

## 4. FORECAST OF TRAVEL DEMAND WITH PUBLIC TRANSIT IMPROVEMENTS

This chapter provides a description of existing and future travel demand patterns in the study area and potential transit ridership to be expected from various generic public transit improvements. This information is used to further refine the potential of alternative methods for improving public transit discussed in the next chapter.

### 4.1 FUNCTION OF THE PROPOSED MARKHAM LINK CORRIDOR PUBLIC TRANSIT IMPROVEMENTS

#### 4.1.1 Existing Corridor Travel Patterns

This section presents an analysis of AM peak period motorized travel (auto and transit) to and from the study area in 2001. Figure 4-1 illustrates the overall travel patterns for trips to and from the study area as well as to and from Markham as a whole.

Analysis of 2001 AM peak period motorized vehicle trips shows that there is a higher number of trips to the study area than from the study area: 128,100 versus 104,500. This is due to the high number of jobs in the Markham portion of the study area, which attracts almost 80% more trips than it generates; while the Toronto portion attracts 84% of the number of trips that it generates.

Perhaps a reflection of the distribution of population and employment in the study area, there is a high degree of self-containment of trips. Approximately 30% of the trips originating in the study area in the AM peak period remain in the study area. Many of these trips are from the residences north of Highway 7, but also from the residential areas in north Toronto (Scarborough area).

Roughly one-third of the commuter trips to the Markham study area are from other parts of Markham and York Region, one-third are from Toronto, and 6% are from southwest Durham Region.

For the study area as a whole, 15% of trips from the study area in the AM peak period are destined to the Toronto Central Area (PD1). For the Markham portion of the study area, only 13% of the trips are destined to PD1.

Figure 4-1 Study Area Travel Patterns (2001 AM Peak Period Total Trips)



## 4.1.2 Existing Transit Ridership

### 4.1.2.1 Regular Transit

As discussed previously, the study area is served by several north-south routes. Table 4-1 provides a summary of ridership at various points for the major routes. It is interesting to note that for all but the McCowan route, the primary direction is the northbound direction. The virtual lack of southbound ridership can be explained by several factors. First, as mentioned previously, the majority of the north part of the study area is employment uses, which generate inbound trips in the morning peak period. Secondly, these routes tend to terminate in employment areas in the north part of the study area and are not accessible to the residential development. Clearly, any rapid transit system would need to establish good feeder bus services from the residential areas in Markham to attract more Toronto-bound riders. A final factor is that most of the TTC routes are not focused on employment areas at their southern ends.

Table 4-1  
Existing Transit Ridership 2003/04 (AM Peak Period)

Route	North of Steeles Avenue		South of Steeles Avenue		North of Finch Ave	
	NB	SB	NB	SB	NB	SB
Victoria Park - TTC 224	297	39	539	61	1243	226
Warden - TTC 68	361	39	360	109	534	597
Birchmount - TTC 17	159	9	139	88	279	366
McCowan - TTC 129	208	458	185	508	397	1233
Don Mills - TTC 25	329	4	138	11	843	325

Source: Toronto Transit Commission, Riding Count Summary, various dates.

### 4.1.2.2 GO Transit

The Stouffville GO Rail service provides access to the downtown for Stouffville, Markham and North Scarborough. Service levels and ridership have been increasing steadily on this line over the last decade. Table 4-2 provides a summary of the AM peak period boardings for the line in 1993 and 2002. As shown, every station has more than doubled in ridership between 1993 and 2002. Overall line ridership in the last 10 years has increased by a factor of three. This is explained partly by the increases in service levels, but also is due to the considerable growth in population in the corridor.

Table 4-2  
Stouffville GO Rail Ridership (1993-2002)

Station	AM Peak Period Boardings	
	1993 (2 trains)	2002 (4 trains)
Stouffville GO Station	95	219
Mount Joy GO Station	-	-
Markham Village GO Station	266	758
Centennial GO Station	-	-
Unionville GO Station	228	890
Milliken	106	335
Agincourt	229	623
<b>LINE TOTAL</b>	<b>924</b>	<b>2825</b>

Source: 1993 GO Rail Passenger Survey, May 2002 Cordon Counts.

## 4.2 TRAVEL DEMAND AND TRANSIT RIDERSHIP PROJECTIONS

This section describes the future travel demand markets as well as the projected ridership on the improved public transit services in the Markham North-South Corridor during the planning period to the 2021 horizon year.

### 4.2.1 The Demand Forecasting Model

The transportation demand forecasting model described in Chapter 3 and used for analysis of the response of alternative transportation solutions to long term travel demand was again used to develop forecasts of the ridership to be carried by the improved public transit alternative.

Ridership forecasts were prepared for a representative rapid transit alignment in the Markham North-South Corridor (which corresponds to the VIVA Phase 1 alignment, originally referred to as the Quick-Start alignment). As discussed later in this chapter rapid transit services were assumed to be in place in all other VIVA corridors.

### 4.2.2 Modeling Scenarios and Assumptions

#### 4.2.2.1 Future Population And Employment

Population and employment projections at the traffic zone level from the Official Plan forecasts provided by York Region and the City of Toronto have been used. No modifications were made to concentrate future development in nodes and corridors served by VIVA, which typically occurs with the introduction of new rapid transit facilities. This reflects a conservative assumption for the development of VIVA ridership forecasts.

