CITY OF HAMILTON
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Hamilton LRT Project Office

TO:	Chair and Members Light Rail Transit Sub-Committee
COMMITTEE DATE:	January 29, 2024
SUBJECT/REPORT NO:	Light Rail Transit Operations Models (PED23166(b)) (City Wide)
WARD(S) AFFECTED:	City Wide
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SUBMITTED BY: **SIGNATURE:**	Abdul Shaikh Director, Hamilton LRT Project Office Planning and Economic Development Department 

RECOMMENDATION

That the City endorse Operations Model 2 (*Municipality performs passenger interface activities)* to be selected as the City's preferred LRT operations model with the right to opt-in (transition) to Operations Model 4 (*Municipality performs all aspects of Operational activities except facility operations*) after an initial 10-year term.

EXECUTIVE SUMMARY

The 2021 Memorandum of Understanding between the City and Metrolinx and the Ministry of Transportation notes that the City will be responsible to pay operations and maintenance costs for the Hamilton Light Rail Transit (LRT) project, save and except lifecycle maintenance costs. The Province has indicated they are open to input from the City regarding the role the City would like to play in the operations of the LRT; however, the final decision rests with Metrolinx.

At the July 26, 2023, LRT Sub-Committee meeting, staff presented Report PED23166 which provided an overview of potential LRT operating models and assessment criteria. On September 25, 2023 staff presented Report PED23166(a) to the LRT Sub-

Committee providing staff's preliminary assessment of the potential LRT operating models.

The purpose of Report PED23166(b) is to present staff's final assessment of the potential LRT operating models, and to seek Council's endorsement of Operations Model 2 (*Municipality performs passenger interface activities)* as the City's preferred LRT operations model with the right to opt-in (transition) to Operations Model 4 (*Municipality performs all aspects of Operational activities except facility operations*) after an initial 10-year term.

Alternatives for Consideration – See Page 15

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The Memorandum of Understanding with Metrolinx and the Ministry of Transportation commits the City to fund the costs of operations and non-lifecycle maintenance costs, whether or not the City is the operator. Staff's assessment of the relative financial impacts of the different potential operating models is summarized in Appendix "D" and Appendix "E" to Report PED23166(b).

Staffing: Staff's assessment of the relative staffing impacts of the different potential operating models is summarized in Appendix "B" to Report PED23166(b). The staff recommendation to endorse Model 2 would require the City to perform passenger interface activities for the LRT operations period. This will require dedicated City staffing resources for customer service, communications, fare enforcement and safety and security of customers and staff.

Legal: The City and Metrolinx will need to execute the legal agreements necessary for the operating and maintenance period, including performance and service levels, in accordance with the recommendations from the report and the terms and conditions set forth in the Memorandum of Understanding.

HISTORICAL BACKGROUND

On September 15, 2021, City Council ratified a Memorandum of Understanding with Metrolinx and the Ministry of Transportation to move forward with the 14-kilometre Hamilton Light Rail Transit (LRT) Project. The Memorandum of Understanding notes that the City will be responsible to pay operations and maintenance costs, save and except lifecycle maintenance costs. Metrolinx has indicated they are open to input from the City regarding the role the City would like to play in the operations of the LRT; however, the final decision rests with Metrolinx.

At the July 26, 2023, LRT Sub-Committee meeting staff presented Report PED23166 which provided an overview of potential LRT operating models and assessment criteria.

At the September 25, 2023, LRT Sub-Committee meeting staff presented Report PED23166(a) summarizing staff's preliminary assessment of the potential LRT operating models.

At the LRT Sub-Committee meeting on December 11, 2023, Mike Murray, consultant to the City for the Hamilton LRT project, presented Sub-Committee with a lessons-learned overview, highlighting the Region of Waterloo's approach to the operations and maintenance of the Waterloo ION LRT system.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

N/A

RELEVANT CONSULTATION

Staff undertook internal as well as external consultation, including a peer review, and also considered the input received at previous LRT Sub-Committee meetings.

- *LRT Project Office and Operational Models Working Group*

  The LRT Project Office has been supported by an Operational Models Working Group which includes representatives from various City departments who will interact with LRT planning and operations. The process involved development of assessment criteria followed by a ranking and weighting of the proposed criteria. These steps were followed by a detailed assessment of each option against the criteria and validation by the Operational Models Working Group .

