

Exhibit 3-18 indicates that at some locations surveyed, up to 30% or 1/3 of Riverside Drive traffic origins were from outside Windsor and its immediate suburbs. At all survey locations, with the exception of Bridge Avenue, traffic from within the Riverside East district accounts for either the highest or second highest percentage of traffic.

### 3.4.5 LEVELS OF SERVICE

Synchro traffic modeling/analysis software was used to evaluate existing traffic conditions in the study area. Existing traffic volumes, lane configurations, pedestrian volumes and signal timings were entered into Synchro using a saturation flow capacity of 1750 to develop a base-case, existing conditions model. SimTraffic, Synchro's associated traffic simulation software, was used to assist in the development of a model that accurately replicates existing traffic conditions.

Levels of service (LOS) were calculated using HCM (Highway Capacity Manual) methodology contained in Synchro for 63 signalized intersections within the primary and secondary study areas. LOS uses a six-letter grade scale (A to F) to rank the overall traffic handling ability of an intersection or network based on delay per vehicle. LOS A indicates excellent traffic operations with minimal delays, LOS F is congested conditions with long delays and LOS E-F are considered undesirable.

The results indicate good to excellent traffic operations throughout most of the primary study area. As shown in Exhibit 3-19 and 3-20, all studied signalized intersections on Riverside Drive are operating at LOS C or better, with the exception of Montreuil Avenue and Drouillard Street<sup>2</sup>. A majority of the studied intersections are operating at LOS A or B during both peak hours. All signalized intersections in the extended study area on University Avenue and Wyandotte Street are operating at LOS C or better during both peak hours. As with Riverside Drive, the majority of these intersections operate at LOS A or B. The results of the traffic modelling indicate that there are few significant delays for traffic travelling on the Riverside Drive and Wyandotte Street corridors, which is in line with the findings of the travel time runs discussed in Section 3.3.2.

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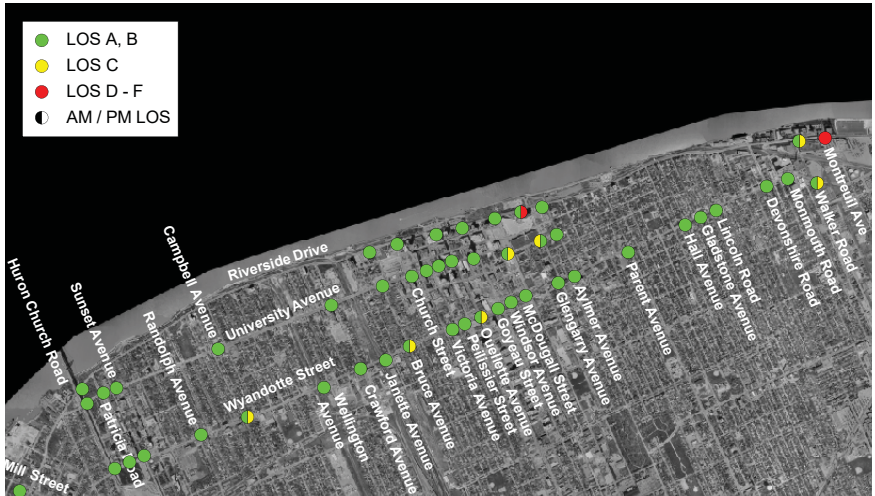
<sup>2</sup> Due to a lack of turning movement counts for the intersections of Riverside Drive with Ferry and Hiram Walker, no operational analysis was performed for these intersections.

**EXHIBIT 3-19: LEVELS OF SERVICE AT STUDY AREA INTERSECTIONS**

Cross Street	Riverside Drive	University Avenue	Wyandotte Street
Mill	A / B		
Huron Church	A / A	B / B	B / B
Patricia			B / B
Sunset		B / B	B / B
Randolph			A / A
Campbell		A / A	B / C
Wellington			A / A
Crawford		A / B	B / B
Janette			A / B
Bruce	A / A	B / B	B / C
Church	A / A	A / A	
Victoria		A / A	A / A
Pellissier		A / A	A / A
Ferry	See note		
Ouellette	A / B	B / B	B / C
Goyeau	B / B	B / B	B / B
Windsor			A / A
McDouqall	B / B	B / C	B / B
Mercer			
Glengarry	A / D	C / B	B / B
Aylmer	A / A	B / B	A / A
Parent			A / B
Hall			A / A
Gladstone			B / B
Lincoln			A / A
Devonshire			A / B
Monmouth			A / A
Hiram Walker	See note		
Walker	B / C		B / C
Montreuil	D / E		
Drouillard	B / D		A / A
Strabane	A / A		A / B
George			A / B
Pillette	B / B		D / B
Raymo			
Thompson			A / A
St. Louis			A / A
Jefferson			B / B
St. Rose			A / A
Lauzon	B / B		B / B
Riverdale	A / A		
Flora			
Martinique			
Florence	A / A		
Greenpark			

**Note:** No traffic volumes were provided for the intersection on this table left blank, and as a result, no operational analysis was conducted for these locations.

