8.0 EVALUATION OF ALTERNATIVE SOLUTIONS

This chapter describes both the assessment methodology and the evaluation of the alternative solutions that were identified in Chapter 7.

8.1 Assessment Methodology

An assessment methodology was developed in order to evaluate the alternatives to the undertaking. The assessment addressed a comprehensive range of criteria and measures, encompassing the natural, social and economic environments, as well as transportation service and cost.

8.1.1 Factors, Criteria and Measures

The alternatives evaluation framework was defined in terms of three components:

1. **Categories.** These are the components of the environment that may be affected and must be addressed according to the EA Act, grouped according to community input with respect to presentation and evaluation. The four categories were Transportation, Business and Community, Natural Environment, and Cost;
2. **Criteria.** These are the parameters that the combined public and project team input yielded, in terms of characterizing the categories. For example, travel time savings and total person-carrying capability are a few criteria under the Transportation category; and
3. **Measures.** The criteria were further defined in terms of quantifiable or measurable attributes where possible. Alternatives were subsequently compared in terms of these measures. For example: number of persons carried per segment of roadway (both transit and automobile) is the measure of the criterion, 'Total person carrying capability'. Some measures could only be addressed qualitatively.

The assessment methodology was developed through an ongoing process within the Environmental Assessment Study. This involved the project team's input and continuous feedback from the public and community groups through various public meetings and workshops.

8.1.1.1 Development of Categories, Criteria and Measures

The development of the evaluation criteria began during the Phase 1 round of public meetings. These meetings included an interactive board with a table containing an initial

draft list of categories and potential criteria. Staff asked the public to indicate what they felt were the most important three measures for the categories by placing coloured dots in the boxes, the public was also asked to add any potential criteria that they thought were important but were not listed on the board. The blank table is shown in **Figure 8.1.1.1.1.**

Figure 8.1.1.1.1: Draft Measure of Effectiveness for Alternatives Assessment Presented in the First Round of Public Meetings

CATEGORY	POTENTIAL CRITERION	Place Dot Here
Transit service	Travel time savings	
	Efficiency	
	Reliability/quality of service	
	Safety	
Transportation service	Delays/Travel time	
	Intersection design and operations	
	Construction feasibility and operations	
	Overall safety (for all road users)	
	Effect on pedestrians and cyclists	
Social and natural environment	Redevelopment potential	
	Economic effect on adjacent businesses	
	Effect on natural environment	
	Future air quality (qualitative)	
	Noise	
Community disruption and impact on adjacent property (including traffic infiltration and site access)	Neighbourhod traffic infiltration	
	Quantity/location of parking	
	Property/business access (for customers, loading and deficiencies)	
Sidewalks/Streetscape	Ability to provide for urban amenities	
Costs	Construction and maintenance	

The results and comments received on the interactive board are shown in **Figure 8.1.1.1.2.**

Figure 8.1.1.1.2: Results and Comments on Criteria Board in the First Round of Public Meetings

CATEGORY	POTENTIAL CRITERION	From Oct. 16/03 Number of Dots	From Oct. 21/03 Number of Dots	Total	Total of Each Category	% of Total
Transit service	Travel time savings	5	12	17	60	36.6
	Efficiency	2	1	3		
	Reliability/quality of service	21	15	36		
	Safety	2	2	4		
Transportation service	Delays/Travel time	6	11	17	54	32.9
	Intersection design and operations	2	5	7		
	Construction feasibility and operations	1	1	2		
	Overall safety (for all road users)	5	4	9		
	Effect on pedestrians and cyclists	14	5	19		
Social and natural environment	Redevelopment potential	2	3	5	5	3.0
	Economic effect on adjacent businesses	7	4	11		
	Effect on natural environment	5	5	10		
	Future air quality (qualitative)	13	6	19		
	Noise	2	0	2		
Community disruption and impact on adjacent property (including traffic infiltration and site access)	Neighbourhood traffic infiltration	12	6	18	32	19.5
	Quantity/location of parking	1	1	2		
	Property/business access (for customers, loading and deficiencies)	9	3	12		
Sidewalks/Streetscape	Ability to provide for urban amenities	5	5	10	10	6.1
Costs	Construction and maintenance	2	1	3	3	1.8
Other	(Please use a post-it note)	*	**			

* Comments: (From Oct. 16/03 Meeting)	- Cycle lanes - Integrate infrastructure, zoning bylaws (increased densities - main str), urban design, the environment - We are losing billions of dollars per year from traffic calming programs and TTC Right of ways and bottle necks. Goods need to flow freely. No over building. Eliminate trollies and build subways, busses, and GO trains. - Urban Design
** Comments: (From Oct. 21/03 Meeting)	- Making any changes fair to all traffic on St. Clair; minimize impact on auto travel times

'Transit Reliability/Quality of Service' received the most responses. This was followed and Cyclists' and 'Future Air Quality'. Among the Categories, Transit Service and Transportation Service were concluded to be of higher importance based on the responses.

Suggestions made through the public process resulted in some modifications of the factors, including the definitions of the categories. Social environment and economic environment were subsequently grouped under 'Community and Business'.

At the Phase 2 community workshop, the attendees were asked to rank the above mentioned potential criteria between 1 and 5 (1= Not at all important, 5= Very Important). **Figure 8.1.1.1.3** summarizes the responses received from the attendees.

Figure 8.1.1.1.3: Criteria Importance Ratings Received from Phase 2 Workshop #1

Category	Criterion	Average Importance
Transit Service	Travel time savings	4
	Efficiency (vehicle utilization)	4
	Reliability/quality of service	5
	Ability to attract riders/accommodate demand	4
	Ability to connect with potential GO Rail station	3
	Accessibility for the disabled	4
	Improves passenger accessibility, comfort	5
	Effects on safety (vehicle, passenger)	5

Category	Criterion	Average Importance
Transportation Service	Changes to vehicle delays, travel time (existing and future demands)	4
	Effects on Intersection operations (existing and future demands)	4
	Effects on corridor traffic operations	3
	Effects on overall safety (for all users)	4
	Effect on pedestrian accessibility, comfort, safety	4
	Effect on cyclist accessibility, comfort, safety	4
	Construction feasibility	3
	Ability to maintain road and related facilities	4

Category	Criterion	Average Importance
Community and Business	Support of Official Plan objectives	3
	Effects on redevelopment potential	4
	Support of Community Planning initiatives	5
	Ability to meet Urban Design objectives	4
	Economic Effects on Adjacent Business	4
	Economic effects on residential property	3
	Effects on property and business access for employees, customers and deliveries	3
	Effects on parking availability in commercial/retail areas	3
	Effects on neighbourhood traffic volumes and access (existing and future demands)	4
	Effects on access to community services	4
	Noise impacts (after construction)	3
	Effects during construction	3
	Effect on heritage features	3
Natural Environment	Effect on air quality	4
	Effect on sensitive natural habitats (plants & animals)	4
	Effect on Stormwater management	3
Costs	Effects on City/TTC budgets	3
	Cost effectiveness	4

Based on the workshop ratings, it can be concluded that the following criteria ranked the highest in terms of their averaged importance:

- Transit Service: Reliability/Quality of Service
- Transit Service: Improves Passenger Accessibility/Comfort
- Transit Service: Effects on safety (vehicle, passenger)
- Community and Business: Support of Community Planning initiatives

Figures 8.1.1.1.2 and 8.1.1.1.3 reveal that ‘Reliability and Quality of Transit Service’ was perceived to be the most important criterion to both the public and community groups.

As a result of the public's input to this point, Transit Service and Transportation Service were merged into one category, based on the public comments that these two groups are aspects of one component – overall Transportation Service. Social and economic factors were grouped under the category "Community and Business".

8.1.1.2 Public Comments on the Categories, Criteria and Measures

In the Phase 2 Workshop #1 involving the stakeholder groups, the attendees were asked to assign relative importance to the weightings of the four categories, namely Transportation, Community and Business, Natural Environment and Costs. **Figure 8.1.1.2.1** summarizes the responses received from the workshop. It should be noted that the results are summarized as one averaged response per stakeholder group.

Figure 8.1.1.2.1: Responses Received on the Weightings of Categories from the Phase 2 Workshop #1

	Community Group Response																	
Category	St. Clair Gardens BIA	Regal Heights Residents Association	St. Clair West Revitalization Committee	Corsa Italia BIA	My St. Clair	Wychwood Park Ratepayers Association	Toronto Pedestrian Committee	Rocket Riders Transit Users Group	Humewood Neighborhood Ratepayers Associat	SCRIPT	St. Clair West BIA	Save our St. Clair	Wychwood Heights BIA	Hillcrest BIA	Toronto Pedestrian Committee	Name Withheld	Deer park Ratepayers Group Inc.	**Average**
Transportation	13	48	34	28	10	35	25	45	25	58	20	30	40	20	20	60	60	**35**
Community and Business	77	43	32	53	80	40	18	25	50	18	60	45	40	70	5	10	10	**37**
Natural Environment	7	5	20	10	5	15	48	10	25	20	10	10	15	10	75	20	10	**19**
Costs	3	5	14	10	5	10	10	20	0	5	10	15	5	0	0	10	20	**9**
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	**100**

Similar to the Phase 2 workshop #1, the project team requested the public's input on the Weightings of Categories in the first round of Phase 2 public meetings. Ninety-six responses regarding category weightings were received from the public. The averaged public weightings are shown below:

- Transportation: 37%
- Community and Business: 29%
- Natural Environment: 21%
- Cost: 13%

8.1.1.3 Agreed-Upon Categories, Criteria, Measures and Weightings

An overall listing of the categories and their averaged weighting of importance was presented by the team to the community and business groups, and the public, based on all the ratings received. This is as follows:

- Transportation: 38%
- Community and Business: 38%
- Natural Environment: 14%
- Cost: 10%

The public and the stakeholders also gave their feedback on the criteria and measures for each category. The final listing of criteria and is presented in **Figure 8.1.1.3.1.**

These criteria were used to evaluate the alternatives. The evaluation of the alternatives is described below in Section 8.2.