  The LRT Project Office reports to the City's LRT Steering Committee, which includes directors from key departments, who provided input into the decision-making process.

  The LRT Project Office has received the endorsement of staff's recommendations from the City's Senior Leadership Team.

- *Consultation with Metrolinx*

  The LRT Project Office has engaged Metrolinx, as the asset owner, from the early stages of the process. This includes a series of workshops led by Metrolinx on the activities involved with operations and maintenance of the LRT. These workshops have assisted staff in their assessment of LRT models.

- *Strategic Advisory Services*

  Mike Murray, former Region of Waterloo Chief Administrative Officer, has been providing strategic advisory services to the City on the Hamilton LRT project for two years. Mr. Murray is a member of the City's Operational Models Working Group, providing input into the assessment of the LRT operating model. Mr. Murray shared a Waterloo ION LRT lessons-learned presentation at the December 11, 2023, LRT Sub-Committee.

- *Peer Review*

  Dennis Fletcher & Associates was retained by the LRT Project Office in August 2023 to provide peer review and assessment support to the development of operational models for Hamilton LRT. The purpose of this review was to provide verification and validation of the internal assessment by an experienced external source. The goal was to review the process, activities and recommendations with the LRT Project Office.

  Dennis Fletcher & Associates has observed and reviewed the overall process of operational model development and evaluation and found it to be a comprehensive process, with assessments that are accurate and consistent with industry practice and experience.

  The peer review assessment can be found in Appendix "C" to Report PED23166(b) "Peer Review Assessment for Hamilton LRT Operational Models."

ANALYSIS AND RATIONALE FOR RECOMMENDATION

Operating Models

Staff has worked with Metrolinx to develop a list of operational activities and group related activities into three bundles:

a) Bundle 1: Light Rail Transit B Line Operations
b) Bundle 2: Light Rail Transit Vehicle Operations
c) Bundle 3: Passenger Interface Provider

These bundles are designed to assess the advantages, disadvantages and/or implications to the City in taking on any of the bundle activities. Details of each bundle were set out in Report PED23166 and presented at the July 26, 2023, LRT Sub-Committee meeting and are described in more detail in Appendix "A" to Report PED23166(b) "Operational Activities." Additional operational activities related to facility

operations as well as a series of maintenance activities (lifecycle and non-lifecycle) will be the responsibility of a third party selected through Metrolinx's procurement process.

Based on these bundles, the following four operating models were selected for review and assessment:

a) Model 1: Third party performs all 'Operational Activities.' Staff are not presently aware of any use of this model for LRT systems in Ontario.

b) Model 2: City performs 'Passenger Interface Provider Activities.' This model is presently used in the Region of Waterloo's LRT system and will also be used for the Hazel McCallion Line in Peel Region.

c) Model 3: City performs 'LRT Vehicle Operations and Passenger Interface Provider Activities.' Staff is not presently aware of the use of this model for LRT systems in Ontario. However, this model is similar GO Transit's operating arrangement, whereby a third party provides staffing and operates GO under a contract with Metrolinx.

d) Model 4: City performs all 'Operational Activities.' This is the approach planned for operating the Eglinton Crosstown and Finch West lines, whereby the TTC will perform all operating functions, and the City of Ottawa's Confederation Line, which is being operated by OC Transpo.

Table 1 summarizes the operational activity bundles and the operating models.

Table 1 – Light Rail Transit Operating Models

Operational Activities	Operating Model 1		Operating Model 2		Operating Model 3		Operating Model 4	
	City	Third Party	City	Third Party	City	Third Party	City	Third Party
Bundle 1: LRT B Line Operations		x		x		x	x	
Bundle 2: LRT Vehicle Operations		x		x	x		x	
Bundle 3: Passenger Interface Provider		x	x		x		x	

Assessment Criteria

As outlined in Report PED23166, staff developed four criteria for the assessment of the operating models. A series of questions were also provided for each criterion to assist with context and the application of the criterion. The assessment criteria and questions were further refined based on feedback received at the July 26, 2023, LRT Sub-Committee meeting and outlined in Report PED23166(a) at the September 25, 2023, LRT Sub-Committee meeting:

a) *Customer experience:* To assess a seamless experience between all modes of transit, ease of information, and continuity for the public and to determine if the model fosters opportunities for enhanced Inclusion, Diversity, Equity and Accessibility (IDEA).

b) *Interface(s) between parties:* To assess the interface(s) between Metrolinx, the City and various third parties and to determine the associated complexities with shared activities.

c) *Risks and liability:* To assess the types of risks and liabilities that exist for each model, their likelihood of occurrence, the consequences associated with each risk and the potential for mitigation.

d) *Cost to the City:* To assess the relative cost impact of each model to determine if this creates an additional funding liability for the City.

