TORONTO

STAFF REPORT
ACTION REQUIRED

Strachan Avenue and the Georgetown / Milton Rail Corridor Grade Separation Design Concept Study

Date:	October 27, 2008
To:	Toronto and East York Community Council
From:	Robert Freedman, Director, Urban Design, City Planning Division
Wards:	Ward No. 19 – Trinity Spadina
Reference Number:	te080068

SUMMARY

GO Transit is about to commence an Individual Environmental Assessment study of the "Georgetown South Corridor Service Expansion and Airport Transportation Link". The rail link from Union Station to Pearson Airport is one of Metrolinx priority investments. The expected increase in passenger rail service along the Georgetown / Milton rail corridor will in the opinion of City of Toronto staff, require the elimination of the at-grade rail crossing of Strachan Avenue. Key City objectives are to improve safety conditions for all users of this street, including pedestrians and cyclists and preserve Strachan as a continuous street, providing a vital link to the waterfront. The City has undertaken a study to determine a preferred grade separation option of Strachan Avenue and the Georgetown / Milton rail corridor. This study has concluded that this grade separation should be carried out by lowering the railway corridor to allow Strachan Avenue to pass over the rail lines. This solution will allow Strachan Avenue to reach its full potential as a gracious urban street that connects the City to the Waterfront and provides a good relationship to adjacent development and land uses.

The purpose of this report is to enable City Council to inform GO Transit that, based on assessment of various alternatives, the option which best satisfies the City's objectives is to lower the rail corridor and allow Strachan Avenue to pass above.

RECOMMENDATIONS

The City Planning and Transportation Services Divisions recommend that:

1. City Council strongly supports the Grade Separation Option outlined in this report, which lowers the Georgetown / Milton Rail corridor, allowing Strachan Avenue to pass over the rail lines.

2. City Council direct staff to forward this report to the GO Transit Board requesting that the City Council preferred Strachan Avenue Grade Separation Option be included as part of the Individual Environmental Assessment study of the "Georgetown South Corridor Service Expansion and Airport Transportation Link".

Financial Impact

There is no financial impact to the City as a result of this report.

ISSUE BACKGROUND

In 2006 City Planning staff, in conjunction with Architects Alliance and LEA Consulting completed the Toronto West-Central Area Strategic Transportation Network Review study. This study included a review of the Strachan Avenue corridor between King Street West and Lake Shore Boulevard West and identified Strachan Avenue as one of few direct connections to the waterfront within the west-central area (between Bathurst Street and Parkside Drive).

Strachan Avenue is a historic street that once served as a major access route to industrial lands including the former Massey Ferguson and Inglis complexes. These industrial sites have now been redeveloped as new residential / employment neighbourhoods (Former Massey Ferguson lands, Liberty Village, King Liberty Lands). Strachan Avenue serves as a major gateway connecting the Waterfront, the Fort York National Historic Site and Exhibition Place with the existing and new neighbourhoods and parklands to the north including Trinity Bellwoods Park. However, the above-noted study concluded that Strachan Avenue lacked a sense of identity as a major gateway to this intensifying west central district. The corridor was also cited as lacking an urban character and being very pedestrian and cyclist unfriendly.

Since the completion of the network review study there have been improvements made to Strachan Avenue in the vicinity of Lake Shore Boulevard West and the Princes' Gates. These modifications, which include bicycle lanes and intersection modifications, have improved the pedestrian and bicycle environments on this short section of Strachan Avenue. These improvements need to be extended along the full length of Strachan Avenue in order to transform this street into a safe and urban thoroughfare.

Between King Street West and Lake Shore Boulevard West, Strachan Avenue has two lanes in each direction with left turns at the intersecting cross streets. North of Ordnance Street/ East Liberty Street, Strachan Avenue crosses the GO Georgetown/Milton line at-grade. To the south, Strachan Avenue crosses above the GO Lakeshore line.