Figure 8.1.1.3.1: Final Criteria and Measures

CATEGORY	WEIGHTING	#	CRITERION	MEASURE (S)
Transportation	38%	A1	Travel time savings	• Marginal change in travel time from Gunns Road to Yonge Street, relative to existing service *
		A2	Efficiency (vehicle utilization)	• Number of vehicles required to address demand *
		A3	Reliability/quality of service	• Marginal change in number of short turns projected * • Uniformity of spacing between vehicles * • Consistency in day-to-day trip times*
		A4	Ability to attract riders/ accommodate demand	• Competitiveness with other modes (travel time, trip cost) • *Measure comfort of trip (no. of passengers/vehicle)*
		A5	Ability to connect with potential GO Rail station	• Qualitative assessment of feasibility (access, available space, integration with east-west transit service)
		A6	Accessibility for the disabled	• Qualitative assessment; width of platforms; access from sidewalk
		A7	Improves passenger accessibility, comfort	• Provision of adequate/safe passenger waiting facilities • *Number of passengers per vehicle*
		A8	Changes to vehicle delays, travel time (existing and future demands)	• Marginal change in travel time for transit and automobiles from Gunns Road to Yonge Street * • Marginal change in delay to transit and automobiles in primary study area (average and/or overall delay) *
		A9	*Flexibility and adaptability of transit service to technological change*	• *Qualitative assessment of future upgrades, replacement, and/or development time*
		A10	*Overall person carrying capacity*	• *Number of persons carried per segment of roadway (both transit and automobile).*
		A11	Intersection operations (existing and future demands)	• Change in overall level of service (at key intersections)* • Number of major intersections with critical movements (e.g. less than 10 percent of capacity unused) *
		A12	Corridor traffic operations	• Change in overall level of service on parallel routes *
		A13	Emergency vehicle operations	• Change in emergency vehicle time response time • Changes in emergency vehicle access
		A14	Safety (vehicle, passenger, pedestrians, cyclists)	• Projected change in collisions: vehicles, pedestrians, cyclists, and transit vehicles

CATEGORY	WEIGHTING	#	CRITERION	MEASURE (S)
Transportation (continued)	38%	A15	Pedestrian accessibility, comfort	• Net change in sidewalk-width (# of metres by BIA or road section) • Change in intersection crossing times • Changes in intersection waiting times • *Changes to cross-street access at non-signalized intersections* • Effect on cross-street access (provision of median islands, differential in grades for ROW)
		A16	Cyclist accessibility, comfort	• Change relative to existing situation; ability to provide reserved or shared bike lanes • Ability to enhance crossings of St.Clair Ave. • Ability to provide cycling storage
		A17	Construction feasibility	• Qualitative assessment of construction feasibility
		A18	Ability to maintain road and related facilities	• Ease of maintenance (snow removal, minor repairs)
Community and Business	38%	B1	Support of Official Plan and other policy objectives	• Qualitative assessment of how well the alternative meets the Official Plan goals for Avenues (supporting mixed-use, transit-oriented development, quality pedestrian environments, enhanced street amenities, etc.) • *Evaluation of alternative meeting broader planning policy guidelines (e.g. Provincial Policy Statement, Smart Growth etc)*
		B2	Effects on redevelopment potential	• Projected change in development potential relative to baseline, up to horizon of 2021
		B3	Support of community planning initiatives	• Potential to improve public spaces • Potential to improve personal safety
		B4	Ability to meet Urban Design objectives	• Potential for streetscape enhancement • Potential for sidewalk expansion/improvement • Opportunity to create public spaces • *Opportunity to create areas for cultural/art features (festivals, special events, and street festivals)* • *Opportunity to promote community cohesion (north and south sides of St. Clair)*

CATEGORY	WEIGHTING	#	CRITERION	MEASURE (S)
Community and Business (continued)	38%	B5	Economic effects on adjacent businesses	• Projected change in employment, land use, building permits • Projected change in retail activity based on changes to vehicular access (addressing parking supply, left turn access, loading access) • *Projected change in sidewalk commercial activities* • *Projected change in business attractiveness due to improved streetscape (qualitative)* • Estimation of broad economic gains/losses for the short term (1-2 years after construction), medium term (5-10 years) and long term (15-20 years)
		B6	Economic effects on residential property	• Assessment value (limited by data availability) comparing broad Spadina situation to St. Clair. Short, medium and long-term timeframes to be assessed
		B7	Effects on property and business access for employees, customers and deliveries	• Changes to hours during which on-street parking and loading are permitted • Changes to permitted turning movements on access routes (consideration for absolute number of route alternatives) • Changes to delivery and loading access (# of businesses affected)
		B8	Parking availability in commercial/retail areas	• On-street: net change in number of spaces, by section (e.g. BIA boundaries) • Off-street: opportunity to create off-street parking by section (e.g. BIA boundaries)
		B9	Effects on neighbourhood traffic volumes and access (existing and future demands)	• Projected change in volume, by section of the corridor, and on local streets (compared to existing conditions and expected future conditions with 'do nothing') • Change in number of full-moves accesses into and out of specific neighbourhoods of concern • Changes to Emergency vehicle access to primary routes • *Changes in activity patterns in sensitive areas (schools, daycares, seniors residences)*
		B10	Access to community services	• Changes in the access of existing public institutional, cultural and recreational facilities and services (e.g. Piccininni Community Centre
		B11	Noise impacts (after construction)	• Marginal change in noise levels as per MOE criteria

CATEGORY	WEIGHTING	#	CRITERION	MEASURE (S)
Community and Business	38%	B12	Effects during construction	• *Duration and extent of construction relative to baseline (replacement of tracks only) (noise/vibration)*
		B13	Effect on heritage features	• *Number of heritage features affected (i.e. level of irreversibility, severity and duration of effect)*
Natural Environment	14%	C1	Air quality	• Qualitative effect on air quality due to changes in vehicle delays/speeds
		C2	Natural habitats (plants & animals)	• Qualitative effect on local natural environment (terrestrial and aquatic habitat, vegetation such as street trees)
		C3	Stormwater management	• Requirement for stormwater management facilities • Effect on existing stormwater facilities • *Ability of soil to allow for (storm)water infiltration*
Costs	10%	D1	Effects on City/TTC budgets	• Construction cost • Capital and operating costs over a 20 year lifecycle • Utilities (relocation, upgrading, etc.)
		D2	Cost effectiveness	• Change in operating costs from existing • Cost per new rider

Note: Criteria and measures in Italics were added or amended in response to community input.

8.2 Case Studies

Case study research was conducted into the effects of priority streetcar service implementation in cities around the world, in response to concerns raised by community stakeholders. This provided input to the socio-economic and community impact assessments.

Research was conducted into more than 60 light rail routes in Canada, the United States, Australia, and Europe, to find examples that are comparable to the St. Clair Avenue West streetcar route. Examples that were considered comparable included light rail routes that operate on street in a commercial downtown or main street environment, not in a separate rail corridor. This research resulted in identifying 15 streetcar routes in other cities that are considered to be successful and that operate in an environment similar to that of St. Clair West. The operators of these routes were then contacted by telephone for an interview to collect information on overall policies, operations, right-of-way design, and

if the route was recently implemented, public attitudes during planning and methods for measuring economic impacts before and after installation, if applicable. A summary of findings is shown in **Figure 8.2.1**.

Policies and elements that seem consistent among the successful cases include:

1. Transit is given priority over auto travel, through signal priority and/or pre-emption, and/or traffic restraining measures including reduction of auto parking or pricing increases.
2. Route operation in exclusive right-of-ways is often seen more often in Europe on pedestrian only streets, but also can be found in some North American examples.
3. Economic impacts were not measured before or after implementation, as the installation of the streetcar route was often used as a tool for economic development and revitalization. In some cases, local business owners and/or the community implemented and operate the route, not the local transit system. This is the case in Memphis, San Francisco, and Dallas. Business owners often promote the route, realizing that reliable transit service will bring more potential customers past their shops.

The streetcar systems that could be related to St. Clair model are described below. **Appendix 8A** is a detailed report on the effects of investment in streetcar services based on independent case study research.

8.2.1 Summary of Other Cities' Experience

High-quality light rail systems in Europe, including the cities of **Freiburg** (Germany), **Zurich** (Switzerland), and **Basel** (Germany), share several operational and policy similarities. First, a high level of traffic signal priority for transit vehicles; second, in the city centres, operating in pedestrian only areas and/or significantly limiting the availability of car parking spaces in the city centre. In addition, in these cities, car ownership rates are quite low when compared to other European cities. Also, the modal split shows low auto usage for most trips.

A number of case studies revealed positive effects of streetcar service introduction (with full details in Appendix 8A). These included:

- **San Diego, California trolley**. Studies for the San Diego Association of Governments revealed: a 10% increase in hotel occupancy with one-half mile of stops; 80% of streetcar riders at two stations also shop at the malls located at these

Figure 8.2.1 Case Studies: Summary of Findings

City	Name of route	Year established	In mixed traffic?	Length of Route	Purpose/ Connections	Web Links
Baltimore, MD		1997		Three extensions - 7.4 miles		
Boston, MA						
Buffalo, NY		1984	No auto traffic on Main Street		Looking at adding traffic lane to ped/rail only mall	
Charlottesville, WV					Not a streetcar - a commuter rail on freight line	
Cincinatti, OH	**East End**	lapsed plan at conceptual stage only	Excl. r-o-w on-street is seen as best alternative	Would feed passengers to the light rail system, seen as a method of revitalizing the east end		
Charlotte, NC	Charlotte Trolley	1996	Operates on railroad r-o-w with a tow-behind generator	16% increae in tax values along corridor since 1991		
Cleveland, OH	Waterfront Extension	1996		2.2 miles		
Dallas, TX	Richardson/Plano and Garland	2003		23.0 miles		
Dallas, TX	Transit Mall through City Centre	1996		2.0 km		
Dallas, TX	**McKinney Avenue**	1989	Operates on-street, non-exclusive r-o-w, at sidewalk	3.0 miles	Since opening, $170 million in retail and residential development has occurred along route	http://www.mata.org/
Denver, CO	Central Platte Valley	2000		1.8 miles		
Denver, CO	Platte Valley	1989		3.5 miles	Runs on abandoned freight rail and on-street next to sidewalk, non-excl r-o-w	
Detroit, MI		discontinued	Ran on the sidewalk			
Fort Collins, CO		1985	Runs on grass median, like St. Charles, NO	1.5 miles		
Galveston, TX	**Island Trolley**	1988	Operates on-street, non-exclusive r-o-w, in middle and at sidewalk	5.2 miles		
Galveston, TX	**extension**	2004		2.1 miles	Connects U of T Medical Branch with transit system	
Guadalajara		1988				
Houston, TX	Main Street LRT	2004			To connect downtown and the Medical Center	
Jersey City, NJ	Hudson-Bergen LRT	2005		13.0 miles		
Kenosha, WI	Downtown loop	2000				
Little Rock, AR	River Rail	2004	Will operate in mixed traffic, with exclusive r-o-w on the bridge	2.2 miles	Connects downtown to River Market to sports arena	
Los Angeles, CA	Pasadena Blue Line	2003		13.7 miles		http://128.241.143.185/AAReportEXECrev.pdf
Memphis, TN	**Main Street Line**	1993	operates in exclusive r-o-w as well as mixed traffic	4.5 miles	Revitalized Main Street, after pre-streetcar development completely failed	http://www.matatransit.com/
Memphis, TN	Riverfront Loop		Runs on Illinois Central Railroad along bluff of Mississippi			
Memphis, TN	**Madison**	2001	operates in mixed traffic	East 2 miles to medical center		
Minneapolis - St. Paul		2003				
Monterrey, CA						
New Orleans, LA	Canal Street	2001	No - in previously existing median			
New Orleans, LA	**Desire Streetcar Line reestablished**	2004			Downtown and the French Quarter	http://www.regionaltransit.org/news/desire/toc.php
New Orleans, LA	Riverfront Line	1988				
Orlando, FL						
Philadelphia, PA	**Girard Avenue**	2004	on-street		Long line crosses city north of downtown	
Pittsburgh, PA						
Portland, OR	MAX	1988	in expressway r-o-w, median of suburban arterial, abandoned railway, and in the downtown for 1.5 miles	15.1 miles		
Portland, OR	Portland Interstate MAX	2004		5.5 miles		
Portland, OR	**Vintage Trolley**	1991	on-street	2.0 miles	operates between Lloyd district and downtown	http://www.trimet.org/improving/index.htm http://www.ti.org/transit.html
Sacremento, CA	South Line & Folsom Extension	2003		17.0 miles		
Sacremento, CA			Shares the track with autos in some parts of northern section and has priority at most traffic lights in city centre		operates at average speed of 33 kph compared to 21 kph for buses	There has been significant development in the downtown area, which may be due to light rail.