Report PED23166(a) also provided a ranking and weighting of each criterion per the following (1 is highest, 4 is lowest):

1. Customer Experience (35%);
2. Risks and Liability (30%);
3. Costs to the City (25%); and,
4. Interfaces between Parties (10%).

The first three criteria, i.e., Customer Experience, Risks and Liability, and Costs to the City, are considered to be of greatest priority. Customer Experience is the highest priority as it fundamentally addresses the success of the system to attract and retain ridership and serve the residents of Hamilton. Interfaces between Parties criteria are given lesser importance, as these can be mitigated through carefully planned operations.

Preliminary Assessment

Report PED23166(a) presented a preliminary review of the operating models against the four assessment criteria. The assessment of the operations models was anchored on a series of themes aligned with the selected criteria:

1) Maximize seamless customer experience with enhanced opportunities for Inclusion, Diversity, Equity and Accessibility;

2) Minimize risk exposure and liability for the City with consideration for 'ease of mitigation' of the risk or deficiency; and,

3) Maximize accountability.

Cost to the City

At the September 25, 2023, LRT Sub-Committee further elaboration on the "Cost to the City" criterion was requested.

The cost assessment in this exercise is qualitative, not quantitative, due to the complexities involved. Precise cost estimates of each model would require significant further work, as well as knowledge of operational aspects for the project that are not certain at this time. Estimates would not be able to be guaranteed until the bids are received through a competitive bidding process.

To undertake this qualitative analysis, staff referred to the 2011 analysis undertaken by the City with respect to the Preliminary Operations and Maintenance Plan. It identified items involved for the costing purposes of operations and maintenance of the LRT. The breakdown of these proportional costs is summarized in Table 2.

Table 2 – Operations and Maintenance Cost Share Breakdown (%)

Items	Approximate Cost Share
Labour Costs (Admin, operation, maintenance)	83.3%
Vehicle Maintenance Costs	2.7%
Track maintenance / rail replacement	0.6%
Power Costs	3.4%
Cost for parts for maintenance of Catenary and Traction Powered Sub Station (TPSS)	0.4%
Cost for parts for maintenance of Communication and fare collection equipment	0.2%
Office supplies	0.3%

Items	Approximate Cost Share
10% insurance, rates, property taxes, etc.	9.1%
Total	100%

Labour costs are estimated to represent more than 80% of the total costs involved in operations and maintenance, which therefore make it a key factor in staff's assessment of the "Cost to the City" criteria.

To complete this qualitative assessment, staff broke down the cost assessment into three categories: 1 - Cost Certainty, 2 - Start-Up (upfront) Cost and 3 - Ongoing Cost.

- *Cost Certainty*

  Per industry practices, it is generally expected that the greatest cost certainty can be achieved for procurement with contracts assigned to a third party, as costs will need to be presented as fixed (as part of the bidders' submissions) over a defined period of time for the operations phase. Cost certainty is low when the City takes on more responsibilities, as it depends on various factors, including the periodic collective bargaining process.

- *Start-Up (up-front) Cost*

  Start-up costs are costs associated with setting up facilities, equipment, and hiring and training staff required to undertake the operations activities. Start-up costs are typically high if the municipality has not provided the operation activity in the past or needs to be further expanded to meet the requirements of LRT infrastructure. As this would be the City's first LRT line, the start-up cost would be higher as the City takes on more up-front responsibilities compared to a third party with experienced staff from similar projects.

- *Ongoing Cost*

  Ongoing cost, in the context of operations activities, includes staff salaries, ongoing training, hiring, and onboarding training of new personnel. Operations will typically have lower ongoing costs with a third party provider, as operations agreements go through a procurement process which encourages multiple vendors or suppliers to propose competitive costs, driving prices down as each participant tries to offer the most competitive pricing to win the contract. To lower the cost, the third party could employ some efficiencies, such as fewer activities being outsourced to another third party on a retainer basis, rather than keeping full-time employees.

