

## MEMO



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Project: 23-12

### Hamilton LRT Operational Models Assessment Review

#### Purpose

Dennis Fletcher & Associates (DFA) was retained by the City of Hamilton LRT Project Office in August 2023 to provide peer review and assessment support to the development of operational models for the Hamilton LRT.

This review's purpose was to provide verification and validation of the internal assessment by an experienced external source with a broader range of experience and local understanding and expertise.

The goal was to review the process, activities, and recommendations from the LRT project Office to the LRT Sub-Committee.

#### Process Context

Following Council's approval in 2017 of a Memorandum of Understanding for the Hamilton LRT project, Metrolinx sought input from the City regarding a preferred operational model outlining the responsibilities for the various operational activities. This framework is to be independent of cost responsibilities, is not to include facility and maintenance activities and a final decision is to remain with Metrolinx.

The assessment and evaluation process was divided into three stages:

- **Stage 1:** Develop models and assessment framework. The results of this stage of work were presented to the Sub-committee in July 2023.
- **Stage 2:** Preliminary Analysis of operational models. The results of this stage of work were presented to the Sub-committee in September 2023
  - **Stage 3:** Final Analysis and recommendations. The results of this stage are to be presented to the sub-committee in November 2023

This review was initiated during Stage 2, but included a review of the outcomes of Stage 1

The LRT project office is supported in this work by an Operational Models Working Group (OMWG) comprising representatives of various City departments that will interact with the LRT planning and operations. The Project Office reports to the LRT Sub-Committee through the LRT Steering Committee, including senior staff from key departments and the Senior Leadership Team, among others. This ensures comprehensive vetting of analysis and recommendations.

The following sections of this review examine the evaluation activities and outcomes of this process.

## Evaluation Activities and Outcomes

### Activity Bundling and Model Development

The development of operational models began with developing an understanding of the activities to be considered. These various bundles were then used to construct a range of operational models that covered various combinations of allocation of responsibilities for the bundles between the City and the contracted third party (through Metrolinx).

### Activity Bundling

Staff developed three activity models to form the basis of the operational model options:

- Bundle 1 – including LRT network operations
  - Operations Control Centre
  - Scheduling, planning and service management
  - Safety, security and emergency management
- Bundle 2 – including LRT vehicle operations
  - Driving LRT vehicles
  - Operator staff management (recruiting, training etc.)
- Bundle 3 – including passenger interface activities
  - Customer experience (call centre, lost and found etc.)
  - Fare collection and enforcement
  - Customer communications
  - Passenger safety and security

Staff noted that the separation of network and vehicle operations into distinct bundles is not common in the industry but was done to give the City the option to consider these activities separately.

Separating these two aspects of the operations is not standard industry practice for a variety of reasons, which were made clear in the detailed assessment. However, the approach taken by staff did achieve the stated goal of allowing consideration of both aspects separately, and ultimately led to a better understanding of the implications of the models among the OMWG members and improved the final assessment for presentation to the Sub-Committee.

### Operational Model Options

Operational models for consideration were developed by creating different distributions of responsibility for each activity bundles between the City and the third party. Figure 1 shows the characteristics of the four models.

Figure 1 - Operational Model Options

Operational Activities	Operational Model 1		Operational Model 2		Operational Model 3		Operational Model 4	
	Third party Performs all Operational Activities		City performs Passenger Interface Provider Activities.		City performs Passenger Interface Activities and LRT Vehicle Operations		City performs all aspects of Operational Activities except for Facility Operations	
	City	Third Party	City	Third Party	City	Third Party	City	Third Party
<b>Bundle 1: LRT B Line Operations</b>		X		X		X	X	
<b>Bundle 2: LRT Vehicle Operations</b>		X		X	X		X	
<b>Bundle 3: Passenger Interface Provider</b>		X	X		X		X	

Model 1, where the third party is responsible for all aspects of the operation, is commonly referred to as a Design-Build-Operate-Maintain (DBOM) model, and in the Metrolinx setting, often expanded to include Financing (DBFOM). Both the Waterloo ION and Ottawa Confederation Line projects were originally conceived as DBFOM models but are being implemented as somewhat modified models. No other current Ontario transit projects are being implemented as strict DBFOM models. In the United States, DBOM models are not uncommon, but very few to date have included the financing aspect.

In Model 4, where the municipality takes responsibility for all operational activities (excluding facility), the third party is primarily responsible for the Design-Build-Finance-Maintain components (DBFM). The current TTC projects, Eglinton Crosstown and the Finch West LRT, as well as Ottawa’s Confederation Line, operate as DBFM models. In each case, it was considered vital by the respective agencies to keep control of both the vehicle operations and customer interface elements.

These two models, Model 1 and Model 4, represent the traditional approaches to private sector project involvement.

Model 2, where the municipality takes responsibility for the passenger interface elements of the service, is actually a modified DBFOM model, where the third party retains operational responsibility for all network and LRT operations. Model 2 is a special case where the City retains customer interface elements. Both Waterloo ION and the Mississauga Hazel McCallion Line use this model, though they are often called DBFOM applications.

Model 3 is a unique application derived from the non-traditional separation of activity Bundle 1 and Bundle 2. There are no current known LRT projects using this model.

The process of model development using the unique bundling approach created a robust set of operational models for consideration. The range of models was both exhaustive and comprehensive within Metrolinx’s guidelines and presented logically.