Figure 8.2.1 (continued) Case Studies: Summary of Findings

City	Name of route	Year established	In mixed traffic?	Length of Route	Purpose/ Connections	Web Links
Salt Lake City, UT	East-West Connection	2002				http://www.pb4d.com/projects/transi t/slc/slcdt.htm
San Diego, CA	North Park	proposed				
San Diego, CA	Mission Valley West	1997	runs on union pacific rail lines	6.1 miles		
			runs on former railway alignment and on a highway, non-excl r-o-w			
San Diego, CA	East extension	1989	runs downtown through C street, 5 of 17 blocks other vehciles are prohibiited	extention is 18 km	downtown	
San Jose, CA	Tasman West Extension 1999	Tasman East/Capitol & vasona Exts. 2004 15.1 miles		7.6 miles		
San Jose, CA	**Valley West**	1988 - currently not operating	**operates 2 tracks center of street in excl r-o-w, no on-street parking**	4.5 miles		www.vta.org
San Pedro, CA	Port of LA Waterfront Red Car Line	2003	Off street in excl r-o-w	1.5 miles	connects cruise ship terminal with other waterfront attractions	
San Francisco, CA	Third Street Extension	2005		5.4 miles		http://www.sfmuni.com/aboutmun/3r dover.htm
San Francisco, CA	**F-Line**	1988	**operates in mixed traffic, 2 tracks center of street, non-excl r-o-w, on street parking**	5.8 miles		
Savannah, GA	no rail - rubber tired trollley					http://www.catchacat.org/catchacat/ shuttle.htm
Seattle, WA	Tacoma Link	2002	along sidewalk in an exclusive r-o-w	1.6 mile	shuttle between Tacoma Dome multi-modal terminal and downtown Tacoma	http://www.wsdot.wa.gov/rail/transit/ lightrail.cfm
Seattle, WA	Waterfront Streetcar	1982		Replaced a bus route		http://transit.metrokc.gov/am/vehicl es/wfsc.html
St. Louis, MO						
Tampa		2002	single track, exclusive r-o-w Access to tourist venues	Connects Ybor City and Tampa	Resident and business community initiated	http://www.tecolinestreetcar.org/mai n.htm http://www.hartline.org/news/new_e vents/inventing_the_future.pdf
Tuscon, AZ	Old Pueblo Trolley	1993	**Operates in mixed traffic, center of street, non-excl r o-w**	1.1 mile	Much smaller city, less traffic	http://www.oldpueblotrolley.org/
Vancouver						http://www.translink.bc.ca/
Overseas						
Barcelona, Spain						http://www.tramways.com/tramways /spain/barcelona1/index.html
Baron, Switzerland						
Caen, France						
Freiburg/Breisgau, Germany			operates on-street, non-excl r-o-w	low-traffic area		
Genevieve, Germany						
Genova, Italy						
Grenoble, France		1987	operates on-street, non-excl r-o-w, also pedestrian mall			
Lausanne, Switzerland		1991				
Lyon			in median			
Melbourne, Victoria, Australia		1906	operates in downtown mixed traffic	operates in middle of street with no separation, no platforms so passengers must cross traffic to board	Usage is low. Speed is low due to mixed traffic	http://www.yarratrams.com.au/
Montpellier				downtown area		
Paris, France	St. Denis-Bobigny	1990	operates on-street, non-excl r-o-w	low-traffic area		
Stockholm, Sweden		1991				
Strasbourg, France		1994	In the city centre, operates in pedestrian only areas; outside the city centre, operates in own r-o-w			
Vienna, Austria						
Zurich, Switzerland	VBZ (13 routes)	1990	operates on-street - 70% of track in own r-o-w identified only by white markings and has signal priority 100% of the time. Zurich has one of the lowest car ownership rates in Europe.	downtown area - high-end shopping street		

stations; and 57% of these riders indicated that they would not have shopped at these locations without the transit service;

- **Portland, Oregon MAX streetcar service.** A 1996 study determined that the original Eastside MAX line had been responsible for $1.3 billion of development immediately adjacent to the line. Property values at stations increased at more than double the county-wide rate. MAX also had a measurable effect on retail business: according to a 1987 survey, 66% of business owners said their business had been helped by a location near MAX, and 54% said they saw increased sales as a result;
- **Dallas DART streetcar line**. University of North Texas researchers collected appraisal data for the period 1994-1998 on 700 commercial and residential properties within a quarter-mile of DART streetcar stops, and compared this to data for other similar properties not near the streetcar. They found that for properties close to the stations: increase in value was 25% higher; occupancy levels and rents were higher, and retail sales growth was higher. A 2003 University of North Texas study examined the economic impacts from 1997 to 2001, and found that values of residential and office properties increased more rapidly than the control group. Retail property values showed no meaningful difference based on DART service;
- **Hudson-Bergen Light Rail Transit Line, New Jersey**. The economic impact of the first 12-km phase has been dramatic since opening in 2001. From 1974 to 2001, 8.7 million square feet of development were constructed. Following the line's opening, constructed and approved development has totalled 17 million square feet in only four years. A New Jersey City University study showed that cities served by the line have benefited. In Bayonne, property values have increased by 40%, rental rates have increased by 60% and there has been a 500% increase in building permits.

8.2.2 Spadina Streetcar, Toronto

The TTC's Spadina streetcar provides the closest comparison in Toronto. The 510 Spadina streetcar runs between Spadina Station on the Bloor-Danforth subway line and Union Station on the Yonge subway, via Spadina Avenue and Queens Quay West. A dedicated streetcar right-of-way was constructed in 1997, with the final design completed in 2000.

In the workshops, it was pointed out that the form and function of the Spadina corridor is different and not directly comparable. However, it was agreed that there is value in reviewing a recent Toronto example of a dedicated streetcar right-of-way project. The review consisted of an assessment of economic factors as well as a survey of businesses and area residents. Full details of the review are contained in **Appendix 8B**, the Socio-Economic Assessment.

The review covered the 1993 to 2003 period, addressing both the pre and post-completion periods. To aid in the understanding of Spadina and its patterns of economic change, the data were assessed for four specific study areas:

- Front to Queen;
- Queen to Dundas;
- Dundas to College; and,
- College to Bloor.

Following the Introduction of the Streetcar, Employment Growth along Spadina exceeded that of the City

The data for the four Spadina Study Sub-Areas indicates that total employment did not increase consistently over the time period. The corridor lost employment in the Queen to College stretch in the early part of the period. In total, however, Spadina generally outperformed the City in total employment gains over the study period.

Employment data is shown in **Figure 8.2.2a**. A detailed review of the data indicates that much of the change in total employment results from variability in the reporting of employment for University of Toronto employees, and from structural changes in the fashion industries and related manufacturing, already underway at the time, which resulted in a consequent relocation from lower Spadina (a trend which results from global influences). For this reason, the data excluded U of T employment, as well as employment in the wholesale fashion sector and MacGregor Industries (a fashion manufacturer).

Figure 8.2.2a: Spadina Avenue Total Employment (1993 – 2003)

Spadina Avenue	Retail & Retail Service Employment			% Change	
	1993	1997	2003	1993-2003	1997-2003
Front to Queen	1,237	1,855	2,126	71.9%	14.6%
Queen to Dundas	1,663	1,431	1,616	-2.8%	12.9%
Dundas to College	1,413	1,025	1,234	-12.7%	20.3%
College to Bloor	623	536	634	1.8%	18.3%
Spadina Avenue	**4,072**	**4,416**	**5,118**	**25.6%**	**15.7%**
City	**238,790**	**238,508**	**255,790**	**7.1%**	**7.2%**

Source: City of Toronto Employment Survey

Total employment growth in the Spadina corridor has outperformed the City as a whole. However, in the 1993 to 1997 period, it mainly came from the growth in the Front to Queen area, which has experienced a resurgence in recent years due to the reduction in City zoning requirements. In the 1997 to 2003 period, following the introduction of the streetcar, employment growth exceeded that in the City and was more evenly distributed along the corridor.

Retail and Service Retail Employment Exceeds that of the City

Figure 8.2.2b indicates that the employment makeup of Spadina is similar to that of the City, with the exception of institutional employment and a relative greater reliance on retail employment.

Figure 8.2.2b: Spadina Avenue and City of Toronto Employment, by Classification, 2002

	Toronto	Spadina
Manufacturing	14.16%	12.52%
Retail & Service	22.16%	31.53%
Office	46.13%	49.47%
Institutional	14.40%	2.78%
Other	2.55%	3.70%
Total	100.00%	100.00%

Source: City of Toronto Employment Survey

Retail Employment Losses in the 1993-1997 Period were reversed in the Next Six Years Following the Introduction of the Streetcar

Figure 8.2.2c indicates that retail and service retail employment was lost on Spadina between 1993 and 1997, but stabilized in the latter part of the analysis period. The second half of the 1993 to 2003 period indicates a recovery for retailers on the street. With the exception of the southerly part of the street, employment levels in all areas rebounded in the retail and retail service sectors, and this reversal expressed itself in the period following the completion of the streetcar. While by 2003 this reversal had not brought retail and retail service employment levels fully back to the 1993 totals, the gain in jobs in the Dundas to Bloor areas exceeded that of the average for the City.