Staffing Requirements for LRT Operating Bundles

The City's 2011 Preliminary Operations and Maintenance Plan also outlined preliminary staffing requirements for the operations and maintenance of LRT. According to this report, a total of 182 staff would be required for operations and maintenance activities. Staffing requirements per the 2011 Preliminary Operations and Maintenance Plan can be found in Appendix B to Report PED23166(b).

Though this report does not break down the staffing requirement for the three bundled activities under consideration for this assessment, information is provided for context related to the types of positions which will be required. This information will be reassessed and validated as needed at a later stage.

Based on learning from similar projects, the following could be considered as an estimate for the staffing requirements for each bundle:

- Bundle 1: Up to 15 employees will be required as controllers, supervisors, etc.
- Bundle 2: Up to 70 employees will be required as operators, trainers, recruiters, supervisors, etc.
- Bundle 3: Up to 30 employees will be required as safety and security officers, fare enforcement officers, customer service and communications specialists, supervisors, etc.

In addition to the above, the City will need to establish an LRT operations service area, which will be responsible for managing all aspects of the transit service, including coordinating contract administration with Metrolinx. Anticipated positions in the LRT operations service area will include managerial, supervisory, administrative and contract management positions, the size and scope of which are yet to be determined based on the final model selected by the City.

Assessment of the Operating Models

The following is a high-level summary of the assessment of the operating models. A detailed summary of the assessment of the models can be found in Appendix D to Report PED231766(b).

- *Model 1*

  Model 1 may create customer confusion, require more efforts to coordinate schedules between HSR and a third party, with potential lack of alignment between fare enforcement and optimizing revenue for the City, minimal public-facing presence, with the least opportunity for the City to influence delivery of the City's mandate for enhanced Inclusion, Diversity, Equity and Diversity (IDEA).

For Model 1, customer service and fare enforcement/fare collection are additional interfaces anticipated compared to other common interfaces expected for Model 2. Some risks are primarily transferred to the third-party operator, the overall risk to the City is considered medium.

Model 1 would benefit the City by means of the greatest cost certainty due to a procurement contract with a third party, as costs will be fixed as part of the bidding process for a defined period of time over the operations period. Model 1 has the least upfront cost to the City to bring in new functions compared to other models. Ongoing costs should be comparable to Model 2 and slightly lower than Models 3 or 4.

- *Model 2*

Model 2 presents a relatively seamless customer experience, as the City will be responsible for customer interface for both HSR and LRT. With this model, the City has an opportunity to implement measures which consider socio-economic factors when dealing with Customer Service and Fare Enforcement, such as addressing the barriers affordability and enforcement can present to some. This model provides an opportunity to achieve IDEA as the City takes on customer facing and customer service responsibilities. Model 2 has been assessed to have the fewest and least complex interfaces. Model 2 has been assessed to have the least overall risks to the City. Risks related to drivers, collisions, etc., are borne by the third party operator, not the City.

Model 2 has slightly less cost certainty than Model 1, slightly more upfront cost to the City to bring in new functions compared to Model 1, similar ongoing costs to Model 1 and slightly lower ongoing costs than Models 3 or 4.

- *Model 3*

Model 3 presents a relatively seamless customer experience, with considerable effort to coordinate schedules between HSR service and third party operation of LRT. The City could experience an increased public profile and increased opportunity to consider socio-economic factors when dealing with Customer Service and Fare Enforcement. A higher opportunity to achieve IDEA is expected as the City takes on more responsibilities, including driver recruitment and training. Model 3 has the highest number of interfaces between parties, which could lead to added challenges when managing accountability. With overall medium to high risk, operational activities are partially borne by the City, and as such Light Rail Vehicle driver related incidents in case of Light Rail Vehicle collisions present greater accountability on the part of the municipality.

Model 3 was assessed to have less cost certainty than Models 1 and 2, more upfront cost to the City to bring in new functions compared to Models 1 and 2 and ongoing costs similar to Model 4 and slightly higher than Models 1 and 2.

- *Model 4*

  Model 4 presents a relatively seamless customer experience, as the City would be responsible for customer interface for both HSR and LRT. With this model, the City would have a high public profile with increased opportunity for the City to consider socio-economic factors when dealing with Customer Service and Fare Enforcement. The highest opportunity for the City to influence delivery of the City's mandate for enhanced IDEA is anticipated. Model 4 contemplates a relatively high number of interfaces, with overall risk being high, as risks associated with all operational activities (Light Rail Vehicle drivers, Light Rail Vehicle-related collisions) are borne by the City.

