74 trip per employed person and the combination of category 1 and 3 gives a figure of 0.83. The true rate for trips from home to work, taking account of intermediate stops for other purposes, is expected to be somewhere in between the two estimates.

(b) Cordon Count Comparisons:

In comparison to an interpolation between the 1985 and 1987 Cordon Count results, TTS a.m. (7-9) peak trips were found to match closely with the actual reported trips at the Metro boundaries, both inbound and outbound. However, a similar comparison for the 12-hour (7 a.m. - 7 p.m.), two-way travels shows a significant under-reporting of trips, approximately by 36%. The extent of this under-reporting appears to be comparable for both auto and transit modes. This suggests that there is a large number of off-peak trips that were unreported to the TTS.

(c) Trips by Purpose and Mode:

When looking at the daily (24 hour) percentage shares of reported trips by mode and purpose, the TTS results appear to be consistent with the results from other surveys. For example, both the 1986 TTC Attitude Survey and the MTTS give similar breakdowns of Metro transit trips by purpose as the TTS (75% for work and school and 25% for others). However, the estimates for the total number of vehicular and transit trips do appear to be low.

Overall, TTS is under-reporting transit trips by approximately 20% with greater under-reporting for TTC streetcar routes, GO Bus services and Vaughan Transit services.

(3) Respondent / Non-Respondent Differences (Appendix 5)

There is a substantial difference in the number of trips per capita in the sample population between individuals that were reporting their own trips (respondents) and those whose trips were reported by someone else in the household (non-respondents), 2.54 versus 1.65. The difference in trip rates is no doubt partly due to the respondent having incomplete knowledge of trips made by other members of the household. However, characteristic differences between the two groups could also explain some of the variation.

(a) Attribute Differences

Single person households are expected to have higher per capita trip rates because trips normally shared by members of the household (e.g. shopping trips) must be now made by the same person. Approximately 20% of respondents were in single person households.

Persons with high mobilities also tend to have high trip rates. About 80% of the respondents possessed a valid drivers licence whereas only 50% of the non-respondents were eligible to drive.

A high proportion of non-respondents were children and teenagers whose trip characteristics are significantly different from adults.

(b) Trip Rates by Purpose, Sex, and Mode:

There was considerable variation of trips by purpose observed between respondents and non-respondents among both males and females. The largest difference appears in the ratio of "facilitating" trips between female respondents and non-respondents (3.25 : 1.0).

Trip rates for female respondents were consistently higher than that of males except for work related trips. However, for non-respondents, female trip rates were conversely lower than that of males except for shopping and personal business trips.

Males are more likely to travel by driving than females for both respondents (80% vs. 60%) and non-respondents (55% vs. 35%).

Trip rates per employed person for work purpose has the second smallest difference between respondents and non-respondents ("others" being first) for both full time (1.0 vs. 0.87) and part time (0.56 vs. 0.49) workers.

The above analysis confirms that non-work trips made by non-respondents tend to be under-reported in relation to those made by respondents. This agrees with the observations that TTS-reported trips are low on off-peak travel and on trip rates for people not in the labour force.

(4) Trip Attractions (Appendix 6, 9)

An examination at TARMS zone level was carried out to check that trip destination by purpose matches the location of major trip generators. This also acts as a preliminary check on the geocoding of major shopping malls, educational institutions and business centres.

(a) Work Trips:

Comparisons of TTS 24-hour work trip estimates and employment data from Metro Toronto and York Region were made. On the whole, the comparisons indicated an acceptable degree of agreement among the data. The exercise revealed some miscoding of work locations, however, these coding errors do not affect the global picture on work travel.

(b) School Trips:

TTS school trips were compared with school enrollments for the Regional Municipalities of Durham and York. The percent distribution of school trips for each TARMS zone was good, but there were significant differences between the actual enrollments and TTS reported trips. For example, the difference between TTS trip data and both York and Durham Region enrollments on an absolute number basis is approximately 20%. This is similar to the observed difference between TTS reported work trips and total employment figures. The 20% difference is likely to account for school absentees due to illness, school and public vacation days.

(c) Shopping Trips:

TTS shopping trips were compared with gross floor area of selected major shopping centres. Generally there seems to be a consistent relationship between reported shopping trips and shopping centre size. For example, major regional centres such as Yorkdale, Sherway Gardens, Scarborough City Centre and Square One all attract approximately 12,000 to 13,000 shopping trips on an average weekday.

No obvious spatial bias was found on trip attractions by purpose. The next validation step is to check for consistency of trip rates by purpose and destination. A fair number of geocoding errors were found with the monument codings, however, these errors do not pose a major concern at the aggregrate level. These errors will be corrected in future versions of the data base.

(5) **Screenline Counts** (Appendix 7, 9)

A 26 zone system was developed for a comparison of TTS trip data with Regional Cordon Count Programs. The zoning is based on locations of major screenlines. The general observations for Metro Toronto are:

- 12 hour (7:00 a.m. to 7:00 p.m.) total TTS trips fall short of boundary volumes by approximately 35-40%. This underestimation is consistent for both inbound and outbound travel at all three boundaries.

- Peak period TTS flows are generally much closer to the counts (especially for AM peak), more for transit than for auto trips.

The findings here agree with earlier conclusions. Peak period travel (mainly work and school trips) is much more accurately reported. Under-reporting of daily trips occurs mainly in off-peak trips (combination of discretionary and non-home based trips). For the Regional Municipality of York, TTS data during the midday period account for only half of all vehicular trips reported by the Cordon Count Program.

One reason for the low number of TTS reported trips is the aforementioned problem of the poor reporting of non-respondent off-peak trips. The zone system trip assignment comparison was also an extremely coarse approach. Many trips have to cross more than one boundary line due to the arterial and highway network configuration, but are only counted once by the zonal assignment method. Furthermore, without a network assignment, TTS trips were assigned manually through boundaries which in reality may not be the true travel routes.

Other plausible sources for the variation are trips excluded from the survey (e.g. taxi and delivery trips), through trips to and from outside of the GTA (e.g. trucks), and people living outside the surveyed area but employed within the GTA.

(6) Transit Assignments (Appendix 8)

A comparison was made between reported TTS trips assigned by MADITUC (a transit network assignment program) to TTC surface routes and TTC riding count data for the same period of the survey.

Generally AM peak period ridership on TTC surface routes appears to be within twenty percent (20%) of the observed ridership. Greatest accuracy is achieved on major routes serving suburban corridors. Minor service routes which overlap major routes have the greatest under-reporting. This is probably due to mis-reporting or mis-coding of trips using minor transit routes to major transit routes.

Incomplete routing information (e.g. missing access / egress modes or short transfers between major routes) is expected to be another major source for the low transit ridership estimates. This is because those under-reported minor service routes also tend to be short, low ridership routes. Furthermore, MADITUC only assigned trips which have a reasonable routing sequence between points of origin and destination. This in turn resulted in the loss of 5% to 10% of reported TTS transit trips prior to the trip assignments.

III. CONCLUSIONS

While there are small discrepancies between TTS data and other sources of demographic data there is no indication of obvious bias or deficiency in the data. The TTS data appears to provide a good representive sample of GTA trip makers.

Looking at peak period travel, TTS provides a good record of both transit and auto trips. The comparisons of TTS peak period transit trips with TTC ridership counts and TTS auto trips with Cordon Count figures show that there is no significant indication of under-reporting. However, there is a substantial under-reporting of trips on a daily basis. This suggests that there are a large number of off-peak trips unreported to the TTS. Two other observations were found to support this suggestion.

First, home-based work and school trips make up the bulk of peak period trips (especially for the AM peak). These were found to be the most accurately reported trips.

Second, for all age groups, the trip rates for non-work and non-school trips were significantly different between the respondent and non-respondent population. This is especially true for persons who are not in the labour force.

It appears that the under-reported trips are mainly discretionary trips, such as shopping and social-recreational trips, and non-home-based trips. Findings to date indicate that the under-reporting is more severe for non-respondents than respondents.

Given the consistency of TTS results and other independent estimates on both auto and transit peak period travel, and the accurate reporting of home-based work and school trips, the TTS data can be used with reasonable confidence for peak period transportation planning.

IV. RECOMMENDATIONS

(1) Data Correction :

To finalize the TTS data base, a detailed examination of monument geocodes is essential. Monuments assigned to incorrect locations must be identified, corrected, and incorporated into future versions of the data base.

(2) Further Study Needs :

The validation exercise revealed several areas where further studies are needed. Two of these areas where immediate action is needed are:

(i) Screenline Comparisons

To provide a more realistic comparison between TTS trip estimates and Cordon Count figures,

1. Auto trips should be assigned onto a network system.

2. Prior to another transit trip assignment, such as one using MADITUC, transit route codes, transfer points (between transit routes and between private and public modes) etc. should be checked.

(ii) Under-Reporting of Trips

A significant difference between respondents and non-respondent trip rates contributed to a gross under-estimation of off-peak trips. An adjustment method is required to account for this under-reporting.

(3) Use of the Data Base :

The data base is good, reliable and can be used as is for peak period transportation planning. However, it should be used with caution for detailed O-D analyses such as those at the TARMS traffic zone level and for off-peak analysis. This is due to the fine disaggregate level of the TARMS system and not because of any sampling error in the TTS. Adjustments for the under-reporting of off-peak trips are recommended.

APPENDIX 1

TTS VERSION 1.0

A USER GUIDE TO THE DATA BASE

FROM : T.D.R.O. (MTO)

DATE : October 27, 1987

TRANSPORTATION TOMORROW SURVEY FILE LAYOUT (VERSION 1.0)

HOUSEHOLD FILE LAYOUT

Columns	Description	Codes
1-6 (6)	Household Number - a unique identifier	Last two digits are batch number in processing of survey. First 4 digits are seq-uential number within batch.
7 (1)	Regional Municipality	1 - Durham 2 - Halton 3 - Metro 4 - Peel 5 - Ham/Wentworth 6 - York 7 - External
8-9 (2)	Area Municipality	See attached map
10-13 (4)	Traffic Zone	1979 TARMS zone system 9999 - DK/Invalid
14-19 (6)	UTMS x coordinate of blockface measured from 500,000 metres west of 78 degrees longitude	Distance east in metres
20-26 (7)	UTMS y coordinate of blockface	Distance from the equator in metres
27 (1)	Dwelling unit type	1 - House (single-detached, semi-detached, link, row or townhouse) 2 - Other (apartments, duplex, mobile home, hotel) 9 - DK/Invalid

28 (1)	Language interview was conducted in	E - English I - Italian P - Portuguese S - Spanish G - Greek C - Cantonese F - French U - Ukranian M - German L - Polish 9 - DK/Invalid
29-31 (3)	Identity code of interviewer	N/A
32 (1)	Call attempt # during which interview was completed	1 - 5
33-34 (2)	Week in which trips were made	Week # of survey 01 -starts Sept 15 1986 14 -Feb 16-20 1987 99 -DK/Invalid
35(1)	Day of week trips made	1 - Monday 2 - Tuesday 3 - Wednesday 4 - Thursday 5 - Friday 9 - DK/Invalid
36-37 (2)	# persons living in household	01 - 98 99 - DK/Invalid
38 (1)	# vehicles per household (available for personal use)	0 - 8 99 - DK/Invalid
39-40 (2)	Total # trips made by household on trip date	00 - 98 99 - DK/Invalid
41-45 (5)	Expansion factor	See text

PERSON FILE LAYOUT

Columns	Description	Codes
1-6 (6)	Household Number - a unique identifier	Last two digits are batch number in processing of survey. First 4 digits are seq-uential number within batch.
7 (1)	Regional Municipality	1 - Durham 2 - Halton 3 - Metro 4 - Peel 5 - Ham/Wentworth 6 - York 7 - External
8-9 (2)	Area Municipality	See attached map
10-13 (4)	Traffic Zone	1979 TARMS zone system 9999 - DK/Invalid
14 (1)	Dwelling unit type	1 - House (single-detached, semi-detached, link, row or townhouse) 2 - Other (apartments, duplex, mobile home, hotel) 9 - DK/Invalid
15-16 (2)	Week in which trips were made	Week # of survey 01 -starts Sept 15 1986 14 -Feb 16-20 1987 99 -DK/Invalid

17(1)	Day of week trips made	1 - Monday 2 - Tuesday 3 - Wednesday 4 - Thursday 5 - Friday 9 - DK/Invalid
18-19 (2)	# persons living in household	01 - 98 99 - DK/Invalid
20 (1)	# vehicles per household (available for personal use)	0 - 8 9 - DK/Invalid
21-22 (2)	Total # trips made by household on trip date	00 - 98 99 - DK/Invalid
23-27 (5)	Expansion factor	See text
28-29 (2)	Person # (unique identifier within household)	01 - 98 99 - DK/Invalid
30 (1)	Respondent (household member who provided information)	Y - Same as Person # N - another person provided info for this person #
31-32 (2)	Age	00 - < 1 year old 01 - 96 years old 97 - 97 and over 99 - DK/Refused
33 (1)	Sex	1 - Female 2 - Male 9 - DK/Refused
34 (1)	Posession of driver's licence	Y - Yes N - No 9 - DK/Refused
35 (1)	Employment status	F - Full Time P - Part Time H - Work at home (for income) O - Other
36 (1)	Student status	S - Student - Other
37-38 (2)	# trips made on trip date by person	00 - 98 99 - DK/Invalid

TRIP FILE FORMAT

Columns	Description	Codes
1-6 (6)	Household Number - a unique identifier	Last two digits are batch number in processing of survey. First 4 digits are sequential number within batch.
7 (1)	Regional Municipality	1 - Durham 2 - Halton 3 - Metro 4 - Peel 5 - Ham/Wentworth 6 - York 7 - External
8-9 (2)	Area Municipality	See attached map
10-13 (4)	Traffic Zone	1979 TARMS zone system 9999 - DK/Invalid
14 (1)	Dwelling unit type	1 - House (single-detached, semi-detached, link, row or townhouse) 2 - Other (apartments, duplex, mobile home, hotel) 9 - DK/Invalid
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35 (1)	Employment status	F - Full Time P - Part Time H - Work at home (for income) O - Other
36 (1)	Student status	S - Student - Other
37-38 (2)	# trips made on trip date by person	00 - 98 99 - DK/Invalid
39-40 (2)	Trip # (unique identifier for each trip)	01 - 98 99 - DK/Invalid

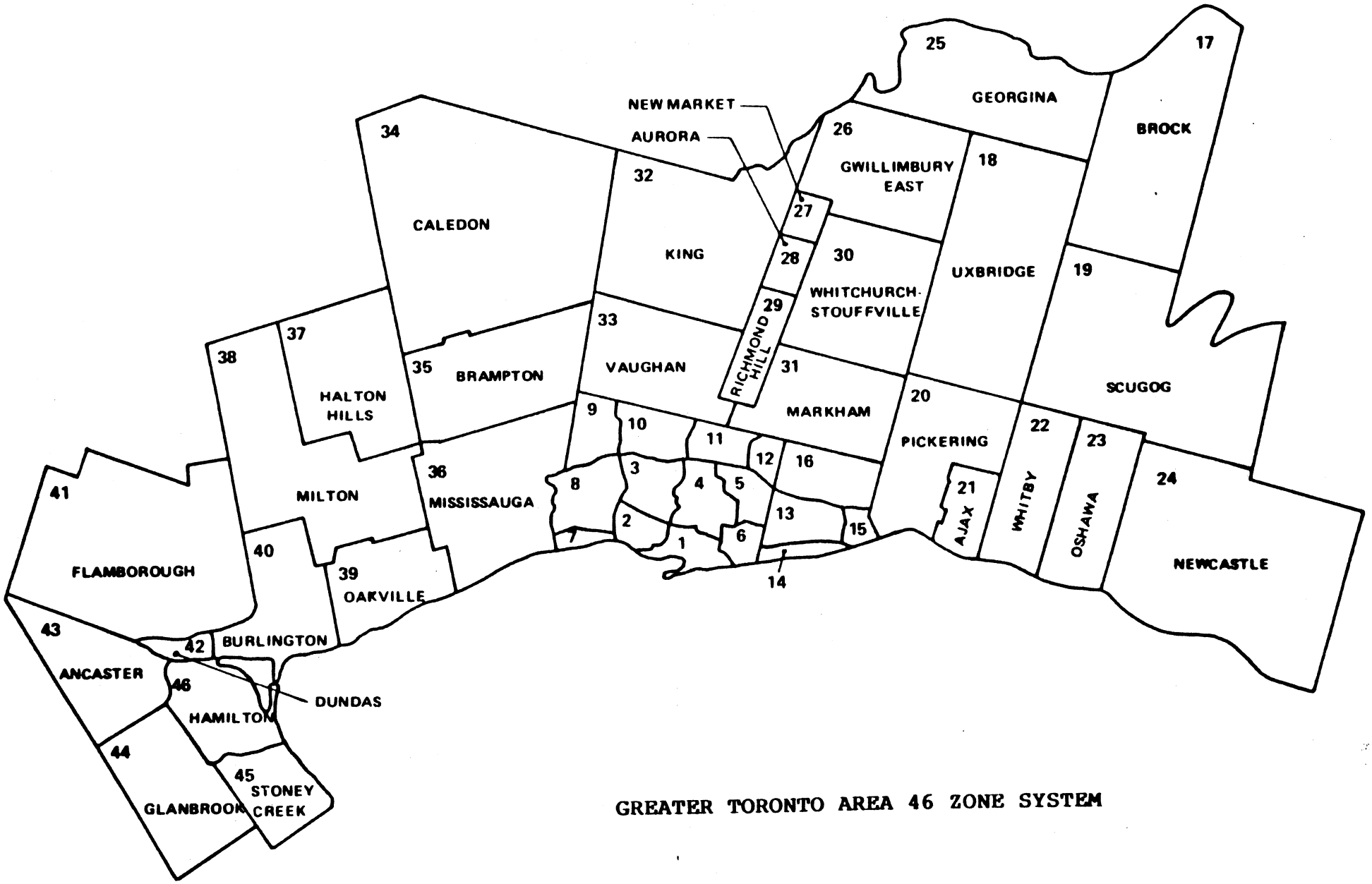
41 (1)	Origin purpose (purpose of previous trip)	W - Work S - School M - Market/Shop P - Personal Business E - Entertainment/ Social/ Recreational F - Facilitate Passenger (pick up/drop off) H - Home O - Other 9 - DK/Refused
42-43 (2)	Area municipality of origin	See map
44-47 (4)	Traffic zone of origin	1979 TARMS zone system 9999 - DK/Invalid
48-53 (6)	UTMS x coordinate of origin	Blockface or intersection quadrant
54-60 (7)	UTMS y coordinate of origin	Blockface or intersection quadrant
61-64 (4)	Start time of trip	0400 - 2800 (4 a.m. on trip day to 4 a.m. the following day) 9999 - DK/Invalid
65 (1)	Destination purpose (purpose of trip)	See above
66-67 (2)	Area munic. of destination	See map
68-71 (4)	Traffic zone of destination	1979 TARMS zone system 9999 - DK/Invalid
72-77 (6)	UTMS x coordinate of destination	Blockface or intersection quadrant
78-84 (7)	UTMS y coordinate of destination	Blockface or intersection quadrant

85 (1)	Total # of modes used for trip	1 - 5 (1 unless primary mode is transit)
86 (1)	Primary mode (if any part of a trip is made by transit, the primary mode will be transit(B)	W - Walk D - Auto Driver P - Auto Passenger T - Taxi C - Bicycle M - Motorcycle B - Transit (Bus/ Subway/Train) O - Other 9 - DK/Refused
87-90 (4)	Trip Length	Km * 10 9999 - not known

FOR TRANSIT TRIPS ONLY:

91 (1)	Access mode (mode used to access transit)	See above modes
92-93 (2)	Area municipality of access transfer point	See map
94-97 (4)	Traffic zone of access transfer point	1979 TARMS zone system 9999 - DK/Invalid
98-103 (6)	UTMS x coordinate of access transfer point	
104-110 (7)	UTMS y coordinate of access transfer point	
111 (1)	Egress mode (mode used upon exiting transit)	See above modes
112-113 (2)	Area municipality of egress transfer point	See map
114-117 (4)	Traffic zone of egress transfer point	1979 TARMS zone system 9999 - DK/Invalid
118-123 (6)	UTMS x coordinate of egress transfer point	
124-130 (7)	UTMS y coordinate of egress transfer point	

131 (1)	Transit mode	B - Bus/Streetcar S - Subway/Train
132-135 (4)	Transit property and route	See list
136-155 (4*5)	Columns 131-135 repeated for each transit mode used in sequence of use (up to a maximum of 5 total modes)	



GREATER TORONTO AREA 46 ZONE SYSTEM

ROUTE CODES FOR

LOCAL & INTER-REGIONAL TRANSIT OPERATORS

TRANSIT OPERATORS (CARRIERS)

CODE	TOWN/CITY	COMMENTS
AJ--	Ajax	
AU01	Aurora	One large route - no name
BR--	Brampton	
BU--	Burlington	
HA--	Hamilton	
MA--	Markham	
MI--	Mississauga	
NE--	Newmarket	
O---	Oakville	
OS--	Oshawa	
PI--	Pickering	
RI--	Richmond Hill	
T---	Toronto	T500 Wheel-Trans SU01 Yonge Subway SU02 University/Spadina Subway SU03 Bloor/Danforth Subway SU04 Scarborough RT
VA--	Vaughan	
WH--	Whitby	
GT--	GO Train	
GB--	GO Bus	
VIbb	Via Rail Canada	
ONbb	Ontario Northland Railway	
IN--	Intercity Bus	01 Grey Coach 02 Grey Hound 03 Voyageur 04 Canada Coach 05 PMCL (Penatang Midland Coach Lines)
Sbbb	School Bus	includes:
SBbb	School Bus	U of T Shuttle Bus Erindale Shuttle Bus Seneca Shuttle Bus
Cbbb	Charter Bus	
CBbb	Charter Bus	
DKbb	Don't Know	

Note :

- \- refers to the route codes
- b means blank

TORONTO TRANSIT COMMISSION

ROUTE CODES

T117 Alness Bus
T003 Ancaster Park Bus
T002 Anglesey Bus
T004 Annette TC
T001 Armour Heights Bus
T005 Avenue Road Bus
T007 Bathurst Bus
T511 Bathurst Streetcar
T006 Bay Trolley Coach
T011 Bayview Bus
T026 Bayview NB
T009 Bellamy Bus
T017 Birchmount Bus
T010 Bloor-Danforth NB
T049 Bloor West Bus
T021 Brimley Bus
T128 Brimley North Bus
T008 Broadview Bus
T050 Burnhamthorpe Bus
T018 Caledonia Bus
T120 Calvington Bus
T506 Carlton Streetcar
T126 Christie Bus
T019 Church Bus
T020 Cliffside Bus
T087 Cosburn Bus
T022 Coxwell Bus
T042 Cummer Bus
T113 Danforth Road Bus
T093 Danforth East NB
T127 Davenport Bus
T028 Davisville Bus
T023 Dawes Bus
T025 Don Mills Bus
T108 Downsview Bus
T027 Downtown Bus
T502 Downtowner St Car
T125 Drewry Bus
T029 Dufferin Bus
T505 Dundas Streetcar
T111 East Mall Bus
T101 Edwards Gardens Bus
T034 Eglinton East Bus
T032 Eglinton West Bus
T015 Evans Bus
T104 Faywood Bus

T001 Armour Heights Bus
T002 Anglesey Bus
T003 Ancaster Park Bus
T004 Annette TC
T005 Avenue Road Bus
T006 Bay Trolley Coach
T007 Bathurst Bus
T008 Broadview Bus
T009 Bellamy Bus
T010 Bloor-Danforth NB
T011 Bayview Bus
T012 Kingston Road Bus
T013 Rouge Hill Bus
T014 Glencairn Bus
T015 Evans Bus
T016 McCowan Bus
T017 Birchmount Bus
T018 Caledonia Bus
T019 Church Bus
T020 Cliffside Bus
T021 Brimley Bus
T022 Coxwell Bus
T023 Dawes Bus
T024 Victoria Park Bus
T025 Don Mills Bus
T026 Bayview North Bus
T027 Downtown Bus
T028 Davisville Bus
T029 Dufferin Bus
T030 Lambton Bus
T031 Greenwood Bus
T032 Eglinton West Bus
T033 Forest Hill Bus
T034 Eglinton East Bus
T035 Jane Bus
T036 Finch West Bus
T037 Islington Bus
T038 Horner Bus
T039 Finch East Bus
T040 Junction TC
T041 Keele Bus
T042 Cummer Bus
T043 Kennedy Bus
T044 Kipling South Bus
T045 Kipling Bus
T046 Martin Grove Bus

TORONTO TRANSIT COMMISSION (Cont'd):

T039 Finch East Bus
T118 Finch Via Allen Bus
T036 Finch West Bus
T100 Flemingdon Park Bus
T033 Forest Hill Bus
T135 Gerrard Bus
T014 Glencairn Bus
T119 Grandravine Bus
T122 Graydon Hall Bus
T031 Greenwood Bus
T038 Horner Bus
T048 Humber Blvd bus
T037 Islington Bus
T110 Islington South Bus
T035 Jane Bus
T083 Jones Bus
T040 Junction TC
T041 Keele Bus
T107 Keele North Bus
T043 Kennedy North Bus
T504 King Streetcar
T012 Kingston Road Bus
T114 Kingston Road E Bus
T503 Kingston Road Tripper
T045 Kipling Bus
T044 Kipling South Bus
T030 Lambton Bus
T047 Lansdowne TC
T052 Lawrence Bus
T054 Lawrence East Bus
T056 Leaside Bus
T051 Leslie Bus
T507 Long Branch St Car
T064 Main Bus
T058 Malton Bus
T059 Maple Leaf Bus
T102 Markham Road Bus
T046 Martin Grove Bus
T016 McCowan Bus
T129 McCowan North Bus
T130 Middlefield Bus
T057 Midland Bus
T132 Milner Bus
T062 Mortimer Bus
T074 Mount Pleasant TC
T133 Neilson Bus
T103 Nortown East TC

T047 Lansdowne TC
T048 Humber Blvd Bus
T049 Bloor West Bus
T050 Burnhamthorpe Bus
T051 Leslie Bus
T052 Lawrence Bus
T053 Steeles East Bus
T054 Lawrence East Bus
T056 Leaside Bus
T057 Midland Bus
T058 Malton Bus
T059 Maple Leaf Bus
T060 Steeles West Bus
T061 Nortown West TC
T062 Mortimer Bus
T063 Ossington TC
T064 Main Bus
T065 Parliament Bus
T066 Prince Edward Bus
T067 Pharmacy Bus
T068 Warden Bus
T069 Warden South Bus
T070 O'Connor Bus
T071 Runnymede Bus
T072 Pape Bus
T073 Royal York Bus
T074 Mount Pleasant TC
T075 Sherbourne Bus
T076 Royal York Sth Bus
T077 Spadina Bus
T078 St. Andrews Bus
T079 Scarlett Road Bus
T080 Queensway Bus
T081 Thorncliffe Pk Bus
T082 Rosedale Bus
T083 Jones Bus
T084 Sheppard West Bus
T085 Sheppard East Bus
T086 Scarboro Bus
T087 Cosburn Bus
T088 South Leaside Bus
T089 Weston TC
T090 Vaughan Bus
T091 Woodbine Bus
T092 Woodbine South Bus
T093 Danforth East NB
T094 Wellesley Bus

TORONTO TRANSIT COMMISSION (Cont'd):

T061 Nortown West TC
T131 Nugget Bus
T116 Oakdale Bus
T070 O'Connor Bus
T063 Ossington TC
T072 Pape Bus
T065 Parliament Bus
T067 Pharmacy Bus
T066 Prince Edward Bus
T501 Queen Streetcar
T080 Queensway Bus
T109 Ranee Bus
T082 Rosedale Bus
T013 Rouge Hill Bus
T073 Royal York Bus
T076 Royal York S Bus
T071 Runnymede Bus
T078 St. Andrews Bus
T512 St. Clair Streetcar
T086 Scarboro Bus
T079 Scarlett Road Bus
T085 Sheppard East Bus
T084 Sheppard West Bus
T075 Sherbourne Bus
T123 Shorncliffe Bus
T115 Silver Hills Bus
T088 South Leaside Bus
T077 Spadina Bus
T053 Steeles East Bus
T060 Steeles West Bus
T134 Tapscott Bus
T081 Thorncliffe Pk Bus
T090 Vaughan Bus
T024 Victoria Park Bus
T068 Warden Bus
T069 Warden South Bus
T094 Wellesley Bus
T112 West Mall Bus
T089 Weston TC
T098 Willowdale/Senlac Bus
T096 Wilson Bus
T105 Wilson Heights Bus
T091 Woodbine Bus
T092 Woodbine South Bus
T097 Yonge Bus
T095 York Mills Bus
T106 York University Bus
T506 Carlton Streetcar
T511 Bathurst Streetcar

T095 York Mills Bus
T096 Wilson Bus
T097 Yonge Bus
T098 Willowdale/Senlac Bus
T100 Flemingdon Park Bus
T101 Edwards Gardens Bus
T102 Markham Road Bus
T103 Nortown East TC
T104 Faywood Bus
T105 Wilson Heights Bus
T106 York University Bus
T107 Keele North Bus
T108 Downsview Bus
T109 Ranee Bus
T110 Islington South Bus
T111 East Mall Bus
T112 West Mall Bus
T113 Danforth Road Bus
T114 Kingston Road E Bus
T115 Silver Hills Bus
T116 Oakdale Bus
T117 Alness Bus
T118 Finch Via Allen Bus
T119 Grandravine Bus
T120 Calvington Bus
T122 Graydon Hall Bus
T123 Shorncliffe Bus
T125 Drewry Bus
T126 Christie Bus
T127 Davenport Bus
T128 Brimley North Bus
T129 McCowan North Bus
T130 Middlefield Bus
T131 Nugget Bus
T132 Milner Bus
T133 Neilson Bus
T134 Tapscott Bus
T135 Gerrard Bus
T400 Ex Express Bathurst
T401 Ex Express Keele
T402 Ex Express Union
T500 Wheel Trans
T501 Queen Streetcar
T502 Downtowner St Car
T503 Kingston Road Tripper
T504 King Streetcar
T505 Dundas Streetcar
T507 Long Branch St car
T512 St. Clair Streetcar

TORONTO TRANSIT COMMISSION (Cont'd):

SUBWAY-RT ROUTE CODES

SU03 Bloor-Danforth Sub	SU01 Yonge Subway
SU04 Scarborough RT	SU02 University-Spadina
SU02 University-Spadina	SU03 Bloor-Danforth Sub
SU01 Yonge Subway	SU04 Scarborough RT

DURHAM REGION

ROUTE CODES

Oshawa	OS01 Simcoe - South Lake
	OS02 Simcoe - North Lake
	OS03 King East - Adelaide
	OS04 Park Road - Cedar
	OS05 Appleville
	OS06 Ritson
	OS07 Rossland
	OS08 Thornton Road
	OS09 Mary Nonquon
	OS10 Bond West - Rossland
Whitby	WHOA Otter Creek
	WHOB Gerrard Park
	WHOC Kendalwood
	WHOD Hospital - West Lynde
Ajax	AJ01 Beach
	AJ02 Elm
	AJ03 Duffins
	AJ04 Wesney Heights
Pickering	PI01 Industrial
	PI02 Liverpool
	PI2A Village East
	PI03 Amberlea
	PI05 West Shore
	PI5A Lookout Point
	PI06 Bay Ridges
	PI07 Rosebank
	PI08 Shuttle
	PI09 Highbush
	PIZ1 Dial-a-Bus Zone 1
	PIZ2 " " Zone 2
	PIZ3 " " Zone 3
	PIZ5 " " Zone 5
	PIZ6 " " Zone 6