Figure 8.2.2c: Spadina Ave. Retail & Retail Service Employment, % Change 1993-1997-2003

Spadina Corridor	Total Employment			% Change	
	1993	1997	2003	1993-2003	1997-2003
Front to Queen	277	279	259	-6.5%	-7.2%
Queen to Dundas	619	571	586	-5.3%	2.6%
Dundas to College	777	610	674	-13.3%	10.5%
College to Bloor	100	64	71	-29.0%	10.9%
Total Spadina	1,773	1,524	1,590	-10.3%	4.3%
Toronto City	238,790	238,508	255,790	7.1%	7.2%

Source: City of Toronto Employment Survey

Residential Uses have become more Dominant, Particularly South of Queen

The decline in retail and service retail employment reflects a change in land uses from employment-based to those with a more residential focus. Over the 1993 to 2003 period, Spadina added just under 91,000 square meters of residential space, representing a 63% growth rate. This excludes institutional dormitory space. The City overall only added about 24% to the amount of non-dormitory residential space that existed in 1993. In both instances, much of the change in land use is considered to be attributed to "conversions".

This conversion in use encompassed about 32,000 sq. m. of space that included industrial losses of almost 4,600 sq. m., warehousing and storage losses of about 12,000 sq. m, institutional losses of over 13,000 sq m and office commercial reductions of 2,200 sq. m. The majority of these conversions occurred in the College to Dundas area, which lost a total of about 23,000 sq. m. of warehousing and institutional space, but gained 30,000 sq. m of apartments and dormitories. However, the key item that can be drawn out of the data is the fact that, like other areas along the corridor, the area added about 19,000 sq. m. residential space while at the same time posting a relatively strong recovery in employment over the 1997 to 2003 time period.

The change in land use underscores that Spadina is changing in a way that is quite unrelated to changes in transit

The "relaxation" of zoning requirements in the lower end of the street has allowed for relatively easy conversion of manufacturing and warehousing space to condominiums/residential and small office business. Further, with the rapid growth of Chinese communities in the Markham, Richmond Hill and Agincourt areas, the

importance of the traditional Chinatown retail function and its importance as a tourist attraction may be declining.

Businesses and Customers felt predominantly Positive about the Effects of the Streetcar

A survey of businesses along Spadina was undertaken to assess the perceived effect of the introduction of the streetcar. The survey focused on several key items including traffic, pedestrian safety, property access, business environment, customer satisfaction, parking availability, public transit availability, and convenience of deliveries.

The survey attempted to interview all business types along the corridor. Responses were distributed as shown in **Figure 8.2.2d**.

The survey over-represented retail and wholesale businesses. The survey results indicate that the respondents overwhelmingly felt that conditions are better or the same than before the streetcar was introduced, except for parking availability. The survey also found that 43% of businesses felt the streetcar has had positive effects on their business and 38% felt there was no change. The business owners surveyed also indicate that their mix of customers (i.e. tourists, casual customers, etc.) has not changed since the introduction of the streetcar. Critical survey results are summarised below:

Most Customers are Planned Stop Customers

54 respondents to this question indicated that, on average, roughly 31% of customers are casual shoppers, 58% are planned stop customers and 11% are tourists.

Most felt that Gross Sales Levels have not Changed or have Improved

Of the 53 respondents who responded to the survey question asking if they thought gross sales along the street have been affected by the introduction of the streetcar, 34% felt that the streetcar improved gross sales, 19% felt that there was a decrease, while 47% felt that there was no change.

81% felt that the Streetcar has had no Effect or a Positive Effect on their Business

43% of the 58 businesses that responded to this question felt that the streetcar has positively affected their business. 19% felt that the streetcar has negatively affected their business. 38% felt that the streetcar has had no effect on their business.

Figure 8.2.2d: Spadina Business Survey Respondents by Type

Store Type	Business Inventory on Spadina		Survey Response	
	# Businesses	%	# Businesses	%
Collective Residential	1	0.1%	-	-
Processed Goods Processing	5	0.5%	-	-
Product Assembly	27	2.8%	1	1.6%
Printing, Reproduction, Data Processing and Sorting	3	0.3%	3	4.8%
Storage	5	0.5%	-	-
Retail Shopping	271	28.7%	26	41.9%
Food Retail Shopping	35	3.7%	9	14.5%
Repairing, Cleaning and Servicing Consumer Commodities	9	0.9%	-	-
Personal Services	113	12.0%	6	9.6%
Rental Services	5	0.5%	2	3.2%
Accommodation Services	1	0.1%	-	-
Rental Services	6	0.6%	-	-
Retail Non Public (Wholesaling)	18	1.9%	14	22.5%
Mining Manufacturing, Transportation, Utilities, Construction and Resource Production	20	21.1%	-	-
Finance, Insurance and Real Estate	28	2.9%	-	-
Business Services	169	17.9%	-	-
Technical Services	20	2.1%	-	-
Communication and Media	48	5.1%	-	-
Trade and Personal Services	17	1.8%	-	-
Health Services Offices	65	6.9%	1	1.6%
Government	2	0.2%	-	-
Associations, Other and Ancillary Office Activities	36	3.8%	-	-
Educational, Public	5	0.5%	-	-

Figure 8.2.2d: Spadina Business Survey Respondents by Type

Store Type	Business Inventory on Spadina		Survey Response	
	# Businesses	%	# Businesses	%
Educational, Private (Separate)	12	1.2%	-	-
Religious	1	0.1%	-	-
Health Service Institutions	3	0.3%	-	-
Indoor Entertainment (passive)	13	1.4%	-	-
Indoor Sporting and recreation (active)	4	0.4%	-	-
	942	**100.0%**	**62**	**100.0%**

Most Respondents think Parking is the biggest Influence on their Business

Of the 58 businesses that responded to this question, the most common response in terms of the most important factor influencing their business was parking availability (45%). The next two most common responses were customer satisfaction (24%) and traffic (18%).

Summary of Spadina Corridor Review

In general, the change in transit from bus service to exclusive streetcar lanes coincides with significant changes in the makeup of the Spadina Corridor. However, as other factors external to the corridor were occurring over the same time period, it is not possible to link these changes directly to the transit changes, nor would this add significantly to the data review for the St. Clair situation.

On-street parking was reduced with the introduction of the Spadina streetcar lanes, a fact which was mentioned by a number of the business survey respondents. It should be noted, approximately 40% (representing 166 spaces) of the on-street spaces were completely removed along Spadina. (The Toronto Parking Authority subsequently added about 180 spaces in the area but not specifically as part of the streetcar project). Importantly, however, most businesses indicated that business conditions stayed the same or improved following the introduction of the exclusive streetcar lanes.

The review of the Spadina experience shows a significant change in the 1997-2003 period from the previous 1993-1997 period. The data supports the fact that the introduction of a streetcar service with physically separate lanes did not negatively affect the economics of this area, because following the 1997 completion of the streetcar line, the corridor outperformed the City in all significant economic factors.

8.3 Evaluation of Alternative Solutions

The evaluation process involved an assignment of weight to each criterion according to the stakeholder ranks of the importance of each criterion. Attendees at the first Phase Two Public Meeting were asked to identify and rank five criteria they perceived as most important within each of the four categories. The responses were summarized to reflect the frequency of appearance of each criterion. A score was also calculated to measure the importance the public assigned to each criterion. The score was calculated by assigning weights to the top five ranks, and multiplying the ranks by the weightings:

Importance	Weight
Most Important	5
2nd Most Important	4
3rd Most Important	3
4th Most Important	2
5th Most Important	1

Based on the scores, the five most important criteria from each category were chosen as the factors for comparative evaluation of all the alternatives. The chosen criteria within each category are shown in **Figure 8.3.1.** It should be noted that the Natural Environment and Costs categories each had less than five criteria in total. All of the criteria with these categories were therefore chosen as factors for evaluation of the alternatives.

Figure 8.3.1: Ranks of Criteria Chosen for Comparative Evaluation of the Alternatives

	Ranks of Five Most Important Criteria	Frequency	Score
Transportation	Reliability / quality of service	43	188
	Ability to attract riders / accommodate demand	37	124
	Safety (vehicle, passenger, pedestrians, cyclists)	30	101
	Overall person carrying capacity	20	65
	Travel time savings	14	51
Business and Community	Economic effects on adjacent businesses	31	117
	Effects on neighbourhood traffic volumes and access (existing and future demands)	35	109
	Ability to meet Urban Design objectives	31	84
	Support of Official Plan and other policy objectives	27	83
	Effects on property and business access for employees, customers and deliveries	21	65

	Ranks of Criteria	Frequency	Score
Natural Environment	Air Quality	44	111
	Natural Habitats (plants and animals)	9	16
	Stormwater Management	6	9
Costs	Effects on City/ TTC budgets	11	26
	Cost Effectiveness	14	21

Figures 8.3.2 through **8.3.5** present a summary of the comparative evaluation of the alternatives based on the criteria listed in Figure 8.3.1. **It should be noted that Alternative 9 was not assessed in detail at this stage** as it was assumed to consist of the best combination of Alternatives 2, 3 and sections of 6, to reflect the opportunities and constraints of the distinct communities along St. Clair Avenue.

The following sub-sections describe the alternatives evaluation for each category.

Figure 8.3.2 Alternatives Assessment Based on the Five Highest Ranked Criteria in the Transportation Category (Based On Public Weightings)

