



Memorandum

August 23, 2006

To:

P. Safos, YRT

From:

Dennis Fletcher, ENTRA Consultants

Subject:

YRT New vivastation Location Analysis

Project No:

26-34B

This memo summarizes the results of the requested vivastation analysis. I look forward to the opportunity to review this in detail with you, at your convenience.

Introduction

ENTRA was requested by YRT staff to assess the potential for new vivastation locations in the Yonge Street north corridor and Highway 7 corridor, based on customer service requests (CARES) and other direct communication. This assessment is based on the Region's approved standards for vivastation locations, local demographic and ridership data, standard analysis methods examining potential catchment areas in the vicinity of each vivastation location.

The table below summarizes YRT's standard for adding vivastations:

Viva Route	1		2	
	Minimum New Boardings ¹		Minimum New Boardings ²	Minimum Station Spacing
blue (Finch-Bernard)	300	OR		No less than 750 metres, with an average spacing along the line above 1,000 metres
blue (Bernard-Newmarket)			100	
purple				
orange			75	
green				

¹ As per YRT Five-Year Service Plan 2006-2010

² Secondary Analysis Based on Current Conditions, D. Allen, IBI Group July 2006

Consideration for an additional vivastation may be given to a location which will generate a minimum of 300 net new passenger boardings per weekday. Consideration for an additional vivastation may also be given if the following 2 criteria are met:

1. a minimum net new passenger boardings of 300 (viva blue Finch to Bernard), 100 (viva blue Bernard to Newmarket Terminal, viva purple, viva orange), and 75 (viva green) and;
2. a minimum station spacing of no less than 750 metres, with an average spacing along the line above 1,000 metres.

Chalmers Road

ENTRA cannot support the introduction of a new vivastation at Chalmers Road at this time, since it does not meet the criteria outlined above.

The reasons for these standards are to protect the integrity of the route design, ensuring that minimum speed and productivity increases can be met. In this regard, the minimum spacing requirement is very important, since it helps ensure faster operating speeds.

Spacing

The current spacing is approximately 1200 metres from Bayview to Valleymede. The average spacing on the route east of Yonge is approximately 900 metres, based on the locations of the stations designated in the detailed implementation studies.

Exhibit 1

Highway 7 vivastation Analysis

Stop Point	Distance , km	
	from previous stop	Cumulative
McCowan	0.00	
Bullock	0.40	0.40
Kennedy	0.65	1.05
Enterprise	0.65	1.70
Warden	1.30	3.00
Town Ctr.	0.75	3.75
Montgomery	0.75	4.50
Woodbine	0.35	4.85
Allstate Pkwy.	0.35	5.20
E. Beaver Cr.	1.45	6.65
Leslie	0.45	7.10
W. Beaver Cr.	0.45	7.55
Valleymede	0.50	8.05
Bayview	1.20	9.25
Yonge	2.95	12.20
Total	12.20	
Average	0.87	

Introducing a new station at Chalmers would introduce spacings of 650 metres from Bayview to Chalmers and 550 metres from Chalmers to Valley Mede, which clearly does not meet the minimum spacing standard. Further, introducing this station would further reduce the average spacing, already below the minimum. The current average is acceptable since it is derived from designated stations, but any new station within the existing route will degrade this average. New stations on route extensions, if they exceed 900m spacing, will help to drive the average up. Preferably, any new station on Highway 7 should only be located on a route extension and preferably with spacing exceeding 1000 metres. Alternatively, new stations on the existing route could be considered if they replace an existing station.

Net New Boardings

ENTRA estimated the new boardings for the proposed station location based on a comparison of previous counts for Route 1 to new Viva ridership counts at Bayview and Valley Mede vivastations, with consideration for current and future population and employment and proposed area developments (see Exhibit 2).

