OTTAWA LIGHT RAIL TRANSIT COMMISSION

Report of the Ottawa Light Rail Transit Public Inquiry

Final Report

November 2022

The Honourable William Hourigan
Commissioner

The Honourable William Hourigan, Commissioner

November 30, 2022

The Honourable Caroline Mulroney
Minister of Transportation
777 Bay Street, 5th floor
Toronto, Ontario
M7A 1Z8

L'honorable William Hourigan, commissaire

Le 30 novembre 2022

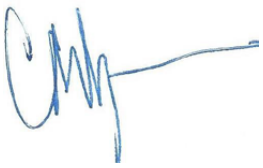
L'honorable Caroline Mulroney
Ministre des Transports
777 rue Bay, 5e étage
Toronto, Ontario
M7A 1Z8

Dear Minister Mulroney / Madame la Ministre Mulroney :

With this letter I deliver the Report of the Ottawa Light Rail Transit Public Inquiry in both English and French.

Par la présente, je vous prie de bien vouloir recevoir le rapport d'enquête publique sur le réseau de train léger sur rail d'Ottawa en anglais et en français.

Sincerely / Cordialement,



William Hourigan
Commissioner / commissaire

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8
info@olrtpublicinquiry.ca
Tel: 1-833-597-1955

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8
info@enquetepubliqueTLRO.ca
Tel: 1-833-597-1955

Report of the Ottawa Light Rail Transit Public Inquiry

Final Report

November 2022

The Honourable William Hourigan
Commissioner

Report of the Ottawa Light Rail Transit Public Inquiry
Final Report

ISBN 978-1-4868-6351-8 (English) (Print)

ISBN 978-1-4868-6352-5 (English) (PDF)

ISBN 978-1-4868-6355-6 (French) (Print)

ISBN 978-1-4868-6356-3 (French) (PDF)

Report of the Ottawa Light Rail Transit Public Inquiry
Executive Summary and Recommendations

ISBN 978-1-4868-6353-2 (English) (Print)

ISBN 978-1-4868-6354-9 (English) (PDF)

ISBN 978-1-4868-6357-0 (French) (Print)

ISBN 978-1-4868-6358-7 (French) (PDF)

This report is available at ottawalrtpublicinquiry.ca (English)
and enquetepubliquesurletlrdottawa.ca (French).

Contents

Acknowledgements

I would like to thank Co-Lead Counsel John Adair, Christine Mainville, and Kate McGrann; and the counsel team: Tara Boghosian, Mark Coombes, Chris Grisdale, Fraser Harland, Anthony Imbesi, Cassandra Jarvis, Jordan Katz, Angela Lee, Liz McLellan, Daniella Murynka, Manish Oza, Carly Peddle, Anthony Sangiuliano, Emily Young, and Mathew Zaia.

Special thanks to the Honourable Frank Marrocco, who served as the Privilege Arbitrator, assisted by Yadesha Satheaswaran; and to Sharon Kour and Pat Corney, who served as privilege and confidentiality claims counsel.

I would also like to thank Commission staff, including Tracy Shultis, Executive Director; Sherisse DeFreitas, Director of Policy and Operations; John McGrath, Director of Communications; Carla Novakovic, Senior Project Manager; Jacqueline Steventon, Senior Project Manager; Justin Chee, Senior Project Manager; Sanja Kuzmanovic, Senior Project Manager; Sejal Jain, Director of Policy and Operations; Victoria Granier, Scheduling Coordinator; Melissa Iliopoulos, Executive Assistant; Mónica Enríquez Goyes, Communications Project Manager; former Executive Directors Falguni Debnath and Heidi Francis; and Estelle Saint-Martin, former Director of Communications.

Table of Abbreviations

AFM ..... alternative financing methodology
AFP ..... alternative financing and procurement
AMC ..... Agreement Management Committee
AOC ..... Agreement Oversight Committee
APS ..... auxiliary power supply
AREMA ..... American Railway Engineering and Maintenance-of-Way Association
AVKR ..... aggregate vehicle kilometre ratio
BRT ..... bus rapid transit
CAF ..... Construcciones y Auxiliar de Ferrocarriles (Grupo CAF)
CBTC ..... communications-based train control
CCB ..... Change Control Board
CCM ..... commercially confidential meeting
CCTV ..... closed-circuit television
CEO ..... Chief Executive Officer
City ..... City of Ottawa
CMC ..... Contingency Management Committee
Council ..... Ottawa City Council
CSO ..... Chief Safety Officer
CTP ..... Capital Transit Partners
DBFM ..... design-build-finance-maintain
DBFOM ..... design-build-finance-operate-maintain
DPM ..... design presentation meeting
ESAC ..... engineering safety and assurance case
ESC ..... Executive Steering Committee
FEDCO ..... Finance and Economic Development Committee
ICD ..... Interface Control Document
IMIRS ..... integrated management information reporting system

Infrastructure Ontario .....Ontario Infrastructure and Lands Corporation
KPI.....key performance indicator
LMB.....light maintenance bay
LRT .....light rail transit
LRV .....light rail vehicle
MOU .....Memorandum of Understanding
MSF .....maintenance and storage facility
MTO.....Ontario Ministry of Transportation
NPV .....net present value
OC Transpo .....Ottawa-Carleton Regional Transit Commission
OLRT.....Ottawa Light Rail Transit
OLRT1.....Stage 1 of the OLRT
OLRT-C .....Ottawa Light Rail Transit Constructors
P3 .....public-private partnership
PICO.....post-installation check out
PSOS.....project-specific output specifications
R1 .....replacement bus service
RFI.....Request for Information
RFP .....Request for Proposals
RFQ.....Request for Qualification
RIO .....Rail Implementation Office
RMCO.....Regulatory Monitor and Compliance Officer
RSA.....Revenue Service Availability
RTG.....Rideau Transit Group
RTM.....Rideau Transit Maintenance
SCADA.....supervisory control and data acquisition
SITs .....system integration tests
SMS.....Safety Management System
TMP.....Transportation Master Plan
TRA.....Transportation Resource Associates
TRRT.....Trial Running Review Team
TSB .....Transportation Safety Board of Canada
VOBC .....vehicle on-board controller

Chapter 1
Executive Summary

The Ottawa Light Rail Transit project was supposed to provide safe and reliable transportation for the residents of Ottawa. It was part of an integrated transit plan designed to operate with existing and future OC Transpo services to relieve traffic congestion in the downtown and beyond. The people of Ottawa were the intended beneficiaries of the project. Their tax dollars were being invested in a light rail transit (LRT) system that would make their commute a little easier, giving them more time with their family and friends instead of being stuck on a bus going nowhere in downtown traffic.

For the design, construction, and maintenance of Stage 1 of the Ottawa Light Rail Transit (OLRT1) system, the City of Ottawa (City) signed a contract (Project Agreement) with Rideau Transit Group (RTG). The project was to be operated by OC Transpo.

RTG signed a Construction Contract with Ottawa Light Rail Transit Constructors (OLRT-C), which then entered into several subcontracts, including with:

- Alstom for the supply of train vehicles,
- Thales Canada for the control system, and
- RTG Engineering Joint Venture for design and engineering services.

RTG also signed a contract with Rideau Transit Maintenance (RTM) for maintenance of the LRT system. RTM, in turn, contracted out the maintenance to Alstom and other companies.

The transit system that was ultimately handed over after a delay of approximately 16 months was unreliable, as members of the public repeatedly told the Commission during public meetings in Ottawa in May 2022. Trains derailed on the main line on two occasions and regularly had issues that harmed the system's reliability. Fortunately,

the derailments caused no injuries. As problems developed on the OLRT1 project, the relationship between the City and RTG became strained and the parties ultimately engaged in multi-million-dollar litigation, which the taxpayers of Ottawa will continue to fund for the foreseeable future.

The Ontario government established this Commission of Public Inquiry and gave it a broad mandate to investigate the commercial and technical circumstances that led to the breakdowns and derailments of the OLRT1. In doing so, the Commission was to examine each major aspect and component of the project from start to finish, and to identify ways to avoid similar problems in future projects. The Commission views its primary role as providing answers to the people of Ottawa about what happened and why, as well as recommendations for ways to avoid repeating the problems that plagued this project.

At a high level, it is clear that RTG failed to deliver a reliable system by the initial deadline of May 24, 2018, or indeed within the several new deadlines that RTG chose after that. It is not unreasonable to expect that a company consisting of some of the biggest players in the construction industry should be able to fulfill its obligations to the City, which was the purchaser of a product that RTG undertook to provide. However, a closer examination reveals that the reasons for the project's problems are multi-faceted, and include the following:

- The City chose an essentially new vehicle based on unproven technology. Thus, the City had to suffer the inevitable start-up problems with the introduction of new technology. This problem was exacerbated by the City's technical demands, which strained the limits of an LRT.
- The model chosen for delivery of the project, which relied on the private sector to build and maintain the OLRT1, resulted in the City avoiding significant financial liability during the construction phase, but it also led to a situation where the parties' attention was diverted to protecting their legal rights instead of opening a reliable LRT.
- The delivery model chosen by the City left the City with little control over RTG's work.
- RTG and OLRT-C failed to ensure the integration of roles, responsibilities, and deliverables through the construction of the OLRT1. Further, the arrangements for subcontractors on this project were complex and uncoordinated. At times subcontractors, which had overlapping ownership interests, were working at cross-purposes, which contributed to an overall lack of integration.
- The OLRT1 project was characterized by new relationships, new designs, new facilities and infrastructure, and new undertakings that affected nearly every aspect of the project. The parties failed to appreciate and plan for the resulting delays and reliability issues.

- A series of factors led to the project's construction delays, including a sinkhole, provincial rules requiring specified amounts of Canadian content, and a failure to integrate engineering systems. While some of these factors were outside the parties' control, it was unconscionable that RTG and OLRT-C would knowingly provide inaccurate information to the City about when the OLRT1 system would be ready for operation, which resulted in the City communicating unachievable dates to the public.
- Considerable political pressure to begin operation caused the City to rush the system into public service. It agreed to consider the system as having met the Project Agreement's definition of Substantial Completion, even though significant operating issues remained. The City also agreed to lower the trial running testing criteria, which were supposed to operate as an objective measurement of the system's readiness. It did so because the OLRT1 could not pass the testing criteria previously agreed to by the City and RTG. Further, it appears that the City negotiated passes and fails with RTG instead of sticking with an independent and objective measure of the system's readiness for operation.
- Generally, City staff properly shared information about the OLRT1 with the public and Ottawa City Council (Council) during the construction phase. However, this changed during the problematic trial running testing period when critical information was withheld and provided only to Mayor Jim Watson and his office, and the Chair of the Transit Commission. Most troubling was the deliberate effort by Steve Kanellakos, the City Manager, to mislead Council on the decision to lower the testing criteria and on the testing results. The Mayor had accurate information about trial running and the decision to change the testing criteria, but failed to provide that information to Council. Thus, the conduct of senior City staff and the Mayor irreparably compromised the statutory oversight function of Council.
- The City lessened the requirements for accepting the system at the stage called Revenue Service Availability, or RSA.
- The City failed to follow best practices by not implementing a soft start for the opening of the OLRT1 to the public. Instead, it opened with full service for the public from Day 1. This resulted in a situation where start-up issues were being worked out during the initial operations period.
- RTG and its subcontractors provided inadequate maintenance resources. Consequently, there were ongoing problems with the system that caused service delays and general system unreliability. The City contributed to this problem by filing hundreds of work orders in the first weeks of operation, many of which were categorized as urgent, to respond to minor issues that would have been largely resolved through regular maintenance.

- The OLRT1 experienced two main-line derailments. The Transportation Safety Board of Canada (TSB), a federal body that has exclusive legal jurisdiction to investigate and determine the causes of the derailments, determined that the first derailment was caused by the failure of an axle bearing. All parties agree the second derailment was a result of human error in servicing the vehicles. The City and RTG, along with its subcontractors, eventually worked together co-operatively and relatively effectively to respond to the derailments. The City brought in an outside safety expert to provide advice and guidance regarding the reduction of problems and to advise on a safe opening date for the system.
- Despite this co-operation in responding to the derailments, the Commission concludes that there is an ongoing issue with the wheel and track interface that is continuing to cause problems. Given the problems identified later in this summary regarding the failure of City Manager Kanellakos to properly update Council, it is recommended by this Commission that the City continue to retain outside safety advisors and that they report directly to Council or the Transit Commission.

What follows is a high-level summary of the events that led to the OLRT1's failure and the Commission's views on how to avoid similar issues in the future, as well as examples of where the parties got things right. These issues will be discussed in greater detail in this report, but are outlined here to give the reader the necessary context to understand the report and the Commission's recommendations.

1.1 Project Delivery Model

When governments are faced with constructing large infrastructure projects, they must determine the best method to ensure that the project is completed to their specifications and within the established budget and schedule. The various options to meet these needs are referred to as delivery models. For the OLRT1 project, the City did not have the necessary in-house expertise to select the appropriate delivery model. So it sought the assistance of the consulting firm Deloitte and Ontario Infrastructure and Lands Corporation (Infrastructure Ontario), a Crown corporation, to advise it on the best way to build a safe and reliable system.

Deloitte and Infrastructure Ontario recommended to the City that it enter into a contractual arrangement known as a public-private partnership (P3). P3s are partnerships between governments and the private sector to build infrastructure or deliver services where the private sector takes a leadership role in building the infrastructure. The specific P3 model selected was a design-build-finance-maintain (DBFM) model, which requires private-sector companies to design, construct, and finance the project, in addition to providing maintenance services after construction. This was one of the P3 models Infrastructure Ontario used to build vertical infrastructure projects like courthouses and hospitals. Under the Project Agreement, RTG was required to deliver a fully operational LRT system at a fixed price to the City and then maintain the system for 30 years.

That model was chosen in circumstances where there was heavy political pressure to deliver the project “on time and on budget,” a strong desire at the City to transfer the economic risks associated with the project onto a private partner, and a concern that Ontario’s contribution commitment was at risk if the City did not adopt a P3 model for the delivery of the OLRT1.

The significant involvement of the private sector in this project has been a point of controversy in this Inquiry. The City and Infrastructure Ontario take the position that the P3 DBFM model worked well and protected the financial position of the City. In contrast, the Amalgamated Transit Union Local 279 submits that the involvement of the private sector in this model created issues in the construction phase and has been an ongoing source of problems in the operational phase. In my view, the use of a P3 model had a mixed impact on the project.

One of the primary rationales underlying P3s is to transfer risk. In this case, the City was able to offload the geotechnical risk to RTG. The risk transfer was a significant benefit to the City because that risk materialized with the Rideau Street sinkhole. The financial impact of the sinkhole was substantial; the City saved costs of over $100 million because it had transferred the geotechnical risk to RTG. It is unfair to dismiss this cost saving as a lucky benefit of the model. Because the downtown tunnel was included in the project and the City and its advisors identified the heightened geotechnical risk early in the project, they acted jointly to eliminate that risk. They deliberately chose the P3 model to reduce this risk. Thus, the P3 model worked precisely as it should have by transferring that risk. The people of Ottawa were the beneficiaries of this good planning.

Yet, in many ways, the P3 model caused or contributed to several of the ongoing difficulties on the project. For example, whereas the City traditionally had a hands-on, leading role in projects, given the lesser role it played under this model, the City was left in a position where it had limited insight or control over the OLRT1 project. Further, when problems developed, the City's insistence on enforcing its contractual rights was a significant contributor to the breakdown in the relationship between the parties. This adversarial relationship hurt the parties' ability to respond to problems. The ultimate result is that, despite some recent improvements in the relationship, the people of Ottawa face the spectre of a largely dysfunctional partnership operating and maintaining the OLRT1 for decades.

While it is important to weigh the relative merits of the P3 model in this project, this consideration regarding future projects has been largely overtaken by events. The Commission heard evidence that the assumption of risk required in P3 models is causing some major construction companies to decline to participate in P3 projects. This reluctance is understandable because, in the context of significant infrastructure projects, the potential financial risk can be almost unlimited. Thus, while the City was able to transfer risk in this case, it may not be able to do so in the future or the cost to do so may be significantly higher.

I do not suggest or claim that a single delivery model should be used for all infrastructure projects. However, it is essential that governments do not start projects with the mindset that there is only one acceptable delivery model. Instead, I recommend that government agencies procuring large and complex infrastructure projects critically analyze the full range of delivery model options using objective criteria appropriate to the project's circumstances and the public procurer's various priorities. I recognize that government agencies need to prioritize cost certainty and risk transfer. Still, decision makers should be cautious about assigning too much weight to these two priorities in assessing options.

Public procurers should also appreciate that it may not always be helpful to structure the relationship in a manner that creates a zero-sum game whereby one party bears all the risk and “loses” if that risk materializes. A true partnership may be more effective.

Finally, as an overarching consideration, a public agency must prioritize the protection of the public interest. The public has the right to safe, reliable infrastructure and to receive regular and honest communications from the government regarding its construction status and operations.

1.2 Bidding Process

The $2.1 billion fixed price for the OLRT1 was based on an initial estimate that City staff provided to Council in 2009. This estimate included project components like land acquisition, project scope changes, and design refinements, but it did not account for inflation. It also had a variance of plus or minus 25 percent. Although the estimate was the product of considerable work by City employees and expert consultants, it was never intended to be an actual budget for the OLRT1 project. However, Mayor Watson made clear in his public statements during his run for the mayor's office in 2010 that he would ensure that the project was completed "on time and on budget." The budget he was referring to was the estimate provided by City staff.

It would have been preferable if the City had recognized the initial estimate for what it was and only committed to a budget later, after the preliminary engineering work was completed and the design was sufficiently advanced to have reasonable confidence that the budget could be maintained. While there is no evidence that the fixed price dissuaded qualified constructors from bidding on the project, the Commission did hear evidence that certain design choices were made based on the inflexibility of the budget. For example, platform doors were excluded from the design due to budgetary constraints. These platform doors would have prevented riders on the platform from interfering with the vehicle doors – activity that contributed to early reliability issues during public service.

The evidence considered by the Commission established that the actual bidding process was fair and reasonable and was consistent with best practices. The City attracted bids from major players in the construction industry, and two of the three bids were under the affordability cap set by the City. The RTG consortium was made up of world-class leaders in the construction industry that had completed significant infrastructure projects in Canada and around the world. Therefore, it was reasonable for the City to expect that RTG could deliver the LRT system it promised.

1.3 Contractual Arrangements

Under the Project Agreement, RTG was responsible for the construction and maintenance of the OLRT, and the City would be the operator of the system. The Project Agreement, which was based on Infrastructure Ontario's P3 template, gave the City limited control over the construction process or the subsequent maintenance of the system. Therefore, the City's ability to direct the project was generally limited to enforcing specific financial remedies under the Project Agreement. In essence, the City was in a position where it had to rely on RTG to fulfill its contractual obligations and could only attempt to ensure compliance by withholding funds or otherwise enforcing contractual remedies.