Criteria \ Alternatives	1: Track Replacement (Do-Nothing)	2: Minor Transportation Improvements	3: Transit Priority Improvements	4: Other Transportation System Strategies	5: Transit Improvements on other East-West Streets	6: Exclusive Transit Lanes on St. Clair Avenue	7: Change Transit Technology (i.e. vehicles)	8: Road Widening of St. Clair Avenue or nearby Parallel Roads
Reliability and Quality of Transit Service	Reliability and quality of trip would not increase; would decrease in future due to continuing, increasing interference from traffic and collisions. St. Clair from Yonge Street to Avenue Road has the highest midblock collision rate in the City for 2002.	Reliability and quality of trip would improve marginally at first, because traffic interference and congestion would decrease In future, growth in traffic would likely negate any improvement in reliability or quality of transit service.	Conditions east of St. Clair West Station indicate the issues related to this alternative. St. Clair from Yonge Street to Avenue Road has the highest mid-block collision rate in the City for 2002. This alternative would extend this operational concept further west. Reliability and quality of trip would increase slightly because transit would have improved priority west of St. Clair West Station. However, they would still affected by collision-related delays, and vehicles turning across the tracks.	**TDM/TSM** would not improve reliability/quality; they have no direct effect on transit service reliability. **HOV:** Reliability of trip would increase during weekday peak periods only, but not during off-peaks or weekends. Under HOV, transit still affected by collision-related delays and turns from HOV lanes. Reliability/quality would decline over time as traffic increases in the HOV lanes.	Reliability and quality would improve on routes parallel to St. Clair. No improvement on St. Clair. Only minimal improvement on Eglinton, where HOV lanes are in place.	**Physically separate option:** Reliability/quality would improve significantly due to reduction in delay from turning vehicles and from collisions. Reliability/ quality would remain high as traffic grows. (Spadina has fewer mid-block collisions, despite higher traffic volumes). **Signed transit lanes:** reliability would improve only slightly (based on King Street experience and Spadina experience before it was made fully exclusive). Quality would improve during peak periods.	Reliability/quality would improve under option of buses in curb HOV lanes. Some delay due to right-turning vehicles, but not to the degree of centre HOV lanes (as under Alternative 4). Depends on degree of enforcement.	Initially, there would be a slight improvement due to provision of additional auto capacity. This would allow more signal time to be allocated to left turns, which would decrease delay to streetcars. Over time, reliability and quality of transit would decrease, because additional auto capacity is expected to foster growth in traffic.
Ability to Attract Riders/ Accommodate demand **NOTES:** **1. Current peak period demand = 1,600 per hour** **2. Morning and afternoon peak period demands = 57% of total. 14,000 trips (43%) occur during weekday off-peak times**	Service would be slightly more attractive than it is currently, because repairs to safety problem areas would allow streetcars to operate at a more normal speed. (This improvement would apply to all alternatives.) Capacity = approx. 1,800 during peak periods. Cannot accommodate growth in demand, because streetcar service would still be unreliable and subject to traffic-related delays. Comfort level of trip (i.e. space per rider) would decrease as demand grows and streetcars are impeded by traffic.	Service would be slightly more attractive to potential riders at first, due to reduced conflicts from traffic. As traffic grows to fill the additional capacity, ability to accommodate demand would decrease. Capacity of the streetcar service would not increase - no ability to accommodate growth in demand. Comfort level of trip (i.e. space per rider) would remain as is. Delay due to collisions and left turns would remain approximately as is, impeding ability to accommodate demand.	Service would be marginally more attractive to potential riders. Comfort level of trip (e.g. overcrowding) would improve marginally. Delay due to collisions would not change - complex traffic operations would extend further west. See above re collision rate east of Avenue Road. Capacity would increase by a certain amount (difficult to be definitive - could be in the range of 10%, and increase to 1,980 from the current 1,800).	**TDM/TSM:** Service would not be more attractive to potential riders **HOV:** Transit service would be more attractive during peak periods, assuming that adequate enforcement is in place. Capacity of the streetcar service could increase to 2,200 (close to 25%)	Would attract more riders over broader area, but attractiveness is limited by lesser/non-existent connections to Yonge/ University/Spadina Subway on Rogers, Dupont, and Davenport. These three streets also have limited opportunity to generate the all-day, two-way ridership needed to support transit. Would not attract riders to St. Clair service. No change in capacity on St. Clair, and therefore no ability to accommodate growth in demand.	**Physically separate option:** Highest quality service of the alternatives would attract more riders through improved reliability of service. Streetcars in exclusive lanes would have the highest capacity (approx. 3,500/hour) and thus could accommodate future growth in demand. **Signed transit lanes:** capacity would improve to approximately 2,300 to 2,500 passengers per hour (assuming adequate enforcement is in place).	Buses would degrade attractiveness, and accommodating future growth would be difficult. Capacity of buses in mixed traffic = approx. 720, far below capacity. Capacity of buses in HOV lanes = 1,800 per hour.	Increase in vehicular capacity would not attract more riders; would detract from attractiveness as traffic increases. No improvement in ability to accommodate demand.
Safety (Vehicles, Passenger, Pedestrians and Cyclists)	Collision risk would likely remain the same. The number of collisions would increase over time as traffic grows. St. Clair from Yonge Street to Avenue Road already has the highest mid-block collision rate in the City for 2002. No safety improvement for pedestrians or cyclists. Safety would improve for streetcars and others driving on the currently unsafe streetcar lanes (same for all alternatives).	Collision risk would decrease at selected locations through the prohibition of parking, addition of turn lanes, etc. This decrease would be minimized over time as more traffic would increase the number of collisions. Marginal safety improvement for pedestrians and cyclists at intersections where improvements are added.	Collision rates would likely increase, due to the added complexity of traffic operations created by the addition of more part-time exclusive turn lanes. Safety would not improve for pedestrians and cyclists.	Collision rates would likely increase, due to the added complexity of traffic operations (i.e. combination of through vehicles + left turn vehicles in HOV lane, with weaving in and out of HOV lane). Safety would not improve for pedestrians and cyclists.	Collision rates would likely increase on St. Clair, due to increasing congestion and lack of action to address traffic. Safety would not improve for pedestrians and cyclists.	**Physically separate option:** Collision rates would likely decrease, because of increased separation between streetcars and vehicles. Pedestrians would also have increased security on platforms and at mid-block crossings. **Signed transit lanes:** some improvement, but collision incidence would remain higher than under physically separate option, due to complexity of traffic operations.	Collision rates would likely increase on St. Clair, due to increasing congestion. Safety would not improve for pedestrians. For cyclists, safety and security would likely decrease, due to presence of buses in curb lanes.	Collision rates would likely increase on St. Clair, due to increasing congestion. Decreased safety for cyclists and pedestrians due to increased traffic. Longer street crossing times would also have negative effect on pedestrian safety.
Overall Person Carrying Capacity	Person-carrying capacity would not improve. It could worsen because of congestion. More streetcars could be added, but with a declining quality of service, speed and reliability.	Person-carrying capacity would improve marginally at present due to the addition of more capacity. Capacity would decline again over time as demand increases.	Person-carrying capacity would improve marginally. Transit capacity would increase by approximately 10%, auto capacity would decrease marginally, by perhaps the same amount.	**TDM/TSM:** Person-carrying capacity would improve only marginally **HOV lanes:** capacity would increase by up to 1,000 persons per hour (based on increase in HOV lanes, offset by reduction in non-HOV capacity)	Person-carrying capacity would improve across the secondary study area, but not on St. Clair Avenue.	Person-carrying capacity would improve to the greatest degree of the alternatives being considered. Increase of transit capacity from 1,800 to 3,500 per hour would be offset by a decrease of approximately 650 in auto-based capacity. This is a net increase of 1,050.	Person-carrying capacity would increase by approximately 650 per hour (no improvement in transit capacity, some improvement in auto-based HOV capacity). Transit capacity of buses in HOV have approximately the same capacity as streetcars in mixed traffic.	Person-carrying capacity would improve by one vehicle lane (approximately 650 per hour).
Travel Time Savings for Transit	No improvement in travel time from Gunns Road to Yonge Street, relative to existing service. Travel time would increase over time as demand grows.	Very limited improvement in travel time from Gunns Road to Yonge Street, relative to existing streetcar service (less than 5%). Time savings would decrease as traffic growth continues	Marginal improvement in travel time savings, relative to existing streetcar service, during peak periods. Improvement would be in the range of 1 to 2 minutes per one-way trip (assuming changes at 7 major intersections west of St. Clair West Station).	**HOV lanes**: travel time would decrease measurably during peak periods, but would be affected by left turn queues. Savings would decrease over time as traffic grows. Improvement would be in the range of 1 to 2 minutes per one-way trip (assuming changes at 7 major intersections west of St. Clair West Station) (10 to 20 seconds per intersection) **TDM/TSM:** No improvement in transit travel time, relative to existing streetcar service.	No improvement in transit travel time projected, relative to existing streetcar service on St. Clair (current or future).	**Physically separate option:** Improvement in transit travel time projected, relative to existing streetcar service. This applies to existing and future conditions. Travel time savings for transit expected to be in the range of 4 to 8 minutes one-way. (10 to 20 seconds per intersection, with 24 intersections affected) **Signed transit lanes:**Transit travel time savings would be less than for full-time lanes (due to issues with traffic interference). Not possible to quantify difference.	Some improvement in transit travel time projected, relative to existing streetcar service, for buses in HOV. Could be degradation in transit time as traffic demand grows. Improvement in transit travel time depends on use of the HOV lanes by other vehicles.	Road widening would not result in transit travel time savings. Traffic would grow to use the available road space, countering any initial improvement.

Figure 8.3.3: Alternatives Assessment Based on the Five Highest Ranked Criteria in the Community and Business Category (Based on Public Weightings)