Exhibit 2 Highway 7 Ridership Estimates

	Route Section			
	Bayview	Chalmers	Valley Mede	Total
Previous Ridership				
Route 1				
boarding	38	59	136	233
alighting	40	59	145	244
Post-Viva ridership				
boarding	219		279	498
alighting	177		272	449
Assumed diversion from Route 1				
Assumed Route 1 Ridership transferred to Viva	60%		60%	
Assumed remaining Route 1 Ridership	15		54	
	23		82	
Estimated new ridership to Viva (excluding transfer from Route 1)				
boarding	196		197	393
alighting	153		185	338
New Viva/Previous Route 1 ratio	1.7			
Estimated new station ridership (2006)				
boarding		100		
alighting		82		
Estimated future ridership growth (future)				
	15%	25%	15%	
boarding	252	125	321	698
alighting	204	103	313	620

Exhibit 2 shows the Route 1 ridership prior to Viva and the post-Viva ridership on the purple and pink lines combined. New counts for Route 1 since the launch of Viva are not yet available. Assuming a 60 percent diversion from Route 1 to Viva, new Viva ridership at the existing stops is estimated at approximately 200 boardings each. The ratio of new Viva ridership to previous Route 1 ridership was applied to the Chalmers area Route 1 ridership (2 stops) to estimate the new boardings, projected to be approximately 100 in the short-term. This is lower than the estimated new ridership at the upstream and downstream stops, since the catchment area of these stops reduces the area in the vicinity of the proposed Chalmers stop to be served.

ENTRA also tested the sensitivity of these estimates to different levels of development growth and ridership diversion from Route 1. If we allow an accounting for all of the trips currently on Route 1 as new Viva passengers (an assumption that is not reasonable and contravenes the standards calculations) and allow future development increases in the area to exceed current estimates by 25 percent, net boardings increase to approximately 125, still well below the approved standard. Even if a 50 percent growth was allowed, (replicating activity levels north of Highway 7 on the south side) this would still only result in an estimate of 150 new boardings in the future.

For these reasons, ENTRA cannot recommend a new vivastation at the proposed Chalmers Road location. YRT may wish to revisit this conclusion in the future, when and if the proposed 407 BRT facility is built in this area.

Stouffville Road

ENTRA supports the introduction of a new vivastation at Stouffville Road, since it meets the criteria outlined on page 1.

The reasons for these standards are to protect the integrity of the route design, ensuring that minimum speed and productivity increases can be met. In this regard, the minimum spacing requirement is very important, since it helps ensure faster operating speeds.

Spacing

The current spacing is approximately 4200 metres from King Road to Gamble Road. The average spacing on the route north of Elgin Mills (Bernard) is approximately 1900 metres, based on the locations of the stations designated in the detailed implementation studies. Exhibit 3 shows the current spacing of stops.

Exhibit 3
Yonge North vivastation Analysis

Stop Point	Distance , <i>km</i>	
	from previous stop	Cumulative
NM Terminal	0.00	
Eagle	1.46	1.46
Mulock	0.95	2.41
Orchard	2.95	5.36
Wellington	0.95	6.31
Golf Links	1.05	7.36
Henderson	0.95	8.31
Bloomington	2.10	10.41
King	2.10	12.51
19th-Gamble	4.20	16.71
Elgin Mills	2.00	18.71
Total		18.71
Average	1.87	