YORK REGION

ROUTE CODES

Newmarket	NE33 Quaker Hill NE11 Bayview Hills NE22 South East NE55 Davis Drive NE44 Northwest
Aurora	AU01 (Only one large route) (No name)
Vaughan	VA01 West Woodbridge VA02 East Woodbridge VA03 Maple VA04 Kleinberg VA05 Clark Ave.
Richmond Hill	RI01 Beverley Acres RI1A York Central Hospital RI02 Allencourt/Hillcrest Mall RI3A York Central Hospital RI3B Richvale RI04 Oak Ridges
Markham	MA01 Hwy. 7 Trunk Route MA02 Northeast Markham MA03 Unionville MA04 Unionville - Markham MA05 Thornlea MA06 Thornhill MA07 Romfield MA08 Royal Orchard

PEEL REGION

ROUTE CODES

Mississauga	M101 Dundas
	M102 Hurontario
	M103 Bloor
	M104 Applewood
	M105 Dixie
	M106 Burnhamthorpe/Credit
Woodlands	
	M107 Airport
	M108 Cawthra/Lorne Pk.
	M109 Streetsville
	M110 Meadowvale/Erin Mills
	M111 Malton Express
	M112 Rexdale
	M113 Clarkson/Erindale College
	M115 Malton Industrial West
	M116 Malton East
	M117 Dixie Industrial South
	M118 Malton Industrial Pk.
	M119 Mississauga-Brampton
Connection	
	M120 Rathburn
	M121 Dundas/Streetsville
	M122 Humber College
	M123 Lakeshore
	M124 Meadowvale GO Special
	M125 Brittannia Industrial
	M126 Burnhamthorpe/Erin Mills
	M127 Meadowvale/Dundas Express
	M128 Eglinton East
	M129 Meadowvale/Burnhamthorpe
	M130 Malton West/Woodbine Centre
	M131 Erindale College
	M141 Port Credit
	M151 Tomken
Brampton	BRIA Queen
	BRIB Queen
	BR02 Main
	BR06 Centre
	BR07 Kennedy
	BR08 Rutherford
	BR09 Vodden
	BR10 Industrial
	BR11 Steeles
	BR12 Grenoble
	BR13 Avondale
	BR14 Torbram
	BR15 Bramalea
	BR17 Howden
	BR18 Dixie
	BR20 East Industrial

HALTON REGION

ROUTE CODES

Oakville Transit	010A GO Special
	010B West Industrial
	011A Linbrook - GO
	011B Eastlake - Downtown
	014A Sheridan
	014B Lakeshore West
	014C Falgarwood
	015A Bridge - GO
	015B Speers - Bronte North
	016A Speers - Falgarwood
	016B Bridge - Bronte North
	016C Speers - GO
	017A White Oaks
	017B Queen Mary - Kerr
	018A Glen Abbey
	018B Speers - GO
	019A River Oaks
	019B GO Station
Burlington	BU01 Fairview - New Street
	BU02 Guelph Line - Brant St
	BU03 Mt. Forest, Palmer, Mainway
	BU04 Pinedale
	BU05 Aldershot
	BU07 Tyandaga

HAMILTON

ROUTE CODES

ALPHABETICAL

HA06 Aberdeen
HA02 Barton
HA04 Bayfront
HA10 Beeline (Express)
HA53 Burlington
HA03 Cannon
HA35 College
HA56 Confederation Park
HA05 Delaware
HA52 Dundas Local
HA31 Fennell
HA32 Garth
Crosstown
HA01 King
HA45 Limeridge/Heritage
HA07 Locke
HA41 Mohawk
HA57 Nash
HA16 North Ender
HA11 Parkdale
HA09 Rock Gardens
HA33 Sanatorium/Ancaster
HA15 Sherman/Ottawa Crosstown
HA55 Stoney Creek Central
HA58 Stoney Creek Local
HA51 University/Ancaster
HA23 Upper Gage
HA27 Upper James
HA21 Upper Kenilworth
HA22 Upper Ottawa
HA34 Upper Paradise
HA24 Upper Sherman
HA26 Upper Wellington
HA25 Upper Wentworth
HA08 York

NUMERICAL

HA01 King
HA02 Barton
HA03 Cannon
HA04 Bayfront
HA05 Delaware
HA06 Aberdeen
HA07 Locke
HA08 York
HA09 Rock Gardens
HA10 Beeline (Express)
HA11 Parkdale
HA15 Sherman/Ottawa

HA16 North Ender
HA21 Upper Kenilworth
HA22 Upper Ottawa
HA23 Upper Gage
HA24 Upper Sherman
HA25 Upper Wentworth
HA26 Upper Wellington
HA27 Upper James
HA31 Fennell
HA32 Garth
HA33 Sanatorium/Ancaster
HA34 Upper Paradise
HA35 College
HA41 Mohawk
HA45 Limeridge/Heritage
HA51 University/Ancaster
HA52 Dundas Local
HA53 Burlington
HA55 Stoney Creek Central
HA56 Confederation Park
HA57 Nash
HA58 Stoney Creek Local

GO TRAIN: ROUTE CODES

GT50 Lakeshore GO Train
GO Bus connections to Burlington and Hamilton in the west, and Ajax, Whitby and Oshawa in the east.
Oakville GO Station
Clarkson GO Station
Port Credit GO Station
Long Branch GO Station
Mimico GO Station
Exhibition GO Station
Union Subway Station
Danforth GO Station
Scarborough GO Station
Eglinton GO Station
Guildwood GO Station
Rouge Hill GO Station
Pickering GO Station

GT51 Georgetown GO Train
GO Bus connection for Guelph
Georgetown GO Station
Brampton GO Station
Bramalea GO Station
Malton GO Station
Etobicoke North GO Station
Weston GO Station
Bloor GO Station (Dundas West Subway Station)
Union Subway Station

GT52 Bradford GO Train
GO Bus connection for Barrie
Bradford GO Station
Newmarket GO Station
Aurora GO Station
King City GO Station
Maple GO Station
Union Subway Station

GT53 Richmond Hill GO Train
GO Bus connection for Newmarket
Richmond Hill GO Station
Langstaff GO Station
Old Cummer GO Station
Oriole GO Station
Union Subway Station

GT54 Stoufville GO Train
Stoufville GO Station
Markham GO Station
Unionville GO Station
Milliken GO Station
Agincourt GO Station
Scarborough GO Station
Danforth GO Station
Union Subway Station

GT55 Milton GO Train
Milton GO Station
Meadowvale GO Station
Streetsville GO Station
Erindale GO Station
Cooksville GO Station
Dixie GO Station
Kipling GO Station (Kipling Subway Station)
Union Subway Station

GO BUS: ROUTE CODES

GB14 Lakeshore West
Hamilton - Oakville - Toronto (via Lakeshore)

GB16 City Link Express
Hamilton - Toronto (via Queen Elizabeth Way)

GB27 Milton
Milton - Meadowvale - Yorkdale - York Mills

GB31 Guelph
Guelph - Georgetown - Brampton - Yorkdale - York Mills

GB34 Brampton Express
Brampton - Bramalea - Yorkdale - York Mills (Express)

GB35 Brampton Local
Brampton - Bramalea - Yorkdale - York Mills (Local)

GB36 Bramalea
Bramalea - Yorkdale - York Mills

GB61 Richmond Hill/Finch
North Yonge GO Bus - Local "C" Service

GB62 Newmarket - Finch

GB63 Richmond Hill/Bayview
Richmond Hill - Finch (via Bayview Avenue)

GB64 Newmarket - Yorkdale

GB65 Newmarket - King

GB68 Barrie

GB69 Sutton

GB75 Uxbridge - Toronto

GB76 Uxbridge - Stouffville

GB94 Oshawa - Pickering

GB95 Ajax

GB96 Oshawa - Toronto

GB98 Bowmanville

APPENDIX 2

TTS SAMPLE EXPANSION FACTORS

FROM : Pentti Suokas
James Wong

DATE : September 8, 1987

APPENDIX 2

TTS SAMPLE EXPANSION FACTORS

1. Zone System:

A 268 zone system was defined as the level of aggregation for expansion of the Transportation Tomorrow Survey records on a household basis.

In general, Minor Planning Districts were used as the level of aggregation for Metropolitan Toronto and the Regional Municipalities of Durham, York and Halton. The Regional Municipalities of Peel and Hamilton-Wentworth defined their own districts.

Exhibit 1 lists the aggregations from TARMS traffic zones to the 268 zones.

2. Population and Dwelling Unit Factors:

The 1986 Census population and dwelling units at the Census Tract level and municipality level were used to generate the factors. The TTS household file used for the analysis consists of 61,665 records.

(a) Calculation of Factors:

$$\text{POPULATION FACTOR} = \frac{\text{CENSUS POPULATION}}{\text{TTS POPULATION}}$$

$$\text{DWELLING UNIT FACTOR} = \frac{\text{CENSUS DWELLING UNITS}}{\text{TTS DWELLING UNITS}}$$

b. Review of Factors:

The expansion factors for population and dwelling units were reviewed by the Transportation Demand Research Office. Certain districts were combined to satisfy the minimum number of 2,500 households in each aggregation district.

EXHIBIT 1.

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

METRO

MINOR PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
1A	1	1-2
1B	2	3-5,9-11
1C	3	6-8,20-24
1D	4	12-16,28-29
1E	5	17-19,25-27,33-35
1F	6	30-32,36-41
1G	7	44-45
1H	8	42-43
2A	9	46-47,68
2B	10	48,66-67
2C	11	49-50,64-65
2D	12	51-53
2E	13	54-56
2F	14	69-70
2G	15	62-63,71-73,81
2H	16	60-61,74-75,80
2I	17	57-59,76-79
3A	18	82-85,90-92
3B	19	86-89
3C	20	93-94
3D	21	95-96,108-112
3E	22	97-98,106-107
3F	23	99-100,102-105
3G	24	113-114,124
3H	25	115,119-123
3I	26	101,116-118
4A	27	125-128,134-135
4B	28	129-130,132-133
4C	29	136-137,149-150
4D	30	138-141,146-148,152
4E	31	131
4F	32	142-145
4G	33	151,156-160
4H	34	153-155
5A	35	161,170-172
5B	36	162-163,168-169,173-174,177
5C	37	164-167,175-176

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

METRO

MINOR PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
6A	38	178
6B	39	179-182
6C	40	183,187
6D	41	184-186
6E	42	190-197
6F	43	188-189
6G	44	198-204
6H	45	205-210
7A	46	211,213-214,220
7B	47	212
7C	48	215-216
7D	49	217-219
8A	50	221-226
8B	51	227-228,238-239
8C	52	229-235,242-244
8D	53	236-237,240-241
8E	54	249-252
8F	55	245-248,253-256
9A	56	257-262
9B	57	263-275
10A	58	276-278,289-292
10B	59	279-288,293-300
11A	60	310-313
11B	61	301-302,308-309,314
11C	62	303-307,315-316
12A	63	317-325
13A	64	326-329,342,345-346
13B	65	330-333,339-341
13C	66	334-338
13D	67	343-344,348-351
13E	68	347,352-353
14A	69	354-356
14B	70	357-360
14C	71	361-363
15A	72	371-374
15B+C	73	364-370
16A	74	375-378,398-400
16B	75	379-382,393,395-397
16C	76	383-392,394

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

DURHAM

MINOR PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
17A	77	411,416-417,421-426
17B	78	412-415,418-420,427-430
17C	79	431-435,437-438
17D	80	436,439-443
18A	81	458-461
18B	82	456-457,462-464
18C	83	447-449,451-455
18D	84	444-446,450
19A	85	465-466
19B	86	467-469
19C	87	470-471
20A	88	477-480,483
20B	89	474-476,484,488
20C	90	472-473,485-486
21A	91	481-482,491
21B	92	487,489-490
21C	93	492-496
22A	94	544-546
22B	95	542-543,547
22C	96	540-541,548-549
23A	97	532-536
23B	98	506,518-521
23C	99	528-531,537-538
23D	100	514-517,522-525
23E	101	507-510
23F	102	526-527,539
23G	103	511-513
24A	104	500-505
24B	105	497-499
25A	106	582-585
25B	107	586-588
25C	108	592-593
25D	109	589-591,594
26A	110	550,569,581
26B	111	563-564,579-580
26C	112	570-578
26D	113	565-568
26E	114	551-556
26F	115	557-562
27A	116	595-599
27B	117	600-601
27C	118	602-605

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

DURHAM

MINOR PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
28A	119	614-615
28B	120	616-618
28C	121	619-620
29A	122	608-609
29B	123	606-607,610
29C	124	611-613

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

YORK

MINOR PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
30A	125	707
30B	126	708-711
30C	127	712-713
30D	128	714-715
31A	129	702-705
31B	130	700-701,706
32A	131	696-697
32B	132	695,698-699
33A	133	632,636
33B	134	633,637
33C	135	634,638,640
33D	136	631,635,639
34A	137	641-643
34B	138	644-648
35A	139	651,654
35B	140	650,653,656
35C	141	649,652,655
36A	142	660,664,668
36B	143	658-659,662-663,666-667
36C	144	657,661,665
37A	145	716-718
37B	146	719-721
38A	147	752-754
38B	148	749-751
38C	149	737-739
38D	150	740-744
39A	151	745-748
39B	152	722-724
40A	153	725-727
40B	154	728-730,734-736
40C	155	731-733
41A	156	685-688
41B	157	684,689
41C	158	683,690
42A	159	669-671
42B	160	672-674
42C	161	676-678
42D	162	675
43A	163	679-682
43B	164	691-694

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

PEEL

PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
1	165	775-777
2	166	778-779
3	167	780
4	168	781-782
5	169	783-785
6	170	786-787
7	171	788,791-793
8	172	789,794-795
9	173	790,796,805
10	174	797,806
11	175	770,798-799
12	176	800
13	177	801-802,807-808,814-815
14	178	803-804
15	179	771,812-813
16	180	809
17	181	810-811
18	182	816-817
19	183	818
20	184	772-774
21	185	819-820,850-851
22	186	852-854
23	187	855-856
24	188	848
25	189	832,839-847,849
26	190	882-885,895,905
27	191	880,901-903
28	192	881,887-888,904
29	193	913-914,917-918
30	194	886,896,906
31	195	897,907
32	196	908-909
33	197	891,893
34	198	898-899
35	199	900,910
36	200	874,892
37	201	875,894
38	202	862-873,876-879,915-916,921-923
39	203	859-861,889-890,911-912,919-920
40	204	925,931,933-937
41	205	926-930
42	206	924,932,938-944
43	207	833,857-858
44	208	821-822,824-825,827-828,830-831
45	209	823,826,829,834-838

NOTE : PLANNING DISTRICTS ARE DEFINED BY PEEL

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

HALTON

MINOR PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
54A	210	979-982
54B	211	973-978
54C	212	985-989
54D	213	983-984,990-991
54E	214	968-972
55A	215	960-967
55B	216	992-996
55C	217	997
55D	218	998-1000
56A	219	1093-1094
56B	220	1081-1085
56C	221	1077-1080,1088-1089
56D	222	1086-1087,1090-1092,1095-1097
57A	223	1052-1057
57B	224	1058
57C	225	1059-1063
57D	226	1050-1051
58A	227	1064-1070
58B	228	1071-1076
59A	229	1006-1012
59B	230	1013-1018
59C	231	1019-1023
59D	232	1024-1027
60A	233	1001-1002
60B	234	1003-1005
60C	235	1035-1042
61A	236	1028-1034
61B	237	1043-1049

EQUIVALENCE FILE FOR TTS ANALYSIS TARMS TO 268 ZONE SYSTEM

HAMILTON-WENTWORTH

PLANNING DISTRICT	268 ZONE SYSTEM	TARMS ZONE SYSTEM
1	238	1182-1185
2	239	1177-1178
3	240	1186-1191
4	241	1179-1181
5	242	1240-1241
6	243	1232-1239
7	244	1212-1214
8	245	1207-1211
9	246	1204-1206
10	247	1192-1193
11	248	1194-1197
12	249	1198-1203
13	250	1215-1224
14	251	1225-1231
15	252	1253-1255
16	253	1247-1252
17	254	1242-1246
18	255	1256-1259
19	256	1260-1263
20	257	1264-1265
21	258	1172-1176
22	259	1165-1171
23	260	1160-1164
24	261	1155-1159
25	262	1150-1154
26	263	1148-1149
27	264	1141-1144
28	265	1145-1147
29	266	1131-1136
30	267	1137-1140

NOTE : PLANNING DISTRICTS ARE DEFINED BY THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH

EXTERNAL	268	401-410,621-630,755-769,945-959 1098-1130,1266-1400

c. Household Expansion Factors:

The dwelling unit factors defined in (a) were used as the household expansion factors for the TTS household records. The same factors were used for person records and trip records with the same household numbers.

Exhibit 2 lists the population and dwelling unit factors for the Greater Toronto Area.

EXHIBIT 2.

POPULATION AND DWELLING UNIT FACTORS

METRO

268 ZONE	CENSUS POPULT	CENSUS DWELLU	TTS POPULT	TTS DWELLU	POP FACTOR	DWELLU FACTOR	CENSUS POP/DU
1	15594	7830	571	320	27.31	24.47	1.99
2	20998	14119	869	553	24.16	25.53	1.49
3	45778	22310	1437	734	31.86	30.40	2.05
4	22560	8580	853	387	26.45	22.17	2.63
5	7440	4358	312	162	23.85	26.90	1.71
6 + 8	14863	6874	564	265	26.35	25.94	2.16
7 + 44	35086	11493	1245	454	28.18	25.31	3.05
9	11634	4282	489	190	23.79	22.54	2.72
10	16232	6145	590	247	27.51	24.88	2.64
11	17983	9210	831	394	21.64	23.38	1.95
12	20314	6431	620	209	32.76	30.77	3.16
13	15949	4914	603	205	26.45	23.97	3.25
14	9892	4480	374	166	26.45	26.99	2.21
15	44317	18346	1574	698	28.16	26.28	2.42
16	26862	8924	789	271	34.05	32.93	3.01
17	35658	10795	1230	419	28.99	25.76	3.30
18	38064	12637	1484	512	25.65	24.68	3.01
19	14998	4690	707	238	21.21	19.71	3.20
20	13205	6309	535	249	24.68	25.34	2.09
21	33001	12228	1140	427	28.95	28.64	2.70
22	14940	5257	627	229	23.83	22.96	2.84
23	34145	13001	1239	480	27.56	27.09	2.63
24	12651	3908	459	154	27.56	25.38	3.24
25	34682	10800	1286	441	26.97	24.49	3.21
26	28476	12124	1165	476	24.44	25.47	2.35
27	35062	14475	1464	605	23.95	23.93	2.42
28 + 31	22207	8460	1272	492	17.46	17.20	2.62
29	19189	8800	816	394	23.52	22.34	2.18
30	49155	27254	1828	992	26.89	27.47	1.80
32 + 38	25266	11572	1023	457	24.70	25.32	2.18
33	23158	12967	985	556	23.51	23.32	1.79
34	12183	4797	647	269	18.83	17.83	2.54
35	11741	4328	468	179	25.09	24.18	2.71
36	47362	17512	1856	709	25.52	24.70	2.70
37	48913	18986	2006	794	24.38	23.91	2.58
39	24895	10872	1140	508	21.84	21.40	2.29
40	26570	10410	907	351	29.29	29.66	2.55
41	24354	10427	826	341	29.48	30.58	2.34
42	40641	14995	1685	650	24.12	23.07	2.71
43	13732	5101	546	206	25.15	24.76	2.69

METRO

268 ZONE	CENSUS POPULT	CENSUS DWELLU	TTS POPULT	TTS DWELLU	POP FACTOR	DWELLU FACTOR	CENSUS POP/DU
45	38450	15700	1608	668	23.91	23.50	2.45
46	15206	5272	642	233	23.69	22.63	2.88
47	9692	4129	396	152	24.47	27.16	2.35
48	9786	3928	391	160	25.03	24.55	2.49
49	16025	7278	564	246	28.41	29.59	2.20
50	53272	19450	2334	847	22.82	22.96	2.74
51	35592	13267	1582	604	22.50	21.97	2.68
52	38035	14406	1816	672	20.94	21.44	2.64
53 + 54	25200	10503	1118	466	22.54	22.54	2.40
55	25777	10360	1138	456	22.65	22.72	2.49
56	49975	14395	1893	575	26.40	25.03	3.47
57	26909	8822	1098	356	24.51	24.78	3.05
58	33680	9731	1358	413	24.80	23.56	3.46
59	114385	37527	4380	1488	26.12	25.22	3.05
60	27323	10858	1227	472	22.27	23.00	2.52
61	50199	20027	2530	990	19.84	20.23	2.51
62	46684	17070	2121	829	22.01	20.59	2.73
63	78582	26354	3555	1215	22.10	21.69	2.98
64	32071	11750	1884	684	17.02	17.18	2.73
65	47881	16412	1883	674	25.43	24.35	2.92
66	46225	15043	2154	696	21.46	21.61	3.07
67	31334	10938	1176	431	26.64	25.38	2.86
68	21849	8911	857	360	25.49	24.75	2.45
69	12149	5203	639	264	19.01	19.71	2.33
70	23513	8350	920	356	25.56	23.46	2.82
71	23130	8041	869	318	26.62	25.29	2.88
72	28450	9880	959	335	29.67	29.49	2.88
73	42900	12949	1766	544	24.29	23.80	3.31
74	85884	28685	3808	1303	22.55	22.01	2.99
75	51962	14391	2535	734	20.50	19.61	3.61
76	37888	10145	1686	471	22.47	21.54	3.73
TOTAL	2189758	820776	89949	34395	24.34	23.86	2.67

DURHAM

	268 ZONE	CENSUS POPULT	CENSUS DWELLU	TTS POPULT	TTS DWELLU	POP FACTOR	DWELLU FACTOR	CENSUS POP/DU
PICKERING								
	77	17179	5115	737	234	23.31	21.86	3.36
	78 TO 80	31779	9466	1389	425	22.88	22.27	3.36
AJAX								
	81	9867	2959	607	191	16.26	15.49	3.33
	82	14956	4979	439	143	34.07	34.82	3.00
	83 TO 84	11098	3652	533	177	20.82	20.63	3.04
WHITBY								
	85 TO 87,90	7574	2294	300	100	25.25	22.94	3.30
	88	13210	4784	552	195	23.93	24.53	2.76
	89	8873	2579	355	108	24.99	23.88	3.44
	91 TO 93	16161	4972	755	235	21.41	21.16	3.25
OSHAWA								
	94 TO 95	13985	4417	530	160	26.39	27.61	3.17
	96 + 102	19396	5935	852	265	22.77	22.40	3.27
	97	13000	4580	451	156	28.82	29.36	2.84
	98	12003	4092	556	202	21.59	20.26	2.93
	99	16633	6365	563	220	29.54	28.93	2.61
	100	18521	6677	750	286	24.69	23.35	2.77
	101	18611	6990	789	290	23.59	24.10	2.66
	103 TO 105	9258	2910	238	77	38.90	37.79	3.18
NEWCASTLE								
	106 TO 109	9187	2971	327	112	28.09	26.53	3.09
	111 TO 112	16342	5320	784	256	20.84	20.78	3.07
	110,113-115	8544	2667	232	77	36.83	34.64	3.20
SCUGOG								
	116 TO 118	15205	4994	659	210	23.07	23.78	3.04
BROCK								
	119 TO 121	10003	3447	376	130	26.60	26.52	2.90
UXBRIDGE								
	122 TO 124	11895	3875	399	137	29.81	28.28	3.07
TOTAL		323280	106040	13173	4386	24.54	24.18	3.05

YORK

268 ZONE	CENSUS POPULT	CENSUS DWELLU	TTS POPULT	TTS DWELLU	POP FACTOR	DWELLU FACTOR	CENSUS POP/DU
GEORGINA							
125 + 128	12746	4241	457	161	27.89	26.34	3.01
126 + 127	12717	4421	470	157	27.06	28.16	2.88
GWILLIMBURY EAST							
129 + 130	14644	4346	615	192	23.81	22.64	3.37
WHITCHURCH-STOUFFVILLE							
131 + 132	15135	4880	741	246	20.43	19.84	3.10
NEWMARKET							
133 TO 136	34923	10705	1654	522	21.11	20.51	3.26
AURORA							
137	9022	2843	326	107	27.67	26.57	3.17
138	11883	3818	546	187	21.76	20.42	3.11
RICHMOND HILL							
139 TO 142	8955	2834	306	93	29.26	30.47	3.16
143 TO 144	36724	11875	1691	560	21.72	21.21	3.09
KING							
145 TO 146	15951	4969	607	189	26.28	26.29	3.21
VAUGHAN							
147	13087	3814	530	151	24.69	25.26	3.43
148	17268	4692	706	197	24.46	23.82	3.68
149 TO 152	11186	3124	511	150	21.89	20.83	3.58
153 TO 155	23518	5981	1112	288	21.15	20.77	3.93
MARKAM							
156 + 164	21958	6224	687	213	31.96	29.22	3.53
157	13077	4064	601	186	21.76	21.85	3.22
158	18409	5122	912	261	20.19	19.62	3.59
159	19706	7016	840	295	23.46	23.78	2.81
160	23203	6262	1011	276	22.95	22.69	3.71
161 TO 163	18244	4783	726	196	25.13	24.40	3.81
TOTAL	352356	106014	15049	4627	23.41	22.91	3.32

PEEL

	268 ZONE	CENSUS POPULT	CENSUS DWELLU	TTS POPULT	TTS DWELLU	POP FACTOR	DWELLU FACTOR	CENSUS POP/DU
MISSISSAUGA								
	165	16745	6093	635	219	26.37	27.82	2.75
	166	13298	5590	495	213	26.86	26.24	2.38
	167	15367	4568	581	177	26.45	25.81	3.36
	168	13016	3846	539	171	24.15	22.49	3.38
	169	16914	5516	686	231	24.66	23.88	3.07
	170	15251	4625	577	176	26.43	26.28	3.30
	171	19580	5957	693	229	28.25	26.01	3.29
	172	15954	6106	602	230	26.50	26.55	2.61
	173	14756	4859	752	252	19.62	19.28	3.04
	174	11106	3632	291	99	38.16	36.69	3.06
	175	19158	5713	722	221	26.53	25.85	3.35
	176	11531	3513	667	200	17.29	17.57	3.28
	177	17537	5152	565	171	31.04	30.13	3.40
	178	15685	5187	632	211	24.82	24.58	3.02
	179	9285	2632	575	163	16.15	16.15	3.53
	180	12741	5637	444	191	28.70	29.51	2.26
	181	18470	6566	661	238	27.94	27.59	2.81
	182	17705	5146	666	205	26.58	25.10	3.44
	183	11052	3414	430	141	25.70	24.21	3.24
	184	9832	2849	399	117	24.64	24.35	3.45
	185	7833	2582	400	131	19.58	19.71	3.03
	186	17621	5400	627	188	28.10	28.72	3.26
	187	15396	5585	843	290	18.26	19.26	2.76
	188	31782	8499	1220	345	26.05	24.63	3.74
	189,207-9	7158	2184	279	89	25.66	24.54	3.28
BRAMPTON								
	190	21059	6739	789	267	26.69	25.24	3.12
	191	12781	4317	613	211	20.85	20.46	2.96
	192	14110	4474	676	238	20.87	18.80	3.15
	193	11429	3165	409	117	27.94	27.05	3.61
	194	16698	5163	670	207	24.92	24.94	3.23
	195	18035	4724	694	201	25.99	23.50	3.82
	196	14862	3950	643	172	23.11	22.97	3.76
	197	12440	5152	427	193	29.13	26.69	2.41
	198	12082	3461	421	133	28.70	26.02	3.49
	199	16274	4201	799	221	20.37	19.01	3.87
	200	8856	2629	353	112	25.09	23.47	3.37
	201	14795	4134	524	161	28.23	25.68	3.58
	202	6932	2288	231	61	30.01	37.51	3.03
	203	8192	2595	390	119	21.01	21.81	3.16
CALEDON								
	204	8851	2595	399	117	22.18	22.18	3.41
	205	8211	2458	388	119	21.16	20.66	3.34
	206	12454	3908	356	114	34.98	34.28	3.19
TOTAL		592834	186804	23763	7661	24.95	24.38	3.17

HALTON

268 ZONE	CENSUS POPULT	CENSUS DWELLU	TTS POPULT	TTS DWELLU	POP FACTOR	DWELLU FACTOR	CENSUS POP/DU
OAKVILLE							
210 + 211	17260	5565	725	248	23.81	22.44	3.10
212	15542	5274	591	201	26.30	26.24	2.95
213,216-218	13774	4046	708	204	19.45	19.83	3.40
214	13183	5023	437	176	30.17	28.54	2.62
215	27369	8952	1148	399	23.84	22.44	3.06
HALTON HILLS							
219	6997	2277	373	124	18.76	18.36	3.07
220	15553	5014	886	291	17.55	17.23	3.10
221 + 222	13021	3969	636	200	20.47	19.85	3.28
MILTON							
223-4,6-8	8569	2612	351	104	24.41	25.12	3.28
225	23469	7144	1045	333	22.46	21.45	3.29
BURLINGTON							
229	20217	9020	853	379	23.70	23.80	2.24
230	13545	5060	515	193	26.30	26.22	2.68
231	11418	3445	577	164	19.79	21.01	3.31
232	14861	5011	557	191	26.68	26.24	2.97
233 + 234	14280	5127	731	267	19.53	19.20	2.79
235	27492	8406	1231	386	22.33	21.78	3.27
236 + 237	14862	4225	624	190	23.82	22.24	3.52
TOTAL	271412	90170	11988	4050	22.64	22.26	3.01

HAMILTON-WENTWORTH

268 ZONE	CENSUS POPULT	CENSUS DWELLU	TTS POPULT	TTS DWELLU	POP FACTOR	DWELLU FACTOR	CENSUS POP/DU
STONEY CREEK							
238 + 240	32516	10800	1604	543	20.27	19.89	3.01
239 + 241	11038	3207	516	151	21.39	21.24	3.44
HAMILTON							
242 + 243	34954	12726	1426	524	24.51	24.29	2.75
244 TO 246	14059	4666	306	98	45.94	47.61	3.01
247	16597	7441	740	306	22.43	24.32	2.23
248	13957	5831	738	301	18.91	19.37	2.39
249	25768	14085	864	501	29.82	28.11	1.83
250	55179	21758	2050	785	26.92	27.72	2.54
251	29506	11469	1356	508	21.76	22.58	2.57
252	21845	7905	1087	371	20.10	21.31	2.76
253	42254	16165	1758	690	24.04	23.43	2.61
254	27945	9271	1204	413	23.21	22.45	3.01
255 TO 257	24786	7228	1181	339	20.99	21.32	3.43
GLANBROOK							
258 + 259	9592	2976	369	120	25.99	24.80	3.22
ANCASTER							
260 + 261	17167	5442	836	265	20.53	20.54	3.15
DUNDAS							
262 + 263	20191	7060	949	348	21.28	20.29	2.86
FLAMBOROUGH							
264 + 265	11159	3677	402	132	27.76	27.86	3.03
266 + 267	15007	4562	473	151	31.73	30.21	3.29
TOTAL	423520	156269	17859	6546	23.71	23.87	2.71

SUMMARY

	CENSUS POPULT	**CENSUS DWELLU**	**TTS POPULT**	**TTS DWELLU**	**POP FACTOR**	**DWELLU FACTOR**	**CENSUS POP/DU**
METRO	2189758	820776	89949	34395	24.34	23.86	2.67
DURHAM	323280	106040	13173	4386	24.54	24.18	3.05
YORK	352356	106014	15049	4627	23.41	22.91	3.32
PEEL	592834	186804	23763	7661	24.95	24.38	3.17
HALTON	271412	90170	11988	4050	22.64	22.26	3.01
H-W	423520	156269	17859	6546	23.71	23.87	2.71
GTA	4153160	1466073	171781	61665	24.18	23.77	2.83

APPENDIX 3

SUMMARY OF VALIDATION EXERCISE RELATED TO DEMOGRAPHICS

FROM : Pentti Suokas

DATE : January 19, 1988

APPENDIX 3

SUMMARY OF VALIDATION EXERCISE RELATED TO DEMOGRAPHICS.

