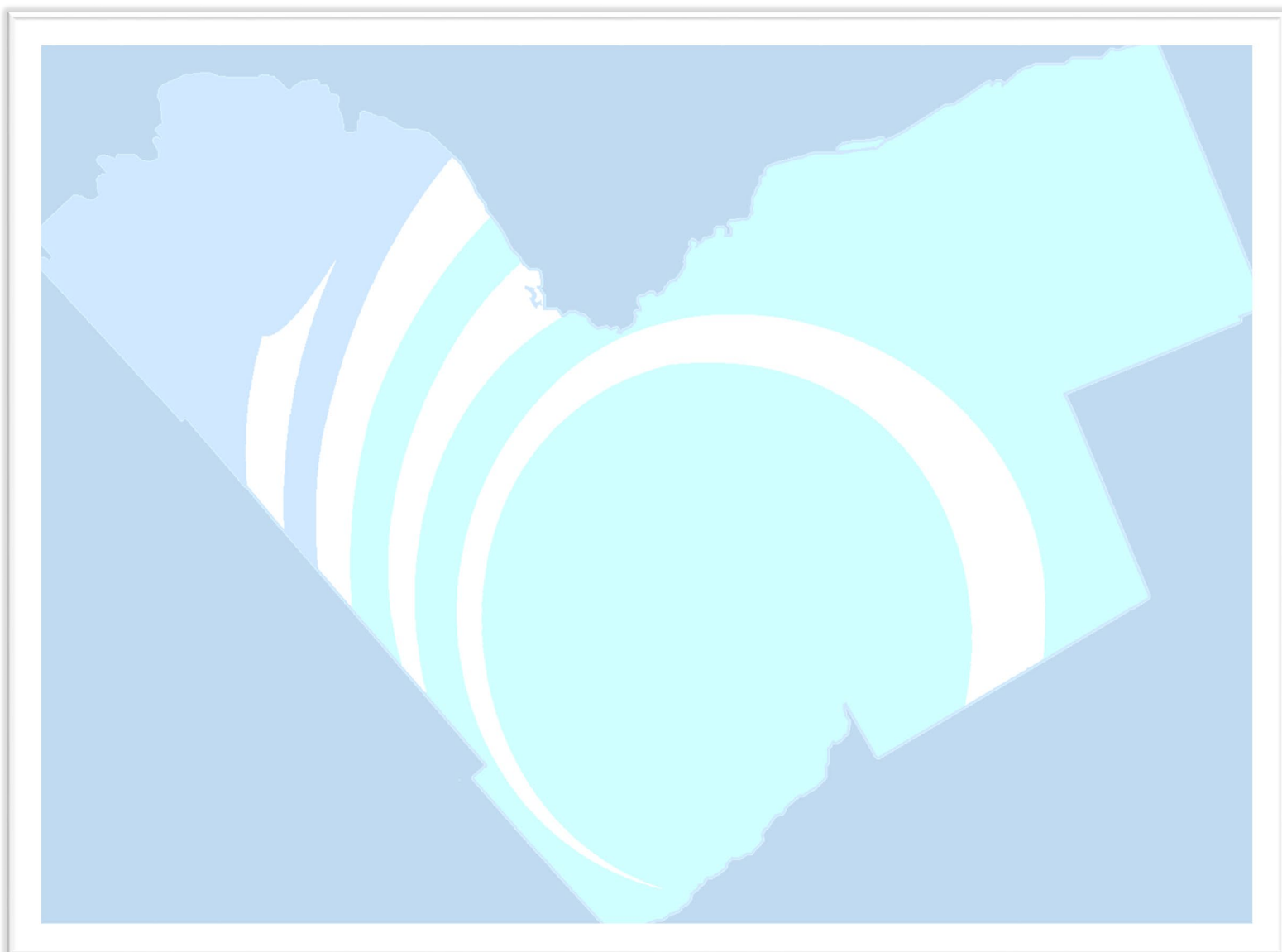


# Ottawa LRT Public Inquiry

## *Action Plan*



**Transit Services Department**

**April 2023**

## Introduction

On December 16, 2021, the Province of Ontario called for a public inquiry to review the ongoing operational issues with the City of Ottawa’s Stage 1 light rail transit (LRT) system. The system had numerous challenges shortly after launching culminating with two derailments in August and September 2021.

Honourable Justice William Hourigan was appointed as Commissioner of the Public Inquiry and tasked “to investigate the commercial and technical circumstances that led to the Stage 1 breakdowns and derailments of the OLRT system.”

The 103 recommendations outlined in the OLRT Public Inquiry Report reflect directly on Stage 1 LRT, as well as more general issues related to infrastructure projects. Those issues include procurement models, contractual arrangements and project agreements. As LRT was the focus of the inquiry, Transit Services will be the lead department moving forward, which will include reporting to Light Rail Sub-Committee and Council on the progress of the 103 recommendations.

The following table provides a synopsis of the recommendations, presented as themes within the final Public Inquiry Report.

**Table 1: Light Rail Sub-Committee Presentation, Feb. 16, 2023**

<b>Theme</b>	<b>Recommendations</b>
Planning Complex Infrastructure	1-7
Preparing Project Estimates and Budgets	8-12
Selecting a Project Delivery Model	13-16
Risk Reduction during Procurement	17-20
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As of April 17, 2023, 36 of the 103 recommendations are considered complete or have been incorporated into ongoing City policies for implementation in future projects. Eight of the recommendations lie within the jurisdiction of the Provincial and Federal governments and cannot be implemented through this action plan.

#	Recommendation	Lead Department(s)	Actions to address the recommendation	Status and timelines for completion
1	Public entities, and their representatives, should take care to ensure that the priorities they set for complex infrastructure projects are appropriately applied throughout the planning and implementation stages of the project.	Finance and Corporate Services	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.</p> <p>The P3 model is not commonly used by the City of Ottawa for complex infrastructure projects. However, Supply Services will update the P3 Policy to highlight the need for Departments to ensure priorities are appropriately aligned throughout the planning and implementation phases of a project.</p>	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4, 2023.</p> <p>Supply Services will update the P3 Policy by the end of Q3 2023.</p>
2	Public entities should consider ways they can identify and address the root causes of cognitive biases. Optimism bias in project planning, for example, leads people to underestimate project costs and risks. Public entities should consider using established approaches such as reference class forecasting, which uses data about prior projects and their outcomes to account for unconscious biases and unanticipated risks.	Finance and Corporate Services	The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4 2023. Any policy or procedure changes will be communicated to City staff.	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p> <p>Infrastructure and Water Services agrees and will support actioning the recommendation.</p>

3	Public entities should also strive to avoid “uniqueness bias” – the belief that the project being planned is unique and not comparable to others. Instead, public entities should identify similarities to established projects and learn from the outcomes of those projects.	Finance and Corporate Services	The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.	In Progress  Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4, 2023.  Infrastructure and Water Services agrees and will support actioning the recommendation.
4	Public entities should avoid, wherever possible, introducing complexity into the major components of the project. For example, if there are to be several stations on a rail line or similar project, keep the differences between the stations to a minimum.	Finance and Corporate Services	The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.  Supply Services will update the P3 Policy to highlight the need for Departments ensure complexity is avoided whenever possible.	In Progress  Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4, 2023.  Supply Services will update the P3 Policy by the end of Q3 2023.  Infrastructure and Water Services agrees and will support actioning the recommendation.
5	Public entities should ensure, from the project outset, that they have access to the expertise that will be required throughout the project, in order to effectively engage in and oversee the project’s development from planning through to public launch.	Finance and Corporate Services	The City’s P3 Policy currently addresses this requirement.  The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be	In Progress  Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4, 2023.

			concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.	
6	A detailed Concept of Operations should be prepared before the preliminary design of the project, and where the operation of the system is not being contracted out, ideally before the project agreement is finalized.	Finance and Corporate Services	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.</p> <p>The concept was introduced partway through Stage 1, and the work is included in the Stage 2 and Stage 3 programs.</p>	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4, 2023.</p> <p>Transit Services has incorporated a Concept of Operations into the Stage 2 and Stage 3 programs.</p>
7	<p>The Province of Ontario should investigate how to develop the skills and capabilities at the municipal level required to lead large infrastructure projects. For example, the province may wish to consider:</p> <p>a. Creating a training program like the Major Projects Leadership Academy at Oxford University in England, to instill and improve the project management skills required for complex infrastructure projects at the municipal level;</p> <p>b. Creating career paths within government to encourage civil servants to develop and use the project management skills and</p>	Government of Ontario	N/A	For the Provincial Government's consideration

	<p>experience they gained through training or on previous complex infrastructure projects; and</p> <p>c. Ensuring that municipalities undertaking complex infrastructure projects have ongoing access to expert advice and guidance throughout the project, from procurement through to construction and operations, particularly with respect to managing the relationship with the private-sector partner.</p>			
8	<p>Public entities should clearly communicate (to elected officials, the public, and other stakeholders, as appropriate) any restrictions, caveats, or limitations applicable to cost estimates developed during the planning of complex infrastructure projects. They should also clearly communicate that such estimates are subject to change as the project planning progresses. Particularly when communicating with the public, public entity representatives should not commit to an estimate as if it were a set budget for a project. The public should be accurately informed about the status of the estimate and, where the estimate is subject to change, that fact should be clearly communicated.</p>	<p>Office of the City Clerk</p> <p>Transit Services</p> <p>Finance and Corporate Services</p>	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4 2023. Any policy or procedure changes will be communicated to City staff.</p> <p>The Project Delivery Review and Cost Estimating report (ACS2013-PAI-INF-0012) was approved by Council in 2013. This report provides a cost estimate classification system and a reporting mechanism to Council where cost estimates for capital projects are provided and future capital budget documents to ensure consistent methods of estimating to total project costs.</p> <p>Legal Services is undertaking a review of the <a href="#">Employee Code of Conduct</a>, with updates anticipated for Q1 of 2024. The revised Code will reinforce staff's obligations with respect to transparency and accountability.</p>	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p> <p>Supply Services will update the P3 Policy by the end of Q3 2023.</p>

