Analysis of Individual Transit Trips in EMME/2: Calibration of 1996 TTC Trips Disaggregate Assignment

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Introduction

Short and mid term planning tasks performed on an everyday basis in large public transit agencies require a quick assessment of the impacts of service changes on their customers. Built-in features of EMME/2 dealing with disaggregate transit assignment can be applied to serve this particular need.

The advent of disaggregate transit trip information from the 1986 Transportation Tomorrow Survey (TTS) conducted in the Greater Toronto Area (GTA) created an opportunity for modeling individual transit trips at the route level. The availability of more recent disaggregate transit trip information from the 1996 Transportation Tomorrow Survey provided the opportunity for the Toronto Transit Commission (TTC) staff to update the calibrated parameters to reflect any trip-making behavior changes that may have occurred over the past 10 years. An updated set of calibrated parameters will ensure that transit planners will be generating assignment results that best reflect the decision-making patterns of transit users. The updated calibrated model can be used in many transit planning applications, its largest contribution being the ability to measure the change in travel time of customers due to a change in the base TTC network. This was, and continues to be, an important step in the process of ranking the performance of existing and proposed routes. Measuring the change in travel time has played an even greater role over these past few years of service cuts due to significant reductions in TTC operating budgets and subsidies.

This is the first major project undertaken by TTC Planning staff with the use of EMME/2. The TTC's on-line connection to the EMME/2 model at the Data Management Group, University of Toronto, provides an opportunity to assess its applicability as a tool to analyse the effects on customers due to service changes.

Background

The 1996 TTS is a comprehensive travel survey which collected detailed demographic and travel information on all household members for 5% of all households in the GTA. The TTS data include travel information about the trips made by the household members over an entire weekday. Notable trip information collected were start time, trip purpose, mode of transport, origin location, destination location, and sequence of transit routes for those trips using transit. The origin and destination locations are identified by the zones in which they reside and by their geocodes (x, y coordinates). The geocoded information allows more detailed spatial analysis (or disaggregate analysis) compared to that at a zonal level. In order to expand the information to the 100% level, expansion factors were applied. The expansion factors were applied to all the information collected from each household. The expansion factors were determined by the ratio of actual number of households (as determined by the 1996 Census) to the number of surveyed households at the Census Sub-Division level. The 1996 TTS expansion factors for households in Toronto range between 19 and 22. Thus each transit trip is assigned an expansion factor in this range. The 1996 TTS contains approximately 500,000 individual trip records for those trips made by persons living in the GTA. Of these trips, about 55,000 used the TTC which is equivalent to about 1.1 million TTC trips on an expanded basis. It is these expanded TTC trips that are used as the demand for input in the calibration of the EMME/2 disaggregate transit assignment model.

Calibration Procedure

The calibration procedure involves testing different sets of parameters to match model assignment ridership statistics with ridership statistics obtained by on-board counts conducted by TTC field staff. It is an iterative process using trial and error at the beginning and then making changes to the model parameters based on the results of previous calibration runs. The criteria being used in the selection of assignment parameters is on a rather aggregated level. Overall system performance indicators such as total ridership on each mode, link volumes, average number of transit boardings per customer trip, and ridership by route were used.

The disaggregate transit assignment module in EMME/2 requires the following input information:

1) the disaggregate transit trips (demand) to be assigned to the transit network;
2) the transit network (supply); and
3) the parameters for the transit assignment process.

Each input is discussed in more detail below.

Disaggregate Transit Trips

The disaggregate transit trips were extracted from the 1996 TTS data. The trips to be used for calibration consisted of AM peak period trips that used the TTC for any part of the trip but did not use commuter rail (GO Rail). TTC trips that used GO Rail were excluded because they would add a complexity to the calibration due to the modelling of an additional fare. The joint TTC-GO Rail trips, however, correspond to a very small fraction (about 3%) of all AM peak transit trips using the TTC.

The demand input file consists of the origin and destination geocodes for each trip and the expansion factor corresponding to that particular trip. In total, there were about 16,000 individual transit trip records which represents an expanded total of about 320,000 AM peak transit trips.

Transit Network

The base transit network to which the transit trips were assigned consists of all transit routes that were in operation during the AM peak period in the Greater Toronto Area in the fall of 1996. This base network was available at the Data Management Group at the University of Toronto. The network conformed with the coding standards as developed by the GTA Model Development Group in the fall of 1997.