Over the study horizon (2001 to 2031), York Region is anticipated to have the highest absolute population growth (an increase of 586,000 to 1.36 million) as compared to other regions in the GTA. York Region is also forecast to have very strong employment growth (348,000), which follows only Toronto (380,000) in terms of absolute employment growth.

Most of this growth takes place in the three southern municipalities of York Region: Markham, Vaughan, and Richmond Hill. Approximately two-thirds of the population growth and three-quarters of the employment growth forecast for York Region are anticipated to take place in these municipalities. Population and employment growth for these municipalities is illustrated on Figures 4-2 and 4-3.

Table 4-3 summarizes the population and employment forecasts for the study area relative to Markham and Regions within the GTA. As observed over the last decade, growth in the Markham study area is expected to be significantly greater than that of the Toronto study area over the next 30 years at 41% for population and 34% for employment in the former and 3% and 23% in the latter. This is consistent with expected growth in the Regions in which each area is located. It also indicates a reversal of trend in the Markham study area, in that population growth will exceed employment growth.

Table 4-3  
Population and Employment Growth Forecasts, 2001 to 2031

AREA	POPULATION					
	2001	2011	2021	2031	Growth 2001-2031	% Growth 2001-2031
STUDY AREA	241,000	256,000	267,000	279,000	38,000	16%
Markham area	80,000	93,000	103,000	113,000	33,000	41%
Toronto area	161,000	163,000	164,000	166,000	5,000	3%
TOWN OF MARKHAM	218,000	281,000	326,000	370,000	152,000	70%
GTA REGIONS	5,065,000	6,106,000	6,740,000	7,337,000	2,272,000	45%
York	772,000	1,008,000	1,195,000	1,358,000	586,000	76%
Toronto	2,451,000	2,720,000	2,800,000	2,882,000	431,000	18%
Durham	503,000	657,000	786,000	919,000	416,000	83%
Peel	967,000	1,215,000	1,352,000	1,475,000	508,000	53%
Halton	372,000	506,000	607,000	703,000	331,000	89%
AREA	EMPLOYMENT					
	2001	2011	2021	2031	Growth 2001-2031	% Growth 2001-2031
STUDY AREA	150,000	173,000	184,000	195,000	45,000	30%
Markham area	97,000	115,000	122,000	130,000	33,000	34%
Toronto area	53,000	58,000	62,000	65,000	12,000	23%
TOWN OF MARKHAM	119,000	169,000	200,000	226,000	107,000	90%
GTA REGIONS	2,662,000	3,472,000	3,930,000	4,157,000	1,495,000	56%
York	386,000	540,000	655,000	734,000	348,000	90%
Toronto	1,454,000	1,688,000	1,798,000	1,834,000	380,000	26%
Durham	167,000	258,000	326,000	364,000	197,000	118%
Peel	488,000	704,000	799,000	835,000	347,000	71%
Halton	167,000	282,000	352,000	390,000	223,000	134%

A large portion of the growth in the Markham portion of the study area will be due to the development of Markham Centre. At full built-out, this is expected to add some 23,000 residents and 37,000 jobs to the area. The approved master plan for the Downtown Markham Area (the area between Warden Avenue and Kennedy Road, south of Highway 7) includes 8,120 residents and 20,000 jobs.

Even though population will exceed employment growth, there will still be a net in-commuting of workers to fill jobs in the area. While the north part of Toronto (Scarborough) will continue to provide workers, many jobs may also be filled by people living in Markham, particularly as the majority of prospective employers are in the high tech or 'white-collar' sector and will draw on the younger population of Markham.

