



The Corporation of the TOWN OF MILTON

Report to: Chair & Members of the Community Services Standing Committee

From: Jennifer Reynolds, Director, Community Services

Date: October 9, 2007

Report No. COMS-052-07

Subject: Walkway over CPR Rail Crossing Feasibility Study

RECOMMENDATION: THAT Staff Report COMS-052-07 regarding the construction of a walkway over the CPR rail line between Livingston Road and Tupper Drive be received for information.

REPORT

Background

In accordance with the Milton Council meeting of January 29, 2007, the following resolution was approved:

"THAT Staff Report COMS-010-07 regarding Councillor Best's inquiry regarding the feasibility and associated costs of constructing a walkway over the CPR rail line between Livingston Road and Tupper Drive be received for information.

AND THAT Staff Report COMS-010-07 be referred to the Trails Advisory Committee for further review and incorporated into the recommendations of the Trails Master Plan Update.

AND FURTHER THAT the walkway be recommended for consideration in the 2008 Capital Budget. "

Discussion

The firm of Marshall Mackin Monaghan (MMM) who is currently updating the 2001 Trails Master Plan was retained by the Town to undertake a feasibility study for a potential



pedestrian crossing over the Canadian Pacific Railway (CPR) Line. The study included an analysis of the opportunities and constraints, consideration of alternate crossing locations, and a conceptual design and cost estimate for construction. A key design principal that was to be included in the proposal was that the facility be fully accessible. A copy of the Rail Crossing Feasibility Study is included in this report as Appendix A.

The existing rail corridor acts as a major barrier to north/ south movement of pedestrian traffic. The proposed pedestrian crossing would permit residents with a direct and safe passage over the active rail line and serve as a critical trail linkage allowing the free flow of pedestrians to a variety of neighbourhood destinations.

The most viable opportunity for a pedestrian rail crossing between Thompson Road and the 4th Line is in the vicinity of Livingston Road and Tupper Drive. This linkage is identified both in the Bristol Survey Secondary Plan and the 2001 Trails Master Plan.

The MMM report concluded it is feasible to construct an overhead pedestrian crossing to connect the north and south neighbourhoods subject to adequate funding and receiving agency approvals such as Conservation Halton and CPR.

Conservation Halton has expressed initial concerns advising the design must take into consideration the floodplain limits and minimize impacts on the adjacent woodlot.

CP Rail generally does not encourage pedestrian overhead crossings but would prefer pedestrians crossing at designated road grade separations over or under CPR tracks. CPR's initial comments indicate they would entertain an application for a pedestrian overhead crossing providing their guidelines and subsequent grade separation requirements are complied with.

It is anticipated that public consultation will form an important role in development of the design, as it is anticipated that there may be significant visual impacts by the introduction of the overhead structure on the study area.

At the Trails Advisory meeting of June 12, 2007, the Rail Crossing Feasibility Study was presented and circulated for review and comment. There was support for the pedestrian rail crossing and as a result the study recommendations have been incorporated into the draft of the Trails Master Plan Update (2007).



Mr. Mark Inglis, Associate Partner with the firm Marshall, Macklin Monahan will be in attendance on October, 9th, 2007 to present the feasibility study.

Relationship to the Strategic Plan

The implementation of a pedestrian overpass is in keeping with the goal of Destiny Milton 2 : " A thriving natural environment that is a valued community asset to be protected, maintained and enjoyed " and Directives which "Promote the establishment of Trails throughout the community and natural environmental areas" and " Encourage the establishment of a healthy community that is made up of an interconnected system of open spaces , walking trails, bicycle routes and natural heritage features".

Financial Impact

The construction cost for the pedestrian bridge crossing over the CPR Line is estimated to be \$1,258,840.00. Of this total, approximately \$813,840.00 is required for the main bridge structure and stairs and \$445,000.00 is estimated for ramps/retaining walls making the facility fully accessible.

The project has been included in the draft 10 year capital budget forecast with the design and approvals being completed in 2008 and construction to follow in 2009.



Respectfully submitted,

Jenifer Reynolds
Director, Community Services Department

If you have any questions on the content of this report: John Bryant, Manager, Parks and Open
Space, Tel: 905-878-7252. EXT.2160

Attachments: Appendix A - Rail Crossing Feasibility Study

CAO Approval: _____

Town of Milton



Final Draft

Rail Crossing Feasibility Study

Submitted by:



September 26, 2007

Introduction:

MMM Group Limited was retained by the Town to study a potential pedestrian raised crossing over a Canadian Pacific (CP) Rail Line, between 4th Line and James Snow Parkway. The feasibility study included an analysis of existing conditions and constraints, consideration of alternative locations, and a conceptual design and cost estimate for a crossing. If possible, the Town wished to implement a fully accessible crossing. The Town has proposed a primary location for the crossing at a storm water management pond located at the end of Livingston Road and the CP Rail tracks, also adjacent to a naturalized channel. However, alternatives along the tracks were also considered. For a location of the study area, see the attached *Figure 1: Site Context Plan* showing the study area and the surrounding land uses. Photos of the study area are found on *Figure 5: Site Context Images*.