Initial Calibration Parameters

There are several assignment parameters required by the disaggregate assignment module in EMME/2. The critical parameters are the weights given to access time and wait time, and the penalty for transfers from one route to another. The initial set of parameters was based on calibrated parameters from the TTC's 1986 model.

The initial parameters used are listed in Table 1 below.

Table 1 – Initial Calibration Parameters

Assignment Variable	**Parameter Value**
Number of access/egress nodes	3
Access distance	2 km
Access/egress speed	3 kph
Auxiliary transit link speed	6 kph
Dispersion parameter	1
Minimum access probability	15%
Modes to consider	all transit modes
Boarding times	0.5 minutes
Wait time factor	0.5
Wait time weight	1.5
Auxiliary transit time weight	2.5
Boarding time weight	1.0

The general structure of the disaggregate trip data extraction, preparation, and assignment procedure is shown in Figure 1. The process starts with the TTS database which is resident in Empress. An Empress SQL is then used to extract TTS trips in accordance with predefined criteria such as time period, transit agencies used, location of origin and destination of the trip, etc. Finally, the data are reformatted for input into EMME/2 module 5.34.

Comparison Statistics

To determine the "goodness-of-fit" of parameters, the results of each disaggregate assignment are compared to observed ridership statistics obtained from on-board counts conducted by TTC field staff. It would be a time-consuming task to attempt to compare the observed volumes (from field counts) and simulated volumes (from the model) on every transit link or even on a transit line basis. To determine whether a good fit was achieved, the following statistics were compared:

1) volumes on key subway links (Table 2)
2) total ridership on each mode ie. bus, streetcar, subway, RT (Table 3)
3) average number of transit boardings per customer trip [value of 1.89 from 1986 TTS]
4) ridership on each transit line (Appendix A)