In October 2006, GO Transit submitted Terms of Reference to the Ontario Ministry of the Environment (MOE) for an Individual Environmental Assessment study of the "Georgetown South Corridor Service Expansion and Airport Transportation Link". The Environmental Assessment Study will investigate the following:

- Proposed improvements along the Georgetown South rail corridor that would meet the increasing demand and future need for GO service to the communities along the corridor between Halton and Peel Regions and the City of Toronto.
- Alternatives, both within and outside the Georgetown South rail corridor, for an Airport Transportation Link, including the proposed Air-Link service, between Union Station and Lester B. Pearson International Airport.

The expected increase in passenger rail service along the Georgetown South rail corridor will require the elimination of the at-grade rail crossing of Strachan Avenue. In response to this scenario the City of Toronto has retained a team of consultants lead by duToit Allsopp Hiller with BA Consulting and Delcan to develop and assess various opportunities and options to replace the existing at-grade crossing of Strachan Avenue and the GO Georgetown/Milton line. Urban design, "place making" was an integral component of this study.

The Strachan Avenue and Georgetown Rail Corridor Grade Separation Study is available on the City of Toronto Web Site, at http://www.toronto.ca/planning/strachanstudy.htm
The objective of the study is to enhance the existing built environment and to establish a clear identity for the area with Strachan Avenue as a gateway to the waterfront and as a neighbourhood street including a technically feasible alternative to the at-grade rail crossing. Maximizing the development potential of the surrounding lands was a key criterion for the study. The outcome of this exercise will be used as input to the GO Transit Individual EA study.

COMMENTS

In 2000 the City undertook an exhaustive review of all existing rail level crossings within the City limits. Included in this review was the level crossing on Strachan Avenue. The study provided an overview of the status of level rail crossings in the City of Toronto and ranked them in order of priority based on the exposure index for each crossing. The exposure index is calculated by multiplying the average annual daily traffic (AADT) on the road by the number of trains passing/crossing per day. Grade separations are usually considered when the exposure index for a grade crossing exceeds 200,000. In 2000, the exposure index for the Strachan grade crossing was 272,000 and it was ranked as the ninth highest exposure index for the City of Toronto. Currently there are 14,000 daily vehicular trips that cross the GO Georgetown/ Milton Rail line on Strachan Avenue and 49 daily train crossings resulting in an exposure index of 686,000. The exposure index for Strachan Avenue supports the recommendation to grade separate this crossing.

Between Dufferin Street and Bathurst Street, Strachan Avenue is the only street that connects the City to the waterfront. Currently there are 14,000 daily vehicular trips that

cross the GO Georgetown/ Milton Rail line on Strachan Avenue. This daily Strachan Avenue traffic volume is more than daily traffic volumes on Dufferin Street and less than Bathurst Street. It is not feasible to close Strachan Avenue and from the safety perspective of all road users the grade separation of the intersection with the Georgetown / Milton rail corridor is necessary.

The area of the city south of King Street West, between Dovercourt Road and Bathurst Street has undergone extensive redevelopment as former industrial sites such as the Massey Ferguson and Inglis lands have been transformed into new mixed-use neighbourhoods. These new neighbourhoods are isolated by the GO Georgetown/ Milton Rail line which divides them into separate neighbourhoods: the King Liberty lands (former Inglis lands), located south of the Rail Corridor and the former Massey Ferguson lands located north of the rail corridor to King Street. These new neighbourhoods are connected to each other and to the waterfront by Strachan Avenue.

Strachan Avenue needs to become a significant urban street that connects the waterfront, Fort York and the neighbourhoods that border it to King Street, Queen Street, and the historic Trinity Bellwoods Park. To fulfill this fundamental city building goal, Strachan Avenue, south of Wellington Street, needs to be transformed from an industrial access route into a green urban street that accommodates pedestrians, bicycles and vehicles in a balanced fashion. This transformation hinges on how the grade separation of Strachan Avenue at the GO Georgetown/ Milton Rail line is carried out.