  Model 4 provides the least cost certainty compared to the other models, as fewest activities are contracted with a fixed amount per year during the operation period. This model is presumed to have the most upfront cost to the City to bring in new functions compared to other models. The City would be required to expand some HSR customer service activities, create a fare enforcement program, hire, train and manage Light Rail Vehicle drivers, and operate and manage the LRT system. Ongoing costs are estimated to be similar to Model 3 and slightly higher than Models 1 and 2.

Assessment Results

Staff have assigned numeric scoring from 1 to 9 to assess the operating models; a higher score would mean a more favourable model for the City (i.e., Score 1 is the least favourable to the City, and Score 9 is the most favourable to the City). The scores were carefully allocated for each model based on the qualitative assessment information developed together with the Working Group.

Appendix "E" to Report PED23166(b) "Model Assessment Results" summarizes the scoring along with key rationale and overall weighted scores for each model.

Table 3 – Scoring Summary

Operations Model Assessment Criteria	Established Weights**	Model 1	Model 2	Model 3	Model 4
		Scores*	Scores*	Scores*	Scores*
Customer Experience	35%	2	5	6	7
Accountability - Interfaces between parties (# of interfaces, complexity and ease of mitigation)	30%	6	7	5	6
Risks and Liabilities (consequence, likelihood, overall risk)	25%	8	9	6	5
Cost (cost certainty, up-front and ongoing cost)	10%	6	6	3	2
Weighted Scores* **		**5**	**7**	**5**	**6**

** Higher score translates to more favourable/benefit to the City*
*** Level of importance to the City (higher weight means the criterion is more important to City)*
****Scores for operations model accounting for the criterion's weighing*

Some of the key observations from the assessment of the models are summarized below:

- For ‘Customer Experience’, targeted questions were designed for fair assessment of each model. According to Table 3, Model 4 appears to be the most favourable to the City due to showing the highest score (7) from a Customer Experience perspective.

- For ‘Accountability – Interfaces between parties’, relevant qualifiers such as number of known interfaces, complexity of the interface, and ease of mitigation of each interface are used to numerically identify the most favourable model to the City. As shown in Table 3, Model 2 appears to be the most favourable to the City, from an accountability/interface perspective, with the highest score (7) compared to the other models.

- For ‘Risks and Liabilities’, relevant qualifiers such as risk consequence and risk likelihood are used to quantify the overall risk associated with every risk known and identified for the models. As shown in Table 3, Model 2 appears to be the most favourable to the City, from a Risks and Liabilities perspective, with the highest score (9) compared to the other models.

- For ‘Cost’, relevant cost components such as cost certainty, upfront cost and ongoing cost are used to quantify the overall cost score associated with the models. As shown in Table 3, Models 1 and 2 appear to be the most favourable to the City, from a cost perspective compared to the other models.

The assigned weights, as an indication of the level of importance of the City for each criterion, are used to generate the overall scores across all models. Considering the established weights for the models, Table 3 shows Model 2 has the highest overall weighted score (7), followed by Model 4 with the second highest overall weighted score (6).

Based on staff’s analysis, Model 2 is recommended as the preferred operating model for the City as it would:

- provide relatively seamless customer service, with the City providing the customer-facing functions;
- minimize risks associated with the transition from design and construction to operations and maintenance;
- minimize the City's risk related to operational activities;
- provide greater cost-certainty to the City; and,
- likely be one of the lowest cost options for the City.

Transitional Approach

As discussed in the September 25, 2023, Report PED23166(a), though the operating models have been analysed as discrete models for the purposes of the assessment, in practice opportunities exist for “transition” between the models. For example, there can be an initial “start-up” period in which certain functions are operated by a third party, with an option for the City to assume responsibility for those functions after an initial period of time. This can be an automatic option or an optional “opt-in” approach.

Transitional operations models are being used in other jurisdictions. For example, Waterloo Region’s LRT system has a contract with a third party operator for an initial 10 year operations period, with up to four five-year extensions. Waterloo Region has the option to operate LRT after the expiry of the initial period. Similarly, Metrolinx has an agreement with the TTC to operate the Eglinton Crosstown LRT line for an initial period of 10 years with two successive renewal terms, each for an additional 10 years.

