

Appendix D
Agency Comments on Final EPR and Project Team Responses

Hamilton Rapid Transit Preliminary Design and Feasibility Study

B-LINE

ENVIRONMENTAL PROJECT REPORT
v1.0



Table 1: Agency Comments on Final EPR and Project Team Responses

Item	Section/Para.	Agency Comment	Response to Comment/Action
Ministry of the Environment - Environmental Approvals Branch - Environmental Assessment Services Section (November 09, 2011)			
2. Project Description			
1		Identify where in the final EPR the statement of the purpose of the transit project is located.	The purpose of the project is the Vision Statement, which is stated on page 1-1 of the EPR as follows: "Rapid Transit is more than just moving people from place to place. It is about providing a catalyst for the development of high quality, safe, environmentally sustainable and affordable transportation options for our citizens, connecting key destination points, stimulating economic development and revitalizing Hamilton".
2		The description of the project should include reference to the proposed construction of a new bridge over Highway 403, modifications to the existing pedestrian bridge and Red Hill Valley Parkway Bridge, seven traction power substations, and special trackwork locations.	Noted. The description of the project should read: The project involves the introduction of high frequency Rapid Transit service using Light Rail Transit (LRT). The 13.9 km dual-track line will run along Main Street between McMaster University and Highway 403, along King Street from Highway 403 through Downtown to the junction of King Street and Main Street, and along Main Street and Queenston Road to Eastgate Square. In addition to the terminus stops at McMaster University and Eastgate Square, 16 on-street stops will be strategically located along the route for access by walking, cycling and north-south bus routes. A new 325m, multi-span LRT-only bridge will be built to cross the Highway 403 corridor, the skywalk pedestrian bridge in the downtown area needs further assessment to define the extent of required modification, and the bridge over the Red Hill Valley Parkway requires improvements to be able to take the LRT loading. The B-Line LRT will operate with one vehicle per train, on a combination of shared and exclusive at grade guideway to allow cross-movements and access to properties. The LRT service will receive priority at signalized intersections, achieving high operating speeds compared to other modes of transport (such as buses and private vehicles), particularly during peak travel periods. Seven (7) power sub-stations will be built with a relatively even spacing arrangement along the corridor to feed power to the system via a network of overhead wires using a centenary system. These sub-stations will be fed from the main hydro grid at different locations. Special trackwork will be incorporated to provide efficient and reliable operation at key locations to be determined during subsequent design phases.
3		Clarification is needed about the planning process to be undertaken for the McMaster University Terminus, including timing and identification of proponent leading the process.	The City of Hamilton will lead the planning process in its 2012 work plan, which looks at better integration with the GO Bus Terminal, McMaster University and to complete a study on mitigation measures required to protect McMaster's Scanning Electron Microscope from Electromagnetic Field interference caused by the LRT system. The City of Hamilton will be the proponent on any revisions, if required, to the LRT station or guideway to better integrate with McMaster and the GO Bus Terminal, following the amendment procedure outlined in