Alternatives / Criteria	1: Track Replacement (Do-Nothing)	2: Minor Transportation Improvements	3: Transit Priority Improvements	4: Other Transportation System Strategies	5: Transit Improvements on other East-West Streets	6: Exclusive Transit Lanes on St. Clair Avenue	7: Change Transit Technology (i.e. vehicles)	8: Road Widening of St. Clair Avenue or nearby Parallel Roads
Economic effects on adjacent businesses	No effect on employment, land use, building permits No increase in retail activity projected, based on vehicular access and lack of change to streetscape	Little or no effect on employment, land use, building permits No change in retail activity projected, based on vehicular access and lack of change to streetscape. If peak period parking prohibited, could have negative effect in selected locations.	Little or no effect on employment, land use, building permits No change in retail activity projected, based on vehicular access and lack of change to streetscape. Negative effect in selected locations if peak period parking is prohibited.	Marginal effect on employment, land use, building permits No change in retail activity projected, based on vehicular access and lack of change to streetscape	Little or no effect on employment, land use, building permits No change in retail activity projected on St. Clair Avenue.	Little or no effect on employment, land use, building permits, based on Spadina experience. Streetcar implementation in other cities is used as a tool for revitalization. Little or no change in retail activity projected, based on Spadina experience.	Marginally negative effect on employment, land use, building permits (because of the perception of degradation of transit service to bus). Marginal decrease or no change in retail activity projected.	Negative effect on employment, land use, building permits due to disruption related to widenings. Decrease in retail activity projected, based on perception of change to streetscape and parking availability. (Parking during peak periods would likely need to be prohibited).
Effects on neighbourhood traffic volumes and access (existing and future demands)	No change from current condition in short term. In the longer term, local street traffic is expected to grow (varies by neighbourhood) Number of full-moves neighbourhood accesses would not change Emergency vehicle access into neighbourhoods would not change Little or no change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences)	Volume on neighbourhood streets would likely not change, relative to do-nothing Number of full-moves neighbourhood accesses could decrease by a small number No change in emergency vehicle access Little or no change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences)	Volume on neighbourhood streets would likely not change, relative to do-nothing Number of full-moves neighbourhood accesses could decrease slightly due to introduction of additional sections of exclusive turn lanes No change in emergency vehicle access No change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences)	Volume on neighbourhood streets would likely not change, relative to do-nothing Number of full-moves neighbourhood accesses unchanged Possible peak period improvement in emergency vehicle access, as emergecny vehicles could use the HOV lanes No change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences)	Little or no change in volume on neighbourhood streets, relative to do-nothing Number of full-moves neighbourhood accesses unchanged No change in emergency vehicle access No change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences)	Volume on some neighbourhood streets would likely increase, others would decrease (this depends on the design, which is to be assessed in detail in Phase 3) Number of full-moves neighbourhood accesses would decrease (number to de determined at design concept stage). Emergency vehicle access would likely improve, based on Spadina experience Little or no change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences). Access would be maintained by all modes	Volume on neighbourhood streets would likely increase with decrease in transit service Number of full-moves neighbourhood accesses unchanged Emergency vehicle access would likely improve marginally, as these vehicles could use the HOV lanes Little or no change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences). Proximity of buses to curb could affect pedestrian perceptions of security and access.	Volume on neighbourhood streets would likely increase, due to general growth in traffic Number of full-moves neighbourhood accesses unchanged Emergency vehicle access would improve at first, then decline as volumes grow Some change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences), due to decrease in sidewalk widths. Could affect pedestrian perceptions of security and access.
Ability to meet Urban Design objectives	No streetscape enhancement No effect on sidewalk expansion/improvement, or public spaces for cultural/art features No effect on community cohesion	Marginal negative effect on streetscape enhancement, sidewalks in isolated locations Could be marginal change in opportunities for public spaces for cultural/art features Little or no change in community cohesion	Little or no effect on streetscape enhancement, sidewalk expansion/ improvement Little change in public spaces for cultural/art features (some features could be built into shelters/stops) No change in community cohesion	No effect on streetscape enhancement, sidewalk expansion/improvement, or opportunity to create public spaces for cultural/art features Negative effect could be perceived re: north/south community cohesion due to presence of high volume of traffic and transit vehicles in centre lanes	No effect on streetscape enhancement, sidewalk expansion/improvement, or opportunity to create public spaces for cultural/art features No change re: community cohesion	Opportunity for streetscape enhancement and sidewalk expansion/improvement Changes to public spaces for cultural/art features could be incorporated into design Positive effect on north/south community cohesion, as provision of enhanced median would provide additional pedestrian refuge for crossings of St. Clair	No effect on streetscape enhancement, sidewalk expansion/improvement, or opportunity to create public spaces for cultural/art features No change re: community cohesion	Expected to reduce streetscape enhancement opportunities and sidewalks. Less opportunity for creation of public spaces for cultural/art features Wider road decreases north/south community cohesion.
Support of Official Plan and other policy objectives	Does not support transit service improvement or enhancement/ intensification goals of the Official Plan Does not advance support for provincial SmartGrowth policies	Negligible support of transit service improvement goals of the Official Plan, and of provincial SmartGrowth policies. Depending on specific improvements, could be seen as protecting neighbourhoods as per Official Plan.	Limited support of transit service improvement goal of the Official Plan, and of provincial SmartGrowth policies.	**TDM/TSM:** very limited support of transit service improvement goals (in terms of encouraging more use of transit services). **HOV:** some support for transit service goals of the Official Plan.	Limited support of transit service improvement goals for the parallel streets; does not support OP goal for St. Clair. Some support for provincial SmartGrowth policies.	In direct conformance with the transit service improvement and intensification goals of the Official Plan, for Avenues. Support of provincial SmartGrowth policies. Design can act to protect neighbourhoods, in accord with Official Plan goals, by reducing opportunities for cut-through traffic.	Contrary to Official Plan goals for St. Clair in terms of transit priority and intensification. Also contrary to broader provincial SmartGrowth policies.	Goes against Official Plan goals for St. Clair in terms of transit priority and intensification. Also contrary to broader provincial SmartGrowth policies.
Effects on property and business access for employees, customers and deliveries	No changes to hours during which on-street parking and loading are permitted, in short term On-street loading would become more difficult, due to increasing traffic.	If peak period parking prohibited in selected areas, access decreases. If parking spaces are eliminated, negative effect on delivery and loading access as well (no loading in no stopping zones) Marginal increase in overall traffic access.	Little effect on ease of access, or delivery and loading access in terms of on-street space. Some businesses at intersections would likely experience a decrease in access. Marginal decrease in traffic access to St. Clair for north/south traffic, due to reduced north/south green time.	**HOV:** some change in ease of access due to added demand in centre (left-turn) lane	No change on St. Clair; some reduction may occur on parallel streets	Some decrease in access due to turn restrictions (turns will be accommodated via left turn lanes / U-turn lanes at needed spacings). Some parking is expected to be prohibited during weekday peak periods. Loading and delivery space on-street is not projected to change significantly overall; times available may change, and some localized reduction can be expected Customer access to and from north/south would not change significantly, some access restrictions east/west due to turn restrictions.	Bus stopping areas would interfere with on-street loading areas; negative effect	Decrease in ease of access due to loss of on-street parking

Figure 8.3.4: Alternatives Assessment Based on All Criteria in the Natural Environment Category (Based on Public Weightings)

Alternatives / Criteria	1: Track Replacement (Do-Nothing)	2: Minor Transportation Improvements	3: Transit Priority Improvements	4: Other Transportation System Strategies	5: Transit Improvements on other East-West Streets	6: Exclusive Transit Lanes on St. Clair Avenue	7: Change Transit Technology (i.e. vehicles)	8: Road Widening of St. Clair Avenue or nearby Parallel Roads
Air Quality	Air quality would be similar to current conditions at first, but would decline in future due to decrease in vehicle speeds and increased delay, as traffic volumes grow.	Air quality would decline along most of St. Clair due to increase in vehicle volumes. This would be offset slightly at selected locations where minor traffic flow improvements are made.	Air quality would decline due to increase in vehicle delay for north/south streets (the orientation of much of the traffic in the area). This would likely be offset by air quality improvements due to better flow of traffic on St. Clair.	Air quality would decline due to increase in vehicle volumes and delay in HOV lanes, and increased delay in non-HOV lanes.	Air quality would decline on St. Clair due to increase in vehicle volumes, because transit service would not improve. Marginal improvement may occur over the secondary study area, if more people use transit instead of auto.	Air quality would likely improve due to potential shift of trips from auto to transit. Air quality would likely decline due to increased delay in auto lanes. In balance, it would likely remain the same.	Local air quality would decline due to increase in vehicle volumes, and the replacement of streetcars by buses.	Air quality would decline significantly due to increase in vehicle volumes. The addition of one more lane would likely result in a one third increase, approximately.
Natural Habitats (plants & animals)	No change to local natural environment (terrestrial and aquatic habitat, vegetation such as street trees)	No change to local natural environment (terrestrial and aquatic habitat, vegetation such as street trees)	No change to local natural environment (terrestrial and aquatic habitat, vegetation such as street trees)	No change to local natural environment (terrestrial and aquatic habitat, vegetation such as street trees)	No change to local natural environment (terrestrial and aquatic habitat, vegetation such as street trees)	Little change to local natural environment (terrestrial and aquatic habitat, vegetation such as street trees). Some potential for increased street trees as part of median and/or curb extensions	No change to local natural environment (terrestrial and aquatic habitat, vegetation such as street trees)	Degradation to local natural environment - loss of some street trees expected
Stormwater Management	Stormwater management would not change	Marginal decrease in permeability due to localized road expansions.	Stormwater management would not change	Stormwater management would not change	Stormwater management would not change	**Physically separate option:** Stormwater management could be improved by increased permeability of planted median elements and/or curb extensions **Signed transit lanes:** Stormwater management could be improved by increased permeability of planted median elements and/or curb extensions	Stormwater management would not change	Stormwater management would be degraded due to reduced permeability (increased hard road surface)

Figure 8.3.5 Alternatives Assessment Based on All Criteria in the Cost Category (Based On Public Weightings)

Alternatives / Criteria	1: Track Replacement (Do-Nothing)	2: Minor Transportation Improvements	3: Transit Priority Improvements	4: Other Transportation System Strategies	5: Transit Improvements on other East-West Streets	6: Exclusive Transit Lanes on St. Clair Avenue	7: Change Transit Technology	8: Road Widening of St. Clair Avenue or nearby Parallel Roads
Effects on City/TTC budgets	Construction cost for replacement has been budgeted ($25M). Operating costs would increase over time due to inefficient service (more streetcars needed, and more drivers and maintenance staff)	Slightly higher cost than basic track replacement (depends on number of intersections affected). Costs could include: • $100 - 500K for typical intersection changes (there would be fewer than 10 of these, with a total resulting upper cost estimate of $5M) • $5M+ for widening St. Clair at the rail crossings. This cost could easily exceed $10M if temporary rail bridges are needed. Property costs could also be substantial • Total capital cost, including track replacement and intersections but not rail bridge widenings, would be in the range of $26M to $30M Operating costs would increase in longer term as traffic continues to grow Enforcement costs would increase slightly due to added turn restrictions and parking limits	Slightly higher cost, relative to basic track replacement (depends on number of intersections affected). Costs could include: • $100 - 500K for typical intersection changes (there would be fewer than 10 of these, with a total resulting upper cost estimate of $5M) • Total capital cost could be in the range of $30M, including the track replacement Transit operating costs would increase in longer term as traffic continues to grow Enforcement costs would increase slightly due to added turn restrictions	Capital costs would be slightly higher than for basic track replacement (including signage, pavement markings). Total capital costs would be in the range of $26M. Transit operating costs would increase Enforcement costs would increase due to added restrictions and parking limits.	High cost for purchase of additional buses and supporting infrastructure (storage and maintenance facility, signal systems, etc). Cost for buses would be in the range of $7M to $14M. Cost for garage would be in the range of $3M to $6M. Therefore total capital cost in the range of $10M to $20M. Transit operating costs would increase significantly, due to need for more vehicles and drivers. Enforcement costs would increase slightly due to added restrictions, parking limits.	**Physically separate option:** Slightly higher cost than base case replacement cost (depends on design of exclusive lanes). Additional capital cost estimated in the range of $ 7 M to $ 10 M, plus track replacement of $25M, for total cost of $32 to $35M. **Signed transit lanes:** slightly higher cost than base case replacement cost. Additional capital cost in the range of $0.5M to $0.75M, plus track replacement of $25M, for total cost of $25.5M to $25.75M. Transit operating costs would decrease due to increased efficiency.	High cost for purchase of additional buses and supporting infrastructure (signal systems, bus storage facility, etc). Cost for buses would be in the range of $18M to $25M. Cost for garage would be in the range of $8M. Rebuild the road without streetcar tacks $13M. Therefore total capital cost in the range of $39M to $46M. Transit operating costs would increase significantly, due to need for more vehicles and maintenance.	High cost for widening due to construction and property costs. Capital cost of widening = approximately $10M+, not including property. Transit operating costs would increase, due to need for more vehicles to cope with traffic increases.
Cost effectiveness	Operating costs would increase significantly due to impedance of streetcars by vehicles. Low benefit/cost ratio, because few new riders would be attracted. Lack of improvement in capacity also indicates a low benefit/cost ratio.	Benefit in terms of new riders relative to added cost would be low, because the transit service would be only marginally more attractive. Low benefit/cost ratio, because of only a very limited transit capacity increase (i.e. spending up to $5M for little added transit capacity).	Benefit in terms of new riders relative to added cost would be low (service only marginally more attractive). Benefit/cost ratio would be higher than Alternative 2, because of greater transit improvement, but overall benefit/cost ratio (taking into account track replacement.	Benefit in terms of new riders relative to added cost would be low, because streetcar service would still be delayed by HOV vehicles.	Benefit in terms of new riders relative to added cost would be very low, because the parallel streets (Dupont, Davenport, Rogers) are not high transit trip generators. No benefit on St. Clair, particularly taking the cost of track replacement into account.	Benefit in terms of new riders relative to added cost would be high. The benefit/cost ratio would be the highest of any alternative, because this alternative adds the most capacity with a practical additional cost beyond the basic track replacement cost.	Not cost-effective, due to requirement for new vehicles, garage, drivers and maintenance staff. Investment would not result in increased ridership; it would in fact decrease attractiveness for ridership. Therefore very low benefit/cost ratio.	Not cost effective in dealing with transportation demand increases (high capital cost combined with low ridership increase).