EXHIBIT 3-20: LEVELS OF SERVICE AT STUDY AREA INTERSECTIONS



### 3.4.6 ROAD USER SAFETY

#### Scope

The road user safety review included two separate but interrelated components, namely:

- A review of past reported collision trends along Riverside Drive to determine the relative safety performance of the study area intersections and road sections and determine plausible contributory factors; and
- Field investigations to identify any physical or operational safety concerns and potential hazards that may or may not be contributing to the previous collision experience. In addition, the field investigations were used to identify potential countermeasures and remedial measures to carry forward into the assessment of the alternative options in the next steps of the project.

#### Data Collection and Field Investigations

The following data and information reports were provided by the City of Windsor:


- Ranking of City intersections by number of collision for each year 2000 to 2004;
- Top ten mid-block collision locations, by collision frequency, in the City for each year from 2000 to 2004, inclusive;
- Detailed collision attribute listings for the intersections and mid-block sections on Riverside Drive from 2000 to 2004, by location. Attributes include date, time, day of week, environment, road surface conditions, light conditions, impact type, severity and initial vehicle direction; and
- Annual collision reports for the City, 2000 to 2002. Includes various summaries relating to City-wide collision attributes and high collision locations.

It should be noted that all collision statistics provided by the City reflect those occurrences that are reported to Police Services.

IBI Group Staff completed field studies of the higher collision locations on April 5, 2005.

#### Relative Safety Performance

The City of Windsor currently relies on collision frequency to rank their higher-risk intersections and road sections. The most recent annual collision report provided by the City at the time the safety reviews were conducted for this EA was the 2002 Collision Report prepared by Wesley Hicks dated February 2003. It ranks the high risk locations based on frequency of collisions, i.e., the number of collisions that have occurred annually and the average over a five-year period. The Riverside Drive/Walker Road intersection is the only study intersection that ranks in the “top 50” in the City (31<sup>st</sup> of 50).



In addition, City staff provided a summary of the top high collision mid-block sections in the City for the five-year period between 2000 and 2004. The mid-block section on Riverside Drive from Dieppe to Riverdale rated number 11 in a city-wide list of the top 12 high collision mid-block sections in 2004. No other mid-block sections in the study area were identified as high collision locations between 2000 and 2004.

#### Identification of Higher Collision Locations Within the Study Area

Applying the city-wide statistics noted above, would result in the classification of one intersection and one mid-block section as requiring a detailed collision review. Based on the fact that the City and various stakeholders identified road user safety as a principle issue, an alternative method of determining potential safety issues was established.

A threshold value of 15 collisions over the five-year reporting period has been applied as an indicator of potential high-risk locations. This method is conservative in that it represents an average of three collisions per year, which is at the threshold that is typically used in warranting procedures for traffic control and traffic calming devices in many municipalities. It should be noted that this methodology does not take into account exposure or relative safety performance of similar locations throughout the City; however, it does represent the best-available ranking process based on the readily accessible data.