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			Section 5.4 of the EPR.
4. Project Environmental Effects, Mitigation and Monitoring			
4		Ensure all commitments to future work, consultation, mitigation and monitoring described in this section include timeframes for completion, all of which, including all identified potential impacts and net effects, are to be carried forward to Table 4-5. <i>The proponent must adhere to all commitments to future work, consultation, mitigation and monitoring described in the final EPR and Appendices even though not all commitments have been reflected in Table 4-5.</i>	The City of Hamilton confirms that it will adhere to all commitments to future work, consultation, mitigation and monitoring described in the final EPR and Appendices, even though some commitments may not have been reflected in Table 4-5 of the EPR.
5		An assessment and evaluation of impacts for all described local environmental conditions are to be provided in the final EPR, including identification where impacts are not anticipated. <i>Identified impacts, mitigation, monitoring, etc., for assessed criteria not presented in Table 4-5 (see Land Use and Hydrogeology and Groundwater).</i> <i>Clarification is needed concerning the commitment to provide compensation and reimbursement funds for post-construction tree replacement.</i>	Table 4.5 has been amended to include all of the assessed criteria identified in the main body of Chapter 4. A redline copy of Table 4.5 is attached, identifying the amendments. The commitment to provide compensation and reimbursement funds for post-construction tree replacement on Page 4-10 of the EPR has been made in the context of the City of Hamilton's Public Tree Removal Policy, the Forest Management Plan (Reforestation Policy) and By-Law 06-151 (Public Trees By-Law), as amended. This is an internal commitment from the City's Rapid Transit Team to the City's Urban Forestry group. Copies of the Public Tree Removal Policy, the Forest Management Plan (Reforestation Policy) and By-Law 06-151 (Public Trees By-Law) are attached for MOE's information.
Appendix B. Technical Support Documents			
6	Appendix B.4	Appendix B.4: Mitigation measures (7.2) provide information related to the north side of Roadway 401 located east and west of Warden Avenue. Adjust accordingly. <i>The information requested was not provided in the final Appendix B.</i>	Amendments to the Air Quality component in the main text of the EPR were made in response to pre-submission comments from MOE's Air and Noise Unit. However, some of these were not reflected in the version of the Air Quality report included in EPR Appendix B.4. The following amendments cover these instances. The reference to the "north side of Roadway 401 located east and west of Warden Avenue" should be removed from the EPR. Paragraph 1 under Section 7.2 (Mitigation Measures) on Page 13 of Appendix B.4 should read: "Trees have been found to be effective in both aiding the mixing and dispersion of various pollutants and in the capture of particulate matter, helping to prevent the spread of particulate matter away from the roadway. The maximum PM10 concentrations contributed by the roadway are

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			<p>generally associated with very low wind speeds. A study done by Fugii et al. (2008), used wind tunnel tests to measure how much motor vehicle exhaust particulate passes through a 2m wide vegetative barrier under various wind speeds [17]. The particulate removal was very effective at wind speeds less than about 2 m/s, especially for conifers (Redwood). At 1 m/s the removal efficiency was as high as around 80%. Above 2 m/s, the removal efficiency was very low - less than 20%. The study concluded that the effectiveness of vegetation barriers is greatest at low wind speeds and where the planting is done very close to the source.”</p> <p>There are also statements that should appear in the Appendix B.4 report that address the modelling of benzo(a)pyrene (BaP).</p> <p>Paragraph 4 on Page i (Executive Summary) should read:</p> <p>“For most contaminants, the predicted maximum concentrations at sensitive receptors near the roadways in the study area are within applicable air quality thresholds when combined with background concentrations. This is true for all roadway assessed, regardless of whether traffic changes with the LRT in place are positive or negative. The exceptional contaminants are benzene, benzo(a)pyrene (BaP) and to some extent PM10.</p> <p>Paragraph 6 on Page i should read:</p> <p>“For benzene, both maximum 24-hour and annual concentrations exceed the thresholds at all locations, irrespective of positive or negative traffic changes and mainly due to the fact that the ambient background concentrations alone are higher than the thresholds. The anticipated changes in road traffic will add slightly to the benzene levels in some areas (most notably along York Boulevard) and will improve benzene levels slightly in other areas (along King Street and Main Street). Overall the net effect of the LRT on benzene levels is anticipated to be small. The findings for BaP are similar to those for benzene.”</p> <p>Two additional paragraphs should be added after Table 1 on Page 2:</p> <p>“Benzene, 1,3-butadiene, formaldehyde, acetaldehyde and acrolein are key representatives of a category of vehicle pollutants known as hydrocarbons. A sub-category of hydrocarbons that is not explicitly represented in Table 1 is the so-called polycyclic aromatic hydrocarbons (PAH’s), of which the key representative is benzo(a)pyrene (BaP). In this study, BaP was represented by benzene as a surrogate. The available emissions data for BaP and benzene indicates that they are emitted by motor vehicles in a similar ratio to the ratio of their ambient air quality standards. Therefore,</p>