Analysis of data from various independent sources has been carried out to check the validity of the information collected in the Transportation Tomorrow Survey. A number of different aspects of TTS data have been addressed.

One of the foci of this analysis has been the basic demographic component of the TTS data. The main activity has been the comparison of TTS data with data from the census and other Statistics Canada surveys.

A. Number of Households:

The expansion of the survey sample to the universe was based on the number of TTS household records and the number of households as indicated by the Census. Any difference between the expanded TTS and Census figures are the results of rounding-off of numbers.

1986 HOUSEHOLDS BY REGIONS, TTS & CENSUS

	TTS	Census	Difference	% Diff.
Metro	820866	820776	90	0.01
Durham	106161	106040	121	0.11
York	106048	106014	34	0.03
Peel	186802	186804	-2	0.00
Halton	90175	90170	5	0.01
Hamilton	156319	156269	50	0.03
GTA Total	1466371	1466073	298	0.02

B. Household Size:

A comparison of household size has been carried out in terms of both average household size and % distribution of households by size. Census data on persons per household are only available at the Census Metropolitan Area level at this time.

There are only small differences in the size distribution of households between the TTS results and Census data. One general observation is that a small under-count of both single person households and the larger sized (5+) households occurred in all parts of the study area. Possible reason for the low single person households relates to the greater level of activity participation by single people, thus, making it more difficult to contact these persons.

PERCENTAGE DISTRIBUTION OF
1986 HOUSEHOLDS BY NUMBER OF PERSONS PER HOUSEHOLD (PPH)
3 CMA'S, TTS & CENSUS

CMA/PPH	1	2	3	4	5	6	7	8	9	10+
Toronto										
TTS	19.5	30.9	18.9	19.6	8.1	2.2	0.7	0.2	0.1	0.0
Census	21.5	28.4	17.1	19.0	8.7	3.2	0.9	0.2	0.1	0.1
Oshawa										
TTS	14.2	29.0	20.1	25.5	9.2	1.6	0.2	0.2	0.0	0.0
Census	15.9	28.1	19.6	23.6	9.3	2.6	0.5	0.2	0.1	0.0
Hamilton										
TTS	18.9	31.9	18.5	20.4	7.6	2.0	0.5	0.2	0.0	0.0
Census	21.6	30.3	17.9	19.1	7.8	2.4	0.6	0.2	0.1	0.0

We believe that the scale of difference observed does not represent a significant departure from actual populations.

C. Population Base:

The expansion of the survey data results in an under-estimation of population compared to census data. For the GTA as whole there is an under count of about 92,000 or 2.2%. This difference in the population base is spread across all of the study area except for the Region of Hamilton-Wentworth.

1986 POPULATION BY REGIONS TTS & CENSUS

	TTS	Census	Difference	%
Metro	2135450	2189758	-54308	-2.5
Durham	318157	323280	- 5123	-1.6
York	344491	352356	- 7865	-2.3
Peel	577508	592834	-15326	-2.7
Halton	265344	271412	- 6068	-2.3
Hamilton	423781	423520	- 261	-0.1
GTA Total	4064731	4153160	-88429	-2.2

At least part of this difference can be accounted for by persons in institutions (i.e. retirement homes, chronic care centres, orphanages, etc.) as they were not included in the TTS household survey.

D. Population by Age Group:

The population distribution by age group from the survey matches very closely to the census data for the 3 Census Metropolitan Areas in the GTA. The data have been grouped to correspond to age groups that are of particular interest to transportation planners.

1986 POPULATION AGE GROUP DISTRIBUTION
BY 3 CMA'S, TTS & CENSUS

CMA/AGE GROUP	0 to 14	15 to 19	20 to 29	30 to 49	50 to 69	70+
Toronto						
TTS	18.0	7.4	19.7	31.8	18.5	5.0
Census	19.5	7.3	19.2	29.6	18.0	6.4
Oshawa						
TTS	22.8	7.7	17.0	32.4	16.0	4.1
Census	22.8	7.8	18.1	29.6	16.2	5.5
Hamilton						
TTS	19.4	7.6	16.9	29.2	20.7	6.3
Census	19.8	7.6	17.4	27.6	20.0	7.6

In most cases there is very little variation between the census data and the results of the TTS. In general there seems to be an overstatement of the 30 to 49 age group for all 3 CMA's. As well, there is an understatement of the 70 years and over population in the TTS and of the 0 to 14 age group (Metro and Hamilton).

E. Participation in the Labour Force:

Labour force participation rates at the 46 zone level vary from about 0.65 (Planning District 1) to 0.48 (Hamilton) with an average of 0.547 for the whole of the GTA. Since no data regarding the labour force are available from the 1986 Census at this time comparisons must be made with the 1981 data. The analysis of parti- cipation rates includes a judgement as to a reasonable growth between 1981 and 1986. A 6 region summary of labour force participation based on the TTS data is provided below. We also provide a similar participation table based on the more detailed 46 zone system. The increase in the proportion of the total population that is working reflects our understanding of labour force trends.

1981 LABOUR FORCE PARTICIPATION RATES
BY 6 REGIONS. (CENSUS)

	Population (Pop)	Labour Force (L.F.)	L.F./Pop
Metro	2137395	1137561	53.2
Durham	283639	132654	46.8
York	252063	125698	49.9
Peel	490731	255965	52.2
Halton	253883	125618	49.5
Hamilton	411445	188174	45.8
GTA Total	3829156	1965670	51.3

1986 LABOUR FORCE PARTICIPATION RATES
BY 6 REGIONS. (TTS)

	Population (Pop)	Labour Force (L.F.)	L.F./Pop
Metro	2135450	1207410	56.5
Durham	318157	164857	51.8
York	344491	183719	53.3
Peel	577508	324212	56.1
Halton	265344	139985	52.8
Hamilton	423781	203710	48.1
GTA Total	4064731	2223893	54.7

The increase from 51.3 to 54.7 percent in the proportion of the population that is working may be somewhat high especially in view of the economic recession that occurred in the early 1980's.

The consistency in participation rate growth across all 6 regions suggests that any problem is the result of a universal factor rather than any geographic bias in the sample. If the population under-count is largely among persons who are not in the work force this would tend to ameliorate the problem of a high participation rate increase. As the survey did not include persons in institutions (e.g. retirement homes) it may be inferred that this is the case.

F. Part Time vs. Full Time Employment:

The TTS definition of full and part time work is not consistent with definitions used in the census or for the Statistics Canada labour force survey. TTS used less than 25 hours per week as the definition of part time while the other sources use less than 30 hours a week. This difference in definition accounts for about 17,500 workers to be coded as full time by TTS while other sources would had coded them as part time workers.

In spite of difference in definitions, TTS reported a total of 1,179,600 workers in Metro Toronto while the Labour Force Survey reported 1,174,300. There is only a minor difference of 5,300 workers.

PART AND FULL TIME WORKERS IN METRO TORONTO/GTA
MALE AND FEMALE, 1986

		TTS	L.F. SURVEY
Males	Full Time	1122000	589400
	Part Time	85800	44200
Females	Full Time	750300	453500
	Part Time	211400	87200
Total	Full Time	1872300	1042900
	Part Time	297200	131400

PERCENTAGE OF PART AND FULL TIME WORKERS IN
METRO TORONTO/GTA
MALE AND FEMALE, 1986

		TTS	L.F. SURVEY
Males	Full Time	93.0	93.0
	Part Time	7.0	7.0
Females	Full Time	78.0	83.8
	Part Time	22.0	16.2
Total	Full Time	86.4	88.8
	Part Time	13.6	11.2

CONCLUSIONS:

While there are small discrepancies between the data collected in the Transportation Tomorrow Survey and other sources of demographic data, there is no obvious deficiency or bias in the data that have been collected. This portion of the TTS data can be used as it is and does not require further refinement at this time.

LABOUR FORCE PARTICIPATION RATES BY 46 ZONES

Zone	Work At Home (1)	Full Time (2)	Part Time (3)	Labour Force (4 = 1+2+3)	Do not Work (5)	Total Pop. (6 = 4+5)	Part. Rate % (4/6)	% Part Time	% Work At Home
1	2966	67879	8897	79742	42668	122410	65.1	11.2	3.7
2	1782	93525	12493	107800	80263	188063	57.3	11.6	1.7
3	2661	103113	13975	119749	97653	217402	55.1	11.7	2.2
4	3579	90448	12233	106260	77179	183439	57.9	11.5	3.4
5	1433	49949	7238	58620	46502	105122	55.8	12.3	2.4
6	2892	97588	13132	113612	86134	199746	56.9	11.6	2.5
7	752	25806	2956	29514	22057	51571	57.2	10.0	2.5
8	2212	83660	13407	99279	79100	178379	55.7	13.5	2.2
9	924	35561	5386	41871	32719	74590	56.1	12.9	2.2
10	1060	68016	9818	78894	63461	142355	55.4	12.4	1.3
11	1976	54271	9422	65669	57427	123096	53.3	14.3	3.0
12	846	36873	6268	43987	33055	77042	57.1	14.2	1.9
13	1874	85542	12836	100252	75571	175823	57.0	12.8	1.9
14	456	25364	3829	29649	26506	56155	52.8	12.9	1.5
15	955	31685	5344	37984	32328	70312	54.0	14.1	2.5
16	1472	81493	11563	94528	75417	169945	55.6	12.2	1.6
17	345	3368	822	4535	5436	9971	45.5	18.1	7.6
18	368	4610	763	5741	5543	11284	50.9	13.3	6.4
19	523	5969	1451	7943	7729	15672	50.7	18.3	6.6
20	576	22085	3118	25779	21309	47088	54.7	12.1	2.2
21	613	15982	3049	19644	16266	35910	54.7	15.5	3.1
22	631	18746	3336	22713	22163	44876	50.6	14.7	2.8
23	1470	51415	9259	62144	57889	120033	51.8	14.9	2.4
24	536	13117	2705	16358	16965	33323	49.1	16.5	3.3
25	733	10200	1471	12404	12868	25272	49.1	11.9	5.9
26	204	6362	951	7517	6407	13924	54.0	12.7	2.7
27	554	14870	2728	18152	15793	33945	53.5	15.0	3.1
28	176	9295	1572	11043	8768	19811	55.7	14.2	1.6
29	631	20633	3607	24871	20277	45148	55.1	14.5	2.5
30	377	6309	873	7559	7143	14702	51.4	11.5	5.0
31	1812	48452	8731	58995	52792	111787	52.8	14.8	3.1
32	473	7177	1236	8886	7072	15958	55.7	13.9	5.3
33	796	29023	4473	34292	29652	63944	53.6	13.0	2.3
34	753	12736	2843	16332	12798	29130	56.1	17.4	4.6
35	1801	87404	12550	101755	78713	180468	56.4	12.3	1.8
36	4385	177252	24488	206125	161785	367910	56.0	11.9	2.1
37	549	15481	2329	18359	16434	34793	52.8	12.7	3.0
38	523	13209	2706	16438	14794	31232	52.6	16.5	3.2
39	764	36310	7503	44577	39474	84051	53.0	16.8	1.7
40	1480	48703	10428	60611	54657	115268	52.6	17.2	2.4
41	904	9494	2000	12398	13092	25490	48.6	16.1	7.3
42	345	7568	1583	9496	9759	19255	49.3	16.7	3.6
43	349	6902	1150	8401	8771	17172	48.9	13.7	4.2
44	446	3497	793	4736	4415	9151	51.8	16.7	9.4
45	346	17306	2868	20520	22344	42864	47.9	14.0	1.7
46	1950	118918	27299	148167	161682	309849	47.8	18.4	1.3
GTA	53253	1873166	297482	2223901	1840830	4064731	54.7	13.4	2.4

APPENDIX 4

TRIP PRODUCTIONS

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APPENDIX 4

TRIP PRODUCTIONS

This appendix is divided into three sections. Section 4.1 summarizes the comparison between TTS work trip estimates and labour force surveys. The comparisons between TTS total trip estimates with Metro cordon counts and TTC ridership surveys are discussed in Sections 4.2 and 4.3 respectively. The following is a brief summary for the three sections.

A. Work Travel:

As documented in Section 4.1, work trip rates, as reported in the TTS, appear to be logical and consistent with 1981 place of work data and our understanding of changes in labour force participation and the growth of part-time employment. Section 4.1 also looks briefly at work travel patterns by comparing reported TTS trips between regional municipalities with 1981 census figures and also 1983 Regional York Travel Survey results. The TTS results are logical for the most part in comparison to 1981 Census Place of Work data and expected trends in residential location and work travel patterns.

B. TTS Results Versus Observed Travel:

Sections 4.2 and 4.3 summarize preliminary analyses of the expanded TTS trip files. Section 4.2 compares daily and AM peak period TTS trip estimates with cordon count data at the Metro boundary cordon. This comparison suggests that where TTS-based figures for the AM peak period appear to be reasonable, total daily travel at all three sections of the Metro boundary cordon is underestimated by approximately 36%. Further investigation is required at other cordons and at the Metro boundary cordon during other time periods. It is essential that we establish the reasons for this under-reporting.

Section 4.3 compares selected TTS-based trip making estimates with independent estimates of travel by purpose and mode. When looking at total trips by mode and transit trips by purpose, the TTS results appear to be consistent with the results of other surveys. For example, the shares of reported trips by transit, auto driver and auto passenger modes reported in 1986 are very similar to the shares reported in 1979 for the Metro Toronto Travel Survey. However, the total amount of vehicular trips reported in the TTS appear to be low in comparison to the expanded 1979 Metro Toronto Travel Survey results. Looking only at transit travel for Metro trip origins, preliminary estimates

of transit trip purposes derived from the 1986 survey are very similar to both 1979 Metro Toronto Travel Survey and 1986 TTC Attitude Survey results when trip purpose definitions in the three surveys are taken into consideration.

Section 4.3 also presents a comparison of TTS daily transit trip estimates with reported daily ridership. This comparison suggests that the TTS is under-reporting transit trips by approximately 20% with greater under- reporting for TTC streetcar routes, GO Bus services and Vaughan transit services. In contrast, TTS estimates for GO Rail and Markham transit services are close to the reported figures.

A cursory review of the spatial distribution of accurately reported TTC routes shows that routes north and east of Bloor and Yonge Streets tend to be quite accurately reported. In contrast, inner city routes and those in North York, Etobicoke and Vaughan tend to be substantially underestimated.

Summary

There is no evidence, for transit at least, of substantial under-reporting of travel for particular trip purposes. However, there appears to be some spatial bias in reporting which suggests that there may be some systematic explanation for the general under-reporting of transit trips and possibly total travel.

The fact that peak period travel and transit travel within Scarborough appears to be accurately reported suggests that the TTS survey method was sound. Basic methodological errors would be expected to result in generalized under-reporting because the assignment of sample households to interviewers was completely random. If the survey method resulted in under-reported trips, one would expect that the TTS would have a much higher proportion of work and school trips by transit than the 1979 M.T.T. survey (which successfully estimated total TTC trip making). As this is not the case, and given the spatial biases which are evident in the estimation of transit travel by route, systematic errors at the coding and data reduction stages may account for errors in both auto and transit travel estimates.

The results of planned analyses of travel by period for various cordons across the region and transit routes, particularly within Metropolitan Toronto, should provide further clues as to the origins of the under-reporting problems identified above.

SECTION 4.1

SUMMARY OF VALIDATION EXERCISE REGARDING TRIP PATTERNS AND TRIP RATES

Data on both travel patterns and trip rates are limited. As a result the TTS data have been compared to data for a number of different years. These time differences must be considered in the analysis of this data. The professional expertise of members of the data validation team has been relied on to determine the validity of the TTS results.

As with other parts of the data validation exercise it has been assumed that the results of the error correction process will not result in major changes at a global scale of analysis.

A. Trip Rates:

The number of persons who reported having either a full time or part time job in the TTS was 2,224,000 compared to 1,965,000 from the 1981 census. The number of home to work trips from the TTS was 1,607,000 resulting in an average trip rate of .74 trips per employed person. (Excluding those who work at home).

TRIP RATES FOR WORK TRIPS BY REGION

	Home to Work	Home + Other to Work	Total to Work
Metro	0.74	0.81	0.90
Durham	0.73	0.81	0.86
York	0.74	0.82	0.88
Peel	0.75	0.83	0.88
Halton	0.75	0.85	0.91
Hamilton	0.72	0.81	0.87
GTA	0.74	0.83	0.89

A trip rate of 0.74 is considerably lower than rates used for transportation planning in the past in the GTA. The Ministry of Transportation has been using a trip rate of about 0.82 trips for each job.

Part of the explanation for this lower trip rate is the definition of home to work trips in the TTS. A number of trips

are missed because the person makes a trip prior to going to work. (e.g. Facilitating trips where the respondent goes out of his/her way to drop a respondent at a GO Station will not be counted as a home to work trip).

To deal with this problem, trips to work from locations other than home were also examined. Trips to work were broken up into 3 categories; 1. Home to work (already discussed), 2. Work to work (assumed to be business trips) and 3. Other to work.

We can assume that the actual trip generation rate per member of the work force will consist of category 1 and part of category 3. The actual proportion cannot be determined without detailed analysis.

Another component of the analysis was the variation of travel by employment status (i.e. Full time versus part time) of the workers. Full time worker trip rate is approximately 2 times that of part time workers.

VARIATION IN HOME TO WORK TRIPS BY LABOUR FORCE STATUS
BY REGION OF RESIDENCE

	Full Time	Part Time	Average
Metro	0.79	0.42	0.74
Durham	0.78	0.46	0.73
York	0.80	0.41	0.74
Peel	0.79	0.42	0.75
Halton	0.81	0.46	0.75
Hamilton	0.78	0.44	0.72
GTA	0.79	0.43	0.74

B. Travel Patterns:

Most of the work in this area addresses the comparison between the 1981 Census Place of Work - Place of Residence (POW-POR) data and the TTS 24 hour work trips.

The total number of POW-POR linkages from the 1981 census internal to the GTA is about 1,965,000. There are 1,607,000 home to work trips in the TTS data.

There appears to have been a general decrease in the level of self containment at the regional municipality level in the GTA. This decrease is both the proportion of local jobs filled by local residents and the proportion of resident labour force working locally.

REGIONAL DISTRIBUTION OF HOME TO WORK TRIPS

From/To	Metro	Durham	York	Peel	Halton	Hamilton	Total
Metro	764340	9020	53060	50480	3940	1380	882220
Durham	31130	77790	4720	1500	160	90	115380
York	65820	2250	57180	6280	390	100	132010
Peel	90740	650	7100	130430	6150	1400	236470
Halton	18670	190	870	17750	53790	10100	101370
Hamilton	4000	130	260	2210	15050	118070	139720
Total	974700	90030	123190	208650	79480	131140	

(See Table 4.1A for 46 X 46 zone data).

Potentially this may relate the incidence of part time work being in close proximity of the home. This would mean that part of the decrease in self-containment is the result of a lower work trip generation rate for local part time jobs.

A second source of data used was the 1983 Region of York employee travel survey. The comparison here was the origins of work trips for people working in the Region of York at the municipal level. (See Tables 4.1B to 4.1J).

TABLE 4.1A

TTS Home-To-Work Trip Matrix

ORIGIN ZONE

DESTINATION ZONE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	36353	1581	1426	3843	1071	1695	749	1376	778	1274	1132	561	1521	91	139	642
2	32904	10250	4864	4340	1347	1544	1319	4223	2068	2407	1336	588	1724	295	213	757
3	22273	5909	17746	5080	1414	1190	1069	2498	3111	8518	1878	586	1759	126	157	881
4	33882	1716	3243	14973	3900	1745	375	1180	821	2405	2996	1410	2191	120	165	1089
5	10495	680	1509	3965	6594	1701	193	481	414	1629	1838	2076	3744	72	144	1842
6	34824	2080	2212	6228	3520	11982	713	1367	871	994	1836	1476	6542	731	356	2282
7	3901	1034	873	351	188	134	4099	4115	1175	637	358	79	206	59	53	129
8	16667	3364	4654	2455	938	621	2882	13006	6816	3145	1048	399	829	23	67	265
9	3241	748	1894	773	423	250	524	2268	7976	4391	474	125	398	50	0	324
10	6620	1194	5861	2095	925	249	442	1435	3525	16956	2675	471	1149	122	96	844
11	11961	899	2374	3976	1865	986	243	602	1057	4899	7034	1315	1249	149	84	1159
12	7938	456	846	2536	3145	543	65	520	481	1649	2624	2907	2060	152	87	2082
13	14836	869	1356	3748	5536	3642	387	726	793	1502	1496	1728	20645	1268	1134	6190
14	5856	258	375	1171	1176	1455	25	346	263	258	272	420	4237	1520	526	1511
15	5734	195	427	896	1560	1042	130	250	397	493	480	694	5563	628	2370	2906
16	13502	466	1310	3883	4967	2015	319	699	867	2232	2447	3530	11622	569	848	9691
17	53	0	0	0	53	0	0	26	0	27	0	26	53	0	27	27
18	283	0	0	85	169	0	0	0	0	113	0	142	141	29	56	85
19	190	72	0	23	48	0	0	0	0	0	47	0	72	24	0	71
20	3320	45	332	444	821	243	45	66	200	309	398	574	2505	156	420	1352
21	2038	121	198	401	632	200	36	15	37	135	152	278	1242	147	316	805
22	1345	24	89	396	338	165	45	21	63	232	115	232	1043	46	253	373
23	1348	29	171	300	673	195	127	73	29	108	276	192	945	20	171	772
24	429	0	70	102	35	27	0	20	0	0	21	0	82	0	48	90
25	413	27	26	167	107	79	0	0	53	186	55	107	409	0	81	137
26	317	68	158	159	68	22	23	23	68	271	204	91	113	0	0	136
27	861	82	103	348	185	82	41	164	185	513	451	287	246	0	0	144
28	885	21	73	344	188	73	0	47	162	410	329	141	311	0	20	123
29	1963	149	442	810	561	179	21	127	273	1189	1246	243	355	0	0	577
30	377	0	40	99	199	59	20	40	39	199	119	178	318	20	19	278
31	6750	420	885	2098	2254	655	233	502	546	1479	2414	2006	3605	108	285	2765
32	420	53	263	26	26	0	105	263	552	474	131	26	158	0	0	79
33	3187	365	1945	1264	446	162	110	545	1585	3600	1302	375	647	21	21	158
34	473	23	227	86	91	0	133	307	759	592	99	23	34	0	0	22
35	4588	442	1744	1032	502	145	695	2534	4139	3301	491	221	358	20	24	465
36	22037	3224	3813	2872	1795	758	5091	12143	8201	3613	1315	399	1143	117	206	549
37	572	57	126	145	39	19	108	197	306	237	20	0	58	0	0	37
38	712	0	154	136	47	0	196	287	286	290	71	0	22	0	21	0
39	5170	131	219	630	263	89	332	1212	543	215	163	22	73	0	0	140
40	2787	65	201	334	86	40	269	703	438	222	43	0	66	0	0	68
41	116	0	0	28	0	0	0	88	58	0	0	30	0	0	61	0
42	183	0	0	20	0	0	0	0	0	0	21	0	0	0	0	0
43	62	0	0	41	0	0	0	0	0	21	0	0	0	0	0	0
44	25	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0
45	142	0	61	0	0	0	43	21	0	20	40	0	0	0	0	0
46	1527	71	126	94	149	80	95	272	67	148	98	56	122	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	323560	37188	62436	72797	48344	34066	21302	54788	50027	71293	39545	24082	79560	6683	8468	41847

TABLE 4.1A (con't)

TTS Home-To-Work Trip Matrix

DESTINATION ZONE

ORIGIN ZONE	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	TOTAL
1	0	0	0	106	0	24	100	0	31	0	95	0	194	26	727	0	1682
2	0	0	0	226	73	31	33	57	0	0	222	164	78	33	1028	0	2000
3	0	0	0	199	217	27	222	19	0	0	206	25	310	49	1373	50	2375
4	0	28	0	214	41	46	219	0	0	0	43	112	257	0	1244	72	12127
5	0	0	0	218	98	49	98	121	49	0	0	98	122	48	2097	0	10101
6	0	0	24	351	24	69	115	70	21	0	51	46	116	54	1615	0	12060
7	0	0	0	54	27	0	27	0	0	0	0	0	46	27	104	0	41889
8	0	0	21	69	0	43	132	43	0	0	22	45	90	0	666	44	7852
9	0	0	0	124	0	0	50	25	0	0	74	25	126	0	424	50	3191
10	0	26	0	173	49	23	76	0	0	25	225	125	326	25	1162	74	1215
11	0	23	0	123	64	0	105	62	0	0	40	64	703	127	2169	0	9804
12	0	0	0	65	0	0	109	0	0	0	43	65	260	44	2042	0	5782
13	0	17	0	725	275	84	440	70	25	22	64	72	221	49	2630	22	12104
14	0	0	0	213	99	100	142	0	0	0	24	23	108	0	503	0	3813
15	0	48	0	398	202	136	183	24	0	24	47	0	119	24	1133	0	47052
16	0	83	0	295	194	146	454	88	0	44	85	44	443	0	5912	22	2778
17	1352	106	27	0	106	106	238	0	239	27	0	53	26	133	53	0	
18	85	1018	85	56	29	84	142	0	0	0	141	0	0	255	565	0	
19	48	214	1688	119	238	261	1546	190	0	0	24	0	47	24	72	0	
20	0	22	0	3069	795	243	730	89	0	0	24	0	47	24	863	0	
21	0	15	0	1294	3477	447	1043	168	0	0	132	23	88	89	408	0	
22	0	0	64	1048	1152	4110	3705	503	0	0	35	20	0	0	311	0	
23	44	0	234	1945	2526	5007	26656	1803	0	0	0	0	72	23	359	0	
24	20	42	26	296	235	722	4395	4151	0	35	28	37	65	62	55	0	
25	113	56	29	112	55	26	0	28	2595	346	26	0	0	0	0	0	
26	0	67	114	0	22	0	23	0	23	384	1019	378	429	137	934	158	
27	20	62	0	41	0	20	62	0	102	287	1200	385	181	227	362	181	
28	0	26	0	0	20	0	27	0	20	0	4349	902	841	164	779	370	
29	0	0	0	0	0	21	73	0	0	21	734	2124	601	155	611	319	
30	0	99	0	60	20	59	20	20	59	0	242	271	3876	237	2157	201	
31	0	24	29	315	0	103	138	98	0	0	139	100	198	1250	1190	40	
32	0	0	0	0	0	0	26	0	27	0	88	184	1049	431	9968	19	
33	0	0	0	47	47	0	49	75	0	0	184	262	79	0	342	763	
34	0	0	34	0	0	0	79	22	0	0	135	70	428	21	1291	146	
35	0	0	0	45	0	24	54	0	0	0	0	22	98	34	285	44	
36	24	0	0	77	16	0	260	19	0	0	50	26	160	25	570	26	
37	0	0	0	0	0	0	0	60	0	0	0	17	292	17	626	83	
38	0	0	0	0	0	0	0	25	0	0	0	17	55	0	39	0	
39	0	0	0	0	0	0	0	22	0	0	0	0	0	0	25	0	
40	0	0	0	22	0	0	65	0	0	0	0	0	0	0	87	53	
41	0	0	0	0	0	0	0	22	0	0	0	0	0	0	189	41	
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
46	0	0	0	28	0	21	0	0	0	0	0	0	0	23	52	0	
47	0	0	0	0	0	28	53	0	0	0	0	0	0	0	0	0	
TOTAL	1682	2000	2375	12127	10101	12060	41889	7852	3191	1215	9804	5782	12104	3813	47052	2778	

TABLE 4.1A (con't)

TTS Home-To-Work Trip Matrix

DESTINATION ZONE

ORIGIN ZONE	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	TOTAL
1	586	25	352	1523	52	101	182	51	0	0	0	0	0	248	212	58867
2	1742	85	1175	4937	0	58	402	153	0	0	0	0	0	146	223	81045
3	4631	26	947	4848	76	0	323	77	0	0	0	0	29	162	43	87054
4	642	71	430	1555	0	28	187	82	0	0	0	18	0	124	249	77873
5	607	0	339	823	0	0	0	73	0	0	0	0	0	48	73	42338
6	376	49	130	2147	24	48	107	0	25	0	0	0	0	92	143	83711
7	241	77	305	2875	0	0	164	79	0	24	0	0	0	57	52	21550
8	1128	200	1943	8891	46	68	562	200	0	0	23	0	22	200	155	71792
9	1522	50	948	3267	25	25	75	25	0	0	0	0	0	75	100	30869
10	5965	49	1292	3366	0	26	171	0	0	0	0	0	0	0	125	57962
11	2185	23	302	1746	41	0	20	0	0	0	0	0	0	44	20	47713
12	846	0	130	911	21	0	22	0	0	0	0	0	0	22	65	32736
13	667	46	341	1257	17	0	71	49	0	0	0	0	17	0	120	73157
14	193	20	90	344	0	24	25	0	0	0	0	0	0	0	20	21597
15	279	0	302	285	0	0	29	24	0	0	0	0	0	0	0	27022
16	896	0	298	1704	0	22	22	63	0	0	0	0	0	0	86	69868
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212	2970
18	85	0	28	29	0	0	0	0	0	0	0	0	0	0	28	3733
19	0	23	24	24	0	0	24	0	0	0	0	0	0	0	24	5137
20	111	0	88	310	0	0	0	22	0	0	0	0	0	44	44	17992
21	15	0	0	285	0	0	36	0	0	0	0	0	0	0	42	14038
22	69	24	49	254	0	23	23	0	0	0	0	0	0	0	114	16324
23	47	0	122	220	29	0	0	0	0	0	0	0	0	47	89	44749
24	0	0	0	21	0	0	0	0	0	0	0	0	0	0	35	11051
25	323	0	138	52	27	0	0	0	0	0	0	0	0	28	107	8937
26	385	23	45	91	22	0	0	23	0	0	0	0	0	0	0	5479
27	615	61	62	369	0	0	62	0	0	0	0	0	0	0	164	13024
28	659	0	68	161	0	0	0	0	0	0	0	0	0	0	0	8652
29	1753	64	209	495	0	0	63	21	0	0	0	0	0	0	85	17924
30	79	0	20	139	0	0	0	0	0	0	0	0	0	0	60	5556
31	1210	48	271	1039	0	19	71	0	0	0	0	0	0	46	115	42270
32	1183	157	105	184	0	0	0	0	0	0	0	0	0	27	26	5941
33	4207	208	786	1481	0	0	45	41	0	0	0	0	0	0	42	24852
34	302	2442	2245	1962	159	69	145	35	0	0	34	0	0	66	160	11106
35	2090	542	32958	15711	329	131	408	182	0	0	0	19	0	91	210	74352
36	2310	265	6680	67722	177	312	3521	683	0	0	16	27	71	1077	352	151940
37	92	285	2169	2167	5356	635	362	96	17	0	0	0	0	58	178	13507
38	65	43	426	1946	487	4820	802	423	43	0	0	0	0	165	139	11631
39	91	64	512	6467	115	263	14188	1024	22	0	0	0	49	839	219	33260
40	115	19	454	3217	208	588	5620	18855	533	110	133	0	306	7830	593	44177
41	0	28	30	379	0	209	290	1559	1879	376	146	0	172	1896	408	7783
42	0	0	0	20	0	20	122	467	345	1481	162	41	81	3875	162	7000
43	20	0	0	21	0	20	144	616	103	62	1088	41	185	2814	226	5464
44	0	0	0	0	24	25	75	223	25	49	124	223	149	1811	49	2827
45	40	0	0	122	0	39	280	828	105	61	62	84	3104	9100	163	14336
46	90	0	320	1288	21	201	2222	7668	1030	1127	1178	390	4940	79873	971	104408
47	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	21
TOTAL	37462	5017	57133	146655	7256	7774	30865	33642	4127	3290	2966	843	9125	110926	6703	

GRAND TOTAL OF MATRIX = 1615595

TOTAL OF INTRAZONALS OF MATRIX = 493128 (31%)

TABLE 4.1B

Place of Employment: GEORGINA

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	3155	2710	2595
East Gwillimbury	125	230	25
Newmarket	95	190	100
Aurora	15	90	20
Richmond Hill	5	115	0
Whitchurch-Stouffville	20	10	60
Markham	5	15	0
King	5	15	25
Vaughan	10	10	0
Metro	60	75	115
Durham	240	250	240
Peel, Halton, Hamilton	0	25	0
Total	3735	3735	3180

TABLE 4.1C

Place of Employment: EAST GWILLIMBURY

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	95	115	345
East Gwillimbury	550	480	385
Newmarket	125	400	285
Aurora	75	105	0
Richmond Hill	40	5	20
Whitchurch-Stouffville	10	25	0
Markham	10	10	0
King	620	65	0
Vaughan	25	10	0
Metro	85	80	115
Durham	25	80	25
Peel, Halton, Hamilton	30	15	0
Total	1690	1390	1175

TABLE 4.1D

Place of Employment: NEWMARKET

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	770	970	1020
East Gwillimbury	1285	1340	1200
Newmarket	6115	5310	4345
Aurora	595	750	735
Richmond Hill	230	255	240
Whitchurch-Stouffville	250	250	140
Markham	100	115	90
King	310	380	180
Vaughan	40	30	135
Metro	560	305	1245
Durham	175	200	385
Peel, Halton, Hamilton	50	385	90
Total	10480	10290	9805

TABLE 4.1E

Place of Employment: AURORA

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	345	400	380
East Gwillimbury	355	475	385
Newmarket	935	1235	905
Aurora	2735	1995	2125
Richmond Hill	370	310	270
Whitchurch-Stouffville	90	170	100
Markham	105	140	185
King	275	230	265
Vaughan	15	30	70
Metro	505	795	905
Durham	30	55	135
Peel, Halton, Hamilton	50	85	65
Total	9190	8700	8140

TABEL 4.1F

Place of Employment: RICHMOND HILL

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	220	370	430
East Gwillimbury	260	440	280
Newmarket	625	1405	840
Aurora	765	1105	600
Richmond Hill	6425	6030	3875
Whitchurch-Stouffville	260	295	200
Markham	1095	1350	1075
King	250	365	80
Vaughan	290	405	430
Metro	2730	2685	3520
Durham	225	360	300
Peel, Halton, Hamilton	305	260	605
Total	13450	15070	12235

TABLE 4.1G

Place of Employment: WHITCHURCH-STOUFFVILLE

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	95	270	135
East Gwillimbury	50	185	225
Newmarket	85	400	165
Aurora	55	120	155
Richmond Hill	50	85	240
Whitchurch-Stouffville	2220	1385	1250
Markham	235	330	430
King	0	50	0
Vaughan	0	40	20
Metro	290	635	505
Durham	540	685	585
Peel, Halton, Hamilton	45	0	100
Total	3665	4185	3810

TABLE 4.1H

Place of Employment: MARKHAM

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	410	615	935
East Gwillimbury	225	365	360
Newmarket	585	910	780
Aurora	410	470	610
Richmond Hill	1805	1320	2155
Whitchurch-Stouffville	985	1345	1190
Markham	10205	8180	9965
King	210	160	345
Vaughan	660	380	1290
Metro	18045	23850	24835
Durham	2075	3145	2685
Peel, Halton, Hamilton	1085	1175	1900
Total	36700	41915	47050

TABLE 4.1I

Place of Employment: KING

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	140	10	160
East Gwillimbury	665	100	180
Newmarket	215	255	370
Aurora	175	395	320
Richmond Hill	135	245	200
Whitchurch-Stouffville	20	90	40
Markham	25	70	20
King	1565	1255	760
Vaughan	80	100	145
Metro	305	375	335
Durham	25	20	0
Peel, Halton, Hamilton	95	130	245
Total	3445	3045	2775

TABLE 4.1J

Place of Employment: VAUGHAN

Place of Residence:	1981 Census	1982 York Survey	1986 TTS
Georgina	160	245	325
East Gwillimbury	220	280	385
Newmarket	615	1015	615
Aurora	405	930	660
Richmond Hill	1315	2155	1755
Whitchurch-Stouffville	90	85	80
Markham	800	1270	1210
King	690	920	1185
Vaughan	3565	2385	4205
Metro	13050	14515	21780
Durham	240	360	330
Peel, Halton, Hamilton	2605	365	330
Total	23755	24525	32860

SECTION 4.2

CORDON COUNT COMPARISON

The Validation Team compared the TTS estimates of daily and peak period person travel at the Metro Toronto boundary with available 1985 and 1987 Metro Cordon Count data. The intent of this preliminary investigation was to identify the nature and extent of any apparent under-reporting of trips by mode. The results reported herein are preliminary given the inconsistencies between available cordon count data and the preliminary TTS tabulations that were available in November, 1987.