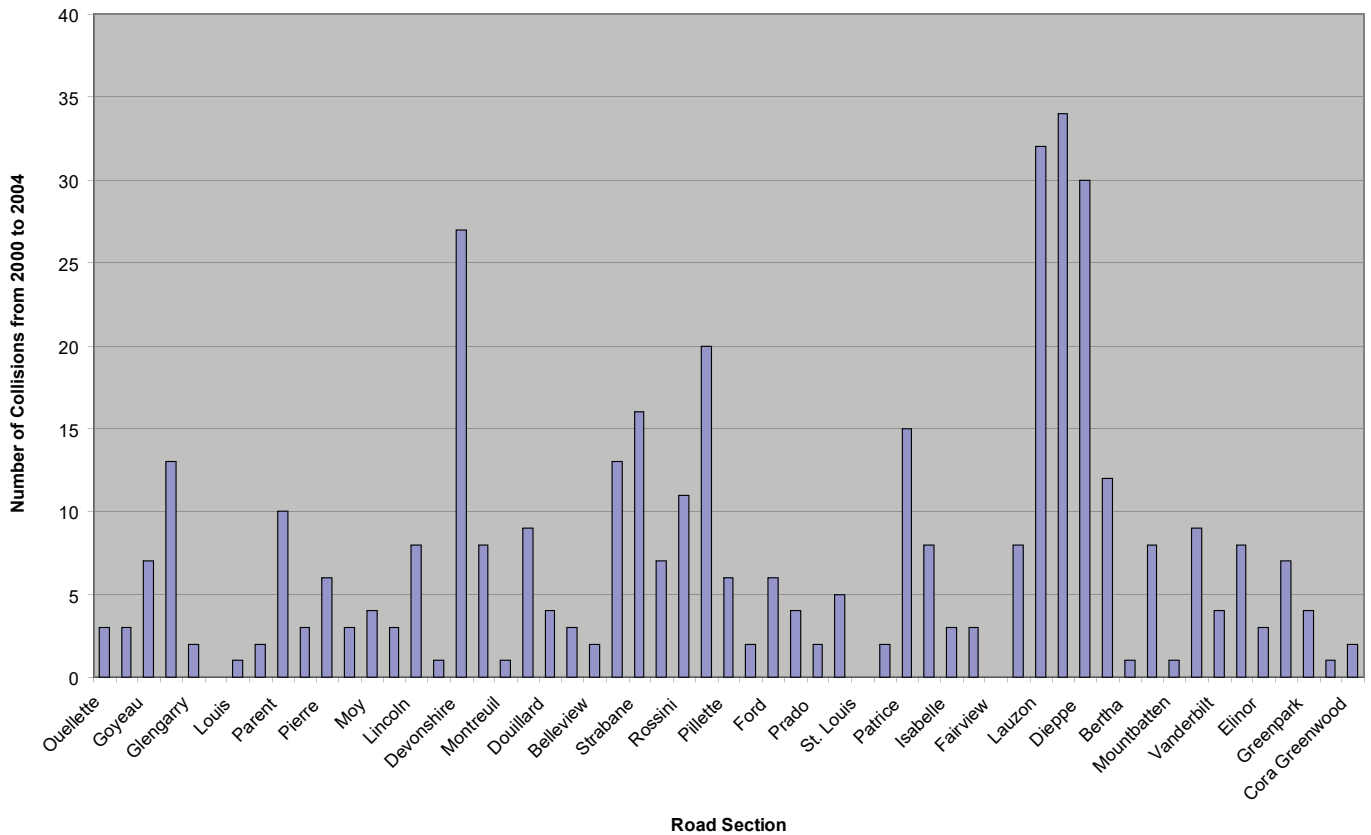
Applying this method to the study intersections and road sections netted the following “higher-risk” locations, including intersections and mid-block sections, as shown in **Exhibit 3-21**.

**EXHIBIT 3-21: HIGH RISK COLLISION LOCATIONS 2000-2004**

Location	Number of Collisions					
	2000	2001	2002	2003	2004	5-Year Total
Riverside Drive East at Ouellette Avenue	9	5	4	5	7	30
Riverside Drive East at Goyeau Street	5	6	5	5	3	24
Riverside Drive East at McDougall Avenue	2	1	2	4	7	16
Riverside Drive East at Parent Avenue	8	2	2	6	3	21
Riverside Drive East at Devonshire Road	1	5	7	8	1	22
Riverside Drive East at Walker Road	10	13	11	13	5	52
Riverside Drive East at Pillette Road	1	3	4	3	7	18
Riverside Drive East at Lauzon Road	3	4	7	4	3	21
Riverside Drive East at Riverdale Avenue	3	7	5	3	2	20
Riverside Drive East at Greenpark Boulevard	1	4	4	3	4	16
Riverside Drive – Devonshire to Walker	5	7	3	3	9	27
Riverside Drive – Strabane to George	3	5	1	3	4	16
Riverside Drive – Jos Janisse to Pillette	9	5	2	1	3	20
Riverside Drive – Patrice to St. Rose	2	4	5	1	3	15
Riverside Drive – Lauzon to Watson	10	7	6	6	3	32
Riverside Drive – Watson to Dieppe	6	7	8	9	4	34
Riverside Drive – Dieppe to Riverdale	6	5	2	4	13	30

An investigation of mid-block collision frequency was carried along the length of Riverside Drive to compare the locations in **Exhibit 3-21** above to other sections of Riverside Drive. **Exhibit 3-22** below shows this comparison graphically.

