Comparison of Rail Transit Modes[1]

	Heavy Rapid Transit	Medium Rapid Transit	Light Rapid Transit	Streetcar	Commuter Rail
Toronto example	Subway	Scarborough RT	Spadina (low end of range due to pedestrian activity) and The Queensway.	Queen, King, Dundas, etc.	GO Transit
Infrastructure	Completely grade-separated in tunnel, on elevated or in a fenced right-of-way.	Same as subway	Can use any HRT-type infrastructure but can also run at grade with level crossings or in street medians.	Runs at grade on primarily shared right-of-way with other street users.	Mainline railway construction.
Stations	Large. Grade separated out of necessity because of the inability of passengers or road traffic to cross the tracks.	Smaller than subway stations owing to the shorter trains. Same constraints for access.	Can be grade separated, but also can be at grade with pedestrians and road traffic crossing the tracks.	At grade with pedestrians and other traffic sharing the right-of-way. Safety islands and lane markings may be used.	Stations at grade due to operational constraints of trains. Under/overpasses are required for passengers to access tracks.

[1] Amended version March 23, 2006. URL for Scarborough RT study added. Clarification that the ability to cross a right-of-way applies to both pedestrians and road traffic for certain modes.

	Heavy Rapid Transit	Medium Rapid Transit	Light Rapid Transit	Streetcar	Commuter Rail
Platform arrangement	High platform level with car floor	Same as subway	Platforms are usually at the car floor height, although older implementations use low platforms with steps inside the vehicles like streetcars. Newer, low-floor cars do not require raised platforms.	Older cars have high floors with steps from low platforms or the street pavement. Newer low-floor cars minimize the height difference from the pavement.	Both high floor and low floor configurations are possible. Go Transit uses fairly low floors plus a raised section of the platform to provide level loading at selected points.
Fare collection	Prepaid	Prepaid	Usually, but not necessarily prepaid. Onboard payment or ticket validation may be used.	Usually on board fare collection or ticket validation.	Prepaid

	Heavy Rapid Transit	Medium Rapid Transit	Light Rapid Transit	Streetcar	Commuter Rail
Capacity (Note that the design capacity affects station layouts and higher capacities require more and larger pathways for passenger flow)	Up to 40,000 per hour with appropriate signaling, track geometry and operational rigour.	For SRT, the theoretical capacity is 40 6-car trains per hour, or 12,000. However the existing fleet and stations allow only 15 4-car trains per hour, or 3,000.	Two-car trains holding 300 riders could operate at 30 per hour for a capacity of 9,000. Larger capacity is possible, but the longer trains would require bigger stations and there would be some constraints on location of the corridor.	Two-car trains holding 150 riders can operate at 40 per hour for a capacity of 6,000. Higher capacities are possible in theory, but even this level can only be achieved on routes where streetcars rule the road. The most recent example in Toronto is Bloor-Danforth before 1966.	Ten-car trains with a comfortable capacity of 1,000 can be operated at 4 to 6 per hour provided that conflicting traffic does not interfere. More frequent service is possible if a line is electrified so that trains can accelerate and stop in shorter distances, more like subway trains. Terminal capacity problems can be severe if many lines converge on one point such as Union Station.

	Heavy Rapid Transit	Medium Rapid Transit	Light Rapid Transit	Streetcar	Commuter Rail
Geometric constraints on routes	Tight curves must be avoided to maintain full-speed operation. Stations must be sited where there is enough room for the structure and for connecting surface facilities.	Curve and grade requirements are less stringent than on HRT due to the use of smaller vehicles.	Curve and grade requirements would ideally be at MRT standards, but where the line is constrained, a tighter/steeper alignment is possible.	Curve and grade requirements match those of city streets. Extreme grades are technically possible but should be avoided. (The steepest grade in Toronto is on Bathurst street north of Davenport.)	Curve and grade requirements are the most stringent for mainline railways because these are shared with regular freight operations and because high-speed operations on curves must be possible without disturbing passengers.
Suitability for automated operation	Yes	Yes	Cab signaling is possible but the ability for trains to interact at grade crossings and stations requires manual vehicle control.	No. Manual control is essential.	Cab signaling with speed limitations may be used, but manual control is essential for interaction with other traffic and trains.
Top speed (note that top speed is generally a function of station spacing and safety rather than technical limitations of the vehicle)	45 mph	45 mph	45 mph	Limited by prevailing traffic speed.	90 mph