RTG's project plan required the various engineering systems that went into the OLRT1 to be carefully integrated. However, the subcontractors operated in silos. These decentralized arrangements made it essential that the parties integrate their efforts and engage in near-constant communication. They failed to do so, OLRT-C did not effectively coordinate their efforts, and the project suffered due to this lack of coordination.

1.4 Unproven Design

The City received advice at the start of the project that the best course in establishing its technical requirements for the system was to use proven vehicles. In other words, vehicles that had been used successfully in other cities with similar needs and climatic conditions should be used on this project. This would reduce the risk of design flaws, delays, and malfunctions, and would minimize the chances of service interruptions. Consistent with this advice, the City included a requirement in the Project Agreement that the vehicle for the OLRT1 be a "service-proven" vehicle.

Despite this advice and the requirements of the Project Agreement, the City chose to proceed with unproven technology. The vehicle used, Alstom's Citadis Spirit model, included existing components from other train models but was actually a new custom-built vehicle for this project. Further, the City's demands for the vehicle, including a low floor and performance requirements that made the use of an automatic train control system with aggressive acceleration and deceleration rates necessary, among other performance capabilities, pushed the limits of performance for an LRT. In effect, the City elected to gamble with unproven technology. As one of the City's consultants stated, Ottawa "took one for the team" by being the first adopter of the new technology, because other cities would benefit from the City's experience of living through the growing pains of a new vehicle. As will be discussed, this problem was compounded by the decision to make RTG solely responsible for the delivery of the vehicle. Given that the Project Agreement put the risk on RTG to supply a proven vehicle, and that RTG via OLRT-C subcontracted that task to Alstom, the City had no direct relationship with the key supplier.

1.5 Inexperience

The OLRT1 project was characterized by new relationships, new designs, new facilities and infrastructure, and new undertakings. These include: (1) the City had no experience with an LRT project of this complexity, or with using a P3 model to deliver a project like the OLRT1; (2) Infrastructure Ontario had never undertaken a light rail system or an infrastructure project involving a tunnel; (3) Alstom had never worked with the Canadian content requirement; and (4) OC Transpo had never previously operated a complex LRT system. Collectively, these "firsts" were at the core of nearly every aspect of the LRT system: procurement, the contract, the trains, systems integration, manufacturing and assembly, operations, and maintenance.

I do not criticize any of the parties involved in this project for attempting to do something they had not done before. However, the participants fell short in not appreciating the extent to which they were entering uncharted waters and anticipating the issues that would likely arise as a result. They should have planned better for lengthy delays (and informed the public accordingly), understood that reliability problems would arise (and staffed accordingly), and allowed sufficient time for testing and trial running in the context of an unproven vehicle, unproven relationships, and inexperience.

1.6 Project Delays

In a project of this size and complexity, construction delays are a strong possibility. They were not out of the parties' expectations. The OLRT1 project experienced several delays that led to RTG missing four dates that it had established for handing over the system to the City, dates known as RSA dates. As discussed below, construction problems were significant because they set the stage for handover problems. In other words, the delays during construction caused delays to the RSA date, which increased the pressure to open the system.

The most significant delay for the project was the Rideau Street sinkhole in 2016, which profoundly disrupted the construction timeline and caused an immediate delay in OLRT-C's sequencing of the work. While there were other delays at the same time – such as Alstom's delivery of the vehicles and OLRT-C's systems engineering and assurance failures – the sinkhole disrupted OLRT-C's progress at a critical stage of construction. This delay had knock-on effects throughout the project, most significantly in OLRT-C's ability to deliver the necessary track and other infrastructure to test the vehicles and the train control system. This resulted in a shortened testing schedule and a resequencing of this work to use the available infrastructure.

Another significant factor leading to delay was the impact of the Ontario government's rules established in 2008 that require specified amounts of Canadian content in the vehicles, including material and labour. Alstom had never manufactured or assembled its light rail vehicles (LRVs) in Canada and thus did not have a network of proven suppliers or experienced labour available in the area. Further, due to these rules, Alstom had to manufacture almost all of its vehicles in a new maintenance and storage facility in Ottawa that had a green workforce, was adapted from its original single function, and was not ready for production when it should have been.

The third delay factor was OLRT-C's failure to integrate its many components and systems. The OLRT1 was an untested system created through many new relationships. RTG and OLRT-C should have made integration a priority from the outset of the project. They failed to do so. The best example of the lack of integration on the project was that two critical subcontractors, Thales for the control system and Alstom for the vehicles, were working to conflicting schedules.

Ultimately, RTG failed to provide to the City a reliable system in a timely manner. While delays are understandable on any project, what is inexplicable was RTG's and OLRT-C's insistence on providing RSA dates to the City that they had no realistic hope of achieving. When the City announced these dates, it caused confusion and frustration for the residents of Ottawa, which, in turn, created pressure to open the system.

1.7 The Relationship between RTG and the City

After the Rideau Street sinkhole, the relationship between RTG and the City deteriorated and generally became adversarial. The City and RTG disagreed about which party was responsible for the sinkhole. According to the City, it was caused by RTG's tunnelling activities, which made the sinkhole the responsibility of RTG. In contrast, RTG took the position that the sinkhole was the responsibility of the City because it improperly installed a joint on a relocated fire hydrant. RTG argued that it should have relief because the sinkhole was a Delay Event and a Compensation Event according to the Project Agreement. RTG also sued the City for damages to recover the significant costs it incurred to address the consequences of the sinkhole. Further, it made a claim under its insurance policy related to the money spent on the sinkhole. Likewise, the City made an insurance claim. In the end, the City and RTG settled their legal actions on this issue. No relief was granted under the Project Agreement to RTG, and the City did not make any settlement payment to RTG. However, RTG's insurer paid a portion of its costs in response to its claim.

The sinkhole put OLRT-C in a position of knowing in mid-2017 that it was nearly impossible to meet its RSA date of May 2018. However, OLRT-C via RTG delayed telling the City that because it wanted the City to accept certain delay and other claims before it addressed the delay in the RSA date. For its part, the City was understandably frustrated by the project delays. While there were instances after mid-2017 where the City was prepared to work with RTG to make it easier to finish the project, the default position of the City was that it was entitled to enforce its rights under the Project Agreement, including requiring RTG to make payments relating to the delay.

The risk of the relationship between the City and RTG deteriorating was a risk inherent in the DBFM model, which can drive parties to assert their contractual rights when significant problems develop on a long-term project. However, the City had the option of taking a co-operative approach with RTG, working as partners to complete the project for the benefit of the people of Ottawa. Indeed, in October 2011 the City had prepared a Project Charter for the OLRT1, which established a framework for governance and for managing the relationship between the City and its future private partner. In the Project Charter, the City set out the guiding principles and committed itself to an approach that encouraged all stakeholders "to work together in a shared team approach."

That approach was important to the City because it recognized that an aggressive, adversarial, or uncooperative approach was more likely to lead to a poor outcome.

Despite the City's Project Charter and its explicit recognition that the project would benefit from a team approach, the City took a relatively rigid approach to its relationship with RTG that was based on enforcing the Project Agreement. For example, the City's conduct in enforcing the payment mechanism was often punitive toward RTG, and the City took aggressive positions in asserting contractual claims. The City evidently believed financial pressure was the best method to achieve its desired result.

Another example of this approach is what has been described as the "debt swap," a financial transaction through which the City stepped into the shoes of RTG's long-term lenders. The debt swap came about because of the failure of the Project Agreement to effectively provide for the next stage of the LRT project. There were legitimate financial reasons for the City to enter this transaction. However, it is also apparent that the City saw the debt swap as another way to exert financial pressure on RTG.

The bottom line is that the relationship between the City and RTG was adversarial at critical stages of the construction and maintenance of OLRT1, and this fact contributed to problems with the OLRT1 project.

1.8 City Governance Prior to Trial Running Testing

Trial running was the final stage of testing for the OLRT1. The evidence before the Commission establishes that from the beginning of the project up to the time of trial running, City staff were regularly updating Council and the public about the progress of the OLRT1 project. In addition to the full Council briefings, City staff routinely updated the Finance and Economic Development Committee (FEDCO) regarding the project. That committee's meetings were usually open to the general public. Thus, the people of Ottawa had access to high-level information about the project status regularly. For example, on one occasion, John Manconi, the General Manager of the Transportation Services Department, used his appearance at a FEDCO meeting to dispute an RSA date provided by RTG that he viewed as unachievable. It turned out that Manconi was correct, and that date was not met.

At his Council and FEDCO appearances, Manconi also frequently assured councillors and the public that the City would require strict compliance with provisions of the Project Agreement to ensure that the OLRT1 was safe and reliable. On at least one occasion, he advised Council explicitly that there would be no compromise on the trial running of the system.

1.9 Testing and Commissioning

In order to identify potential issues with the OLRT1, the parties agreed in the Project Agreement that the system would be subjected to various tests during the construction process and before it went into public service. The system would also undergo a commissioning process, which was designed to verify that the systems and components (such as vehicles) were complete and operational, subject only to minor deficiencies.

It is clear from the evidence that everyone knew or should have known that there would be significant reliability issues with the system. Therefore, a robust testing and commissioning process was required to ensure that reliability problems did not arise during public service.

By the summer of 2018, testing and commissioning had been significantly delayed. The vehicles had not been able to run on the full track because of construction delays, which delayed validation testing. As a result, the timeline for integration testing was reduced. Further, there was no winter-specific testing on the track; that testing was limited to a laboratory.

The delays meant that the final stages of testing and commissioning had to be reduced, or the timing for RSA had to be changed again. The parties did not want to change the RSA date, because there was pressure on all concerned to get the system up and running. There was public pressure on the City, as Mayor Watson had announced publicly that the system would be open to the public in mid-September. For RTG, it would continue to be responsible for extra contractual payments until the OLRT1 was open. In contrast, once the system achieved Substantial Completion and RSA, RTG would receive in excess of $250 million and the significant maintenance payments it expected.

This is an example of the parties failing to put the interests of the people of Ottawa first. Instead of extending the time for testing and commissioning, they prioritized the swift completion of the project, thereby reducing the time scheduled for these critical activities because it was in their interests to do so. Unfortunately, as will be discussed in the next two sections, this was part of a pattern to get the system open regardless of the consequences.

1.10 Substantial Completion

In the spring of 2019, as the project continued to drag on, City staff changed their approach dramatically. They became willing to compromise to get the system into operation and agreed to defer work, waive requirements, and delay addressing known problems with the OLRT1. The Commission does not fault the City for trying to work co-operatively with RTG. However, it is evident that the decision to compromise was based on political pressure and not on the best interests of the people of Ottawa.

Before the system could be handed over to the City for operations and opened to the public, it needed to achieve Substantial Completion under the Project Agreement and then successfully complete trial running. When RTG first sent notice in April 2019 that Substantial Completion had been achieved, the City denied the claim. When RTG submitted a second notice in July 2019, the City decided to agree that Substantial Completion was achieved and to defer the resolution of ongoing, known problems with the system.

In my view, the City's decision to agree that Substantial Completion was achieved was made because the City was intent on moving the project into trial running, whether it was ready or not. The practical result was that the parties pushed out resolving known problems into the period of system operation.

1.11 Trial Running Testing and Vehicle Reductions

Trial running, the final testing phase, was designed to ensure that the system was safe and reliable and ready for operation. It was to be carried out after Substantial Completion was reached by OLRT-C. The Trial Running Review Team (TRRT), which included members of RTG and the City, oversaw trial running with testing performed daily. Each day's performance would be scored by the TRRT team members as a "pass," "fail," "repeat," or "restart."

There were no specific trial running testing standards in the Project Agreement (beyond the requirement of 12 consecutive days). However, the parties agreed to standards in 2017, which included achieving a 96 percent average dependability score (a ratio of kilometres actually travelled to those intended) for the best 9 out of 12 days of testing. In 2019, as trial running began, the parties agreed to new standards, which included a 98 percent average dependability score over 12 consecutive days of testing. This more rigorous standard was designed to mirror the performance levels that RTG was expected to meet during operations. It was intended to be applied to the level of service that would be required under the Project Agreement, including running 15 double-car trains (30 coupled LRVs) during peak usage periods.

The first three days of testing showed that there were significant reliability problems. The TRRT made a decision to "pause" or suspend trial running. This was a significant development in the process. Manconi recognized the importance of the suspension of testing and prepared a memorandum dated July 31, 2019 to inform Council. However, Manconi testified that Kanellakos directed him not to release that memorandum.

Evidence produced by RTG raises troubling concerns about Manconi's conduct during the trial running testing. In an email the CEO of RTG, Peter Lauch, sent to consortium partners and directors of RTG, OLRT-C, and RTM on August 7, 2019, Lauch reported on a meeting with Manconi and his team. Lauch stated that there was a discussion regarding the trial running scorecard and how Lauch anticipated that the scorecard for that day would be a failure necessitating "another favour from the client" for it to be considered a repeat as opposed to a restart. Later in the email, Lauch stated: "Manconi made it clear that he wants to know 'what's in it for me' to get you a PASS on Trial Running. We have been down that road before..."

Manconi has denied making that specific statement. Regardless, there can be no doubt that he was discussing specific daily testing results with Lauch and that Lauch appeared to believe that the interpretation of testing results could be the subject of negotiations between the parties. It is important to note that Manconi was not part of the TRRT, while Lauch was a team member. The assessment of test results by the TRRT involved judgment calls. But those judgment calls were supposed to be based on data and the judgment of TRRT members and should not have been influenced by outsiders like Manconi. The interpretation of trial running results certainly should not have been the result of trade-offs or bartering between the City and RTG. The Commission finds that Manconi created a situation where there is an appearance that he was interfering with test results.

Any doubt about whether Manconi was prepared to interfere in order to obtain favourable test results was removed when he and his staff negotiated an agreement with RTG (confirmed by a letter dated August 16, 2019) to lower testing standards to the 2017 criteria. The system was then able to pass the reduced testing standards, but even on some of the days of trial running that received a pass, the scores indicated that there would be significant disruptions for riders. Mayor Watson was in constant contact with Manconi during this period and was advised about the ongoing problems and the decision to lower the testing standards.

In addition to the foregoing, the City also agreed to reduce the minimum number of vehicles that had to be available for use. The City and RTG were both aware that they could not meet the Project Agreement requirement for RSA of having 17 double cars (34 LRVs) available for use, so they agreed to amend the Project Agreement to reduce the requirement to 13 double cars (26 LRVs).

Certain City witnesses testified that this decision was based on an analysis from September 2018 that showed that anticipated ridership levels did not require the full complement of trains called for in the Project Agreement. The Commission does not accept that the City's insistence on 17 double cars available for use changed because of a belief that suddenly formed in August 2019 that the September 2018 analysis had been correct. Other witnesses from both the City and RTG acknowledged that the change was made because RTG was struggling to get the full 15 trains (plus 2 spares, for a total of 17) on the line. The bottom line is that the City reduced the minimum number of double cars because it was intent on getting the system opened.

1.12 City Governance during Trial Running Testing

There is no dispute that the full information on the testing results and the City's decision to lower testing standards was not shared with Council. However, this critical information was provided on a regular basis to Mayor Watson, several members of his staff, and Councillor Allan Hubley (the Chair of the Transit Commission) through a WhatsApp chat group.

According to Manconi and Kanellakos, the July 31, 2019 memorandum prepared by Manconi for Council was not released because they had committed to *only* advise Council of the status of trial running testing once it was completed. In his testimony, Mayor Watson also adopted this explanation for *not* updating Council during the trial running period. This evidence from Mayor Watson, Manconi, and Kanellakos does not withstand scrutiny, and the Commission does not accept it as a truthful explanation of what motivated the failure to communicate with Council. On the contrary, the Commission finds that no such commitment was made.

The source of information about what, if any, commitment was made to Council are internal City documents that indicate, "once RTG has achieved all Trial Running requirements, staff will inform Council." Those words cannot reasonably be understood to mean that no updates would be provided for any reason during trial running. Councillor Diane Deans testified that she was "shocked" to learn of the changes to the trial running criteria and expected to be informed of such important matters as they happened.

The City's conduct is also inconsistent with this alleged commitment. Council received updates regarding the project (however brief and misleading) on August 7 and 16, 2019. Mayor Watson fairly acknowledged in his evidence to the Commission that sending the August 16 memo to Council was inconsistent with the alleged commitment not to communicate until the system has passed the trial running testing. Further, by drafting the July 31, 2019 memorandum, Manconi recognized that Council had a right to know what was going on with the trial running as it happened. The very notion that Manconi and Kanellakos would make a commitment to withhold information that was vital for councillors to fulfill their statutory obligations is nonsensical and smacks of an obvious attempt to justify the wrongful withholding of information retroactively and dishonestly.

The Commission finds that no commitment was made to not update Council during trial running. Instead, decision-making authority and information sharing were informally restricted to the people on the WhatsApp Group. The Commission further finds that Manconi revealed, in a moment of candour, the real reason the July 31, 2019 memorandum was not sent. He testified that if he released it, he feared the Council would "ask too many questions."

Manconi and Kanellakos, along with Mayor Watson, argue that there was nothing wrong in not providing Council with testing information during trial running because Council was eventually advised about the test results in a memorandum from Kanellakos dated August 23, 2019. This document is the linchpin of their position that the Council was advised of the testing results after the testing was complete. Yet even a cursory examination of the August 23 memorandum shows that it did not provide critical information that councillors had a right to receive in order to fulfill their statutory obligations. For example, nowhere in the memorandum is Council informed that early testing of the system resulted in repeated failures. Nor was Council told that the testing was paused and restarted. Nor was Council told that the trial running standards were lowered to obtain a pass. Council was also not told that the City and RTG had agreed to use the higher 2019 standards. Instead, Council was provided with this deliberate falsehood, "RTG, as part of their Trial Running test plans, indicated they wanted to not only meet these targets but exceed them. RTG targeted a figure of 98% for service availability and wanted to assess if they could reach 98% for the entire twelve (12) day period."

In his testimony, Kanellakos conceded that this was not an accurate statement. The Commission finds that the August 23, 2019 memorandum from Kanellakos did not seek to provide information; it sought to disseminate misinformation and hide critical facts from Council so that councillors could not properly exercise their oversight function. The inescapable conclusion is that Kanellakos deliberately misled Council.