A. Daily Person Trips (Two-Way):

The preliminary expanded version of the TTS data suggests that a total of 1,126,500 person trips crossed the Metro boundary over a 24-hour period during the fall of 1986 (see Exhibit 4.2A). Approximately 156,000 of these person trips involved transit. Based on TTC data on Park-N-Ride and Kiss-N-Ride activity at terminal stations, up to 36,000 of these daily person trips actually crossed the boundary by auto. A further 15,000 daily person trips walked to and from the Metro boundary to access/egress TTC transit services. Thus, preliminary TTS results account for approximately 1,111,000 vehicular person trips at the Metro boundary cordon.

Interpolating between the spring 1985 and spring 1987 Cordon Count information and assuming that the 12-hour cordon count covers approximately 80 per cent of total 24-hour two-way travel, total person trips crossing the Metro boundary would be approximately 1,725,000. This estimate suggests that the TTS estimates under-report total daily travel at the Metro boundary by approximately 36 per cent.

The extent of this under-reporting appears to be comparable for both the auto and transit modes. Whereas expected fall 1986 transit trips would be approximately 105,000 based on the TTS results (excluding multi-modal walk trips across the boundary), the Cordon Count-based estimate is approximately 177,000. Hence, the TTS estimate of cross-boundary transit trips appears to be approximately 40 per cent low. The comparable auto person trip estimate, allowing for similar adjustments, is 36 per cent low.

B. Peak Period Travel:

The validation team also compared the TTS estimates of AM peak period travel with the 1985 and 1987 counts at the Metro boundary. As shown on Exhibit 4.2B, the preliminary TTS results, which exclude school trips, are much closer to the interpolated estimate of 1986 travel in the 7:00 to 9:00 AM period. It is expected that the inclusion of vehicular school trips will bring the TTS estimate for the AM peak period into line with the Cordon Count based estimate of total person travel inbound across the Metro boundary.

C. Summary:

The preliminary TTS estimates of travel across the Metro Toronto boundary suggest substantial under-reporting of off-peak period trips by both auto and transit.

EXHIBIT 4.2A

METRO TORONTO CORDON (PERSON TRIPS X 1000)

	CORDON COUNTS				
	SPRING 1985	SPRING 1987	Fall 1986 Estimates (1)	TTS - BASED ESTIMATES	
Total					
12 hours	1,236.5	1,432.0	1,365.5		
24 hours			1,725.0 (3)	1,126.5	
				- 15.0	walk trips to boundary (2)
				1,111.5	
Transit					
12 hours	133.8	159.6	150.8		
24 hours			177.4 (5)	156.0	
				- 36.0	part-way trips (4)
				- 15.0	walk trips to boundary (2)
				105.0	
Auto					
12 hours	1,102.8	1,272.5	1,214.8		
24 hours			1,547.6 (6)	970.5	
				+ 36.0	part-way trips (4)
				1,006.5	

Note:

(1) Fall 1986=Spring 1985 + .66 X (Spring 1987 - Spring 1985)
(2) Based on TTC counts, approximately 15,000 daily transit trips walk across the Metro boundary to/from TTC services.
(3) Assumes 7:00 AM - 7:00 PM period accounts for 80% of total 24-hour travel.
(4) Based on TTC data, up to 36,000 daily person trips originating from, or destined for the Regions, use TTC Kiss-N-Ride and Park-N-Ride facilities.
(5) Assumes 7:00 AM - 7:00 PM period accounts for 85% of transit trips.
(6) 24-hour auto travel = total - transit.

EXHIBIT 4.2B

METRO BOUNDARY PEAK PERIOD TRAVEL ESTIMATES (INBOUND)

7:00 - 9:00 AM

	CORDON COUNTS			TTS
	FALL 1985	FALL 1987	FALL 1986 Estimates	START 6:30-8:30 (excludes school trips)
TOTAL	173.4	193.1	186.6	174.9 (1)
TRANSIT	30.5	35.1	33.5	37.7 (1)
AUTO	142.8	158.1	152.9	137.2

Note:

(1) includes walk to/from TTC transit

The Regional Municipality of York

MEMORANDUM

To: Data Validation Committee

From: J. Barnes, Transportation Planner

Date: February 25, 1988

Re: **Cordon Count Data vs. TTS Calibration Exercise**

Concern has been raised in D. Crowley's memo of January 19, 1988 regarding the low volumes tabulated from the TTS data in comparison to the Cordon Count data. Some or all of the difference may be accounted for by the following:

- Travel to and from destinations in York Region via Steeles Avenue and Peel Region (ie. north and south) via 427 and Hwy. 50. These trips will be double counted in both directions instead of not being counted at all by TTS since they would not be assigned to cross any Regional boundaries.

- Travel to and from York Region and either Peel or Durham via the 400/401 combination or 404/401 combination. All these trips also are double counted in each direction. These trips have also not been assigned to cross the Metro boundary.

- True through trips via highways 400 and 401 from north, east or west of the GTA to destinations outside the study area. These trips are also double counted for each one way journey through Metro Toronto. Considerable truck traffic particularly during the midday period falls into this category.

- Midday commercial trips. Once a survey respondent had reported his/her journey to work and started business trips throughout the day for sales or delivery purposes, these trips were not counted.

  A great many of these trips would cross the north and west Metro screenlines.

- Finally, there is evidence that there is a general increase in propensity to travel during the summer (good weather) conditions as opposed to winter conditions. In so far as the Cordon counts are taken during the summer period and the TTS data was taken by and large in the late fall period, there may be some slight seasonal adjustment necessary.

Given these five factors and the compound effect that they may possibly have, particularly on the midday travel characteristics, I feel that

the TTS data as it stands should be accepted with the appropriate qualifications for any future analysis on midday travel patterns.

After all, as noted by D. Crowley,

- the TTS demographic profile vs. the 1986 Census suggests that the sample is satisfactory.
- the AM peak period travel at the Metro boundary appears reasonable
- modal split shares are consistent with the 1979 Metro Toronto Travel Survey.

This review, however, cannot necessarily explain the under reporting of transit trips by TTS expect to note specifically that much of it is on streetcar routes. I had observed during my tenure with TTC that a great deal of short distance travel occurred on such routes as Dundas, Queen and King in the vicinity of the subways which was often ignored in trip reporting since it was such a minor link and could often be omitted by walking instead (particularly during good weather). As far as GO bus and Vaughan Transit trips are concerned double counting of passengers transferring between services is a possible explanation for the apparent under utilization of these other transit systems, however, reported system ridership rates are supposed to have taken this into account.

Conclusion

The TTS data appears generally sound and should be accepted. Continued testing of the data is, however, probably still appropriate and qualifications would be appropriate when using the data for off peak analysis on a disaggregate sub area basis. Research is appropriate to determine confidence limits for such analysis.

J. Barnes
Transportation Planner

JB/kp

SECTION 4.3

TRIPS BY PURPOSE AND MODE

This section compares selected TTS based trip making estimates with comparable 1979 Metro Toronto Travel Survey data (MTTS) on travel by purpose and mode and other independent estimates of transit ridership.

A. Mode Shares:

Exhibit 4.3A compares TTS trips by mode for Metro trip origins with 1979 MTTS estimates of trip by mode for Metro residents. The mode shares are similar recognizing that the TTS includes walk trips to and from work and school whereas the 1979 MTTS includes only walk trips to and from work. However, excluding all walk trips, the TTS trip count is only slightly higher than the MTTS count, which suggests that the vehicular trip rate declined between 1979-1986, an unlikely result.

B. Transit Trips by Purpose:

Exhibit 4.3B compares TTS transit trips for Metro residents by purpose with 1979 MTTS estimates of home based trips by purpose for transit. Both surveys suggest that approximately 75% of the transit trips within Metropolitan Toronto are for work and school purposes with the remainder being for shopping, social recreation and personal business in approximately equal proportions. The 1986 TTC Attitude Survey information, which is based on a random sample of individuals 15 years and older, also suggests the same basic breakdown of trip purpose for transit trips within Metropolitan Toronto.

C. Transit Trip Making Comparisons:

Exhibit 4.3C tabulates TTS estimates of daily transit trip making (boardings) with independently derived estimates of daily transit ridership by property and in some cases by mode. The comparison suggests that TTS is under-reporting total daily transit trips by as much as 36% in the case of reported daily ridership on TTC streetcar routes. Overall, TTC daily ridership appears to be understated by approximately 23% while GO Rail ridership (for which most of the travel is in peak periods) is identical to reported ridership, and Markham transit is actually higher than the ridership observed during the fall of 1986.

Analysis of TTC ridership by route suggests that TTS estimates of daily travel are within 10% of reported ridership for 15% of routes and within 20% for 40% of routes. Also, reported cross boundary transit trips accessing TTC subway by car (drivers plus passengers) is close to an independent TTC estimate of this number. There appears to be a definite pattern to TTS trip reporting at the transit route level. Those routes within 10% of reported ridership tend to be north and east of Bloor and Yonge Streets. Scarborough routes tend to be generally well reported, whereas streetcar and trolley bus routes are consistently under-reported, except for the Mount Pleasant (74) trolley. The routes which are most likely to be under-reported tend to be short, low ridership routes such as the Junction TC, and Edwards Gardens, Rosedale and Silver Hills diesel bus routes, all of which are under-reported by 50% or more.

D. Summary and Conclusion:

TTS results with respect to mode share and purpose, for transit only, are consistent with previously collected travel behaviour information. This suggests that TTS results should not under-report travel by particular modes or trip purposes for transit. However, as shown in Exhibit 4.3C, there appears to be substantial under-reporting of transit trips for specific properties and/or modes. This under-reporting may reflect incomplete routing information, such as for those persons from the regional municipalities who used the subway but did not report an access mode; unreported trips for non-respondents; or some form of bias associated with specific sub-populations such as non-English speaking groups within parts of Metropolitan Toronto and the Town of Vaughan.

Further investigation is necessary in order to understand the source of inconsistencies in the data base. The TTC, with the assistance of the Ecole Polytechnique, is looking at TTS ridership by route and time period in order to gain further insights into trip underestimation. It would be helpful if other agencies reviewed transit and auto use data at the route and cordon level in order to provide further insights into the causes of under-reporting and other inconsistencies.

EXHIBIT 4.3A

TRIPS BY MODE

	1986 TTS (for Metro trip origins)		% Veh. trips	1979 (Metro Toronto residents only)		% Ve tri
1. Auto Driver	2,311,540	51%	56%	2,238,451	53%	55
2. Auto Passenger	610,478	14%	15%	682,680	16%	17
3. Transit	1,173,219	26%	29%	1,153,052	26%	28
4. Walk and Other	426,391**	9%		119,100*	5%	
Total	4,521,628			4,193,283		
Total Excluding 4:	4,095,237			4,074,183		
Person Per Auto :	1.26			1.30		

Metro Toronto Internal Trips:

1. Auto Driver	1,883,407	48%
2. Auto Passenger	522,167	13%
3. Transit	1,090,850	28%
4. Walk and Other	418,088	11%
Total:	3,914,512	

* includes only walk to work
** includes walk to school and work

EXHIBIT 4.3B

TRANSIT TRIPS BY PURPOSE FOR METRO TRIP ORIGINS

TRIP PURPOSE	1986 TTS TOTAL TRIPS	1986 TTS % OF TOTAL	1986 TTS % OF TOTAL (EXCLUDING HOME)	1979 MTTS (HOME-BASED TRIPS ONLY)	1986 TTC ATTITUDE SURVEY (FOR POPULATION AGED 15 AND OLDER)
Work	316,419	27.0%	51.0%	54.5%	54%
School	148,852	12.7%	24.0%	21.6%	17%
Shop	44,828	3.8%	7.1%	8.5%	
Social/Rec.	48,477	4.1%	7.7%	8.4%	29%
Personal Bus.	57,450	4.9%	9.2%	6.7%	
Home	552,044	47.1%			
Other	4,512				
TOTAL	1,172,582				

EXHIBIT 4.3C

TRANSIT TRIP COMPARISON

PROPERTY/MODE	TTS DAILY TRANSIT TRIPS	DAILY RIDERSHIP*	TTS/ REPORTED RIDERSHIP
GO Bus	27,000	36,000	0.75
GO Rail	62,000	62,000	1.00
Markham	7,900	7,500	1.05
Mississauga	49,300	54,000	0.91
TTC Subway & RT (linked)	790,000	940,900	0.84
TTC Bus	1,027,000	1,360,100	0.76
TTC Streetcar	192,000	298,300	0.64
Vaughan	1,300	1,800	0.72

* reported by transit properties

APPENDIX 5

COMPARISON OF ATTRIBUTES AND TRAVEL BEHAVIOUR CHARACTERISTICS OF RESPONDENTS AND NON-RESPONDENTS FROM TTS

FROM : Pentti Suokas

DATE : March 15, 1988

APPENDIX 5

COMPARISON OF ATTRIBUTES AND TRAVEL BEHAVIOUR CHARACTERISTICS OF RESPONDENTS AND NON-RESPONDENTS FROM TTS

There is a substantial difference in the number of trips per capita among the sample population between individuals that were reporting their own trips and those whose trips were reported by someone else in the household.

Persons who responded on behalf of the household (Respondents) made an average of 2.54 trips on the survey day themselves. The other persons in the household that they were reporting for (Non-Respondents) made an average of 1.65 trips per capita. This difference is no doubt partly due to the respondent having incomplete knowledge of trips made by other members of the household but there may also be differences in the characteristics of the two groups that explain some of the variations. Many of the factors are interrelated.

A. Comparison of Respondents and Non-Respondents:

1. Household Size:

Almost 20% of respondents were in single person households compared to zero for non-respondents (Actually 25 records were coded as non-respondents in 1 person households but this is a coding error).

- Many of these people (one person households) are in the young adult group of the population age structure and thus are more active.
- Work trips are the predominant trip purpose and most singles will be workers.
- We assume that there will be a certain number of non-discretionary trips (eg. grocery shopping) that will be made by each household. Singles will have to make all such trips themselves, whereas these could be split among household members in larger households.

Note: Due to various reasons (e.g. rounding-off of numbers, invalid responses to questions, etc.) the grand totals for the following tables cannot be taken as constants.

2. Age:

Persons under age 5 account for about 11% of non-respondents compared to 0% of respondents.

- Trips were not to be reported for persons under age 5 but this sector of the population is included in the calculation of overall trip rates. The trip rate for non-respondents over age 5 would be 1.84 trips per capita.

Persons under age 16 account for about 31% of non-respondents compared to 1% of respondents.

- The lower trip rate among non-workers, and those without a drivers licence combine to create a lower trip rate in this age group. Data on walk trips were only to be collected for purpose of work and school.

3. Licensed Drivers:

About 80% of the respondents possessed a valid drivers licence whereas only 50% of the non-respondents were eligible to drive.

- The driver mode is predominant for most trip purposes. As a result higher rate are expected among those individuals that have the choice of driving and are not dependent on other modes.

5. Labour Force Status:

There are substantial differences in terms of labour force participation between respondents and non-respondents. About two thirds (69%) of respondents work while less than half of the non-respondents (46%) are employed. Most of this difference is among full time workers (59% vs. 39%).

- The work trip is the dominant trip purpose (e.g. home to work trip rate is 0.74 per employed person). Thus, a higher number of trips among those persons with jobs is expected.

6. Student Status:

Students make up 30% of non-respondents compared to 7% of respondents.

- For a large number of students only the school trips were reported and they were made mainly by walk or cycle.

7. Region of Residence:

There does not appear to be any significant differences in terms of geographic distribution among the regions for respondents and non-respondents. The largest difference is for Metro where the respondents make up 55% of the regional total and non-respondents 50%. This difference is likely the result of a greater percentage of single person households in Metro.

8. Trip Day:

There is no difference as to the day of week for travel among respondents and non-respondents.

9. Sex:

There is a slightly higher non-respondent/respondent ratio for females than it is for male, 1.86 and 1.64 respectively. This variation does not seem to be large enough to contribute to differences in trip rates between respondents and non-respondents.

Conclusion:

From the above we can determine that aside from obvious factors that would determine the capability of the person to respond to the survey, there do not appear to be major differences in the characteristics of the respondent.

The lack of difference relating to regional coverage or travel day suggests that any understatement of total travel will not have bias in terms of these variables. This in turn means that it will be possible to use universal factors in interpretation of the data.

All the data used in the above discussion are summarized in Table 1.

TABLE 1.

COMPARISON OF ATTRIBUTES OF RESPONDENTS AND NON-RESPONDENTS IN TTS

% share of population by Region	Dur.	Hal.	Metro	Peel	H-W	York	External
respondent	7.1	6.6	55.7	12.5	10.5	7.5	0.1
non-respondent	8.0	7.2	50.4	14.6	10.3	9.5	0.1
different	-0.9	-0.6	5.3	-2.1	0.2	-2.0	0.0

# of persons in household	1	2	3	4	5	6	7	8	9	10+
responent	11608	19227	11886	12783	5253	1369	415	114	30	19
non-respondent	25	18761	23094	37146	20079	6600	2315	766	240	171
ratio	0.00	0.98	1.94	2.91	3.82	4.82	5.58	6.72	8.00	9.00

# of vehicles in household	0	1	2	3	4	5	6	7	8	9
respondent	8896	26462	20994	4675	1207	294	118	35	13	9
non-respondent	6474	38575	46812	12212	3689	906	342	114	39	37
ratio	0.73	1.46	2.23	2.61	3.06	3.08	2.90	3.26	3.00	4.11

# of persons by sex	male	female
respondent	33133	29531
non-respondent	54221	54816
ratio	1.64	1.86

TABLE 1. (con't)

# of persons by age	0-5	6-12	13-15	16-21	22-25	25-34	35-44	45-54	55-64	65+	unknown
respondent	35	87	493	3890	5292	14727	13622	8269	7596	8162	531
non-respondent	11607	15022	6475	11944	7880	16132	13713	10640	8323	6620	2645
ratio	331.63	172.67	13.13	3.07	1.49	1.10	1.01	1.29	1.10	0.81	4.98

% of persons by dwelling unit	house	other
respondent	66.9	33.0
non-respondent	81.1	18.8
ratio	1.21	0.57

# of persons by driver licence	yes	no
respondent	51058	11635
non-respontent	55964	53082
ratio	1.10	4.56

# of persons by employment status	full time	part time	work at home	other
respondent	36818	5254	1171	19461
non-respondent	42247	7354	1069	58530
ratio	1.15	1.40	0.91	3.01

# of persons by student status	student	other
respondent	4941	58413
non-respondent	33241	75959
ratio	7.75	1.30

B. Respondent/Non-Respondent Trip Rates:

A second aspect that also needs to be examined is a more detailed analysis of trip rates by respondents and non-respondents by trip purpose and modal choice. These trip rates are summarized into various tables at the end of the appendix.

1. Trip Rates by Purpose by Sex: (Table 2)

Total trip rates for respondents were higher among both males and females than for non-respondents. The difference was less pronounced for males (2.53 vs. 1.98) than for females (2.84 vs. 1.71). It is interesting to note that the trip rates among respondents were higher for women than men while the opposite was true for non-respondents.

The was considerable variation in the differences observed by trip purpose between respondents and non-respondents among both males and females. These range from a difference of 1.15 (expressed as respondent trip rate / non-respondent trip rate) for "home" trips by males to 3.25 for "facilitating" trips for females.

Trips by females were consistently higher than for males among respondents except for work trips. Conversely, among the non-respondents the trip rate for females was lower except for shopping and personal business.

2. Trip Rates by Mode of Travel by Sex: (Table 3)

There are significant differences among males and females in terms of trips by mode of travel. In general there is greater similiarity among male and female respondents than there is among non-respondents.

The percentage of all trips made by driving for male and female respondents are 80% and 60% respectively. This is compared to only 55% and 35% for male and female non-respondents.

Male respondents are half as likely to be car passengers as non-respondents, 0.13 vs. 0.26 trip/person. Among females, respondents and non-respondents both exhibited about the same passenger trip rate, about 0.46 trip/person.

3. Trip Rates by Trip Purpose by Employment Status: (Table 4)

Among persons that are full time workers there is relatively little difference between respondents (1.0) and non-respondents (0.87) in terms of work trip rates. A similar situation also exists for part time workers although the trip rate itself is lower for both respondents (0.56) and the non-resondents (0.49).

There are a number of instances where non-workers are reported making work trips. By definition these trips should be errors but it is not clear whether the problem arises from miscoding of trip purpose or miscoding the employment status.

The biggest difference in trip rates for most trip purposes occurs among the persons who are not in the labour force while the smallest is among full time workers.

- It would seem that respondent/non-respondent differences are least among the portion of the population who are most regular in their trips. As a result we would expect that the peak hour travel will not have the same degree of undercounts as total travel.

4. Trip Rates by Mode of Travel by Employment Status: (Table 5)

The auto driver mode is dominant for work trips for respondents of all the different groups of employment status. For non-respondents the same pattern holds except for the population not in the work force where it is the lowest of the major modes (i.e. not counting the "other" mode).

The largest variation between respondents and non-respondents occurs among people who are not in the work force. Driver trip rate for respondents is almost five times that of non-respondents.

- One reason for this is the high proportion of persons under age 16 in the non-respondent, non-worker group.

Car passengers are most prominent among part-time workers with almost equal trip rates for respondents and non-respondents. The same is also true for transit users. Part time workers who were respondents generate almost twice as many driving trips as non-respondents.

5. Trip Rates by Trip Purpose by Age Group: (Table 6)

The total trip rate for respondents and non-respondents is almost equal for the sector of the population between ages 6 and 15. The school and home trips dominant such that there are virtually no other trips made.

Trip rates increase up to the group aged 25 to 44 and then decline. Work trips follow the same pattern as do total trips.

TABLE 2.

TRIP PURPOSE BY SEX BETWEEN RESPONDENT AND NON-RESPONDENT

I. **MALE**

(a) Number of Trips:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents	787692	165326	94066	810338	145196	2524	16883	50811	557252	1994351
non-resp.	1277893	153915	87040	1142489	99897	5453	11353	343626	585047	2530999
difference	-490201	11411	7026	-332151	45299	-2929	5530	-292815	-27795	-536648

(b) Trip Rates:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents		0.21	0.12	1.03	0.18	0.00	0.21	0.06	0.71	2.53
non-resp.		0.12	0.07	0.89	0.08	0.00	0.09	0.27	0.46	1.98
resp/non-resp.	0.62	1.74	1.75	1.15	2.36	0.75	2.41	0.24	1.55	1.28

N.B.

Enter. : Entertainment
Facil. : Facilitate
Perbus. : Personal Business

TABLE 2. (con't)

II. **FEMALE**

(a) Number of Trips:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents	701257	174402	119401	806433	237220	3563	190605	58806	403684	1994114
non-resp.	1293183	144706	67829	998030	156405	6751	109829	327590	394590	2205730
difference	-591926	29696	51572	-191597	80815	-3188	80776	-268784	9094	-211616

(b) Trip Rates:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents		0.25	0.17	1.15	0.34	0.01	0.27	0.08	0.58	2.84
non-resp.		0.11	0.05	0.77	0.12	0.01	0.08	0.25	0.31	1.71
resp/non-resp.	0.54	2.22	3.25	1.49	2.80	0.97	3.20	0.33	1.89	1.67

N.B.

Enter. : Entertainment
Facil. : Facilitate
Perbus. : Personal Business

TABLE 3.

CHOICE OF MODE BY SEX BETWEEN RESPONDENT AND NON-RESPONDENT

I. **MALE**

(a) Number of Trips:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents	787692	1585048	98590	245190	54499	2524	1985851
non-resp.	1277893	1404581	337485	434875	342968	8737	2528646
difference	-490201	180467	-238895	-189685	-288469	-6213	-542795

(b) Trip Rates:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents		2.01	0.13	0.31	0.07	0.00	2.52
non-resp.		1.10	0.26	0.34	0.27	0.01	1.98
resp/non-resp.	0.62	1.83	0.47	0.91	0.26	0.47	1.27

TABLE 3. (con't)

II. **FEMALE**

(a) Number of Trips:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents	701257	1191107	322931	398699	64382	15159	1992278
non-resp.	1293183	764632	583802	529894	317647	9804	2205779
difference	-591926	426475	-260871	-131195	-253265	5355	-213501

(b) Trip Rates:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents		1.70	0.46	0.57	0.09	0.02	2.84
non-resp.		0.59	0.45	0.41	0.25	0.01	1.71
resp/non-resp.	0.54	2.87	1.02	1.39	0.37	2.85	1.67

TABLE 4.

TRIP PURPOSE BY EMPLOYMENT STATUS BETWEEN RESPONDENT AND NON-RESPONDENT

I. FULL TIME WORKERS

(a) Number of Trips:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents	874867	192349	123363	1055832	166430	2768	196395	13519	873308	2623964
non-resp.	998298	135121	98577	1054798	99935	3310	108623	12571	871126	2384061
difference	-123431	57228	24786	1034	66495	-542	87772	948	2182	239903

(b) Trips Rates:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents		0.22	0.14	1.21	0.19	0.00	0.22	0.02	1.00	3.00
non-resp.		0.14	0.10	1.06	0.10	0.00	0.11	0.01	0.87	2.39
resp/non-resp.	0.88	1.62	1.43	1.14	1.90	0.95	2.06	1.23	1.14	1.26

N.B.

Enter. : Entertainment
Facil. : Facilitate
Perbus. : Personal Business

TABLE 4. (con't)

II. PART TIME WORKERS

(a) Number of Trips:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents	124340	31894	25277	156560	38808	691	34526	28796	69994	386546
non-resp.	173142	25355	15772	188664	25134	975	20028	62905	85613	424446
difference	-48802	6539	9505	-32104	13674	-284	14498	-34109	-15619	-37900

(b) Trips Rates:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents		0.26	0.20	1.26	0.31	0.01	0.28	0.23	0.56	3.11
non-resp.		0.15	0.09	1.09	0.15	0.01	0.12	0.36	0.49	2.45
resp/non-resp.	0.72	1.75	2.23	1.16	2.15	0.99	2.40	0.64	1.14	1.27

N.B.

Enter. : Entertainment
Facil. : Facilitate
Perbus. : Personal Business

TABLE 4. (con't)

III. **WORK AT HOME**

(a) Number of Trips:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents	27733	7281	7400	28355	10339	151	11684	596	9269	75075
non-resp.	25518	3984	3151	16075	4624	47	4806	311	5772	38770
difference	2215	3297	4249	12280	5715	104	6878	285	3497	36305

(b) Trips Rates:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents		0.26	0.27	1.02	0.37	0.01	0.42	0.02	0.33	2.71
non-resp.		0.16	0.12	0.63	0.18	0.00	0.19	0.01	0.23	1.52
resp/non-resp.	1.09	1.68	2.16	1.62	2.06	2.96	2.24	1.76	1.48	1.78

N.B.

Enter. : Entertainment
Facil. : Facilitate
Perbus. : Personal Business

TABLE 4. (con't)

IV. NOT IN WORK FORCE

(a) Number of Trips:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents	462955	108408	57560	376996	166982	2477	117035	66867	8883	905208
non-resp.	1377947	134516	37419	882809	126637	7871	90023	596447	17746	1893468
difference	-914992	-26108	20141	-505813	40345	-5394	27012	-529580	-8863	-988260

(b) Trips Rates:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
respodents		0.23	0.12	0.81	0.36	0.01	0.25	0.14	0.02	1.96
non-resp.		0.10	0.03	0.64	0.09	0.01	0.07	0.43	0.01	1.37
resp/non-resp.	0.34	2.40	4.58	1.27	3.92	0.94	3.87	0.33	1.49	1.42

N.B.