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			<p>findings for BaP in relation to its acceptable threshold would be similar to those presented for benzene.</p> <p>The reason for handling BaP this way is that available emission factors for BaP are less thoroughly documented than is the case for contaminants listed in Table 1. The emission factors are not broken out by vehicle speed, model year, etc., and while the U.S. EPA has used them in the past to estimate nation-wide emissions, they are less useful for assessing specific sections of roadway and for estimating emissions in future years. Another issue is that historical data on background levels of BaP are more limited and less reliable than those for other key pollutants.”</p> <p>Paragraphs 1 and 2 after Table 8 on Page 12 should read:</p> <p>“The results in Tables 6 to 8 show that, for most of the contaminants and averaging times, the predicted maximum cumulative concentrations are well within the applicable thresholds. In these cases, therefore, the anticipated changes in road traffic with the LRT in place do not have a significant effect. The exceptions are benzene (and also BaP by analogy) and PM10 (inhalable particulate matter), which are discussed in the following paragraphs.</p> <p>Benzene is a gaseous organic compound with evidence of adverse effects in humans (the direct evidence is based industrial exposures at much higher levels than those predicted here). In all cases, the roadway’s maximum contribution to benzene levels, on its own, is well within the proposed AAQC for benzene, but when it is added to the background concentration, the resulting cumulative concentrations exceed the criteria at all receptors. In fact, the background concentrations for both averaging times alone were higher than the applicable thresholds. In most cases, the contribution of the modeled road traffic is very small in relation to the background concentration (generally less than 10%, even at locations adjacent to the roadways). This indicates that the traffic changes associated with implementation of the LRT will have only a very small impact on the cumulative concentrations. Similar findings apply to BaP (benzo(a)pyrene).”</p> <p>Paragraph 1 under Section 7.3 (Emissions During the Construction Stage) on Page 14 should read:</p> <p>“Air quality impacts from the construction phase are assessed qualitatively in this section. No attempt was made to quantify them by computer modeling. Construction activities will involve heavy equipment that generates air pollutants and dust; however, these impacts are temporary in nature. The emissions are highly variable and difficult to predict, depending on the specific activities that are taking place and the effectiveness of the mitigation measures. However, it is</p>

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			<p>known that these emissions have the potential to cause undesirable air quality impacts unless effective mitigation measures are in place. Air quality concerns are related primarily to total suspended particulate (TSP) and dustfall impacts caused by these activities. Dust emissions may result from the movements of construction vehicles, pavement cutting, and wind erosion of stockpiles and exposed graded areas.”</p> <p>Under Section 8 (Conclusions), Paragraph 2 on Page 15 should read:</p> <p>“For benzene, both maximum 24-hour and annual concentrations exceed the thresholds at all locations, irrespective of positive or negative traffic changes and mainly due to the fact that the ambient background concentrations alone are higher than the thresholds. The anticipated changes in road traffic will add slightly to the benzene levels in some areas (most notably along York Boulevard) and will improve benzene levels slightly in other areas (along King Street and Main Street). Overall the net effect of the LRT on benzene levels is anticipated to be small. A similar finding applies to benzo(a)pyrene (BaP).”</p>

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Ministry of the Environment - West Central Region (October 21, 2011)			
Surface Water Impact Evaluation			
1		<p>In our review of the draft report, we were generally satisfied with the manner in which potential impacts to the Chedoke and Red Hill Creeks were assessed during the construction phase. Because of the need to make improvements to the crossing at Red Hill Creek, impacts are possible as construction will occur on the valley floor in proximity to the Creek. The final report indicates that design, mitigation and best management practices will be employed to avoid and/or minimize potential impacts. This is acceptable.</p> <p>With regards to stormwater management, the minimal increase in impervious surface associated with this project is expected to be addressed using accepted stormwater management approaches. Additional ministry review will take place in the event that chosen approaches</p>	<p>The City of Hamilton welcomes the MOE West Central Region offer of assistance and looks forward to working in a collaborative manner with the Region in the design of surface water control measures and any related monitoring program.</p>