			<p>Supply Services will update the P3 Policy to highlight the need for Departments to effectively communicate any restrictions, caveats, or limitations applicable to cost estimates when seeking Council authorization.</p> <p>Transit Services management will work with other levels of government to assess funding agreements for increased flexibility with funding levels as project needs evolve, increased flexibility of eligibility criteria for costs, increased flexibility in timing for determination of final contribution amounts, and more generally, increased flexibility in administration of transfer payment agreements.</p> <p>The Project Delivery Review and Cost Estimating report (ACS2013-PAI-INF-0012) was approved by Council in 2013.</p>	
9	Public entities should avoid setting budgets too early, and remain flexible as project cost estimates evolve during the planning for such projects.	Finance and Corporate Services	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.</p> <p>The Project Delivery Review and Cost Estimating report (ACS2013-PAI-INF-0012) was approved by Council in 2013. This report provides a cost estimate classification system and a reporting mechanism to Council where cost estimates for capital projects are provided and future capital budget documents to ensure consistent methods of estimating to total project costs.</p>	<p>In Progress</p> <p>Investigating which City policies can be updated to incorporate this recommendation as a best practice.</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p>

			Transit Services management will work with other levels of government to assess funding agreements for increased flexibility with funding levels as project needs evolve, increased flexibility of eligibility criteria for costs, increased flexibility in timing for determination of final contribution amounts, and more generally, increased flexibility in administration of transfer payment agreements.	
10	The Province of Ontario and the federal government should review the process for determining the size of funding contributions to municipal infrastructure projects and, where required, make changes to that process to ensure that such funding contributions are not based on preliminary estimates that do not end up accurately reflecting the true costs of the project.	Government of Ontario Government of Canada	N/A	For the Provincial and Federal government's consideration
11	Where the Province of Ontario and/or the federal government are contributing to the funding of a project, they should incorporate some flexibility to respond to the evolving project needs.	Government of Ontario Government of Canada	N/A	For the Provincial and Federal government's consideration
12	Where a senior level of government requires that a particular project delivery model, such as a public-private partnership (P3), be used by a municipality as a condition of senior government funding, that government	Government of Ontario Government of Canada	N/A	For the Provincial and Federal government's consideration



	<p>should ensure that the costs associated with that model are eligible for coverage by the senior government funding. For example, where a P3 model is to be used, the financing costs of the P3 should qualify as eligible expenses.</p>			
13	<p>When selecting a delivery model for a complex infrastructure project, the public entity should use objective criteria appropriate to the project's circumstances to evaluate the available delivery models, including:</p> <ul style="list-style-type: none"> <li>a. The model's comparative value from the perspective of quality, cost, and schedule as compared with other approaches;</li> <li>b. Whether the model properly aligns the interests of the parties involved, and whether the project risks will be managed by the parties best positioned to handle them. Consideration should be given to whether the transfer of specific risks, in whole or in part, is likely to encourage or undermine collaborative behaviour between the parties working on the project;</li> <li>c. The incentives and tools that each model offers to enforce contractual obligations;</li> </ul>	<p>Finance and Corporate Services</p>	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.</p> <p>Supply Services will update the strategic assessment criteria outlined in the P3 Procedures used by Departments to assess project delivery models.</p> <p>Transit Services management acknowledge and agree with this recommendation related to the delivery model of a complex infrastructure project. The recommendations that have comparative value, level of project controls, evaluation criteria, and the benefits and drawbacks should be clearly articulated as part of selecting a delivery model.</p>	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p> <p>Supply Services will update the P3 Policy by the end of Q3 2023.</p>

	<p>d. The measures each model has in place to ensure public transparency, accountability, and oversight of major infrastructure projects;</p> <p>e. The degree of control the government authority should retain, given the project’s circumstances and the public authority’s experience;</p> <p>f. The degree of flexibility each model offers to the public entity to alter the infrastructure over the project’s life without facing major contract change fees; and</p> <p>g. The manner and extent to which each model prioritizes the public interest.</p>			
14	<p>The public entity should ensure that the evaluation criteria used accurately reflect all the priorities set for the project.</p>	<p>Finance and Corporate Services</p>	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.</p>	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p>

15	The public entity should ensure that the potential benefits and drawbacks associated with each delivery model are identified and considered.	Finance and Corporate Services	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4 2023. Any policy or procedure changes will be communicated to City staff.</p> <p>Transit Services management acknowledge and agree with this recommendation related to the delivery model of a complex infrastructure project. The recommendations that have comparative value, level of project controls, evaluation criteria, and the benefits and drawbacks should be clearly articulated as part of selecting a delivery model.</p> <p>The City's P3 Policy and Procedures currently requires that a strategic assessment of the benefits and risks of delivery models be identified and considered. Supply Services will update the P3 Policy to highlight the need for Departments to effectively communicate the benefits and drawbacks of various delivery models when seeking Council authorization of the recommended approach.</p>	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p> <p>Supply Services will update the P3 Policy by the end of Q3 2023.</p>
16	In considering a delivery model that requires the private sector to provide project financing, care must be taken to ensure that the rights accorded to private creditors do not create additional risks for the project. For example, where changes to the project require creditor consent, limits should be placed on the additional equity they	Finance and Corporate Services	The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p>

	can demand as a condition to their consent.		<p>concluded by Q4, 2023. Any policy or procedure changes will be communicated to City staff.</p> <p>Transit Services management acknowledge and agree with this recommendation related to the delivery model. The recommendations that have comparative value, level of project controls, evaluation criteria, and the benefits and drawbacks should be clearly articulated as part of selecting a delivery model.</p>	
17	<p>Introducing new or untested project elements (including technology and workforce) increases project risk. Where possible, public entities should give preference to using service-proven designs, components, labour markets, and supply chains. This is particularly so for key project components, components that present the most inherent risk, and components that cannot be quickly and cost-efficiently replaced in the event of a problem. For example, LRVs should be built in dedicated manufacturing facilities, and ideally in a pre-existing LRV production facility.</p>	Finance and Corporate Services	<p>The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4 2023. Any policy or procedure changes will be communicated to City staff.</p>	<p>In Progress</p> <p>Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.</p>
18	<p>Regarding the Province of Ontario's Canadian Content for Transit Vehicle Procurement Policy established in 2008, the province should study how to strike the right balance for the policy, so the goals of industrial and skills development can be addressed without requiring a single project to take on the</p>	Government of Ontario	<p>Transit Services will consult with the Province of Ontario regarding this requirement for future procurements of transit vehicles.</p>	<p>For the Provincial Government's consideration</p>

	costs and risks of creating new skilled manufacturing jobs. For instance, a price preference could be applied, or another advantage given, depending on the Canadian content a bidder includes in its bid. Any waivers or accommodations should be broad enough to account for the current limitations of the Canadian market and ensure transit operators are able to obtain a quality product produced by a qualified workforce and for the public interests.			
19	The Province of Ontario should consider requiring that key project components be service proven. If this requirement is implemented, any applicable local content requirements should include waivers, exemptions, or other means to allow for such service-proven components to be used.	Government of Ontario	City management acknowledges this recommendation and will consult with the Province of Ontario regarding this requirement for future procurements.	For the Provincial Government's consideration
20	A public entity may include elements in its procurement process that could result in the introduction of new components to respondents' bids during the in-market period. For example, if the public entity includes a pre-qualification process for suppliers during the in-market period, a bidder whose proposed supplier is disqualified during that process must source and incorporate a different supplier into its bid. When the procurement process includes steps that may result in the	Supply Services	Supply will update the Procurement Manual to add clarity around timelines for amendments during the in-market period.  City management acknowledge and agree with this recommendation. Recent procurements for Stage 2 and the Confederation Line project included pre-qualifying suppliers as part of its process to allow for bidders to meet with qualified suppliers prior to their bid submission.	In Progress  Supply can commit to updating the Procurement Manual by the end of Q2 2023.

	introduction of new components to respondents' bids during the in-market period, the public entity should ensure that respondents are given adequate time to incorporate those new components into their bids. This should be accounted for in the procurement plans.			
21	The public-sector entity should consider retaining (or empowering) an independent advisor with expertise in the type of project to be constructed to ensure that any draft project agreement used as a starting point for negotiations reflects best practices and does not include scope gaps.	Finance and Corporate Services	The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4 2023. Any policy or procedure changes will be communicated to City staff.	In Progress  Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.
22	The project agreement should address responsibility for public communications to ensure timely and accurate information is provided during the life of the project.	Supply Services  Transit Services	Supply Services will update the P3 Policy to specifically identify responsibility and requirements for project communications as an element to be included in the Project Agreement.	In Progress  Supply Services will update the P3 Policy by the end of Q3 2023  .
23	The project agreement should provide for meaningful involvement from the public-sector and private-sector parties in all public communications about the project.	Supply Services  Transit Services	Supply Services will update the P3 Policy to specifically identify responsibility and requirements for project communications as an element to be included in the Project Agreement.	In Progress  Supply Services will update the P3 Policy by the end of Q3 2023