Enter. : Entertainment
Facil. : Facilitate
Perbus. : Personal Business

TABLE 5.

CHOICE OF MODE BY EMPLOYMENT STATUS BETWEEN RESPONDENT AND NON-RESPONDENTS

I. FULL TIME WORKERS

(a) Number of Trips:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents	874867	1935519	207605	399478	64086	14488	2621176
non-resp.	998298	1632074	310966	369655	60148	9480	2382323
difference	-123431	303445	-103361	29823	3938	5008	238853

(b) Trip Rates:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents		2.21	0.24	0.46	0.07	0.02	3.00
non-resp.		1.63	0.31	0.37	0.06	0.01	2.39
resp/non-resp.	0.88	1.35	0.76	1.23	1.22	1.74	1.26

TABLE 5. (con't)

II. PART TIME WORKERS

(a) Number of Trips:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents	124340	239089	53024	70323	21905	1799	386140
non-resp.	173142	186900	81804	102840	49218	1451	422213
difference	-48802	52189	-28780	-32517	-27313	348	-36073

(b) Trip Rates:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents		1.92	0.43	0.57	0.18	0.01	3.11
non-resp.		1.08	0.47	0.59	0.28	0.01	2.44
resp/non-resp.	0.72	1.78	0.90	0.95	0.62	1.73	1.27

TABLE 5. (con't)

III. WORK AT HOME

(a) Number of Trips:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents	27733	60700	7634	5249	803	507	74893
non-resp.	25518	28558	7420	2243	214	182	38617
difference	2215	32142	214	3006	589	325	36276

(b) Trip Rates:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents		2.19	0.28	0.19	0.03	0.02	2.70
non-resp.		1.12	0.29	0.09	0.01	0.01	1.51
resp/non-resp.	1.09	1.96	0.95	2.15	3.45	2.56	1.78

TABLE 5. (con't)

IV. NOT IN WORK FORCE

(a) Number of Trips:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents	462955	542170	153708	169190	31991	7142	904201
non-resp.	1377947	320526	522129	491476	551633	7256	1893020
difference	-914992	221644	-368421	-322286	-519642	-114	-988819

(b) Trip Rates:

	Persons	Driver	Passeng.	Transit	Walk/Cyc.	Other	Total
respodents		1.17	0.33	0.37	0.07	0.02	1.95
non-resp.		0.23	0.38	0.36	0.40	0.01	1.37
resp/non-resp.	0.34	5.03	0.88	1.02	0.17	2.93	1.42

TABLE 6.

TRIP PURPOSE BY AGE GROUP BETWEEN RESPONDENT AND NON-RESPONDENT

(A) NUMBER OF TRIPS:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
AGE: 6 - 15										
respodents	13743	1578	63	14339	491	0	502	12416	362	29751
non-resp.	504379	58928	1983	526577	23396	5747	22304	458054	4173	1101162
difference	-490636	-57350	-1920	-512238	-22905	-5747	-21802	-445638	3811	-1071411
AGE: 16 - 24										
respodents	179189	46209	11817	202668	23460	699	30463	65244	97154	477714
non-resp.	419788	61986	16372	431483	25132	1455	33028	187680	182989	940125
difference	-240599	-15777	-4555	-228815	-1672	-756	-2565	-122436	-85835	-462411
AGE: 25 - 44										
respodents	714852	169676	147697	851967	175939	3208	190716	26153	586661	2152017
non-resp.	705263	101338	93114	706593	97545	2981	93767	20229	511640	1627207
difference	9589	68338	54583	145374	78394	227	96949	5924	75021	524810

TABLE 6. (con't)

(A) NUMBER OF TRIPS (con't):

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
AGE: 45 - 64										
respodents	374736	78877	53377	403569	110997	1312	93664	4408	253808	100001
non-resp.	453364	55375	36928	391389	73218	1357	53432	3549	263041	87828
difference	-78628	23502	16449	12180	37779	-45	40232	859	-9233	12172
AGE: 65 - 98										
respodents	194000	41407	10152	133681	68908	867	41601	1131	16508	31425
non-resp.	156743	20287	5604	74916	35797	582	19938	855	11525	16950
difference	37257	21120	4548	58765	33111	285	21663	276	4983	14475
AGE: UNKNOWN										
respodents	12542	2185	494	11525	2767	0	2693	426	8883	28973
non-resp.	62141	1064	918	11389	1243	82	1001	1866	6881	24444
difference	-49599	1121	-424	136	1524	-82	1692	-1440	2002	4529

TABLE 6. (con't)

(B) TRIP RATES:

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
AGE: 6 - 15										
respodents		0.11	0.00	1.04	0.04	0.00	0.04	0.90	0.03	2.16
non-resp.		0.12	0.00	1.04	0.05	0.01	0.04	0.91	0.01	2.18
resp/non-resp.	0.03	0.98	1.17	1.00	0.77	0.00	0.83	0.99	3.18	0.99
AGE: 16 - 24										
respodents		0.26	0.07	1.13	0.13	0.00	0.17	0.36	0.54	2.67
non-resp.		0.15	0.04	1.03	0.06	0.00	0.08	0.45	0.44	2.24
resp/non-resp.	0.43	1.75	1.69	1.10	2.19	1.13	2.16	0.81	1.24	1.19
AGE: 25-44										
respodents		0.24	0.21	1.19	0.25	0.00	0.27	0.04	0.82	3.01
non-resp.		0.14	0.13	1.00	0.14	0.00	0.13	0.03	0.73	2.31
resp/non-resp.	1.01	1.65	1.56	1.19	1.78	1.06	2.01	1.28	1.13	1.30

TABLE 6. (con't)

(B) TRIP RATES (con't):

	Persons	Enter.	Facil.	Home	Shop	Other	Perbus.	School	Work	Total
AGE: 45 - 64										
respodents		0.21	0.14	1.08	0.30	0.00	0.25	0.01	0.68	2.67
non-resp.		0.12	0.08	0.86	0.16	0.00	0.12	0.01	0.58	1.94
resp/non-resp.	0.83	1.72	1.75	1.25	1.83	1.17	2.12	1.50	1.17	1.38
AGE: 65 - 98										
respodents		0.21	0.05	0.69	0.36	0.00	0.21	0.01	0.09	1.62
non-resp.		0.13	0.04	0.48	0.23	0.00	0.13	0.01	0.07	1.08
resp/non-resp.	1.24	1.65	1.46	1.44	1.56	1.20	1.69	1.07	1.16	1.50
AGE: UNKNOWN										
respodents		0.17	0.04	0.92	0.22	0.00	0.21	0.03	0.71	2.31
non-resp.		0.02	0.01	0.18	0.02	0.00	0.02	0.03	0.11	0.39
resp/non-resp.	0.20	10.17	2.67	5.01	11.03	0.00	13.33	1.13	6.40	5.87

APPENDIX 6

TRIP ATTRACTIONS

FROM : Martin R. Seekings
Jim W. Bate
Dave F. Crowley
Pentti Suokas

APPENDIX 6.1

TRIP ATTRACTIONS: WORK TRIPS

FROM : Martin R. Seekings

DATE : April 19, 1988

The Municipality of
Metropolitan Toronto

Planning Department

MEMORANDUM

April 19, 1988

TO: Data Validation Team

From: Martin Seekings

Re: Work Trip End Validation

The accompanying Table compares TTS 24 hour work trip attractions with total employment data from the Metro employment survey as updated in 1986, for TARMS traffic zones 1-400 within Metro Toronto. Since all trips with work destinations are included, the trip attraction rate per employee is higher than would be expected for home based work trips only. The average attraction rate for Metro as a whole is 0.94. Attraction rates for individual zones vary widely, but some general observations can be made:

- Areas with mostly industrial employment have lower than average trip attraction rates, probably due to shift work and fewer non-home based (e.g. work-to-work) trips;

- High density office buildings and government offices have higher than average attraction rates, as there is relatively little shift or part-time employment and a greater attraction of non-home based (work-to-work) trips;

- Zones with a high percentage of part-time and/or shift workers (e.g. shopping centres, hospitals, major recreational facilities) have particularly low attraction rates.

Some specific discrepancies which appear to be due to mis-coding of work locations include:

- Zones 10 and 11 (Queens Park): it appears that many work trips have been coded to zone 11 (west of Bay St.) which are actually destined to government buildings in Zone 10 (east of Bay St.); when the zones are combined, the attraction rate is 0.99;

- Zones 142 and 143 (Leaside): excess work trips are assigned to Zone 142, which is largely residential, while the adjoining Zone 143, which includes the Leaside industrial area, has a very low attraction rate;

- Zone 296 (Downsview Airport) has an attraction rate of 0.24; it is known that the DeHavilland Aircraft factory has been assigned in the Monument File to Zone 298 to the south, and that there have been other errors in assigning Downsview Air Base trips

On the whole, the comparison indicates an acceptable agreement between the two sets of data, bearing in mind that both are derived from sample surveys using widely different methodologies.

COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-8

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
1	1,747	19%	2,482	735		1.42	$	
2	6,528	16%	6,782	254		1.04		
3	2,154	15%	2,186	32		1.01		
4	16,159	15%	15,909	(250)		0.98		
5	11,414	11%	11,096	(318)		0.97		
6	338	12%	336	(2)		0.99		
7	9,107	11%	7,010	(2,097)	&	0.77		WELLESLEY HOSP./OFFICE
8	1,372	26%	1,438	66		1.05		
9	17,852	23%	15,958	(1,894)	&	0.89		M.L. GARDENS/OFFICE/INSTIT
10	17,350	12%	11,274	(6,076)	&	0.65	*	) QUEENS
11	8,663	11%	14,443	5,780	&	1.67	$$	) PARK
12	7,567	10%	11,822	4,255	&	1.56	$$	U of T
13	1,529	22%	2,454	925		1.60	$$	
14	1,637	21%	1,312	(325)		0.80		
15	5,010	20%	3,712	(1,298)	&	0.74	*	)
16	14,825	11%	11,092	(3,733)	&	0.75	*	) INSTITUTIONAL (HOSPITALS)
17	13,418	17%	15,683	2,265	&	1.17		)
18	8,938	9%	8,058	(880)		0.90		
19	9,697	21%	8,469	(1,228)	&	0.87		RYERSON
20	1,999	21%	2,290	291		1.15		
21	559	28%	648	89		1.16		
22	122	13%	336	214		2.75	$$	
23	1,983	7%	1,509	(474)		0.76		
24	1,209	9%	1,860	651		1.54	$$	
25	6,015	21%	6,998	983		1.16		
26	17,158	19%	13,791	(3,367)	&	0.80		EATON CENTRE
27	6,111	11%	10,186	4,075	&	1.67	$$	CITY HALL
28	10,831	12%	6,595	(4,236)	&	0.61	*	A.G.O./OFFICE
29	1,646	22%	1,957	311		1.19		
30	5,898	8%	4,875	(1,023)	&	0.83		IND./1001 QUEEN ST. HOSP.
31	9,991	4%	7,297	(2,694)	&	0.73	*	INDUSTRIAL/OFFICE
32	10,696	10%	10,510	(186)		0.98		
33	65,519	5%	65,656	137		1.00		)
34	22,279	9%	25,567	3,288	&	1.15		) C.B.D.
35	18,477	10%	18,241	(236)		0.99		)
36	9,028	9%	8,918	(110)		0.99		
37	4,944	10%	4,682	(262)		0.95		
38	2,574	34%	2,987	413		1.16		
39	10,194	13%	7,511	(2,683)	&	0.74	*	CENTRAL WATERFRONT
40	6,924	14%	3,518	(3,406)	&	0.51	*	HARBOURFRONT
41	6,249	26%	3,779	(2,470)	&	0.60	*	C.N.E./ONTARIO PLACE
42	31	16%	279	248		9.00	$$	ISLAND AIRPORT
43	712	6%	270	(442)		0.38	**	
44	8,417	9%	4,812	(3,605)	&	0.57	*	DOCKS
45	5,241	33%	1,876	(3,365)	&	0.36	**	GREENWOOD RACETRACK
46	87	18%	0	(87)		0.00	**	
47	1,120	22%	903	(217)		0.81		
48	736	20%	546	(190)		0.74	*	
49	1,233	12%	1,303	70		1.06		
50	1,021	21%	713	(308)		0.70	*	

& = DIFF>1,000 ** = RATIO<0.5 * = RATIO<0.75 $ = RATIO>1.25 $$ = RATIO>1

COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
51	1,584	5%	968	(616)		0.61	*	
52	3,131	18%	3,584	453		1.14		
53	999	4%	1,181	182		1.18		
54	469	14%	556	87		1.19		
55	1,124	16%	1,105	(19)		0.98		
56	2,091	26%	1,473	(618)		0.70	*	
57	1,775	14%	1,785	10		1.01		
58	729	15%	466	(263)		0.64	*	
59	468	9%	346	(122)		0.74	*	
60	2,254	30%	2,229	(25)		0.99		
61	2,902	7%	2,253	(649)		0.78		
62	1,185	24%	1,031	(154)		0.87		
63	648	19%	723	75		1.12		
64	1,337	23%	1,062	(275)		0.79		
65	163	18%	433	270		2.66	$$	
66	859	16%	895	36		1.04		
67	1,508	24%	1,442	(66)		0.96		
68	433	23%	92	(341)		0.21	**	
69	2,668	19%	1,929	(739)		0.72	*	
70	91	12%	416	325		4.57	$$	SWANSEA
71	989	68%	522	(467)		0.53	*	
72	3,264	25%	2,434	(830)		0.75	*	
73	1,362	13%	1,049	(313)		0.77		
74	859	22%	802	(57)		0.93		
75	1,614	5%	1,262	(352)		0.78		
76	1,436	21%	1,044	(392)		0.73	*	
77	1,731	12%	1,067	(664)		0.62	*	
78	970	13%	1,271	301		1.31	$	
79	1,317	12%	1,164	(153)		0.88		
80	1,311	15%	1,036	(275)		0.79		
81	4,272	12%	4,673	401		1.09		
82	365	24%	576	211		1.58	$$	
83	2,295	13%	1,157	(1,138)	&	0.50	*	WESTON/401 INDUSTRIAL
84	981	19%	1,553	572		1.58	$$	
85	346	6%	918	572		2.65	$$	
86	9,755	6%	6,140	(3,615)	&	0.63	*	CALEDONIA INDUSTRIAL
87	3,972	48%	4,745	773		1.19		YORKDALE
88	3,952	7%	3,153	(799)		0.80		
89	6,170	6%	5,833	(337)		0.95		
90	4,451	13%	2,722	(1,729)	&	0.61	*	KEELE/INGRAM INDUSTRIAL
91	427	17%	885	458		2.07	$$	
92	2,265	5%	1,425	(840)		0.63	*	
93	2,897	13%	2,184	(713)		0.75		
94	2,696	16%	3,249	553		1.21		
95	1,956	13%	1,448	(508)		0.74	*	
96	536	25%	1,422	886		2.65	$$	
97	4,590	2%	2,731	(1,859)	&	0.59	*	)
98	2,457	25%	1,418	(1,039)	&	0.58	*	) YORK
99	3,439	7%	2,498	(941)		0.73	*	) INDUSTRIAL
100	1,963	14%	1,252	(711)		0.64	*	)

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COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
101	591	26%	733	142		1.24		
102	962	26%	974	12		1.01		
103	467	22%	625	158		1.34	$	
104	376	31%	577	201		1.53	$$	
105	394	5%	788	394		2.00	$$	
106	1,108	21%	965	(143)		0.87		
107	1,517	10%	951	(566)		0.63	*	
108	1,151	3%	604	(547)		0.52	*	
109	175	22%	415	240		2.37	$$	
110	720	25%	1,012	292		1.41	$	
111	1,601	11%	1,426	(175)		0.89		
112	1,951	2%	1,530	(421)		0.78		
113	4,928	4%	4,441	(487)		0.90		
114	1,392	8%	822	(570)		0.59	*	
115	815	23%	1,579	764		1.94	$$	
116	217	13%	128	(89)		0.59	*	
117	291	30%	263	(28)		0.90		
118	1,008	26%	491	(517)		0.49	**	
119	4,086	10%	2,757	(1,329)	&	0.67	*	TTC HILLCREST
120	1,090	29%	1,039	(51)		0.95		
121	532	7%	331	(201)		0.62	*	
122	1,896	3%	786	(1,110)	&	0.41	**	MANUFACTURING
123	1,629	26%	1,948	319		1.20		
124	2,073	6%	1,109	(964)		0.53	*	
125	859	22%	1,800	941		2.10	$$	
126	935	28%	688	(247)		0.74	*	
127	2,851	31%	2,232	(619)		0.78		
128	1,946	23%	1,888	(58)		0.97		
129	1,452	16%	1,461	9		1.01		
130	1,044	21%	1,024	(20)		0.98		
131	6,216	21%	4,334	(1,882)	&	0.70	*	SUNNYBROOK HOSPITAL
132	232	11%	960	728		4.14	$$	
133	912	13%	847	(65)		0.93		
134	798	14%	901	103		1.13		
135	545	37%	746	201		1.37	$	
136	765	12%	1,088	323		1.42	$	
137	178	8%	577	399		3.24	$$	
138	731	17%	470	(261)		0.64	*	
139	5,849	12%	6,528	679		1.12		
140	5,238	13%	5,378	140		1.03		
141	1,870	25%	1,837	(33)		0.98		
142	502	30%	2,277	1,775	&	4.54	$$	NORTH LEASIDE
143	5,860	3%	2,768	(3,092)	&	0.47	**	LEASIDE INDUSTRIAL
144	6,118	13%	4,714	(1,404)	&	0.77		THORNCLIFFE PARK
145	1,954	23%	1,891	(63)		0.97		
146	2,523	10%	2,192	(331)		0.87		
147	9,540	11%	8,695	(845)		0.91		
148	6,052	8%	7,006	954		1.16		
149	1,101	11%	826	(275)		0.75		
150	366	12%	742	376		2.03	$$	

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COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
151	2,871	8%	3,684	813		1.28	$	YONGE/ST. CLAIR (NW)
152	519	10%	130	(389)		0.25	**	
153	55	11%	659	604		11.98	$$	
154	81	26%	291	210		3.59	$$	
155	1,144	19%	1,437	293		1.26	$	
156	5,610	10%	7,697	2,087	&	1.37	$	YONGE/ST. CLAIR (E)
157	6,354	7%	6,022	(332)		0.95		YONGE/ST. CLAIR (SW)
158	993	21%	1,158	165		1.17		
159	3,532	20%	1,096	(2,436)	&	0.31	**	G. BROWN COLL (CASA LOMA)
160	637	48%	1,137	500		1.78	$$	
161	1,525	6%	1,975	450		1.30	$	
162	343	8%	1,012	669		2.95	$$	
163	9,257	6%	7,488	(1,769)	&	0.81		DUNCAN MILL
164	175	18%	690	515		3.94	$$	
165	340	29%	439	99		1.29	$	
166	1,565	18%	1,237	(328)		0.79		
167	259	29%	1,971	1,712	&	7.61	$$	Y. MILLS/401/DVP/LAWRENCE
168	7,756	6%	6,332	(1,424)	&	0.82		
169	71	25%	660	589		9.30	$$	
170	152	22%	272	120		1.79	$$	
171	1,492	37%	1,609	117		1.08		
172	55	20%	69	14		1.25	$	
173	8,610	13%	8,326	(284)		0.97		
174	10,343	4%	9,769	(574)		0.94		
175	4,207	10%	3,130	(1,077)	&	0.74	*	INDUSTRIAL
176	5,732	7%	4,754	(978)		0.83		INDUSTRIAL
177	5,346	5%	8,794	3,448	&	1.64	$$	FLEMINGDON PK (OFFICE)
178	654	28%	895	241		1.37	$	
179	1,136	22%	982	(154)		0.86		
180	710	27%	466	(244)		0.66	*	
181	540	13%	591	51		1.09		
182	361	21%	718	357		1.99	$$	
183	2,191	22%	1,981	(210)		0.90		
184	6,546	2%	4,065	(2,481)	&	0.62	*	INDUSTRIAL
185	463	33%	563	100		1.22		
186	1,004	34%	1,079	75		1.07		
187	1,672	37%	1,034	(638)		0.62	*	
188	2,662	40%	1,865	(797)		0.70	*	
189	1,798	14%	1,368	(430)		0.76		
190	1,003	15%	1,706	703		1.70	$$	
191	1,130	19%	1,394	264		1.23		
192	1,713	8%	1,847	134		1.08		
193	780	33%	899	119		1.15		
194	677	22%	814	137		1.20		
195	732	25%	1,091	359		1.49	$	
196	661	27%	609	(52)		0.92		
197	2,681	13%	1,458	(1,223)	&	0.54	*	RIVERDALE HOSPITAL
198	1,611	13%	1,391	(220)		0.86		
199	1,310	21%	973	(337)		0.74	*	
200	1,203	13%	1,419	216		1.18		

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COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
201	2,586	7%	2,512	(74)		0.97		
202	1,577	45%	1,552	(25)		0.98		
203	1,293	15%	1,291	(2)		1.00		
204	402	13%	197	(205)		0.49	**	
205	990	14%	1,625	635		1.64	$$	
206	550	33%	746	196		1.36	$	
207	562	26%	742	180		1.32	$	
208	929	36%	1,189	260		1.28	$	
209	1,465	20%	1,478	13		1.01		
210	457	13%	771	314		1.69	$$	
211	738	18%	714	(24)		0.97		
212	1,991	11%	2,233	242		1.12		
213	7,485	3%	4,354	(3,131)	&	0.58	*	INDUSTRIAL
214	9,788	2%	6,688	(3,100)	&	0.68	*	INDUSTRIAL
215	6,292	5%	5,091	(1,201)	&	0.81		INDUSTRIAL
216	1,082	19%	1,379	297		1.27	$	
217	882	18%	1,265	383		1.43	$	
218	1,285	5%	793	(492)		0.62	*	
219	284	22%	359	75		1.26	$	
220	2,712	4%	2,010	(702)		0.74	*	
221	955	4%	3,431	2,476	&	3.59	$$	401/ISLINGTON/DIXON
222	1,174	3%	1,016	(158)		0.87		
223	160	36%	484	324		3.03	$$	
224	1,254	35%	1,092	(162)		0.87		
225	775	33%	922	147		1.19		
226	659	19%	1,222	563		1.85	$$	
227	901	26%	854	(47)		0.95		
228	427	39%	551	124		1.29	$	
229	446	25%	496	50		1.11		
230	592	41%	573	(19)		0.97		
231	346	30%	378	32		1.09		
232	68	18%	372	304		5.47	$$	
233	759	21%	1,253	494		1.65	$$	
234	422	37%	235	(187)		0.56	*	
235	151	9%	411	260		2.72	$$	
236	321	18%	593	272		1.85	$$	
237	2,869	10%	3,054	185		1.06		
238	2,104	9%	1,453	(651)		0.69	*	
239	3,394	17%	5,092	1,698	&	1.50	$$	ETOBICOKE CIVIC CENTRE
240	2,616	35%	2,667	51		1.02		
241	3,794	10%	5,140	1,346	&	1.35	$	BLOOR/KIPLING/ISLINGTON
242	540	19%	1,259	719		2.33	$$	
243	827	27%	915	88		1.11		
244	203	16%	368	165		1.81	$$	
245	99	31%	334	235		3.37	$$	
246	935	24%	697	(238)		0.75	*	
247	383	19%	943	560		2.46	$$	
248	5,803	3%	4,627	(1,176)	&	0.80		INDUSTRIAL
249	7,547	8%	5,061	(2,486)	&	0.67	*	INDUSTRIAL
250	4,293	6%	2,068	(2,225)	&	0.48	**	INDUSTRIAL

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COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
251	5,414	43%	4,048	(1,366)	&	0.75	*	SHERWAY
252	7,198	9%	6,358	(840)		0.88		INDUSTRIAL
253	6,427	5%	3,387	(3,040)	&	0.53	*	INDUSTRIAL
254	4,796	9%	3,498	(1,298)	&	0.73	*	INDUSTRIAL
255	148	20%	419	271		2.83	$$	
256	526	7%	181	(345)		0.34	**	
257	4,268	8%	2,983	(1,285)	&	0.70	*	INDUSTRIAL
258	2,390	28%	2,616	226		1.09		
259	116	3%	340	224		2.93	$$	
260	1,482	33%	1,560	78		1.05		
261	835	29%	1,144	309		1.37	$	
262	7,214	21%	7,387	173		1.02		HUMBER COLLEGE
263	3,041	27%	2,850	(191)		0.94		
264	252	4%	144	(108)		0.57	*	
265	696	44%	270	(426)		0.39	**	
266	1,184	40%	1,675	491		1.41	$	
267	807	39%	1,241	434		1.54	$$	
268	6,428	5%	4,645	(1,783)	&	0.72	*	INDUSTRIAL
269	5,210	9%	3,589	(1,621)	&	0.69	*	INDUSTRIAL
270	2,797	1%	1,470	(1,327)	&	0.53	*	INDUSTRIAL
271	1,052	29%	370	(682)		0.35	**	WOODBINE RACETRACK
272	10,825	6%	8,464	(2,361)	&	0.78		INDUSTRIAL
273	6,375	8%	4,798	(1,577)	&	0.75		INDUSTRIAL
274	5,229	5%	4,986	(243)		0.95		
275	8,241	9%	7,401	(840)		0.90		
276	7,790	6%	5,960	(1,830)	&	0.77		INDUSTRIAL
277	7,164	2%	4,622	(2,542)	&	0.65	*	INDUSTRIAL
278	7,446	3%	5,666	(1,780)	&	0.76		INDUSTRIAL
279	3,270	12%	3,177	(93)		0.97		
280	317	28%	932	615		2.94	$$	
281	7,452	60%	4,908	(2,544)	&	0.66	*	YORK UNIVERSITY
282	4,580	5%	3,188	(1,392)	&	0.70	*	INDUSTRIAL
283	10,829	6%	7,862	(2,967)	&	0.73	*	INDUSTRIAL
284	8,501	8%	5,574	(2,927)	&	0.66	*	INDUSTRIAL
285	7,772	10%	3,329	(4,443)	&	0.43	**	INDUSTRIAL
286	706	23%	1,188	482		1.68	$$	
287	1,791	33%	1,626	(165)		0.91		
288	5,995	15%	3,991	(2,004)	&	0.67	*	INDUSTRIAL/HOSPITAL
289	881	36%	1,901	1,020	&	2.16	$$	
290	4,590	7%	4,073	(517)		0.89		
291	2,496	5%	2,624	128		1.05		
292	3,342	2%	2,865	(477)		0.86		
293	3,138	36%	3,266	128		1.04		
294	264	26%	340	76		1.29	$	
295	395	22%	485	90		1.23		
296	7,751	0%	1,856	(5,895)	&	0.24	**	DOWNSVIEW AIRPORT (ERRORS)
297	1,539	1%	675	(864)		0.44	**	TTC WILSON YARDS
298	2,332	11%	5,998	3,666	&	2.57	$$	DE HAVILLAND CODED HERE
299	1,093	15%	3,021	1,928	&	2.76	$$	WILSON/JANE/KEELE (N. SIDE)
300	4,291	6%	4,432	141		1.03		M.T.O.

& = DIFF>1,000 ** = RATIO<0.5 * = RATIO<0.75 $ = RATIO>1.25 $$ = RATIO>1.5

COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
301	1,371	13%	1,928	557		1.41	$	
302	4,211	25%	5,570	1,359	&	1.32	$	RETAIL/OFFICE
303	2,873	27%	3,409	536		1.19		
304	1,169	19%	1,382	213		1.18		
305	2,623	19%	1,996	(627)		0.76		
306	850	12%	1,385	535		1.63	$$	
307	6,029	13%	5,608	(421)		0.93		
308	1,414	17%	2,014	600		1.42	$	
309	1,176	7%	887	(289)		0.75		
310	1,956	14%	3,042	1,086	&	1.56	$$	DEPT. OF ENVIRONMENT
311	1,595	19%	1,851	256		1.16		
312	1,954	21%	2,335	381		1.19		
313	868	27%	1,619	751		1.87	$$	
314	6,241	5%	7,071	830		1.13		NORTH YORK CIVIC CENTRE
315	2,054	9%	3,271	1,217	&	1.59	$$	OFFICE
316	918	30%	3,628	2,710	&	3.95	$$	SENECA LESLIE CAMPUS
317	1,108	36%	1,549	441		1.40	$	
318	1,277	21%	2,798	1,521	&	2.19	$$	SENECA FINCH CAMPUS
319	6,705	5%	4,897	(1,808)	&	0.73	*	PARKWAY/FINCH (OFFICE)
320	1,005	45%	2,729	1,724	&	2.72	$$	RETAIL/OFFICE
321	630	27%	778	148		1.23		
322	1,095	35%	1,147	52		1.05		
323	2,171	38%	1,914	(257)		0.88		N.YORK GEN. HOSPITAL
324	3,224	50%	2,960	(264)		0.92		FAIRVIEW MALL
325	12,713	5%	10,630	(2,083)	&	0.84		CONSUMERS ROAD
326	1,564	47%	2,425	861		1.55	$$	
327	8,003	8%	7,100	(903)		0.89		
328	4,691	19%	4,381	(310)		0.93		
329	3,747	6%	4,903	1,156	&	1.31	$	INDUSTRIAL
330	5,940	6%	5,362	(578)		0.90		PROGRESS INDUSTRIAL
331	5,282	8%	4,220	(1,062)	&	0.80		INDUSTRIAL
332	2,882	43%	2,067	(815)		0.72	*	SCARBORO GEN. HOSPITAL
333	8,360	20%	9,557	1,197	&	1.14		SCARBORO CITY CENTRE
334	10,420	9%	8,681	(1,739)	&	0.83		INDUSTRIAL/OFFICE
335	1,258	35%	1,816	558		1.44	$	
336	757	27%	1,205	448		1.59	$$	
337	523	37%	715	192		1.37	$	
338	1,951	42%	2,156	205		1.11		
339	2,945	22%	2,999	54		1.02		
340	803	19%	1,044	241		1.30	$	
341	1,548	32%	1,463	(85)		0.95		
342	251	19%	875	624		3.49	$$	
343	888	18%	1,425	537		1.60	$$	
344	4,639	4%	4,565	(74)		0.98		
345	3,434	7%	3,119	(315)		0.91		
346	272	30%	454	182		1.67	$$	
347	9,635	10%	8,571	(1,064)	&	0.89		INDUSTRIAL
348	7,025	11%	5,528	(1,497)	&	0.79		OFFICE/INDUSTRIAL
349	1,231	29%	1,661	430		1.35	$	
350	1,584	12%	1,656	72		1.05		

& = DIFF>1,000 ** = RATIO<0.5 * = RATIO<0.75 $ = RATIO>1.25 $$ = RATIO>1.

COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

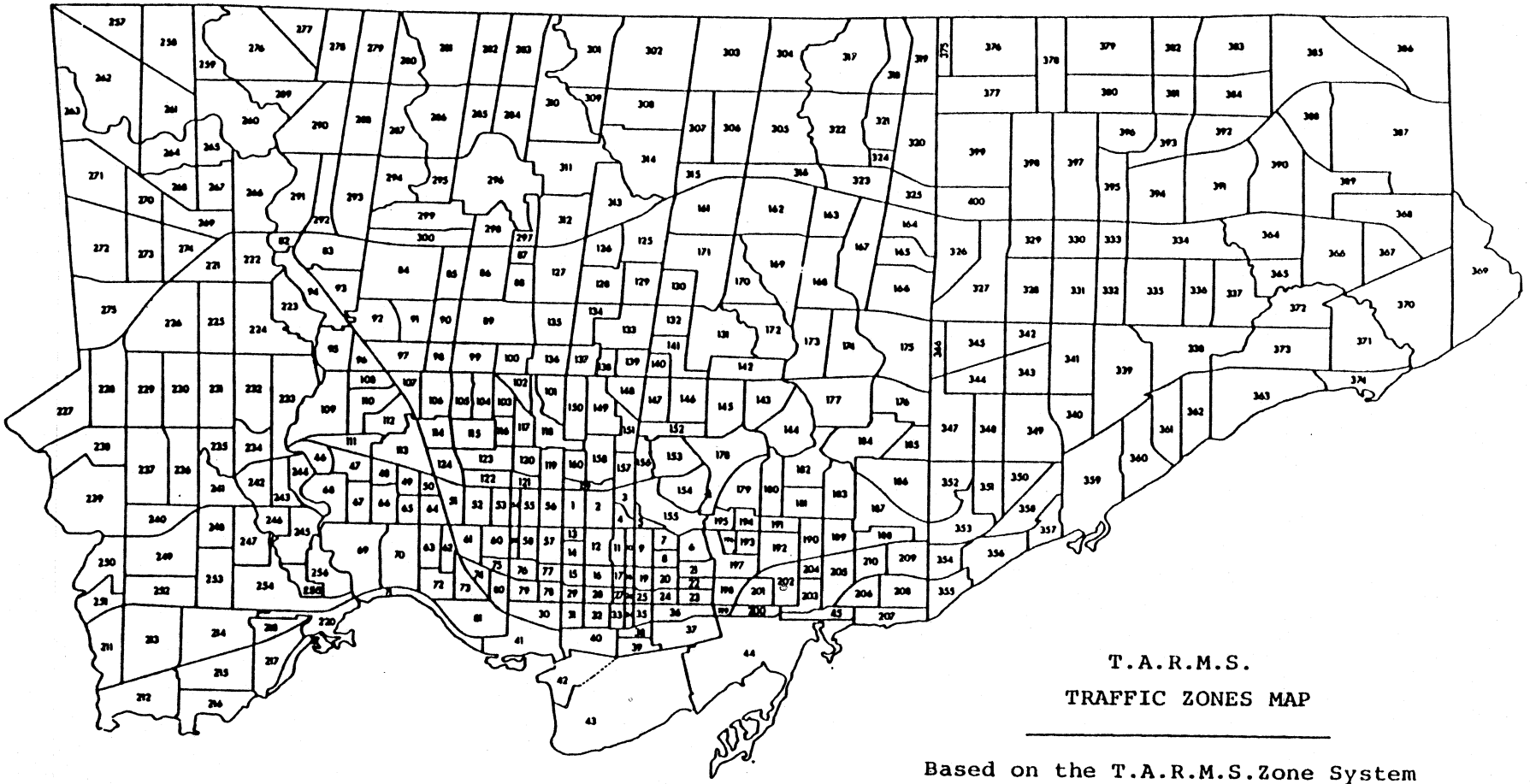
TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE		RATIO		NOTES
351	4,319	9%	2,700	(1,619)	&	0.63	*	INDUSTRIAL
352	284	20%	510	226		1.80	$$	
353	2,087	13%	2,578	491		1.24		
354	349	36%	333	(16)		0.95		
355	293	23%	564	271		1.92	$$	
356	676	13%	1,606	930		2.38	$$	
357	943	31%	877	(66)		0.93		
358	566	6%	691	125		1.22		
359	1,064	18%	1,084	20		1.02		
360	472	32%	532	60		1.13		
361	867	30%	972	105		1.12		
362	991	32%	1,121	130		1.13		
363	385	23%	415	30		1.08		
364	533	35%	574	41		1.08		
365	1,438	31%	1,379	(59)		0.96		
366	592	3%	982	390		1.66	$$	SCARBORO COLLEGE
367	232	9%	120	(112)		0.52	*	
368	132	20%	340	208		2.58	$$	
369	942	40%	812	(130)		0.86		
370	728	14%	867	139		1.19		
371	1,767	22%	1,343	(424)		0.76		
372	2,372	37%	2,414	42		1.02		
373	1,075	25%	1,343	268		1.25		
374	100	0%	96	(4)		0.96		
375	3,127	6%	2,340	(787)		0.75	*	
376	640	10%	2,128	1,488	&	3.33	$$	CONSTRUCTION?
377	4,440	30%	3,677	(763)		0.83		
378	4,189	4%	2,717	(1,472)	&	0.65	*	INDUSTRIAL
379	336	4%	1,325	989		3.94	$$	CONSTRUCTION?
380	1,482	31%	2,641	1,159	&	1.78	$$	RETAIL/INSTIT
381	1,150	14%	1,077	(73)		0.94		
382	1,294	9%	1,087	(207)		0.84		
383	382	4%	489	107		1.28	$	
384	2,242	11%	2,080	(162)		0.93		
385	50	18%	0	(50)		0.00	**	
386	31	58%	67	36		2.16	$$	
387	326	12%	152	(174)		0.47	**	
388	18	11%	25	7		1.39	$	
389	839	8%	603	(236)		0.72	*	
390	977	21%	1,466	489		1.50	$$	
391	3,086	6%	2,677	(409)		0.87		
392	2,970	5%	2,525	(445)		0.85		
393	367	3%	805	438		2.19	$$	CP YARDS
394	7,270	8%	5,841	(1,429)	&	0.80		INDUSTRIAL
395	4,314	9%	4,177	(137)		0.97		
396	513	2%	816	303		1.59	$$	
397	2,809	15%	2,442	(367)		0.87		
398	2,990	38%	3,118	128		1.04		
399	1,825	19%	3,647	1,822	&	2.00	$$	RETAIL/OFFICE/INSTIT
400	1,187	33%	2,450	1,263	&	2.06	$$	RETAIL/SERVICE

& = DIFF>1,000 ** = RATIO<0.5 * = RATIO<0.75 $ = RATIO>1.25 $$ = RATIO>1.5

COMPARISON OF TTS 24HR WORK TRIP ATTRACTIONS WITH 1986 METRO TOTAL EMPLOYMENT 19-Apr-88

TARMS ZONE	TOTAL EMPL.	PART TIME	WORK ATTRS	DIFF-ERENCE	RATIO	NOTES
TOTAL	1,220,801	13%	1,141,645	(79,156)	0.94	

& = DIFF>1,000 ** = RATIO<0.5 * = RATIO<0.75 $ = RATIO>1.25 $$ = RATIO>1.



T.A.R.M.S.

TRAFFIC ZONES MAP

Based on the T.A.R.M.S.Zone System
(Toronto Area Region Model Study)

Note:

- This map is to be used in conjunction with statistical data, demographic studies and surveys compiled by the Research Division of Metropolitan Planning Department. Tel#392-8130
- Other models of the T.A.R.M.S Zone map and pertinent studies are available from the Transportation Division of Metropolitan Planning Department. Tel #392-8112.

APPENDIX 6.2

TRIP ATTRACTIONS: SCHOOL TRIPS

FROM : Jim W. Bate

DATE : May 10, 1988

DURHAM

The Regional
Municipality
of Durham

Planning
Department

Box 623
105 Consumers Dr.
Whitby, Ontario
Canada, L1N 6A3
(416) 668-7731

DR. M. R. MICHAEL, M.C.I.P.
Commissioner of Planning

May 10, 1988

Ministry of Transportation
1201 Wilson Avenue
3rd Floor, West Tower
Downsview, Ontario
M3M 1J8

Attention: Mr. James Wong

Dear Sir:

Re: File: 4.4.14.1 Please Quote Ref. No.

Enclosed as requested is a preliminary comparison of Transportation Tomorrow School Trip Ends (Version One Data) and School Enrollment in the Region of Durham. The school enrollment data is based on the information provided by appropriate school boards with the majority being for the 1985/1986 school year.

I trust this information will be useful in your current work. If you have any questions, please do not hesitate to call.

Your very truly,

J W Bate

Jim Bate,
Senior Planner,
Strategic Operations Branch

:ed
Encl.

TTS VS SCHOOL ENROLLMENT

Introduction

The TTS school trip ends per TARMS zone were compared with school enrollment per zone to appreciate the reliability of the TTS survey.

Other data checks had found some difficulty with coding of monuments in Durham Region and it was expected that some of the TTS school trip ends may be assigned to an abutting wrong zone.

Observations

1. The TTS trips represent from 63 to 114 percent of enrollment All municipalities are under reported except Brock Township. The majority of municipalities have TTS trips ranging around 80% of enrollment with the Regional average being approximately 80%.

2. There are many zones with significance differences between the number of TTS trip ends and enrollment as shown below. Assuming there is some problem in the coding of TTS trip ends and adjusting trip ends to abutting zones with school enrollment, the differences are reduced.

TTS Differs from Enrollment	Unadjusted No. of Zones	Adjusted No. of Zones
100	75	61
500	27	14
1000	10	3

Brock Township has 3 of its 7 zones with trip end differences greater than 100.

3. The zones with considerable differences between TTS trip ends and enrollment involve secondary schools or zones abutting a zone with a secondary school.

4. The percent distribution of TTS school trip ends compares more favourably with percent enrollment distribution than did the absolute numbers. The comparison is shown in the following chart.

TTS SCHOOL TRIP DISTRIBUTION CHECK

MUNICIPALITY	TARMS ZONES	TTS TRIPS AS A % OF ENROLLMENT	DIFFERENCE IN % DISTRIBUTION NUMBER OF ZONES WITH % DIF. 0	1	2	3	4	5	6+	NO. OF ZONES
Pickering	211-	74	21	8	2	1	0	1	0	33
Ajax	244-	63	8	3	0	1	2	0	7	21
Whitby	265-	85	23	5	1	0	1	0	2	32
Oshawa	297-	85	26	9	5	3	5	3	2	53
Newcastle	350-	75	29	5	4	2	1	1	3	45
Scugog	395-	83	6	1	1	1	1	0	1	11
Uxbridge	406-	74	5	1	0	0	0	0	2	8
Brock	414-	114	1	0	0	0	0	2	4	7
DURHAM	211-420	80	119	31	14	8	10	7	21	210

The percent distribution compares more favourably after the adjustment to TTS trip ends mentioned in observation two.

TTS SCHOOL TRIP DISTRIBUTION CHECK
ADJUSTED TTS TRIP ENDS

MUNICIPALITY	TARMS ZONES	TTS TRIPS AS A % OF ENROLLMENT	DIFFERENCE IN % DISTRIBUTION NUMBER OF ZONES WITH % DIF. 0	1	2	3	4	5	6+	NO. OF ZONES
Pickering	211-	74	21	8	2	1	0	1	0	33
Ajax	244-	63	9	4	2	1	1	0	4	21
Whitby	265-	84	24	5	2	0	1	0	0	32
Oshawa	297-	91	33	10	6	3	0	1	0	53
Newcastle	350-	75	31	5	4	2	1	1	1	45
Scugog	395-	83	6	1	1	1	1	0	1	11
Uxbridge	406-	74	5	1	0	0	0	0	2	8
Brock	414-	114	2	0	0	0	0	3	2	7
DURHAM	211-420	80	131	34	17	8	4	6	10	210

Even with re-assigning TTS trip ends Brock Township has 5 of its 7 zones with a percent difference in trip end distribution versus school enrollment of five or more percent.

The percent distribution of TTS school trip ends and school enrollment are comparable for other muncipalities.

Comments

1. School trips in Durham appear to be under reported by approximately 20%.

   Brock Township is the exception and the expansion factors used for TTS trips in Brock should be checked.

2. Prior to more detailed checking of TTS school trip ends the database file should be revised in Durham to correctly locate the identified errors in coding. In particular a check of location coding for all secondary schools should be undertaken.

3. Providing the coding corrections results in the distribution of school trips as per Attachment No. 2, the percent distribution of TTS school trips is useable except for Brock Township.

4. It will be necessary to check TTS trip ends with enrollment once TTS database 2 is generated.

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED UNADJUSTED

TARMS ZONE #	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERANCE #	PERCENT DISTRIBUTION TTS	PERCENT DISTRIBUTION ENROLLMENT	COMMENTS % DIST. DIFFERENCE
211	110	290	-180	2	3	-1
212	134	303	-169	2	3	-1
213	0	0	0	0	0	0
214	45	0	45	1	0	1
215	1923	2141	-218	29	24	5
216	0	0	0	0	0	0
217	926	1347	-421	14	15	-1
218	334	569	-235	5	6	-1
219	44	0	44	1	0	1
220	624	681	-57	9	8	1
221	1121	1765	-644	17	20	-3
222	0	0	0	0	0	0
223	0	0	0	0	0	0
224	0	0	0	0	0	0
225	0	0	0	0	0	0
226	0	0	0	0	0	0
227	90	0	90	1	0	1
228	356	601	-245	5	7	-2
229	0	0	0	0	0	0
230	465	776	-311	7	9	-2
231	21	0	21	0	0	0
232	0	0	0	0	0	0
233	0	0	0	0	0	0
234	0	0	0	0	0	0
235	0	0	0	0	0	0
236	0	0	0	0	0	0
237	0	0	0	0	0	0
238	0	0	0	0	0	0
239	0	0	0	0	0	0
240	0	0	0	0	0	0
241	227	236	-9	3	3	0
242	0	0	0	0	0	0
243	217	240	-23	3	3	0
PIC.	6637	8949	-2312	100	100	
TTS %	74					
244	22	0	22	0	0	+private 0
245	0	0	0	0	0	0
246	0	0	0	0	0	0
247	90	0	90	1	0	1
248	356	0	356	6	0	6
249	0	367	-367	0	4	-4
250	465	0	465	8	0	8
251	21	1228	-1207	0	13	-13
252	0	968	-968	0	10	-10
253	0	392	-392	0	4	-4
254	0	1038	-1038	0	11	-11
255	0	0	0	0	0	0
256	0	0	0	0	0	0

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED UNADJUSTED

TARMS ZONE #	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERANCE #	PERCENT DISTRIBUTION TTS	PERCENT DISTRIBUTION ENROLLMENT	COMMENTS % DIST. DIFFERENCE
257	1100	405	695	18	4	14
258	15	0	15	0	0	0
259	0	0	0	0	0	0
260	407	744	-337	7	8	-1
261	169	0	169	3	0	3
262	3309	4474	-1165	55	47	+private 8
263	66	0	66	1	0	1
264	0	0	0	0	0	0
AJAX	6020	9616	-3596	100	100	
TTS %	63					
265	20	0	20	0	0	0
266	0	0	0	0	0	0
267	0	0	0	0	0	0
268	0	0	0	0	0	0
269	0	0	0	0	0	0
270	0	0	0	0	0	0
271	0	0	0	0	0	0
272	0	0	0	0	0	0
273	0	0	0	0	0	0
274	29	0	29	0	0	0
275	213	209	4	3	2	1
276	29	0	29	0	0	0
277	502	510	-8	6	6	0
278	947	880	67	12	10	2
279	365	427	-62	5	5	0
280	1333	2167	-834	17	24	-7
281	486	0	486	6	0	6
282	1175	1323	-148	15	14	1
283	144	260	-116	2	3	-1
284	1095	1650	-555	14	18	-4
285	533	745	-212	7	8	-1
286	414	467	-53	5	5	0
287	0	0	0	0	0	0
288	0	0	0	0	0	0
289	0	0	0	0	0	0
290	0	0	0	0	0	0
291	21	0	21	0	0	0
292	0	0	0	0	0	0
293	0	0	0	0	0	0
294	469	499	-30	6	5	1
295	0	0	0	0	0	0
296	0	0	0	0	0	0
WHITY	7775	9137	-1362	100	100	
TTS %	85					
297	0	0	0	0	0	0
298	0	0	0	0	0	0
299	1669	0	1669	7.	0	-7

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED UNADJUSTED

TARMS ZONE #	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERANCE #	PERCENT DISTRIBUTION TTS	PERCENT DISTRIBUTION ENROLLMENT	COMMENTS % DIST. DIFFERENCE
300	112	63	49	0	0	0
301	0	0	0	0	0	0
302	45	60	-15	0	0	0
303	160	171	-11	1	1	0
304	173	2651	-2478	1	9	-8
305	0	0	0	0	0	0
306	128	0	128	1	0	1
307	518	641	-123	2	2	0
308	607	1091	-484	3	4	-1
309	23	0	23	0	0	0
310	0	0	0	0	0	0
311	0	0	0	0	0	0
312	0	0	0	0	0	0
313	1086	0	1086	5	0	5
314	541	613	-72	2	2	0
315	0	575	-575	0	2	-2
316	2070	1910	160	9	7	2
317	29	0	29	0	0	0
318	823	1029	-206	3	4	-1
319	405	1683	-1278	2	6	+private-4
320	624	0	624	3	0	3
321	1561	0	1561	7	0	5
322	1599	1125	474	7	4	3
323	247	381	-134	1	1	0
324	1008	499	509	4	2	2
325	52	871	-819	0	3	-3
326	346	1717	-1371	1	6	-5
327	2092	1283	809	9	5	-4
328	457	1606	-1149	2	6	-4
329	80	151	-71	0	1	-1
330	1118	364	754	5	1	4
331	1021	1344	-323	4	5	-1
332	71	1019	-948	0	4	-4
333	455	0	455	2	0	2
334	497	1000	-503	2	4	-2
335	0	0	0	0	0	0
336	749	1218	-469	3	4	-1
337	45	220	-175	0	1	-1
338	447	733	-286	2	3	-1
339	22	17	5	0	0	+private 0
340	0	0	0	0	0	0
341	248	272	-24	1	1	0
342	242	399	-157	1	1	0
343	22	0	22	0	0	0
344	23	0	23	0	0	0
345	0	0	0	0	0	0
346	0	0	0	0	0	0
347	2092	2942	-850	9	10	-1
348	496	662	-166	2	2	+private 0

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED UNADJUSTED

	TARMS ZONE #	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERANCE #	PERCENT DISTRIBUTION TTS	ENROLLMENT	COMMENTS % DIST. DIFFERENCE
	349	0	0	0	0	0	0
0	OSHAWA	24003	28310	-4307	100	100	
	TTS %	85					
	350	0	0	0	0	0	0
	351	0	160	-160	0	2	-2
	352	0	0	0	0	0	0
	353	55	0	55	1	0	1
	354	259	958	-699	5	13	-8
	355	579	150	429	10	2	8
	356	0	72	-72	0	1	-1
	357	0	0	0	0	0	0
	358	0	0	0	0	0	0
	359	169	256	-87	3	3	0
	360	0	0	0	0	0	0
	361	0	0	0	0	0	0
	362	154	479	-325	3	6	-3
	363	0	0	0	0	0	0
	364	0	0	0	0	0	0
	365	0	0	0	0	0	0
	366	145	111	34	3	1	2
	367	0	0	0	0	0	0
	368	0	0	0	0	0	0
	369	0	0	0	0	0	0
	370	587	909	-322	10	12	-2
	371	55	377	-322	1	5	-4
	372	234	285	-51	4	4	0
	373	1333	1423	-90	24	19	5
	374	786	549	237	14	7	7
	375	0	0	0	0	0	0
	376	201	174	27	4	2	+private 2
	377	0	0	0	0	0	0
	378	0	0	0	0	0	0
	379	0	0	0	0	0	0
	380	0	0	0	0	0	0
	381	0	0	0	0	0	0
	382	0	0	0	0	0	0
	383	0	0	0	0	0	0
	384	0	0	0	0	0	0
	385	49	314	-265	1	4	-3
	386	0	0	0	0	0	0
	387	53	76	-23	1	1	0
	388	0	0	0	0	0	0
	389	513	772	-259	9	10	-1
	390	292	277	15	5	4	1
	391	142	183	-41	3	2	1
	392	0	0	0	0	0	0
	393	0	0	0	0	0	0
	394	35	42	-7	1	1	0

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED UNADJUSTED

	TARMS ZONE #	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERANCE #	PERCENT DISTRIBUTION TTS	ENROLLMENT	COMMENTS % DIST. DIFFERENCE
	NEW.	5641	7567	-1926	100	100	
	tts %	75					
	395	0	0	0	0	0	0
	396	0	0	0	0	0	0
	397	0	0	0	0	0	0
	398	648	590	58	23	17	6
	399	0	0	0	0	0	0
	400	402	611	-209	14	18	-4
	401	1659	2039	-380	58	59	-1
	402	0	0	0	0	0	0
	403	71	83	-12	2	2	0
	404	53	0	53	2	0	2
	405	24	124	-100	1	4	-3
0	SCUGOG	2857	3447	-590	100	100	
	TTS %	83					
	406	125	188	-63	7	8	-1
	407	0	0	0	0	0	0
	408	1292	1885	-593	75	81	-6
	409	0	0	0	0	0	0
	410	0	0	0	0	0	0
	411	295	240	55	17	10	7
	412	0	0	0	0	0	0
	413	0	0	0	0	0	0
	UX.	1712	2313	-601	100	100	
	TTS %	74					
	414	0	0	0	0	0	0
	415	27	394	-367	1	21	-20
	416	530	0	530	25	0	25
	417	477	191	286	22	10	12
	418	769	795	-26	36	42	-6
	419	239	313	-74	11	17	-5
	420	103	192	-89	5	10	-5
	BROCK	2145	1885	260	100	100	
	TTS %	114					
	DURHAM	56790	71224	-14434			
	TTS %	80					

TTS VS SCHOOL ENROLLMENTCOMMENTS ON SPECIFIC ZONES

ZONE NO.	COMMENT
215	No explanation
248,249	It appears high school students (Z249) were coded to an abutting zone Z248)
250-253	No explanation
254,257	It appears high school students (Z254) were coded to an abutting zone (Z257)
262	High school in Z262 may be under reported.
280,281	The zone limit change in 1985 does not appear to be reflected in TTS trip ends.
284	High school students in Z284 may be under reported
299,304	Durham College (Z304) appears to be assigned incorrectly to abutting zone (Z299).
313,326	High school students (Z326) appears to be assigned incorrectly to abutting zone (Z313).
319,321	High school students (Z319) appears to be assigned incorrectly to diagonally abutting zone (Z321)
327,328	There are a number of schools in each of these zones including a high school. It appears the high school students (Z328) were incorrectly assigned to zone (Z327)
330,332	High school students (Z332) appear to be incorrectly assigned to zone (Z330).
354,355	High School students (Z354) appear to be incorrectly assigned to zone (Z355)
371-374	Central Bowmanville requires further work
390	No explanation
400	Contains a High School
408	Contains a High School
411	No explanation
414 - 420	There is only 1 elementary and 12 secondary students in the Durham Board that are non-residents
	Students (Z415) appear to have been erroneously assigned to zoned (Z416). Further analysis is required.

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED ADJUSTED

TARMS ZONE	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERENCE #	PERCENT DISTRIBUTION TTS	PERCENT DISTRIBUTION ENROLLMENT	% DIST. DIFFERENCE	COMMENTS
211	110	290	-180	2	3	-1	
212	134	303	-169	2	3	-1	
213	0	0	0	0	0	0	
214	45	0	45	1	0	1	
215	1923	2141	-218	29	24	5	
216	0	0	0	0	0	0	
217	926	1347	-421	14	15	-1	
218	334	569	-235	5	6	-1	
219	44	0	44	1	0	1	
220	624	681	-57	9	8	1	
221	1121	1765	-644	17	20	-3	
222	0	0	0	0	0	0	
223	0	0	0	0	0	0	
224	0	0	0	0	0	0	
225	0	0	0	0	0	0	
226	0	0	0	0	0	0	
227	90	0	90	1	0	1	
228	356	601	-245	5	7	-2	
229	0	0	0	0	0	0	
230	465	776	-311	7	9	-2	
231	21	0	21	0	0	0	
232	0	0	0	0	0	0	
233	0	0	0	0	0	0	
234	0	0	0	0	0	0	
235		0	0	0	0	0	
236	0	0	0	0	0	0	
237	0	0	0	0	0	0	
238	0	0	0	0	0	0	
239	0	0	0	0	0	0	
240	0	0	0	0	0	0	
241	227	236	-9	3	3	0	
242	0	0	0	0	0	0	
243	217	240	-23	3	3	0	
PIC.	6637	8949	-2312	100	100		
TTS %	74						
244	22	0	22	0	0	0	+private
245	0	0	0	0	0	0	
246	0	0	0	0	0	0	
247	90	0	90	1	0	1	
248	0	0	0	0	0	0	356 to z249
249	356	367	-11	6	4	2	356 from z248
250	465	0	465	8	0	8	
251	21	1228	-1207	0	13	-13	
252	0	968	-968	0	10	-10	
253	0	392	-392	0	4	-4	
254	800	1038	-238	13	11	2	800 from z257
255	0	0	0	0	0	0	

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED ADJUSTED

TARMS ZONE	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERENCE #	PERCENT DISTRIBUTION TTS	ENROLLMENT	% DIST. DIFFERENCE	COMMENTS
256	0	0	0	0	0	0	
257	300	405	-105	5	4	1	800 to z254
258	15	0	15	0	0	0	
259	0	0	0	0	0	0	
260	407	744	-337	7	8	-1	
261	169	0	169	3	0	3	
262	3309	4474	-1165	55	47	8	+private 8
263	66	0	66	1	0	1	
264	0	0	0	0	0	0	
AJAX	6020	9616	-3596	100	100		
TTS %	63						
265	20	0	20	0	0	0	
266	0	0	0	0	0	0	
267	0	0	0	0	0	0	
268	0	0	0	0	0	0	
269	0	0	0	0	0	0	
270	0	0	0	0	0	0	
271	0	0	0	0	0	0	
272	0	0	0	0	0	0	
273	0	0	0	0	0	0	
274	29	0	29	0	0	0	
275	213	209	4	3	2	1	
276	29	0	29	0	0	0	
277	502	510	-8	6	6	0	
278	947	880	67	12	10	2	
279	365	427	-62	5	5	0	
280	1819	2167	-348	23	24	0	486 from z281
281	0	0	0	0	0	0	486 to z280
282	1175	1323	-148	15	14	1	
283	144	260	-116	2	3	-1	
284	1095	1650	-555	14	18	-4	
285	533	745	-212	7	8	-1	
286	414	467	-53	5	5	0	
287	0	0	0	0	0	0	
288	0	0	0	0	0	0	
289	0	0	0	0	0	0	
290	0	0	0	0	0	0	
291	21	0	21	0	0	0	
292	0	0	0	0	0	0	
293	0	0	0	0	0	0	
294	469	499	-30	6	5	1	
295	0	0	0	0	0	0	
296	0	0	0	0	0	0	
WHITBY	7775	9137	-1362	100	100		
TTS %	85						
297	0	0	0	0	0	0	

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1.
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED ADJUSTED

TARMS ZONE	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERENCE #	PERCENT DISTRIBUTION TTS	PERCENT DISTRIBUTION ENROLLMENT	% DIST. DIFFERENCE	COMMENTS
298	0	0	0	0	0	0	
299	0	0	0	0	0	0	1669 to z304
300	112	63	49	0	0	0	
301	0	0	0	0	0	0	
302	45	60	-15	0	0	0	
303	160	171	-11	1	1	0	
304	1842	2651	-809	8	9	-1	1669 from z299
305	0	0	0	0	0	0	
306	0	0	0	0	0	0	128 to z307
307	646	641	5	3	2	0	128 from z306
308	607	1091	-484	3	4	-1	
309	23	0	23	0	0	0	
310	0	0	0	0	0	0	
311	0	0	0	0	0	0	
312	0	0	0	0	0	0	
313	0	0	0	0	0	0	1086 to z326
314	541	613	-72	2	2	0	
315	0	575	-575	0	2	-2	
316	2070	1910	160	9	7	2	
317	29	0	29	0	0	0	
318	823	1029	-206	3	4	-1	
319	1966	1683	283	8	6	2	1561 from z321
320	624	0	624	3	0	3	
321	0	0	0	0	0	5	1561 to z319
322	1599	1125	474	7	4	3	
323	247	381	-134	1	1	0	
324	1008	499	509	4	2	2	
325	52	871	-819	0	3	-3	
326	1432	1717	-285	6	6	0	1086 from z313
327	1092	1283	-191	5	5	0	1000 to z327
328	1457	1606	-149	6	6	0	1000 from z327
329	80	151	-71	0	1	-1	
330	318	364	-46	1	1	1	800 to z332
331	1021	1344	-323	4	5	-1	
332	871	1019	-148	4	4	0	800 from z330
333	455	0	455	2	0	2	
334	497	1000	-503	2	4	-2	
335	0	0	0	0	0	0	
336	749	1218	-469	3	4	-1	
337	45	220	-175	0	1	-1	
338	447	733	-286	2	3	-1	
339	22	17	5	0	0	0	+private
340	0	0	0	0	0	0	
341	248	272	-24	1	1	0	
342	242	399	-157	1	1	0	
343	22	0	22	0	0	0	
344	23	0	23	0	0	0	
345	0	0	0	0	0	0	

TTS SCHOOL TRIP ENDS VERSES SCHOOL ENROLLMENT

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED ADJUSTED

TARMS ZONE	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERENCE #	PERCENT DISTRIBUTION TTS	PERCENT DISTRIBUTION ENROLLMENT	% DIST. DIFFERENCE	COMMENTS
346	0	0	0	0	0	0	
347	2092	2942	-850	9	10	-1	
348	496	662	-166	2	2	0	+private
349	0	0	0	0	0	0	
0 OSHAWA	24003	28310	-4307	100	100		
TTS %	85						
350	0	0	0	0	0	0	
351	0	160	-160	0	2	-2	
352	0	0	0	0	0	0	
353	55	0	55	1	0	1	
354	708	958	-250	13	13	0	449 from z355
355	130	150	-20	2	2	0	449 to z354
356	0	72	-72	0	1	-1	
357	0	0	0	0	0	0	
358	0	0	0	0	0	0	
359	169	256	-87	3	3	0	
360	0	0	0	0	0	0	
361	0	0	0	0	0	0	
362	154	479	-325	3	6	-3	
363	0	0	0	0	0	0	
364	0	0	0	0	0	0	
365	0	0	0	0	0	0	
366	145	111	34	3	1	2	
367	0	0	0	0	0	0	
368	0	0	0	0	0	0	
369	0	0	0	0	0	0	
370	587	909	-322	10	12	-2	
371	55	377	-322	1	5	-4	
372	234	285	-51	4	4	0	
373	1333	1423	-90	24	19	5	
374	786	549	237	14	7	7	
375	0	0	0	0	0	0	
376	201	174	27	4	2	2	+private
377	0	0	0	0	0	0	
378	0	0	0	0	0	0	
379	0	0	0	0	0	0	
380	0	0	0	0	0	0	
381	0	0	0	0	0	0	
382	0	0	0	0	0	0	
383	0	0	0	0	0	0	
384	0	0	0	0	0	0	
385	49	314	-265	1	4	-3	
386	0	0	0	0	0	0	
387	53	76	-23	1	1	0	
388	0	0	0	0	0	0	
389	513	772	-259	9	10	-1	
390	292	277	15	5	4	1	

DISK: TTS TRIP ENDS FILE: SCHOOL1.WK1
TRANSPORTATION TOMORROW SURVEY TRIP ENDS EXPANDED ADJUSTED

TARMS ZONE	TTS TRIPENDS #	SCHOOL ENROLLMENT #	DIFF-ERENCE #	PERCENT DISTRIBUTION TTS	PERCENT DISTRIBUTION ENROLLMENT	% DIST. DIFFERENCE	COMMENTS
391	142	183	-41	3	2	1	
392	0	0	0	0	0	0	
393	0	0	0	0	0	0	
394	35	42	-7	1	1	0	
NEW.	5641	7567	-1926	100	100		
TTS %	75						
395	0	0	0	0	0	0	
396	0	0	0	0	0	0	
397	0	0	0	0	0	0	
398	648	590	58	23	17	6	
399	0	0	0	0	0	0	
400	402	611	-209	14	18	-4	
401	1659	2039	-380	58	59	-1	
402	0	0	0	0	0	0	
403	71	83	-12	2	2	0	
404	53	0	53	2	0	2	
405	24	124	-100	1	4	-3	
0 SCUGOG	2857	3447	-590	100	100		
TTS %	83						
406	125	188	-63	7	8	-1	
407	0	0	0	0	0	0	
408	1292	1885	-593	75	81	-6	
409	0	0	0	0	0	0	
410	0	0	0	0	0	0	
411	295	240	55	17	10	7	
412	0	0	0	0	0	0	
413	0	0	0	0	0	0	
UX.	1712	2313	-601	100	100		
TTS %	74						
414	0	0	0	0	0	0	
415	557	394	163	26	21	5	530 from z416
416	0	0	0	0	0	0	530 to z415
417	477	191	286	22	10	12	
418	769	795	-26	36	42	-6	
419	239	313	-74	11	17	-5	
420	103	192	-89	5	10	-5	
BROCK	2145	1885	260	100	100		
TTS %	114						
DUR.	56790	71224	-14434				
TTS %	80						

APPENDIX 6.3

TRIP ATTRACTIONS: SHOPPING TRIPS

FROM : Dave F. Crowley
Pentti Suokas

DATE : April 12, 1988

FROM: D.F. Crowley

DATE: April 12, 1988

TO: TTS Data Validation Team

SUBJECT: Analysis of TTS Shopping Trips

COPY: Wayne Nicholl

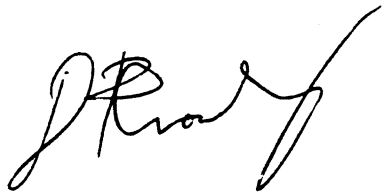
I have compared the distribution of TTS shopping trips (by TARMS zone) with the location of selected major shopping centres in the Toronto area, as a preliminary check on the geocoding of shopping centre locations and in order to assess the relationship between gross retail floor area and estimated shopping trips.