Background Information:

The Town of Milton's Trails Master Plan (2001 and 2007 update) identifies trail routes within the Town to form part of a connected network. The trail connection across the CP Railway line is an important link in the Master Plan, as it connects neighbourhoods on the north and south side of the tracks to major destinations such as the Milton Leisure Centre, Milton Memorial Arena, Lions Sports Park, and also key connections to Bruce Trail Public School and Bishop Reding Secondary School.

Currently, there is evidence of unauthorized pedestrian crossings of the tracks at grade. This situation is dangerous, and as such, the Town would like to consider options and determine the feasibility of a grade-separated structure to allow pedestrian and cyclist movement over the railroad tracks.

Opportunities and Constraints:

In order to select a location for the proposed crossing, an analysis of the opportunities and constraints of the study area was undertaken.

The opportunities include:

- Use of the berms along the railroad buffer zones as part of the ramps for a structure;
- Access to the maintenance roads connecting to Lions Sports Park;
- Woodlot is set back from the environmental buffer at the Storm Pond providing additional space for a proposed crossing;
- Location of the potential primary crossing is ideal to connect to Town or Public facilities.

The constraints, which are described in more detail in the following sections, include:

- CP rail regulations and crossing requirements;
- Potential environmental impact on the woodlot, storm water management pond and naturalized channel;
- Utility Easements (i.e. regional sanitary sewer);
- Potential visual impact on neighbouring properties.



CP Railway Constraints:

CP Rail was contacted in order to determine the requirements they would have for a grade separated pedestrian crossing of the railway. They provided the following information:

The railway at this location has 3 main tracks with a potential for a 4th main track. The rail traffic in this corridor is extensive as this is the CP Rail main track for freight moving from Montreal / Toronto to Windsor / Detroit / Chicago. Additionally, movements include the GO Transit service from Milton to Toronto.

In discussions with the railway, the railway Subdivision and Mileage needs to be identified. (*Canadian Pacific Railway Galt Subdivision, Milton, Ontario, situation between Thompson Road (mileage 31.02 Galt Subdivision) and 4th Line, James Snow Parkway (mileage 30.16 Galt Subdivision)*)

Additional specific items to be aware of:

- 1) The minimum vertical clearance above the top of the highest rail (ATR= Above Top of Rail) must be a minimum of 7.01 metres.
- 2) The structure should span the railway right of way with substructure supports completely off the railway right of way. There are currently three tracks at this location with the possibility of a fourth track at some time in the future. The right of way width varies throughout the Milton area, thus specific location of the Pedestrian walk way would need to be identified so as to secure the exact right of way width.
- 3) Suitable fencing will be required (2 metre chainlink) along the common property line with the railway from James Snow Parkway to Thompson Road to discourage trespassing and to ensure that pedestrians are directed to this overhead structure.
- 4) Concern regarding the occupants of the walkway either throwing items from the walkway or the potential for suicide attempts. CP Rail does not have any specific standards for this, however the walkway must be constructed to protect against this happening. Chain link fence could be utilized or research into other methods to deter could be investigated.
- 5) Concern regarding drainage and snow removal – CP Rail will not permit either drainage or plowed snow to be directed onto the right-of-way or tracks.
- 6) The Town of Milton will be required to enter into a grade separation agreement with CP Rail which will document that all costs of construction and future maintenance of this structure will be the responsibility of, and at the cost to the Town. This agreement must be executed before any construction work commences in the field. The agreement takes some time so this needs to be an early action item.

See Appendix A for CP Railway Crossing Application



Environmental Considerations / Conservation Halton:

In order to assess the environmental constraints and requirements, Conservation Halton was contacted. Generally, they described the following concerns and information:

- The limits of the regional floodplain are completely within the naturalized channel and storm water management blocks for this area;
- The 7.5 metre environmental buffer is outside this floodplain, and is acceptable for use, although is not preferred these structures;
- Conservation Halton’s primary concerns are: how a proposed structure would affect the 7.5 metre buffer or creek block with any grade changes, and any effect on the woodlot; and
- A permit may be needed for any works that would affect the naturalized channel, environmental buffer, or woodlot.