The grade separation of Strachan Avenue is a major city building initiative. It is important to preserve Strachan as a continuous street. Therefore it is not feasible to eliminate the crossing of the GO Georgetown/ Milton Rail line. The grade separation must reinforce the urbanization of the lands that adjoin Strachan Avenue and assist in it's transformation into an urban street. This is particularly important given the proximity of Strachan Avenue to the Downtown Core of the City

Railway Underpass

Strachan Avenue is at an important intersection along the GO Georgetown / Milton Rail line. North- west along this rail line, streets such as King and Queen Streets pass under the rail corridor creating very unfriendly pedestrian routes at these locations. East of Strachan Avenue this rail corridor merges with the Lake Shore Line at the entrance to the downtown. Peter, Spadina, Bathurst, Strachan, Dufferin, Jameson and Dowling pass over a sunken Lake Shore rail corridor creating a much improved pedestrian environment on these bridges. Strachan Avenue at the GO Gerogetown / Milton line should resemble this bridge condition rather then the underpass condition.

From a city-building perspective, the best grade separation solution is to leave the street network intact and take the railway down and under Strachan Avenue as illustrated on Attachment 1. This approach has little or no impact on the existing fabric and maintains all opportunities for improving the pedestrian environment and facilitating future development. In this way, Strachan Avenue can become the lively, livable city street that it must if the surrounding area is to evolve into a viable new community.

Strachan Avenue will evolve as the precinct's main street. It will provide many connections into the surrounding neighbourhoods, and will become an even more important north/south connection linking downtown with Lake Ontario. It will also become the dignified address of many important landmarks including Trinity Bellwoods Park, Fort York, the Princes' Gates, the Canadian National Exhibition and Coronation Park.

The lowering of the grade of the rail corridor will also make it easier to implement the planned pedestrian bridge along the Shaw Street alignment (connecting the New King Liberty neighbourhood with the former Massey Ferguson lands neighbourhood) and the Fort York Pedestrian bridge (connecting Stanley Park to Fort York) because these bridges will not have to rise as high to get over the rail corridor. It may also assist in facilitating a new GO Station at King Street West, west of Shaw Street by improving access to GO station platforms.

Over time, the street will be enhanced for pedestrians and cyclists who will enjoy bike lanes, broad sidewalks, street trees, ornamental plantings and decorative lighting. New developments will front onto Strachan Avenue, animating the street and making it safe.

Functional Feasibility

Initial studies indicate that the solution meets the stringent requirements of GO Transit and CN Rail:

A clearance of 24'-3" (7.4 m) can be provided, which allows for future electrification of the rail corridor;

In excess of 33 m, the span will accommodate up to 7 tracks;

The tracks will climb out from the underpass at a maximum slope of 2%, and will impact neither the existing King Street underpass to the west nor the Lakeshore line that merges to the east.

Strachan Avenue Profile

In order to meet the requirements, it is necessary to raise Strachan Avenue about 2.0 m at the underpass. This will have no negative impacts on intersecting streets.

To the north, the elevated Strachan Avenue will slope 2% down to the Douro/Wellington intersection. Gradients are further reduced by slightly adjusting the elevation of the Douro/Wellington intersection as well.

To the south, Strachan Avenue will slope 2% down to meet the existing East Liberty Street intersection. Alternatively, Strachan Avenue can remain elevated all the way to the existing overpass at the Lakeshore Line. This would have the benefit of reducing the existing slope on East Liberty as it approaches Strachan, and reducing the slope on the approach to the existing overpass.

Utilities

Like all north/south connectors in the city, Strachan Avenue has several major underground utilities that will have to be modified or relocated. The most challenging of these is a 3.0 metre square concrete storm sewer, the top of which is located about 4.0 metres below the surface.

Strategies for dealing with the pipe include capturing the water in an upstream cistern and pumping it across the railway or diverting the water to another location where crossing the railway is more feasible.