**EXHIBIT 3-22: COLLISION FREQUENCY FOR MID-BLOCK SECTIONS ON RIVERSIDE DRIVE 2000-2004**



It is apparent from **Exhibit 3-22** that the mid-block sections at Devonshire and from Lauzon to Riverdale have significantly higher collision frequency than the sections immediately to their east and west. Relatively consistent two-way traffic volumes between these high-collision sections and adjacent sections indicate that the increased collision frequency is likely not due to higher traffic volumes.

Analysis of Higher-Risk Locations

Having identified the high-risk locations, attention is then turned to determining contributing factors for the collisions. One means of determining causal factors is to compare the collision characteristics at the subject intersections to those that would be experienced or “expected” at similar locations within the City.



An initial screening of the dominant collision types and the following collision characteristics was undertaken at each high-risk location, to provide background for the field investigations:

- Month of year;
- Time of day;
- Environmental conditions;
- Road conditions; and
- Impact type including initial vehicle direction.

Based on this screening process, the following potential “over-represented” attributes were identified on Riverside Drive:





### EXHIBIT 3-23 – CURSORY REVIEW OF POTENTIAL CONTRIBUTORY FACTORS

Location	Potential Over-Represented Attributes
Riverside Drive East at Ouellette Avenue	• Angle collisions
Riverside Drive East at Goyeau Street	• No apparent trends
Riverside Drive East at McDougall Avenue	• No apparent trends
Riverside Drive East at Parent Avenue	• Angle collisions
Riverside Drive East at Devonshire Road	• No apparent trends
Riverside Drive East at Walker Road	• Rain/wet conditions • Rear end collisions • Turning movement collisions
Riverside Drive East at Pillette Road	• Rear end collisions during clear/dry conditions
Riverside Drive East at Lauzon Road	• Off-peak collisions • Rain/snow conditions • Turning movement collisions
Riverside Drive East at Riverdale Avenue	• Rear end collisions
Riverside Drive East at Greenpark Blvd	• Rear end collisions
Riverside Drive – Devonshire to Walker	• Rear end collisions
Riverside Drive – Strabane to George	• No apparent trends
Riverside Drive – Jos Janisse to Pillette	• Rear end collisions
Riverside Drive – Patrice to St. Rose	• Wet/icy conditions
Riverside Drive – Lauzon to Watson	• Rain/wet conditions
Riverside Drive – Watson to Dieppe	• Rain/snow conditions • Sideswipe, SMV and approaching collisions

#### Other Road Users

A review of the City collision database was undertaken to determine the location and frequency of pedestrian or bicycle collisions that were reported between 2000 and 2004 along the Riverside Drive corridor. Exhibit 3-24 includes a summary of these reported incidents:

**EXHIBIT 3-24 – RIVERSIDE DRIVE PEDESTRIAN AND BICYCLE COLLISIONS – 2000 TO 2004**

<b>Pedestrian Collision Location</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Riverside Drive/Crawford Avenue	0	0	0	0	1	1
Riverside Drive – Ferry to Church Street	0	0	1	0	0	1
Riverside Drive/Goyeau Street	1	0	0	0	0	1
Riverside Drive/Glengarry Avenue	0	0	0	0	1	1
Riverside Drive/Louis Avenue	1	0	0	0	0	1
Riverside Drive/Parent Avenue	0	0	0	1	0	1
Riverside Drive – Pierre Avenue to Hall Avenue	1	0	0	0	0	1
Riverside Drive – Moy Avenue to Gladstone Avenue	0	0	1	0	0	1
Riverside Drive – Drouillard Road to Cadillac Street	0	0	0	0	1	1
Riverside Drive/George Avenue	0	1	0	0	0	1
Riverside Drive/Thompson Boulevard	0	1	0	0	0	1
<b>Bicycle Collision Location</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Riverside Drive/Crawford Avenue	0	0		0	1	1
Riverside Drive/Ouellette Avenue	2	0	0	1	0	3
Riverside Drive/Goyeau Street	1	0	0	0	0	1
Riverside Drive/Aylmer Avenue	0	0	1	1	0	2
Riverside Drive/Louis Avenue	0	1	0	0	0	1
Riverside Drive/Parent Avenue	1	0	0	0	0	1
Riverside Drive – Parent Avenue to Langlois Avenue	1	0	0	0	0	1
Riverside Drive/Devonshire Road	0	0	2	0	0	2
Riverside Drive – Devonshire Road to Walker Road	1	0	0	0	0	1
Riverside Drive/Lauzon Road	0	0	2	0	2	4
Riverside Drive – Lauzon Road to Watson Avenue	0	0	1	0	0	1
Riverside Drive/Flora Avenue	0	1	0	0	0	1