Region of Halton Sanitary Sewer Line

Upon collection of all pertinent base information, it was observed that a 900mm corrugated plastic pipe (CPP) sanitary sewer pipe crosses the CP Rail tracks near the centre of the study area. Discussions with the Region indicated that the line may be as deep as 7 metre in some locations. In addition, there is a permanent easement along this pipe which varies from 5-10 metre on both sides of the line. The limits of the easement provided by the Region are shown on *Figure 2: Potential Layout*. The Region indicated that all substructures and superstructures should be outside of the permanent easement.

Alternatives Explored

The design team looked at crossings both to the east and west of the storm pond at Livingston Trail. However, due to the existing and planned land use, adjacent grades, and the adjacent woodlots, alternative locations are not feasible, or are too close to 4th Line or James Snow Parkway to be convenient.

Preferred Crossing Location Design Summary:

A preferred crossing location was identified along the eastern edge of the naturalized channel and storm pond, just east of the Region’s sanitary easement. The structure is proposed to ramp up parallel with the CP Rail line, and then begin a raised structure up to the railroad property limit. A single-span prefabricated bridge structure would span the railroad tracks, and a raised ramp would begin to descend on the south side, parallel with the naturalized channel. This raised structure would transition to a graded berm ramp which would descend to grade, meeting up with a trail in the 7.5 metre buffer zone and continue south. Stairs could be added in lieu of, or in combination with the ramping system, on either side to create a more direct route for pedestrians. Cyclists would be accommodated by walking their bike a wheel well in the stairs. *Figure 2: Conceptual Layout*, *Figure 3: Conceptual Section*, and *Figure 4: Height Analysis* show the primary elements of the proposed design. *Figure 5: Pedestrian Bridge over Railroads: Examples* shows different examples of pedestrian bridges and various railing and enclosure options.

The general details of the preferred crossing design, including costs are summarized below:



Estimated Order of Magnitude:

Administration and Contingency	\$ 148,270
Advertising	\$ 3,100
Printing and Reproduction	\$ 600
External Permits and Inspection Fees	\$ 15,000
Contingency	\$ 129,570
Professional Fees	\$ 179,070
Contract Administration	\$ 43,190
Design	\$ 86,380
Legal	\$ 2,500
Surveys	\$ 7,000
Technical Studies	\$ 30,000
Other Professional Fees	\$ 10,000
Infrastructure	\$ 931,500
Paving / Hardscapes	\$ 65,700
Plantings	\$ 15,000
Structures (see breakdown below)	\$ 833,800
Lighting / Electrical	\$ 15,000
Signage	\$ 2,000
Total Expenditures	\$1,258,840
Potential Cost Savings	\$ 445,000
Removal of Ramps (Stairs Only)	\$ 445,000

Structure:

Bridge Span:

- 1 Single Span Structure over Rail Line – 30 metre span (+/-8-9 metres off of ground to clear railroad tracks by 7.01metre)

Material: Prefabricated Bridge (i.e. Eagle Bridge), with higher railings and additional intermediate rails for security

Order of Magnitude Costs: \$147,000 (includes bridge with railings, installation, substructure and footings)

North Side Abutment:

- 5m of raised ramp structure and steel railings (7 - 9metre sections, approximately, plus landings)

Material: Concrete

Order of Magnitude Costs: \$185,000



- 73m of ramp cut into berm with stone retaining wall (73 metres, on one side)
Material:
Asphalt Pathway \$13,000
Durahold or Armourstone wall \$85,000
Railings on slope side: \$14,600
 - Optional stairs
Material: steel
Order of Magnitude Costs: \$35,000

South Side Abutment:

- 103metres of raised ramp structure (8 – 9 metre sections, approximately, plus landings)
Material: Concrete
Order of Magnitude Costs: \$260,000
 - 33metres of ramp with graded berm sloping to existing grade
Material:
Asphalt Pathway \$6,500
Earth berm \$23,500
Railings on Both Sides: \$13,200
 - Optional Stairs
Material: steel
Order of Magnitude Costs: \$51,000

Fencing Costs:

Chain link fencing to supplement existing privacy and acoustic fencing from James Snow to Thompson Road will be required by CP Rail. It may be possible to negotiate specific areas requiring fencing with CP Rail, but for the purposes of this study, complete coverage from James Snow to Thompson Road was assumed.

As such, the total cost to implement this item is estimated at **\$170,000.00**. (1700 linear metres at \$100/metre)

Other possible funding sources could be explored, such as the Ontario Trillium Foundation, or the Municipal Green Fund, to assist in capital funding.



Safety Considerations:

A number of important safety concerns should be considered and resolved through the detailed design of the crossing structure. For example:

- Ramp grades should be not exceed 8 percent. Exceeding this gradient can cause excessive exit speeds, especially dangerous if the end of the bridge is located at an intersection.