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		<p>require approval pursuant to Section 53 of the Ontario Water Resources Act.</p> <p>The final EPR describes the mitigation measures that will be employed to address potential-construction related impacts. West Central Region offers its assistance to the City in reviewing and/or having input into the design of any of the control measures and monitoring that is proposed.</p>	
Groundwater Impact Evaluation			
2		<p>In our review of the DEPR, we had noted the general description of geology and groundwater conditions along the proposed route and the conclusion that no significant hydrogeological issues are anticipated. We concur with this conclusion. The DEPR also stated that contaminated soil and groundwater will likely be encountered (mostly associated with existing or former gas stations) during construction.</p> <p>The final EPR describes the mitigation plans that will be developed based on completion of geotechnical assessment along the alignment. West Central Region offers its assistance to the City in reviewing and/or having input into the design of these mitigation plans. With respect to actions to be taken if contamination is encountered, the Hamilton District Office will be contacted, presumably for advice and direction.</p>	<p>The City of Hamilton welcomes the MOE West Central Region offer of assistance and looks forward to working in a collaborative manner with the Region in the development of groundwater mitigation plans and commits to contact the MOE Hamilton District Office for advice and direction if contaminated materials are encountered during construction.</p>
Air Quality Impact Evaluation			
3		<p>Most of the concerns raised in the memorandum on the Draft AQA Report dated Aug 31, 2011 have been adequately addressed. Comments for remaining concerns are summarized below:</p> <p><u>Contaminant of Concern- Benzo(a)pyrene</u></p> <p>One barrier to modeling benzo(a)pyrene in many areas is scarcity of suitable background monitoring data. This was stated as one of the reasons that modeling of that contaminant was not</p>	<p>MOE's remaining concerns regarding one air quality contaminant, benzo(a)pyrene (BaP), not having been explicitly modelled in the assessment are noted. We believe that the Air Quality consultant (RWDI AIR Inc.) provided an acceptable rationale for not modelling benzo(a)pyrene in response to MOE's pre-submission comments in this regard. That is, Benzene was used as a suitable surrogate for benzo(a)pyrene, so BaP is already factored into the identification of areas where consideration of mitigation is warranted. This approach is consistent with MTO practice for air quality assessments of highway projects in Ontario, in which BaP has not been explicitly modelled, because the available emissions models (MOBILE6.2 and MOVES) do not include emission factors for BaP that would make it useful for predicting</p>

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		<p>conducted. Hamilton is a unique community as it has a large network of ambient air monitoring sites, several of which measure benzo(a)pyrene. The HAMN stations, which are generally located in the industrial core, would not be representative of benzo(a)pyrene concentrations in downtown Hamilton. However MOE-operated Stations 29000, located at Elgin St and Kelly St, is situated close to the proposed B-line Light Rail Transit location and would closely approximate the background benzo(a)pyrene concentrations in the study area. Data has been collected at this site since 1992 and can be acquired from several sources including the Annual Clean Air Hamilton Report or directly from the Ministry of the Environment or Environment Canada.</p> <p>In some circumstances using benzene as a surrogate for all organic pollutants may be sufficient to identify areas where mitigation may be warranted. The Project Team Response suggests that the emission factors for benzene and benzo(a)pyrene emitted from motor vehicles are emitted in a similar ratio to their ambient quality standards and therefore could be used as a surrogate. This statement only applies to the contribution from motor vehicles and does not take into consideration the cumulative effects of all benzo(a)pyrene sources. Ambient benzo(a)pyrene concentrations in the downtown area are influenced by non-vehicular sources because of the proximity to the industrial core. Consequently some locations in the study area could experience higher than expected benzo(a)pyrene levels if benzene is used as a surrogate for benzo(a)pyrene.</p> <p>We maintain our recommendation that some attempt be made to directly characterize the impact of the B-Line Light Rail Transit Project on benzo(a)pyrene concentrations. This is based on the availability of suitable background data, the relevance of</p>	<p>project-level emissions. Therefore, we still believe that the modelling completed by RWDI was comprehensive enough to address this contaminant.</p> <p>To address your comment, the City hereby agrees to consult with the MOE West Central Region Technical Support Section to design the B-Line LRT operations phase air quality program committed to in the EPR, and will consider the implementation of practical remedial measures if the air quality monitoring program demonstrates that increased benzo(a)pyrene levels in those areas where vehicle travel is expected to increase due to the LRT project are, in fact, attributable to the project.</p>