Figure 1. Main Steps in Assigning Individual Transit Trips

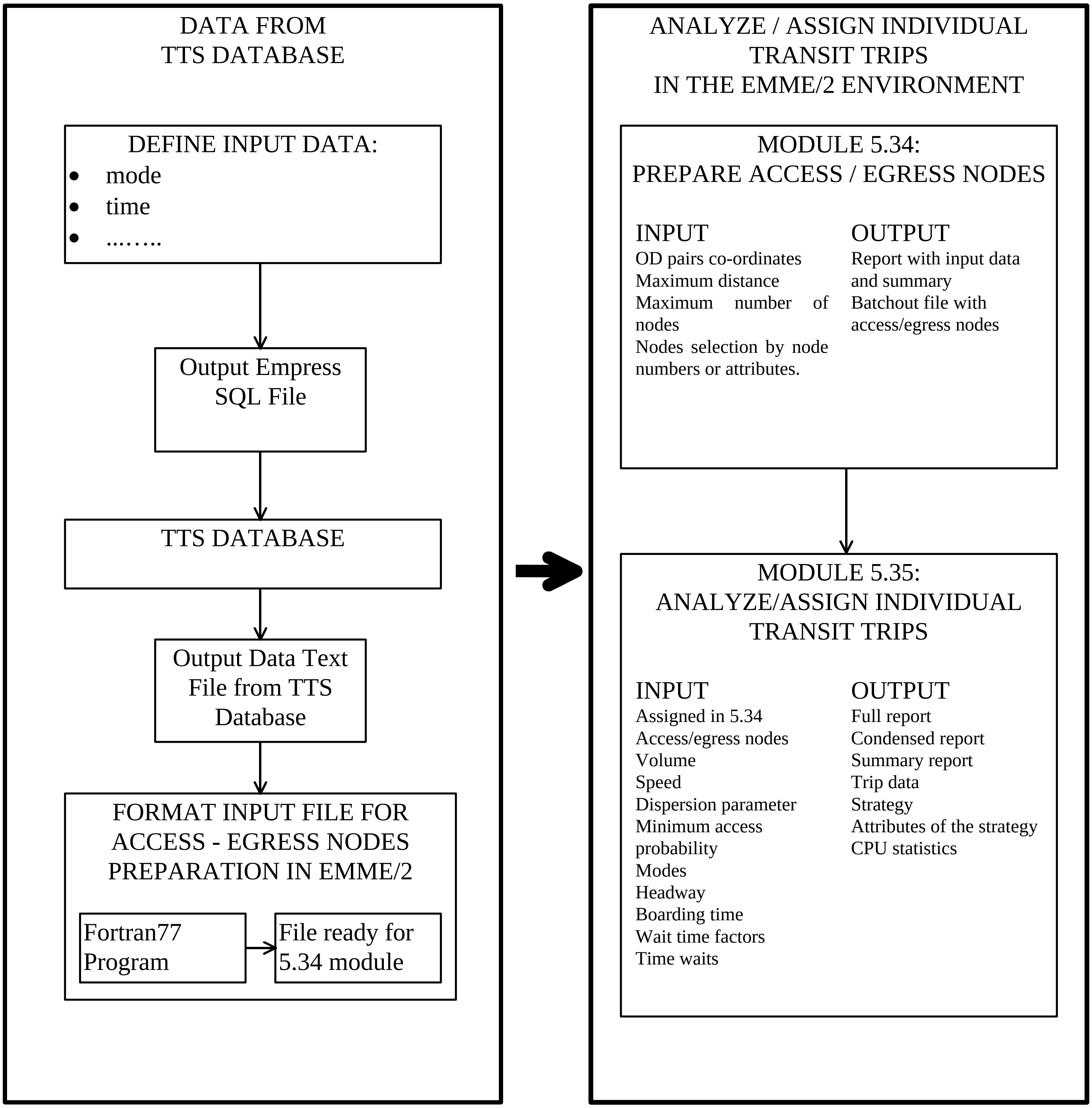

Table 2 - Subway Link Volumes

Route	from Station	to Station	AM Volume
Bloor Danforth	St. George	Spadina	10049
Bloor Danforth	Spadina	St. George	31962
Bloor Danforth	Sherbourne	Yonge	36354
Bloor Danforth	Yonge	Sherbourne	6892
Yonge Univ Spadina	Dupont	Spadina	18472
Yonge Univ Spadina	Spadina	Dupont	6990
Yonge Univ Spadina	Bloor	Rosedale	13154
Yonge Univ Spadina	Rosedale	Bloor	29537
Yonge Univ Spadina	Bloor	Wellesley	36516
Yonge Univ Spadina	Wellesley	Bloor	7632
Yonge Univ Spadina	Museum	St. George	2643
Yonge Univ Spadina	St. George	Museum	26850
Scarborough RT	Kennedy	Lawrence E.	2954
Scarborough RT	Lawrence E.	Kennedy	6633
Totals			236638

Table 3 - Boardings by Mode

TTC Mode	AM Boardings
TTC bus	285523
TTC streetcar	46446
TTC subway	224000
TTC RT	9496

It should be noted that AM peak subway boardings is actually about 229,000 according to TTC ride counts. The figure of 224,000 in Table 3 was adjusted to compensate for elimination of TTC-GO Rail trips. According to the GO cordon count conducted in October 1996, there were approximately 26,000 AM peak GO train passenger trips going to Union Station and 19% of these trips transferred to the subway.

Calibration Results

Tables 4a to 4f contain results from each calibration run. Refinements were made to the calibration parameters and network attributes after each run in an effort to closely match the simulated volumes with observed volumes.

Table 4a lists the parameter values used for a few significant runs. The parameters in Runs 5,6, and 7 are identical but there are differences in the attributes of transit links and lines. This is explained near the end of this section. Table 4b lists global statistics resulting from each calibration run. It should be noted that the average number of transit boardings of 1.89 was derived from the 1996 TTS survey information and not from counts conducted by TTC field staff. In addition, the demand assigned in Run 2 included all transit trips that either originated from or were destined to the City of Toronto. The demand assigned in Runs 5,6, and 7 was significantly lower than that of Run 2 because, as indicated earlier, the demand included only those trips that used the TTC for any part of their trip but excluded joint TTC-GO Rail trips.

Table 4c also lists simulated ridership by TTC mode for each calibration run. Table 4d shows the eventual close matching of simulated and observed ridership on premium express bus routes. Table 4e lists simulated and observed volumes on key subway links.