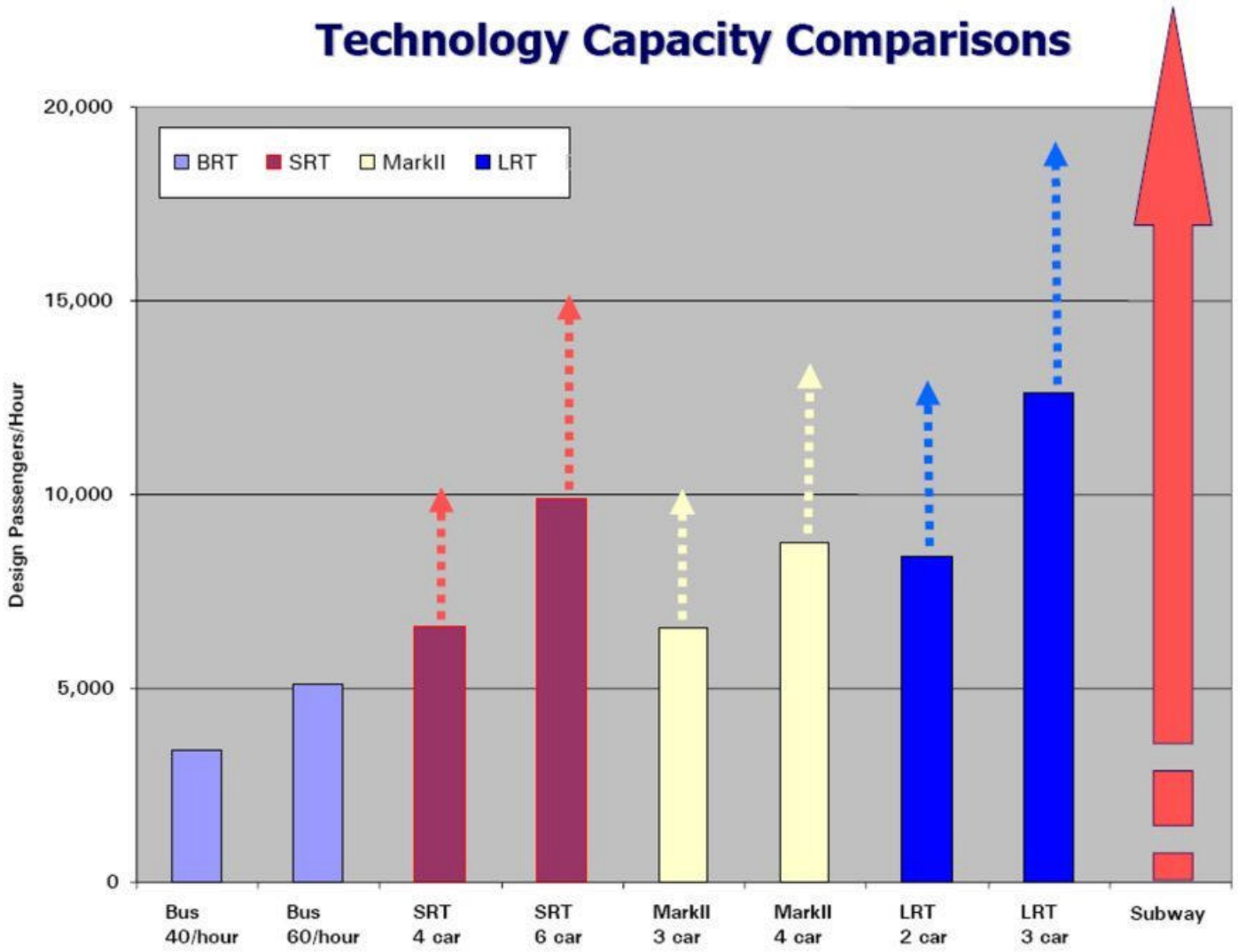
Comparison of Bus Transit Modes

	BRT	Bus	Commuter Bus
Toronto example	None.	TTC bus system.	GO Transit bus system.
Infrastructure	Dedicated roadway for part or all of a route, but can run in mixed traffic as needed.	Shared public roadways.	Shared public roadways including, but not necessarily, expressways. Can use BRT facilities for part of trip.
Stations	Dedicated platforms adjacent to the bus lane.	Curbside usually at intersections or in bus terminals at major interchanges.	Curbside on streets on in bus terminals at major interchanges.
Platform arrangement	Matching floor height of vehicle.	Sidewalks. Level with bus floor only for appropriately designed vehicles.	Sidewalk height.
Fare collection	Prepaid or onboard ticket cancellation	Prepaid or onboard.	Prepaid or onboard.
Capacity	Up to 5,000 per hour (see adjacent notes re buses) subject to constraints imposed by traffic conditions at stations and terminals, and at points where BRT traffic interacts with other road operations.	Up to 5,000 per hour with 60-foot-long articulated buses and 60 buses per hour. This cannot be achieved for local bus service where vehicles must operate in mixed traffic. The practical limit is 40 buses per hour for a design capacity of about 2,200 per hour for 40-foot buses or 3,300 per hour for 60-foot buses.	Seated loads in a 2x2 configuration with narrow aisles. Seating design is intended to compete with the comfort of auto travel.

The chart below is taken from the Scarborough Rapid Transit Replacement Study website at http://www.toronto.ca/srtstudy/index.htm.

In this chart, the modes shown are:

Bus	Standard 40-foot bus with a design capacity of 50 to 55 passengers, 75 crush.
SRT	Scarborough Rapid Transit Car (also known as the Mark I)
MarkII	Vancouver Millenium Line Car (larger version of the Scarborough design)
LRT	Bombardier LRT vehicle or equivalent
Subway	6-car subway trains as on the TTC


Technology Capacity Comparisons
20,000
15,000
10,000
5,000
0
Design Passengers/Hour
BRT
SRT
MarkII
LRT
Bus 40/hour
Bus 60/hour
SRT 4 car
SRT 6 car
MarkII 3 car
MarkII 4 car
LRT 2 car
LRT 3 car
Subway