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		benzo(a)pyrene to downtown Hamilton's air quality and the new Upper Risk Thresholds set out in Schedule 6 of O.Reg. 419/05 and the more stringent AAQC and Standards set in Schedule 3 of the regulation.	
Commitments to Future Work and Consultation			
	Section 6.4	We note that in the Commitment to Future Work and Consultation Section 6.4, the City indicates that air quality monitoring is going to be undertaken once the B-line is operational. In the event that the City does not wish to follow our recommendation with respect to benzo(a)pyrene concentrations, we would be willing to accept the following: that the City consult with MOE West Central Region Technical Support Section to design the monitoring program, and that the City make a commitment to appropriate remedial measures in the event that the monitoring demonstrates increased benzo(a)pyrene levels in those areas where vehicle travel is expected to increase due to alignment changes.	Please refer to the commitment in this regard under Item 3 above.

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Ministry of the Environment - Environmental Approvals Branch - Air and Noise Unit (November 14, 2011)			
1	Light Rail (LRV) Noise Emissions	<p>The Noise and Vibration Report sound level calculations are based on the use of two medium trucks to represent the LRV noise emissions. This is incorrect as medium trucks and LRV's are two different modes of transportation. Medium trucks are driven by diesel engines on rubber tires, while LRV's are driven by electric engines on steel wheels/tracks. Therefore, the use of two medium trucks would not be representative of the LRV sound levels.</p> <p>In addition, the calculated sound levels with the use of two medium trucks are</p>	<p>The MOE staff has suggested that the LRVs be modelled based on STAMSON's (ORNAMENT's) custom ALRV (Articulated Light Rail Vehicle) profile. It is asserted that this is a more accurate representation of the future LRVs located along light rail routes. Currently, in the report, each full length LRV is modelled as two medium-sized trucks in ORNAMENT. The suggestion from the MOE is that the new vehicle be modelled as a single ALRV profile. There are several resources from around the world that indicate that modern light rail vehicles are noticeably quieter than the older vehicles still in service in Toronto such as the CLRV (Canadian Light Rail Vehicle) and ALRV.</p> <p>Regarding the MOE suggestion to use a single ALRV in place of two medium trucks, we note the following:</p>

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		noticeably quieter than the LRV sound levels. This will result in underestimation of the potential noise impacts of the proposed transit line. Therefore, all STAMSON calculations of the LRV sound levels should be based on the ALRV setting and not on medium trucks as suggested by J.E. Coulter Associates Limited. The EPR and the Noise and Vibration Report should be updated once the LRV sound levels are calculated using the ALRV mode.	<ol style="list-style-type: none"> The existing TTC specification for new light rail vehicles places a maximum sound pressure level limit of 82dBA at 7.5m from an LRV moving at 40km/h on concrete encased track. It also sets a maximum sound pressure level limit of 82dBA at 7.5m from an LRV accelerating from standstill up to 30km/h on concrete encased track. These are maximum allowable sound levels from any given vehicle and typically occur when the vehicle is at full speed and travelling under full load. The ALRV profile in ORNAMENT is based on a vehicle that averages approximately 85dBA maximum at 7.5m. In reality, the typical LRV will operate a good deal of the time at lower speeds and/or lower loads through most of the B-Line corridor. This will result in an average sound level that is lower by several dB than the maximum allowable sound level. All of the other elements in the ORNAMENT procedures use average passby levels during operation, not the upper limit of vehicle noise emissions. Recent empirical measurements of a vehicle similar to what may be used in Hamilton (the Alstom Citadis 302 used on the Jerusalem LRT system) indicate maximum sound levels of 75dBA at a distance of 7.5m when the vehicle is moving at 40km/h on concrete track. These actual measurements are 9dB lower than the custom ALRV profile in STAMSON. Additional measurements near Alstom's facility in La Rochelle, France yielded a similar maximum sound level of 76dBA at a distance of 7.5m when the vehicle was travelling at 40km/h on concrete encased track. Bombardier's Flexity Toronto Low Floor Light Rail Vehicle (proposed to replace existing streetcars) is expected to produce 78dBA maximum at 7.5m while moving at 40km/h on concrete encased track, based on data provided by the manufacturer. This is 6dB lower than the ALRV profile in STAMSON. The Bombardier Flexity LFLRV is similar to what is also proposed for new light rail transit lines proposed for various municipalities in Ontario. These measurements confirm our previous assertions that the future LRVs are substantially quieter than the ALRV model in STAMSON would otherwise imply. One of the main changes over previous technologies is that modern LRVs incorporate wheel covers that reduce the wheel noise radiation. The Milan LRT in Italy was measured as producing 72dBA at 7.5m maximum while travelling at 40km/h. The hardware for the Milan LRT is comprised of Bombardier's Flexity Outlook vehicles, similar to those proposed for the former Transit City network in Toronto and what will likely