Figure 4-2  
Population Growth York Region Municipalities, 2001-2021

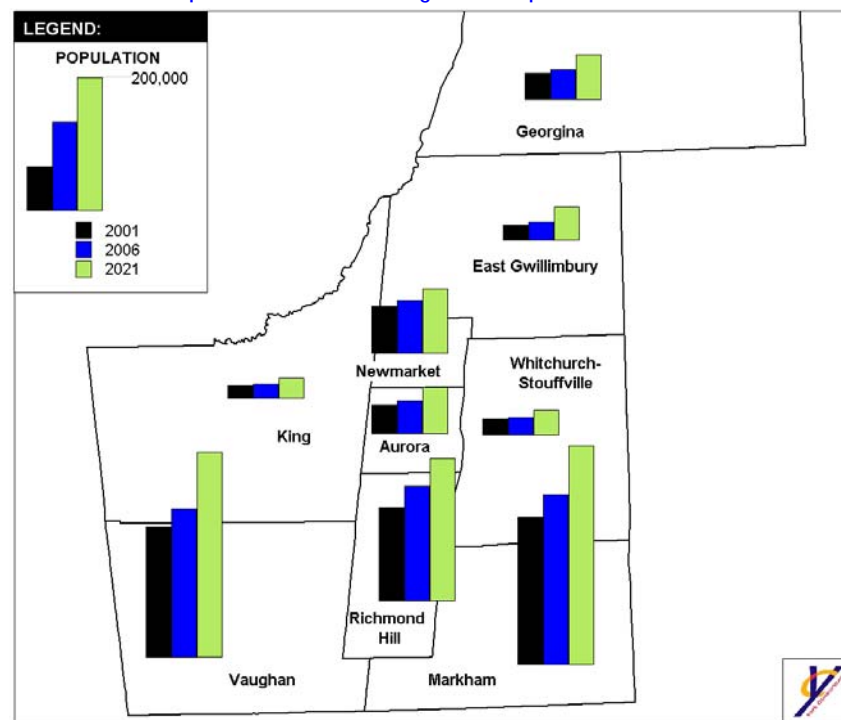
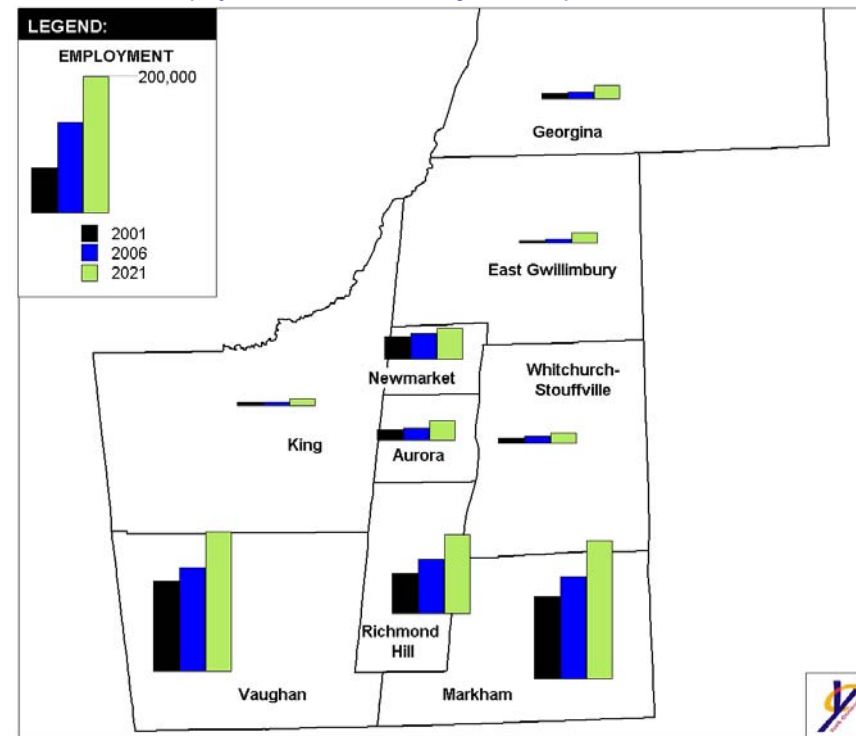


Figure 4-3  
Employment Growth in York Region Municipalities, 2001-2021



#### 4.2.2.2 Base Assumptions for Demand Modelling

The following key assumptions provide the basis for generating 2021 travel demand forecasts for the VIVA Network Scenario (see Section 2.4.2 for description of VIVA), as described below:

**Road Network:** Improvements to the arterial road system in York based on the 10-year York Region capital programme and TMP have been incorporated in the model. Expansion of the provincial highway system within York Region included the proposed extensions of Highway 427 and Highway 404, and the widening of Highway 400.

**York Region Transit (YRT) Network:** For transit improvements up to 2021, most of the recommendations from the *York Region Transit 5-Year Service Plan: Conventional Transit* have been incorporated. This includes route extensions, route restructuring, and new services in newly developed and previously un-serviced areas. The base transit system in York Region for each horizon year is defined by York Region Transit's Five-Year Service Strategy route structure. The main components include:

- Route extensions to new areas of development;

- Re-orientation of existing routes to connect to York University/ Downsview TTC Station, Don Mills TTC Station and new GO Rail stations;
- Enhancements including the filling in of a basic grid system; and
- Enhanced continuous through-services, between York Region and Toronto.

**YRT Route Restructuring:** the following YRT services are assumed to be removed to avoid duplication with Quick Start or VIVA services:

- YRT Highway 407 Express Buses – Markham;
- YRT Highway 407 Express Bus – Unionville;
- GO Yonge 'B' Bus.

(As noted previously in Chapter 2, express services are still in operation and subject to monitoring. As a result, the forecasts presented here for the Markham N-S link may be conservative).

**GO Rail:** Increased services in all GO Rail corridors, consistent with GO Rail's 10 Year Capital Plan and 2021 Plan. This includes full all-day service on the Bradford, Richmond Hill and Stouffville GO Rail lines and new GO Stations located at Kennedy/Bloor-Danforth Subway and Leslie/Sheppard Subway.

**GO Bus:** Highway 407 Express Bus added to network, with York Region stops at Unionville, Langstaff and York University. A peak period headway of 10 minutes is assumed.

**TTC:** Rapid transit system is based on the present system, with extension of the Spadina Subway assumed to York University by 2021.

**Socio-economic Factors:** The model utilizes three transit friendliness measures within the mode choice sub-model, relating to urban density, land use mix, and auto ownership. The first two were estimated using population and employment forecasts at the traffic zone level. Auto ownership has been projected using a multi-variate auto-ownership model, relating car-ownership with such variables as average household income, household size, level of transit service, and urban density.