In summary, as public pressure grew to get the system open for public service, the City and RTG changed the testing criteria to make it easier to pass. That change was covered up when Kanellakos deliberately misled Council in his memorandum. This is not only a serious finding regarding OLRT1, but it also has broader significance for other projects undertaken by the City. Without changes to the information-sharing process and a fundamental shift in the approach of senior City staff, the statutory oversight function of Council will be irreparably compromised. It is also concerning that Mayor Watson, who testified that he believed in "over-communicating," made no effort to correct Kanellakos's misleading information provided to the Council. The Mayor's failure to inform Council prevented Council from exercising effective oversight.

1.13 System Opening and Problems

The City rejected RTG's proposals to begin public service (also called revenue service) with a soft start that would have gradually opened the system to the public and allowed OC Transpo, RTG, and its subcontractors to increase reliability, get to know their roles, and "shake out" bugs in the system. Instead, it took the position that under the Project Agreement it was entitled to a fully functioning system on Day 1, so there was no need for a soft start. After opening, OC Transpo ran a parallel bus service for three weeks. The service then ended, in accordance with plans made before OLRT1 achieved Substantial Completion.

After the parallel bus service ended, the OLRT1 system was plagued by a variety of faults, failures, and breakdowns that undermined reliable public service and frustrated members of the public, OC Transpo staff, and City politicians. The City was repeatedly required to implement replacement (R1) bus service. Notably, the buses for R1 service were pulled from existing bus routes, inconveniencing riders who relied on those bus lines.

The repeated interruptions to public service should not have come as a surprise to RTG or to the City. Some of the problems that stopped trains in their tracks had been identified before public service began. While other failures may not have been foreseeable when the OLRT1 system went into service, the heightened risk that new, unknown issues would affect the system's reliability was well understood by the City and RTG. In these circumstances, the City's insistence on full service from the public launch and forward was misguided and unrealistic.

Given that maintenance was the responsibility of RTG under the Project Agreement, the City had no direct ability to respond to these issues in real time. For example, it could not deploy resources or make operational decisions to respond to problems. Instead, it flooded the maintainers (RTM and Alstom) with work orders. Moreover, RTM and Alstom witnesses gave evidence that City staff characterized certain work orders as requiring the fastest response, rectification, and/or remediation time from the maintainers, and that this practice interfered with effective maintenance.

The City became frustrated and publicly blamed RTG for the system's poor performance. It reverted back to an approach of requiring strict compliance with the Project Agreement. Councillors called for an end to the City's contract with RTG. City Manager Kanellakos delivered a memo to Council explaining the City's approach was to drastically

reduce or eliminate monthly maintenance payments to RTG, including by carrying over deductions imposed in one month to reduce the maintenance payment in the following month. In fact, the City did not make any maintenance payment to RTG for several months. This strategy did not help to resolve the ongoing maintenance problems. RTG's Lauch testified that eventually RTG had "no stick" to force Alstom to perform its maintenance obligations, because it had not received sufficient funds from the City to pay Alstom.

Considering all the problems with the OLRT1 during its first two years of public service, it is understandable that the relationship between the City and RTG/RTM suffered during that time, with increasing mistrust and discontent. However, eventually the parties improved their relationship to the extent that they were able to work together and focus on improving the reliability of the system. RTG, RTM, and Alstom later made changes to their leadership, staffing, and approach to the OLRT1 system. City staff worked with the maintainers to resolve technical issues on the line, create opportunities for dedicated rehabilitation and maintenance of the system, and improve responses to incidents that arose on the system. These efforts improved the maintenance and performance of the system.

1.14 Derailments and Safety

The first main-line derailment occurred on August 8, 2021 when a train was returning to the service yard from Tunney's Pasture Station. The train was travelling at approximately 30 kilometres per hour. There were no passengers on board. No injuries were reported from the incident. The fleet was immediately grounded while the issue was assessed. The TSB, an agency of the federal government, determined that an axle bearing failure caused a wheel falling off its axle. The entire fleet of vehicles was grounded so that Alstom could inspect it to determine whether any problems with other axle bearing assemblies existed. Following the inspection, the vehicles were put back in service. Alstom also implemented a plan to periodically inspect the axle bearing assemblies on each vehicle every 7,500 kilometres.

In May 2022, Alstom delivered its preliminary root-cause analysis for the first derailment. This report concluded that the axle bearing failure came about from excessive fretting (microscopic movement of two surfaces) under the axle bearing caused by excessive transversal loads on the axle assembly, particularly on the sharp curves in the track. The report refers to a combination of factors: the track alignment, the wheel/rail interface, and the operating profile. RTG has disputed the conclusions of Alstom's report but has not delivered its own root-cause analysis. The precise root causes of the first derailment are still under investigation by the TSB, which has asserted its exclusive legislative jurisdiction to make this determination.

On September 19, 2021, a second main-line derailment occurred when a train was proceeding on the westbound track from Tremblay Station. The train was travelling at approximately 35 kilometres per hour and had one operator and 12 passengers on board at the time of the derailment. Following the derailment, it continued travelling for approximately 427 metres before coming to a stop. The train destroyed a signal mast and switch heater and disturbed ballast underneath the track. No injuries were reported from the incident. Following this derailment, the entire fleet was grounded until November 12, 2021.

All parties agree that the second derailment was caused by a motor gearbox falling off the axle and wheel. It was subsequently determined that this was caused by Alstom employees failing to properly torque (or tighten) the bolts on the bogie assembly, following its disassembly to replace the cartridge bearing assembly as part of the remedial work after the first derailment.

The Commission finds that Alstom did not have a sufficiently robust quality control system in place at the time of the second derailment. There was a lack of proper checklists and record keeping for the assembly and repair of safety-critical parts. This work should be reviewed and approved by supervisory or quality control staff who are qualified to ensure that work has been completed to the proper standard. The second derailment shows that such a system is all the more important where maintenance and repair work is started by one shift of workers but continued or completed by another.

Following the August 2021 derailment, the parties implemented a plan to detect and prevent similar issues from occurring with the vehicles. After the two derailments, the parties implemented a more expansive return-to-service plan approved by an independent third party retained by the City, Transportation Resource Associates (TRA). There has been ongoing monitoring performed to ensure compliance with this plan. The parties have also been working together more collaboratively, and maintenance practices have improved. Provided the parties continue down this path, these efforts will continue to have a positive impact on the safety and reliability of the system going forward. However, there is more that needs to be done.

It is clear from the evidence that the misalignment in the wheel/rail profile is still a significant issue. This misalignment was identified prior to the start of public service. It was critical that the parties take the necessary steps to address this issue and its knock-on effects. However, the evidence established that the parties did not adequately address this problem. For example, a recommendation was made in the Track Safety Justification Report and the Operational Restrictions Document that a special working group be established to monitor wheel and rail wear data. The purpose of this working group was to identify remedial actions that could be taken to prevent the deterioration of the rail and wheel components. Unfortunately, a working group was never established to monitor the wheel/rail interface as recommended. Further, the need to study the wheel/rail interface has been consistently communicated by several parties, including OLRT-C and Alstom's grinding subcontractor. Unfortunately, it took too long for the parties to get serious in their efforts to address this issue.

The Commission has heard that because of the issues the system has experienced following the public launch, both Alstom and RTM have now placed greater focus on the wheel/rail interface to try to address the problem. This is important, as it has a myriad of potentially serious implications for the system. Several remedial actions have been suggested and undertaken to address the issues arising from the misalignment of the wheel/rail profile. These include reducing track corrugation through maintenance, reprofiling (grinding) the track, modifying the wheel profile, and adjusting the operating parameters of the system. To date, only temporary measures have been put in place to

address the issues arising from the August 2021 derailment. Additional measures have also been proposed but have not yet been implemented.

The Commission recommends that TRA or another competent, independent third party continue monitoring the safety issues and any remedial actions undertaken by the parties to ensure the continued safe operation of the system. This will provide a level of assurance that the necessary work is being performed in a proper and timely manner and will ensure an external level of oversight in respect of any safety issues. Given the previous failures of senior City staff to honestly communicate critical information to Council, it is recommended that the third party report directly to Council or the Ottawa Transit Commission. At this juncture, nothing less will suffice to regain the public's trust in the OLRT1 system.

1.15 Conclusion

As mentioned at the beginning of this summary, the Commission views its primary role as providing answers about what happened and why, and making recommendations to avoid a repetition of the project's problems. In doing so, I do not hold the project or its participants to a standard of perfection. That would be unrealistic and unfair. In any enterprise of this size and complexity, there are bound to be errors and misjudgments. What is essential in a review like this is to identify those missteps, determine their causes, and learn from them for future projects.

While human errors are understandable and expected, deliberate malfeasance is unacceptable in a public project. When participants deliberately mislead the public regarding the status of a public undertaking, they violate a fundamental obligation that underlies all public endeavours. The public rightly trusts both the government and private-sector entities to act in a manner that furthers the broader public interest. As a condition of their involvement, participants in a public project undertake to honour that obligation to the public. There are two instances in the OLRT1 project that stand out as egregious violations of the public trust.

First is the conduct of RTG and OLRT-C in providing RSA dates that they knew were entirely unrealistic. It is evident that this was done as part of a misconceived scheme to increase commercial pressure on the City. As a commercial tactic, it was a failure because the deliberate communication of unachievable dates did nothing to improve RTG's commercial position with the City. To the contrary, this gambit only served to increase and accelerate the mistrust that was developing between the parties. More fundamentally, it represented a troubling lack of concern for the public nature of the project and the interests of the people of Ottawa. The leadership at RTG and OLRT-C seemed to have given no thought to the fact that the provision of this misinformation adversely impacted the daily lives of hundreds of thousands of people. The people of Ottawa trusted RTG and OLRT-C to be straight with the City and tell them honestly when the system would be ready. The Commission finds that RTG and OLRT-C betrayed that trust.

Second is the conduct of senior City staff and Mayor Watson in not sharing information about trial running. This conduct prevented councillors from fulfilling their statutory duties to the people of Ottawa. Moreover, it is part of a concerning approach taken by

senior City officials to control the narrative by the nondisclosure of vital information or outright misrepresentation. Worse, because the conduct was wilful and deliberate, it leads to serious concerns about the good faith of senior City staff and raises questions about where their loyalties lie. It is difficult to imagine the successful completion of any significant project while these attitudes prevail within the municipal government.

Is there any reason to believe that their conduct regarding the trial running testing results was an aberration or that transparency has improved within the City? Unfortunately, based on the City's conduct during this Inquiry, there is not. By way of example, throughout the hearings, the City published, at taxpayers' expense, a summary of the proceedings that was a blatant attempt to spin the testimony in a way that was favourable to the City. This appears to be unprecedented in Canadian judicial history and is part of a troubling pattern of controlling and shaping information flow to Council and the public.

In the end, the problems with the OLRT1 were a consequence of myriad factors, including the reliance on new vehicles and new relationships, a lack of integration, decisions to rush the system into service, an inadequate investment in maintenance, and several other factors, some of which were beyond the control of the parties. The result was a flawed LRT that failed to meet the needs of the people of Ottawa.

Despite the foregoing, there is reason for optimism, as the parties have begun working together more co-operatively and the reliability of the system is showing some signs of improvement. This improvement demonstrates that, over time, structural problems can be resolved through good faith, communication, and co-operation. However, until such time as the private and public entities involved in the OLRT1 project understand that their first obligation is to the public, there is reason to be concerned that the project will continue to suffer problems.

Chapter 2
Timeline of Key Events

Chapter Contents

2.0 Introduction

This chapter sets out a chronological narrative of key events in relation to Stage 1 of the Ottawa Light Rail Transit (OLRT1) system that occurred between 2006 and 2021 and that are relevant to the Commission's mandate. The narrative is divided into five time periods that address the following topics:

- Background
- Procurement
- Construction and manufacturing
- Revenue Service Availability
- Public service

2.1 Background: The Transportation Master Plan, Funding, and Preliminary Engineering (2006–2010)

Between 2006 and 2010, the City of Ottawa (City) reorganized its transportation infrastructure plans by shifting away from a light rail transit (LRT) system running north-south to supplement its existing bus system. The City instead developed a plan for a different LRT system that included a tunnel underneath the city's downtown core. This effort included investigating the feasibility of a tunnel, conducting an Environmental Assessment and engineering analysis, developing a project budget, and seeking provincial and federal funding.

- **December 14, 2006.** Ottawa City Council (Council) votes not to proceed with earlier plans to construct a north-south rail transportation system that would have connected the downtown with neighbourhoods to the south. The decision to cancel the north-south project and its impact on the transit system was very costly for the City.
- **June 13, 2007.** Council accepts a recommendation to build an east-west electrified LRT line with a tunnel underneath the downtown core instead of the north-south line previously envisioned. The recommendation was made by the Task Force on Transportation established by Ottawa Mayor Larry O'Brien.
- **May 28, 2008.** Council accepts joint recommendations made by the City's Transit Committee and Transportation Committee to build the new east-west LRT line on a course running between Tunney's Pasture and Blair Road, via a tunnel running through downtown.
- **November 28, 2008.** Council approves a more detailed plan for the east-west rail system and the downtown tunnel, with an estimated preliminary budget of $1.68 billion, as outlined in a Transportation Master Plan (TMP) recommended by the Joint Transportation and Transit Committee.
- **May 27, 2009.** Council accepts the recommendations of an interim report from the Transit Committee that builds on the TMP by identifying where the rail line and train stations will be placed for the OLRT1 (called the "corridor alignment").

- **October 23, 2009.** Council receives an update on the OLRT1, including a functional design estimate totalling $2.1 billion. This estimate had a margin of error of plus or minus 25 percent and was expected to change.
- **January 13, 2010.** Council receives a study on the downtown tunnel prepared by the Transit Committee and accepts its recommendations. The study recommendations include that the City undertake an Environmental Assessment of the downtown tunnel route and begin preliminary engineering for the transit line. The study also includes a budget estimate for the OLRT1 of $2.1 billion.
- **March 31, 2010.** The City issues a Request for Qualification (RFQ) for preliminary engineering for the OLRT1.
- **May 20, 2010.** The City determines that four engineering firms or consortiums are qualified to submit proposals for the preliminary engineering of the OLRT1 project: AECOM, Capital Transit Partners (CTP), Delcan+PB, and Ottawa Transit Alliance.
- **June 14, 2010.** The City issues a Request for Proposals (RFP) for preliminary engineering on the OLRT1. The City engages PPI Consulting to act as Fairness Commissioner, providing advisory services for ensuring the fairness, openness, and integrity of the proposal evaluation and selection process.
- **August 17, 2010.** The Government of Ontario approves an Environmental Progress Report prepared by the City for the OLRT1 based on an earlier Environmental Assessment the City had completed. This step is essential for securing federal and provincial funding for the OLRT1.
- **September 2010.** The City receives an approval in principle from the Government of Canada for $600 million in funding for the OLRT1, and a Green Light Letter from the Ontario Minister of Infrastructure confirming eligibility for a $600 million funding commitment for the OLRT1.
- **September 2, 2010.** The City enters a Preliminary Engineering and Management Services Agreement with CTP, a consortium consisting of STV Canada Consulting, URS Canada, Jacobs Associates, and Morrison Hershfield.

2.2 Procurement: The RFP Process and Selection of Rideau Transit Group (2010–2013)

After the 2010 election of Ottawa Mayor Jim Watson, the City accelerated the schedule for procuring and constructing the LRT line. The City obtained outside advice with respect to the best procurement model (landing on a public-private partnership, or P3, project model – the design-build-finance-maintain, or DBFM, delivery model) and then undertook a procurement to identify suitable private-sector construction firms. As a result of the procurement process, the City entered into a Project Agreement for Stage 1 of the OLRT project with the Rideau Transit Group (RTG) in early 2013.

- **October 25, 2010.** Jim Watson is elected Mayor of Ottawa, replacing Larry O'Brien. During his mayoral campaign, Watson expressed a preference for having experts from the private sector oversee construction of the OLRT1 to avoid "meddling" by politicians and avoid cost overruns and delays. Early in his term, Mayor Watson prioritizes the construction of the OLRT1.
- **February 28, 2011.** Deloitte delivers a report to the City recommending that the City pursue a project delivery model for the OLRT that requires bidders to finance the project and take responsibility for operating and maintaining it for a period of time after completion of construction. This model was thought to be one that would satisfy the City's objective of transferring financial risks to the private sector.
- **May 25, 2011.** Council approves recommendations in a report initiated by the City's Finance and Economic Development Committee (FEDCO), which directs the City's Rail Implementation Office (RIO) to modify the plan and design to accelerate the completion of the OLRT1. The revised plan is to complete the OLRT1 by spring 2018 rather than by spring 2019, as originally planned.
- **June 29, 2011.** Following additional work to account for the City's objectives, Deloitte recommends that the City adopt a DBFM delivery model for the OLRT1, which would require private-sector companies to design, construct, and finance construction in addition to providing maintenance services, but not operation services, after construction.
- **June 30, 2011.** The City issues an RFQ to identify private companies with the necessary skills and expertise to deliver the OLRT1.

- **July 14, 2011.** Council approves recommendations that the City adopt a DBFM delivery model for the OLRT1 and engage Infrastructure Ontario to lead the commercial aspects of the procurement.
- **September 1, 2011.** The Government of Ontario signs a Contribution Agreement with the City, formalizing its agreement to provide $600 million in funding for the OLRT1.
- **October 1, 2011**. Transport Canada delegates its regulatory oversight authority to the City.
- **October 21, 2011.** The City announces the results of the RFQ: three groups are qualified to submit proposals to deliver the OLRT1: Ottawa Transit Partners, Rideau Transit Partners, and RTG.
- **October 25, 2011.** The City issues a Project Charter for the OLRT1, which establishes a high-level framework of management and governance for its planning and implementation.
- **October 26, 2011.** The City signs a Memorandum of Understanding (MOU) with Infrastructure Ontario making it the Commercial Procurement Lead for the OLRT1. According to the MOU, Infrastructure Ontario will be responsible for developing procurement documents, negotiating terms and conditions of a Project Agreement, and coordinating the development of project-specific output specifications (PSOS).
- **October 27, 2011.** The City releases the RFP for the OLRT1 project. Proposals from the pre-qualified respondents will be evaluated based on cost and risks accepted by the respondents, in addition to scores for design, construction, and maintenance, as well as personnel, financial capability, and experience needed to deliver a large and complex rail transportation project. The RFP contains project-specific requirements that proposals must satisfy relating to operations, maintenance, and OLRT features including tunnels, vehicles, and stations.
- **January 6, 2012.** Under the RFP, pre-qualification submissions for vehicles and train control systems are due by this date. RTG puts forward several options including Grupo CAF and Alstom as vehicle providers.
- **May 10, 2012.** Following a competitive selection process it ran, RTG puts CAF forward as its vehicle supplier.
- **June 21, 2012.** CAF presents its vehicle proposal in a meeting between RTG, the City, and Infrastructure Ontario and responds to the City's concerns that CAF does not meet the requirements for a service-proven vehicle. The City then determines that CAF's proposed vehicles are not service proven and refuses to pre-qualify CAF.
- **Late June 2012.** RTG asks Alstom to develop a new proposal for the OLRT1.