8.3.1 Transportation Service Evaluation

8.3.1.1 Public Transit

- Alternative 1 (do-nothing) would not improve the reliability of transit. The service is expected to improve marginally due to track repairs. This improvement would apply to all alternatives. There would be an overall reduction in reliability and quality of service in future with increasing interference from traffic and collisions;
- Alternatives 2 (minor improvements) and 3 (transit priority improvements) would improve the reliability and quality of transit marginally at the beginning because of the decrease in traffic interference and congestion. Mixed traffic would reduce the reliability in the long term with increase in demand and collisions;
- Under alternative 4, Travel Demand Management and Transportation Systems Management have no direct effect on transit service. HOV lanes in tandem with bus transit might improve the reliability of bus service during peak periods only, but examples from other locations within Toronto and other cities have shown that HOV lanes are extremely difficult to enforce. Also, transit reliability would remain poor during off-peak periods and weekends;
- Alternative 5: Transit Improvements on other east/west streets would improve reliability of transit on those streets only. These streets are not within acceptable walking distances from St. Clair for transit riders. Rogers Road and Davenport Road have no connection to the Yonge-University-Spadina subway line, and therefore have a lower ridership potential. Eglinton Avenue already has HOV in place; hence there is a small scope of improvement related to these options;
- Alternative 6 (exclusive transit lanes): The physically separate option would significantly improve reliability because of reduction in delay from turning vehicles and collisions. Reliability and quality are expected to remain high in the future. The physically separate option offers less need for enforcement compared to signed exclusive transit lanes. This alternative would be able to provide the highest quality of service and hence is the most attractive of the two options. This alternative can best accommodate future growth in demand due to increased person carrying capability;
- Alternative 7: Changing transit technology in tandem with HOV lanes would make bus transit more reliable, but signed HOV lanes are difficult to enforce. Buses have always been less attractive compared to streetcars. Person carrying capacity of buses is approximately 720 per hour in mixed traffic while in an HOV lane person carrying capacity is between 850 and 1,700 per hour depending on the compliance level of the reserved lanes. Transit capacity of buses in HOV has approximately the same

capacity as streetcars in mixed traffic. This would not represent an improvement in service;

- Alternative 8 (road widening): A slight improvement of the short-term reliability of transit will be negated by a rapid growth of traffic, which the increased auto capacity would foster. The numbers of collisions and delays are expected to increase with more auto traffic. This option is expected to divert more transit riders to auto. Lesser reliability will reduce the attractiveness for transit riders.

8.3.1.2 Traffic

- Alternative 1 will not improve traffic flow. The level of service for traffic is expected to improve marginally with track and road repair, but with increasing demand, more delays are expected due to congestion and collisions. No improvement in travel time is expected. Travel time will increase over time;
- Alternative 2 will create a marginal improvement in the level of service because of the more optimized traffic flow conditions. Delays due to collisions and turn movements would remain at current levels. Over time, increasing traffic demand will increase delays due to congestion and collisions;
- Alternative 3 would negatively affect the traffic level of service as some available green time is offered to the transit at the expense of the traffic green time. St. Clair already has transit priority operations at most of the signalized intersections. Alternative 3 is expected to lead to marginal reduction in traffic level of service compared to the Do Nothing Alternative;
- Alternative 4: TDM/TSM would marginally decrease traffic demand as auto occupancy increases. HOV lane implementation would reduce the level of service for single occupant vehicles. Delays to auto traffic would also increase due to collisions resulting from more complex movements involving HOV lanes;
- Alternative 5: Transit improvements on other east-west streets are expected to reduce auto traffic on St. Clair by a very minor amount, if any. Conditions are projected to be very similar to the Do Nothing Alternative;
- Alternative 6: Auto traffic operations could be affected by a reduction in the number of traffic lanes, but the objective would be to maintain existing capacity. Overall person carrying capacity is expected to increase because a streetcar can typically carry about 60 times more riders than a single occupant vehicle. Auto traffic travel time was expected to increase, but with the physically separate option, delays due to collisions are expected to reduce because of the separation of streetcars and vehicles. Signed transit lanes would also reduce collision related delays, but not to the extent of the physically separate option because of the complexity of traffic movements and potential for violation;

- Alternative 7: Buses in mixed traffic would not be able to provide capacity relief to traffic. There is a higher probability of collisions and movement-related delays while buses weave out to the curb for boardings/unloadings and merge back to the through traffic lanes. The presence of buses in curb lanes would likely decrease the safety of cyclists. Buses in HOV lanes would reduce the level of service and increase delays to auto traffic because of reduced number of available lanes;
- Alternative 8: Initially, there would be an improvement in the level of service and reduction in delays due to provision of additional auto capacity by widening or eliminating parking. Over time the level of service will reduce because additional auto capacity is expected to foster an equivalent traffic growth. Collision related delays would probably increase because of the added complexity of traffic operations.

8.3.2 Business Evaluation

- Alternative 1: The Do Nothing option is projected to have no effect on businesses, employment or retail activities because there would be no changes to vehicular access and streetscape. On street loading would become more difficult, due to increasing traffic. Some on-street parking would be removed to accommodate longer platforms, intended to facilitate multi-unit streetcar operation (i.e. two streetcars coupled together) and to facilitate boarding/alighting, when streetcars are delayed behind traffic queues;
- Alternative 2: Very minor changes (if any), are expected to employment, land use and building permits. In absence of any new streetscape and due to similar vehicle access to existing, no change in retail activity is expected. Retail activity, deliveries and loading access could suffer at some locations if peak-period on-street parking prohibitions come into effect;
- Alternative 3: Similar effects are expected as under Alternative 1;
- Alternative 4: Similar effects are expected as under Alternative 1. However, with dedicated HOV lanes there is the potential of reduction in the ease of access;
- Alternative 5: Very little to no effect on employment, land use, building permits and businesses is expected. No change in accesses is expected on St. Clair, though some access reductions may occur on parallel roads;
- Alternative 6: The Spadina streetcar analysis has revealed little or no effect on employment, land use, building permits and retail activity along that street that can be directly attributed to the implementation of exclusive streetcar lanes. These indicators suggest that Spadina has performed at a similar rate as the City in general, or outperformed it. A decrease in access for vehicles is expected due to turn restrictions at unsignalized intersections only. Loading and delivery space on street is not projected to change significantly. Some localized reductions are expected;

- Alternative 7: Employment, land use, activities and building permits are expected to reduce marginally because of the perceived degradation of transit service to bus. Bus stop locations would negatively affect on-street loading and parking areas, which could affect business viability;
- Alternative 8: Employment, land use and building permits are expected to be negatively affected due to disruptions related to widenings, or removal of on-street parking. Perception of inferior streetscape and on-street parking prohibitions would reduce retail activity.

8.3.3 Community Effects Evaluation

- Alternatives 1, 2, 3, 5 and 7: There is little scope for streetscape or sidewalk improvements, public arts or cultural features associated with these alternatives. No change in community cohesion is expected. These alternatives would all be very similar to the existing situation;
- Alternative 4: With policy changes or HOV lanes, there is little scope for streetscape enhancement or sidewalk improvement, or opportunity to create public spaces for cultural/art features. This alternative could have a negative effect on the community cohesion due to the presence of high volumes of traffic and transit vehicles in centre HOV lanes;
- Alternative 6: There is an opportunity to create streetscape improvement and sidewalk improvement. The design for this alternative can incorporate public spaces for cultural/art features. Medians and loading platforms can act as pedestrian refuges, thereby providing north-south community cohesion. The dedicated right-of-way along with medians and platforms can become a streetscape focal point throughout St. Clair Avenue. Sufficient traffic capacity would be maintained, indicating that traffic infiltration would be minimized. This suggested that effects on sensitive users of community facilities would be minimal as well (though transit access for these groups would improve);
- Alternative 8: This alternative is expected to reduce opportunities for streetscape and sidewalk improvements. A wider roadway would also reduce community cohesion and reduce opportunities for creation of spaces for cultural/art features. Promotion of auto traffic would have a negative effect on sensitive users, such as public school students. Noise would increase.

8.3.4 Natural Environment Evaluation

- Alternative 1: Air quality would be similar to the existing conditions, but decline in the future due to decrease in vehicle speeds and increased delay, as traffic volumes

grow. Stormwater management would not change. No change in terrestrial and aquatic habitat is projected;

- Alternative 2: Conditions would be similar to Alternative 1. Locations with minor traffic flow improvements would probably have a slightly improved localized air quality;
- Alternative 3: Air quality is projected to decline on the north-south streets, because of reduced available green time. This would be offset by air quality improvements due to slightly better traffic flow on St. Clair. Local natural aquatic and terrestrial environment and stormwater are not projected to change;
- Alternative 4: Air quality would decline due to increased delays in non-HOV lanes. Local natural environment and stormwater management are not expected to change;
- Alternative 5: Air quality would decline gradually on St. Clair because of the lack of transit improvements. Marginal improvements over the secondary study area are expected, if more people use the expanded transit service instead of personal automobiles;
- Alternative 6: Air quality is expected to improve with shifting of trip mode to transit for more people. Automobile-related emissions would likely remain the same, as equivalent capacity will be provided. Little change is expected in the natural environment. There is a potential for increased street trees as part of medians and/or curb extensions. Stormwater management can be improved by planted medians and curb extensions;
- Alternative 7: Air quality is expected to deteriorate with the introduction of buses to replace the streetcars, and due to the increase in auto volumes. Local natural environment is not expected to change. Stormwater management would remain the same;
- Alternative 8: Air quality is expected to deteriorate significantly due to the increase in vehicle volumes. Loss of trees are expected as a part of street widening, which would result in degradation of local natural environment. Also stormwater management would degrade due to replacement of permeable soil with a hard surface.

