



## MEMO / NOTE DE SERVICE

To / Destinataire Mayor and Members of Council File/N° de fichier: 23-2022

From / Expéditeur Director, Rail Construction Program  
Transit Services Department

Subject / Objet Mott MacDonald Independent Expert Review – Line 1 Confederation Line Date: April 29, 2022

The purpose of this memo is to inform the Mayor and Members of Council that the Mott MacDonald report is now available through the City's Public Disclosure [page](#), and to provide an overview of the report's findings and recommendations. At the October 13, 2021 Finance and Economic Development Committee, Council directed City staff to release the independent expert review of Line 1 Confederation Line, once complete. Mott MacDonald has completed its work related to the infrastructure and vehicles.

Mott MacDonald has issued a report to the City that summarizes their analysis and findings. The report also includes a number of recommendations to improve the sustainability and reliability of the system, which will ultimately benefit transit customers. Their findings confirm that Rideau Transit Group (RTG) clearly exceeded the Project Agreement Failure Points thresholds, which validates the City's March 2020 and September 2021 Notices of Default. The report also finds that RTG's rectification plan to respond to the March 2020 Notice of Default includes various actions that will improve the system once the plan is fully implemented. Mott MacDonald's recommendations include specific infrastructure and vehicle improvements to enhance the customer experience and make it viable for the long-term.

### **Project Agreement**

As Members of Council are aware, in 2013, the City entered into a Design-Build-Finance-Maintain (DBFM) contract with RTG for the Stage 1 Confederation Line project. As a reminder, a copy of the Project Agreement and its various technical schedules are listed on the City's Public Disclosure [page](#). The document has been redacted in accordance with MFFIPA, but the various technical schedules are generally complete and fully available.

Under the Project Agreement, RTG is responsible for the design, construction and maintenance of the system for the entire 30-year period. The Project Agreement outlines various mechanisms available to the City to keep RTG accountable for their responsibilities including, the default mechanism, remedial rights, and increased monitoring, all of which the City is currently utilizing. In terms of the payment mechanism, during the maintenance period, RTG is paid for the performance it delivers and is subject to deductions from its monthly payments set out in the Project Agreement when performance fails to meet required metrics.

## **Background**

The City's external legal counsel, Singleton Urquhart Reynolds Vogel LLP, retained Mott MacDonald to provide an independent expert review of the Line 1 Confederation Line, including a review of the Project Co Failure Points, the track and rail systems, the maintenance and storage facility and the vehicles.

Mott MacDonald is an international transportation engineering consultancy firm formed in 1989 and based in the United Kingdom. They are leading transportation industry experts, who have worked on light rail projects worldwide, including the Melbourne Underground Rail Loop and the London Underground.

## **Key findings**

The findings in the Mott MacDonald report include the following:

- The Project Agreement uses a Failure Points calculation to measure RTG's performance during the maintenance period. RTG's prolonged exceedances of these Failure Point thresholds was a key basis for the City's issuance of the March 2020 and September 2021 Notices of Default. Mott MacDonald's review confirms the City's determination that RTG clearly exceeded the Failure Points thresholds both in 2019 and 2020, thereby validating the City's March 2020 Notice of Default. Likewise, Mott MacDonald confirmed that RTG clearly exceeded the Failure Points thresholds in August, September and October 2021, thereby validating the City's September 2021 Notice of Default.
- In response to the March 2020 Notice of Default, RTG submitted a Rectification Plan to the City outlining the work required to remedy system performance issues during the maintenance period. The Mott MacDonald report confirms that RTG's Rectification Plan proposes improvements to the system, but ongoing performance monitoring is required to ensure that the improvements are effective and implemented according to the Rectification Plan.
- The Mott Macdonald report highlights some discrete technical issues that require additional attention and/or a repair. The report also highlights a series of maintenance-related technical issues for both vehicles and track and systems infrastructure that need attention through improved maintenance practices.

The Mott MacDonald report also confirms that the maintenance sustainability over the long term is contingent on RTG adjusting its maintenance practices to gather and track the necessary data to provide traceability and continuity on how often assets have been adjusted, how long they have run, and the magnitude of any adjustments and replacements made. This data should be maintained through the lifecycle of the project and used to apply a proactive approach to maintenance and asset management.