Table 4a - Calibration Parameters

Assignment Parameter	Run 2	Run 5	Run 6	Run 7
number of access/egress nodes	3	3	3	3
access distance [km]	2	2	2	2
access/egress speed [kph]	3	5	5	5
auxiliary transit link speed [kph]	6	5	5	5
dispersion parameter	1	1	1	1
minimum access probability	0.15	0.15	0.15	0.15
modes to consider	all	all	all	all
boarding times	0.5	0.5	0.5	0.5
wait time factor	0.5	0.5	0.5	0.5
wait time weight	1.5	1.5	1.5	1.5
auxiliary transit time weight	2.5	2.5	2.5	2.5
board time weight	1	10	10	10

Table 4b - Global Statistics Results

Indicator	emme/2 termin	AM count Observed	Run 2	Run 5	Run 6	Run 7
Total TTC trips		293000	408879	318995	318995	318995
Average Impedance	[imped]		55.83	57	56.94	57
Average in-vehicle time	[inveh]		26.73	26.61	26.6	26.63
Average number of transit boardings	[nbotr]	1.89	2.21	2.02	2.02	2.02
Average wait time	[wait]		6.11	4.73	4.73	4.72
Average auxiliary transit time	[auxtr]		7.53	5.28	5.26	5.27
Average access time	[access]		4.15	2.84	2.83	2.83
Average egress time	[egress]		2.68	1.76	1.76	1.76

Table 4c – Mode Totals

TTC Mode	AM count Observed	Run 2	Run 5	Run 6	Run 7
TTC bus	285523	351879	294256	293539	291943
TTC streetcar	46446	47535	41800	41791	42623
TTC subway	224000	238738	214412	214814	216095
TTC RT	9496	6792	5789	6730	6726

Table 4d – Premium Express Bus Routes

Route Number	Route Name	AM count Observed	Run 2	Run 5	Run 6	Run 7
T136	Premium Express via Wynford	174	495	513	513	182
T141	Premium Express via Mt. Pleasant	169	190	462	462	134
T142	Premium Express via Avenue Road	218	1907	1676	1676	223
T143	Premium Express via Queen East	162	1060	995	995	262
T144	Premium Express via Underhill	141	399	367	358	139

Table 4e - Subway Link Volumes

Route	from Station	to Station	AM Volume Observed	AM Volume Run 2	AM Volume Run 5	AM Volume Run 6	AM Volume Run 7
Bloor Danforth	St. George	Spadina	10049	10105	9225	9241	9267
Bloor Danforth	Spadina	St. George	31962	31921	26917	26937	26934
Bloor Danforth	Sherbourne	Yonge	36354	37001	32641	32890	32990
Bloor Danforth	Yonge	Sherbourne	6892	7340	7232	7310	7314
Yonge Univ Spadina	Dupont	Spadina	18472	18621	17978	17989	18020
Yonge Univ Spadina	Spadina	Dupont	6990	6689	5303	5308	5305
Yonge Univ Spadina	Bloor	Rosedale	13154	12865	11942	11927	12048
Yonge Univ Spadina	Rosedale	Bloor	29537	33404	35748	35565	36386
Yonge Univ Spadina	Bloor	Wellesley	36516	45761	45123	45089	45879
Yonge Univ Spadina	Wellesley	Bloor	7632	6318	5557	5557	5574
Yonge Univ Spadina	Museum	St. George	2643	2661	2132	2132	2113
Yonge Univ Spadina	St. George	Museum	26850	35349	31802	31851	31839
Scarborough RT	Kennedy	Lawrence E.	2954	1916	1965	2377	2377
Scarborough RT	Lawrence E.	Kennedy	6633	4307	3418	3946	3946
Totals			236638	254257	236982	238118	239994

Table 4f summarizes some of the link volume information from Table 4e. It contains the volume totals of the subway links that form screenlines into and out of the downtown area. From Tables 4e and 4f, there seems to be an over-representation of peak direction (southbound) subway trips on the Y-U-S line and an under-representation in the non-peak direction on both subway lines and the inbound direction along the B-D line.

Table 4f - Subway Screenline Volumes

Screenline Description	AM Volume Observed	AM Volume Run 2	AM Volume Run 5	AM Volume Run 6	AM Volume Run 7
Inbound to Downtown area along Y-U-S and B-D subways	116325	120947	114284	113381	114330
Outbound from Downtown area along Y-U-S and B-D subways	37085	36999	33702	33786	33934
Inbound to Downtown area along Y-U-S south of Bloor	63366	81110	76925	76940	77718
Outbound from Downtown area along Y-U-S south of Bloor	10275	8979	7689	7689	7687

The initial set of parameters listed in Table 1 was a good starting point but resulted in a high average number of transit boardings per customer trip with a figure of about 2.2. This was eventually reduced by increasing the boarding time weight to a figure of 10. In addition, walk mode was attached to those transit links within two links from subway, RT, and GO Rail stations to discourage the use of short transit links. This was sufficient to decrease the average number of transit boardings per customer trip to a figure of about 2.0.