The proposed crossing width should be adequate (including railings) to safely accommodate multiple users or user groups. For the purposes of this study, 3.5 metre width was used, which is consistent with the 2007 Trails Master Plan.

The bridge travel surface should be a non-slip material. Untreated wooden or flat metal surfaces become slippery when wet or icy. Bridge slats made of self-weathering steel with raised dimples for traction have been used successfully. Open metal grating, on the other hand, is noisy and difficult to travel on by in-line skaters.

Adequate railings and barriers must be provided along the raised structures as well as along the bermed ramp areas. The railings must be in accordance with CHBDC (the Canadian Highway Bridge Design Code). The railing and its posts must be designed for a uniform load of 1.2 kN/m (with live load factor of 1.7) applied laterally and vertically simultaneously. The height for pedestrian railing must be 1.05 m, and for bicycle railing must be 1.37 m. Opening in the railing for the lower 1.05 m of railing must not exceed 150 mm, or shall be covered with chain link. Opening in chain link mesh shall not be larger than 50X50 mm. The wires making up the mesh shall have a minimum diameter of 3.5 mm.

A fully enclosed bridge would provide the highest security to address CP Rail's concerns. However, providing high railings has been used in many other railway crossing bridges as evidenced by a number of the examples in *Figure 5*. To maintain ventilation, views and personal security the sides of a bridge should not be fully enclosed with a solid material. The cost estimate does not include full enclosure but is based on high railings. Prior to any detailed design, specific options for screening and enclosure should be explored.

Railings along the bermed ramps must meet the requirements of the Ontario Building Code for guards (Section 9.8 of the Ontario Building Code). Railings should be a minimum height of 1.05 metres. Openings in the guards should have an opening size which prevents the passage of a spherical object having a diameter of more than 100mm unless it can be shown that the location and size of openings which exceed this limit do not represent a hazard. The guard should also be designed to prevent climbing.



Maintenance Considerations

Unless the bridge is completely enclosed, snow clearance and drainage will be issues that must be addressed. CP Rail will not allow drainage or snow to be deposited on their right-of-way. As such, the bridge should be cambered as opposed to flat and include a barrier along the edge to drain away from the centre, outside of the CP Rail right-of-way.

As the structure will include significant concrete abutments and supports, there is the possibility of graffiti being applied to the structure. This will need to be removed on a regular basis as part of the ongoing maintenance of the bridge. Further investigations into treatments for the concrete abutments and supports should be considered during the detailed design phase, in order to minimize this maintenance requirement.

The prefabricated bridge structure should be designed of weathering steel which rusts naturally, and does not require annual maintenance to the surface.

Prefabricated bridge structures, as well as the concrete ramps are durable materials which will not require frequent repairs.

Visual Impact

Due to the clearance required by CP Rail, the structure will have a significant visual impact on the study area. The structure will be visually prominent from residences on the north side of the track looking to the south, including those residences on Ellis, Livingston, Collins, and Cartmer (on the North). Additionally, it will significantly affect the view looking east towards the woodlot, for residences on the south side of the tracks, including Bonin, west of the channel.

The visual impact of the structure is demonstrated by the *Figure 3: Height Analysis*. Using known elevations from subdivision and survey plans, the height and horizontal limit of the proposed structure was estimated. The figure shows the approximate limits of the primary crossing structure, and the start points of each of the ramps.

Environmental Impact

The proposed edge of the structure varies from a minimum of 13 meters to a maximum of 30 meters away from the flood plain limit. The structure is also completely outside of the environmental buffer zone.

On the south side of the tracks, the structure is located within the woodlot block. However, the area of the woodlot block where the structure is proposed, consist of vegetation of low environmental value, and the proposed structure would not require removal of any large trees. Conservation Halton should be consulted and be an integral component of the detailed design.



Mitigation Measures

In order to mitigate some of the visual and environmental impacts above a number of solutions are possible. These solutions are not part of the cost estimate, and should be implemented as deemed necessary through consultation with Stakeholders, the Public, Town Staff, and Town Councillors.

- In order to maintain the privacy of those residents closest to the structure, a semi-opaque material could be used along the ramp railings.
- To mitigate the visual impact of the structure to adjacent residences, tree planting on Public property could be implemented. This could be proposed on the south side of the tracks between the environmental buffer and the structure, or on the north side of the tracks between the structure and the wood acoustic fence. The plantings on public property on the north side could only be implemented if the stairs are not realized.
- To mitigate the visual impact of the structure to adjacent residences on the north side, tree planting on the berm on Private Property could be implemented. This would be the only space available if the optional steps are implemented, but could also be done to supplement plantings on public property.