8.3.5 Evaluation of On-street Parking Effects

Because of its importance to the business community, this criterion has been broken out in the evaluation. Effects are projected as follows:

- Alternative 1: The Do Nothing option would require extension of platforms from the existing 34 metres to 46 metres, which would reduce on-street parking. On-street parking would further reduce in the future due to an increase in auto traffic. Reductions due to elongated platforms could be common to all alternatives except

Alternatives 6: Exclusive Transit Lanes on St. Clair Avenue and Alternative 7: Change Transit Technology;

- Alternative 2: This option could further reduce on-street parking at some locations, in order to provide exclusive turning lanes;
- Alternative 3: On street parking supply could be reduced by a small amount if transit 'queue jump lanes' are implemented at selected intersections;
- Alternative 4: Parking availability would significantly decrease during the peak periods, if dedicated HOV lanes are implemented, in order to allow auto traffic movement;
- Alternative 5: This option would have a similar effect to the Do Nothing Alternative;
- Alternative 6: With a physical separation between the transit and traffic lanes and the potential need to maintain traffic capacity by prohibiting parking in the peak directions, peak period parking availability is expected to decrease;
- Alternative 7: On street parking would be decreased due to provision of bus stops at the curb. Parking may be further reduced if HOV lanes are implemented;
- Alternative 8: Compared to Alternative 1, road widening on St. Clair Avenue can increase on-street parking supply at some locations in the near future, but only until traffic demand increases. If the alternative involved elimination of on-street parking instead of road widening, all or most of the parking would be removed.

8.3.6 Neighbourhood Traffic Evaluation

- Alternative 1: The Do-Nothing option is projected to have no change from current conditions in the short term. However, in the longer term, local street traffic is expected to grow in various neighbourhoods. The number of full movement neighbourhood accesses and emergency vehicle access into the neighbourhood would not change. There is little to no change in neighbourhood activity patterns along St. Clair in sensitive areas, such as schools, daycares, and seniors' residences;
- Alternatives 2, 3, and 5: Traffic volumes on neighbourhood streets would likely not change, relative to do-nothing. The number of full-moves neighbourhood accesses could decrease slightly, except for Alternative 5. The emergency vehicle access is expected to have no change. There will be little or no change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors' residences);
- Alternative 4: Similar to Alternative 2, except the number of full-moves neighbourhood accesses is likely to be unchanged and there is a possible peak period improvement in emergency vehicle access, as emergency vehicles could use the HOV lanes;

- Alternative 5: Similar to Alternative 2, except the number of full-moves neighbourhood accesses is likely to be unchanged;
- Alternative 6: The traffic volumes on some neighbourhood streets would likely increase, while others would decrease depending on the design (which is evaluated in detail in Chapter 9). The number of full-move neighbourhood accesses would decrease. Emergency vehicle access would likely improve, based on Spadina Avenue streetcar experience. Neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences) are expected to see little to no change. Access would be maintained by all modes;
- Alternative 7: Traffic volumes on neighbourhood streets would likely increase with deterioration in transit service. The number of full-moves neighbourhood accesses would remain unchanged. Emergency vehicle access would likely improve marginally, as these vehicles could use the HOV lanes. It is expected that there would be little or no change in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences). Proximity of buses to curb could affect pedestrian perceptions of security and access;
- Alternative 8: Traffic volumes on neighbourhood streets would likely increase, due to general growth in traffic. The number of full-moves neighbourhood accesses would not change. The emergency vehicle access would improve at first, then decline as traffic volumes grow. Some changes in neighbourhood activity patterns along St. Clair in sensitive areas (schools, daycares, seniors residences), due to decrease in sidewalk widths. This could affect pedestrian perceptions of security and access.

8.3.7 Pedestrian and Cyclist Evaluation

- Alternative 1: Safety for pedestrians and cyclists is not expected to improve. The collision risk would likely remain the same. The number of collisions would increase over time as traffic grows. Safety would improve for streetcars and others driving on the currently unsafe streetcar lanes (same for all alternatives);
- Alternative 2: There is only marginal safety improvement for pedestrians and cyclists at intersections where improvements are added. The collision risk would decrease at selected locations through the prohibition of parking, addition of turn lanes, etc. This decrease would be minimized over time, as more traffic would increase the number of collisions;
- Alternatives 3, 4, and 5: The collision rates would likely increase and safety would not improve for pedestrians and cyclists, due to the added complexity of traffic operations;
- Alternative 6: For the physically separated option, pedestrians and cyclists would have increased security on or adjacent to platforms and at mid-block crossings.

Collision rates would likely decrease because of the increased separation between streetcars and vehicles. For the signed transit lanes sub-option, there will be some improvement in safety, but collision incidence would remain higher than under the physically separate option, due to the complexity of traffic operations;

- Alternative 7: Safety would not improve for pedestrians, while safety and security would likely decrease for cyclists due to the presence of buses in curb lanes. The collision rates would likely rise due to increasing congestion;
- Alternative 8: Longer street crossings would have a negative effect on pedestrian safety. Increased traffic congestion would cause safety to be decreased for pedestrians and cyclists, and likely result in an increase in collision rates.

8.4 Public Comments on the Alternatives Evaluation

The public and the community representatives gave their feedback on alternative solutions throughout the EA Phase 2 process. **Figure 8.4.1** summarizes the comments and results regarding the alternatives received during and after each public meeting.

Figure 8.4.1: Responses on the Acceptability of Alternatives from Public Meetings

Alternative	First Phase 2 Public meeting (number of responses)		Second Phase 2 Public meeting (number of responses)	
	For	Against	For	Against
1. Track Replacement (Do Nothing)	7	3	5	0
2. Minor Transportation Improvements	7	2	19	7
3. Transit Priority Improvements	10	1	17	8
4. Other Transportation System Strategies	5	2	1	0
5. Major Transit Improvements on Other East West Roads	9	3	0	0
6. Exclusive transit Lanes on St. Clair Avenue	46	15	159	48
7. Change in Transit Technology	9	3	2	0
8. Road widening – St. Clair or Parallel Roads	0	0	0	0
9. Combination of Some Alternatives (Alts. 2, 3 and 6)	14	2	13	11
Total Number of Responses Received	107		235	

From the above figure it can be inferred that Alternative 6: Exclusive Transit Lanes on St. Clair Avenue was preferred by the highest number of attendees. The second most popular was Alternative 9: Combination of Some Alternatives. It should be noted that Alternatives 2 and 3 were carried forward to the design stage as a part of Alternative 9. Alternative 6 also received the most comments in opposition though the number of those opposed was much lower than the number in favour.

In order to understand what the community groups felt about the alternatives, the project team asked the representatives to rate the alternatives based on each category at the second Phase 2 Workshop. Representative(s) of the following groups gave their ratings on the alternatives:

- Corso Italia BIA
- Deer Park Ratepayers
- Toronto Cycling Committee
- Rocket Riders
- Regal Heights Residents Association
- Save our St. Clair
- St. Clair Right-of-way Initiative for Public Transit
- St. Clair West Revitalization Committee
- Toronto Pedestrian Committee
- Rosemount Earlscourt Residents Association
- Humewood Neighbourhood Ratepayers Association
- Hillcrest BIA
- South Hill Homeowners Association
- Davenport-Perth Neighbourhood Centre Arts Community
- Wychwood Heights BIA
- St. Clair West Residents Association
- St. Clair Gardens BIA

Each category could be ranked as –1, 0 or +1 based on negative, neutral or positive impact, respectively. Responses obtained from the community representatives are summarized in **Figure 8.4.2**.

The following points were considered while summarizing the data:

- Responses only from identifiable community and stakeholder groups were considered;
- Only one averaged response was used per community group in case of multiple responses;
- While determining the final rank per category it was assumed that if the average was:

- less than –0.33, the rank is negative;
- between –0.33 and +0.33, the rank is neutral; and
- greater than +0.33, the rank is positive

- In order to determine the overall weighted rank per alternative, the agreed upon category weights discussed in Section 8.1.1.3 was used.

Figure 8.4.2 Alternatives Assessment by the Community Groups in Second Phase 2 Workshop

Alternative	Category	Rank	Weighted Rank
1. Track Replacement ("Do Nothing")	Transportation	*Negative*	*Negative*
	Community & Business	*Negative*	
	Natural Environment	*Negative*	
	Costs	*Negative*	
2. Minor Transportation Improvements	Transportation	*Negative*	*Negative*
	Community & Business	Neutral	
	Natural Environment	*Negative*	
	Costs	Neutral	
3. Transit Priority Improvements	Transportation	*Negative*	*Negative*
	Community & Business	Neutral	
	Natural Environment	*Negative*	
	Costs	*Negative*	
4. Other Transportation System Strategies	Transportation	*Negative*	*Negative*
	Community & Business	*Negative*	
	Natural Environment	*Negative*	
	Costs	*Negative*	
5. Major Transit Improvements on other east-west streets	Transportation	*Negative*	*Negative*
	Community & Business	*Negative*	
	Natural Environment	*Negative*	
	Costs	*Negative*	
6. Exclusive Transit Lanes on St. Clair Avenue	Transportation	Positive	Neutral
	Community & Business	Neutral	
	Natural Environment	Positive	
	Costs	Positive	
7. Change Transit Technology (i.e. vehicles)	Transportation	*Negative*	*Negative*
	Community & Business	*Negative*	
	Natural Environment	*Negative*	
	Costs	*Negative*	
8. Road Widening - St. Clair or parallel roads	Transportation	*Negative*	*Negative*
	Community & Business	*Negative*	
	Natural Environment	*Negative*	
	Costs	*Negative*	
9. Combination of some alternatives	Transportation	Not evaluated in detail at this stage	
	Community & Business		
	Natural Environment		
	Costs		

From the above figure it can be concluded that Alternative 6 received the only overall positive response from the community groups. In the overall weighted rank per alternative, Alternative 6 was the only one that scored a neutral rank; the rest received a negative rating.

The overall public and community group responses indicate an overall support for the Alternative 6: Exclusive Transit Lanes on St. Clair Avenue. This is also the alternative that the Team concluded would have the greatest benefit to the streetcar operation and has the potential of meeting the 20-25 year horizon transportation demand. Overall person-carrying capability across St. Clair would increase with this alternative. Alternative 9 was carried forward as a design option assuming that it would contain elements of Alternatives 2, 3 and possibly 6. It should be noted that alternatives 2 and 3 were the only alternatives, apart from Alternative 6, that received neutral ranks in a few of their categories from the community groups.

8.5 Short-listed Alternatives

Two alternatives were carried forward to the design stage based on the evaluation. The short-listed alternatives are as follows:

1. Alternative 6: Streetcars in exclusive transit lanes on St. Clair Avenue
2. Alternative 9: Combination alternative; including:
   - Alternative 2: Minor Transportation Improvements
   - Alternative 3: Transit Priority Improvements
   - Alternative 6: Exclusive Transit Lanes (in short sections)