By calibration run # 5, results were looking better with correlation coefficients at 0.997 for transit line comparisons, and at 0.97 for subway link volume comparisons. The total ridership figures on each mode were very close except for the RT where the assigned ridership was 40% lower than the observed counts. This was partially solved in run # 6 by reducing the transfer penalty between the RT and B-D subway at Kennedy Station. This penalty reduction was achieved by decreasing the auxiliary transit link distance between these rapid transit lines from 100m to 10m. This resulted in the RT ridership to be only 30% lower than observed counts.

The assigned volumes on key subway links were within ±25% of observed volumes except for those key links on the SRT where volumes were underestimated by 20% to 40%. The volumes generally seem to indicate lower volumes on the B-D subway, higher volumes on the Y-U-S in the southbound direction, and lower volumes on the Y-U-S in the northbound direction compared to observed volumes.

The set of downtown premium express bus routes were dealt with separately in run # 7 because they were consistently assigned volumes 2 times to 7 times the actual ridership. To decrease the ridership assigned, higher penalties were assigned to these express routes in the form of longer boarding times compared to boarding times for other bus routes. As shown in Table 4, the global boarding time is 0.5 minutes. For the premium express routes, a boarding time of 1.0 minute for the T136 and T141, and a value of 1.5 minutes for T142, T143, and T144 generated demand that closely reflects the actual observed ridership.

The parameters used for Run 7 produced the best fit in matching simulated and observed ridership levels. Appendix A contains a table listing the observed and simulated ridership for each TTC route.

Discussion

The final calibration parameters are only applicable for analysing the effects of TTC service changes. A TTC-only model was developed because of the additional complexity of calibrating agency-to-agency transfers at a disaggregate trip level. A new exercise is required to produce a calibrated transit assignment model that can simulate these inter-agency transfers correctly.

Attempts were made in the initial stages of the calibration to model inter-agency (or inter-modal) transfers. This proved to be problematic because, in EMME/2 disaggregate assignment, there is no global way to explicitly assign a penalty for such transfers. A way to simulate additional fares paid, due to an inter-agency transfer, is to increase the impedance on the auxiliary transfer link that connects the two transit routes. For example, the auxiliary transit link between the GO station and TTC station at Union can be defined with a 1 km distance instead of a 100 m distance. This accomplishes the task of placing a higher penalty for using this link for those trips that transfer between GO Train and TTC. However, it also penalises those who access the node at either end of the auxiliary link and uses the link to access a transit line. In this case, the trip is unnecessarily hit with a penalty even though the trip is not using the link for transferring purposes. A possible solution to this would be to have a new feature in the disaggregate transit assignment module that consists of an inter-agency (or inter-modal) transfer penalty matrix. This matrix would contain penalty values for all combinations of agency-to-agency transfers.

Finally, one can question the criteria for choosing the final set of calibration parameters. The criteria were based on the comparison of simulated volumes to observed volumes collected by on-board counts. By using the on-board counts as comparative figures, it is assumed that the TTS data matches these counts very closely. In fact, the draft 1996 TTS Data Validation report indicates that there are some notable differences in route ridership. For example, TTS reported 20% lower SRT ridership compared to TTC counts. In fact, the total demand from TTS that was assigned to the EMME/2 network as part of this calibration process was about 10% higher than the TTC system-wide AM peak ridership. For this reason, the resulting volumes from each calibration run had to be factored down to account for this over-reporting. This over- and under-reporting most likely would not significantly alter the final calibration parameters but it may be worthwhile to conduct a comparison of calibrated volumes to the volumes obtained by loading the TTS transit trips to the TTC routes specified in their trip record.

Summary and Results

The resulting parameters of the calibrating procedure are:

Parameter	Value
Number of access/egress node	3
Access distance	2 km
Access/egress speed	5 kph
Auxiliary transit link speed	5 kph
Dispersion parameter	1
Minimum access probability	0.15
Boarding times	0.5 minutes
Wait time factor	0.5
Wait time weight	1.5
Auxiliary transit time weight	2.5
Boarding time weight	10.0

In addition to the above, changes to specific auxiliary transit links and individual route attributes were made to assist in the model calibration.