Exhibit 1 lists major centres by name, showing location (TARMS zone), gross floor area, and number of shopping trips recorded on the average weekday for the subject TARMS zone. Note that in many cases the TARMS zones contain more than one shopping centre/area and hence the reported shopping trips will overstate the attraction of the centre identified.

All but one of the thirty-two centres identified appear to be correctly located (the Promenade Mall in the Town of Vaughan appears to have been assigned to traffic zone 749 rather than traffic zone 751).
Generally there appears to be a consistent relationship between reported shopping trips and shopping centre size. For example, major regional centres such as Yorkdale, Sherway Gardens, Scarborough City Centre and Square One all attract approximately 12,000 to 13,000 shopping trips on the average weekday. The differences observed between the average daily trip attraction for malls of similar size appear to be explainable. For example, the TARMS zone containing Hillcrest Mall in Richmond Hill attracted fewer trips than the zone containing the smaller Markdale Mall in nearby Markham. This result was expected given that Sears had moved from Hillcrest Mall to the new Promenade Shopping Centre which opened just prior to the survey, leaving Hillcrest much less attractive as a shopping destination.

I have not been able to assess the shopping trip generation rate in relation to gross floor area given the available data. However, there generally appears to be an inverse relationship between average daily shopping trip-ends and gross floor area as would normally be expected.

My general impression is that the data on shopping trip-ends is consistent with the distribution of major shopping centres. Further research is required to assess the extent of any underreporting of shopping and other trips to specific centres. The information required for this analysis is currently not available.



11-111-71
Attachments

EXHIBIT 1

TTS SHOPPING TRIPS FOR MAJOR SHOPPING CENTRES

NAME OF MAJOR SHOPPING CENTRE	TARMS ZONE	M^2 (,000)	# OF SHOPPING TRIPS
Metro Toronto			
Eaton Centre	26	160.3	14152
Dufferin Mall	60	52.2	3297
Yorkdale	87	120.8	12374
Thorncliffe S.C.	144	41.9	2482
Don Mills Centre	173	46.5	4743
Shoppers World-Danforth	188	23.0	1147
Cloverdale Mall	240	32.6	6735
Sherway Gardens	251	92.9	11485
Woodbine Centre	263	60.8	3387
Rexdale Plaza	266	23.1	2089
Jane-Finch Mall	287	21.7	2476
Sheridan Mall	293	42.7	3574
Towne & Countrye Square	302	61.8	5393
Fairview Mall	324	65.0	8312
Scarborough City Centre	333	101.0	12049
Cedarbrae Plaza	338	36.3	4449
Eglinton Square	347	28.8	5660
Warden Woods Plaza	348	28.4	2531
Agincourt Mall	398	27.4	3592

11-111-71
April 11, 1988

Service Planning Department

REGION	NAME OF SHOPPING CENTRE	TARMS	M^2 (in thousands)	# OF SHOPPING TRIPS
York (Vaughan)	Promenade* (in 749 but should be in 751)	749	83.9	3,927
York (Richmond Hill)	Hillcrest Mall	661	51.0	3,886
York (Markham)	Markville Mall	688	45.5	4,606
Durham (Pickering)	Pickering Town Centre	427	32.2	7,211
York (Newmarket)	Upper Canada Mall	631	33.5	5,745
Peel (Mississauga)	Dixie Plaza	785	47.5	4,658
Peel (Mississauga)	Rockwood Mall	818	25.8	1,723
Peel (Mississauga)	Square One	815	98.2	13,257
Peel (Mississauga)	Sheridan Mall	787	27.8	2,829
Peel (Mississauga)	Meadowvale Town Centre	855	32.5	3,105
Peel (Mississauga)	Westwood Mall	848	29.3	2,587
Peel (Brampton)	Shopper's World	903	70.2	5,907
Peel (Brampton)	Bramalea City Centre	893	92.0	8,536

11-111-71
April 11, 1988

Service Planning Department

TORONTO, EAST YORK, & YORK

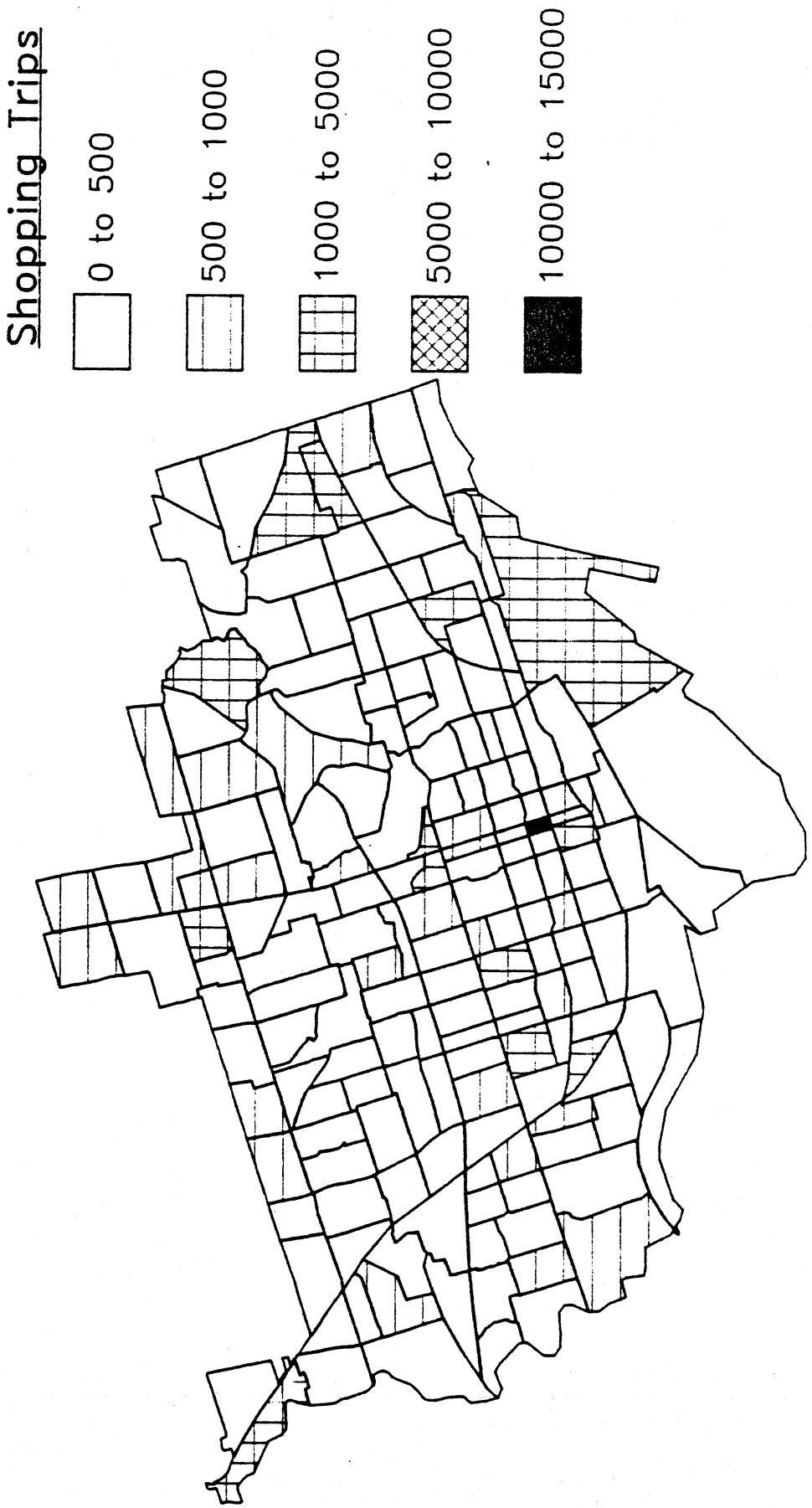
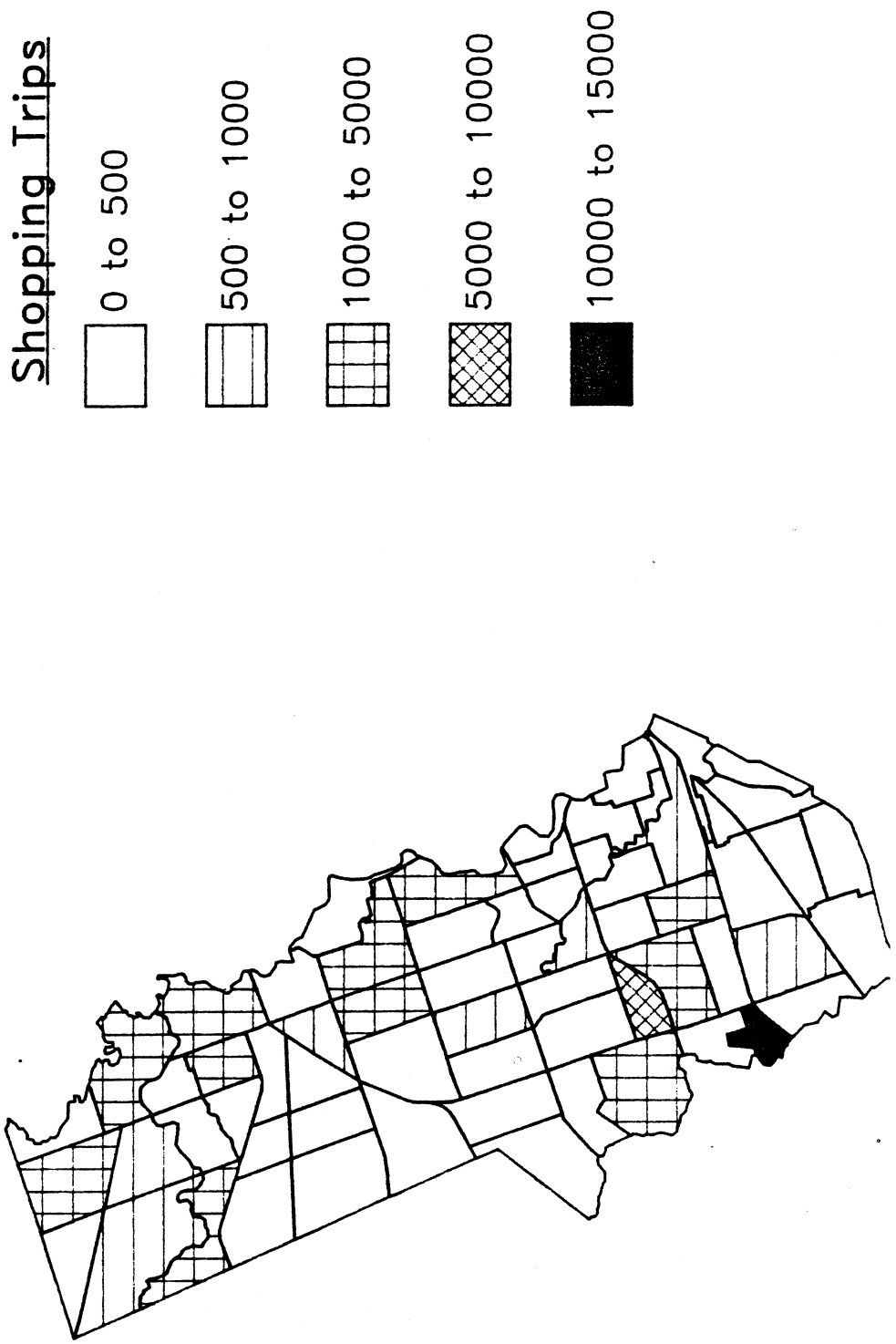
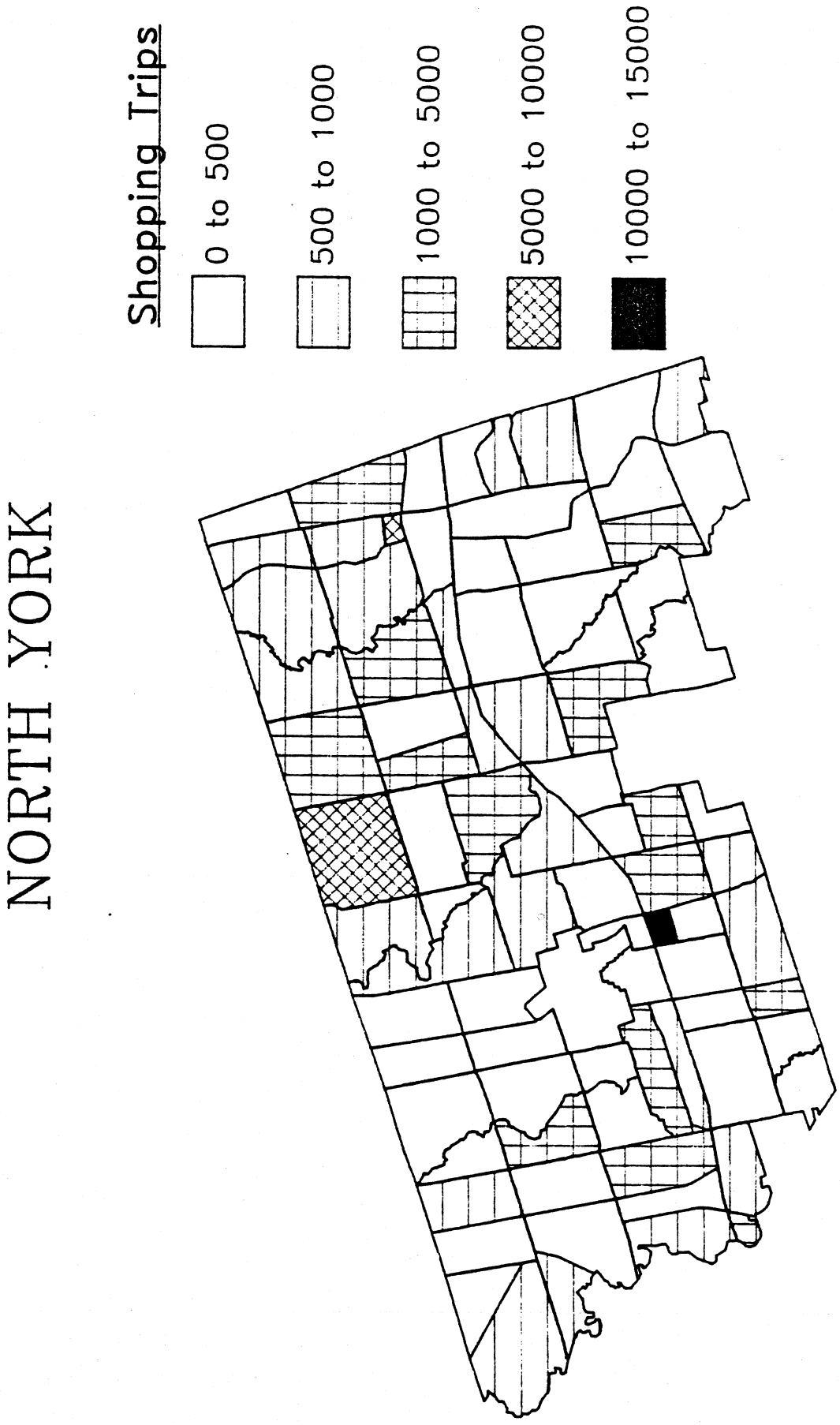
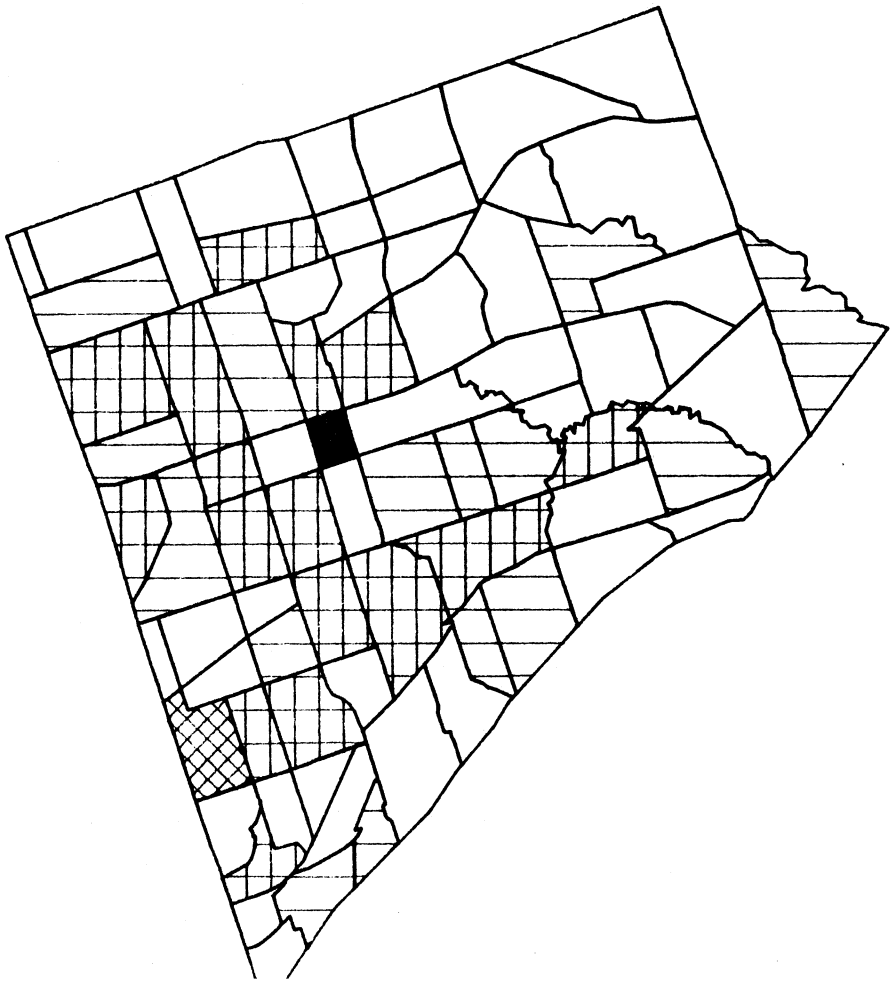


EXHIBIT 2B


Shopping Trips
0 to 500
500 to 1000
1000 to 5000
5000 to 10000
10000 to 15000
ETOBICOKE


Shopping Trips
0 to 500
500 to 1000
1000 to 5000
5000 to 10000
10000 to 15000
NORTH YORK

SCARBOROUGH

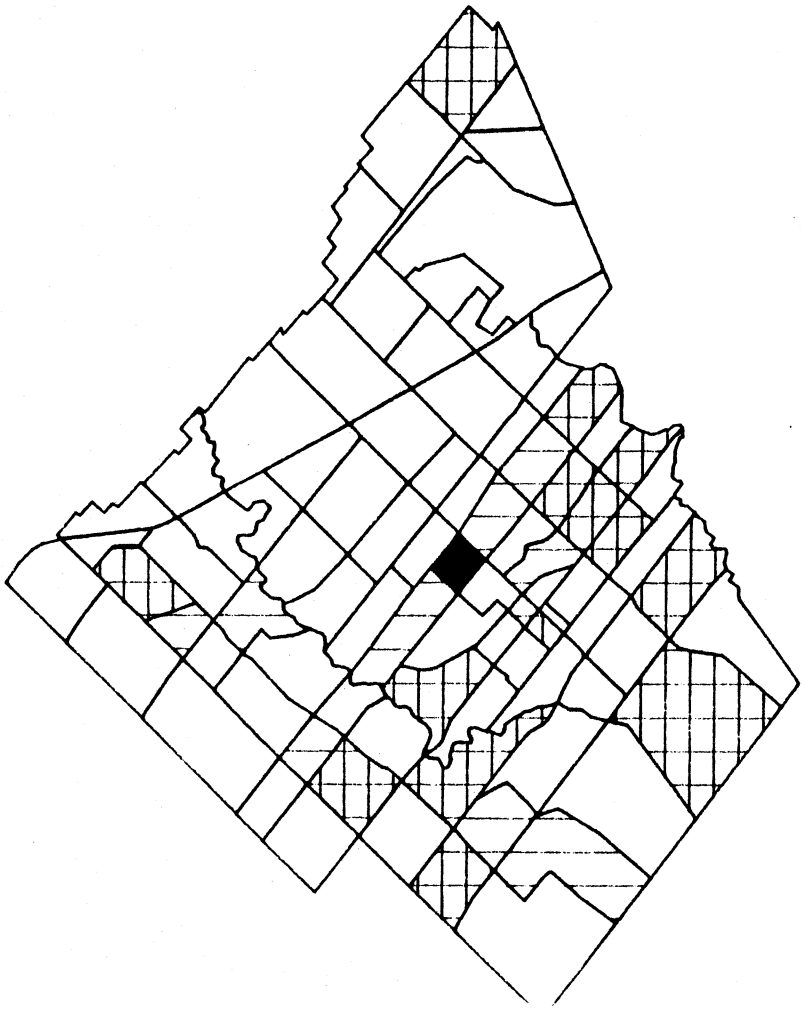


Shopping Trips

- 0 to 500
- 500 to 1000
- 1000 to 5000
- 5000 to 10000
- 10000 to 15000

EXHIBIT 2D

MISSISSAUGA

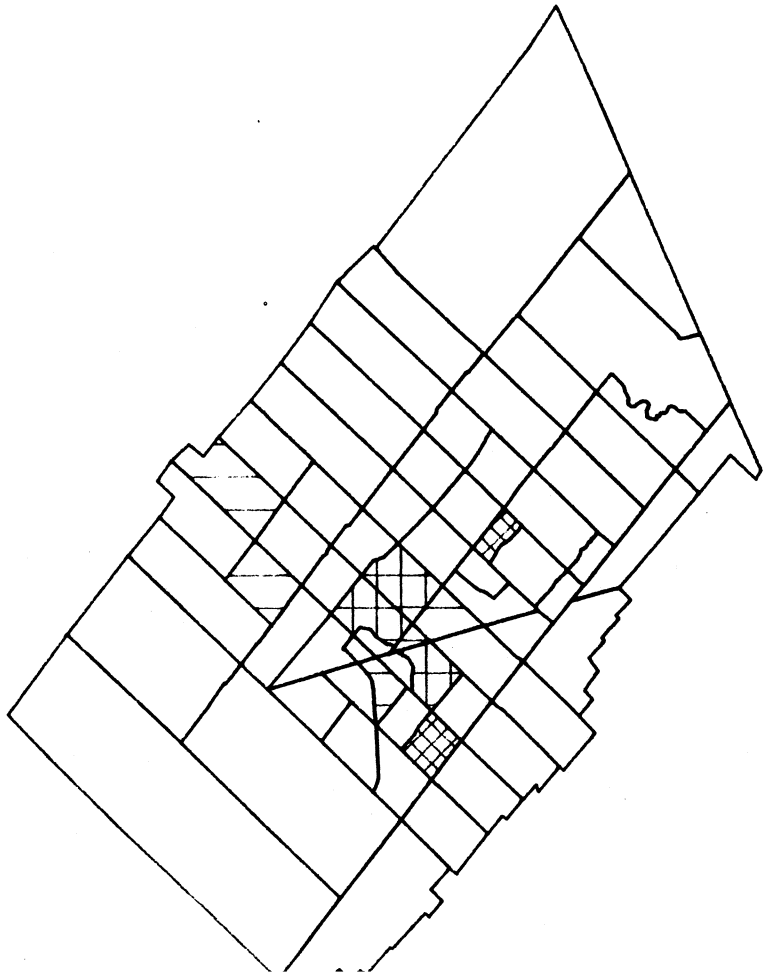


Shopping Trips

- 0 to 500
- 500 to 1000
- 1000 to 5000
- 5000 to 10000
- 10000 to 15000

EXHIBIT 2E

BRAMPTON

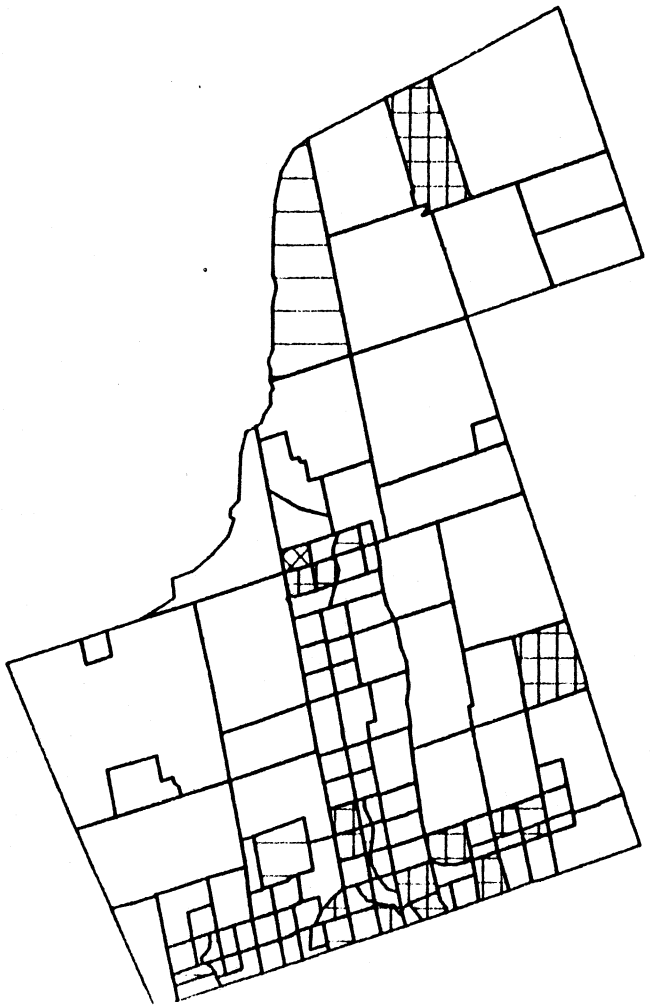


Shopping Trips

- 0 to 500
- 500 to 1000
- 1000 to 5000
- 5000 to 10000
- 10000 to 15000

EXHIBIT 2F

REGION OF YORK



Shopping Trips

- 0 to 500
- 500 to 1000
- 1000 to 5000
- 5000 to 10000
- 10000 to 15000

EXHIBIT 2G

APPENDIX 7

SCREENLINE COUNT COMPARISONS

FROM : Martin R. Seekings

DATE : April 20, 1988

The Municipality of
Metropolitan Toronto

Planning Department

MEMORANDUM

DATE: April 20, 1988

TO: Data Validation Team

FROM: Martin Seekings

RE: TTS and Cordon Count Screenline Comparisons

The accompanying Table shows comparisons between 1987 Metro Cordon Count data and TTS trip data derived from 26x26 zone O-D tabulations by mode, purpose and time period. Comparisons were made at 6 screenlines (East, West and North Metro boundaries, Humber River, Highway 401 south side and Uxbridge Subdivision), for three modes (auto drivers, transit passengers and total persons) and three time periods (12 hour, a.m. peak and p.m. peak periods).

The trip O-D's assumed to cross each screenline are listed following the table. The coarseness of the zone system and lack of a network assignment meant that some inaccuracies in the allocation of trips was inevitable. For example, the assumption that all trips between York Region and Pickering, Ajax, Whitby and Oshawa would cross the North and East Metro boundaries and the Uxbridge Subdivision would result in an overestimation.

The 12 hour comparisons were made on the basis of trip start times between 7:00 a.m. and 7:00 p.m., and on screenline counts for the same period. For the a.m. peak period, the TTS tabulations for trips beginning between 6:30 and 8:30 a.m. were taken as equivalent to screenline counts taken from 7:00 to 9:00 a.m.; in the p.m., tabulations for trip start times of 3:45 to 5:45 p.m. were compared to screenline counts between 4:00 and 6:00 p.m. This was another simplifying assumption, based on examination of the TTS O-D tables for various different two-hour periods. 7:00 a.m. to 7:00 p.m. was the only 12 hour period for which TTS tables were available.

TTS auto driver trips were compared to screenline vehicle counts of private autos (excluding taxis and trucks); TTS transit trips were compared to combined counts of bus, subway and GO Rail passengers, and TTS all-mode trips were compared with total person screenline counts (which exclude pedestrians, truck occupants and bus and taxi drivers). It should be remembered that the TTS tabulations do not include trips made by non-residents of the G.T.A., or of trips made by residents to or from external locations, since all external trip ends were assigned to one zone and could not be allocated to screenlines. Park'n'Ride and Kiss'n'Ride trips which are classified in the TTS as "transit" trips will be counted as auto trips where they cross screenlines in the auto driver or auto passenger mode; this will be particularly significant at the Metro boundary screenlines. Also, persons beginning trips outside Metro and walking to transit services within Metro are not recorded in the screenline counts; this would be most significant at the North Metro boundary.

Given the relative crudity of the analysis, the following general observations can be made:

- Twelve-hour TTS trips fall short of screenline volumes by a considerable amount in all cases, except for transit trips across the North Metro boundary, possibly due to the effects noted above.

- Peak period TTS flows are generally much closer to the counts, more so for transit than auto. A major exception is for auto travel across the Highway 401 south screenline; in this case, trips from, e.g., central Etobicoke (Zone 3) to central Scarborough (Zone 6) would take Highway 401 as the fastest route and be recorded twice in the screenline counts, but would not be allocated to this screenline in the TTS tabulations; this may occur to a lesser extent at the North Metro boundary, e.g. with trips between two points in York Region using Steeles Avenue.

The findings support the conclusions of other analyses of the TTS (and of previous surveys) that home-based work and school trips, which form the bulk of peak period trips, particularly on transit, are the most accurately reported, since they are taken on a regular and predictable basis. Other trips which occur during

off-peak periods, including discretionary trips and non-home based trips, particularly those made by non-respondents, are generally under-reported.

This analysis permits only some general conclusions to be drawn; any more detailed comparison between survey data and roadside counts will require assignment of trips to transportation networks based on a much finer zone system.