24	The project agreement should require that communications to the public be accurate and well founded. Uncertainty should be acknowledged.	Supply Services Transit Services	Supply Services will update the P3 Policy to specifically identify responsibility and requirements for project communications as an element to be included in the Project Agreement.	In Progress Supply Services will update the P3 Policy by the end of Q3 2023
25	The project agreement should require that communications to the public be focused at all times on furthering the public interest.	Supply Services Transit Services	<p>Supply Services will update the P3 Policy to specifically identify responsibility and requirements for project communications as an element to be included in the Project Agreement.</p> <p>The Stage 2 Project Agreement includes a robust communications strategy designed to ensure transparency with Council, public, media and stakeholders. Transparency on the project schedule, including any issues or delays, is key to retaining the public's trust.</p> <p>Transit Services will continue with ongoing Stage 2 community and stakeholder outreach. Staff will continue to provide communication to Council through bi-weekly construction updates, quarterly construction memos and presentations to the Light Rail Sub-Committee.</p> <p>Building upon the work already in progress, Transit Services is creating an information campaign to educate and build excitement for the O-Train expansion. This includes web, social, events, and outreach, which will be incorporated into a larger strategy to improve customer communications and build public trust.</p>	In Progress Supply Services will update the P3 Policy by the end of Q3 2023
26	Within a given model, the early resolution of disputes should be incentivized in the project agreement, particularly where those disputes will	Supply Services	While this is currently a requirement of the Contract Administration Policy, Supply Services will update the Policy to clarify that the overarching objective of timely dispute	In Progress Supply Services will update the P3 Policy by the end of Q3 2023

	<p>affect the work going forward. Resolving operational problems and providing reliable public service must take precedence over all other priorities, including contract enforcement. The resources necessary to address a problem should be mobilized ahead of contractual interpretation and dispute resolution. This could all be done without prejudice to the parties' claims against one another.</p>		<p>resolution is to ensure the continuation of reliable public service.</p>	
27	<p>The provincial government should investigate how to better incentivize in P3 contracts the timely solution of infrastructure problems to avoid delay due to disputes between the parties. Positive and negative incentives should be considered. For example, positive incentives might include a break in payment mechanism deductions if significant problems are resolved before a Key Performance Indicator (KPI) deadline in the contract.</p>	Government of Ontario	N/A	For the Provincial Government's consideration
28	<p>Project partners must clearly define the roles of the safety auditor and the Independent Certifier, and agree upon the nature and degree of assurance each can provide.</p>	Transit Services	<p>Transit Services agrees with the recommendation and considers it complete. As noted in memos sent to Council in August 2022 and April 2023, an independent System Integration Verifier and Independent Certifier have been identified and contracted to oversee the Stage 2 project extensions.</p>	Complete
29	<p>Where amendments to contracts are being considered, relevant and</p>	Transit Services	<p>Transit Services agrees with the approach and it is standard practice to ensure that affected parties are included in the</p>	Complete



	affected parties should be involved in those discussions, including relevant subcontractors.		<p>development and agreement to contracts. The current practice with contract variations is to ensure that both the constructor and the maintainer provide input to the contract changes.</p> <p>For the Confederation Line extension project, a formalized process for the maintainer to identify “divergences” or cost impacts has been established to ensure that there is a process for dealing with changes that will affect their work.</p>	
30	Construction contracts should include mechanisms for calculating extensions of time and adjusting schedules if obstacles arise and delays are encountered.	Transit Services	Project Agreements include standard provisions for dealing with different types of time extensions and for handling impacts if there are obstacles that are encountered.	Complete
31	Specific testing and commissioning requirements should be clearly defined in the project agreement. In the case of large or complex LRT projects, these should account for a sufficient period of integration testing. In the case of an LRT system, the train manufacturer should also be involved.	Transit Services	<p>The approach to integration testing has changed in Stage 2 to require the application of European (EN) standards, amongst others, to ensure that a rigorous process is in place to deal with systems integration and integration testing more broadly.</p> <p>Furthermore, a new Systems Integration Verifier role has been added to Stage 2 that will work to ensure the integration of the headend equipment at the Transit Operations Control Centre and the field equipment is properly completed. This role is intended to review integration issues between the City’s delivery scope in the control centre and Project Co’s delivery scope in the field; the role does not consider other integration that is otherwise covered by the project delivery teams. In instances where the integration work is fully within Project Co’s remit, systems integration will be led by the Project Co’s Systems Integration Manager. Finally, the vehicle manufacturer is included in the overall test programme for their elements of the work.</p>	Complete

32	<p>In locations with unusual climatic conditions, or climates that vary dramatically, a provision should be made for climate-specific testing of the full system, including dynamic testing. For instance, there should be specific requirements for dynamic winter testing – not merely testing during the winter – in locations like Ottawa that have a severe winter climate.</p>	Transit Services	<p>For the Trillium Line, the existing Alstom LINT vehicles have been tested in service during multiple Ottawa winters. The new Stadler FLIRT vehicles have been tested in winter periods and will be used for the first time in passenger service during the 2023-2024 winter period. Backup bus service will remain in place throughout the first winter of service.</p> <p>For the Confederation Line, multiple changes have been made to the vehicles and infrastructure to improve winter performance. In the run-up to service on the east, the infrastructure and vehicle will be tested over the 2024-2025 winter period.</p>	<p>Complete for Stage 1 In Progress for Stage 2</p>
33	<p>Trial running standards should be set out in detail in the relevant contracts. Minimum standards should be set at the outset of the project for both duration and scoring. The scoring should be based on the same performance specifications that the parties have agreed to apply to the system in operation.</p>	Transit Services	<p>The City has added specific criteria into the Stage 2 agreements in order to address this gap. The additional criteria for Trial Running have been included in the contract and are based on the performance specifications that the parties have agreed to apply to the system in operation.</p>	Complete
34	<p>As with testing, the circumstances imposed during the trial running period must mirror as closely as possible the actual public operation of the service. For example, the trial running for transit must mirror intended ridership, climatic conditions, and realistic rider use (e.g., holding, blocking, and pushing the doors). The trial running criteria must be established with a view to having the system <i>consistently</i> demonstrate that it can achieve those</p>	Transit Services	<p>The City has added specific criteria into the Stage 2 agreements in order to address this gap. The additional criteria for Trial Running have been included in the contract and are based on the performance specifications that the parties have agreed to apply to the system in operation. Additionally, the requirements and criteria need to be achieved over a longer period to demonstrate consistency.</p>	Complete

	criteria based on anticipated ridership and service conditions.			
35	An independent expert should be appointed, either individually or as part of a panel with representatives from key stakeholder groups, who must (i) assess trial running criteria and performance, and (ii) approve any material change to the trial running criteria or process.	Transit Services	An independent third-party is in the process of being appointed to take on this function and will be in place to provide oversight for Trial Running.	In Progress
36	There must be proper documentation of any material changes to the trial running criteria with an explanation, analysis, and approval of such changes to be clearly recorded in writing.	Transit Services	An independent third-party is in the process of being appointed to take on this function and will be in place to provide oversight for Trial Running. Material changes are unlikely but if required, would be documented by the City and presented to Council in order to provide full transparency and documentation of the change.	In Progress
37	Maintenance work and systems should be meaningfully and objectively evaluated during trial running, and any failures that would impair public use of the asset if they occurred during public operation should be treated seriously in the evaluation process.	Transit Services	Evaluation of maintenance practices will be evaluated during Trial Running process and will be reported out as part of final demonstration that the system is ready for service.	Complete
38	The relevant project contracts should account for a bedding-in period prior to public service (revenue service) – a period of extensive running of the fully integrated system in real operating conditions prior to public launch. Such a bedding-in period gives operations and maintenance staff real-time	Transit Services Supply Services	Transit Services will assess the opportunity for a period of extensive running of the fully integrated system prior to launch. The running of the complete system and the application of a longer Trial Running period will be used to develop the level of proficiency of the operations teams and the maintenance teams prior to service. Equally, the Trial Running period will include a series of troubleshooting	In Progress  Supply Services will update the P3 Policy by the end of Q3 2023

	<p>experience of the system before the public is asked to rely on it. The length of the bedding-in period should:</p> <ul style="list-style-type: none"> <li>a. Be appropriate to the project (including its technical complexity and inherent risk profile);</li> <li>b. Account for any aspects of the project that increase the risk of hidden issues arising; and</li> <li>c. Include a series of predetermined troubleshooting scenarios that mimic the kinds of incidents that could arise during public service. This will allow all involved in the operation and maintenance of the infrastructure to learn and foster a collaborative relationship between those who will be directly involved once the asset begins serving the public.</li> </ul>		<p>shooting to ensure that the teams are properly trained to deal with issues that arise in service.</p> <p>Supply Services will update the P3 Procedures to include a bedding-in period as a consideration.</p>	
39	<p>Greater consideration should be given to a gradual or soft start to public service (revenue service), particularly when all systems and infrastructure on a project are new. This should be accounted for in the relevant project contracts.</p>	<p>Transit Services Supply Services</p>	<p>Transit Services will assess the opportunity for a period of extensive running of the fully integrated system prior to launch. For Stage 2 of the Trillium Line, the decision has been taken to retain the replacement buses in service over the first winter period in order to help reduce the pressure on the new service and to ensure that alternative service is readily available if there is an issue with rail service.</p> <p>Supply Services will update the P3 Procedures to include a soft-start to public service as a consideration.</p>	<p>In Progress</p> <p>Supply Services will update the P3 Policy by the end of Q3 2023</p>

