

3 | Transit Service Guidelines





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YRT/Viva's Transit Service Guidelines are intended to make transit services convenient and easy to use for customers, and to ensure services are efficient, safe and reliable.

The Guidelines are applied to conventional and Viva services. They bring clarity and consistency to the process of continually adjusting and improving Regional transit services. The Guidelines allow flexibility to respond to customer needs and community expectations in an accountable, equitable and efficient manner.

3.1 | Performance Indicator Guidelines

Performance of the YRT/Viva system is measured differently for system-wide performance and individual route performance. Each category of route serves a particular transit market, and each plays an important role in the success of the overall system network. Although each route is reviewed individually, YRT/Viva must consider the overall system goals when evaluating changes or improvements to service. At the system-wide level, system performance is measured based on the following indicators:

- > Regional subsidy per route (Net cost per passenger)
- > Route performance assessment
- > On-time performance
- > Trips not accounted for
- > Mean Distance Between Failures (MDBF)
- > Accident rate
- > Route coverage
- > Service levels and span of service
- > Vehicle capacity

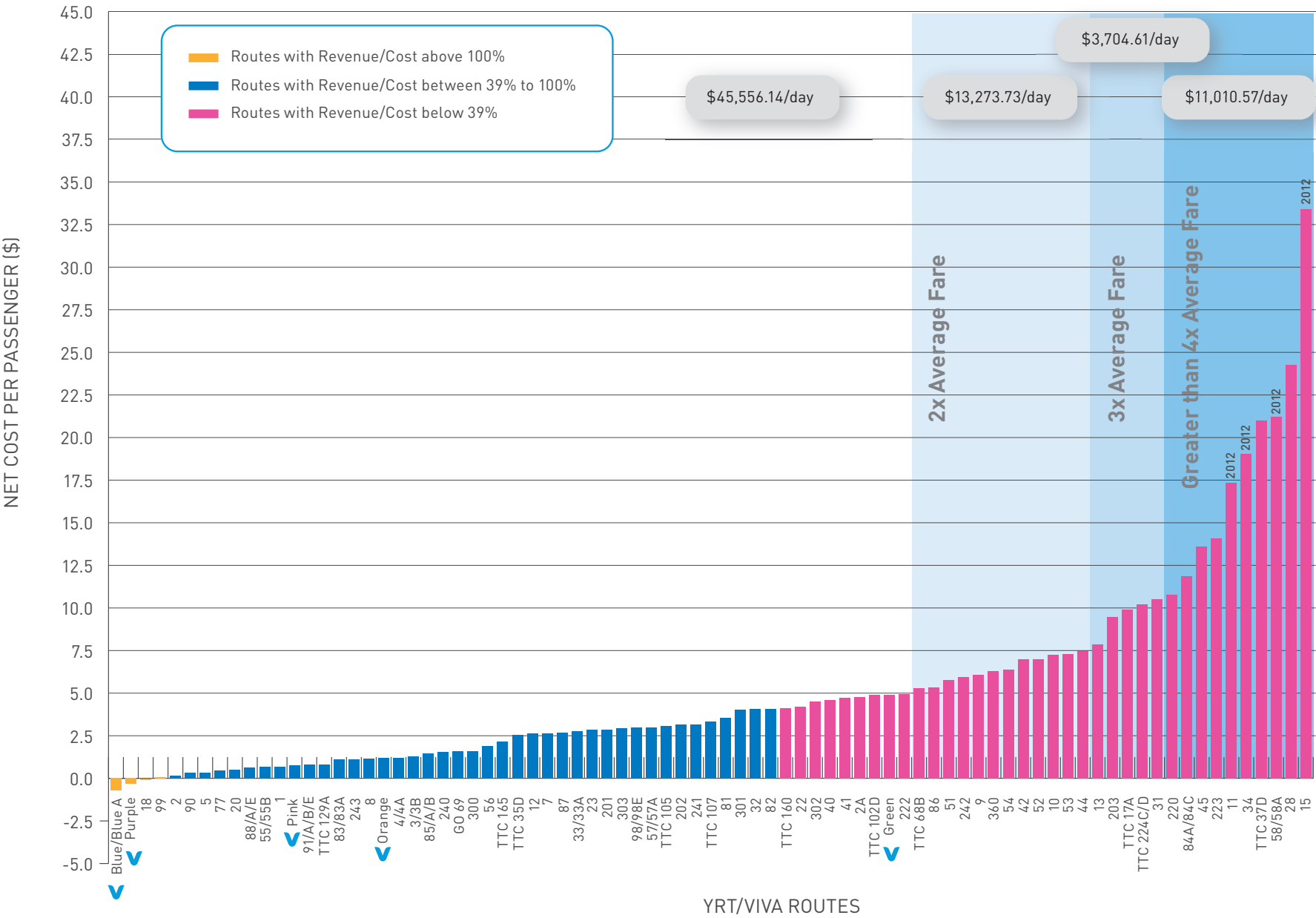
These indicators identify how reliable and cost-effective the service is. They must be considered together, not individually, with the goal to strike a balance between them.