**Auto Costs:** Parking costs in real dollars are assumed to increase by 15% over existing conditions within the City of Toronto. The existing spatial coverage of parking costs will expand, consistent with strategies of the Toronto Parking Authority. Within York Region, a \$5 parking charge is assumed at major nodes (e.g. Markham Centre, Vaughan Corporate Centre) and at employment locations in the VIVA corridors of Yonge Street and Highway 7. No parking charge is assumed at GO stations.

**Fares:** Current fare structure is assumed with the YRT three-zone system, GO Transit fare by distance and TTC flat fare. No increase in fares in real dollars is assumed for TTC, GO Transit and YRT services. VIVA is assumed to have the same fare as YRT services, with free transfers between YRT and VIVA services.

**Fare Integration:** It is assumed that current fare policies would be in effect in 2021, with no fare integration between TTC and YRT/VIVA and a double fare for many short cross-boundary transit trips across the York/Toronto, consistent with current policies.

**Service Policies:** Closed door services of YRT/VIVA routes in Toronto is assumed. This reflects current policies, with YRT services operating in Toronto not permitted to serve internal Toronto trips.

**4.2.2.3 VIVA Networks**

The VIVA Phase 1 networks are assumed to operate in all four VIVA corridors. The rapid transit program, which commenced in Fall 2005 and was implemented in stages, is designed to begin building long-term rapid transit ridership and serve the Region's Corridors and Centres land use plans designed to support higher transit usage.

For purposes of this report, full implementation of VIVA is modelled assuming Bus Rapid Transit (BRT) in each of the four corridors. The ultimate VIVA network configuration could involve combinations of BRT, Light Rail Transit (LRT) or subway with the technology transitions taking place over time as required by demand and when funds are available. BRT ridership levels are also considered representative of the potential ridership that might be achieved with LRT technology operating the same corridors.

In the scenario modelled, BRT is assumed to be operating in dedicated bus lanes with traffic signal priority treatment at signalized intersections and other transit priority treatments, as required to maximize transit operations.

**Route Structure**

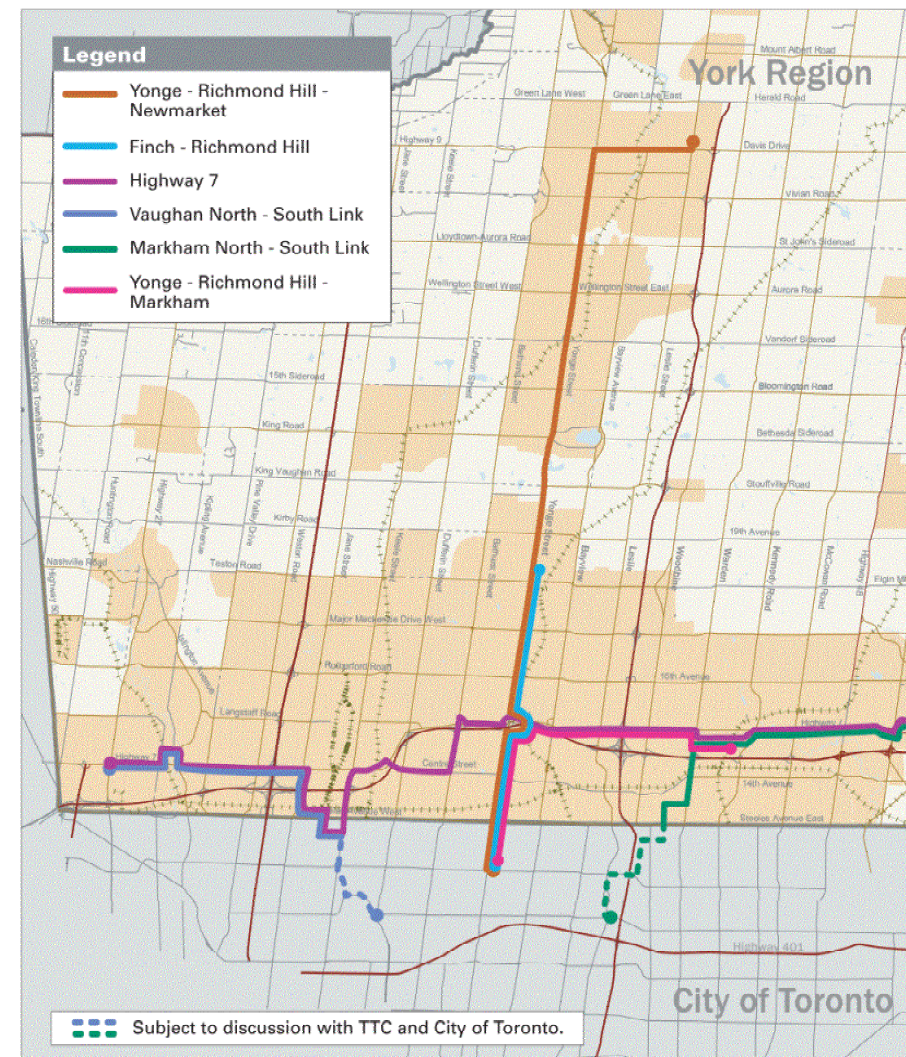
The route structure for VIVA services is comprised of six services as described below and shown in Figure 4-4.