40	<p>On a new system or where the private sector is providing services after completion of construction, such as maintenance or operations, the relevant project contracts should provide for a bedding-in period in the payment mechanism following the start of revenue service – that is, a period of time following revenue service where deductions are not applied in full.</p>	<p>Transit Services  Supply Services</p>	<p>Transit Services will assess the opportunity for a period of extensive running of the fully integrated system prior to launch. This recommendation has been included in the contract for the Stage 2 Trillium Line extension</p> <p>Supply Services will update the P3 Procedures to include a bedding-in period as a consideration.</p>	<p>In Progress</p> <p>Supply Services will update the P3 Policy by the end of Q3 2023</p>
41	<p>The relevant project contracts should provide for the early involvement of anyone engaged in public service (revenue service), prior to handover, to ensure that they are fully informed about the infrastructure and its maintenance needs, and fully trained to perform their respective roles. This early involvement should include, where possible, shadowing workers during construction and manufacturing.</p>	<p>Transit Services</p>	<p>Transit Services will ensure that early engagement of operations and maintenance are prioritized for Stage 2. A number of contract mechanisms are in place to deal with the handovers; however, early access for the maintainer and a clear handover process will be critical at this juncture.</p> <p>For the Stage 2 Trillium Line, a number of project staff who are experienced with the design and construction will transition to the maintenance team. Additionally, the maintainer has been able to recruit a number of key technicians from the original Trillium Line service to provide vehicle maintenance services.</p> <p>For the Stage 2 Confederation Line, the existing maintainer will grow their team over the coming years to accommodate the growth in maintenance obligations. Steps are being taken now to plan for this early familiarization and training. Early opportunities for handover of facilities will also enable the operators and maintainers to be fully informed about the infrastructure.</p>	<p>Complete</p>

42	The handover process between entities responsible for the construction stage of the project and those responsible for the operations and maintenance stage needs to be organized and clearly and formally defined. Careful attention should be given to the transfer of responsibilities and information from the constructor to the maintainer, and the various criteria for handover should be explicitly set out, and cover both maintenance manuals and historical maintenance documentation.	Transit Services	<p>Transit Services will ensure that early engagement of operations and maintenance are prioritized for Stage 2. For the Trillium Line extension, TNEXT is solely responsible for maintenance services and has begun the process for handover from its construction team.</p> <p>For the Confederation Line extension, agreements are in place between the design-build team and the maintainer to ensure that transfer of responsibilities is clear.</p>	In Progress
43	Project agreements should provide for different performance requirements for differing weather conditions. An LRT system cannot be expected to perform in the same way in any and all weather conditions.	Transit Services	Design changes applied to Stage 1 have been incorporated into Stage 2. Currently, Transit Services does make operational adjustments due to weather conditions.	In Progress
44	Project agreements should be structured to account for potential expansions or additions to the project, and provide a reasonable and realistic process to make sure the expansion does not undermine the balance of power between the parties already involved in the contract. This may include provisions that set the lenders' consent to eventual system extensions.	Transit Services  Supply Services	Supply Services will update the P3 Policy to note that in drafting Project Agreements, consideration should be given to whether the project may expand at some point in the future, and how that would be accommodated. A similar update would likely need to be made the Project Management Policy to account for non-P3 projects.	In Progress

45	Regardless of the project delivery model chosen, collaboration should be at the heart of the relationship between the public entity and private-sector partner(s).	Transit Services	The January 2023 Global Settlement between the City of Ottawa and RTG addressed, as a key priority, the relationship and collaboration between the two parties to improve service.	Complete
46	All private-sector stakeholders should be required to acknowledge that they are working in the public interest. The public interest should be a core organizational principle that informs all steps taken on a project.	Transit Services	The January 2023 Global Settlement between the City of Ottawa and RTG addressed, as a key priority, the relationship and collaboration between the two parties to improve service.	Complete
47	All stakeholders, including suppliers, operators, and maintainers, should be involved as early as is practicable in the project (including, where possible, procurement) with a view to aligning the parties' incentives to collaborate and to avoid conflicts in stakeholder objectives.	Finance and Corporate Services	The Finance and Corporate Services Department is reviewing the impact of this recommendation on the Business Case and Project Management Policy and the Enterprise Risk Management Policy. Where changes are required, staff will update the language of these policies and link to department-specific procedures for project execution. This review is part of a review of the Business Case and Project Management Policy that is already underway, which is expected to be concluded by Q4 2023. Any policy or procedure changes will be communicated to City staff.	In Progress  Finance and Corporate Services expects to update the Business Case and Project Management Policy by Q4 2023.
48	The entity charged with overseeing a project must ensure that its various subcontracts align and are consistent with each other, and that no gaps in project obligations or deliverables are left unaddressed.	Transit Services  Supply Services	Transit Services will ensure that agreements are fully aligned. During the inquiry there was information raised which suggested a misalignment between subcontracts at the design-build level, and the City will assess.	Complete
49	The contractor should involve or consult with the necessary experts to ensure that the plans, including timelines and scope of responsibilities	Transit Services  Supply Services	Transit Services will ensure that agreements are fully aligned. During the inquiry there was information raised which	Complete

	for the subcontracted work, are logical and realistic.		suggested a misalignment between subcontracts at the design-build level, and the City will assess.	
50	The contractor needs to pay early attention to systems integration. A qualified systems integrator should be involved in the project from the design phase through to construction and manufacturing. In particular, a systems integrator should be a required member of the bid team and be involved in key contractual negotiations.	Transit Services	<p>The approach to integration has been changed in Stage 2 where staff rely on European standards, amongst others, to ensure that a rigorous process is in place to deal with systems integration and integration testing more broadly.</p> <p>As noted previously, a new Systems Integration Verifier role has been added to Stage 2 that will work to ensure the integration of the headend equipment at the TOCC and the field equipment is properly completed. This role is intended to review integration issues between the City's delivery scope in the control centre and Project Co's delivery scope in the field; the role does not consider other integration that is otherwise covered by the project delivery teams.</p> <p>In instances where the integration work is fully within Project Co's remit, systems integration will be led by the Project Co's Systems Integration Manager.</p>	Complete
51	Systems integration should be overseen by a single entity, and not split between different subcontractors or entities. Responsibility for this work should be clearly defined.	Transit Services	<p>The approach to integration has been changed in Stage 2 where staff rely on European standards, amongst others, to ensure that a rigorous process is in place to deal with systems integration and integration testing more broadly.</p> <p>As noted previously, a new Systems Integration Verifier role has been added to Stage 2 that will work to ensure the integration of the headend equipment at the TOCC and the field equipment is properly completed. This role is intended to review integration issues between the City's delivery scope in the control centre and Project Co's delivery scope in the field; the role does not consider other integration that is otherwise covered by the project delivery teams.</p>	Complete



			In instances where the integration work is fully within Project Co's remit, systems integration will be led by the Project Co's Systems Integration Manager.	
52	For major infrastructure projects with complex components like LRVs, steps should be taken to ensure that prototypes and component designs are finalized early enough in the project to allow for best practices in confirming the prototype (for example, validation testing) before starting serial manufacturing.	Transit Services	The approach to integration testing has changed in Stage 2 to require the application of European standards, amongst others, to ensure that a rigorous process is in place to deal with systems integration and integration testing more broadly.	Complete
53	The contractor should maintain a consolidated program schedule incorporating all project activities. These scheduled activities need to align. All stakeholders should have access to this consolidated program schedule.	Transit Services	The Project Agreements set out clear requirements for schedule reporting and provision of an accurate consolidated schedule.	Complete
54	The consolidated program schedule incorporating everyone's activities should be updated to reflect changes to the schedule as the work progresses. The consolidated schedule should remain logical, realistic, and reasonable.	Transit Services	The Project Agreements set out clear requirements for schedule reporting and provision of an accurate consolidated schedule.	Complete
55	Material changes in the construction or manufacturing plans should be communicated to those stakeholders who may be impacted by the change.	Transit Services	Improvements to the monitoring of contingency fund spending were brought forward for Stage 2 Light Rail in response to the findings of the Auditor General in the Audit of Stage 2 LRT	Complete

	Ideally, these partners will be consulted in advance of a material change being made to the project.		Contingency Funding. This is an ongoing process where material changes to the design are brought forward for review.	
56	The contractor must keep its public-sector client apprised of realistic timelines for the completion of the project.	Transit Services	The Project Agreements set out clear requirements for schedule reporting and provision of an accurate consolidated schedule.	Complete
57	The public-sector client must show leadership and approach the project with a view to delivering a quality end product. It must act co-operatively and flexibly in a manner consistent with the public interest. The client must also be reasonable and respond fairly if challenges arise that may result in project delays. This includes enabling the ability to pause and slowly replan the work as necessary. The public-sector client must also be realistic and not require the submission of schedule updates indicating on-time completion, unless on-time completion is realistic in all the circumstances.	Transit Services	Transit Services has taken a collaborative approach to management of the project schedules during Stage 2. We have openly and transparently reported on project schedules with the public and have worked closely with the contractors to address and deal with delays. We are working closely with the contract teams in a collaborative and open manner while still preserving our contractual rights.	Complete
58	Public entities and private-sector service providers working on complex infrastructure projects should continually foster a culture of early reporting of issues, challenges, and mistakes.	Transit Services	Transit Services has worked diligently to foster a culture of continuous improvement and early reporting of challenges.  The January 2023 Global Settlement between the City of Ottawa and RTG addressed, as a key priority, the relationship and collaboration between the two parties.	Complete