COMPARISON OF TTS TRIP TABLES WITH 1987 CORDON COUNTS AT MAJOR SCREENLINES

		12 HOUR INBOUND		12 HOUR OUTBOUND		AM PEAK INBOUND		PM PEAK OUTBOUND	
SCREENLINE	MODE	TTS	COUNT	TTS	COUNT	TTS	COUNT	TTS	COUNT
HUMBER RIVER	DRIVERS	182,461	245,984	178,361	227,555	63,463	56,834	56,996	52,336
	TRANSIT	66,528	93,400	67,480	90,780	42,791	41,530	35,068	39,131
	ALL MODES	282,781	402,222	276,667	372,006	116,226	109,748	102,614	105,458
HWY. 401 (S. SIDE)	DRIVERS	276,109	523,829	274,574	522,031	89,814	114,572	86,039	122,164
	TRANSIT	112,755	166,349	111,750	165,024	63,923	62,769	50,979	56,564
	ALL MODES	443,614	819,083	437,975	814,859	170,176	201,573	154,016	211,321
CN UXBRIDGE SUB.	DRIVERS	126,721	174,888	129,979	171,069	51,537	47,449	48,367	49,855
	TRANSIT	44,282	66,327	48,473	65,455	29,131	29,664	23,763	25,924
	ALL MODES	197,973	287,174	203,544	279,646	88,484	87,360	80,943	88,845
WEST BOUNDARY	DRIVERS	157,989	246,179	158,282	233,080	62,700	61,981	55,657	60,509
	TRANSIT	30,832	48,907	34,255	44,612	25,807	22,558	20,544	20,146
	ALL MODES	215,911	363,031	218,098	337,861	98,273	96,791	86,660	97,333
NORTH BOUNDARY	DRIVERS	132,419	217,056	130,327	212,490	43,490	55,299	40,905	54,839
	TRANSIT	23,507	19,436	23,681	25,795	13,512	8,278	11,115	8,909
	ALL MODES	180,251	293,082	178,624	290,970	64,154	75,421	60,023	77,461
EAST BOUNDARY	DRIVERS	41,031	51,187	42,369	48,844	19,255	14,218	18,086	14,023
	TRANSIT	4,766	9,251	6,333	11,551	4,942	4,307	4,517	3,528
	ALL MODES	53,266	75,104	56,399	71,974	27,111	21,001	25,524	20,525

NOTES: 12 HOUR = 7:00 A.M.-7:00 P.M.
AM PEAK = 6:30-8:30 FOR TTS, 7:00-9:00 FOR CORDON COUNT
PM PEAK = 3:45-5:45 FOR TTS, 4:00-6:00 FOR CORDON COUNT

TTS DOES NOT INCLUDE TRIPS TO OR FROM OUTSIDE THE G.T.A.

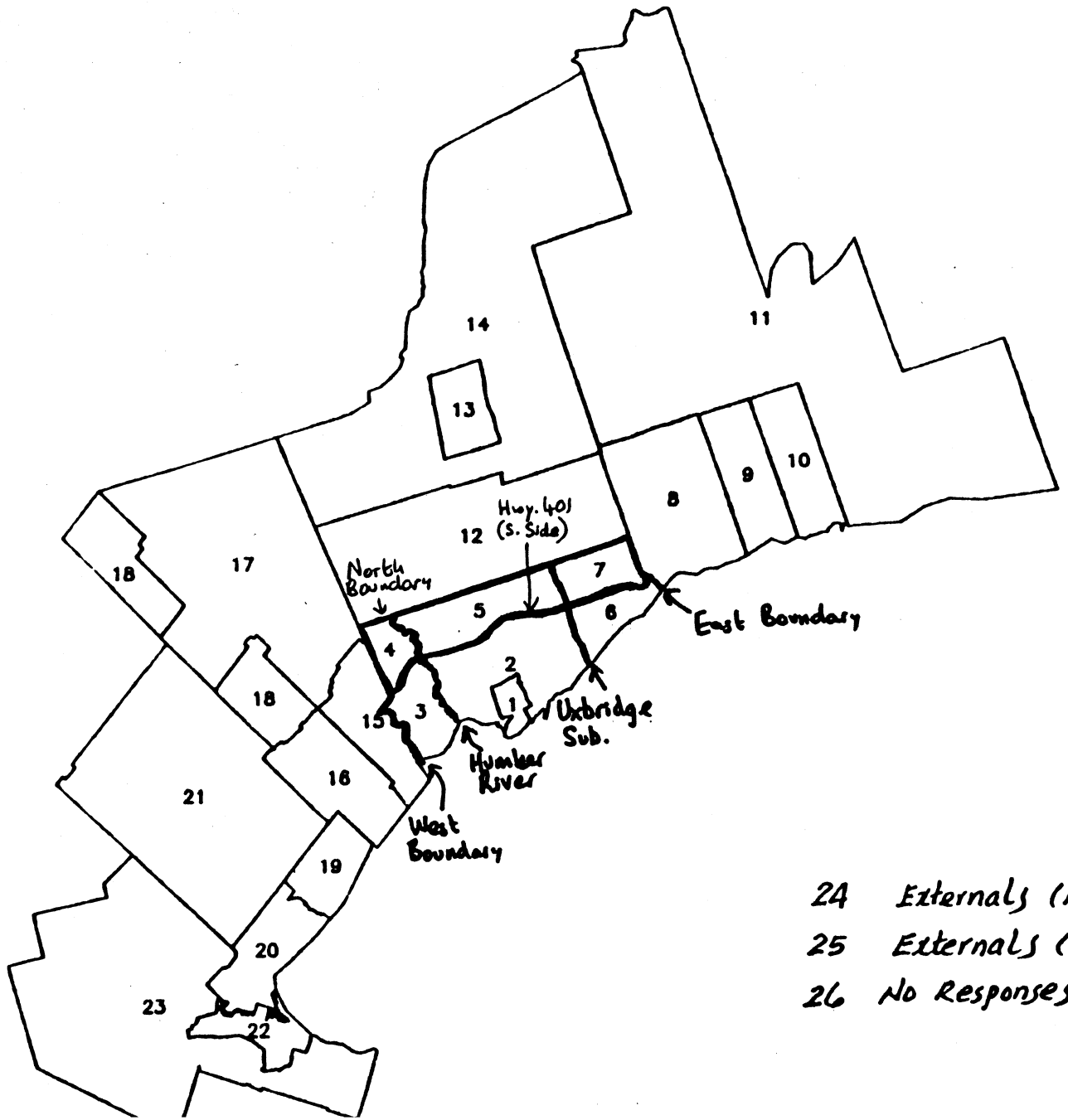
20-Apr-88

COMPARISON OF TTS TRIP TABLES WITH 1987 CORDON COUNTS AT MAJOR SCREENLINES

SUMMARY OF TRIP O-D'S ASSUMED TO CROSS SCREENLINES (INBOUND DIRECTION)

SCREENLINE	FROM ZONES	TO ZONES
HUMBER RIVER	3,4,15,16,19-23	1,2,5-14
	17,18	1,2,5-10
HWY. 401 (S. SIDE)	4,5,7-14	1-3,6,19,20,22,23
	17,18,21	1,2,3,6
UXBRIDGE SUB.	6-10	1-5,12-23
	11	1-5,15-23
WEST BOUNDARY	15,16,19-23	1-14
	17,18	1-10
NORTH BOUNDARY	12-14	1-10,15,16,19-23
EAST BOUNDARY	8-10	1-7,12-23
	11	1-7,15-23

20-Apr-88



24 Externals (1266-1400)

25 Externals (1401-9998)

26 No Responses (9999)

APPENDIX 8

TRANSIT ASSIGNMENTS BY MADITUC

FROM : Dave F. Crowley

DATE : April 12, 1988

FROM: D.F. Crowley

DATE: April 12, 1988

TO: TTS Data Validation Team

SUBJECT: Comparison Of TTC Counts For AM Peak Period With Reported TTS Transit Travel By Route

COPY: Wayne Nicholl

I have compared reported TTS trips assigned by MADITUC to TTC surface routes with TTC riding count data for the period of the survey. The MADITUC assignment of TTC trips, using a very liberal access/egress validation filter of 99 km, resulted in the loss of five to ten percent of reported TTS transit trips and therefore the total reported transit trips will be understated by up to ten percent.

Table 1 presents MADITUC/TTS estimates vs actual counts for previous to 9:00 AM. Of the 135 routes listed, thirty-six are within plus or minus ten percent of the observed ridership, seventy are within plus or minus twenty percent and ninety-six are within plus or minus thirty percent. Generally, most major routes serving suburban corridors are accurately reported whereas low ridership routes or routes which overlap with other services may be subject to larger estimation errors. For example, ridership on the St. Andrews (78), Silver Hills (115), Graydon Hall (122) and Neilson (133) services is substantially underestimated whereas ridership on the York Mills (95) service is overestimated. This situation results from the fact that transit riders reported that they boarded the bus on York Mills and hence were coded to the York Mills (95) service rather than the services which they actually used. Similar patterns of over and underestimation were observed for Malton, Lawrence, and Eglinton East routes.

A review of the spatial distribution of over and underreporting on TTC surface routes suggests that most major suburban routes feeding the subway system were accurately reported (plus or minus ten or twenty percent) but there is a tendency for the TTS results to understate trips on routes serving industrial areas and inner city

ethnic communities. This result suggests that non-English speaking transit captives who are over-represented on the majority of the subject routes may be under-represented in the TTS sample.

Generally AM peak period ridership on TTC surface routes appears to be within twenty percent of observed ridership, with greater accuracy being achieved on major suburban routes. I am proceeding with transit route coding and geocoding correction in an effort to reduce observed transit errors further.

11-111-71

TABLE 1

MADITUC COUNTS VS ACTUAL COUNTS (PREVIOUS TO 9:00AM)
(SORTED ACCORDING TO PERCENT)

	madituc	riding count	difference	per cent
FINCH VIA ALLEN	603.2	2139	-1535.8	-71.8%
DOWNTOWNER	799.6	2272	-1472.4	-64.8%
EDWARDS GARDENS	72.5	202	-129.5	-64.1%
ALNESS	532.1	1380	-847.9	-61.4%
MIDDLEFIELD	274.5	660	-385.5	-58.4%
JUNCTION TC	724.1	1702	-977.9	-57.5%
HUMBER BLVD	219.0	503	-284.0	-56.5%
GERRARD	327.2	734	-406.8	-55.4%
SILVER HILLS	186.8	406	-219.2	-54.0%
GRAYDON HALL	543.2	1125	-581.8	-51.7%
VAUGHAN	1454.6	2975	-1520.4	-51.1%
NORTOWN EAST TC	684.3	1382	-697.7	-50.5%
SHORNCLIFFE	493.5	961	-467.5	-48.6%
MAPLE LEAF	640.3	1239	-598.7	-48.3%
GRANDRAVINE	327.9	616	-288.1	-46.8%
KEELE NORTH	1099.9	2057	-957.1	-46.5%
HORNER	1065.4	1982	-916.6	-46.2%
ANCASTER PARK	153.6	275	-121.4	-44.1%
MCCOWAN NORTH	1139.3	2004	-864.7	-43.1%
OAKDALE	445.6	777	-331.4	-42.7%
QUEENSWAY	857.9	1450	-592.1	-40.8%
BAYVIEW	473.3	798	-324.7	-40.7%
KINGSTON ROAD TRIPPER	1024.3	1670	-645.7	-38.7%
CALEDONIA	2117.9	3412	-1294.1	-37.9%
CALVINGTON	574.2	915	-340.8	-37.2%
MALTON	2048.1	3217	-1168.9	-36.3%
BAY TC	4682.4	7226	-2543.6	-35.2%
WOODBINE SOUTH	547.1	836	-288.9	-34.6%
THORNCLIFFE PARK	1812.1	2744	-931.9	-34.0%
SCARBORO	2210.2	3344	-1133.8	-33.9%
EGLINTON WEST	7099.3	10684	-3584.7	-33.6%
FLEMINGDON PARK	3093.9	4449	-1355.1	-30.5%
KINGSTON ROAD	2214.4	3156	-941.6	-29.8%
EVANS	1066.0	1518	-452.0	-29.8%
PRINCE EDWARD	1142.0	1617	-475.0	-29.4%
OSSINGTON	6054.8	8525	-2470.2	-29.0%
SPADINA	5139.4	7002	-1862.6	-26.6%
ST ANDREWS	466.0	631	-165.0	-26.1%
SHERBOURNE	1986.9	2685	-698.1	-26.0%
LANSDOWNE TC	2576.0	3433	-857.0	-25.0%
RANEE	1089.3	1449	-359.7	-24.8%
PAPE	2008.8	2629	-620.2	-23.6%
BATHURST SC	4481.4	5851	-1369.6	-23.4%
WESTON TC	3572.8	4658	-1085.2	-23.3%
SCARLETT ROAD	1557.3	2027	-469.7	-23.2%
NEILSON	1060.4	1368	-307.6	-22.5%
MORTIMER	1074.1	1378	-303.9	-22.1%
COSBURN	1319.9	1691	-371.1	-21.9%
MARKHAM ROAD	4027.2	5158	-1130.8	-21.9%
WEST MALL	1742.5	2229	-486.5	-21.8%

YONGE	2148.5	2739	-590.5	-21.6%
DANFORTH ROAD	856.6	1084	-227.4	-21.0%
TAPSCOTT	1321.1	1664	-342.9	-20.6%
BATHURST BUS	6865.2	8633	-1767.8	-20.5%
LONG BRANCH	2453.1	3079	-625.9	-20.3%
ROSEDALE	668.5	833	-164.5	-19.7%
ANNETTE TC	2026.5	2523	-496.5	-19.7%
COXWELL	1430.0	1772	-342.0	-19.3%
MILNER	243.5	301	-57.5	-19.1%
ST CLAIR	7045.5	8692	-1646.5	-18.9%
DUFFERIN	9646.0	11894	-2248.0	-18.9%
GLENCAIRN	1056.4	1302	-245.6	-18.9%
DUNDAS	8104.8	9881	-1776.2	-18.0%
STEELES WEST	4928.3	5970	-1041.7	-17.4%
MIDLAND	3179.7	3849	-669.3	-17.4%
NORTOWN WEST TC	1419.2	1669	-249.8	-15.0%
FAYWOOD	1041.6	1221	-179.4	-14.7%
DOWNSVIEW	2114.5	2475	-360.5	-14.6%
KIPLING SOUTH	2034.3	2375	-340.7	-14.3%
FINCH EAST	9311.5	10787	-1475.5	-13.7%
JANE	10649.3	12193	-1543.7	-12.7%
NUGGET	771.4	883	-111.6	-12.6%
ISLINGTON SOUTH	1612.0	1845	-233.0	-12.6%
BIRCHMOUNT	3897.8	4413	-515.2	-11.7%
KIPLING	6106.3	6909	-802.7	-11.6%
ROYAL YORK SOUTH	1810.8	2041	-230.2	-11.3%
BRIMLEY NORTH	1471.2	1651	-179.8	-10.9%
WELLESLEY	4339.3	4867	-527.7	-10.8%
WARDEN	4763.0	5317	-554.0	-10.4%
EAST MALL	1018.4	1123	-104.6	-9.3%
CARLTON	10172.4	11183	-1010.6	-9.0%
WOODBINE	2470.1	2703	-232.9	-8.6%
LAWRENCE EAST	7779.0	8508	-729.0	-8.6%
LEASIDE	1763.0	1920	-157.0	-8.2%
BLOOR WEST	1506.3	1626	-119.7	-7.4%
CHRISTIE	723.8	778	-54.2	-7.0%
WILLOW-SENLAC	1215.3	1304	-88.7	-6.8%
QUEEN	11927.0	12549	-622.0	-5.0%
BELLAMY	922.5	967	-44.5	-4.6%
PHARMACY	2437.6	2541	-103.4	-4.1%
KING	12336.0	12768	-432.0	-3.4%
KEELE	7892.6	8158	-265.4	-3.3%
WILSON	13315.4	13705	-389.6	-2.8%
LAMBTON	980.8	1005	-24.2	-2.4%
JONES	717.0	732	-15.0	-2.0%
WILSON HEIGHTS	1081.6	1094	-12.4	-1.1%
ANGLESEY	1705.8	1714	2.0	-0.5%
MARTIN GROVE	3804.5	3808	-3.5	-0.1%
RUNNYMEDE	2036.3	2032	4.3	0.2%
DAWES	1724.3	1718	6.3	0.4%
OCONNOR	2588.2	2576	12.2	0.5%
VICTORIA PARK	7193.0	7125	68.0	1.0%
YORK UNIVERSITY	3477.0	3444	33.0	1.0%
ROUGE HILL	190.4	185	5.4	2.9%
SHEPPARD WEST	4895.8	4717	178.8	3.8%
FINCH WEST	10304.4	9743	561.4	5.8%

ROYAL YORK	1636.6	1545	91.6	5.9%
LAWRENCE	8432.4	7874	558.4	7.1%
ISLINGTON	6043.4	5630	413.4	7.3%
DON MILLS	9363.2	8713	650.2	7.5%
AVENUE ROAD	1598.9	1482	116.9	7.9%
CLIFFSIDE	1398.9	1291	107.9	8.4%
SHEPPARD EAST	12011.5	11069	942.5	8.5%
PARLIAMENT	811.2	747	64.2	8.6%
BURNHAMTHORPE	1601.7	1470	131.7	9.0%
LESLIE	1622.3	1474	148.3	10.1%
CUMMER	2953.4	2682	271.4	10.1%
KENNEDY	3845.6	3490	355.6	10.2%
DAVISVILLE	3051.6	2769	282.6	10.2%
EGLINTON EAST	12859.0	11625	1234.0	10.6%
FOREST HILL	821.8	736	85.8	11.7%
GREENWOOD	1515.2	1346	169.2	12.6%
DAVENPORT	969.4	841	128.4	15.3%
STEELES EAST	4185.4	3595	590.4	16.4%
BRIMLEY	1627.6	1390	237.6	17.1%
MCCOWAN	3296.4	2706	590.4	21.8%
MAIN	1948.0	1569	379.0	24.2%
WARDEN SOUTH	1658.2	1277	381.2	29.9%
MT PLEASANT TC	797.0	603	194.0	32.2%
BROADVIEW	874.2	640	234.2	36.6%
DREWRY	1004.7	734	270.7	36.9%
YORK MILLS	9623.0	6769	2854.0	42.2%
CHURCH	520.3	328	192.3	58.6%
ARMOUR HEIGHTS	144.3	87	57.3	65.9%
KINGSTON ROAD EAST	1423.2	854	569.2	66.7%
BAYVIEW NORTH	1531.6	885	646.6	73.1%
TOTAL	399570.9	451950.0		

APPENDIX 9

GENERAL REGIONAL MUNICIPALITY COMMENTS

York	:	John Barnes
Hamilton-Wentworth	:	Andrew Head
Halton	:	Janet Lucht
Peel	:	Ali Mekky

REGION OF YORK

York Region staff have examined the Transportation Tomorrow Survey data with respect to:

1. Monuments coding by TARMS zone.
2. The TARMS zone boundary file.
3. School trips ends.
4. Work trips O/D matrix by municipality.
5. Shopping trip ends.
6. Cordon Screenline checks.

1. Monuments Coding

A detailed examination of the monuments listing by TARMS zone uncovered a fair number of geo-coding errors. These have been corrected and will be incorporated in Version III of the database.

2. TARMS Zone Boundary File

The analysis which was done to correct monuments geo-codes uncovered an additional problem with the file describing the geocode boundaries for TARMS zones throughout the Region. The file was originally prepared by Stats Canada in the '70's to describe and locate enumeration zone centroids. As such, there was not a great emphasis on accuracy. The application of this file to street address locations occassionally resulted in monuments being assigned to adjacent zones. Future refinement of this file will be necessary, but at the present time, it poses only a minor problem.

3. School Trips Ends

The attached table shows the total public and separate school enrollment by TARMS zone matched with version II of the TTS data. Geo-coding for several schools has been corrected, but it appears that there is still substantial variation between zones and even between the degree of reporting by municipality. Some of this variation is due to other schools (community colleges and private schools), but detailed use of these statistics should be undertaken with caution and used as percentage distributions rather than as absolute numbers of trips unless appropriate expansion factors are applied.

SCHOOL TRIPS VERSUS ENROLMENTS - 1986

Municipality	Tarm Zone	Trips	Enrolm.	Comments
Georgina	707	1601	0	* Should have been coded into Zone 712
	708	0	0	
	709	0	0	
	710	0	0	
	711	0	498	Zone 712 trips (275) should be in Zone 711?
	712	275	2024	14% - * Sutton H.S., coded into 707
	713	0	0	
	714	-	727	* Trips were coded into 715
	715	2298	1158	198%
		4174	**4407**	**95%**
				* Monument listing shows coding errors
East Gwillimbury	700	46	0	Should have been coded into 702?
	701	430	403	107%
	702	477	768	62%
	703	0	0	
	704	343	873	39%
	705	113	115	98%
	706	0	0	
		1409	**2159**	**65%**
Newmarket	631	153	0	
	632	1011	1610	63%
	633	2741	3188	86%
	634	0	0	
	635	65	0	
	636	1274	1844	69%
	637	1772	3293	54%
	638	0	0	
	639	152	0	St. Andrews was coded in 639 on monument lists
	640	0	0	
		7168	**9935**	**72%**

SCHOOL TRIPS VERSUS ENROLMENTS - 1986 Cont'd.

Municipality	Tarm Zone	Trips	Enrolm.		Comments
Markham	669	205	198	104%	
	670	1212	1296	94%	
	671	2974	2543	117%	
	672	4712	5260	90%	
	673	338	387	87%	
	674	1375	1500	92%	
	675	1236	1456	85%	
	676	0	0		
	677	0	0		
	678	0	0		
	679	1768	2357	75%	
	680	674	735	92%	
	681	0	0		
	682	0	0		
	683	140	484	29%	
	684	353	649	54%	
	685	68	0		Montessori school s/b in zone 668 on monument
	686	68	0		
	687	1434	2608	55%	
	688	369	415	89%	
	689	919	1429	64%	
	690	3793	5209	73%	
	691	0	521		
	692	294	379	76%	
	693	327	0		Dickson Hill P.S. s/b in zone 692 on monument
	694	0	0		
		22259	**27426**	**81%**	

SCHOOL TRIPS VERSUS ENROLMENTS - 1986 Cont'd.

Municipality	Tarm Zone	Trips	Enrolm.	Comments
Richmond Hill	649	666	601	111%-Some belong in zone 650
	650	27	83	33%
	651	0	0	
	652	43	0	
	653	0	0	
	654	21	0	
	655	24	0	
	656	336	149	225%
	657	1601	2214	72%
	658	42	0	
	659	1122	1866	60%
	660	939	1289	73%
	661	458	1693	27%
	662	42	0	
	663	696	510	136%-Monuments show Walter Scott P.S. should be 659
	664	126	0	
	665	1380	979	141%-Tor. Waldorf School coded 665 on monument list
	666	0	0	
	667	87	0	
	668	24	0	
		7634	9495	80 %

SCHOOL TRIPS VERSUS ENROLMENTS - 1986 Cont'd.

Municipality	Tarm Zone	Trips	Enrolm.	Comments
Vaughan	722	208	498	42%
	723	127	0	Monuments show school but not in listings
	724	0	0	
	725	478	711	67%
	726	42	468	9%
	727	0	0	
	728	2116	3057	69%
	729	0	0	
	730	0	388	
	731	1390	1585	88%
	732	114	0	
	733	0	0	
	734	423	805	53%
	735	21	0	
	736	0	0	
	737	25	0	
	738	0	0	
	739	121	0	
	740	0	0	
	741	26	0	
	742	0	0	
	743	0	0	
	744	0	0	
	745	347	934	37%
	746	0	0	
	747	0	0	
	748	0	0	
	749	0	0	
	750	1301	1476	88%
	751	746	868	86%
	752	21	0	
	753	46	0	
	754	748	1219	61%
		8300	**12009**	**69%**

SCHOOL TRIPS VERSUS ENROLMENTS - 1986 Cont'd.

Municipality	Tarm Zone	Trips	Enrolm.	Comments
Aurora	641	205	1215	Some trips on monument listings were coded into 644
	642	0	0	
	643	0	0	
	644	1999	2641	76%
	645	1064	1256	85%
	646	0	0	
	647	0	0	
	648	0	0	
		3268	**5112**	**64%**
Whitchurch-Stouffville	695	179	211	85%
	696	0	0	
	697	951	1943	49%
	698	139	336	41%
	699	0	0	
		1269	**2490**	**51%**
King	717	1421	192	Some King High got coded at Seneca College?
	718	547	1855	
	719	363	330	110%
	720	265	0	Monument listing shows Brockdale P.S. coded in 720
	721	206	350	59%
		2802	**2727**	**103%**

York Region
Analysis of School Trips Ends

Municipality	TTS School Trips Ends	1986 Public and Separate School Enrollment	TTS/School Percentage
Georgina	4,174	4,407	95%
East Gwillimbury	1,409	2,159	65%
Newmarket	7,168	9,935	72%
Aurora	3,268	5,112	64%
Whitchurch-Stouffville	1,269	2,490	51%
King	2,802	2,727	103%
Vaughan	8,300	12,009	69%
Richmond Hill	7,634	9,495	80%
Markham	22,259	27,426	81%
Total York	**58,283**	**75,760**	**77%**

4. Work Trip Ends by Municipality

The TTS data proves to be very accurate for York Region with respect to work trips. York Region was involved in the pilot study to analyse the 1986 Census Place of Work data and therefore this information is available (at a 10% sample level) to validate the sample from York Region. The matrix comparisons on a 46 X 46 (municipal) zone system are shown in Appendix 2.

The reporting on an absolute number basis is between 70 and 80 percent of the Census place of work information. Given the fact that daily absenteeism and vacations and adjustments for part time work account for this order of magnitude difference, the TTS very closely matches the Census data.

A supplemental table of percentage or share distribution of work trip ends standardizes the data for analysis purposes and indicates more accurately the degree of correspondence. Also included is a comparison with 1981 Census data.

5. Shopping Trip Ends

There were some minor problems with geo-coding which will be corrected with version III of the database but which don't affect the analysis by Municipality area. Despite this, it can be seen that there is an extremely wide range of observations from 1.65 trips/job in Newmarket to 0.75 in Aurora. While generally these relate to the nature

of shopping in the area (i.e., whether linked shopping trips are prevalent or not), the variation is significant enough that no conclusions can be reached on the volume of trips or if they are fully representative of actual trip making (excluding trips by children).

Further analysis should be concentrated on evaluations of trade areas by type of shopping trip, households and/or geographical area. It is felt that very few conclusions can be reached regarding the trip rate generation factors of the T.T.S. Telephone survey, and that more work should be done with the Trip Diary survey to test overall trip generation data.

York Region
Analysis of Shopping Trip Ends

Municipality	Retail Jobs 1986	TTS Shopping Trips	Trips/Job Ratio
Newmarket	5,512	9,079	1.65
Aurora	2,144	1,614	0.75
Richmond Hill	4,903	7,027	1.43
Markham	14,725	18,887	1.28
Whitchurch-Stouffville	1,171	1,784	1.52
East Gwillimbury	421	448	1.06
Georgina	1,598	2,468	1.54
King	910	1,101	1.21
Vaughan	10,346	9,466	0.91
Total York	**41,309**	**51,424**	**1.24**

Note: There may be definitional differences in retailing between the two surveys.

6. Cordon Count Comparison

Overall, the peak period match between the TTS survey data and traffic counts appears to be good. The attached table of traffic data by time period through the day shows a comparison between the TTS survey statistics and a calculated value for a fall 1986 Cordon figure. The analysis compares drivers from the TTS survey to total cars counted during the Cordon studies.

The results of this comparison shows that the TTS data during the midday period accounts for only half the actual trips made. While the TTS data may be generally low because of non-response during off-peak periods as previously identified with transit data, there are a number of other possible explainations:

- light trucks and vans which are not marked as commercial vehicles are included as cars in the Cordon Count program. This can result in higher cordon data than TTS.

- through car, etc. traffic to and from north of York Region and east or west of the GTA is counted by the Cordon studies but not recorded by the TTS.

- any home based traffic from Bradford, Barrie or other points north of York Region was not part of the survey.

- this analysis is based on an overly simplistic transportation assignment network.

A recent employment survey in York Region showed the following percentages of employees in each employment area who were resident in Bradford and other points north of the TTS study area which affect the South York Cordon:

- Vaughan	4.5%
- Markham	0.8%
- Richmond Hill	3.9%

Furthermore, the following may also affect the Newmarket-Aurora cordon:

- Newmarket	11.7%
- Aurora	8.7%
- Whitchurch-Stouffville	2.8%
- Richmond Hill	3.9% (would be double counted)

This may account for about 3,000 trips in each direction affecting the South York Cordon and 4,000 trips in each direction affecting the Newmarket-Aurora cordon. In addition, a considerable number of workers commute from the areas outside the survey area into Metro Toronto.

Screenlines

As you are fully aware, due to technical problems, which we were unable to correct and wrong master listings, we have been unable to do any screenline analysis to date on the T.T.S. data.

Modal Splits

On the inter Regional travel via transit, we have no data to make comparison with other than GO Transit summary figures which are not located in our office and, therefore, were not checked. For intra Regional travel, the percentage using public transit appears fairly consistent with the 1974 Hamilton Survey in which transit ridership was approximately 12% of total trips made. Whereas, the T.T.S. results show that 12.4% of trips use transit. These figures appear to be constant and we feel correct because the total share of transit riders has been rising only slightly, but the overall number of transit riders has risen accordingly.

The mode split by trip purpose and time of day is difficult to analyze because time-of-day data is unavailable for both the T.T.S. (technical difficulties) and the '74 Hamilton Survey was analyzed and designed for specifically the p.m. peak hour. Tertiary checks were made on some of the data available and no apparent variances or discrepancies were found. An overall breakdown by mode of the 1974 Hamilton Survey compared to the '86 T.T.S. for a 24-hour period shows no alarming discrepancies.

Mode	1974 Hamilton	1986 T.T.S.
Driver	59.6	58.8
Passenger	20.3	18.9
Transit	11.7	12.2
Other	8.4	9.9

Overall, the T.T.S data analyzed to date appears to be in line with previous survey data. For your information, I have enclosed the section from the 1974 Hamilton Survey entitled "Trip Purpose Summary" which summarizes findings of the survey and compares to TARMS values.

I trust this information is sufficient for your requirements at the present time.

Sincerely,

Andrew Head.

Andrew Head, C.E.T.
Transportation Planning
Technologist

AH:dr
Encl.

THE REGIONAL MUNICIPALITY OF HALTON
TRANSPORTATION TOMORROW SURVEY
COMMENTS

An initial examination of trip ends and modal splits for Halton Region did not uncover any major discrepancies. More detailed analysis will be performed when time allows.

An average of 2.42 trips per person per day were made in Halton (based on total number or trips divided by 1986 Census population). The majority of work trips from Halton to outside the Region are to Metro, Peel and Hamilton-Wentworth, in decending order, as expected. The majority of school trips from Halton Region are to Hamilton-Wentworth, Peel and Metro (again in decending order and as expected), and shopping trips from Halton are mostly to Hamilton-Wentworth and Peel. (Internal trips make up the majority in all categories.)

Shopping, school and work trips appear to be ending up in the correct TARMS zones. Major trip generators such as Sheridan College, Burlington Mall, and Oakville Place are all correctly assigned.

Modal splits for school trips from Halton to Metro and York do show that 21 persons supposedly walked to Metro and 91 persons walked to York. This may be due to respondents reporting walking as primary mode when in fact primary mode was transit or passenger. Modal splits for other trip purposes do not indicate any discrepancies.

Generally, the quality of data for Halton appears quite good. Although a more detailed examination of results may yet uncover errors, most of the data seems to be in order at this point.

Comments on the Validation of TTS Data

- Although the peak period flows at the very aggregate level (long screen lines) seem to be reasonable, the off peak and the 12 hour volumes are grossly underestimated.

- The comparison between TTS and employment was unsatisfactory for two reasons:

  . Large differences in numbers
  . Non-Metro areas were not considered

- Respondents/non-respondents study should be clarified in a better way. The names "respondents" "no-respondents" should be changed to "direct-reporting" and "indirect reporting".

- A study of the response/non-response in its original meaning should be carried out (non-response is the failure to measure some of the units in the selected sample).

- There is a need to validate the data on the following basis:

  . Shorter screen lines
  . Using labour force data
  . Using population data disaggregated by age cohorts
  . Using employment data for the whole GTA

- If the validation is unsatisfactory more sophisticated expansion methelodogy should be sought.

A. Mekky
Senior Planner

c.c. Doug Thwaites