Regional subsidy per Route (Net cost per passenger)

Performance of individual routes is assessed by evaluating the Regional subsidy per route and passenger boardings per vehicle-hour. These indicators identify how well a service is being utilized by customers as shown in **Figure 3**. The evaluation of boardings (including transfers) gives additional importance to a route that may carry an above average number of transferring passengers, which plays a vital role in the performance of an effective transit network.

Figure 3: Net Cost Per Passenger



Route Performance Assessment

YRT/Viva utilizes Computer Aided Dispatch and Automatic Vehicle Location (CAD/AVL) technology as a tool to help measure route performance. Mobile Statistics, a reporting program of the INIT system, is used to provide operational data including travel time, passenger boarding, alighting activity and trips not accounted for.

On-Time Performance

YRT/Viva has established a start-of-trip, on-time performance goal of 95 per cent for Viva and 90 per cent for conventional base routes. An arrival at last stop of 85 to 90 per cent has been established for all routes. To improve on-time performance for trip start times, YRT/Viva continues to update schedules to reflect actual travel times.

Service Planning, Operations, Customer Service and contractors-staff work to improve on-time performance by:

- Identifying areas requiring improvements
- Analyzing routes departing less than 90 per cent on-time
- Analyzing routes arriving less than 85 per cent on-time
- Identifying corrective measures
- Identifying schedule changes
- Developing interim operational measures
- Recommending technology changes and upgrades
- Recommending Bus Operator training
- Developing contingency bus requirements



The on-time performance goals for conventional and Viva routes are summarized in **Table 5**.

In 2012, system performance improved, and contractors were more accountable for the services provided. YRT/Viva's ability to track on-time performance, and the number of trips operated, helps YRT/Viva to better understand the reliability of the overall system.

Trips Not Accounted For

A target of one (1) to one-and-a-half (1.5) per cent of all scheduled trips has been set. YRT/Viva has implemented a new process to track trips not accounted for by category, including:

- Mechanical breakdowns
- Operators sick/late
- 20 plus minute delay due to traffic
- Accidents
- Police, Fire, EMS Emergencies
- Inclement weather

Performance indicators hold YRT/Viva operations and maintenance contractors directly accountable for the number of trips not accounted for. Performance based contract incentives/disincentives ensure contractors operate a reliable service.

Table 5: On-Time Performance Goals

Service		Target (%)	2009 (%)	2010 (%)	2011 (%)	2012 (%)
Conventional	Start of Trip	90	76	81	83	86
	Arrival Last Stop	85	43	39	59	63
Viva BRT	Start of Trip	95	86	83	89	88
	Arrival Last Stop	90	16	16	42	42

Mean Distance between Failures (MDBF)

MDBF tracks the total distance a bus fleet will operate in-service before there is a mechanical break down. By tracking MDBF, YRT/Viva and its contractors can improve fleet reliability and provide better service to customers. **Figure 4** provides an example how YRT/Viva tracks MDBF for each contract.

Accident Rate

Accident rate analysis provides a year-to-year, and month-to-month comparison of each contractor allowing YRT/Viva to examine how contractor accidents are trending. YRT/Viva measures all accidents by their profile to design and develop behaviour specific training programs the contractors can use to decrease accidents. **Figure 5** provides an example how Accident Rates are tracked.