59	There must be an appropriate process to honestly identify and communicate reliability and safety issues, not only within the project stakeholder group, but also within the public entity and to the public.	Transit Services	Transit Services has publicly committed to providing daily updates during the Trial Running period in order to openly and directly communicate any reliability issues and safety issues to the public.	Complete
60	The decision-making and information sharing by city staff about project implementation must always accord with the terms of any delegation of authority and other governing council resolutions.	Office of the City Clerk  Legal Services	<p>Subsection 270(1)(6) of the <i>Municipal Act, 2001</i> (the Act) provides that a municipality shall adopt and maintain policies with respect to the “delegation of its powers and duties.” The Council-approved <a href="#">Delegation of Powers Policy</a> fulfills the requirements of the Act and provides that, “Every delegation of a power or duty of Council shall be accompanied by a corresponding accountability and transparency mechanism.” The policy further requires that enhanced accountability and transparency mechanisms, including consultation and reporting over and above what may be required under the <i>Delegation of Authority By-law</i>, are “formally considered and assessed in potentially high-profile or sensitive matters.”</p> <p>The accountability and transparency mechanism generally includes a “reporting out” requirement that may specify the frequency and means by which Council is provided with information about the exercise of delegated authority. The reporting out requirement may be set out in items such as the <i>Delegation of Authority By-law</i>, a staff report recommendation, or a Council resolution.</p> <p>As part of the <a href="#">2022-2026 Council Governance Review report</a>, the Office of the City Clerk recommended that the Council and Committee report template be amended to include a new “Delegation of Authority Implications” section. The Implications section summarizes the delegated authority being requested, or where existing authority is being exercised. In addition, staff are required to specify how the</p>	Complete

			<p>exercise of delegated authority will be reported out, in accordance with the Delegation of Powers Policy.</p> <p>Legal Services is undertaking a review of the <a href="#">Employee Code of Conduct</a>, with updates anticipated for Q1 of 2024. The revised Code will reinforce staff’s obligations with respect to transparency and accountability. Related guidance documents will refer to the requirement for staff to adhere to applicable policies and by-laws, including the Delegation of Powers Policy and the <i>Delegation of Authority By-law</i>.</p>	
61	The participation of any elected officials in project decision-making must be done transparently, and in accordance with the governance mechanisms established by council, including any delegation of authority.	Office of the City Clerk	<p>Section 5 of the <i>Municipal Act, 2001</i> (the Act) provides that, “The powers of the municipality shall be exercised by its council,” and that a municipal power “... shall be exercised by by-law unless the municipality is specifically authorized to do otherwise.” In accordance with the statute, Council as a whole approves decisions and resolutions on all matters, including project decision-making, during public meetings held pursuant to the Act. Council’s decisions and resolutions are encompassed in the <i>Confirmation By-law</i> which, enacted at the end of every Council meeting, provides that every Council decision is made by by-law.</p> <p>Existing governance mechanisms such as the Council-approved <a href="#">Accountability and Transparency Policy</a> may apply to the participation of Members in project decision-making. At its public meetings, Council may also establish project-specific governance mechanisms that provide for specific delegations of authority, along with related accountability and transparency mechanisms such as “reporting out” requirements. The conduct of Members who participate in decision-making must adhere to any requirements set out in the <a href="#">Code of Conduct for Members of Council</a>, including obligations with respect to transparency.</p>	Complete

			<p>While the role of Council as a whole is outlined above, it should be noted the Mayor has authority to “exercise the powers of the municipality to direct municipal employees” regarding certain matters under Bill 3, the <i>Strong Mayors, Building Homes Act, 2022</i>, and its related Regulations, which came into force on November 23, 2022. That said, any such direction issued by the Mayor is subject to statutory requirements with respect to transparency, including the requirement that the direction be issued in writing and made available to Council and the public.</p> <p>Regular reviews of Council’s governance mechanisms are conducted twice per term of Council, and include matters relating to delegation of authority, transparency and accountability. Members of Council will continue to receive orientation and training from the Office of the City Clerk regarding the role of Council and delegated authority in project decision-making. The Integrity Commissioner will continue to provide Members with information regarding their obligations under the Code of Conduct for Members of Council.</p>	
62	Council and any other person or entity (such as the City of Ottawa’s Transit Commission) charged with project oversight must be able to exercise meaningful oversight of critical decisions made by city staff. This includes by receiving timely updates from staff relating to system performance, testing, and modifications to safety and reliability criteria. Where projects encounter serious difficulty and decisions must be made that will have a significant impact	City Manager’s Office	<p>City Council recently approved resolutions and issued a direction relating to project oversight and delegated authority for Stage 1 and Stage 2 Light Rail Transit (LRT), and delegated authority more broadly, as follows:</p> <ul style="list-style-type: none"> <li>On February 22, 2023, Council considered the matter of, “Motion – City Manager Delegated Authority on Amendments to the Stage 1 Light Rail Transit Project Agreement.” Council approved recommendations from the Light Rail Sub-Committee <b>and</b> directed the Interim City Manager “to bring forward to Council a report on the Delegated Authority which has been delegated to the Interim City Manager with respect to the Stage 1 and</li> </ul>	<p>In Progress</p> <p>The Light Rail Sub-Committee and Council received the report on the City Manager’s Delegated Authority with Respect to Stage 1 and Stage 2 Light Rail (ACS2023-TSD-TS-0001) on March 29 and April 12 respectively.</p> <p>The City Manager’s Office expects to bring forward a report summarizing the purpose and</p>

	<p>on the public interest, council must be kept fully informed so that it has the opportunity to act.</p>		<p>Stage 2 Project Agreements that would permit Council to receive a briefing on the current use and application of delegation of authority on Stage 1 and Stage 2 of the LRT.”</p> <p>Council further approved that the Light Rail Sub-Committee receive regular updates on the use of the delegated authority from the Interim City Manager with respect to Stage 1 and Stage 2 LRT Project Agreement amendments, and directed the Interim City Manager to bring forward to Council for approval any material amendments related to the Stage 1 and Stage 2 LRT Project Agreements.</p> <p>On December 7, 2022, Council issued a direction to the Interim City Manager “to bring forward a report summarizing the purpose and scope of all existing and requested Delegated Authority set out under each Schedule of the <i>Delegation of Authority By-law</i> to the Finance and Economic Development Committee [Finance and Corporate Services Committee] and City Council for consideration.”</p>	<p>scope of all authority set out under each schedule of the Delegation of Authority By-law in Q2 2023.</p>
63	<p>All relevant project agreements and subcontracts, as well as any modifications made to them, should be available for review by city council, unless there is a compelling reason that it should not be made available. The burden of establishing a “compelling reason” should be placed upon the party asserting that the contract should not be available.</p>	<p>Office of the City Clerk Transit Services</p>	<p>The City must adhere to statutory provisions that may apply to the disclosure of certain types of information under legislation such as the <i>Municipal Freedom of Information and Protection of Privacy Act</i> (MFIPPA). Furthermore, as disclosing certain contractual provisions might prejudice the City’s legal and other interests, the City may need to place limits on the internal use and external disclosure of information. Such limits may include ensuring that the information is only used for certain purposes and is safeguarded in a secure place at all times.</p> <p>That said, in the absence of a compelling statutory reason that the information should not be made available, the</p>	<p>Complete</p>

			<p>following approaches may be considered to provide Members with access to contract documentation that would not otherwise be made public:</p> <ul style="list-style-type: none"> <li>• Council may elect to establish, by way of resolution, a formal process for accessing the information.</li> <li>• Council and/or a Standing Committee/Commission may elect to receive certain information <i>in camera</i>, in keeping with Subsection 239(2) of the <i>Municipal Act, 2001</i>.</li> <li>• Upon request from a Member, the relevant General Manager may provide an opportunity for the Member to review the documentation at a particular location by appointment, further to a review of the information sought and any applicable statutory and/or contractual provisions to ensure that the Member's viewing complies with any legislative or contractual requirements. Such an opportunity to review the documentation would be provided to all Members if one request is granted.</li> </ul> <p>The City may also publicly disclose certain contracts and related information, subject to redactions to address the statutory and contractual requirements described above. As set out in the <a href="#">Accountability and Transparency Policy</a>, the City proactively discloses executed <a href="#">contracts</a> with a value of \$100,000 or more that were not a result of public procurement, as well as contracts resulting from a public procurement exercise that are of significant public interest (such as the Confederation Line project). In addition, documentation may be routinely <a href="#">released</a> by City departments under the Routine Disclosure and Active Dissemination Policy.</p>	
64	The system's safety requirements should be identified and detailed during the design phase of the project and	Transit Services	Stage 2 contractors have been following EN50126 and incorporating safety requirements into their design,	Complete

	referred to as the project evolves during construction. The contractor should design and build for safety from the outset to avoid a retroactive review of hazards and safety. It should aim to reduce the operational restrictions required to account for safety gaps upon completion of the project, to reduce risks of human error.		<p>construction and testing and commissioning verification and validation processes.</p> <p>Additionally, an Independent Safety Auditor role exists in Stage 2 and was engaged early in the design process to ensure that the contractors follow the complete program. The City has been deliberately more prescriptive in terms of the specific standards and approaches that are being used by the delivery teams in order to meet safety certification requirements and the subsequent review that is taken by the safety auditor on behalf of the project.</p>	
65	The safety management systems for those involved in various aspects of public service must be developed in collaboration with each other and must be aligned. This alignment should be confirmed prior to the start of public service. The safety management systems should also be updated as appropriate.	Transit Services	<p>Stage 2 will undergo a review of all administrative documentation. This review has been added to the Regulatory Compliance project within the Rail Operational Readiness program</p> <p>The Safety Management System (SMS) for TNEXT for the Trillium Line will be reviewed and confirmed to be in alignment with OC Transpo's SMS for the Trillium Line.</p> <p>The SMS from RTM will be reviewed and confirmed to be in alignment with OC Transpo's prior to the launch of the Confederation Line extensions.</p> <p>OC Transpo has two SMS documents due to the differences in the regulatory regimes and requirements between Trillium and Confederation lines. The SMS documents are reviewed and updated annually.</p>	In Progress
66	An independent safety auditor should be engaged early on in the construction of complex infrastructure	Transit Services	As noted in memos sent to Council in August 2022 and April 2023, SENER has been engaged as the Safety Auditor for all three Stage 2 extensions since Q3 of 2020.	Complete