Cost

Clearly, the biggest challenge is cost. Realigning 800 m of railway and building a 33 m long bridge will entail a significant premium over some other solutions. However, this is a project about city-building, a project that will have impacts, for better or for worse, on a large part of the downtown. To do less than the best would, in the long run, compromise existing assets and forfeit future opportunities. The cost of this option is in the order of $125,000,000. It is the opinion of City of Toronto staff that this cost should be borne by the Georgetown South Corridor Service Expansion and Airport Transportation Link project.

Other Options Considered

A full range of options, including overpasses and underpasses, were examined for a crossing on the Strachan Avenue alignment and a Liberty to Wellington alignment. These are described in The Strachan Avenue and Georgetown Rail Corridor Grade Separation Study, which is available on the City of Toronto Web Site, at http://www.toronto.ca/planning/strachanstudy.htm and are summarized in Appendix 2. All these options have a detrimental impact on the pedestrian and cycling environment of Strachan Avenue and sterilize development frontages due to the long sloping approaches necessary to have Strachan Avenue pass over or under the rail corridor.

From a city-building perspective, the best grade separation solution is to leave the street network intact and take the railway down and under Strachan Avenue. This approach has little or no impact on the existing fabric and maintains all opportunities for improving the pedestrian environment and facilitating future development. In this way, Strachan Avenue can become the lively, livable city street that it must if the surrounding area is to evolve into a truly viable new community. A summary evaluation of all the options considered is included in Appendix 3.

CONCLUSION

The City's Strachan Avenue Grade Separation Design Concepts Study has concluded that the grade separation of Strachan Avenue at the Georgetown / Milton rail corridor should be carried out by lowering the railway corridor to allow Strachan Avenue to pass over the rail lines. This solution will allow Strachan Avenue to reach its full potential as a gracious urban street that connects the City to the Waterfront and provides a good relationship to adjacent development and land uses.

CONTACT

Eric Pedersen,
Program Manager, Urban Design, City Planning Division
Tel. No. (416) 392-1130
Fax No. (416) 392-1744
E-mail: epederse@toronto.ca