### Evaluation Process

The evaluation process was designed to be a collaborative effort between LRT Project Office staff and the OMWG. The process involved two preliminary steps: 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 OMWG.

### Assessment Criteria

LRT Project office staff developed preliminary assessment criteria, based on their expertise and experience in other systems. Each of the four criteria was further elaborated in a set of questions that not only helped articulate the implications of the criterion but provided a basis for detailed assessment.

The four criteria are:

- **Customer experience**, including aspects of communication, planning and scheduling implications, City profile with customers and such
- **Risk and liability**, including assessment of likelihood and consequence of identified risks and potential for mitigation
- **Cost**, including both overall cost and potential for cost certainty and assessing operating and maintenance cost as well as costs of new functions
- **Interface between parties**, assessing the number and complexity of interfaces between agencies for each model, with the understanding that fewer and less complex interfaces are preferred.

### Ranking and Weighting

Developing relative weights for the assessment criteria included a two-step process where the members of the OMWG first ranked the assessment criteria from most to least important without regard for weights. A workshop process was used to reach consensus on the overall ranking of the criteria. Once established, the ranked criteria were further reviewed in a workshop process to reach a consensus on the relative weights of the criteria.

In any process of ranking and weighting evaluation criteria, there is a risk of introducing bias by the key staff developed in the way the criteria are presented. Even the order in which the criteria are described to evaluators can be perceived as a bias.

This process was not immune to that influence, but staff went to considerable lengths to try to eliminate bias through careful consideration of all criteria and encouraging OMWG members to consider alternatives.

The initial ranking process resulted in the criteria being ranked, from most important to least as

- Customer experience
- Risk and liability
- Cost
- Interface between parties

More than 90 percent of participants rated Customer experience at 35 to 40 percent, Risk and liability at 30 percent, Cost at 25 to 30 percent and interfaces at 10 percent.

There was some discussion of minor variations in some of these values, within similar ranges. However, the initial values were accepted as consensus with the understanding that the weights would be applied qualitatively rather than strictly quantitatively.

This notion of a more qualitative assessment is appropriate given the level of data and information available (for example, specific costs are unknown at this time)

### Detailed Assessment

This review is not to revisit the detailed assessment but to examine the process and identify areas where consideration was inadequate or misaligned with industry practice and experience.

Initial assessments for each model were prepared by Project Office staff, then reviewed by OMWG members. DFA participated in assessment, both in the development phase and the review with OMWG.

The conclusion is that the detailed assessment is comprehensive. An assessment such as this cannot be exhaustive, but the assessment was certainly comprehensive and addressed a wide range of key aspects. Considering industry practice and experience, no important aspects of the assessment relevant to the Hamilton context were left out.

Challenges and suggestions from the Sub-Committee and OMWG were welcomed and incorporated into the assessment. A key example is the IDEA principles which were incorporated and adjusted to be consistent with the assessment of other criteria.

## Presentation

A key challenge in this process was creating a summary of the assessment that was detailed enough to reflect key elements and nuance of the assessment in each area, while being summarized at a level that would help comprehension by senior decision-makers.

Staff put considerable effort into achieving this balance, and in DFA’s opinion, the overall implications of the detailed assessment are accurately reflected in the summary material.

In DFA’s opinion, the risks associated with Model 3, where third party private sector contractors would be responsible for directing the work activities of represented municipal employees are somewhat understated in the summary presentation, though they were well understood by the evaluators. However, in this case, strengthening the presentation of an argument against Model 3 merely re-enforces the overall recommendation.

## Evaluation Outcomes

Generally, the results of the evaluation reflected concern over Model 1 where the City would not have control over customer facing elements. As noted here, all other Ontario examples of DBFOM models (Model 1), separate the customer interface elements from the operations aspects, creating a modified DBFOM model, which in this case is Model 2.

Model 3 was the least preferred, with the highest level of risk.

Model 4 was also supported, with the concern over the City’s lack of experience in key areas of network management and operations, particularly in the short-term.

## Recommendations

The recommendation derived from this process, to be presented to the Sub-Committee in November, is “That the City adopt Operations Model 2 as the most preferred model for Hamilton, with the City reserving the right to opt-in to Operations Model 4 after 10 years of LRT operations”.

This review supports that recommendation, with the caveat that a potential transition after some period of time must be addressed in some detail in the initial contract considerations, as it will have financial implications for the third party contractor.

The recommendation includes a summary of the merits of the recommendation:

Benefits associated with Models 2 and Model 4 Hybrid, include but are not limited to:

- The City taking on the role as Passenger Interface Provider from the outset (Model 2)
- Minimizing the risks associated with the transitions from the design and construction phases to the start-up, commissioning, operations and maintenance phases
- Minimizing the City's risks related to operations for the initial operating period

- An opportunity for the City to observe and learn and take over operations when the initial commissioning period has passed and with any outstanding matters addressed. **Option for the City to Model 4, as decided by the City.**

DFA supports this rationale, adding that the City maintaining control of the passenger interface elements is of paramount importance

## Conclusions

In summary, DFA has observed and reviewed the overall process of Operational Model development and evaluation directed by the LRT Project Office and found it to be a comprehensive process, with assessments that are accurate and consistent with industry practice and experience.

Further DFA supports the recommendation to adopt Model 2, with the future option to transition to Model 4.