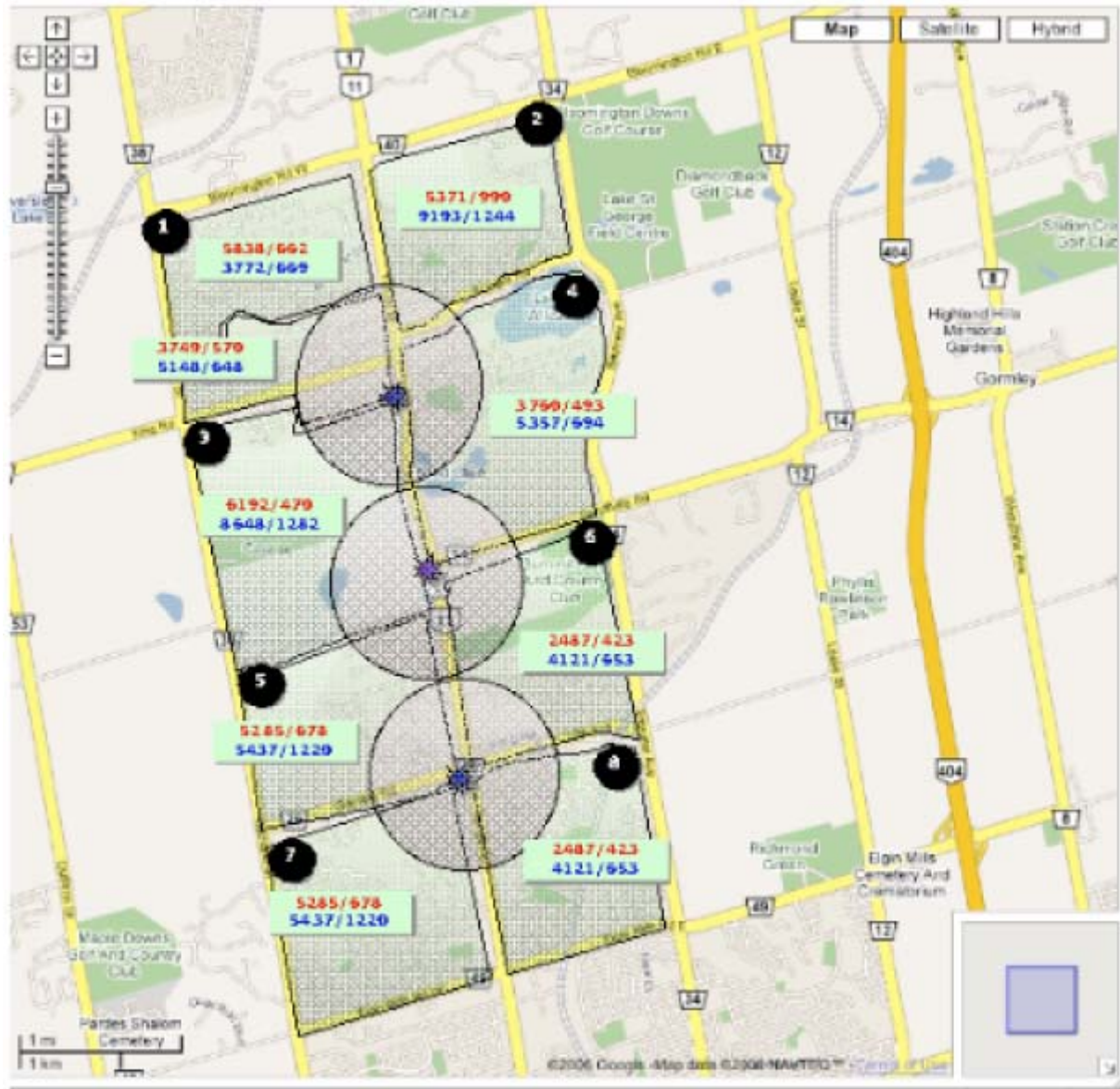
Introducing a new station at Stouffville Road would introduce spacings of approximately 2000 metres from King Road to Stouffville Road and a similar distance from Stouffville Road to Gamble Road, which clearly meets the minimum spacing standard. Further, introducing this station would only reduce the average spacing to 1560 metres, clearly within the existing standards. (Note, the exact split of distances was not calculated, since the location will need to be assessed from a geometric and safety standpoint to identify the most appropriate location. The methodology used for estimating ridership is not sensitive to changes between near- or far-side of the intersection, or other locations in the vicinity of Stouffville Road.