- **July 18, 2012.** RTG and Alstom meet with the City to present Alstom's vehicle solution. The City then pre-qualifies Alstom's proposal.
- **September 10, 2012.** Technical submissions in response to the RFP are due by this date. RTG submits a design proposal including Alstom as its proposed vehicle provider.
- **October 1, 2012.** Financial submissions in response to the RFP are due by this date.
- **December 19, 2012.** Council delegates significant authority over the OLRT1 Project Agreement to the City Manager.
- **December 19, 2012.** Following evaluation of the proposals submitted in response to the RFP, RTG achieves the best score and Council approves awarding the OLRT1 contract to RTG, a consortium consisting of ACS Infrastructure Canada, EllisDon, and SNC-Lavalin. Council also approves a $2.13 billion budget for the OLRT1 project. The Government of Canada signs a Contribution Agreement with the City, agreeing to provide $600 million in funding for the construction of the OLRT1.
- **February 12, 2013.** The City and RTG sign the OLRT1 Project Agreement. The Project Agreement sets a Required Revenue Service Availability (RSA) Date of May 24, 2018, according to which the OLRT1 system should be ready for public service in just over five years.

2.3 Construction and Manufacturing: Delays and the Rideau Street Sinkhole (2013–2018)

Between 2013 and early 2018, RTG's related construction company (Ottawa Light Rail Transit Constructors, or OLRT-C) built the OLRT1 system, including the stations and rail lines. Alstom designed and manufactured the vehicles. Two sinkholes appeared adjacent to the tunnelling work for the downtown tunnel. The completion of construction and vehicle manufacturing was repeatedly delayed.

- **February 12, 2013.** RTG signs a Construction Contract with OLRT-C, an unincorporated joint venture consisting of Dragados Canada, EllisDon, and SNC-Lavalin.
- **February 12, 2013.** OLRT-C signs a Subcontract Agreement with Alstom, in which Alstom agrees to manufacture and supply the vehicles for the OLRT1 project, specifically the Citadis Spirit light rail vehicles (LRVs).
- **February 12, 2013.** OLRT-C signs a Subcontract Agreement with Thales Canada, in which Thales agrees to provide the automatic train control system.
- **February 12, 2013.** RTG signs a Maintenance Contract with Rideau Transit Maintenance (RTM), a consortium consisting of ACS, EllisDon, and SNC-Lavalin.
- **February 12, 2013.** RTM and Alstom sign a Maintenance Subcontract Agreement, in which Alstom agrees to assume some of RTM's maintenance obligations under RTM's Maintenance Contract with RTG.
- **February 12, 2013.** Altus Group is designated as the Independent Certifier responsible for determining whether RTG has met contractual milestones specified in the Project Agreement and is entitled to payment for meeting them.
- **March 15, 2013.** OLRT-C signs a Services Agreement with RTG Engineering Joint Venture, an unincorporated joint venture of SNC-Lavalin and MMM Group, in which RTG Engineering agrees to provide design and engineering services.
- **April 26, 2013.** Under Alstom's subcontract with OLRT-C, Thales is to deliver a finalized Interface Control Document for its control system by this date. This deadline is unrealistic and does not align with Thales's obligations under its own subcontract with OLRT-C.

- **May 2013.** Construction begins on the OLRT1 project.
- **August 8, 2013.** OLRT-C agrees to a proposal made by Alstom to move the manufacturing location for the two prototype LRVs from Alstom's facility in France to Alstom's facility in Hornell, New York.
- **October 11, 2013.** A media event is hosted by Mayor Watson to announce the imminent start of tunnelling for the OLRT1. Tunnelling work is to begin in early November 2013.
- **February 20–21, 2014.** A sinkhole appears on Waller Street near one of the OLRT1 tunnelling locations. A root-cause analysis conducted by OLRT-C concludes that the tunnelling crossed under a previously excavated construction pit that was unrelated to work on the OLRT1.
- **June 2, 2014.** OLRT-C agrees to a proposal made by Alstom to move the manufacturing location for one of the two prototype LRVs from Alstom's facility in Hornell to the maintenance and storage facility (MSF) in Ottawa.
- **2015.** The City retains Parsons Corporation, an engineering firm, to provide operations and maintenance readiness support.
- **May 2016.** Steve Kanellakos becomes City Manager.
- **June 6, 2016.** OLRT-C agrees to a plan proposed by Alstom to conduct high-speed dynamic testing of the first LRVs in Ottawa on the constructed OLRT1 line between Blair Station and Cyrville Station.
- **June 8, 2016.** A sinkhole appears on Rideau Street near Sussex Drive during OLRT1 tunnelling, causing vehicle and pedestrian traffic closures, gas and water-main leaks, business closures, and a power outage.
- **June 14, 2016.** OLRT-C notifies the City of its position that the Rideau Street sinkhole entitles OLRT-C to delay the construction schedule under the terms and conditions of the Project Agreement.
- **June 28, 2016.** The City and RTG enter into an agreement to put disputes about the Rideau Street sinkhole on hold until it is investigated and repaired.
- **September 16, 2016.** The Independent Certifier reports that certain contractual milestones under the Project Agreement have not been met and work is behind schedule.
- **September 22, 2016.** The City requests that, as required by the Project Agreement, RTG deliver a recovery plan for mitigating scheduling delays.

- **December 22, 2016.** McMillen Jacobs Associates (formerly Jacobs, a member of CTP) finalizes a root-cause analysis of the Rideau Street sinkhole requested by the City. The analysis indicates that the cause of the sinkhole was the presence of wet, sandy soil under Rideau Street that was disturbed by nearby tunnelling and excavation.
- **January 10, 2017.** Alstom begins cold-weather testing of LRVs in an indoor National Research Council of Canada laboratory facility.
- **April 20, 2017.** OLRT-C requests that Alstom provide a plan to mitigate scheduling delays in the manufacturing and testing of the LRVs.
- **May 10, 2017.** Thales requests an extension of time from OLRT-C to complete its obligations under the Subcontract Agreement.
- **November 7, 2017.** SEMP, an engineering consultant, delivers a report on the OLRT1 at the request of OLRT-C to assess and rehabilitate the systems engineering processes for the OLRT1 project. The report concludes that systems engineering "is considered to be substantially below the minimum acceptable level for a project of this size and complexity," and that this is particularly evident in the lack of integration between the various infrastructure, assets, and personnel involved.
- **December 2017.** OLRT-C grants Thales an extension to November 2018 to complete its obligations. The RSA date is necessarily affected.
- **January 12, 2018.** The City rejects RTG's position that the Rideau Street sinkhole entitles RTG to delay the construction schedule specified in the Project Agreement.
- **February 5, 2018.** RTG advises the City that it will not meet the original RSA date of May 24, 2018 specified in the Project Agreement. The new RSA date becomes November 2, 2018.
- **May 24, 2018.** This is the original RSA date agreed to in the 2013 Project Agreement. This date is missed.

2.4 Handover: Substantial Completion, Trial Running, and Revenue Service Availability (2018–2019)

As construction belatedly approached completion, the City and RTG agreed to amend the requirements for RTG to achieve the milestone of Substantial Completion, thus permitting the system to enter into trial running. The City and RTG also agreed to change the testing criteria and project requirements, thereby allowing the system to pass trial running and achieve RSA. The OLRT1 system opened to the public approximately 16 months behind schedule.

- **August 2018.** In preparation for the opening of the OLRT1 to the public, OC Transpo shortens various bus routes and issues layoff notices to bus-driver employees.
- **August 15, 2018.** The Independent Certifier expresses “major concern” over the slippage of schedule completion dates in its monthly status report.
- **September 7, 2018.** RTG advises the City that it will be able to meet an RSA date of November 30, 2018, but with only 32 LRVs provided to the City on that date rather than the 34 required under the Project Agreement.
- **September 14, 2018.** The City notifies RTG that it will not accept that RSA is met unless all 34 required LRVs are delivered.
- **January 3, 2019.** RTG proposes a new RSA date of March 31, 2019.
- **March 5, 2019.** RTG advises the City that it will not be able to meet the RSA date of March 31, 2019.
- **April 26, 2019.** RTG provides the City with a Notice of Substantial Completion. The City objects to the notice, stating that the requirements for Substantial Completion have not been met, including that RTG has not delivered all 34 LRVs as required under the Project Agreement. The Independent Certifier agrees with the City.
- **July 10, 2019.** John Manconi, the City’s General Manager of Transportation Services, informs the FEDCO of a new scheduled RSA date of August 16, 2019.
- **July 26, 2019.** The City and RTG sign a Substantial Completion Agreement, changing the criteria for Substantial Completion and thereby allowing RTG to achieve the milestone of Substantial Completion.

- **July 29, 2019.** Trial running begins.
- **July 31, 2019.** OLRT-C finalizes the trial running test procedure to be used to evaluate the system's overall readiness to achieve RSA. The City agrees to the trial running pass criteria developed by OLRT-C.
- **August 16, 2019.** The City and RTG agree to modify the criteria to be applied in evaluating the success of trial running.
- **August 23, 2019.** Trial running concludes. City Manager Kanellakos informs Council that the criteria for the trial running test procedure have been met.
- **August 30, 2019.** RTG provides the City with notice of RSA. The City and RTG amend the Project Agreement by executing a Term Sheet regarding Revenue Service Availability that allows RTG to achieve RSA.
- **August 30, 2019.** The City and the Independent Certifier accept that RSA has been met on the condition that RTG completes certain specified outstanding work by September 14, 2019.
- **September 14, 2019.** The OLRT1 opens to the public.

2.5 Public Service: Malfunctions and Derailments (2019–2021)

Between 2019 and 2021, the OLRT1 experienced frequent breakdowns and service disruptions. Cracked wheels were discovered on vehicles, and two vehicle derailments occurred on the main line. These issues led to investigations by the Transportation Safety Board of Canada (TSB). The City and RTG worked with a variety of consultants to return the OLRT1 to safe operation.

- **Fall 2019 and winter 2020.** After opening to the public, the OLRT1 experiences several problems causing service disruptions on the line. These include failures in vehicle doors opening and closing properly, power supply failures, and switch issues.
- **July 2, 2020.** An LRV is taken out of service due to a cracked wheel, prompting an investigation by the TSB. The cracked wheel is linked to protruding screws that were installed by the wheel's manufacturer. Alstom inspects other LRVs and identifies additional cracked wheels.
- **June 17, 2021.** The OLRT1 is closed for 14 days after the City and RTM agree to shut it down to perform maintenance and repair work.
- **August 8, 2021.** An LRV derails at Tunney's Pasture Station, causing a 5-day shutdown of the OLRT1. This derailment is linked to a failure of an axle bearing.
- **September 19, 2021.** An LRV derails near Tremblay Station, causing a 54-day shutdown of the OLRT1. This derailment is linked to a fallen gearbox resulting from improperly torqued bolts.
- **September 22, 2021.** A motion is made in Council to initiate a public inquiry into safety and reliability issues on the OLRT1, but the motion is later defeated.
- **October 4, 2021.** Transportation Resource Associates (TRA), hired by the City, begins work to advise on the plan to return the OLRT1 to service following the derailments.
- **November 10, 2021.** TRA approves a partial return to service for the OLRT1, based on plans proposed by RTG.
- **November 12, 2021**: The OLRT1 reopens to the public.
- **December 16, 2021.** The Government of Ontario orders a Commission of Public Inquiry into the OLRT1 and appoints the Honourable Justice William Hourigan as Commissioner.

Chapter 3
The Ottawa Light Rail Transit Project, Stage 1: Background; Key Roles and Responsibilities

Overview

- The OLRT1 – a 12.5-kilometre east-west electric rail line that serves 13 stations, 3 of which are in a 2.5-kilometre tunnel under downtown Ottawa – is the biggest and most costly infrastructure project in Ottawa's history. It is also the first project of this scope and complexity that the City delivered using a public-private partnership model.
- Ottawa's existing transit network was insufficient to meet the demands of its growing population. The City began work on a North-South LRT project, but it was eventually cancelled, leaving the City with both significant costs and transit needs that were still unmet.
- Following the cancellation of the North-South LRT project, a Task Force on Transportation recommended an east-west electric LRT system, including a tunnel under Ottawa's downtown.
- In October 2009, City staff provided Council with a "functional design" cost estimate of $2.1 billion for the OLRT1 project.
- The City delegated authority for the OLRT1 project to key City officials, including the City Manager and City Treasurer, and to key committees including the Finance and Economic Development Committee. The City also established new governance bodies for the OLRT1, most notably the Rail Implementation Office.
- As it lacked the in-house experience for the OLRT1 project, the City hired both technical and financial experts to advise on its procurement and construction.

Chapter Contents

3.0 Introduction

This chapter provides an overview of Stage 1 of the Ottawa Light Rail Transit (OLRT1) system, the origins of the OLRT1 project, and key aspects of the governance structure used by the City of Ottawa (City) for the project.

OLRT1 was conceived after an earlier light rail project was cancelled before construction began, resulting in significant costs for the City, as well as unmet transportation needs, particularly for travel into and through the downtown core. As a result, the OLRT1 project received considerable public and political attention during Ottawa's 2010 **City Council (Council)** election and afterwards.

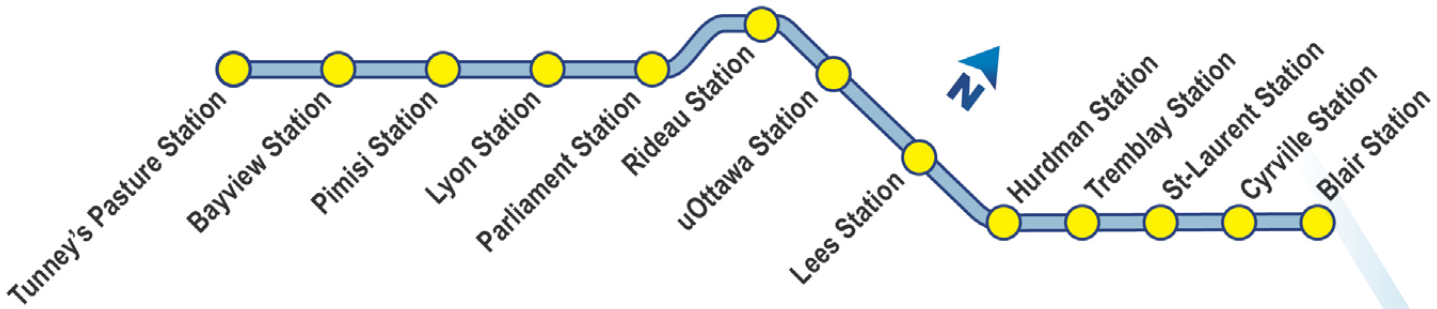
The OLRT1 project represented a number of "firsts" for the City: it was the first electric LRT system the City had built and the City's first project of this scope and complexity delivered using a public-private partnership (P3) model.[1] It was also the City's biggest (and most expensive) infrastructure project to date – as City Treasurer Marian Simulik testified, "We never had a project that big." The City established oversight of the project by committees of Council and staff – creating a group of staff dedicated to delivering the project, and retaining a number of experts to advise on the technical, financial, and operational aspects of the project. Names of key parties and key terms appear here in boldface so that they can be easily referred to later.

3.1 Overview of OLRT1

The **Ottawa Light Rail Transit (OLRT) system** is a **light rail transit (LRT)** system running on two parallel tracks, providing an east-west transit route through the City as part of the City's multi-modal transit network. The **OLRT1** is also known as the O-Train Line 1 and the Confederation Line. The network is operated by the City's public transit agency, the **Ottawa-Carleton Regional Transit Commission (OC Transpo)**.

The OLRT1, shown on the map in Figure 3-1, is made up of approximately 12.5 kilometres of electric light rail track and a maintenance and storage facility at Belfast Road. Part of the OLRT1 runs through a 2.5-kilometre tunnel underneath downtown Ottawa, from just east of Pimisi Station (at LeBreton Flats) to just north of the uOttawa Station at the University of Ottawa campus. It also includes 10 kilometres of rail running at ground level that was converted from Ottawa's previous bus rapid transit (BRT) system, known as the Transitway. The Confederation Line stops at 13 stations, running from Blair Station in the east to Tunney's Pasture Station in the west, including 3 stations within the downtown tunnel (Lyon, Parliament, and Rideau). The OLRT1 was planned to include 34 light rail vehicles (LRVs, also called rolling stock), which can be connected to operate in pairs.

Figure 3-1: Map of the Ottawa Light Rail Transit Project, Stage 1 (OLRT1)



3.2 The Origins of the OLRT1 Project

The OLRT1 project grew out of the City's unmet transit needs and an anticipated increasing demand for public transportation. This section reviews the City's transit system as it was before the construction of the OLRT1 and discusses the evolution of the project from concept through to the 2010 municipal elections, when the OLRT1 became a focus for new Mayor Jim Watson and the 2010–2014 Council.

3.2.1 The Transitway

Ottawa's transit system included a BRT system (the **Transitway**) with buses operating in dedicated traffic lanes, which allowed high-speed bus travel even during rush hour. While the Transitway had been expanded through the 1970s and 1980s, it had limited capacity to address the City's anticipated population growth and increasing transit needs.

The City had already anticipated that the Transitway would not offer a complete solution to Ottawa's future transit needs. "Grade-separated" rapid transit through downtown (operating at a different height from road traffic, such as underground or via an overpass) was first suggested in the mid-1970s. A tunnel through downtown was identified as an appropriate solution in the late 1980s. However, extension of the Transitway outside of downtown was prioritized at that time. The more expensive project of constructing grade-separated transit was set aside until it was deemed necessary.

3.2.2 The O-Train

In October 2001, the City began operating a pilot transit project in addition to the Transitway: a light rail system known as the **O-Train**, which provided service between the downtown core and communities to the south. The O-Train used diesel-powered vehicles and consisted of 8 kilometres of single track, with 5 stations. Indicative of the City's increasing demand for public transportation, the O-Train exceeded its ridership objectives by 2005, and the City included the O-Train as a permanent component of the OC Transpo system. At the time of writing, the diesel-powered O-Train (now known as the Trillium Line) was closed for construction and expansion.

3.2.3 The Cancelled North-South LRT Line

The City adopted a new Official Plan and **Transportation Master Plan (TMP)** in 2003 under then-Mayor Bob Chiarelli. These plans prioritized an expanded rapid transit network to manage increasing demand for transportation and meet the City's goal of reducing single-occupancy vehicle use. Later that year, City staff recommended an electrified LRT line at street level and running north-south, along with operational improvements to the Transitway; this project was called the **North-South LRT project**.