SIGNATURE

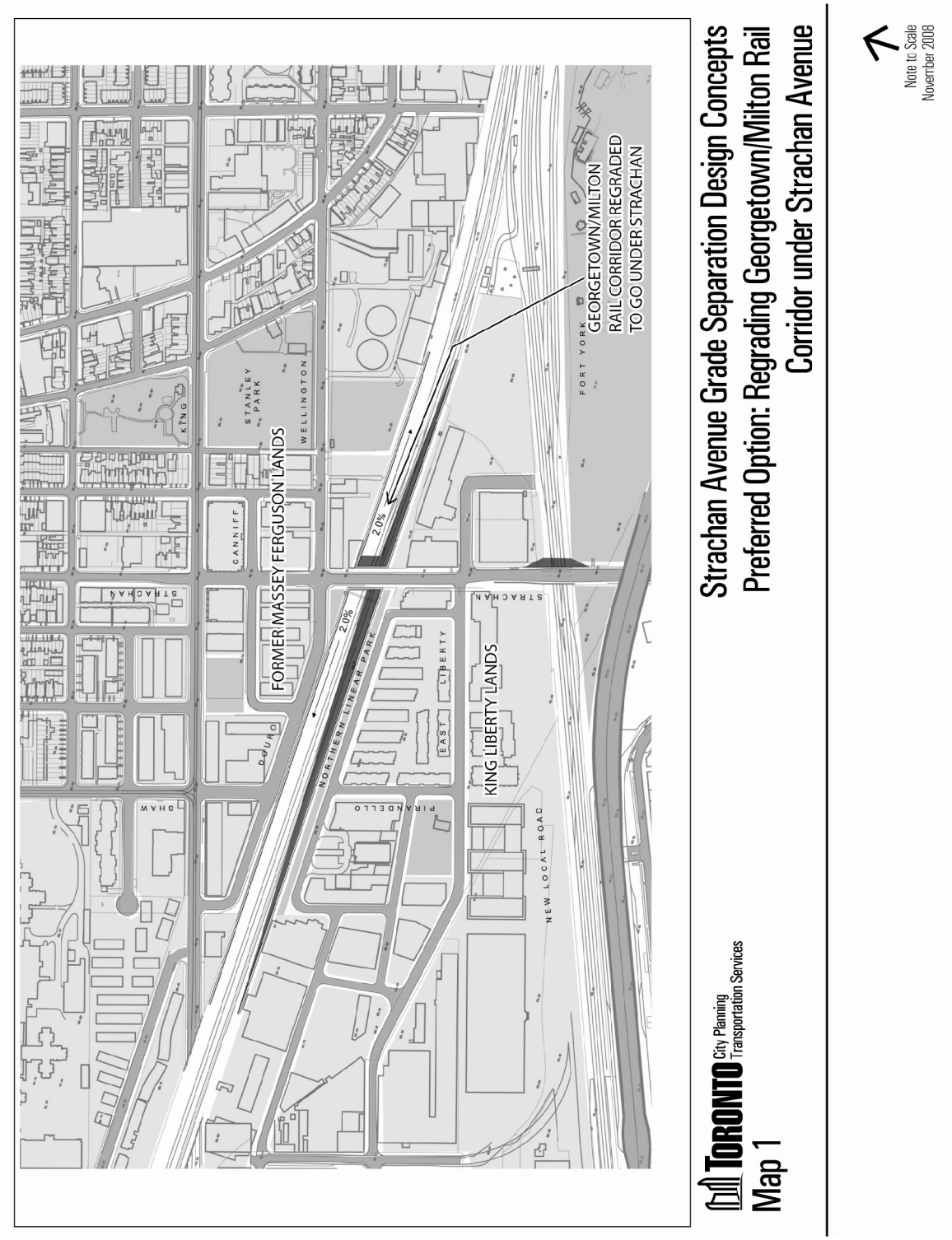
_____

Robert Freedman, Director
Urban Design, City Planning Division

ATTACHMENTS

Attachment 1: [Strachan Avenue Grade Separation Design Concepts: Preferred Option]
Attachment 2: [Strachan Avenue Grade Separation: Other Options Considered]
Attachment 3: [Strachan Avenue Grade Separation: Option Evaluation]

Attachment 1: [Strachan Avenue Grade Separation Design Concepts: Preferred Option]



Attachment 2: [Strachan Avenue Grade Separation: Other Options Considered]

Strachan Overpass

An overpass on Strachan would be the cheapest crossing to construct because it would have little or no affect on either existing utilities or railway operations during construction. However, there are serious problems associated with the overpass approach that are direct consequences of the length of the approaches and their impact on existing and future developments within the Strachan corridor:

- Closes important cross streets including Canniff, Douro/Wellington and East Liberty, severely compromising local circulation; Mitigating measures including increased gradients on the approaches and lowering the tracks slightly provided minimum benefit in terms of street connectivity;
- The cost of repairing the interrupted street network, including land acquisition and capital construction, would be significant;
- Requires an alternate access route to Quality Meats, most likely from Bathurst Street at Front Street;
- Concentrates all traffic on the King/Strachan intersection, which would further impact an already stressed public transit corridor;
- Exaggerates the “rollercoaster” profile of Strachan Avenue produced largely by the existing Lakeshore corridor overpass;
- Creates an uninviting and undesirable environment for pedestrians and cyclists;
- Compromises the street frontage of existing developments north of the tracks and future developments to the south; existing residential buildings north of the tracks would have a massive retaining wall in their front yards;
- The limited existing right-of-way forces a solution with narrow sidewalks, sub-standard driving lanes and no bike lanes.
- Due to the increased clearance required over the tracks, the structure including approaches would be extended, thus impacting more of the street;
- The above-ground structure including approaches would constitute a devastating visual imposition on the existing and future fabric along this part of Strachan Avenue, and would further erode the continuity of the Strachan view corridor.