**Yonge: Newmarket-Finch TTC** – An all day service operating on Yonge Street between Newmarket and the TTC Finch subway station in Toronto.

**Markham Centre-Finch TTC** – A peak period only service operating from Markham Centre on Highway 7 to the TTC Finch subway station via Highway 7, the Richmond Hill Centre and Yonge Street.

**Highway 7** – An all day service operating on Highway 7 between the Cornell Bus loop in Markham and Martin Grove in Woodbridge with the route deviating to serve York University using a loop to the university via Keele Street and Jane Street.

**Figure 4-4**  
Assumed Rapid Transit Network for Modelling Purposes



Note: Alignments are representative; final alignment to be determined through the EA process

Note: VIVA Phase 1 services now in place differ slightly from those modelled and shown on the map. See [www.vivayork.com](http://www.vivayork.com) for a

**Vaughan-Downsview TTC** – An all day service operating on Highway 7 from Martin Grove to Jane Street, extending south to York University.

**Markham-Don Mills TTC** – An all day service operating on Highway 7 from Cornell Bus loop in Markham through Markham Centre to south on Warden Avenue, west on Denison Street, south on Esna Parkway, continuing south

on Pharmacy Avenue, west on Finch Avenue to Seneca College, south on Don Mills Road to TTC Don Mills subway station.

**Speed and Headway**

Table 4-4 shows the speed and headway assumptions for VIVA services. The speeds are indicated by corridor segment and are based on speed and delay studies of existing conditions in the respective VIVA corridors, and estimates of performance based on posted speed limits, stop spacing, level of transit priority and other factors.

Speeds on the Markham North-South Link south of Steeles Avenue will depend on the degree of separation from regular traffic. It is expected that by 2021, the City of Toronto will have constructed dedicated transit lanes on Don Mills Road and will have transit priority measures in place on Victoria Park Avenue.

**Table 4-4**  
Speed and Headway Assumptions

Corridor/Segment	Segment Length (km)	VIVA (BRT)	
		Speed (km/h)	Service Frequency (Buses per Hour)
<b>Yonge Street</b>			
Finch Station to Steeles	1.9	20	120
Steeles to Hwy 7/Langstaff	4.3	25	120
Highway 7/Langstaff - Major MacKenzie	4.0	25	120
Major MacKenzie to 19 <sup>th</sup> Avenue	4.1	25	120
19 <sup>th</sup> Avenue to Newmarket	21.1	35	60
<b>Finch Station to Newmarket</b>	<b>35.4</b>	<b>29.6</b>	
<b>Highway 7 (West)</b>			
Highway 27 to Islington	5.8	35	30
Islington to Highway 400	4.3	30	30
Highway 400 to York U.	3.3	30	30
York U. to Yonge	13.6	35	30
<b>Highway 7 (East)</b>			
Yonge to Bayview	1.9	35	30
Bayview to Leslie	2.0	35	30
Leslie to Woodbine	2.1	35	30
Woodbine to Warden	2.1	30	30
Warden to Kennedy	2.5	35	30
Kennedy to MSH	8.1	35	30
<b>Highway 27 – MSH</b>	<b>45.6</b>	<b>33.1</b>	
<b>Vaughan NS Link</b>			
Highway 7 to Steeles	2.1	30	30
Steeles to York U.	2.2	30	30
York U. to Downsview TTC	5.9	30	30
<b>Markham NS Link</b>			
Markham Centre to Highway 407	1.7	30	30
Highway 407 to Steeles	3.0	30	30
Steeles to Don Mills TTC	6.3	30	30

**Stations**

The station spacing is assumed to be approximately one kilometre in the

denser, built-up portions of the corridors and two kilometres in the lower density areas. The following inter-modal stations are assumed in York Region, allowing transfers between GO Rail, YRT/YTTP, and park-and-ride facilities:

- Langstaff Station – interface between VIVA/YRT services and the GO Richmond Hill Line and GO Highway 407 BRT;
- Unionville/Markham Centre Station – interface between VIVA/YRT and GO Stouffville Line and GO Highway 407 BRT; and
- York University Station - interface between VIVA/YRT services and the GO Bradford Line and GO Highway 407 BRT.

VIVA services extending into the City of Toronto will link to the TTC subway system at Finch Station (Yonge Line), York University Station (on an extended Spadina Line) and Don Mills Station (Sheppard Line).

#### Park-and-Ride Facilities

Table 4-5 shows the assumed location and number of parking spaces at park-and-ride lots serving the VIVA Markham Link service, which extends over a portion of the Highway 7 Transit. Approximately 900 parking spaces are assumed for rapid transit service operating in the study area

Table 4-5  
Park and Ride Lot Capacities

VIVA Corridor	Station	No of Parking Spaces
Highway 7/Markham NS	Warden & Highway 407	300
	Highway 7 E of Highway 404	200
Highway 7 (Others in Study Area)	Highway 7 & Markham Stville. Hosp	200
	Highway 7 & Bayview	200
Total Study Area		900

### 4.3 2021 RIDERSHIP FORECASTS

The following section presents 2021 ridership estimates for the Markham North-South Link, which assumes BRT operations in dedicated lanes with significant transit priority measures. The forecasts assume a 2-minute headway during peak periods, provided over the full length of the service from Highway 7/9<sup>th</sup> Line to TTC Don Mills Station via Markham Centre. The section of the Markham North-South link service operating on Highway 7 between 9<sup>th</sup> Line and Markham Centre (Kennedy Road) combines with the Highway 7 VIVA BRT service to provide an effective 2-minute headway over Highway 7 section. The Markham North-South service is overlaid over the existing YRT route structure, with local services continuing in VIVA corridors. In Toronto, no adjustments to TTC routes have been made, with

VIVA services operating closed door.