The City began to implement the North-South LRT project, obtaining $200 million in conditional contributions from each of the Ontario and federal governments. In 2006, the City signed a design-build contract[2] and a 15-year maintenance agreement for the project (the North-South Project Agreement).

The planned North-South LRT project was not without criticism. There were concerns about it operating on the street level along with buses and general traffic, uncertainties about the project's cost, concerns about provincial and federal funding, and fears the project would not adequately address the City's transportation needs. The North-South LRT project, and the City's transit needs more generally, were a focus of the City's municipal election in the fall of 2006.

The election of a new Council under new Mayor Larry O'Brien in November 2006 brought with it a mandate to reassess the North-South LRT project. In early December 2006, Council revised the project plan, shortening the length of the line and eliminating the downtown portion. Uncertainties surrounding federal and provincial funding ultimately led to a majority of councillors (and Mayor O'Brien) voting against proceeding with both the original and the revised North-South LRT project plans.

The cancellation had significant consequences. Mayor O'Brien's successor, Mayor Watson, testified that the cancellation of the North-South LRT project "cost about $36 million and set back the program by several years." The *Ottawa Citizen* reported that "the cancellation of that north south line cost city taxpayers about $90 million." Furthermore, the cancellation left the City without a solution to its transportation needs. Downtown traffic congestion grew and OC Transpo customer dissatisfaction continued unaddressed.

3.2.4 Planning Begins for the OLRT1

Following the cancellation of the North-South LRT project, Mayor O'Brien established the **Mayor's Task Force on Transportation** in early 2007. The task force was directed to, among other things, make recommendations for the development of an "integrated rapid transportation plan that alleviates existing east-west pressures, is scalable to account for immediate and growing pressures in the south end, and provides options to reduce congestion through the downtown corridor."

The Mayor's Task Force on Transportation delivered its report in the summer of 2007. It stated Ottawa was "already experiencing a rush hour congestion problem" and recommended that the City use existing transportation corridors to build an east-west electrified LRT system, with a tunnel under Ottawa's downtown to alleviate transit congestion. This proposed LRT system would be the biggest and most expensive infrastructure project the City had ever undertaken.

City staff and consultants meanwhile worked on updating the TMP. As part of that work, they produced a study on the development of a downtown transit solution, dated April 2008. The study forecast that public transit ridership would increase by 76 percent for the City and by 85 percent for the National Capital Region by 2031. Among the things the study determined was that a transit tunnel was required through the downtown. It recommended that Council first focus on implementing light rail transit downtown, and then look at building out service to other urban areas.

In November 2008, Council adopted certain updates to the TMP that prioritized the construction of the downtown tunnel and LRT line. At that time, the estimated cost for the project was $1.68 billion. This estimate was preliminary and did not account for inflation or the costs of purchasing land for the project. Council also directed City staff to (1) "contact Infrastructure Ontario and ascertain interest in their implementation of the rapid transit portion of the Transportation Master Plan on behalf of the City," and (2) "contact the provincial and federal governments and ascertain interest in financing … the Transportation Master Plan."

The City began planning for the construction of the OLRT1. In October 2009, City staff provided Council with a "functional design" cost estimate of $2.1 billion, prepared with the assistance of "a team of experts with extensive experience in large capital transportation projects." This estimate included project components like land acquisition, project scope changes, and design refinements, but it was still preliminary and did not account for inflation.

3.2.5 The 2010 Municipal Election

The City held municipal elections in 2010. Once again, the City's transit needs were a campaign focus.

Mayoral candidate Watson expressed concern about the schedule and cost of the proposed project, but ultimately during the election committed to pursuing the project provided that it could be brought in on time and on budget. As he later testified, "We knew that these large projects across the country and around the world were consistently over budget, loaded, late – lots of problems with them – and the last thing I wanted to do was to see the budget balloon." The *Ottawa Citizen* reported that then-mayoral candidate Watson publicly expressed a preference that the **Ontario Infrastructure and Lands Corporation (Infrastructure Ontario)** manage the bidding process for the construction contract to "re-instil the confidence shattered by the decision to cancel the previous light-rail agreement."

After winning the election and taking office, Mayor Watson initiated a review of the budget and schedule for the OLRT1 project as part of his 2011 budget plans for the City. (The City's budget and schedule for the OLRT1 project are the subject of Chapter 4.)

3.3 The City's Governance Structure for the OLRT1

The City's governance structure for the OLRT1 project included City Council, City staff, Council and staff committees, arm's-length agencies, and boards and commissions. Ottawa's City councillors during the time relevant to the Commission's mandate are shown in a table in section 3.3.1. The following is an overview of some City staff roles and offices, which are elaborated on later.

Delegates of City Council
■ City Manager and Deputy City Managers
■ City Treasurer and Deputy City Treasurer
City Committees
■ Finance and Economic Development Committee (FEDCO)
■ Executive Steering Committee (ESC)
City Departments, Commissions, and Offices
■ City Transit Commission (Transit Commission)
■ Ottawa-Carleton Regional Transit Commission (OC Transpo) and the Transportation Services Department
- General Manager of Transportation Services
- Director of Transit Operations
- Chief Safety Officer
■ Rail Implementation Office (RIO) / O-Train Construction Office
- Director of RIO / O-Train Construction Office
■ Regulatory Monitor and Compliance Officer (RMCO)

Council generally has the authority to exercise the City's municipal powers. Council may also delegate the authority to exercise such powers to a person or body (such as a committee), subject to certain restrictions. For the OLRT1 project, Council delegated the authority to oversee and make decisions about various aspects of the project to

a committee of Council (the **Finance and Economic Development Committee**, or **FEDCO**); an executive staff committee (the **Executive Steering Committee**, or **ESC**, also referred to as the Ottawa Light Rail Transit Steering Committee); and to certain members of City staff, including the **City Manager** and **Treasurer**.

The City's **Rail Implementation Office (RIO)** was directly involved in various aspects of the OLRT1 project, including planning, procurement, and operations. City transit staff also oversaw the construction of the OLRT1 and the assembly of the LRVs, although because of the contractual P3 structure, that oversight was primarily via communications with Rideau Transit Group, or RTG (a general partnership between ACS Infrastructure Canada, EllisDon, and SNC-Lavalin that was contracted for the project). City staff were assisted throughout by expert consultants (discussed in more detail in section 3.4). In 2016, RIO was subsumed into the **O-Train Construction Office**, which continued RIO's work.

OC Transpo, the City's public transit agency, began overseeing OLRT1 service after the system's public launch.

In addition to its municipal powers, the City has authority to regulate and manage the OLRT1 project in accordance with the Delegation Agreement with the federal government. Further to this delegation of authority, the City enacted regulations and implemented monitoring and compliance with those regulations, including through the **Chief Safety Officer** and the **Regulatory Monitor and Compliance Officer (RMCO)**.

3.3.1 City Council and the Mayor

Ottawa's City Council is made up of 23 City councillors, each of whom represents one of the City's wards, and the Mayor. The members of Council during the time relevant to the Commission's mandate are shown in the table that follows.

Ottawa Mayor and Councillors, 2006 to 2022

	Terms			
	2006–2010	2010–2014	2014–2018	2018–2022
Mayor	Larry O'Brien	Jim Watson	Jim Watson	Jim Watson
Wards and Councillors				
Orléans (Ward 1)	Bob Monette	Bob Monette	Bob Monette	Matthew Luloff
Innes (Ward 2)	Rainer Bloess	Rainer Bloess	Jody Mitic	Laura Dudas
Barrhaven (Ward 3)	Jan Harder	Jan Harder	Jan Harder	Jan Harder
Kanata North (Ward 4)	Marianne Wilkinson	Marianne Wilkinson	Marianne Wilkinson	Jenna Sudds / Cathy Curry*
West Carleton-March (Ward 5)	Eli El-Chantiry	Eli El-Chantiry	Eli El-Chantiry	Eli El-Chantiry
Stittsville (Ward 6)	Shad Qadri	Shad Qadri	Shad Qadri	Glen Gower
Bay (Ward 7)	Alex Cullen	Mark Taylor	Mark Taylor	Theresa Kavanagh
College (Ward 8)	Rick Chiarelli	Rick Chiarelli	Rick Chiarelli	Rick Chiarelli
Knoxdale-Merivale (Ward 9)	Gord Hunter	Keith Egli	Keith Egli	Keith Egli
Gloucester-Southgate (Ward 10)	Diane Deans	Diane Deans	Diane Deans	Diane Deans
Beacon Hill-Cyrville (Ward 11)	Michel Bellemare	Tim Tierney	Tim Tierney	Tim Tierney
Rideau-Vanier (Ward 12)	Georges Bédard	Mathieu Fleury	Mathieu Fleury	Mathieu Fleury
Rideau-Rockcliffe (Ward 13)	Jacques Legendre	Peter Clark	Tobi Nussbaum	Tobi Nussbaum / Rawlson King†
Somerset (Ward 14)	Diane Holmes	Diane Holmes	Catherine McKenney	Catherine McKenney
Kitchissippi (Ward 15)	Christine Leadman	Katherine Hobbs	Jeff Leiper	Jeff Leiper
River (Ward 16)	Maria McRae	Maria McRae	Riley Brockington	Riley Brockington
Capital (Ward 17)	Clive Doucet	David Chernushenko	David Chernushenko	Shawn Menard
Alta Vista (Ward 18)	Peter Hume	Peter Hume	Jean Cloutier	Jean Cloutier

	Terms			
	2006–2010	2010–2014	2014–2018	2018–2022
Cumberland (Ward 19)	Rob Jellett	Stephen Blais	Stephen Blais	Stephen Blais / Catherine Kitts‡
Osgoode (Ward 20)	Doug Thompson	Doug Thompson	George Darouze	George Darouze
Rideau-Goulbourn (Ward 21)	Glenn Brooks	Scott Moffatt	Scott Moffatt	Scott Moffatt
Gloucester-South Nepean (Ward 22)	Steve Desroches	Steve Desroches	Michael Qaqish	Carol Anne Meehan
Kanata South (Ward 23)	Peggy Feltmate	Allan Hubley	Allan Hubley	Allan Hubley

* City Council appointed Cathy Curry to replace Jenna Sudds after Sudds was elected as a member of Parliament in the 2021 federal election.

† Rawlson King was elected to replace Tobi Nussbaum in a 2019 by-election after Nussbaum became the CEO of the National Capital Commission earlier that year.

‡ Catherine Kitts was elected to replace Stephen Blais in a 2020 by-election after Blais was elected as a member of provincial parliament to the Legislative Assembly of Ontario earlier that year.

Generally speaking, Council's role is to represent the public and to set matters of policy for the municipality. Council may delegate certain of its powers, including administrative or operational responsibility, to a person or body, subject to certain restrictions set out in the *Municipal Act, 2001*. As discussed in more detail below, over the life of the project, Council delegated authority regarding the OLRT1 to committees and individual staff members.

The *Municipal Act, 2001* identifies the Mayor as the "chief executive officer of the municipality." Despite this title, the Mayor's role is not comparable to the role of a CEO of a private corporation. According to the Ontario *Municipal Act*, *2001*, as municipal chief executive officer, the Mayor shall

(a) uphold and promote the purposes of the municipality;

(b) promote public involvement in the municipality's activities;

(c) act as the representative of the municipality both within and outside the municipality, and promote the municipality locally, nationally and internationally; and

(d) participate in and foster activities that enhance the economic, social and environmental well-being of the municipality and its residents.

Mayor Watson was closely involved in the OLRT1 project through his role as Chair of the FEDCO (discussed further below), through interactions with City staff, including the City Manager and General Manager of Transportation Services (tasked with overseeing the OLRT1 project), and via direct communications that he instigated with representatives of RTG and its key subcontractors. Mayor Watson also featured prominently in the City's public communications about the OLRT1 project from the planning, procurement, and construction and manufacturing phases, into public service. The Mayor's involvement in and impact on the project is discussed throughout this report.

3.3.2 City Manager

The City Manager, assisted by staff in the City Manager's office, acts as the City's chief administrative officer, overseeing and managing the administration of the government and affairs of the municipality. The City Manager is appointed by and accountable to Council, and is responsible for the administration of the City's departments, using the authority and control given by City Council.

Council granted a broad delegation of powers and responsibilities with respect to the OLRT1 project to the City Manager, including the power to "negotiate, approve, execute, deliver, amend and extend the Project Agreement and associated ancillary agreements for the OLRT project." Council also appointed the City Manager as "the senior executive accountable for the operations and activities of the [OLRT1], including the safety management system and other regulatory matters imposed by applicable Federal legislation and regulations." The City Manager chaired the ESC (which is discussed in more detail below).

Kent Kirkpatrick served as Ottawa's City Manager from 2004 to around March 2016. Current City Manager Steve Kanellakos replaced Kirkpatrick in 2016.

Prior to July 2016, the City's organizational structure included a Deputy City Manager for Planning and Infrastructure. Nancy Schepers served in this role until 2014. Schepers oversaw the planning for the OLRT1 project and implementation of the project. She was "quite involved" in reporting to committees and Council on key decisions to be made, including regarding the procurement model, Infrastructure Ontario's role on the OLRT1 project, and negotiation of the Contribution Agreements with the federal and provincial governments. (Schepers's role in the OLRT1 project is discussed in more detail in Chapters 4 and 5.)

3.3.3 City Treasurer

The City Treasurer is responsible for handling and reporting on the financial affairs of the municipality on behalf of and in the manner directed by Council. Council appoints the City Treasurer, who reports to the City Manager. Simulik served as the City Treasurer from 2007 until around December 2019. She was replaced by former Deputy City Treasurer Wendy Stephanson.

Regarding the OLRT1 project, the Treasurer was involved in determining the amount of private financing to require from the private partner in the procurement process and advising on the financial situation of the OLRT1 project as it progressed. The Treasurer was also a member of the ESC.

The Treasurer managed the City's long-term debt commitments, prior to and during the OLRT1 project, to ensure that the City's debt and obligations were within the limits set by the Province of Ontario for municipalities.

The City Treasurer was supported by Deputy City Treasurers. Deputy City Treasurer Mona Monkman was directly involved in the financial planning for the OLRT1 project from 2009 to 2013. Monkman's responsibilities included setting the financial parameters for the procurement process, reviewing the bidders' financial submissions, and negotiating the provincial and federal Contribution Agreements (with the assistance of consultants at Deloitte).

3.3.4 Finance and Economic Development Committee

The FEDCO is a committee of Council and is made up of the Council members who chair standing committees,[3] the Transit Commission Chair, and the Deputy Mayors. The Mayor is the Chair of the FEDCO. Councillors who are not members of the FEDCO are invited to attend and observe the FEDCO meetings.

According to the committee's Terms of Reference, the FEDCO

> is responsible for the City of Ottawa's high-level fiscal and management policy issues, including the development of the fiscal framework and corporate financial planning, overseeing the Operating and Capital Budgets and establishing a budget reporting framework, reviewing efficiency and investment reports, providing guidance on corporate performance measurement policies, ensuring the financial sustainability of the Corporation, and overseeing the City's audit functions.

Regarding the OLRT1 project, Council gave the FEDCO the authority to "have oversight and report to Council on all matters related to [the OLRT1], excluding those assigned by Council to other Standing Committees and the Transit Commission, including procurement, contract award, and construction progress." As part of its oversight role, the FEDCO was to receive quarterly updates from RIO.

The FEDCO oversaw the OLRT1 project until Revenue Service Availability (RSA) was achieved. OC Transpo then assumed the supervisory role for the OLRT1 as the system entered public service. OC Transpo retains oversight over the operations and maintenance of the system at the time of the drafting of this report. (OC Transpo's role is discussed in section 3.3.7.)

3.3.5 Executive Steering Committee

The ESC is a staff committee that was established to coordinate and implement the OLRT1 project. The OLRT1 Project Charter provided that the ESC would be "engaged at the City Manager's discretion to provide approval and guidance regarding high level issues" brought forward by others directly involved in the OLRT1 project.

The City Manager chaired the ESC, which included the City Treasurer, Director of RIO, and the General Manager of Transportation Services. Additionally, two representatives from Infrastructure Ontario – the Senior Vice-President and Vice-President, Civil Infrastructure – were ESC members. Certain advisors to the City also attended ESC meetings, including Remo Bucci, of Deloitte, and Brian Guest, of Boxfish Infrastructure Group.

3.3.6 Rail Implementation Office / O-Train Construction Office

RIO was established by the City to manage the OLRT1 project. RIO provided regularly scheduled monthly reports to senior management and quarterly project updates to the FEDCO and Council on the status of the OLRT1 project. RIO was also required to produce annual financial reports. From the start of the OLRT1 project, RIO oversaw key project deliverables, including:

- The procurement process;
- Communicating with the federal and provincial governments regarding funding contribution agreements;
- Monitoring the construction phase of the project;
- Monitoring and managing project risk; and
- Developing rail regulations, including a safety management system.

The **Director of RIO** was responsible for RIO and for, among other things, bringing key items to senior staff for decision. The Director of RIO was also a member of the ESC. The Director of RIO reported to the City Manager. Steven Cripps was the Director of RIO from April 2014 to October 2016.

In October 2016, RIO was subsumed by the **O-Train Construction Office**. The Director of the O-Train Construction Office reports to the General Manager, Transportation Services (discussed in section 3.3.7), but the Director's role and responsibilities were otherwise unchanged. Cripps served as Director of the O-Train Construction Office until December 31, 2018. In January 2019, Michael Morgan, the City's Director of Rail Construction, assumed responsibility for the O-Train Construction Office.

3.3.7 OC Transpo and Transportation Services

OC Transpo, the City's public transit agency, is responsible for providing transit services across the city of Ottawa and into Gatineau; this includes the OLRT1 project. More specifically, OC Transpo is responsible for operating and overseeing maintenance of the OLRT1 system, including compliance with LRT regulations by all staff, contractors, and suppliers involved.

The **General Manager of Transportation Services**[4] oversees all staff of the Transportation Services Department and provides the strategic direction for Transportation Services. The General Manager reports to the City Manager. Regarding the OLRT1, the General Manager oversees compliance with the OLRT regulations by OC Transpo staff, contractors, and suppliers. Council delegated the General Manager with the authority to "make service adjustments to bus and O-Train service in response to operational needs and requirements." Alain Mercier served as the General Manager of Transportation Services until 2012. John Manconi served as the General Manager of Transportation Services from 2012 to 2021. Manconi was succeeded by Renée Amilcar on October 18, 2021.