Estimated cost - $25 million
(includes structure and approaches)

Strachan Underpass

Since it is below grade, an underpass crossing would preserve the Strachan view corridor and would have slightly less impact on adjacent development. However, there are serious problems associated with the underpass approach that are direct consequences of the length of the approaches and their impact on existing and future developments within the Strachan corridor:

- Closes important cross streets including Canniff, Douro/Wellington and East Liberty, severely compromising local circulation; Mitigating measures including increased gradients on the approaches and lowering the tracks slightly provided minimum benefit in terms of street connectivity;

- The cost of repairing the interrupted street network, including land acquisition and capital construction, would be significant;

- Requires an alternate access route to Quality Meats, most likely from Bathurst Street at Front Street;

- Concentrates all traffic on the King/Strachan intersection, which would further impact an already stressed public transit corridor;

- Exaggerates the “rollercoaster” profile of Strachan Avenue produced largely by the existing Lakeshore corridor overpass;

- Creates an uninviting and undesirable environment for pedestrians and cyclists;

- Compromises the street frontage of existing developments north of the tracks and future developments to the south; existing residential buildings north of the tracks would have a massive outside their front doors;

- The limited existing right-of-way forces a solution with narrow sidewalks, sub-standard driving lanes and no bike lanes.

Estimated cost - $45 million

(includes structure, approaches, utilities and rail staging)

Liberty/Wellington Crossing

Extending East Liberty Street over the tracks to meet Wellington Street would maintain important connections to Douro/Wellington and would reduce the impact on existing Strachan development.

However, an overpass would create a disastrous visual and physical obstacle to creating a continuous open space and visual connection from Stanley Park to Fort York that would celebrate the former alignment of Garrison Creek. This important ambition has been a cornerstone of many planning initiatives in the area.

The situation would be similar to proposals put forward for a bridge over the railway to carry the Front Street Extension. That proposal sparked a reaction from heritage and open space advocates of such significance that the final approved scheme recommended the more expensive underpass solution.

Other serious disadvantages to this approach include:

- Interrupts the continuity of Strachan Avenue corridor and breaks the prevailing network pattern in the area;
- Encourages additional traffic through the Niagara neighbourhood;
- Creates an uninviting environment for pedestrians and cyclists;
- The north approach is steep (8% grade) due to the limited available distance; lowering the tracks to ameliorate this problem would be very expensive.
- Requires property acquisitions;

Estimated cost - $30 million
(includes structure, approaches and property acquisition)

Liberty/Wellington Underpass

Extending East Liberty Street under the tracks to meet Wellington Street would maintain important connections to Douro/Wellington and would reduce the impact on existing Strachan development.

However, an underpass would create a disastrous obstacle to creating a continuous open space and visual connection from Stanley Park to Fort York that would celebrate the former alignment of Garrison Creek. This important ambition has been a cornerstone of many planning initiatives in the area.

Other serious disadvantages to this approach include:

- Interrupts the continuity of Strachan Avenue corridor and breaks the prevailing network pattern in the area;
- Encourages additional traffic through the Niagara neighbourhood;
- Creates an uninviting environment for pedestrians and cyclists;
- The north approach is steep (8% grade) due to the limited available distance; raising the tracks to ameliorate this problem would be expensive.
- Requires property acquisitions;
- Causes high impacts on railway activities during construction.