Conclusion:

Taking into consideration all of the pertinent information collected through the course of this study, including consultation with CP Rail, Conservation Halton, and the Region of Halton, we have concluded that this grade separation is feasible to connect the north and south neighbourhoods at the location shown. However, the cost – benefit to the Town must be considered to determine if the project should move forward to the next stage.

The structure and surrounding site should be designed considering the information presented in this report. However, detailed design will provide further information into the specifics of materials.

Next Steps:

- If supported by Council, the plans should be developed in consultation with stakeholders such as CP Rail, Conservation Halton, and the Region of Halton.
- A formal submission to CP Rail and detailed discussions should take place to obtain their acceptance of the proposal.
- A comprehensive public consultation process should be undertaken to solicit input and feedback from the public.



Appendix A

CP Rail Crossing Application





**CANADIAN
PACIFIC
RAILWAY**

Guide for Road Authorities for Construction or Reconstruction of Grade Separations

Road Authorities wishing to construct or reconstruct a grade separation over or under Canadian Pacific Railway (CPR) track must make a request to the appropriate railway Public Works officer, with copies to CPR Safety & Environmental Services and the local Railway Safety office of Transport Canada. Requests should be forwarded as follows:

Request with 8 copies of plan to:

Mr. David M. Lukianow, P.Eng.
Manager Public Works
Canadian Pacific Railway
Suite 600
1290 Central Parkway West
Mississauga, Ontario
L5C 4R3

Phone: (905) 803-5971

Request with 1 copy of plan to:

Mr. Don M. Thomas
Manager Public Works Program
Safety & Environmental Services
Canadian Pacific Railway
401 - 9th Avenue S.W.
Calgary, Alberta
T2P 4Z4

Request with 1 copy of plans to the appropriate Railway Safety office of Transport Canada (one office only):

Quebec	Ontario
Ms. Héliène Gagnon	Mr. Andre R. Lalonde
Regional Director	Acting Regional Director
Railway Safety Directorate	Railway Safety Directorate
Transport Canada Surface Group	Transport Canada Surface Group
638-800 Rene-Levesque Boulevard	300-4900 Yonge Street
Montreal (Quebec)	North York, Ontario
H3B 1X9	M2N 6A5
Phone: (514) 283 -1774	Phone: (416) 954-9951

The request should contain the following information:

- grade separation summary report (see attached form)
- appropriate number of copies of **single** plan drawn in accordance with grade separation requirements attached below

Upon receipt of the request and plan, CPR will review the proposal and provide its comments. If in agreement with all aspects of the proposal, a grade separation agreement will be prepared and forwarded for execution.

CPR requires that the construction of all rail carrying grade separations or changes to such grade separations must meet the latest version of CPR Requirements for the Design of Steel and Concrete Bridges Carrying Railway Traffic in Canada.

The road profile and bridge structure should be designed to permit future track expansion.

CPR reserves the option to undertake the design and supervise the construction of any rail carrying structures, including the design and construction of the track diversion and roadbed.

Should a track diversion be required during construction, current operating speeds shall be maintained.

All costs associated with the protection of CPR tracks and facilities along the right-of-way are to be included as part of the project costs, including the cost of a Railway flagperson/inspector on site as necessary to ensure the safety of Railway plant and

equipment during construction. CPR costs related to this project are to be reimbursed on an actual cost basis plus applicable overheads as stipulated in the latest Guide to Railway Charges for Crossing Maintenance and Construction, as issued by the Canadian Transportation Agency.

Reconstruction or relocation of utilities must comply with regulatory requirements and be approved by licence agreement with CPR prior to construction.

The Road Authority will be responsible to meet all regulatory requirements including provision of the "Notice of Railway Works" under section 8 of the Railway Safety Act.

The Road Authority will arrange for the financing of this project, paying CPR's expenses as invoiced. Any CPR contribution to the project will be payable upon completion of the project, and after all CPR invoices have been paid. Grade separation projects generally entail certain Railway company expenses such as engineering charges for the preparation or review of plans, costs of on-site personnel for surveys and preparation of estimates including those for protecting telecommunications facilities, track diversions, determination of future needs, etc. These expenses related to CPR work for the project will be charged to the Road Authority regardless of whether the project proceeds. CPR will not undertake to prepare the design, or contract with a consultant to prepare the design of rail carrying structures, prepare detailed estimates for track diversions or carry out any other part of the project until the Road Authority has agreed to reimburse CPR for these services.