The **Director of Transit Operations** reports to the General Manager of Transportation Services and has direct day-to-day oversight over OC Transpo staff, contractors, and suppliers. The Director also oversees the preparation of reports that OC Transpo is required to provide to Transport Canada and the Transportation Safety Board of Canada (TSB), and oversees the preparation of OC Transpo reports to the City Manager, Council, and Transit Commission. Regarding the OLRT1, the Director monitors compliance with the OLRT regulatory framework. The Director is also responsible for ensuring that the Regulatory Monitor and Compliance Officer (RMCO, described in section 3.3.8) is provided with information to support its activities. Troy Charter has served as the Director of Transit Operations since 2016.

The **Chief Safety Officer** reports to the General Manager of Transportation Services and is responsible for developing and implementing a comprehensive safety management system in partnership with staff, the City's health and safety committees, unions, and external governing bodies and agencies. The Chief Safety Officer works with the RMCO and, in the event of "transportation occurrences," engages with the TSB. (Chapter 11 addresses safety in greater depth.)

3.3.8 Regulatory Monitor and Compliance Officer

The RMCO is an independent position charged with assessing compliance with the City's OLRT1 safety and security requirements. The RMCO assesses compliance with City safety and security regulations for the OLRT1 during public service. The RMCO is mandated to provide quarterly updates to the City Manager and an annual compliance report to the Transit Commission and Council. Council appointed Sam Berrada as the RMCO in February 2018, and he remained in that role at the time of the writing of this report.

3.3.9 City Transit Commission

The **Transit Commission** oversees and directs the City's Transportation Services Department on issues relating to the operation of public transit, including the OLRT1, the bus system, and para-transit systems (called Para Transpo).

Council appoints eight Council members (one of whom serves as Chair of the Commission) and four citizen members to be members of the Transit Commission. The Mayor is an ex-officio member, a member of the Transit Commission by virtue of being Mayor of the City.

Once it entered public operations, the OLRT1 fell under the oversight of the Transit Commission. Prior to that, the Transit Commission was involved in setting the bus routes for the construction phase and for the transition to OLRT1 public service. The Transit Commission receives updates on the City's transit services from the General Manager of Transportation Services at the start of every meeting. The Transit Commission also receives reports from staff where required. As discussed in Chapter 14, the Transit Commission was the subject of criticism from the public and certain of the Transit Commission members over a lack of transparency regarding OLRT1 operations.

3.4 Advisors to the City

The OLRT1 project was a significant undertaking for the City – it was the first electric LRT the City had constructed or operated. The City did not have the in-house expertise required to address the various financial, technical, and operational aspects of such a complex rail project.

As Mayor Watson explained, "We did not have the technical expertise to build or design a railway, so a number of experts from around the world were contracted as consultants and hired to work in the Rail Office." City staff were also assisted by subject matter experts who advised on the project delivery model, contractual structure, and financial aspects of the project.

3.4.1 Engineering and Technical Advisors

The City retained technical consultants to assist in areas where it did not have in-house expertise. RIO's Cripps estimated that approximately a quarter to a third of RIO was made up of consultants embedded in the office, and he testified that the City brought in additional experts as needed, either remotely or for short-term assignments. In 2010, the City engaged **Capital Transit Partners (CTP)**, a joint venture between engineering firms STV Canada Consulting, URS Canada, Jacobs Associates, and Morrison Hershfield[5] to perform preliminary engineering for the project. CTP's work on the project included:

- Advising (in collaboration with **Golder Associates**) the City on tunnelling under the Ottawa downtown area;
- Assisting in the procurement for the OLRT1 project, including creating and delivering the project-specific output specifications (PSOS) and proof of concept drawings, and evaluating technical aspects of the bidders' submissions; and
- Acting as the "owner's engineer," assisting the City as needed in its review of the construction of the OLRT1 and enforcement of the PSOS throughout the construction phase.

Once the OLRT1 project entered the construction phase, the City also engaged **Parsons Corporation** to assist in areas where their expertise was required, including

the communications-based train control system, system safety, and readiness for operations and maintenance.

Later in the life of the OLRT1 project, the City formed an **Independent Assessment Team** in 2017, consisting of STV representatives, to assist with determining whether construction of the OLRT1 by RTG was on schedule to meet the RSA date under the Project Agreement. The members of the Independent Assessment Team had significant expertise in the transit industry, and in particular, in the delivery of complex rail systems.

3.4.2 Financial and Transactional Advisors

The City engaged **Deloitte** to provide financial and transactional advisory services for the OLRT. Deloitte provided advice on the procurement model for the OLRT1 project, including conducting a value-for-money assessment, and assisted with the procurement process, including the evaluation of the financial components of the proposals in response to the Request for Proposals. Around 2014, Deloitte worked with **Boxfish** to produce a report for the City called “Lessons Learned” that reviewed the OLRT1 procurement process. The “Lessons Learned” report was delivered in 2015.

Regarding procurement, **Infrastructure Ontario** conducted a preliminary value-for-money assessment of the OLRT1 project in or around 2009, and the City engaged Infrastructure Ontario as the Commercial Procurement Lead on the OLRT1 project in 2011. As procurement lead, Infrastructure Ontario was, among other things, responsible for providing procurement coordination and transaction management services. Infrastructure Ontario representatives reported to the Director of RIO on the progress of the project. Two Infrastructure Ontario representatives sat on the ESC (see section 3.3.5).

Boxfish provided the City with advice on procurement and project management. Boxfish later provided advice to the ESC on disputes between the City and RTG that arose after completion of the Project Agreement.

Notes

1 These “firsts” are explained in detail in Chapter 8.

2 A design-build contract is a contract in which the design and construction of a project are contracted to a single entity by the project owner. A design-build is used to minimize risks for the project owner and to manage the delivery schedule by overlapping the project’s design phase and construction phase.

3 Standing committees are generally made up of councillors, and are formed to study specific issues, on which they report back to Council.

4 In certain documents produced to the Commission and at times during the testimony of witnesses at the Commission’s public hearings, this role was referred to as the “General Manager of Transit Services.” This report uses the title “General Manager of Transportation Services.”

5 Note that URS changed its name to AECOM, and Jacobs is now McMillen Jacobs.

Chapter 4
Setting the Budget and Schedule: Concerns about Interference for Political Reasons

Key Findings

- The $2.1 billion budget for the OLRT1 project was based on a preliminary estimate that had not been designed or intended to be used as a budget. For political reasons, it became what was in essence a fixed budget after the 2010 municipal election. The City should have remained aware that this was an estimate to be adjusted as circumstances warranted rather than making the preliminary figure into a budget and adopting a "design to budget" approach.
- In addition to capping the budget, the same elected officials pressured City staff to accelerate the project schedule for political reasons. The estimated schedule for the project, which had been devised by the City's experts and independent consultants and contemplated the opening of the system for public service in 2019, was accelerated by approximately one year, in part by adjusting the design.
- The City's goals of expediting construction and "hard-capping" costs did not account for the City's broad priorities in undertaking the OLRT1 project, which included not only financial responsibility, but also other important issues such as mobility, quality of resident life, and reliable transportation.
- The politicization of the OLRT1's budget and schedule resulted in additional pressures on the City, RTG, OLRT-C, RTM, and their subcontractors throughout the life of the project. Budget constraints became a driving force behind the RFP process, and the hard-cap approach to OLRT1 project costs left the City and RTG with less flexibility to implement the partnership philosophy that was initially intended. Campaign promises in 2010 created embarrassment when deadlines were missed in 2018 and 2019, which caused increased pressure on City staff, RTG, and OLRT-C.

Chapter Contents

4.0 Introduction

This chapter looks at the early project planning that the City undertook. This planning involved developing a preliminary estimate and schedule, at the same time as preliminary engineering was being done.

The City's budget for the OLRT1 project began to take shape in 2009 with the creation of what is called a **Class D estimate** (a preliminary estimate that has a 25 percent margin of error). This was a preliminary figure, not by any means a budget. The preliminary schedule for the OLRT1 project began to take shape in 2010, when the preliminary engineering work was being done. This chapter addresses the evolution of both the budget and the schedule.

It was entirely appropriate for the City to develop a preliminary estimate of the cost and time necessary for this project. It would be difficult to proceed without such estimates. Unfortunately, the budget and schedule became politicized in 2011 after the fall 2010 municipal elections. Mayor Jim Watson and the Finance and Economic Development Committee (FEDCO) directed that the OLRT1 project be brought in "on budget," despite the fact that there was no actual budget, only a preliminary estimate. This approach turned the existing 2009 Class D cost estimate, which was not designed or intended to be a budget, into a political imperative more in the nature of a "hard-cap" budget than a preliminary estimate (although, as Chapter 6 explains, the City retained discretion to commit to a higher price if none of the bids in response to the Request for Proposals, or RFP, came within the affordability cap). The Mayor also directed that staff find avenues to speed up the schedule.

These directives were set for political reasons: the Mayor had made campaign promises about the budget that he wanted to keep, and he wanted to push the schedule to ensure that the significant construction work would not interfere with Canada's sesquicentennial celebrations in 2017. The goals of expediting construction and hard-capping the costs did not account for the City's broad priorities in undertaking the OLRT1 project, which included not only financial responsibility but also other important issues such as mobility, quality of resident life, and reliable transportation. Senior City staff also felt this political pressure, and it affected their approach to the OLRT1 project.

While it is obviously appropriate, and indeed necessary, to have preliminary cost estimates and schedules, a public entity such as a municipal government must remain flexible in its approach to such matters and not become tethered to a particular budget amount too early in the process. Nor can it allow such issues to become politicized, although governments do not control the public's perceptions.

4.1 The City's Planning and Priorities

The first phase of the City's work on the OLRT1 project is referred to as the planning phase; it took place prior to Council formally approving the project. This work essentially took the project from a concept to a **functional design** (meaning that the project design is approximately 5 percent complete, which allows for preliminary engineering to be done to take the design to 30 percent complete, at which point the City could proceed with procurement).

The planning work included setting the priorities that would guide the City's development and oversight of the project. The City identified broad priorities, with the financial aspect being but one of the guiding principles. In addition to economic impact, the City prioritized environmental, social, and cultural considerations. The City's broad priorities made it clear to all concerned that while the budget was important, it was not the only consideration for the City; the City would also be mindful of quality of life, mobility, system reliability, and other factors that affected the City's residents and visitors.

John Jensen, Director of the City's Railway Implementation Office (RIO), told the Commission that the City believed that a broad set of policy priorities was required in order to serve the best interests of Ottawa's residents and visitors, and the best way to accomplish those policy priorities was by adopting a "partnership philosophy" toward the private-sector contractor (ultimately, RTG) and adopting a policy of "open, transparent communication" with the public. The partnership philosophy and policy of transparency with the public were not particularly important during the early planning phase being examined here (RTG had not even been engaged yet), but they became much more important as the project progressed. This is discussed in later chapters of this report.

The planning phase was led by Nancy Schepers, who was Deputy City Manager with responsibility for infrastructure, and Jensen, who was appointed as head of RIO. Schepers is a professional engineer, and Jensen's education is in transportation planning. They were well qualified for their roles.

Schepers authored a lengthy report that summarized the detailed studies that had been done (including a 134-page report by Delcan, a civil engineering firm), options considered, and rationale for what became the Confederation Line. The report was titled "Downtown Ottawa Transit Tunnel (DOTT) Planning and Environmental Assessment Study – Recommended Plan" and was released to Council on December 9, 2009. That

report described the nature of and rationale for the OLRT1 project as follows. (Note that it references station names – LeBreton and Campus – that are no longer in use, and that the length of the tunnel was later changed to 2.5 kilometres.)

> The substantive recommendation outlined in this report is to approve the recommended plan for the DOTT. The project is approximately 12.5 kilometres of new electrified light rail transit [LRT], between Tunney's Pasture and Blair Stations, primarily on the existing Transitway corridor. Thirteen LRT stations have been identified along this route, which includes four underground stations serving downtown and the University of Ottawa Campus Station in a 3.2-kilometre long tunnel. The DOTT's western portal will be located east of LeBreton Station near Brickhill Street and runs through the downtown core area until it veers south easterly and reaches grade at a portal south of Campus Station. In addition, the recommended plan includes a maintenance and storage facility to support LRT operations in the vicinity of St. Laurent Boulevard, south of the Queensway.…
>
> Transit through downtown accommodates over 10000 riders per direction during peak hours. Currently, transit service is limited to approximately 180 buses an hour along Albert and Slater Streets during peak times to meet travel demand. Effectively, the transit system has reached its capacity in providing Bus Rapid Transit service through the downtown to serve surrounding communities. The system will no longer be able to expand service beyond 2018.

Schepers's report was presented to Council on January 13, 2010 together with recommendations to approve the functional design for the LRT (among other more specific recommendations). Council approved that recommendation. That completed the "pre-approval" planning, and the project began to move toward preliminary engineering and other additional planning work that would take it to the point of being ready for procurement (which is addressed in Chapter 6).

4.2 Government Funding and Preliminary Engineering

The next stage of the planning work was the preliminary engineering phase, which would take the design from a functional design (approximately 5 percent complete) to approximately 30 percent complete, allowing the City to proceed with procurement. The preliminary engineering phase required the hiring of outside experts at a substantial cost (millions of dollars were spent on these experts). Before moving ahead with the preliminary engineering, the City wanted to ensure that the federal and provincial governments would, as expected, share in the OLRT1 project costs.

The process for obtaining federal and provincial government funding deserves some attention. The key early step in obtaining that funding is seeking and getting approval in principle for the project from senior government levels and coming to an agreement about the shared funding. In this case, the first approvals were delivered in September 2010. The federal and Ontario governments agreed in principle to each fund one-third of the $1.8 billion, which was the estimated cost at the time. (The City's preliminary cost estimate, discussed in section 4.3, was a total of $2.1 billion, but the federal and Ontario government funding was not available for some of the costs included in that figure.)

Two aspects of this joint funding had an important impact on the future progress of the OLRT1 project. First, the approvals in principle were based on a very preliminary cost estimate of $2.1 billion. Second, there was a hard cap on the $600 million from each of the federal and Ontario governments: any increase over the cost estimate, whether before or after the OLRT1 project going out to tender, would be for the City to bear. Taken together, these two aspects of the senior government funding put pressure on the City to meet a cost estimate ($2.1 billion) that was created at a time when the design was only 5 percent complete. In a later summary of lessons learned, the consultants Deloitte and Boxfish concluded in their review of the planning for this project that the senior government process for funding creates unhelpful constraints on municipal projects because of how early those approvals must be obtained in the life of the project.

The approvals in principle from the two senior governments allowed the City to fund the preliminary engineering work, which began in late 2010. The purpose of the preliminary engineering was to move the design forward to the point that a meaningful and informed

RFP could be issued as part of the procurement process. To undertake the preliminary engineering, the City retained CTP, a consortium of leading engineering consulting firms with worldwide experience developing transit systems.

4.3 Setting the Budget and Schedule

The expectation during the planning phase was that both the budget and schedule would change during the preliminary engineering work. This section explores how the preliminary estimates were created, and the next section looks at why the preliminary estimates did not change during preliminary engineering as anticipated.

The City prepared an initial cost estimate for the OLRT1 project of $1.4 billion in November 2008, but that did not include certain elements (such as land acquisition costs) and was made before even the functional design had been done. In October 2009, Schepers presented Council with a functional design cost estimate that included land acquisition costs and a refined construction cost based on the functional design. The 2009 estimate took the November 2008 estimate of $1.4 billion and added $140 million for land acquisition, $150 million for scope changes, $50 million for the project office (management) costs, $100 million for design changes, and $160 million for project planning for a total estimate of $2 billion. The 2009 estimate also added $100 million for contingencies. This produced a total estimate of $2.1 billion, which was broken down into the following components.

Project Estimate Presented 2009

Project Element	Refined Cost Estimate
Transit tunnel and underground stations	$735 million
Transitway to LRT conversion, Tunney's to Blair	$540 million
Maintenance facility and vehicles	$515 million
Property, public art, insurance	$160 million
Project office	$50 million
TOTAL	**$2 billion**
Project director's contingency	$100 million
TOTAL	**$2.1 billion**

The December 2009 "DOTT Planning and Environmental Assessment Study – Recommended Plan" confirmed the October 2009 $2.1 billion estimate and provided Council with the following additional information about the estimate:

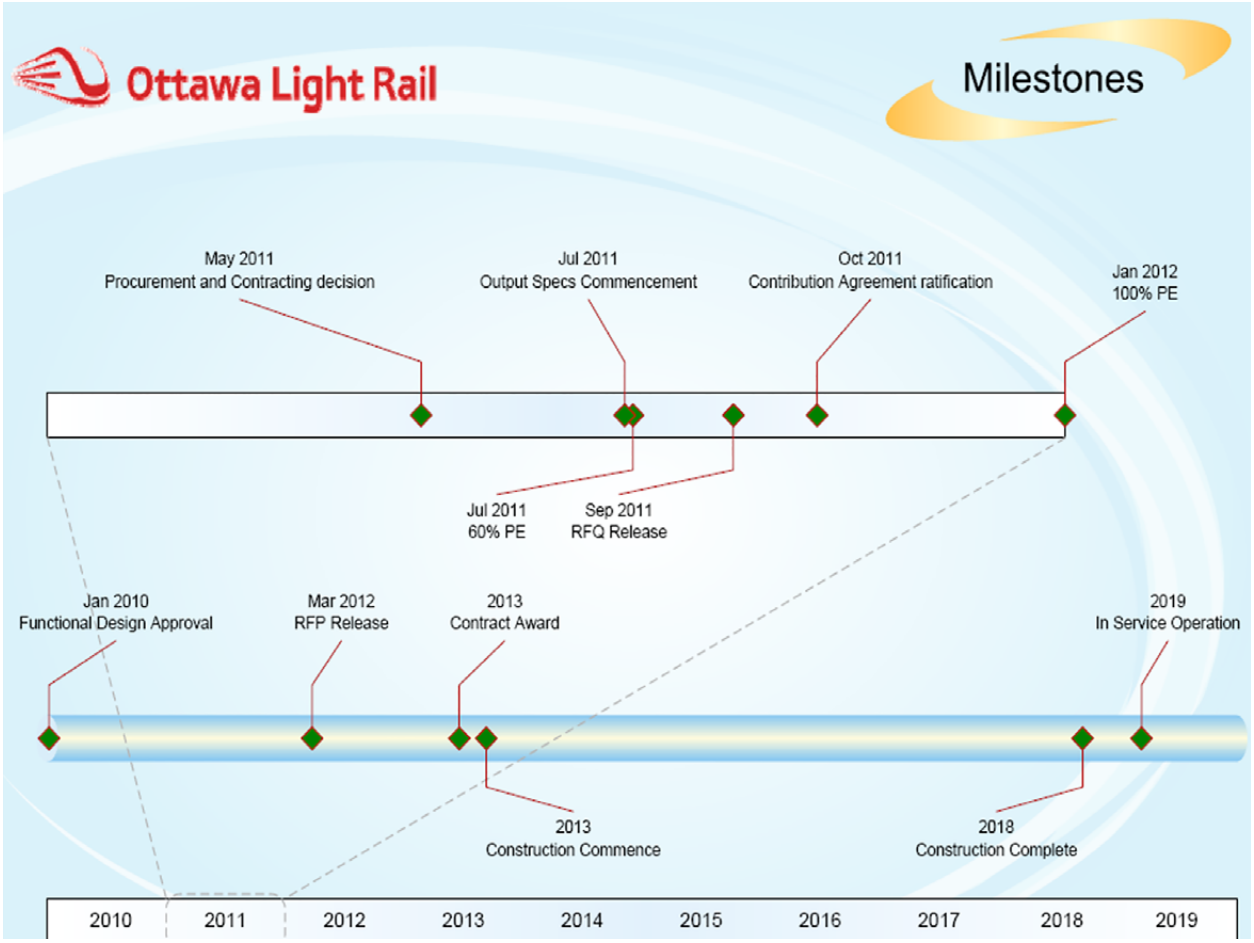
- That this was a Class D estimate, subject to variability of plus or minus 25 percent (meaning that the total variance from the lowest anticipated amount, 25 percent less than the estimate, to the highest anticipated amount, 25 percent more, was more than $1 billion);
- That this was an estimate that would change "as the project progresses through preliminary design"; and
- That the estimate did not account for inflation.