Given this low frequency of pedestrian and bicycle collisions, it is difficult to identify any associated trends. It should be noted that the Lauzon Road intersection and adjacent easterly road sections have experienced six reported vehicle-bicycle collisions in the past five years.



### 3.4.7 SUMMARY OF THE SAFETY OPPORTUNITIES AND CONSTRAINTS

Through the EA process and the assessment and selection of alternative VISTA improvement options, the following should be considered:

- Minor lane configuration signage and directional signage improvements should be undertaken at the Ouellette Avenue, Goyeau Street and McDougall Avenue intersections;
- A checker board warning sign should be placed at the terminus of Goyeau Street at Riverside Drive;
- The City should continue to upgrade their signal heads (including backboards) and street name signage (to mast arm oversize signs), to improve the conspicuity and consistency of application of the traffic controls, intersection locations and intersection identifications. Those locations with dominant rear end and sideswipe collision trends should be made a priority;
- Review opportunities with the Casino operators to define and sign the RIRO (right-in, right-out) access on the south side of Riverside Drive east of McDougall Avenue;
- Review opportunities to restrict parking and increase conspicuity of the northbound stop control at the Riverside Drive/Parent Avenue intersection;
- Address the following issues at the Riverside Drive/Devonshire Road intersection:
  - Definition and transition area of the two to four lane cross-section;
  - Bicycle lane “pinch point” with the eastbound right turn traffic; and
  - Visibility and use of the marked pedestrian crossing on the east side of the intersection.
- Pursue opportunities to reduce traffic volumes and resultant queues on Riverside Drive in the area of Walker Road and Devonshire Road;
- Review operational and geometric opportunities to increase vehicular capacity specifically at the Riverside Drive/Walker Road intersection;
- Review operational and geometric opportunities to increase vehicular capacity specifically at the Riverside Drive/Pillette Road intersection;
- Pursue urban design and passive traffic calming opportunities to highlight transitions and distinguish lower speed areas of Riverside Drive from more free-flow unconstrained conditions, specifically the residential area sections east of Strabane Avenue; and
- Address potential roadway design and signage deficiencies on Riverside Drive between Lauzon Road and Riverdale Avenue based on specific investigations of traffic conditions and collision records in this area conducted during March/April 2005, and with public input provided at a special public meeting of area residents held on April 26, 2005.

### 3.5 Transportation Problem Statement

Transportation-related problems currently facing motorists, cyclists and pedestrians along the Riverside Drive corridor that is the subject of the Riverside Drive Vista Improvement project EA are represented by six main contributing factors:

- 1. Role of Riverside Drive in the Transportation Network** – The section of Riverside Drive generally east of Strabane Avenue does not offer the operational characteristics and physical roadway quality generally expected of an important Scenic Drive within the City of Windsor. This compares to the section of Riverside Drive west of Strabane that includes considerably improved roadway design and operational characteristics for all users, as well as associated streetscape elements relating to public parkland, prominent vistas, dominant architecture and public art.
- 2. Traffic Speed** – The 85<sup>th</sup> percentile speeds recorded on sections of Riverside Drive exceed the 50 km/h posted limit, reaching as high as 80 km/h. The relatively long stretches of roadway, combined with wide travel lane widths, limited street friction (i.e. no on-street parking) and speed enforcement restrictions are all constraints to traffic speed management.
- 3. Traffic Volume** – Riverside Drive includes less signalized intersections than Wyandotte Street. This, combined with speeding opportunities and the streetscape attraction of this waterfront route attract more traffic to sections of Riverside Drive than the nearby parallel Class II Arterial route on Wyandotte Street. Spot speed studies conducted as part of this project and reported in Section 3.3.3 of this report show that although Riverside Drive may be perceived as a faster route than Wyandotte, the Riverside Drive average speed is less than 60 km/h and therefore similar to Wyandotte, but congestion on Riverside results in slower speeds especially on two lane sections. Furthermore, existing traffic volumes along Riverside Drive generally exceed the planning capacity assigned to a Scenic Drive. Therefore, ways must be found to effectively divert appropriate types (i.e. cross-town through traffic) of traffic off Riverside Drive onto the parallel arterial routes.
- 4. Collisions / Safety** – Over the past five years, Riverside Drive has experienced a relatively high collision rate with apparent contributing factors being vehicle speed, driver behaviour, road design, environmental conditions (i.e. weather) and location of abutting buildings. Safety problems for motorists, cyclists, pedestrians and abutting property owners are found at specific locations along Riverside Drive, most notably between Lauzon Road and Riverdale Avenue, at horizontal curves in the road for example between Buckingham Drive and Ford Boulevard east of Coventry Gardens and at unmarked pedestrian crossings of Riverside Drive accessing north side public parkland.
- 5. Driver Behaviour** – Although environmental conditions (i.e. rain, ice, fog) contribute to collisions along Riverside Drive, in part owing to its proximity to the Detroit River, another contributing factor for both recorded and unrecorded collisions is driver behaviour. This is most commonly represented by excessive speed compared to roadway conditions, and in some cases involves driving while under the influence. Prominent vistas can affect motorists, cyclists and pedestrians by either slowing and calming the pace of travel, or distracting the driver. Drivers, cyclists and pedestrians must all be aware of each other at road and off-road trail crossings.

**Roadway Design, Condition and Infrastructure Improvement Coordination** – Much of the Riverside Drive East geometry east of Walker Road is deficient by current standards, with no continuous barrier curbs, sidewalks or bike lanes, and with insufficient lane and R.O.W. width in many locations. Without an approved

Environmental Assessment to improve these Riverside Drive design deficiencies, the City of Windsor cannot commence any significant improvements to the roadway surface and associated boulevards and sidewalks. Similarly, upgrading of underground utilities cannot be coordinated with surface improvements because there is no approved Environmental Assessment for these surface improvements.

### 3.6 Streetscape Opportunities

The following streetscape improvement opportunities along Riverside Drive have been developed as part of this EA, for consideration in the evaluation of alternative solution and selection of preferred designs. A series of streetscape opportunity and constraint maps is provided in **Technical Appendix Volume 1** provided under separate cover, with the map symbols used as follows:



**Nodes (Primary/Secondary/Tertiary)** – A node is identified as a point along Riverside Drive where there is a significant opportunity for activity and some form of special design treatment. These have been categorized as being primary 1, secondary 2, or tertiary 3, depending on the “size” of the event and level of activity that occurs at that point.



**Gateway** – A gateway is some sort of celebration of either a start or finish in the primary piece of Riverside Drive, depending on the movement of travel. One major gateway is visually obvious at the westerly entrance to the Riverside Drive corridor starting in the McKee Park area just west of the Ambassador Bridge, and then approaching Ambassador Park/Assumption Park with the Bridge acting as a major entrance statement. A somewhat less dominant and obvious, yet still important corridor gateway location is found at the eastern extreme of the corridor at the Tecumseh border.



**Bikeway Connection** - There are many points along Riverside Drive where the bikeways, whether on-street bike lanes or off-street multi-use trails, are discontinuous or are not available due to pavement width or physical constraints.



**Walkway-Trail Connection** - Similarly, there are breaks in the east-west pedestrian movement and north-south access to civic parkland along Riverside Drive, especially on the north side of some sections where no sidewalk is provided.



**Special Streetscape Improvement Area (SSIA)** - In all places where connections can be generally improved, in terms of pedestrian, bicycle and rollerblade access, these areas of improvement have been noted as opportunities for improvement.



**Traffic Calming** – Locations and areas have been identified along Riverside Drive where consideration may be given to the potential use of “appropriate” traffic calming measures due to the road alignment, the road width, or the general lane configuration. These areas tend to encourage fast movement of vehicles, and consequently also conflict with pedestrian and vehicular crossings.



**Public Art** – Locations have been identified within the Riverside Drive corridor where there is an opportunity to use public art as an integrated piece of infrastructure and design. This may involve sculpture, as well as other art forms that the City may wish to install on Riverside Drive.



**Vista Enhancement** - Major public views and vistas exist along Riverside Drive, either from the street looking out across the river towards the Detroit River and skyline, or towards significant features and landmarks that might be located within the waterfront park areas.