## **Priority recommendations**

Mott MacDonald also makes several priority recommendations for RTG and Rideau Transit Maintenance (RTM) to improve system performance, primarily through improved maintenance practices and as well as various discrete technical improvements. The key priority recommendations are summarized as follows:

- RTG must formally identify the root cause of the August 2021 derailment.
- RTG must increase the level of effort and focus on maintenance planning to minimize deferred vehicle maintenance and to improve the performance of specific maintenance practices, including data collection, configuration control, spares management, and reliability management.
- RTG must review specific maintenance procedures to ensure they are compliant with original equipment manufacturer specifications and to ensure maintenance practices achieve the desired outcomes for quality and performance.
- RTG must improve the management of track rail neutral temperature to achieve better summer track performance and to improve the control of the wheel-rail interface to minimize noise and vibration impacts to the vehicles.
- RTG must improve monitoring and maintenance to ensure the appropriate configuration of wire heights, wire lateral positioning (stagger), crossovers, section insulators, and balance weights in order to optimize performance of the overhead catenary system (OCS).
- RTG must verify traction power substations and grounding and bonding to ensure that impacts of stray current on adjacent infrastructure are minimized.
- RTG must maintain the Belfast Yard Maintenance and Storage Facility track to appropriate track geometry parameters and commission the new bypass track to ensure full flexibility of yard operations. RTG must also complete the automation of yard equipment, including the track added for Stage 2 expansion to help facilitate the movement of trains in the yard.

## **Implementing the Mott MacDonald recommendations**

Based on ongoing monitoring, active oversight and discussions with RTG, and the Mott MacDonald review, the City can confirm that a number of technical improvements, stemming from RTG's Rectification Plan provided in response to the March 2020 Notice of Defaults, are complete. The completed initiatives will be familiar to Council and include door software upgrades, upgrading electric switch heaters to gas heaters, replacing faulty inductors and inductor assembly covers, replacing cracked wheels, repairing cabling on the overhead catenary assembly, and other initiatives such as trackwork. In April, O-Train Line 1 performance consistently delivered 99 per cent of scheduled service.

There are still several open and ongoing issues identified in the Mott MacDonald report that are still being addressed. These include upgrades to the auxiliary power units, resolution of track performance during periods of high ambient temperatures, resolution of wheel-rail interface issues, and upgrades to the various information systems including platform edge cameras,

passenger counting, and passenger information displays showing the train arrival times. Additionally, two other issues emerged in 2021, including with the wheel-axle failure, which still requires a final root cause analysis, and the gear box derailment, which requires a substantive organizational and process review of the maintenance activity.

Additional work is required by RTG to improve the delivery of maintenance services to ensure they can meet their obligations under the Project Agreement. Mott MacDonald has noted that several improvements are required to ensure the sustainability of the Line 1 system. Improvement areas include key maintenance organizational and processes changes to ensure there is increased and dedicated oversight of maintenance activities and that sufficient personnel is always provided. Maintenance planning improvements are also required to support future performance, particularly as ridership increases.

### **Next steps**

The City will work with RTG as they implement the technical recommendations outlined in the Mott MacDonald report in order to improve system performance. The City will rely on the mechanisms prescribed by the Project Agreement to ensure that all technical rectifications are undertaken, including using the City's remedial rights to accelerate the work. The City is seeking compensation from RTG for all associated costs, pursuant to the City's rights under the Project Agreement.

The City remains continuously engaged with RTG and RTM so that these improvements are implemented in the short term. Transportation Research Associates (TRA) continues to monitor RTG and work on the ground with OC Transpo's Rail Operations to ensure appropriate safety and maintenance practices are followed. Separately, within the City, Transit Services departmental structural changes are also being implemented, including hiring a Director of Engineering Services and a Deputy Chief Safety Officer. These positions create additional in-house capacity to support the system in the long-term.

Should you have any questions about the information provided in this memo, please do not hesitate to contact me.

*Original signed by  
Michael Morgan*

Cc: Senior Leadership Team  
Transit Services Departmental Leadership Team  
Director, Public Information and Media Relations