	projects.			
67	Maintenance needs to be performed by a permanent, skilled, and local workforce. Where this workforce does not exist, extensive training is required. This training should take place prior to the handover of the infrastructure. Experienced workers should be brought in for an extended period before the start of public service to assist with training, to provide work-shadow opportunities for inexperienced staff members, and to assist with the effective maintenance of the system until the permanent staff can maintain the infrastructure on their own. This assistance should continue as required after the start of public service.	Transit Services	<p>TNEXT has retained experienced mechanics to support the Trillium Line, and TNEXT and RTM will provide documentation to the City for Stage 2 to satisfy these requirements:</p> <ul style="list-style-type: none"> <li>• A maintenance safety case which will include, among other things, organization, positions, numbers of staff</li> <li>• Will need to demonstrate maintainability and sustainability of the system</li> <li>• These will be reviewed by the City as well as the Safety Certification Team</li> <li>• The City's oversight plans will provide continual oversight on TNEXT and RTM's performance</li> </ul> <p>Transit Services acknowledges that as governments invest in infrastructure like light rail, local industries and expertise are encouraged to grow.</p>	In Progress
68	Operations needs to be performed by a permanent, skilled, and local workforce. Where this workforce does not exist, extensive training is required to prepare the new operators to handle public service. This training should take place prior to the handover of the infrastructure. Experienced operators should be brought in for an extended period of time before the start of public service to assist with training, to provide work-shadow opportunities for inexperienced staff members, and to assist with the effective operations of the system until the permanent staff	Transit Services	<p>Stage 2 will have opportunities for shadowing and integration with experienced staff.</p> <p>During training of City Diesel Rail Controllers, TNEXT will provide oversight for all on the job training by experienced rail controller personnel. The City is reviewing the opportunity to retain these personnel to provide additional support during the initial period of passenger service.</p> <p>In addition, Transit Services has experienced train operators and supervisors who will be supporting Trillium Line operations. Further, the Confederation Line is an extension of an existing operation and is therefore supported by staff with multiple years of experience.</p>	In Progress

	can operate the system on their own. This assistance should continue as required after the start of public service. A new operator and maintainer must be provided with coordinated opportunities to work and train together on the full system during the pre-launch bedding-in period.			
69	Train operators should be trained on situational awareness. With trains that are automatically controlled, the operator should be trained to have greater awareness of the various surroundings around the train. The training should also address the need to observe and report any issues that arise during their operation of the train.	Transit Services	<p>As part of the ongoing enhancements to the rail curriculum, changes are routinely made to ensure that staff are operating as safely as possible. The main curriculum for Line 1 includes training that speaks to and tests situational awareness throughout the course. All front-line rail staff were required to complete a full day refresher training on situational awareness in 2022.</p> <p>In addition to initial training, Rail Operations performs drills throughout the year, and conducts exercises and compliance tests based on a number of situations that not only assess employees' compliance with existing operating procedures, but also serve to assist in the identification of gaps and areas for improvement.</p>	Complete
70	Upon the system entering public service, the maintenance contractor must have adequate resources to meet the actual needs of the system, including accommodating any outstanding retrofit work.	Transit Services	Transit Services has been working with TNEXT to identify the level of resources to meet the needs of the Trillium Line Service and to minimize the volume of retrofits that could be required during service.	In Progress
71	On a new system or where the maintainers are new to the system, the public entity must allow for a learning curve and avoid putting undue	Transit Services	Transit Services will work with RTG and TNEXT as substantial completion approaches on the three Stage 2 extensions to ensure there is a clear understanding between all parties as to which items will be managed under the Minor Deficiencies	In Progress

	pressure on the maintainers by, for example, generating unnecessary or overly voluminous work orders for the purpose of “testing” the system.		List and which will be managed as work orders following Substantial Completion.	
72	The public entity should consider putting maintenance and operations under the same “umbrella” – that is, have them be carried out by the same stakeholder – as this may allow for better coordination of the two functions and better co-operation between all parties. If maintenance and operations are delivered by two separate entities, they must devise processes that help ensure co-operation and coordination, as these are key to reliable service. These processes should be revisited and adjusted whenever necessary to respond to the realities of operating and maintaining the infrastructure.	Transit Services	<p>Transit Services will review the protocols in place to ensure alignment with the recommendation to ensure better cooperation with RTM and for Stage 2 for Line 1 and TNext for Line 2, in particular, governance documentation to help set the parameters around the relationship between the operator and maintainer.</p> <p>City staff conduct daily and monthly maintenance and engineering meetings with RTM to ensure cooperation and coordination as well as operational debriefs and joint coordination around severe weather events. These processes will also be implemented with TNext for Line 2.</p>	In Progress
73	Maintenance and operating procedures and protocols must clearly set out the scope of work and responsibilities for the maintainers and operators, and how their activities are to be coordinated. These procedures and protocols must be prepared in advance of system handover to allow adequate time for training the maintainers and operators on them, and must enable direct communication between the	Transit Services	<p>Transit Services will ensure that lessons learned from the launch of Stage 1 will be incorporated to clarify procedures and protocols for Stage 2.</p> <p>As part of the launch of Line 2, troubleshooting and interpretation guides will be prepared in advance with the involvement of all parties. Validation of the procedures and protocols in place occurs with the acceptance of the Maintenance Safety Case and the Operators’ Safety Case, which will occur in advance of the system handover. These protocols, procedures and operational guides will be incorporated into the training plans for operational staff and</p>	In Progress

	operators and the maintainers of the system.		jointly developed and updated in partnership with RTM and TNext.	
74	There must be transparency between operators and maintainers regarding the state of the system, the work to be done, how that work will be approached, and what work has been completed. It is also imperative that there be transparency between the operator and maintainer when it comes to incidents on the system or infrastructure. For instance, the maintainer should be able to access operator records to investigate incidents on the line or to improve its processes and procedures.	Transit Services	<p>Transit Services management agree and will seek cooperation from RTG in the accurate and timely reporting of issues affecting the reliability of the system, for instance, the Failure Reporting and Corrective Action (FRACA) system.</p> <p>Transit Services will work with RTG to establish a charter of shared commitments, based on these recommendations, to increase good will and transparency between the parties. RTG currently maintains good tracking systems for light rail vehicles. Transit Services will work with RTG and its subcontractors to encourage the expansion of this level of monitoring and transparency across the whole of the system.</p>	In Progress
75	Transit operations and maintenance plans require regular reviews / ongoing monitoring and forecasting of human resource needs, to ensure that requisite resources are available as needed.	Transit Services	<p>Transit Services will request plans and documentation so as to exercise appropriate oversight over RTM/Alstom staffing projections. Staff have opportunities to discuss staffing and other resource needs as part of the regular meetings with the maintainer.</p> <p>OC Transpo is carefully reviewing its own staffing projections to ensure that staff are properly onboarded and trained to support the handover of Stage 2. TNEXT and RTM will provide documentation to the City for Stage 2 to satisfy these requirements:</p> <ul style="list-style-type: none"> <li>• A maintenance safety case which will include, among other things, organization, positions, numbers of staff</li> <li>• Will need to demonstrate maintainability and sustainability of the system</li> </ul>	In Progress

			<ul style="list-style-type: none"> <li>• These will be reviewed by the City as well as the Safety Certification Team</li> <li>• The City's oversight plans will provide continual oversight on TNEXT and RTM's performance</li> </ul>	
76	Staff of the public entity and the private-sector service providers must ensure that council (or such persons or entity responsible for project oversight) is provided with timely, complete, and accurate information about the infrastructure to allow for effective and transparent oversight. In providing this information, stakeholders must be mindful that they are serving the public and strive to maintain and bolster the public's trust.	Transit Services	<p>City Council has created a new Light Rail Sub-Committee specifically to provide oversight and receive regular reports regarding non-operational light rail issues.</p> <p>Transit Services staff will continue to provide regular, transparent reports to the Light Rail Sub-Committee and the Transit Commission</p> <p>Transit Services will seek assurances from RTM that they will provide timely and accurate information for the purposes of informing Council.</p>	In Progress
77	Maintenance work orders should be fairly and appropriately classified to avoid disputes and ensure efficient operation of the system. Work order systems should clearly define different categories of work to avoid unnecessary disputes and overreach.	Transit Services	Negotiations with RTG are underway to enable the incorporation of lessons learned from Stage 1 into an interpretation guide to clarify procedures and protocols for Stage 2, that will be reviewed and updated regularly.	In Progress
78	The public entity should not overload the maintainer with work orders and should avoid entering batch orders where response times need to be met, in particular at inconvenient hours of the day, where avoidable.	Transit Services	Work is underway to improve the process and options have been explored for entering and tracking work orders to ensure proper pacing of work orders. Improvements have been made to reduce incidents of batch orders, for example offering RTG representatives the opportunity to join City staff on inspections.	In Progress