**SUMMARY REPORT FOR GRADE SEPARATION CONSTRUCTIONS
OR RECONSTRUCTIONS OVER OR UNDER CPR TRACK**

1. The Road Authority having jurisdiction over the road is _____
in the Province of _____.
2. The Road Authority wishes to construct/reconstruct/twin a grade separation which will cross over/under the Railway (strike out inapplicable references).
3. Canadian Pacific Railway location is described as Mileage _____, on the _____ Subdivision.
(This will be confirmed by the Railway).
4. The name of the road is _____,
in the City/Town/Municipality of _____,
in the Province of _____.
5. The Road Authority proposes to do the work in the months of _____
200_____
6. There is/is not a grade crossing which will/will not be eliminated as part of the project (strike out the inapplicable reference). If a crossing is to be eliminated state the name of the road and the CPR mileage and subdivision.
7. The Road Authority is Junior / Senior by title or by virtue of a regulatory order at this location (strike out the inapplicable reference).
8. Briefly describe the proposed work.

DATED THE ____ DAY OF _____ 200 ____

SIGNED BY : _____

(Title)

If the signatory is not an employee of the Road Authority, please advise relationship and attach authorization to act on the Road Authority's behalf.

Grade Separation Requirements

Interpretation

1. In this document;

"grade separation" means a subway or an overhead bridge;

"highway" includes any public road, street, lane, pedestrian walkway or other public way or communication;

"overhead bridge" is a structure, including the approaches thereto, that carries a highway across and over the railway;

"proponent" means the party who proposes, or has proposed, the construction or alteration of a railway work;

"road authority" means a public authority having legal powers to open and maintain highways in the area under its jurisdiction;

"subway" is a structure, including the approaches thereto, that carries a highway across and under the railway;

Procedure

2. Any road authority proposing to construct, reconstruct or improve a grade separation shall file a request with Canadian Pacific Railway and include with the request eight copies of a **single** general arrangement plan of the work duly signed, numbered and dated, and the names and addresses of the head office of any utility companies or authorities whose facilities will be affected.
3. No person shall begin the construction, reconstruction or improvement of a grade separation until:
 - (a) an agreement has been executed with the Canadian Pacific Railway (CPR);
 - (b) a general arrangement plan as described in Section 4 has been approved by CPR;
 - (c) plans showing the detail of design of the proposed project have been approved by CPR;

Plans

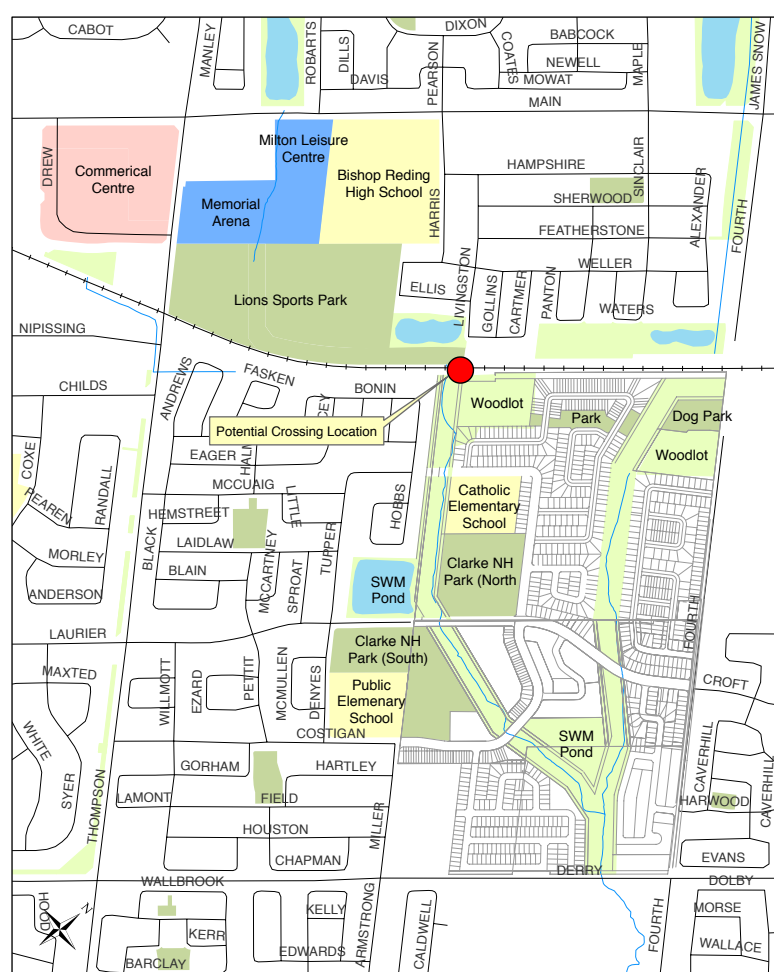
4. The applicant shall show on the general arrangement plan prepared to a scale of 1" = 100' or Metric equivalent dimensioned in both Metric and Imperial measurements:

- (a) the location of the structure and approaches on each side;
- (b) the limits of the project within which the applicant considers that costs are shareable, if applicable;
- (c) the location and number of railway tracks and the boundaries of the railway right-of-way for a distance of at least 100 metres on each side of the crossing;
- (d) any necessary track changes on account of the proposed grade separation;
- (e) the boundaries of the existing road allowance, the proposed road allowance and the railway right-of-way and the boundaries of additional land to be occupied by the proposed structure and approaches, including any additional land required for drainage or to be occupied by utilities, as well as the location and width of proposed road surfaces and sidewalks within the said boundaries
- (f) a plan view of the structure indicating the horizontal and vertical clearances;
- (g) a cross-section of the structure showing the location of curbs, sidewalks, trackage, lighting and width of the highway;
- (h) a profile of the centre of the proposed highway within the limits of the project, prepared at a scale of 1" = 100' horizontally and 1" = 10' vertically or their Metric equivalents;
- (i) an elevation of the proposed structure prepared at a scale of 1" = 10' vertically or its Metric equivalent, and;
- (j) a key map at a scale of 1" = 400' or its Metric equivalent, wherever possible, showing the location of the proposed work and all crossings affected thereby,

Design and Construction

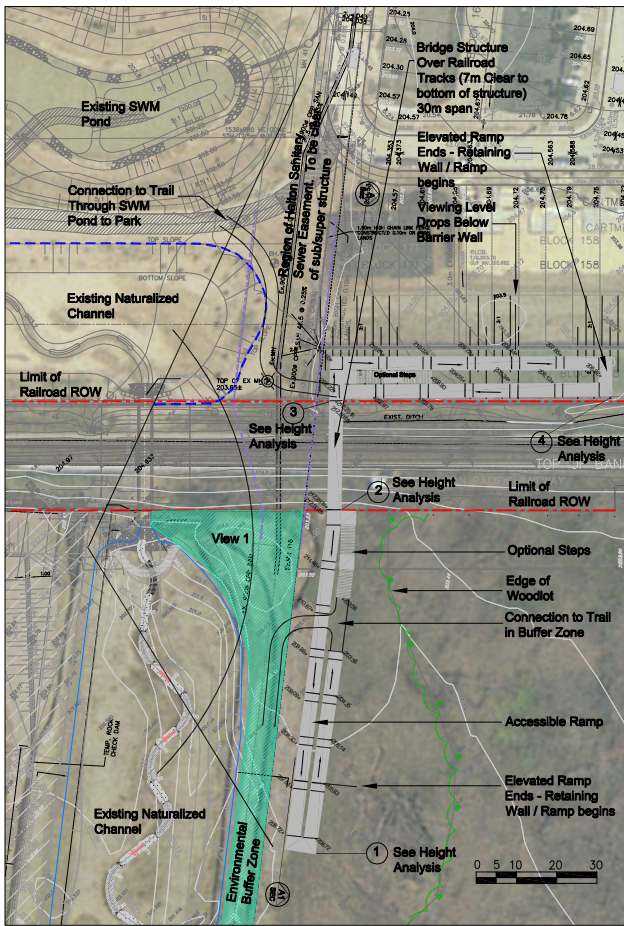
5. With respect to structures supporting railway tracks and facilities, CPR shall reserve the option to:
- (a) design the entire structure and prepare all plans necessary for the construction thereof, and supervise the construction;
 - (b) design, install and maintain all falsework required for the temporary support of its tracks or other facilities during the construction of the work, and perform all work in connection with such changes to any of its facilities as may be necessary to permit the execution of the project and to protect its traffic;
 - (c) invite tenders and award the contracts for the construction of the structure, subject to the approval of the road authority;
 - (d) approve all shop drawings for fabricated structural steel or iron, and perform the necessary mill, shop and field inspection in connection therewith; and
 - (e) carry out all such work in accordance with railway specifications.
6. With respect to structures that carry highways over the tracks and facilities of the railway,
- (a) the road authority shall design such structures, but all plans and specifications shall be submitted to CPR for its approval, except that, by agreement between the parties concerned CPR may design such structure, but all plans and specifications shall be submitted to the road authority for its approval;
 - (b) the construction of such structure within the limits of CPR property shall be carried out to the satisfaction of CPR;
 - (c) all work in connection with changes to an railway facilities, as may be necessary to permit the execution of the project and to protect its traffic, shall be performed by CPR;

- (d) where CPR has consented that the work be performed on its property by any other person, such work may be performed only after such person has received the approval, and provided the work is performed under the supervision, of CPR;
- (e) any part of a structure to be maintained by CPR shall be constructed in accordance with CPR specifications.