Staff is recommending a transitional operations model for Hamilton LRT. This would entail operations Model 2 being deployed, at minimum, for the “start-up” phase for the duration of 10 years, followed by an optional “opt-in” to Model 4.

Staff would bring forward a recommendation report in year seven of the operations and maintenance period which would assess the operations-to-date of the LRT system and recommend whether or not the LRT operational model should transition from Model 2 to Model 4 after the 10-year operation and maintenance “start-up” period.

It is expected that the transition would require approximately 18-24 months lead time as a transition period to allow time for third party notification, for the City to hire and train appropriate staff, to establish Standard Operating Procedures, infrastructure setup, and shift to Model 4 at the beginning of year 11.

The benefits associated with the approach of endorsing Model 2 with the option to transition to Model 4 include:

- The City taking on the role as Passenger Interface Provider role from the outset, which would provide a seamless customer service experience, would give the City an appropriate profile with transit customers and would provide an opportunity to advance the City's objectives and policies related to Inclusivity, Diversity, Equity and Accessibility.

- Minimizing the risks associated with the transition from the design and construction phases to the start-up, commissioning, operations and maintenance phase, for the 10 year “start-up” period, as a single third party entity would be responsible for all activities.

- Minimizing the City's risks related to operations for the initial operating period.

- Providing an opportunity for the City to observe and monitor LRT operation activities, driver management, and LRT line operation, and provide the necessary knowledge and experience for the City to make an informed decision about the risks, costs and benefits of the City taking on these operational activities at an appropriate time in the future, i.e., after the 10 year operation and maintenance “start-up” period.

- Providing an opportunity for the City to choose to take on additional operational activities in the future (transition to Model 4), assuming the City would have access to the systems and processes which had been developed for the initial operations period, which would make it more efficient for the City to put in place the necessary operating procedures.

Maintenance Activities:

At the July 26 and September 26 LRT Sub-Committee meetings, Sub-committee members asked for potential consideration of an additional model within the assessment, referred to as "Model 5", in which the City would perform all maintenance activities in addition to undertaking all operational activities of LRT. Staff noted in Report PED23166 *"Metrolinx has recommended that the four maintenance activities listed above [constituting all non-lifecycle and lifecycle maintenance activities] be performed by the third party…"*. To provide further clarity, the Ministry of Transportation has provided the City with a letter, included as Appendix "F", " Letter to City of Hamilton from Ministry of Transportation regarding maintenance activities, January 22". As noted in the letter, lifecycle maintenance activities will remain with a third party contracted by the Province. There may be opportunities for the City to take on some non-lifecycle maintenance activities (e.g. custodial activities such as platform snow clearing, garbage collection, etc.), however, this is a decision which would be made at a later date.

Next Steps

Upon receiving Council endorsement of an operating model, staff will present the preferred model to Metrolinx. Metrolinx, as owner of the Hamilton LRT project and assets, will ultimately decide on the operating model.

If Metrolinx agrees to the City's preferred operating model, Metrolinx and the City will develop the requirements for procurement and execute the legal agreements necessary for the operating and maintenance period in accordance with the terms and conditions in the Memorandum of Understanding. Procurement documents will specify the roles and responsibilities for the City and the third-party operator during the operation phase of the LRT project.

Staff will work with Metrolinx to assess non-lifecycle maintenance activities and identify specific activities the City should be performing as an alternative to a third party through Metrolinx procurement. Staff will bring this information to the LRT Sub-Committee at a later date.

ALTERNATIVES FOR CONSIDERATION

It is important to note whichever operating model is selected for Hamilton LRT, the City will be responsible for operations and maintenance costs, except lifecycle maintenance.

<u>Alternative One – Select an Alternative Model</u>

Council could decide to endorse an alternative model. This is not recommended for the reasons outlined in this report.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PED23166(b) – Operational Activities
Appendix “B” to Report PED23166(b) – Staffing Requirements for Operations and Maintenance
Appendix “C” to Report PED23166(b) – Peer Review Assessment for Hamilton LRT Operational Models
Appendix “D” to Report PED23166(b) – Detailed Operations Model Assessment
Appendix “E” to Report PED23166(b) – Model Assessment Results
Appendix “F” to Report PED23166(b) – Letter to City of Hamilton from Ministry of Transportation regarding maintenance activities, January 22