79	Deductions for poor maintenance performance must be fair and not overly punitive, and they must be applied fairly, reasonably, and with a view to the public interest in the long-term success of the project.	Transit Services	The Council-approved January 2023 Global Settlement between the City of Ottawa and RTG addressed this recommendation.	Complete
80	There should be timely and proper responses to problems related to maintenance and operations by all parties once they arise. The safety and needs of the public should be prioritized.	Transit Services	<p>Transit Services has strong plans and protocols protecting the safety of the public, such as suspension of service and the implementation of R1 service to meet the needs of transit customers.</p> <p>RTG comment: User and system safety is paramount and the priority factor driving all operational decisions. RTG, through its subcontractor RTM, maintains an operational center at 805 Belfast which provides 24/7 coverage for the full system and yard operations. All problems are reported to the operational centre which ensures the required response is properly planned, taking into account service requirements and other priorities.</p>	Complete
81	To minimize disputes and delays in resolving issues, it is important to clearly define the distinction between issues relating to maintenance and those that may be covered by the warranty of the constructor, as well as who bears responsibility for each.	Transit Services	<p>Transit Services will work with RTG and TNEXT as substantial completion approaches on the three Stage 2 extensions to ensure there is a clear understanding between all parties as to which items will be managed under the Minor Deficiencies List and which will be managed as work orders following Substantial Completion.</p> <p>RTG comment: Maintenance is undertaken in accordance with preventative maintenance programs, and, where appropriate or where required, corrective maintenance is undertaken. This ensures that all issues are addressed as required regardless of whether covered by a warranty. This applies equally to both infrastructure, where the initial two-year infrastructure warranty period has lapsed, and to</p>	In Progress

			vehicles. To ensure that disputes and delays are minimized with the addition of stage 2, robust warranty protocols are being discussed and will be implemented.	
82	The constructor should be required to make an objective assessment of the anticipated retrofit work and scale the resources that it will make available post-handover to match that assessment.	Transit Services	<p>Transit Services will seek assurances, work collaboratively, and exercise appropriate oversight to ensure this assessment takes place.</p> <p>RTG comment: The actual requirements for retrofit works to the vehicle is well-documented and informed from the lessons learned over the past 3.5 years of service. Recent improvements to vehicle reliability, the commissioning of additional stage 2 vehicles and increased staffing will expedite the implementation of the vehicle retrofit plan with minimal impact on day-to-day operations.</p>	In Progress
83	It is critical that the timely and proper completion of maintenance activities be prioritized, including proactive and preventive maintenance.	Transit Services	<p>Transit Services will work with RTM to ensure that they are prioritizing and reporting back effectively and transparently.</p> <p>RTG comment: Maintenance is undertaken in accordance with a preventative maintenance program. Timely completion of maintenance activities is monitored and audited on an ongoing basis both internally and externally. The Maintenance Contractor as well as the Maintenance Subcontractor are revising the current concession management process to ensure that any maintenance schedule changes are justified. Maintenance and warranty tasks have been and will continue to be completed by separate teams to ensure that both are correctly and timeously addressed.</p>	In Progress
84	The party or parties involved in providing maintenance must have effective and robust quality control	Transit Services	Following the August 2021 derailment, RTM undertook a substantial change in their quality control processes. This is part of the work that was completed to allow the safe return to	Complete

	measures in place, including ensuring that work is performed in an orderly way, consistently documenting the completed steps, and having proper checklists and record keeping for the assembly and repair of safety-critical parts.		<p>service. TRA was engaged to provide independent and detailed oversight over this process.</p> <p>The continued exercise of oversight over RTM's operations to ensure ongoing compliance will be incorporated into the Annual Line 1 Oversight Plan developed by Transit Engineering Services and Safety, Regulatory, Training &amp; Development.</p> <p>RTG comment: The Maintenance Contractor conducts regular monthly audits on the Maintenance Subcontractor, these include audits of its (i) maintenance and rehabilitation scope, (ii) health, safety and environment, (iii) support processes and operations as well as (iv) its quality management system. Findings from these audits are used to continuously improve processes, specifically the Safety Management System which is enhanced on an ongoing basis.</p>	
85	Where avoidable, safety-critical maintenance should not be performed over two different shifts. It should also require a supervisory or quality control sign-off to ensure that work has been completed to the proper standard.	Transit Services	<p>Transit Services will continue to exercise oversight over RTG's quality assurance and quality control processes to ensure the implementation of this recommendation.</p> <p>RTG comment: Agreed, the performance of safety critical maintenance is generally not performed over two shifts. If, however, this cannot be avoided, the work is halted at an appropriate point in the activity and proper handover is conducted between the two shifts. These handover processes have been strengthened and handover oversight is provided by the quality control function.</p>	In Progress
86	There should be a process that enables individual maintainers and operators to raise issues they observe	Transit Services	Transit Services conducts daily and weekly meetings with the maintainers and is in regular contact and open to suggestions. There are processes through the SMS and the Confederation	Complete



	on the system that require improvement or fixes, to help identify issues early on and ensure the system is as good as it can be.		<p>Line Safety Committee with the City and its maintainer to raise safety concerns and/or issues.</p> <p>OC Transpo staff working on the line and in the TOCC are trained and expected to report any unusual or abnormal activity / behavior to RTM whether it be vehicle, station and infrastructure or system related. OC Transpo tracks all information provided to the maintainer for tracking, trending and for follow-up where required, including tracking of corrective actions.</p> <p>RTG comment: The Maintainer's Asset Management System, IMIRS, has this functionality; it allows maintainers and operators to raise issues observed on the system through the opening of a work order. The respective work order, depending on its severity, is prioritized to ensure timely response and rectification, failing which, financial penalties are imposed on the Maintenance Contractor.</p>	
87	The province should implement a system for major infrastructure projects that gives legal protection to whistleblowers who bring forward concerns. Consideration should be given to extending legislation for whistleblower programs to municipalities more broadly.	Government of Ontario	N/A	For the Provincial Government's consideration
88	Work undertaken to strengthen the City's oversight framework should continue, including assessing OC Transpo's oversight and monitoring programs and making any	Transit Services	Transit Services' work is underway and ongoing with input from TRA. There is an annual review of the OC Transpo's Line 1 Oversight Plan and associated activities (Engineering & Safety, Regulatory, Training & Development), in addition to ongoing monitoring and oversight conducted by the RMCO.	In Progress

	improvements identified to ensure safety and reliability of the system.		TRA's review of the oversight plan is part of our commitment to continuous improvement and applies an additional safety lens. Other experts such as STV are providing oversight and external assessments.	
89	Following incidents on the system, OLRT1 parties should continue to hold debrief meetings with all stakeholders present, in order to identify lessons learned and make improvements going forward.	Transit Services	<p>Transit Services' SMS and standard operating procedures include a requirement to conduct debrief meetings with stakeholders after incidents on the system. Staff will continue to hold debrief meetings with stakeholders.</p> <p>RTG comment: Several meetings are held with City representatives on an ongoing basis – these include: daily meetings, a bi-weekly meeting, weekly meetings and a monthly meeting. These meetings are in addition to any ad-hoc meetings requested by any of the project stakeholders to make ongoing improvements.</p>	Complete
90	A partnership approach should be adopted during the operations and maintenance phase and to address issues that arise on the system.	Transit Services	<p>Partnership was the main theme RTG emphasized to the Commissioner as one of the prevalent lessons learned from recent years. The City and RTG acknowledge the evolution of the parties' approach to the partnership, leading to the recent resolution of several issues. Partnership requires ongoing dialogue and common objectives. While the parties' relationship continues to evolve, both sides recognize that the sustainability of Ottawa's rail system will depend on a day-to-day commitment to transparency, respect and fairness.</p> <p>Transit Services and RTG have undertaken a partnership exercise and established a charter of shared values to guide discussions throughout the future of the maintenance period.</p>	In Progress

91	Outstanding payment disputes between the City and RTG should be resolved at the earliest opportunity, in particular related to the City's approach to issuing and classifying work orders, and the City's administration of the payment mechanism (the City's carrying forward of deductions incurred in a previous month to the next payment period, and the City's interpretation of the impact of the delayed Revenue Service Availability date on the maintenance payment schedule).	Transit Services	The Council-approved January 2023 Global Settlement between the City of Ottawa and RTG addressed this recommendation.	Complete
92	If RTG continues to be responsible for maintenance during the remainder of the maintenance term, RTG and the City, as well as RTM and Alstom Maintenance, should make efforts to repair their relationships and work together better for the greater good of the OLRT1 project.	Transit Services	<p>The City, RTG and its subcontractors are committed to the success of the OLRT project and are committed to working collaboratively together for the remainder of the Maintenance Term. All parties have been making significant headway towards working collaboratively at resolving issues. Over this period, RTG and its subcontractors have been transparent on all ongoing issues allowing City staff real-time access to information. The parties are committed to working to find an appropriate balance between monitoring and RTG's ability to efficiently carry out day-to-day activities.</p> <p>RTG and the City share the same objectives and expect the partnership to continue to evolve, with the goal of shifting from ongoing monitoring to collaborative oversight.</p>	Complete
93	If not yet complete, an engineering assessment of the appropriate rail neutral temperature for the OLRT1 should be completed, and the rail	Transit Services	Transit Services acknowledges that the maintainer has been actively undertaking various works on the system (cutting/welding, ballast work, lateral anchors, and temperature testing) to improve the performance of the track	In Progress

	neutral temperature adjusted accordingly, so that the track buckling issues can be mitigated for the long term.		<p>in order to mitigate buckling issues. A Rail Neutral Temperature Report will be updated in summer 2023 based on additional measurements.</p> <p>RTG comment: This engineering assessment is ongoing and should be completed in the coming months. Additional testing has been scheduled to take place in May 2023, weather permitting.</p>	
94	Alstom should continue its preventive maintenance of the line inductors, including checking them before and after every winter for any buildup of contaminants, and cleaning them as required.	Transit Services	<p>Transit Services staff will continue to work with Alstom to ensure that this preventative maintenance takes place.</p> <p>RTG comment: The line inductors have undergone a modification program to restrict the ingress of water, salt, and debris into the enclosure. Critically, a batch problem with the inductors has been corrected the units have now been successfully used over multiple winters. RTG is also ensuring that the units are maintained in accordance with the preventative maintenance program.</p>	Complete
95	Alstom should continue its regular inspections of the overhead catenary system to clean the parafils as required, or repair/replace them as necessary.	Transit Services	<p>Transit Services staff will continue to work with Alstom to ensure that this preventative maintenance takes place. Locations with repeated failures will be reviewed and enhancements implemented as necessary to improve system reliability.</p> <p>RTG comment: The parafils are subject to regular inspection; this includes the six-month inspection, which is a detailed review of the major components of the OCS, including the parafils. The root cause of recent incidents affecting the parafils are being analyzed to assess whether the longevity of these assets can be enhanced.</p>	In Progress