The 2009 estimate was approved by the City in January 2010 when Council voted in favour of the LRT plan with the $2.1 billion estimate. That estimate was set in 2009 dollars and did not account for inflation.

As described in section 4.4, that 2009 estimate of $2.1 billion nonetheless became the initial budget for the OLRT1 project. The Commission heard evidence that using such a preliminary estimate as the *initial* budget is relatively standard practice for municipalities. However, the City needed to respect that the $2.1 billion was a very preliminary estimate, with a 25 percent margin of error (plus or minus) and with an expectation that the number would change. As noted earlier, the estimate was derived before even preliminary engineering work, at a time when the design was only 5 percent advanced. It did not account for inflation and did not include any meaningful analysis of the construction design. This was something that senior City staff understood and appreciated. Schepers, who led the planning work, testified that she was not ready to commit to a budget at the time when the $2.1 billion estimate was put forward.

The preliminary schedule took more time to put together, evolving with the preliminary engineering work that began in late 2010 after the federal and provincial governments had committed to providing funding. The City's experts from CTP helped the City put together an estimated schedule, which was presented to Council in March 2011. That schedule contemplated awarding the contract and starting construction in early 2013, completing construction in 2018, and opening for public service in 2019, as shown on the timeline of milestones in Figure 4-1.

Figure 4-1:
OLRT1 Schedule Estimate Presented March 2011



PE = Preliminary Engineering **RFQ** = Request for Qualification **RFP** = Request for Proposals

Source: City of Ottawa

4.4 Political Pressure on the Budget

The preliminary engineering work being done from late 2010 through 2011 coincided with the introduction of a new municipal government after the fall 2010 municipal elections in Ottawa. Necessarily, the OLRT1 project was a significant focus for the new municipal government, which included a new mayor and several new councillors. Mayor Watson and several other candidates had run on a platform promising to complete the OLRT1 project "on time, on budget."

After he was elected, Mayor Watson began to direct City staff overseeing the OLRT1 project to act in accordance with the "on time, on budget" mandate. The most significant step was to direct that the preliminary engineering proceed with a "design to budget" philosophy, meaning that the design would be changed to accommodate the $2.1 billion estimate, rather than the estimate accommodating the best design or even cost and design being managed in tandem to accomplish the City's broad priorities. The $2.1 billion estimate that had been approved in 2010 thus became the budget for the project. City witnesses told the Commission that the $2.1 billion was a target to work toward but not necessarily a hard budget. However, the directive from the Mayor's office to bring the project in "on budget" almost certainly had a significant impact on staff, and contemporaneous correspondence indicates that staff were pushing to meet that budget. The affordability cap, discussed in Chapter 6, put in place during the procurement process also suggests that the $2.1 billion figure was treated as a hard line despite some discretion to exceed technically having been reserved.

There is, of course, nothing wrong per se with elected officials directing senior staff to manage budgets carefully. However, the Mayor's "design to budget" directive was a mistake for three reasons.

First, it pressured staff and, for all practical purposes, constrained the City to that $2.1 billion figure that was not a budget at all, but rather an early estimate provided before any preliminary engineering was done, one that was subject to a 25 percent margin of error and did not account for inflation. Schepers stated in her testimony that it would be irresponsible to use the estimate of $2.1 billion given in late 2009 as a budget, but that is unfortunately precisely what Mayor Watson directed be done.

Second, the City's senior staff and independent experts expected the $2.1 billion figure to change as the engineering and design work was completed, but Mayor Watson's

mandate turned that expectation on its head: rather than the budget changing to meet the best design, the design would change to meet the budget. The Commission received evidence from City witnesses that there would have been opportunities to reconsider the budget had that been necessary, and indeed the key documents did retain discretion. There is, as the City notes, nothing inherently wrong with elected officials seeking to ensure that budgets are adhered to. The officials' conduct becomes a problem on this particular project because it went beyond general oversight of budget and strayed into interference for political purposes.

Third, although the Mayor and Council were rightly involved in managing the City's budget, they did not have the expertise necessary to determine when and how the budget for this specific project should be fixed. Elected officials interfered with the work of experts on the largest and one of the most important infrastructure projects in the City's history, one that had been initiated to meet the broad set of policy priorities described in section 4.1. That interference put pressure on City staff to achieve particular results (meeting the $2.1 billion cost estimate), because those results had been the subject of political promises by elected officials.

The same pattern played out with the OLRT1 project schedule. Although the March 2011 FEDCO presentation of the schedule devised by the City's experts suggested that the OLRT1 project would open to the public in 2019, Mayor Watson directed RIO to review every possible way to accelerate the schedule. The rationale for this drive to accelerate the schedule was political: Mayor Watson wanted construction in the downtown area essentially complete by 2017, in time for Ottawa's celebration of Canada's sesquicentennial. RIO worked with the City's consultants and, through design changes that the consultants identified and through a compression of the procurement schedule, cut 12 months from the schedule that CTP had created. The principal design change was to change the parameters for the tunnel, including by making it more shallow. The design changes were then presented in a report to the FEDCO, which was available to Council.

4.5 Conclusions regarding the Budget and Schedule Process

The evidence with respect to the process for developing and setting the budget and schedule for the OLRT1 project leads me to three main conclusions.

First, the emphasis after the 2010 municipal elections on the budget as the driving force behind the OLRT1 project planning was too narrow. The City had set a broader scope of priorities, as reflected in the Project Charter, that addressed the best interests of the people of Ottawa. These priorities included reliable transportation, mobility, and other important non-financial imperatives. Those broader priorities were lost when the "on time, on budget" mantra began to drive decision-making.

Second, it was appropriate to have a cost estimate early in the process and to begin formulating a budget. As then–City Manager Kent Kirkpatrick told the Commission during his formal interview, the City and its consultants needed a "baseline budget" to be able to perform other analysis, such as studies of value for money. However, the City should have remained aware of the shortcomings of the early Class D estimate rather than becoming fixated on the preliminary figure as a budget and adopting a "design to budget" approach. Deloitte and Boxfish's 2015 "Lessons Learned" report is correct in concluding that setting the budget too early presents challenges for implementation.

Third, the budget and schedule became politicized after the fall 2010 municipal elections. Whereas City staff saw the 2009 cost estimate as just that, an estimate, the new Mayor turned it into a political promise, despite his not having the expertise to define the OLRT1 project budget.

The upshot of all this is that the budget and schedule became flashpoints going forward for the City, RTG, and RTG's subcontractor Ottawa Light Rail Transit Constructors (OLRT-C). Campaign promises in 2010 contributed to the embarrassment of missed deadlines in 2018 and 2019, as well as the resulting pressure to expedite testing and open the OLRT1 line to the public. Budget constraints became a driving force behind the RFP process, and the hard-cap approach to the OLRT1 project costs left the City and RTG less room to implement the partnership philosophy that senior City staff understood was important from the outset. One cannot escape the conclusion that some decision-making in 2010–2011 during the preliminary planning imposed constraints on

the parties that continued to be felt in 2018 and 2019. At a general level, the "on time, on budget" mantra that characterized 2010–2011 limited the City's flexibility in later years and increased public pressure in 2019. Evidence given to the Commission showed that the significant pressure to meet the $2.1 billion estimate resulted in design decisions, including choices about platform design, that contributed to the reliability problems after the public launch of the OLRT1.

Recommendations

See recommendations #1–16 and 45–47 in Chapter 17.

Chapter 5
The Procurement and Delivery Model (2010–2011)

Key Findings

- The City lacked the procurement experience for a project of this magnitude. It engaged Deloitte and Infrastructure Ontario to advise on the best procurement approach. Following their advice, the City adopted a public-private partnership (P3) delivery model – namely, the design-build-finance-maintain (DBFM) delivery model.
- The City saw the DBFM model as the best option to meet its key objectives of maintaining cost and schedule and to guarantee Ontario's funding contribution.
- P3 models have both advantages and disadvantages, both of which were borne out on this project. The model successfully transferred risk to the private sector and resulted in significant cost savings for the City. However, the City had limited control over the project, and the project now risks being operated and maintained through a largely dysfunctional partnership.
- P3 contracts of the size and duration of the OLRT1 are increasingly uncommon. Other major infrastructure projects in Ontario have been broken into smaller contracts and run over shorter periods (with the possibility of extension). In other jurisdictions, a different model is used.
- For future projects, governments should avoid tunnel vision and consider objective criteria to select the best model. These criteria include not only cost and schedule, but also aligning the interests of the parties, government control, flexibility to extend or alter, and above all, the public interest.

Chapter Contents

5.0 Introduction

When a government plans for a large public infrastructure project, it must determine the best option for ensuring that the project is completed according to the project requirements, which include budget and schedule. The various methods to meet those requirements are referred to in this report as delivery models. This chapter first reviews some public-sector-led delivery models. It then considers the underlying rationale for and history of public-private partnerships (P3s), along with their advantages and disadvantages, followed by a discussion about the project delivery model chosen for the OLRT1 project. Finally, because the infrastructure construction market has changed since the building of the OLRT1 project, this chapter discusses the future of the procurement of significant infrastructure.

Governments in Canada have used traditional, public-sector-led approaches for decades, contracting with a number of private corporations to deliver a large-scale infrastructure project. More recently there has also been the emergence of P3s, which bundle some combination of facility design, construction, financing, operations, and maintenance into a single contract with a single private-sector partner.

On the OLRT1 project, the City lacked the expertise to choose the appropriate project **delivery model**, so it turned to Deloitte, a consultancy firm, and Infrastructure Ontario, a Crown corporation, for assistance. Infrastructure Ontario and Deloitte advised the City to procure the OLRT1 using a **public-private partnership**, or **P3**, approach. Ultimately, the City adopted a P3 project delivery model; more specifically, the City decided to use a **design-build-finance-maintain (DBFM) delivery model**. Under the DBFM

model of P3, the City was effectively contracting out these critical components of the OLRT1 project – the design, building, financing, and maintenance components – to the private sector. The City's choice was driven primarily by its desire for cost certainty, the imperative of transferring as much risk as possible to the private-sector participants, and political commitments certain City officials had made regarding the OLRT1 project budget. This chapter will return to those factors again.

The significant involvement of the private sector in this project has been a point of controversy in this Inquiry. The City and Infrastructure Ontario take the position that the DBFM model worked well and protected the financial position of the City. Amalgamated Transit Union Local 279 submits that the involvement of the private sector through this model created problems in the construction phase and has been an ongoing source of challenges during the operation of the OLRT1 system.

5.1 Public-Sector-Led Procurement Models

Traditionally, governments in Ontario were primarily responsible for the construction, operation, and ongoing maintenance of public infrastructure projects. Think of the construction of the 400 series of highways. Until the building of Highway 407, the construction and operation of these public infrastructure projects were government-run, and the private sector's involvement was limited to providing various services; private-sector companies competed for and contracted with the government to complete parts of the projects. Thus, private enterprises were involved as providers of services in such public projects, but the projects were considered public undertakings for which the public held governments responsible. The City of Ottawa, for example, used public-sector-led approaches for most of its infrastructure projects until the OLRT1 and certainly had no experience with a P3 delivery model on a project of this magnitude.

While there are many public-sector-led project delivery models, I will highlight only two: the design-bid-build approach and the design-build approach. My examination of these models is not meant to be comprehensive. Instead, I consider them only to later contrast them with the P3 model, which features more private-sector leadership.

5.1.1 Design-Bid-Build

One of the most widely used traditional delivery models is the design-bid-build model. In this approach, the government agency procures the different parts of the project work separately, which means hiring and working with the different parties required to perform the work. Usually, a public authority hires parties for the design (including professional architects and engineers) and then takes the design to market and seeks to contract with a builder, who then bids to build the project for a set price.

Under this approach, a public agency either does the maintenance and operations for the resulting project itself, in-house, or it contracts with a maintainer and an operator for those tasks. Because of the separate relationships that are part of the design-bid-build model, the government agency works directly with parties for the design stage and for the building stage, and manages the work under those contracts. That direct management role has both advantages and downsides or risks.

One of the primary benefits of the design-bid-build model arises from the government's direct involvement in procuring various parts of the project. Under this approach, the

government agency has direct commercial relationships with key contractors and has responsibilities for coordination and integration; therefore, the government agency should have a thorough understanding of project issues and challenges. These direct commercial relationships will generally give a public agency greater control, because it is leading the project and has more opportunities to intervene in the project. In short, because the government is involved in the detail and activity of the contracted work – is on the ground, so to speak – it can identify issues that arise during the course of a project. And because it has direct relationships with contractors, it can resolve those issues.

A downside of managing multiple contractual relationships is that a government agency may be ill suited for this complex role. For example, a public authority may not have sufficient in-house expertise to coordinate its contractors and integrate their interrelated project work. This inexperience may result in escalating costs, inefficiencies, mismanagement, and schedule overruns. Governments can retain outside experts and advisors to fill their experience gap in complex project management, but this can increase upfront project costs and adds another layer of commercial relationships that require carefully setting expectations and incentives to ensure goals are met.

The design-bid-build approach to infrastructure delivery can also misalign the interests of different project functions. For instance, if a design error is identified during the construction phase of a project, a supply chain problem develops, or a late design change is called for by the public client, the builder may not be incentivized to find the most cost-optimal response because the project is already under way, and the public owner will have few or no options. Thus, because the design-bid-build model separates two project roles – design and build – each contracted party might be less likely to find solutions that align and is more likely to point a finger at the other. This separation of roles and responsibilities between designer and builder can lead to a high number of expensive change orders and disputes over those costs. Inefficiencies and cost escalations might result.

5.1.2 The Design-Build Approach

The design-build model, in theory, remedies some of the coordination and integration risks associated with the design-bid-build approach by bundling the two project roles (design and build) into a single contract with the procuring party (that is, the public agency). This approach attempts to align the designer's and builder's different roles and interests through the technique of **teaming** interrelated roles. The designer and the builder work together during the project's design and construction phases, and coordination and integration are enhanced. In theory, this can result in design and construction innovations that address coordination and integration challenges or budget constraints. This model has the benefits of the design-bid-build model, because the government continues to play an important role in supervising the project.

5.1.3 Downsides of Traditional Project Delivery Models

In addition to noting the drawbacks discussed above, critics of the design-bid-build and design-build approaches argue that the design and construction of the infrastructure are not done with financial incentives to ensure long-term reliability, quality, and performance. This criticism is addressed further in section 5.2.2.

Another criticism of these approaches is that the risk transfer associated with a failure of coordination and integration is not properly secured. Thus, if risks materialize and result in significant cost escalations, there is a chance that the builder will walk off the job in breach of the contract, because it is more economically advantageous to do so than to perform the contract.

5.2 Public-Private Partnerships

P3s are contracts between governments and private-sector partners that provide for the delivery of public assets (infrastructure) and/or asset-related services, such as maintenance or operations. P3s generally have the following characteristics:

- *Teaming:* A single private-sector partner is responsible to the government for different project delivery elements, such as design and construction, project financing, operations, and maintenance. The private-sector partner is generally a consortium of firms that subcontracts aspects of this work to other private-sector service providers.
- *Contract length:* The length of time that the private-sector partner is contracted to operate or maintain the infrastructure asset in a P3 contract typically lasts from 25 to 35 years. At the end of the contract, control of the asset is transferred back to the government owner, which can then either operate the facility itself or contract out the service to a private operator.
- *Contract requirements:* Government agencies provide requirements for how the asset must perform, leaving the question of how to create an asset that can achieve the required performance to the private-sector partner.
- *Payment timing:* The government makes payments to its private partner at defined stages throughout the project, often including payments made after the completion of construction. In Ontario, the government typically makes payments to its private partner at defined stages, including during construction and over the long-term operations and maintenance period of the contract.
- *Project financing:* The private partner is required to obtain its own financing to cover the costs of delivering the asset, and recovers those costs through payments from the government through the life of the project and after the asset has been delivered. In Ontario, the private partner typically recovers those costs through payments from the government that are spread out over the length of the P3 contract.
- *Control:* The private partner essentially controls the project delivery. The government sets the performance standards up front, has rights to information during project delivery, and can levy deductions for poor performance, but it has limited ability to intervene in the private partner's work.

This section reviews the evolution of P3s in Canada and provides an overview of advantages and disadvantages of P3s.

5.2.1 Underlying Rationale and History

P3s are commercial arrangements for procuring and delivering large-scale public infrastructure projects by partnering with the private sector. Under the P3 model, the government agency contracts with a private company or group of companies (called a consortium) to deliver a final infrastructure product. The private company also usually has an ongoing role after construction in maintaining or operating the infrastructure for a concession period of anywhere from 25 to 99 years, after which the asset reverts back to public control. In principle, each partner in the public-private partnership brings its skills and experience to the project: the public partner provides project requirements; the private partner brings technical expertise in its areas of responsibility on the project – designing, building, and possibly financing, maintaining, and operating.

First developed in the early 1990s, the P3 delivery model was designed to address significant and often unpredictable cost escalations and schedule overruns that accompanied the delivery of government infrastructure projects under traditional commercial arrangements. Thus **cost certainty** and **schedule certainty** are key goals of P3 projects.