#### 4.3.1 Rapid Transit Passenger Volumes

Table 4-6 presents a 2021 ridership summary for the Markham North-South Link, for the segments between Markham Centre and Don Mills Station only.

The 2021 a.m. peak hour volume in the peak direction is projected at 3,000 passengers for the Markham North-South Link, with the peak point location southbound at Warden Avenue and Enterprise Drive. The projected daily ridership is estimated at 24,000 for the north-south portion from Markham Centre to the Sheppard Subway and 45,000 for the entire service from the Cornell bus loop to Don Mills Station.

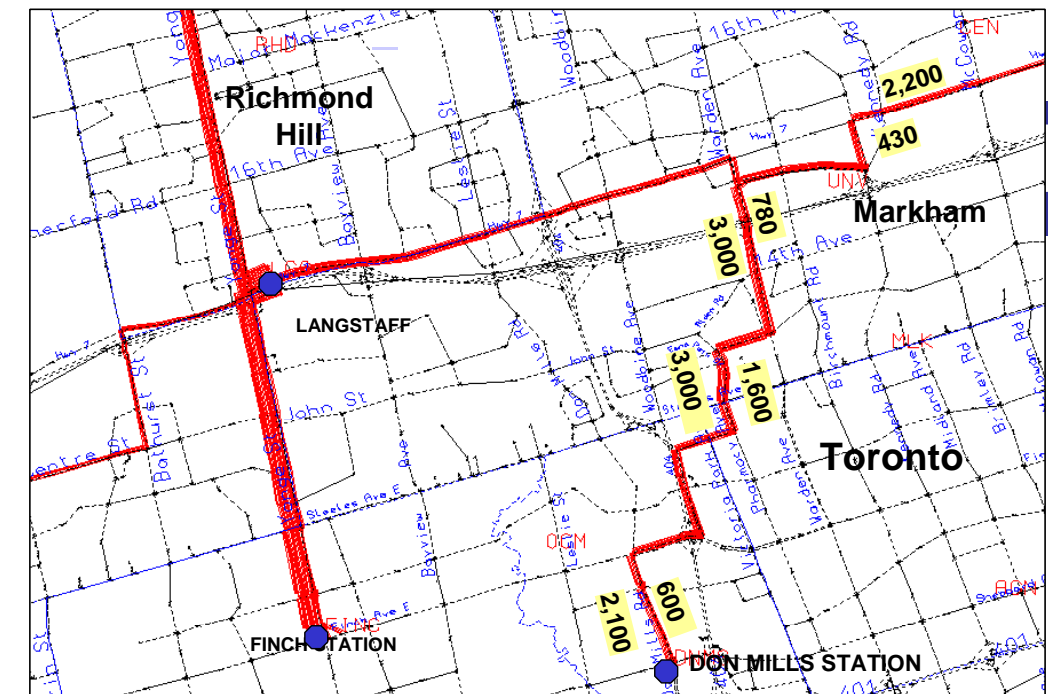
Table 4-6  
2021 Ridership Summary for the Markham Link

Statistic	Cornell Bus loop to Markham Centre	Markham Centre to Don Mills Station	Line total
Peak Headway (min)	2	2	2
Speed (km/h)	30	30	30
Route length (km)	10.2	11.4	21.6
<b>AM Peak (3-Hour) Period</b>			
Passenger Boardings	5210	6030	11,200
Passenger-kilometres	35000	71700	106,700
Vehicle-kilometres	610	680	1,210
Peak Hour Volume	3210	3190	3210
Peak Point Location	Southbound at Markham Centre.	Southbound at Enterprise Dr./Warden	
Daily Boardings	20840	24120	44960

Figure 4-5 provides a plot of the link volumes for the Markham North-South Link service, with maximum loadings at various sections of the corridor. In the a.m. southbound direction, the 2021 peak point volume is approximately 3,000 passengers for the section of the route on Warden Ave, at Highway 407. The volume decreases to 2,730 passengers per hour at Steeles Avenue, then to 2,110 passengers at TTC Don Mills Station.

In the a.m. northbound or reverse peak direction, transit volumes are approximately 50% of the peak direction. At Steeles Avenue, the a.m. peak hour volume is projected to be approximately 1,600 passengers representing the peak point in the northbound direction. Peak hour volumes decrease to approximately 400 passengers on Highway 7 section of the route.

Figure 4-5  
AM Peak Hour Link Volume – 2021 BRT



By the end of 2005 and prior to the construction of any new dedicated transitway infrastructure, York Region proposes to introduce new services with rapid transit characteristics but operating in mixed traffic with signal priority measures (referred to as VIVA Phase 1). Ridership on these services has also been modelled and is included as a Base Case in the discussion below for comparison to provide an indication of the attractiveness of full-featured BRT service.