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			<p>be used along other LRT systems in Ontario.</p> <ol style="list-style-type: none"> According to the ORNAMENT procedure, a single medium truck produces 71 dB at 15m while travelling at 40km/h. Thus, modelling each LRV consist (train) as two medium trucks (with a resultant 73-74 dB maximum at 15m) produces a conservative result, slightly overestimating the LRT system noise based on the measurements from around the world, but can be representative of the actual sound levels that can be expected from this technology without undue overestimation. <p>Finally, MOE staff have indicated that trucks cannot be used to represent rail bound vehicles as they are different modes of transportation. ORNAMENT is based on A-weighted sound levels integrated over a passby to produce a Sound Exposure Level (SEL). The SEL's are then summed after anitloging and squaring and corrected for time period, then the logarithm is taken and adjusted to obtain an L_{eq}. It does not matter whether the sound is coming from a truck or rail vehicle.</p> <p>The primary difference in the propagation of sound between using a truck profile and the LRT profile is the source height. The LRT source height is closer to the ground than the source height of a medium truck. The overhead catenary does not figure into noise emissions at normal street transit operating speeds. Since the topography throughout most of the transit corridor is hard reflective ground, ground effect is irrelevant and the source height has no bearing on the final sound level. Thus, there would be no difference in the distance correction effect and the topography effect between rail and automotive sources. For larger setbacks, the low source height of the LRT will create more ground effect than would occur with the trucks. There will also be a greater effect from any barriers or obstructions. Hence, using the truck propagation model for the transit is conservative at larger distances. The profile of two medium trucks more closely matches the sound emission of the new LRVs and is simpler to use in STAMSON than generating a custom profile for each point of reception.</p> <p>Given the above points, we believe that making the adjustment to the calculations suggested by MOE would exaggerate the estimated future sound levels, causing undue public concern about the impact of the new vehicles in the B-Line corridor with the LRT in place. Using the values selected in the calculated impacts in the B-Line noise report, in our opinion, would better serve the public's need for accurate, up-to-date information as part of the Transit Project Assessment Process. Significantly, this approach has already been used in Toronto, and approved by MOE, for the Eglinton Crosstown LRT noise assessment.</p>

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Ministry of the Environment - Environmental Approvals Branch – Air and Noise Unit (November 14, 2011)			
			The City of Hamilton reaffirms its commitment that “A more detailed noise and vibration assessment will be conducted during the detail design phase of the project, when vehicle and LRT infrastructure design parameters have been refined and more site-specific information will be available (i.e., LRT vehicle and suspension type; track structure; soil conditions and receptor structure setback, type, condition and use)”, as stated in Paragraph 5 on Page 4-15 of the EPR. The City will submit the results of this assessment to the Ministry of the Environment, Environmental Approvals Branch, EA Services Section.