The above set of parameters provides a very good fit with correlation coefficients in the 0.99 range. There are several refinements that can be made to the assignment algorithm and even to the criteria for determining the goodness of fit, as indicated in the previous section. Nevertheless, these parameters provide a firm base from which to make informed and responsible decisions on planning transit service for TTC customers.

Appendix A

Table of AM Boardings by Route

Listed below are observed AM peak period boardings by TTC route which are compared to the assigned boardings from the EMME/2 transit assignment run # 7. These observed boardings statistics are from TTC riding counts conducted by field staff.

Route Code	Route Name	AM Boardings	Run 7	Δ, %
T002	ANGLESEY 2	725	2147	-50
T004	ANNETTE 4	1193	1162	1
T005	AVENUE ROAD 5	895	814	5
T006	BAY 6	3837	4205	-5
T007	BATHURST 7	5448	5036	4
T008	ROADVIEW 8	197	164	9
T009	BELLAMY 9	971	782	11
T010	VAN HORNE 10	1374	1884	-16
T011	BAYVIEW 11	1630	2254	-16
T012	KINGSTON ROAD 12	2285	2754	-9
T014	GLENCAIRN 14	758	371	34
T015	EVANS 15	873	1257	-18
T016	MCCOWAN 16	1885	2167	-7
T017	BIRCHMOUNT 17	3198	3179	0
T020	CLIFFSIDE 20	1144	1761	-21
T021	BRIMLEY 21	716	469	21
T022	COXWELL 22	1442	827	27
T023	DAWES 23	1297	764	26
T024	VICTORIA PARK 24	4385	7562	-27
T025	DON MILLS 25	7675	9226	-9
T028	DAVISVILLE 28	722	421	26
T029	DUFFERIN 29	8496	8357	1
T030	LAMBTON 30	752	960	-12
T031	GREENWOOD 31	1128	762	19
T032	EGLINTON WEST 32	9428	10926	-7
T033	FOREST HILL 33	263	285	-4
T034	EGLINTON EAST 34	5825	6601	-6
T035	JANE 35	9133	10342	-6
T036	FINCH WEST 36	8553	12316	-18
T037	ISLINGTON 37	3351	2962	6
T039	FINCH EAST 39	10342	11826	-7
T040	JUNCTION 40	974	513	31
T041	KEELE 41	4921	7600	-21
T042	CUMMER 42	1914	2496	-13
T043	KENNEDY 43	2512	2422	2
T044	KIPLING SOUTH 44	1440	1194	9
T045	KIPLING 45	4868	5487	-6
T046	MARTIN GROVE 46	2350	3147	-14
T047	LANSDOWNE 47	3892	3448	6
T049	BLOOR WEST 49	1064	512	35
T050	BURNHAMTHORPE 50	1190	1004	8
T051	LESLIE 51	918	1140	-11
T052	LAWRENCE WEST 52	4767	5302	-5
T053	STEELES EAST 53	4311	5437	-12
T054	LAWRENCE EAST 54	6564	8668	-14
T055	WARREN PARK 55	284	327	-7
T056	LEASIDE 56	1048	971	4
T057	MIDLAND 57	3447	4178	-10
T058	MALTON 58	3066	4681	-21
T059	MAPLE LEAF 59	1068	1024	2
T060	STEELES WEST 60	4854	5453	-6
T061	AVENUE ROAD NORTH 61	998	1054	-3
T062	MORTIMER 62	798	619	13
T063	OSSINGTON 63	4455	5163	-7
T064	MAIN 64	1051	1007	2
T065	PARLIAMENT 65	561	553	1
T066	PRINCE EDWARD 66	968	1132	-8
T067	PHARMACY 67	1653	1190	16
T068	WARDEN 68	3676	4004	-4
T069	WARDEN SOUTH 69	919	678	15
T070	O'CONNOR 70	1525	1438	3
T071	RUNNYMEDE 71	1222	901	15
T072	PAPE 72	1755	778	39
T073	ROYAL YORK 73	2034	2060	-1
T074	MT. PLEASANT 74	268	164	24
T075	SHERBOURNE 75	1454	1231	8
T076	ROYAL YORK SOUTH 76	2022	1781	6
T077	SPADINA 77	618	742	-9
T078	ST ANDREWS 78	559	855	-21
T079	SCARLETT ROAD 79	1986	1800	5
T080	QUEENSWAY 80	511	852	-25
T081	THORNCLIFFE PARK 81	1761	1442	10
T082	ROSEDALE 82	436	546	-11