Table 4-7 shows various ridership indicators such as peak volume, boarding, alighting, and passenger-km by segment within the corridor, for the a.m. peak hour for the Base Case and full VIVA (BRT) scenario. With VIVA services, the passenger boardings in the corridor are projected to increase from approximately 2,000 in the Base Case to 3,540, an increase of 75%. The peak load point volume at Steeles Avenue in the southbound direction increases from approximately 2,000 to 3,000 (50%). Essentially, the full BRT system attracts more people throughout the line, but demand is more spread out and therefore total ridership increases more than peak loadings.

**Table 4-7**  
2021 AM Peak Hour Ridership by Segment for Markham Link Corridor

Segment	Base Case (VIVA Phase 1)			VIVA (BRT)		
	Link Volume (Peak Direction)	Ons	Passenger-km	Link Volume (Peak Direction)	Ons	Passenger-km
Markham Centre to Highway 407	2,100	830	4,200	3,000	1,550	6,300
Hwy 407 to Steeles	2,000	100	8,400	3,000	260	12,400
Steeles to Don Mills TTC	1,800	1,090	13,600	2,500	1,730	20,200
Corridor Total		2,020	26,200		3,540	38,900

**a) York/Toronto Screenline Volumes**

Table 4-8 presents the changes in travel in the Markham North South Link corridor based on a screenline at Steeles Avenue between Don Mills Road and Kennedy Road. The screenline summary compares a.m. peak (3-hour) period volumes in 2001 (base year) with 2021 BRT. The BRT service will help to increase total transit trips across the screenline from 2,600 almost 11,000. Approximately 50% of the transit trips will be handled by the BRT service, followed by GO Rail.

It is important to note that these figures will depend on other changes that are made to the transit network in York Region. For example, the extension of the Yonge Subway to Highway 7 will attract some trips from the Markham North-South link onto the planned Highway 7 transit service as it would involve one less transfer.

**Table 4-8**  
(A.M. Peak 3-Hour Period Volumes Screenline North of Steeles between Don Mills and Kennedy)

Service/Mode	2001 - Modelled		2021 - BRT		Change BRT vs 2001	
	SB	NB	SB	NB	SB	NB
TTC / YRT / GO Bus	560	1,520	800	1030		
GO Rail	2,060	-	4,940	-		
Markham NS Line	-	-	5,080	2,690		
Total Transit	2,620	1,520	10,820	3,720		
Auto	12,780	9,810	23,020	23,000		
Total Trips	15,400	11,330	33,840	26,720		

Trips attracted to BRT routes over the planning period, comprise those presently using local YRT/GO bus services that are slated to be replaced by rapid transit in the corridor as well as growth in ridership in key growth areas such as Markham Centre. The remaining transit trips in the corridor are those attracted to the corridor from feeder services due to the improved service of the Yonge Street BRT services. GO Rail ridership on the Stouffville line, consisting primarily of trips destined to Toronto's PD1 zone, is projected to increase by 2,900 passengers or 139% by 2021. This is also

partially due to the new connection to the Bloor Subway line at Kennedy Station.

**b) Travel pattern and modal split**

Travel to and from Markham during the a.m. peak period is shown in Table 4-9 for 2001 and a 2021 BRT scenario. This table presents the total travel flows on an origin-destination basis, indicating growth over the next twenty years and the transit and modal split implications.

Currently, there are approximately 59,400 total trips (auto+transit+GO) originating from Markham in the a.m. peak 3-hour period and this is projected to increase to 82,000 trips by 2021. With BRT, the transit trips increase to 12,100 trips compared to 6,300 in 2001. The corresponding modal split increase for a.m. peak period trips originating from Markham is 10.7% in 2001 increasing to 14.8% in 2021 with BRT.