Figure 4: Veolia Southwest Mean Distance Between Failure

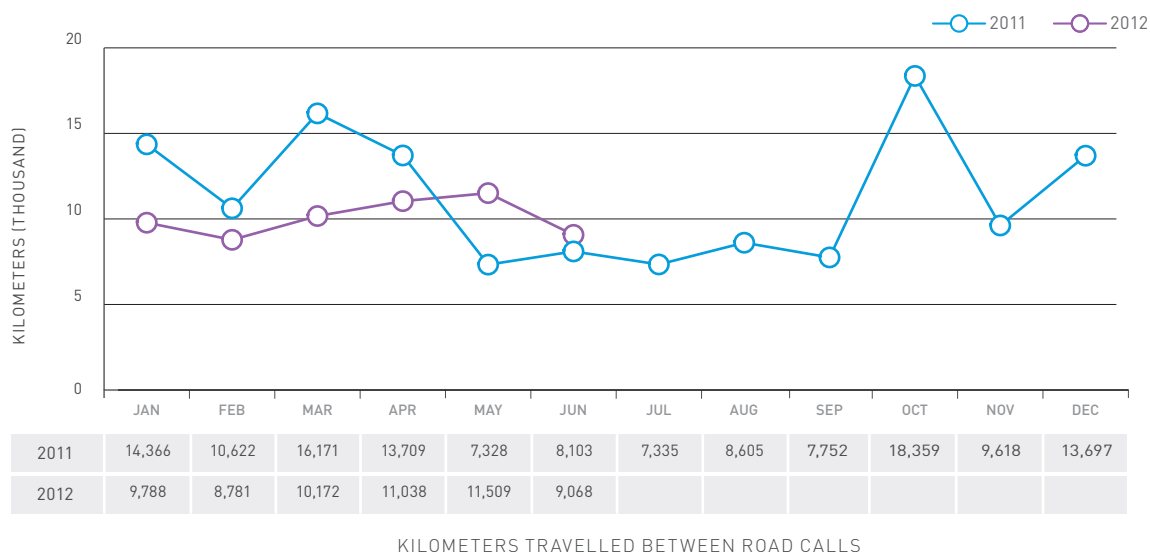
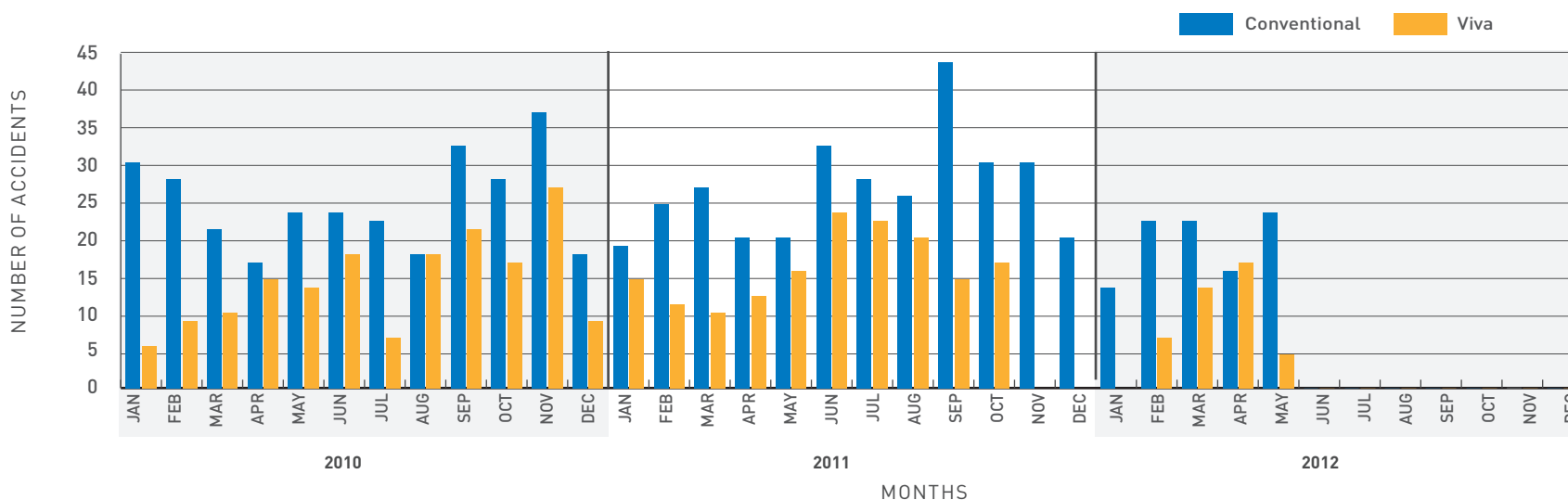


Figure 5: Accident Rate — Conventional vs. Viva (2010-2012)



3.2 | Route Coverage

YRT/Viva will consider operating routes in urban areas that are beyond the maximum walking distance guidelines, as shown in **Table 6**. The objective of the guideline is to provide service to approximately 90 per cent of the urban area.

3.3 | Service Levels and Span of Service

Minimum span of service and service levels are defined for Viva, base, local and Community Bus routes, but not for Express or GO Shuttle services.

Minimum service levels are defined for each operating period and are based on ridership levels. Express and GO Shuttle routes are designed to target locations such as GO routes and subway stations. Express routes are provided as demand warrants based on vehicle capacity, whereas GO Shuttle routes are scheduled to meet GO train times.