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Metrolinx (November 11, 2011)			
1	Section 6.4	Revision to Section 6.4, if we could be accommodated to include the underlined text: "Continue discussions with McMaster University and GO Transit with regard to:"	Noted. The cited text in Section 6.4 should read: "Continue discussions with McMaster University and GO Transit with regard to:"
2	Section 3.2.2	Page 3-7, at the end of the 2nd paragraph of the Downtown Section something to the effect of "High quality streetscaping and way-finding (signage) improvements to facilitate this connection will be taken into consideration as the design progresses towards implementation."	Noted. Text at the end of the second paragraph of the Downtown Section write-up in Section 3.2.2 should read: Furthermore, Metrolinx has identified Downtown Hamilton as a Mobility Hub, which means the area serves a critical function in the regional transportation system as the origin, destination, or transfer point for a significant number of trips. Metrolinx emphasizes their importance in being places of connectivity where different modes of transportation – from walking to riding transit – come together seamlessly and where there is an intensive concentration of working, living, shopping and/or playing. In addition, the Hamilton GO Centre is a major regional transit station within walking distance to the B-Line corridor. High quality streetscaping and way-finding (signage) improvements to facilitate connections among these transportation nodes and facilities will be taken into consideration as the design progresses towards implementation.
3	Glossary of Terms	Major Transit Station Areas, further reference to the updated definition of this term as per the Metrolinx Mobility Hub Guidelines is also warranted here (i.e., 500 to 800m around the station)	Noted but text unchanged. The text included is within the range stated in the Mobility Hub Guidelines.
4	Glossary of Terms	BRT, this definition should be contextualized for the City of Hamilton and should note that for urban areas like Hamilton the upper limit of capacity is closer to 5,000 pphpd	The view expressed is noted but the text remains unchanged. A capacity range is given that covers the number suggested.

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5	Section 2.3.1	There is reference to the design speed of 70km/hr; the table has listed a Maximum cruising speed of 60 km/hr. Previous iterations of the report listed a Maximum catch up speed of 70 km/hr. The design speed should be consistent with the information in the table or be clear about the relationship between the design speed and the maximum speeds listed in the table (i.e., how is the design speed higher than the maximum cruising speed?)	Noted. Design clarification provided below: Normally, systems are designed for speeds higher than the operations speed. This allows the system to operate under safe conditions, even if the operating speed is higher than the posted speed. That being said, it is important to clarify that there are many areas along the corridor where the design speed is lower than 70km/h. This is similar to road design criteria, where the posted speed on a highway may be 100km/h, but the design speed is normally 10km/h higher than the posted speed. Normally, the operating speeds for LRT systems that share the road right-of-way with other modes are limited by the maximum posted speed of the corridor. Therefore, the maximum cruising speed is dictated by the maximum posted speed for the road along the corridor.
6	Table 2.2	Please note that the Metrolinx LRVs currently on order have 2 double doors and 2 single doors per side of the vehicle, which is similar to what is shown in the diagram. This conflicts with the 4 double doors and 1 single door listed in the table.	Noted. The text should read: Table 2-2: Proposed Performance Specifications, Electric double-sliding doors, should read 2 per side. and Table 2-2: Proposed Performance Specifications, Electric single-sliding doors, should read 2 per side.
7	Table 2.3	Metrolinx Rapid Transit Implementation (RTI) team recommends that the OCS Supports should be "Staggered" as it reduces localized pantograph wear. Currently the text reads that "centre" reduces pantograph wear, which is contrary to the RTI recommendation.	Noted. In Table 2.3: Power Supply Characteristics: Overhead Catenary System, Supports replace the word "Centre" with "Staggered".
8	Section 2.10	Please note that the project implementation timelines are relative to the milestone of securing a project funding commitment to show the approximate timeframes required for the associated tasks remaining and that the overall schedule is subject to change depending on when the appropriate funding amount is secured. Please also be clear that the assumption of the design/build approach does not preclude any other delivery methods to be used to deliver this project, but that this approach provides an estimated timeline for the project from its current state to in-service. Table 2.6 Phase B timeframe does not line up with Table 2.7 as Task I, J & K overlap with a number of Phase A items. The text in the previous paragraph is also inconsistent with Table 2.6. Are Tasks I, J	Noted and agreed. No response required. Noted and agreed. No response required. Please refer to the text on EPR Page 2-17. The Preliminary Project Implementation Process lists the tasks of Phase A as they are also shown in Table 2.6. The title for the table should be modified from "Table 2.6:

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		& K a part of Phase A or B? Please ensure the text, Table 2.6 and 2.7 are consistent.	Phase A – Project Implementation Schedule” to “Table 2.6: Phase A – Project Procurement Process”.