96	<p>The City, RTG and its subcontractors, and Alstom must follow through on the outstanding investigations regarding the root cause of the August 8, 2021 derailment, act on the findings, and ensure that any root cause of this derailment is addressed.</p>	Transit Services	<p>Transit Services staff will work with RTG and its subcontractors on any requirements arising from the final root cause report.</p> <p>RTG comment: Alstom and RTG have appointed independent third parties to conduct thorough investigations regarding the root cause of the August 2021 derailment, these investigations are ongoing. Once complete, a consolidated report will be prepared detailing the conclusions reached and the proposed way forward. In the interim, various mitigation strategies have been put in place to ensure the safety and reliability of the system, in addition, the effectiveness of vibration monitoring is being investigated as a possible early detection mechanism.</p>	In Progress
97	<p>A permanent solution to the wheel/rail interface issues needs to be identified and implemented in a timely manner. This solution may involve using a different type of wheel, replacing the track or part of the track, additional track reprofiling, enhancing the axle design to withstand the forces coming from the track, or even modifying the track alignment to address the issue of sharp curves. A wheel/rail interaction study should be undertaken to determine the appropriate solution(s). All parties should work co-operatively to implement the solution(s).</p>	Transit Services	<p>Transit Services, RTG and its subcontractors conduct regular Wheel/Rail Working group meetings as part of the resolution of this recommendation.</p> <p>RTG comment: A permanent solution to the wheel/rail interface issues is being investigated. As part of the investigation, the National Research Council Canada (NRC) prepared a preliminary report examining the initial wheel/rail interaction and identifying detrimental characteristics (such as wear and rolling contact fatigue) in December 2021. A further report was prepared in March 2022 which went beyond the preliminary report, looking at the wear and surface damage trends of the wheels and rails. It also evaluated the current friction management practices to establish the cause for the most prevalent Confederation Line issues such as corrugation and wheel squealing. An optimized wheel/rail profile was also prepared by the NRC which remains part of the ongoing investigation in identifying a permanent solution.</p>	In Progress

98	<p>Transportation Resource Associates or another independent third-party expert should continue to monitor safety issues and remedial actions undertaken by the parties to ensure the continued safe operation of the OLRT1 system, pending a final resolution of the issues relating to the wheel/rail interface and the first derailment. This independent safety expert should report directly to Council or to the Transit Commission.</p>	Transit Services	<p>Transit Services will continue to utilize independent third-party expertise, as well as the additional oversight exercised through OC Transpo's new centralized Transit Engineering Services service area. TRA continues to be engaged to monitor safety issues pending a final resolution of the wheel/rail interface.</p> <p>As mentioned in response to recommendation 88, there is an annual review of OC Transpo's Line 1 Oversight Plan and associated activities, in addition to ongoing monitoring and oversight conducted by the RMCO.</p> <p>City Council has also created additional oversight through the creation of the new LRT sub-committee of Council.</p>	In Progress
99	<p>Pending the implementation of a permanent solution to the wheel/rail interface, and any other issue that may later be found to have contributed to the August 8, 2021 derailment, the City and RTG should continue implementing the current remedial measures intended to ensure the safe and reliable operation of the system, including any new measures that are deemed advisable as more becomes known about the root cause of the derailment and the wheel/rail interface more generally. These should include:</p> <ul style="list-style-type: none"> <li>a. Reducing rail corrugation through maintenance;</li> <li>b. Increasing track lubrication (greasing);</li> </ul>	Transit Services	<p>Transit Services is conducting weekly meetings with RTG and Alstom to track progress on this work. Additional oversight through TRA is integrated into this process.</p> <p>RTG comment: Corrugation is addressed through an annual grinding campaign, which was last conducted in August 2022 during the major maintenance shut down period. There are two types of lubrication (i) gauge face/flange lubrication and (ii) top of rail that are being assessed for effectiveness. Temporary Speed Restrictions are currently in place throughout the system. As discussed in recommendation 97, an optimized wheel to rail profile has been developed and is being investigated.</p>	In Progress

	<p>c. Adjusting the speed profile (to lower the speed in some places, particularly along curves); and</p> <p>d. Modifying the wheel profile to better sustain the transversal forces coming from the track.</p>			
100	<p>RTM should implement the recommendation first made in the Track Safety Justification Report and the Operational Restrictions Document, and establish a wheel/rail working group to optimize the wheel and rail profiles, improve maintenance practices, monitor the wheel/rail interface, and minimize the impacts on the rail and vehicle components. In particular, the working group should focus on:</p> <p>a. Monitoring the rate of wear on the wheels through increased visual inspection or non-destructive testing;</p> <p>b. Increasing visual inspections of wear on the rail at all sharp curves to measure side wear rates;</p> <p>c. Using ultrasonic testing as well as visual inspections, and collecting related data;</p> <p>d. Monitoring the effectiveness of LRV-mounted lubricators to address locations with rail wear, and evaluating the possibility of installing</p>	Transit Services	<p>Transit Services will work collaboratively with RTG to support the implementation of this recommendation.</p> <p>RTG comment: Optimization of the wheel to rail profile is being investigated, please refer to recommendation 99 in this regard. In addition, several focus areas have been explored; these include ultrasonic and visual inspections as well as corrugation measurement conducted by Advanced Rail Management, and the ongoing testing of the effectiveness of wayside rail lubrication. Others, to the extent applicable, continue to be investigated.</p>	In Progress

	<p>rail-mounted or trackside lubricators and friction modifiers;</p> <p>e. Increasing the frequency of preventive rail grinding across the whole system to reduce the risk and growth of “rolling contact fatigue”;</p> <p>f. Measuring corrugation throughout the system to help identify where corrugation is forming and the growth rates, to inform the required frequency of proactive rail grinding;</p> <p>g. Reviewing the profile of the switch blade to reduce the rate of wear; and</p> <p>h. Identifying remedial actions that can be taken to prevent the deterioration of the rail and wheel components.</p>			
101	<p>The operating profile should be adjusted as necessary to ensure the safety and reliability of the OLRT1 system by reducing stress on the vehicle components and avoiding excessive wear. Consideration should be given to reducing vehicle speeds, particularly along curves and to account for different climatic conditions. The parties should work collaboratively over the long term to agree on changes in the best interests of the transit riders and taxpayers.</p>	Transit Services	<p>Instrumented bogie testing will help to support the implementation of this recommendation.</p> <p>Based on the Instrumented Bogie testing of November 2022, RTM has recommended existing temporary speed reductions should remain. A comprehensive report that considers a number of factors that impact safety and reliability of the O-Train system is anticipated in Q2 2023. City staff will review the results of that report.</p> <p>RTG comment: As discussed at recommendation 99 above, Temporary Speed Restrictions have been implemented. In addition, Type 1 and 2 breaking has been proactively implemented to account for changing climatic conditions.</p>	In Progress



			Ongoing investigations are underway in collaboration with all stakeholders to find long-term sustainable solutions to enhance vehicle safety and reliability.	
102	Alstom should follow through with its plans to replace the spline axles on the LRVs following the problems with excessive wear to the splines that were identified in its presentation dated June 30, 2021.	Transit Services	<p>Transit Services will support Alstom in completing this recommendation. A proactive axel replacement program is in place, based on measured wear and kilometres travelled.</p> <p>RTG comment: Alstom, in conjunction with other project stakeholders, is actively involved developing recommendations for a sustainable solution for the Ottawa LRT, a recommendation which is currently being explored is the possible redesign of the spline.</p>	In Progress
103	The parties should consider the use of a detection system as a potential remedial option for overheated roller bearings.	Transit Services	<p>Transit Services is supporting Alstom’s pilot project that started in Q4 2022 to assess the effectiveness of utilising vibration monitoring “Smart Bugs.” Currently 40 axles over 4 LRVs are fitted with “Smart Bugs” and Alstom is monitoring vibrations from vehicles in service to detect a “signature” that would indicate a bearing condition below serviceability limits. Discussions are also underway with the National Research Council to determine the feasibility of undertaking a bench test to establish the “signature.”</p> <p>RTG comment: Vibration monitoring devices have been installed on pilot vehicles to assess whether vibration monitoring would be an effective early detection mechanism. In addition to this pilot project, Alstom, in conjunction with other project stakeholders, is actively involved developing further recommendations for a sustainable solution for the Ottawa LRT.</p>	In Progress