Estimated cost - $40 million

(includes structure, approaches, rail staging and property acquisition)

Attachment 3: [Strachan Avenue Grade Separation Option Evaluation]

Strachan Avenue Grade Separation Study

Options Evaluation

	S1. Strachan Underpass (Rail elevated 2.0 m)	S2. Strachan Underpass	S3. Strachan Overpass
Street Network Connectivity	**POOR** • Maintains Strachan connection • Removes 1 east/west connection • Impacts Quality Meats access	**VERY POOR** • Maintains Strachan connection • Removes 3 east/west connections • Impacts Quality Meats access	**VERY POOR** • Maintains Strachan connection • Removes 3 east/west connections • Impacts Quality Meats access
Open Space Continuity	**VERY GOOD** • Does not impact open space	**VERY GOOD** • Does not impact open space	**VERY GOOD** • Does not impact open space
Pedestrian/cyclist Experience	**POOR** • Unattractive ped environment • No cycle lanes • Shorter structure • Reduced change in grade	**POOR** • Unattractive ped environment • No cycle lanes • Longer structure • Increased change in grade	**VERY POOR** • Unattractive ped environment • No cycle lanes • Very long approaches • Increased change in grade
Existing Development Impact	**POOR** • Disconnects 280m of existing frontage	**POOR** • Disconnects 420m of existing frontage	**VERY POOR** • Disconnects 460m of existing frontage • Overshadows existing development
Development Potential	**MEDIUM** • No impact on adjacent sites • Restricted frontage south of crossing • Restricted access to Triangle Lands	**POOR** • No impact on adjacent sites • Restricted frontage south of crossing • Restricted access to Triangle Lands	**VERY POOR** • High impact on adjacent sites • Restricted frontage south of crossing • Restricted access to Triangle Lands
Cost and Feasibility	**VERY POOR** • Cost of new trackage • Impacts railway operations during construction • Utility impacts	**VERY POOR** • Length of structure • Property acquisitions • Utility impacts • Impacts railway operations during construction	**POOR** • Medium impact on utilities • No impact on railway operations during construction • Difficult construction with adjacent existing development

42 STRACHAN AVENUE GRADE SEPARATION STUDY

E1. Eastern Underpass (Rail elevated 2.0 m)	E2. Eastern Underpass	E3. Eastern Overpass	R1. Railway Underpass
VERY POOR • Disrupts grid network • Impacts Niagara neighbourhood • Removes north/south connection • Maintains Douro connection • Maintains Quality Meats access	**VERY POOR** • Disrupts grid network • Impacts Niagara neighbourhood • Removes north/south connection • Maintains Douro connection • Maintains Quality Meats access • Very high gradients north side	**VERY POOR** • Disrupts grid network • Impacts Niagara neighbourhood • Removes north/south connection • Maintains Douro connection • Maintains Quality Meats access • Very high gradients north side	**VERY GOOD** • Maintains existing patterns and allows for improvements
POOR • Impacts physical continuity	**POOR** • Impacts physical continuity	**VERY POOR** • Impacts physical and visual continuity	**VERY GOOD** • Maintains existing patterns and allows for improvements
POOR • Unattractive ped environment • Longer structure • Reduced change in grade • Reduced south approach	**VERY POOR** • Unattractive ped environment • Longer structure • Increased change in grade • Steep north approach • Long south approach	**VERY POOR** • Unattractive ped environment • Steep north approach • Increased change in grade	**VERY GOOD** • Maintains existing patterns and allows for improvements
GOOD • No impact on existing permanent development	**GOOD** • No impact on existing permanent development	**GOOD** • No impact on existing permanent development	**VERY GOOD** • Maintains existing patterns and allows for improvements
POOR • Severs Triangle Lands and reduces accessibility • Potentially consumes additional land for earthworks	**POOR** • Severs Triangle Lands and reduces accessibility	**POOR** • Severs Triangle Lands and reduces accessibility • Potentially consumes additional land for earthworks	**VERY GOOD** • Maintains existing patterns and allows for improvements
VERY POOR • No impact on utilities • Cost of new trackage • Impacts railway operations during construction	**POOR** • No impact on utilities • Length of structure • Impacts railway operations during construction	**MEDIUM** • No impact on utilities • No impact on railway operations during construction	**VERY POOR** • High impact on utilities • Cost of new trackage • Impacts railway operations during construction

du Toit Allsopp Hillier October, 2008