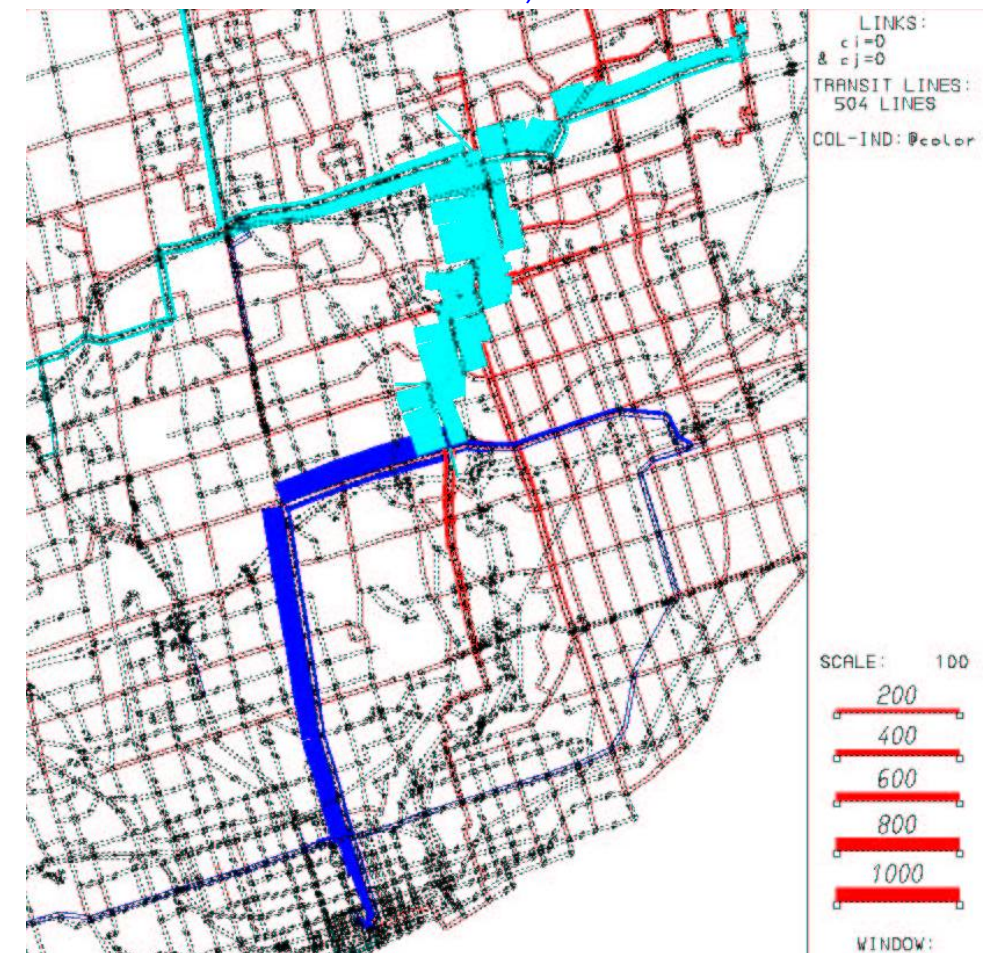
Within Markham, the Markham North-South Link and associated BRT services are projected to increase transit modal split from 2.8% in 2001 to 5.8% in 2021 with BRT. For travel destined to Markham in the a.m. peak period, the transit modal split is projected to increase from 4.7% in 2001 to 7.8% in 2021 with BRT.

**Table 4-9**  
AM Peak (3-Hour) Period Total Trips and Transit Modal Split

From	To	Total Trips (000's)			Transit Trips (000's)		Transit Model Split	
		2001	2021	Growth	2001	2021-BRT	2001	2021-BRT
Markham	Markham	41.7	69.0	27.3	1.2	4.0	2.8%	5.8%
	RH & Vaughan	7.9	12.4	4.6	0.2	0.8	2.9%	6.2%
	PD1	12.2	16.4	4.2	3.8	6.6	31.0%	40.1%
	Toronto (East&Central)	26.8	35.7	8.9	1.7	3.5	6.4%	9.9%
	Toronto (West)	6.0	7.0	1.0	0.5	1.0	8.6%	14.1%
	Other	6.5	10.4	3.9	0.1	0.2	1.1%	2.1%
RH & Vaughan	Markham	13.3	21.8	8.4	0.4	1.4	3.0%	6.4%
Toronto (East&Central)		30.0	39.3	9.3	2.2	4.7	7.2%	12.1%
Toronto (West) / PD1		5.8	8.4	2.5	0.5	1.1	8.2%	13.3%
Other		20.4	33.7	13.4	0.2	0.8	0.9%	2.3%
Markham	All	59.4	82.0	22.5	6.3	12.1	10.7%	14.8%
All	Markham	69.5	103.1	33.6	3.2	8.0	4.7%	7.8%
To / From / Within Markham		170.6	254.0	83.4	10.7	24.1	6.3%	9.5%

Figure 4-6 shows a plot of the origin and destination patterns for trips using any portion of the Markham North South Link (developed through a select line process in EMME/2). The analysis indicates that approximately 21% of the users of the Markham North-South link start and end their trip in York Region. Only 21% of the users starting their journey in York Region continue to Planning District 1 (Central Area of Toronto) while 37% are destined for the rest of Toronto. For transit trips destined to York Region and using the Markham Link, 48% come from within York Region and 48% comes from the rest of Toronto. Only 2% of trips destined to York Region using the Markham Link start in PD1.

**Figure 4-6**  
Origin and Destination Patterns of Transit Riders Using the Markham North-South Link (AM Peak Period)



c) Boarding and alighting patterns

Figure 4-7 presents the station boardings and alightings for the Markham North-South Link service for the a.m. peak 3-hour period. In the peak southbound direction during the a.m. peak period, the main boarding stations include Highway 7/9<sup>th</sup> Line, Highway 48, McCowan and Enterprise, with these stations also including park-and-ride ridership. The Enterprise station includes connections to YRT/GO Stouffville services, resulting in a peak station loading of over 1,500 boardings in the a.m. peak 3-hour period.

Alighting patterns for a.m. southbound services are focused in the employment corridor extending from Markham Centre, and Esna Park/Gordon Baker Business Parks and student travel to Seneca College. Approximately, 5,000 a.m. peak 3-hour passengers connect to the Sheppard Station at Don Mills Station.

Figure 4-7  
AM Peak Period Boarding / Alighting – 2021 Base Case