Net New Boardings

ENTRA estimated the new boardings for the proposed station location based on current and future population and employment data from the Region and census data (see Exhibit 4), proposed and approved area residential developments, and the correlation between new Viva ridership and development patterns at vivastation locations on Yonge Street. (Note: no new ridership counts are available for Route 98 following the implementation of Viva.) Since most of the ridership in this area will be derived from emerging and new development, all projected ridership was assumed to be new, and the sensitivity of reducing these estimates based on the potential diversions from Route 98 was tested.

Exhibit 4

Stouffville Road Area Population and Employment



Population projections were pro-rated based on the estimates of population and employment within the catchment area of each stop. Catchment area population and employment values were then correlated to existing ridership at the upstream and downstream stops to determine the percentage of ridership attracted from each area relative to the catchment area population. The average of these two values (for King vivastation and Gamble Road vivastation) was then applied to the catchment area population estimate for the new stop location at Stouffville Road (see Exhibit 5).

Exhibit 5
Catchment Area Estimates

		Analysis Zones								
		1	2	3	4	5	6	7	8	
2006	population	3,479	5,371	6,192	3,760	5,285	2,487	5,165	4,585	36,324
	employment	662	990	470	493	678	423	1,231	987	5,934
King	vivastation Cathchment									
	% of population/Employment	40%	25%	30%	20%					
	Population+Employment	1,656	1,590	1,999	851	0	0	0	0	6,096
	Boarding									408
	Alighting									434
	Boarding / {PE}									0.07
	Alighting / {PE}									0.07
19th-Gamble	vivastation Cathchment									
	% of population/Employment	0%	0%	0%	0%	30%	30%	30%	30%	
	population, employment {	0	0	0	0	1,789	873	1,919	1,672	6,252
	Boarding									224
	Alighting									221
	Boarding / {PE}									0.04
	Alighting / {PE}									0.04
Stouffville	vivastation Cathchment									
	% of population/Employment	0%	0%	10%	15%	10%	5%	0%	0%	
	population, employment {	0	0	666	638	596	146	0	0	2,046
	Boarding									105
	Alighting									109
	Boarding / {PE}									0.05
	Alighting / {PE}									0.05
2011	population	5,148	9,193	8,648	5,367	5,437	4,121	4,525	4,989	47,428
	employment	648	1,244	1,282	694	1,220	653	1,156	1,298	8,195
King	vivastation Cathchment									
	% of population/employment	40%	25%	30%	20%	0%	0%	0%	0%	
	population+employment	2,318	2,609	2,979	1,212	0	0	0	0	9,119
	Boarding									610
	Alighting									649
	Boarding / {PE}									0.07
	Alighting / {PE}									0.07
19th-Gamble	vivastation Cathchment									
	% of population/employment	0%	0%	0%	0%	30%	30%	30%	30%	
	population+employment	0	0	0	0	1,997	1,432	1,704	1,886	7,020
	Boarding									251
	Alighting									248
	Boarding / {PE}									0.04
	Alighting / {PE}									0.04
Stouffville	vivastation Cathchment									
	% of population/employment	0%	0%	10%	15%	10%	5%	0%	0%	
	population+employment	0	0	993	909	666	239	0	0	2,807
	Boarding									144
	Alighting									149
	Boarding / {PE}									0.05
	Alighting / {PE}									0.05

Based on these parameters, ENTRA estimates the new boardings at the proposed Stouffville Road locations ranges from approximately 105 in the immediate timeframe (based on 2006 demographic data), and 150 in the 2011 timeframe. Since current ridership at this location on the local routes is known to be small, these estimates can be considered net new boardings at this location.

For these reasons, ENTRA recommends a new vivastation at the proposed Stouffville Road location. YRT, in conjunction with the Region's Transportation and Works Department, should examine the location more specifically to identify the most practical location. If the vivastation cannot be located within approximately 100 metres of either curb at Stouffville Road, consideration should be given to moving the proposed stop to a location closer to the other gateway road in the proposed plans of subdivision.

I trust this provides you with the information you require.

Dennis Fletcher
Director, Transit Solutions
ENTRA Consultants

DJF/mf

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