As part of the development of the 2012–2016 Five-Year Service Plan, the current transit service frequency guidelines were updated to match existing operating and budget conditions as shown in **Table 7**.

Table 6: Walking Distance Guidelines

Service Period	Maximum Walking Distance
Monday to Saturday 6:00 a.m. to 7:00 p.m.	500 metres of a bus stop
All other periods as defined in Span of Service Guideline (Weekday and Saturday evenings and all day Sundays and holidays)	1,000 metres of a bus stop

Table 7: Service Frequency Guidelines

Service Span	Service Frequency (minutes)			
	Viva Routes	Base Routes	Local Routes	Community Bus **
Weekdays				
6:00 a.m. to 9:00 a.m. 3:00 p.m. to 7:00 p.m.	15 *	30	60	120
9:00 a.m. to 3:00 p.m. 7:00 p.m. to 11:00 p.m.	15 *	45	80/90	120
Saturdays				
6:00 a.m. to 11:00 p.m.	15 *	45	80/90	120
Sundays/Holidays				
9:00 a.m. to 11:00 p.m.	15 *	60	80/90	120

- > Span of Service is based on demand
- > * Service frequencies are based on demand
- > The current range of frequencies for Viva is 3 to 19 minutes during rush hour.
- > Viva pink and green operate during rush hour only.
- > ** Where a Community Bus operates two branches and each branch operates a 120 minute frequency, the locations serviced by the Community Bus routes will have 60 minutes frequency in opposite directions.

3.4 | Vehicle Capacity

YRT/Viva designs services to keep the number of passengers on vehicles at a reasonable level, and within the limits of safety. This could result in some passengers left standing on buses at times throughout the service day.

Passenger guidelines are calculated (on average) over one hour, in rush hours, and at the busiest point on a route.

If a service operates at a 15 minute frequency, then four buses would pass the busiest point in an hour. The average number of passengers for these four buses must fall within the service guidelines, even though any one bus may be more crowded than the average.

Table 8 shows the average maximum vehicle capacity. If the guideline is exceeded for the average calculation, YRT/Viva will adjust service to manage capacity.

Table 8: Vehicle Capacity Guidelines

Route Type	Seating Capacity	Average Maximum Vehicle Capacity
Base, Local and Express Routes		
60-foot Bus (Viva)	52-54	72 passengers per vehicle
40-foot Bus	39, 43	55 passengers per vehicle
40-foot Bus (Viva)	36	48 passengers per vehicle
30-foot Bus	26	40 passengers per vehicle
Express Routes		
(High-speed or Highway)	43	100 per cent of seating capacity per vehicle
Shuttle Routes		
	26, 39, 43	100 per cent of seating capacity per vehicle
Community Bus Routes		
	26	100 per cent of seating capacity per vehicle

Base, local and most express capacities are based on average maximum passengers per vehicle during non-rush hour and measured over a 60 minute period during rush hour. Seating capacities depend on vehicle year and/or model.

3.5 | Target Performance

Target performance is established for average and minimum passengers per service hour. The target boardings per service hour are defined for each YRT/Viva route type, based on rush hour periods and non-rush hour periods. The performance targets are shown in **Table 9**.

3.6 | Establishing New Transit Service

Determining if service is warranted

Investigating if a route should be provided or not (base or local routes, Express routes and GO Shuttles) is determined by forecasted performance levels. Designating a base route will depend on the network coverage, and if the new designation is meeting the targets set for base routes.

The introduction of a High School Special is similar to that of a GO Shuttle. It depends if the secondary school can be easily served by an existing service within the route network, and the limits of the route directness guideline (as described in **section 3.7**) for those routes.

Community Bus routes are considered for small urban communities or areas consisting of a concentration of senior residents, medical buildings and shopping locations. A population of 15,000 residents is an appropriate guideline for considering service, and should be used to identify communities where these guidelines will apply. Community Bus routes will not be considered if Viva or conventional routes are operating within close proximity of a desired Community Bus route.