T083	JONES 83	647	620	2
T084	SHEPPARD WEST 84	4107	4801	-8
T085	SHEPPARD EAST 85	7049	8726	-11
T086	SCARBOROUGH 86	3767	5187	-16
T087	COSBURN 87	1953	2046	-2
T088	SOUTH LEASIDE 88	1104	1179	-3
T089	WESTON 89	2981	2563	8
T090	VAUGHAN 90	1906	1265	20
T091	WOODBINE 91	1479	1586	-3
T092	WOODBINE SOUTH 92	582	407	18
T094	WELLESLEY 94	282	269	2
T095	YORK MILLS 95	570	8694	-88
T096	WILSON 96	5106	7688	-20
T097	YONGE 97	959	528	29
T098	WILLOWDALE/SENLAC 98	814	460	28
T100	FLEMINGDON PARK 100	3540	4508	-12
T102	MARKHAM ROAD 102	3965	4597	-7
T103	MT. PLEASANT NORTH 103	952	885	4
T104	FAYWOOD 104	772	500	21
T105	WILSON HEIGHTS 105	618	647	-2
T106	YORK UNIVERSITY 106	2555	1348	31
T107	KEELE NORTH 107	1311	3078	-40
T108	DOWNSVIEW 108	1542	1721	-5
T109	RANEE 109	1305	1261	2
T110	ISLINGTON SOUTH 110	2553	2208	7
T111	EAST MALL 111	1113	779	18
T112	WEST MALL 112	2200	1690	13
T113	DANFORTH 113	1023	1021	0
T115	SILVER HILLS 115	289	289	0
T116	MORNINGSIDE 116	3493	4128	-8
T117	ALNESS 117	1399	1079	13
T120	CALVINGTON 120	297	116	44
T121	FRONT - ESPLANADE 121	526	991	-31
T122	GRAYDON HALL 122	928	1147	-11
T123	SHORNCLIFFE 123	975	617	22
T124	SUNNYBROOK 124	612	432	17
T125	DREWRY 125	828	616	15
T126	CHRISTIE 126	818	653	11
T127	DAVENPORT 127	523	854	-24
T128	BRIMLEY NORTH 128	1398	1287	4
T129	MCCOWAN NORTH 129	2606	2824	-4
T130	MIDDLEFIELD 130	634	675	-3
T131	NUGGET 131	1763	2887	-24
T132	MILNER 132	911	1135	-11
T133	NEILSON 133	1406	1147	10
T134	TAPSCOTT 134	1013	158	73
T135	GERRARD 135	762	952	-11
T136	PREMIUM EXPRESS VIA WYNFORD 136	174	182	-2
T139	HUNTINGWOOD 139	974	1413	-18
T141	PREMIUM EXPRESS - MT.PLEASANT 141	169	134	12
T142	PREMIUM EXPRESS VIA AVENUE RD 142	218	223	-1
T143	PREMIUM EXPRESS VIA QUEEN EAST 143	162	262	-24
T144	PREMIUM EXPRESS VIA UNDERHILL 144	141	139	1
T160	BATHURST NORTH 160	728	502	18
T161	ROGERS ROAD 161	1466	1639	-6
T162	LAWRENCE - DONWAY 162	93	58	23
T165	WESTON ROAD NORTH 165	3308	3561	-4
T168	SYMINGTON 168	1468	1098	14
T171	PROGRESS EAST 171	492	635	-13
T191	HIGHWAY 27 EXPRESS 191	911	1212	-14
T501	QUEEN 501	8662	10500	-10
T502	DOWNTOWNER 502	1198	1337	-5
T503	KINGSTON ROAD 503	1090	1192	-4
T504	KING 504	10361	10014	2
T505	DUNDAS 505	6643	4210	22
T506	CARLTON 506	8148	10083	-11
T510	HARBOURFRONT LRT 510	1038	671	21
T511	BATHURST 511	2810	2523	5
T512	ST CLAIR 512	6496	5875	5
T595	BLOOR DANFORTH	102705	98842	2
T596	YONGE-UNIV-SPADINA	126362	136425	-4
T597	SCARBOROUGH RT	9496	7323	13
total		**559852**	**601839**	**-4**