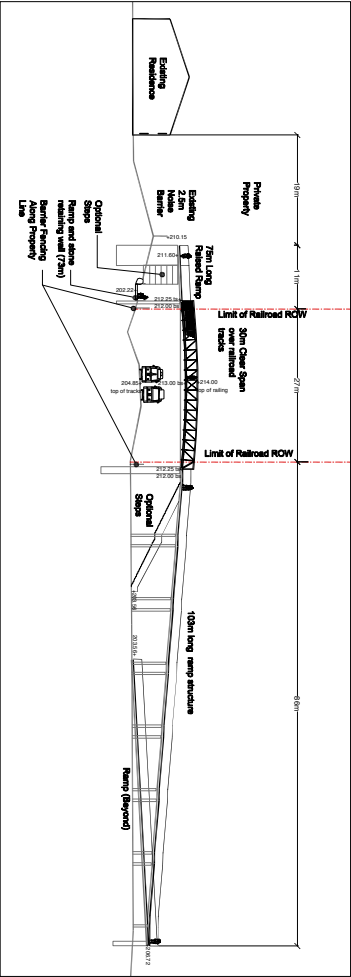
Milton Trails - CP Rail Crossing Feasibility Study
Figure 1: Context Map

June 2007

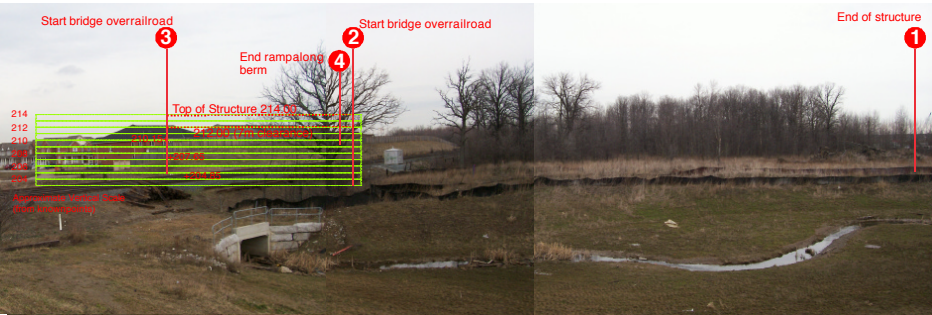


Milton Trails - CP Rail Crossing Feasibility Study
Figure 2: Potential Layout

September 2007

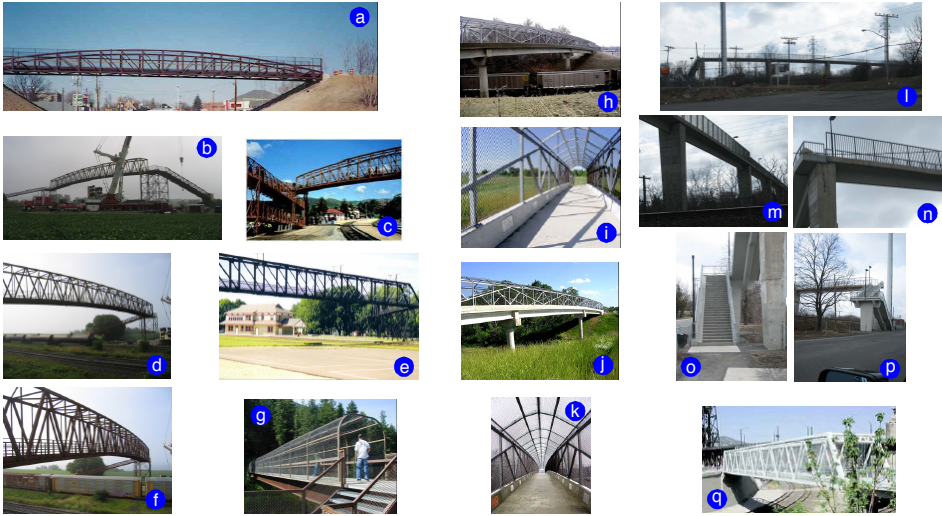


Milton Trails - CP Rail Crossing Feasibility Study
Figure 3: Conceptual Section A-A1 (East Elevation)



Milton Trails - CP Rail Crossing Feasibility Study
Figure 4: Height Analysis - View from South West

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Milton Trails - CP Rail Crossing Feasibility Study
Figure 5: Pedestrian Bridges over Railroads: Examples

September 2007



Image 1) Intersection of tracks and sewer easement, looking west.



Image 2) Intersection of tracks and sewer easement, looking east.



Image 3) Intersection of tracks and sewer easement, looking south.



Image 6) From south side of tracks, looking north-east.



Image 4) Livingston Road, looking south down to tracks.



Image 5) Livingston Road, looking south.

Milton Trails - CP Rail Crossing Feasibility Study
Figure 6: Site Context Images

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