Table 9: Performing Targets by Service Type

Route Type	Weekday Rush Hour	Other Times
Base Routes		
	All routes averaging 30 passengers per service hour, with a minimum of 10 boardings per hour	All routes averaging 22 passengers per service hour, with a minimum of seven boardings per hour
Local Routes		
	All routes averaging 25 passengers per service hour, with a minimum of eight boardings per hour	All routes averaging 22 passengers per service hour, with a minimum of seven boardings per hour
Express Routes		
Fixed Route Express	All routes averaging 30 passengers per service hour, with a minimum of 10 boardings per hour	
Business Express	All routes averaging 35 passengers per service hour, with a minimum of 30 boardings per hour	
Shuttle Routes		
	All routes averaging 25 passengers per service hour, with a minimum of 20 boardings per hour	
Community Bus Routes		
Fixed Route	All routes averaging 15 passengers per service hour, with a minimum of five boardings per hour	All routes averaging 12 passengers per service hour, with a minimum of four boardings per hour
Demand Responsive	All routes averaging 10 passengers per hour, with a minimum of five boardings per hour	All routes averaging 8 passengers per hour, with a minimum of four boardings per hour

**Introduction of an Overlay Express route must maintain the performance levels of the remaining route at current levels, and projected performance of the new Overlay Express route must be better than that of the current route.

3.7 | Design Guidelines

YRT/Viva uses Design Guidelines to create the most effective services and to ensure performance measures of each route are met. If a particular route does not meet these guidelines, remedial action is not necessarily required; however, the route is carefully monitored to ensure its effectiveness.

Route Directness — How direct should a route be?

Base and Viva routes are designed to provide direct service, with minor deviations to serve major destinations. Shuttle services may incorporate more indirect routings to increase the service area. Community Bus routes are circuitous to serve more area residences and community destinations.

Route Deviations — When should a route deviate?

Combined with route directness, route deviation guidelines provide assistance in determining the route structure for services to schools, GO Stations, or major employers. This measure considers the benefit of varying from a direct route to serve a major area, versus the inconvenience to those passengers already on-board.

Route deviations must attract enough new passengers to the route (not merely reduce the walking distance for existing passengers) to make the change worthwhile. For example, additional travel time requires more service hours, therefore, change should only be made if it improves the overall performance of the route.

If the deviation can be achieved with the existing resources (typically less than a one or two minute increase in travelling time), the new ridership gained should be no less than 25 per cent of the passengers affected by the detour. However, to support Viva and the grid network, deviation of Viva or base routes is not recommended.

Locating Bus Stops — Where should bus stops be located?

Bus stops should be placed at most intersections, passenger generators and transfer points subject to minimum spacing criteria. Stop spacing should not normally be less than 200 metres in developed areas and, where demand exists, 500 metres in undeveloped areas (specific major trip generators may require variances in stop spacing).

Development around major stops should be encouraged at greater density and should follow transit supportive design principles. Development should be built closer to the street, favour pedestrian connections and provide customer friendly uses and other passenger amenities.



Bus stops at intersections should be located in the safest position, considering traffic and street conditions. Where possible, stops should be located close to signalized intersections. At Viva transfer points, YRT/Viva stops on the intersecting routes should be located at the near side of the intersection, to facilitate transfers.

Priority factors in selecting bus stops as candidates for transit shelters include:

- All terminals and vivastations
- High ridership locations (more than 20 boardings per weekday)

Stops and the area around them should be made accessible to people with disabilities, including wheelchairs and other mobility aids. Sidewalks should be available along both sides of the street where transit operates.



Locating vivastations

The introduction of additional vivastations along established Viva routes will add travel time and the potential for delay. New vivastations should be added only when warranted by high anticipated demand, and location relative to the other vivastations on the route.

Spacing between vivastations should average at least one kilometer, however, an additional vivastation on an existing Viva route should only be considered if:

- It is located at least 750 metres from the nearest adjacent vivastation, on any Viva route, serving the proposed station
- It will not reduce the average route-wide distance between vivastations on any route it serves to less than 1,000 metres



A new 'infill' vivastation on an existing route should attract more new riders than it discourages as a result of additional travel time, and is expected to attract at least 300 new boardings per weekday (i.e. not including shifts from adjacent vivastations).

New vivastations should be placed to maximize potential ridership. They should be located at least 750 metres apart, and should not have an average spacing of less than 1,000 metres over the entire extension or revised section length.

Recommendations for additional vivastations are subject to budget approval. Vivastation location criteria may be modified with the implementation of rapidways.

Locating Bus Stations / Terminals

Bus terminals and minor turnaround facilities will be located at transit nodes identified in the 2009 Transportation Master Plan, or at the end of a line and convergence of two or more corridors, where local services connect.

Development around stations and terminals should incorporate York Region's Transit-Oriented Development (TOD) design principles. Transit-Oriented Development is an approach to planning and design that strengthens the relationship between how we grow and our ability to provide efficient and effective transit services. TOD guidelines include locating employment uses around transit hubs, and discouraging low density, auto-oriented land use around transit terminals.