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Hamilton Conservation Authority (November 23, 2011) – In Response to Draft EPR (Version 1.0) and Appendices A and B			
1	Section 5.1	Any works within Red Hill Creek or on adjacent lands will require written permission from the HCA pursuant to the <i>HCA Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation 161/06 under Ontario Regulation 97/04</i> .	Section 5.1 of the final EPR cites municipal approvals required to implement the project: “A Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Permit from the Hamilton Conservation Authority (HCA), in accordance with Ontario Regulation 161/06 of the Ontario Conservation Authorities Act; possible for the crossing of the Red Hill valley”. Correction not required, but will be stated in more prescriptive terms, knowing that there will likely be work in the valley (not necessarily in the watercourse). The wording should read “Any works within the Red Hill Creek or on adjacent lands will require written permission from the Hamilton Conservation Authority (HCA) pursuant to the <i>HCA Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation 161/06 under Ontario Regulation 97/04</i> .”
2	Section 4.3.1 Mitigation	With regard to <i>Section 4.3.1 Mitigation</i> of the report, the fisheries timing window should be included in this section. The Red Hill Creek has a no in-water work-timing window of September 15 – June 30 to help protect spawning fish and their habitat (Chinook salmon, brown trout, rainbow trout). The HCA has a Level 2 agreement with Fisheries and Oceans Canada (DFO), not a Level 3 agreement as stated in the report. A Letter of Advice from the HCA on behalf of DFO will be required for any proposed in-water work.	The in-water timing constraint cited by HCA is applicable to fisheries managed as coldwater resources to protect the types of sensitive salmonid species cited in HCA’s letter. HCA has not mentioned such sensitivities or timing constraints in any previous correspondence with the Project Team. We note that the Ministry of Natural Resources (MNR) provided fish community sampling information from both upper and lower Red Hill Creek to the Project Team that indicated the reach of Red Hill Creek under consideration supports warmwater fish species. Further, our interpretation of the <i>Hamilton Harbour and Watershed Fisheries Management Plan</i> (MNR and RBG) suggests that while this reach of Red Hill Creek may be designated as a coldwater or coolwater zone, it does not support a coldwater fishery. The Management Plan includes the following information and statements: Red Hill Creek is designated as intermediate coldwater riverine zone from Hannon Creek to Barton Street. This zone is associated with the Niagara Escarpment in a similar manner to the small coldwater riverine zone. Red Hill Creek becomes warmer as it moves farther downstream from the Niagara Escarpment and is designated as intermediate warmwater riverine zone from Barton Street to its mouth (p. 39). The Niagara Escarpment had a greater impact on the fish community than stream size, and so fish communities have been summarized according to

Item	Section/ Paragraph	Agency Comment	Response to Comment/ Action
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			temperature zones relative to the Niagara Escarpment. Coldwater zones above the escarpment were dominated by brook stickleback, a coldwater species, and northern redbelly dace (Figure 4.23), a warmwater species that is often found in cooler streams. In the coldwater zone below the Niagara Escarpment, the fish community is dominated by blacknose dace and other coolwater species (Figure 4.23). No salmonids populations reproduce in Red Hill Creek, due to marginal temperatures for salmonids. For any in-water work in Red Hill Creek, the City of Hamilton will adhere to the in-water construction timing window in place at the time when proposed construction activities are to occur. Further, a Letter of Advice from HCA on behalf of Fisheries and Oceans Canada (DFO) will be sought for any proposed in-water work in accordance with the Authority’s Level 2 Agreement with DFO.
3	Section 4.3.2 Terrestrial Ecosystems	<i>Section 4.3.2 Terrestrial Ecosystems</i> of the report refers to snow fence being used for tree protection. Please note that snow fence is not suitable for tree protection. Either page wire fencing or preferably plywood sheet fencing should be used for tree protection. See the City of Hamilton Forestry guidelines for tree protection for guidance.	The City of Hamilton will protect trees not scheduled for removal through the development and implementation of a Tree Protection Plan, including the delineation of Tree Protection Zone(s), in compliance with City of Hamilton’s Public Tree Removal Policy, the Forest Management Plan (Reforestation Policy) and By-Law 06-151 (Public Trees By-Law), as amended. Tree protection strategies will be developed in consultation with the City’s Forestry staff and, in HCA-regulated areas, with HCA staff.