Sometimes referred to as the first wave of P3s, the P3 models in the early 1990s were also used to deliver public infrastructure without adding to public debt. These early P3s were often structured to include public user fees and involved partial or total **private ownership**.

During the first wave of P3s, challenges arose because public agencies procuring infrastructure did not have adequate experience with this model. To address that issue, governments across the country created agencies to help public authorities with P3 infrastructure projects. These agencies were set up to focus on P3s and develop expertise in that area to serve various government agencies. For example, British Columbia created Partnerships BC (now Infrastructure BC) and the federal government created PPP Canada.[1] In Ontario, Infrastructure Ontario was established by provincial statute in 2005 as an arm's-length Crown agency and corporation.[2] Since its inception, Infrastructure Ontario has promoted the use of P3 models for the delivery of major government infrastructure across government agencies.

P3 models in Canada have changed since the early 1990s. In response to public frustration with the **privatization** of the underlying infrastructure, the P3 approach evolved in the early 2000s so that the public sector now keeps full ownership of the infrastructure. This second wave of P3s focused on a technical, commercial solution to the cost and schedule issues associated with traditional project delivery models. So the focus became less on avoiding an increase in the public debt and more on the efficiencies that private-sector leadership is supposed to bring to infrastructure projects.

Though P3s have changed over time, they are all based on the belief that the private sector, working in market conditions, is better positioned than governments to allocate resources efficiently and deliver infrastructure. The theory is that private actors that are profit-driven will be more incentivized to allocate resources in cost-effective ways. In addition to efficiency considerations, a P3 model structures the commercial arrangement between the public and private sectors to shift the responsibility for design, construction, maintenance, and/or operational risks to the private sector. The private partner assumes such risks, and is paid a premium to do so, because the management of those risks aligns with its expertise, experience, and incentives.

A public authority might, for different reasons, bundle some but not all project roles, so there is no single, one-size-fits-all P3 procurement and delivery model. Instead, various arrangements are used to better align with different priorities and respond to different project circumstances. While design and construction are always bundled into a P3, maintenance, operations, or both may also be added. Because there are different conceivable bundles or teams in a P3 agreement, there are a variety of P3 models. They have in common that they bundle interrelated project roles to different degrees.

5.2.2 Advantages and Disadvantages of P3s

Like all procurement models, P3s have advantages and disadvantages. This section outlines five perceived advantages of P3s. I also consider some potential problems related to these perceived advantages.

Generally, P3s are more costly up front than traditional project delivery models. This is because governments pay premiums to transfer project risks to the private sector, and because P3s involve higher transaction, monitoring, and borrowing costs than those associated with traditional models. Despite these higher costs, P3s are intended to deliver better value through private-sector innovation, incentivizing the delivery of assets designed and built to perform over the long term, and achieving effective risk transfer to the private partner.

First, as discussed above, one of the principal benefits of the P3 model is the **transfer of risks** to the party with the experience, expertise, and incentive to handle them. Because the public authority is not responsible for integrating or coordinating interrelated project work, the associated risk is transferred to the private partner, and the government agency benefits from a more significant measure of cost and schedule certainty than it would from a public-sector-led approach. Other project-related risks, such as geotechnical risks, can be and often are allocated to the private-sector partner through negotiation and express provision in the P3 agreement.[3]

There are three principal problems with transferring risk through the P3 model. First, the risk transfer comes at a significant cost, as the private sector charges premiums to accept risks. Second, the P3 model minimizes the public partner's role in and direct control over the project, especially in interacting with contractors; the government entity is effectively handing the day-to-day control of the project to the private partner. Therefore, the public party has less control over the project, can see less, and has less involvement in responding to issues that arise during the course of the project. In other words, the trade-off for avoiding risk is a loss of direct involvement and control over the project. Third, in practice, P3s may not protect governments from key risks such as schedule delays. On high-profile projects, even when responsibility and risks are transferred contractually to the private sector, governments will often be held responsible in the public eye for delays or service that falls below expected standards.

The second advantage with a P3 is that it should create a structure where all parties are incentivized to work together to maintain and operate a superior infrastructure product over an extended period. For example, adding the role of maintainer and/or operator to the role of constructor incentivizes the consortium to build and deliver a project with long-term quality, reliability, and high performance. The consortium is collectively responsible for the project's delivery, and the maintainer has an interest in having the project designed and built in a manner that will make its role profitable. Thus, the involvement of a maintainer and/or operator addresses the concern that traditional delivery models do not effectively incentivize long-term quality and reliability.

A downside of a long-term commercial relationship is that sometimes parties in a partnership find that they cannot work together effectively. Relationship failures may occur between the government and its private partner, within the private partner, and/or between the private partner and its subcontractors. Any such inability to work together may only become apparent after the project agreement and subcontracts are signed. This is understandable, because in many cases, the parties that bid on a project have little or no existing relationship with the government entity or with the companies that they subcontract with to provide construction, maintenance, and operation services. The risk is that the contractual players are forced to work together for decades, even though they cannot work together effectively.

Third, another potential benefit associated with the P3 delivery approach has been referred to as **private-sector innovation**. When design, construction, maintenance, and/or operations are bundled into a single contract, it is supposed to create creative tensions between separate project functions to deliver a good product at the lowest price – for example, as Infrastructure Ontario's Rob Pattison explained, "The design builder and the maintainer will be in tension to make sure that what the design builder delivers

will be maintainable for the price that the bidder is bidding for 30 years and will be a safe, durable, high-quality, reliable product." Thus, when the designer, builder, and maintainer are teamed under a single contract, creative tensions between those roles are thought to enhance both economy and quality. Synergies between the builder and designer are supposed to result in economically efficient solutions at the project's design and construction levels that do not diminish quality and performance, and the maintainer is incentivized to ensure that the designer and builder deliver a project that is economical to maintain. In other words, the interests of the members of the consortium are aligned.

There is, however, a tension between the promise of private-sector innovation and the extent to which the public authority procuring the project may be overly prescriptive in the design and features of the project. So, if a public entity that owns a project is inflexible about how it is constructed and operated, that can run counter to the innovative ideas that the private sector is supposed to be developing. The more demands that the public agency places on the infrastructure project's design and features, the more constrained the P3 team is in finding solutions available to it to deliver on price and quality. Conversely, the fewer constraints on the project's design and features, the greater the room for the P3 team to use its expertise to develop solutions that ensure a quality project is delivered economically. Further, while P3 contracts aim to align the interests of the public partner and the private partner, the private partner will always be driven to maximize its profit. As a result, private-sector innovation may lead to fiscally efficient solutions that do not serve the public's interest in the asset.

Fourth, another P3 model benefit is that it enforces risk transfer with a **payment mechanism** that delays payment until after the completion of construction or certain progress has been achieved. In models that incorporate long-term financing, the payment mechanism can delay payment over the life of the project's maintenance and/or operations term. A delay of payment requires the private partner to inject its own equity into the project and borrow private capital for construction and maintenance. Thus, a delayed payment mechanism serves as performance security, because the private partner uses its capital and debt to finance its progress toward its obligations under the project agreement. The private partner goes "under water" financially, paying out more money than it receives in the early stages of the project. The private partner depends on payment from its public partner to repay its lenders. This mechanism makes it much less likely to make economic sense for a private partner to walk away from the project. The mechanism in the project agreement for delayed payments also creates a cushion so that, if the private partner walks away from the project, the funds held back can be applied to replace the contractor.

While the delayed payment mechanism works in theory, practical difficulties may develop. For example, if the cost to fix problems exceeds the damages for breaching

the project agreement, the private partner might decide not to perform the agreement and walk away. In addition, in cases where project progress is significantly delayed, the financial pressure on the private contractor could become so great that the contractor is rendered insolvent. In either case, the risk is not effectively transferred from the public partner to the private partner.

Fifth, including **private financing** adds third-party scrutiny or oversight to the project, which addresses, to some extent, the issue of diminished transparency that accompanies a move away from the traditional delivery models. Private lenders conduct due diligence on the project to determine if the project is feasible. Then the private lender and the private partner enter into a credit agreement that gives the lender, among other things, monitoring rights. The private lender will hire a technical advisor that analyzes the contractual structure, conducts due diligence, and reviews progress to protect the lender's capital from the risk of the project failing. Along with the right to monitor, credit agreements often contain the right to step in, allowing the creditor the right to intervene in the project by replacing contractors if necessary for the project's success. The creditors also have the benefit of what are called "material change provisions," which provide that their consent is required to make significant changes to the project.

The downsides with creditor involvement in infrastructure projects are twofold. First, the creditors are motivated by their commercial interest (to make as much profit as possible on the transaction), and this commercial interest might not align with the public interest. Second, lender consent rights limit the public agency's ability to make changes to the project, because the private lender's consent is required.

5.3 Ottawa Selects a Public-Private Partnership Delivery Model

There is evidence that the City initially considered a traditional approach to building the OLRT1, which is largely consistent with its infrastructure experience before that project. The move to a P3 model was a big step for the City. The City recognized that it did not have the necessary expertise to analyze its delivery options properly. It was unfamiliar with the P3 model for delivering public infrastructure of this scale and engaged several advisors, including Deloitte, to assist. Among other things, the City wanted to ensure that the procurement approach selected was best suited for its budget and schedule commitments.

5.3.1 Deloitte

The City hired Deloitte in 2010 to advise on procurement and financing for the OLRT1 project, including assessing the City's procurement options and advising on the commercial structure, monitoring costs, and funding negotiations with senior governments. In February 2011, Deloitte delivered a report on the City's project delivery options. The report considered and ranked 11 potential project delivery options according to the City's stated priorities. The City's top priorities were the project's total capital cost, operations and maintenance costs, and cost certainty.

As part of its report, Deloitte conducted what is called a **value for money assessment**, which quantified the value associated with transferring project risks to the private sector as compared to a traditional model. Because a P3 model could transfer more risk from the public partner to the private partner, it tended to score higher on a value for money assessment. However, the P3 model also increased the project's cost. In other words, by transferring some responsibilities and risks to a possible private partner to achieve cost certainty, the City would incur extra planned costs. I note that the public's service quality expectations ranked low on the priority list, with the City assigning only 4 points out of 100 for that item.

Of the 11 models identified, Deloitte short-listed 4 models for the City's consideration. The short-listed models were all P3s, and they all teamed design, construction, and maintenance. Deloitte also indicated a preference for a P3 model that included both

short-term and long-term private financing. In other words, this left the DBFM approach and the design-build-finance-operate-maintain (DBFOM) model on the table for the City's consideration.

In the Commission's view, the Deloitte report – informed by the City's priorities – did not fully consider the disadvantages associated with a P3 model for the delivery of the OLRT1, particularly in the context of the transit sector. For example, likely because the City prioritized cost considerations, the report did not highlight the diminished visibility and control associated with a P3 procurement model, and it did not give sufficient attention to potentially diminished flexibility, particularly as it related to the inclusion of maintenance. Because Deloitte recommended that maintenance be included in the delivery model, any expansions to the light rail system would require the City to either engage the same maintainer or engage a new maintainer, which would cause coordination and integration challenges. In addition, if an expansion requires changes to existing contracts governing the delivery of the project, the private lenders' consent may be required to make those changes, further limiting flexibility. On review of the Deloitte report, I was left with the distinct impression that the downsides of proceeding with a P3 were not thoroughly analyzed.

5.3.2 Factors That Led to a Public-Private Partnership

The City was initially reluctant to adopt a P3 approach, because the interest payments associated with the private finance component of the deal would be factored into private-sector bids for the project, thereby risking escalations to the $2.1 billion budget (described in Chapter 4). However, the City ultimately decided to bundle the designer, builder, and maintainer into a single contract and required the consortium to take out short- and long-term private financing to enforce the risk transfer. That decision was made against a backdrop of cost and time pressure that was part of the politicization of the OLRT1 project's budget and schedule, a strong desire inside the City to transfer the economic risks associated with the project onto the private partner, and a concern that the Province of Ontario's contribution commitment was at risk without the adoption of a P3 approach for the delivery of the OLRT1. These reasons for the City's decision will be discussed below.

5.3.2.1 Ottawa Prioritized Cost and Schedule

Many objectives were to guide the OLRT1 project, but (as noted in Chapter 4), two priorities became the focus – the project's budget and schedule – and these priorities were increasingly politicized. That, along with the expert advice the City received and the belief held by at least some at the City that senior government funding was contingent

upon the use of a P3 delivery model, contributed to the City's tunnel vision about the appropriate approach to the delivery of the OLRT1. Given the political directive to complete the OLRT1 project "on time and on budget," it is no surprise that the City was focused on a P3 approach for the OLRT1 project.

Past projects and academic research show that the City's concerns about schedule and budget were valid. As Professor Bent Flyvbjerg told the Commission, 80 years of project data show that, on average, infrastructure projects have run over budget and taken longer than expected to complete. The City knew that P3 approaches generally have fewer cost escalations and schedule overruns tied to the integration and coordination failures that are typical of traditional approaches. Further, other risks, such as the geotechnical risks, were theoretically easier to transfer if the City took a P3 approach to the project. Given Mayor Jim Watson's public commitment that the OLRT1 would be delivered on a $2.1 billion budget and on a predictable and timely schedule, it made good sense to investigate a P3 approach. Indeed, the City's "on time, on budget" mantra echoes Infrastructure Ontario's marketing material.

John Jensen, the Director of the Rail Implementation Office (RIO) who was responsible for OLRT1's procurement, gave evidence that the City was especially mindful that a P3 approach to procurement could reduce the cost uncertainty and schedule uncertainty associated with traditional approaches and, from that perspective, would offer the City the best risk profile. Remo Bucci, a civil engineer with Deloitte who was providing procurement advice to the City, testified that the City wanted to avoid the financial challenges associated with failures in integration and coordination. He also testified that cost was the City's top priority regarding the selection of the procurement and delivery model. Jensen's evidence was that a P3 teaming approach also allowed for parallel work that might otherwise have to be done sequentially, speeding up the project schedule. Jensen explained, "In a traditional design/bid/build, you are running separate procurements for everything and … you can't necessarily overlap parts. You might have to do them sequentially, whereas a design/builder can do things in parallel, change the order … respond to issues more quickly because they can do a quick design alteration and then adjust it with their partners." Those schedule efficiencies would further the City's priority to complete the project in a timely manner.

5.3.2.2 Belief That Provincial Contribution Depended on P3

Ontario made a tentative funding commitment to the City for the OLRT1 project in December 2009. Though the Commission heard evidence that Ontario had not mandated the use of a P3 delivery model as a condition for funding the OLRT1, it is clear that several City staff believed that provincial funds were in jeopardy if the City did not adopt a P3 delivery approach.

For instance, Nancy Schepers, the Deputy City Manager, gave evidence that the City was required to put the OLRT1 project through a P3 screen. Schepers understood that a P3 screen required the City to conduct a value for money assessment and that, if that assessment preferred the P3 approach to other project delivery options, the City would need to have good reasons not to use a P3 approach. Similarly, Chris Swail, the manager of Schepers's office at the time, testified that he believed that the P3 delivery model was required if supported by a value for money assessment.

Adding further pressure to adopt a P3 model, Infrastructure Ontario – which, as noted above, is a provincial Crown corporation – also made a presentation to the City highlighting the benefits of a P3 model. It should be noted that it was only after the City adopted a P3 model that Ontario and the City formally executed a Contribution Agreement, committing the province to provide funding.

Regardless of whether a P3 model was mandated, it is clear to this Commission that City staff believed that the provincial contribution was at risk if the City did not adopt a P3 approach. This was an obvious incentive to avoid other project delivery models and to favour a P3 model. It is reasonable to infer that these factors influenced the City's procurement decision.

5.3.3 Operations and Maintenance in P3s

Advocates for the P3 model promote bundling maintenance and/or operations into the commercial structure of the project so that the private partner takes over these roles. The thinking is that doing so incentivizes the private partner team, during the project's design and construction phases, to account for and address the project's long-term life cycle and operational performance requirements, thereby improving reliability, quality, and performance over the life of the project. Critically, however, the inclusion of maintenance and/or operations into a P3 project agreement adds a long-term dimension to the commercial relationship, as both services involve long-term supply terms with the private partner providing services (and receiving payment) long after the project has been delivered to the public authority.

Deloitte had initially determined that a P3 model that teamed operations with the other key project roles (the DBFOM model) best met the City's priorities. Specifically, Deloitte's analysis concluded that the DBFOM model resulted in the best value for money savings and that the privatization of the system's operations would enhance service quality, because performance-based payment and monitoring systems would better incentivize service performance; those options would not be available if the public sector retained operations. On June 29, 2011, Deloitte delivered a supplemental letter to its February

2011 procurement options report to the City. Deloitte's June 2011 letter provided its revised opinion that the DBFM model – without the O, operations – was the preferred option for the OLRT1 project.

The City's selection of the DBFM delivery model, rather than the DBFOM model, was effectively made by the City's Executive Steering Committee. That decision was based on several factors. For one, the City wanted to have continuity between the operators of the different transportation modes – the bus routes and the light rail trains – as well as continuity along different segments of the light rail train system, as there were plans to eventually extend the rail line. The City was concerned that if multiple operators ran different parts of the City's transit system, it would introduce the risk of coordination issues.

The City also had significant labour relations concerns if it privatized operations. Specifically, because OC Transpo is a unionized workplace, the City had concerns that privatizing the OLRT1 system's operation might breach the collective agreements already in force in the workplace. Indeed, the City had received a legal opinion on the matter that concluded there was a risk that an adjudicator would find that privatizing the LRT operation would be in breach of the workplace agreements.

The concerns related to system continuity and potential labour relations issues drove the City's decision to exclude operations from the delivery model. This decision was reinforced by the City's view that there were insignificant savings to be gained by bundling operations into the delivery model. However, bundling maintenance into the delivery model was considered an option. In other words, while OC Transpo would be the operator, maintenance would be privatized, even though that would require significant work to coordinate and integrate between the private partner and OC Transpo, as the operator. The evidence suggests that these coordination and integration issues were not given sufficient attention. Further, these issues would only be amplified by the compressed timeline from testing to public service (revenue service).

Concerning maintenance, under the Project Agreement, the City has no direct control over the maintenance of the OLRT1 system. While the inclusion of maintenance into the P3 private-sector team is supposed to incentivize quality, the long-term nature of the maintenance terms also increases the importance of a good working relationship between the public partner and the private partner responsible for delivering the infrastructure. If that relationship sours, as it did on the OLRT1 project, the risks of project dysfunction are amplified over the long term.

It is also noteworthy that including maintenance and/or operations into the P3 model, particularly in the transit context, gives the successful bidder an advantage in securing the maintenance and/or operations contracts for project expansions, as there are

clear costs to coordinating and integrating if different maintainers and/or operators are involved. That advantage for the initial private partner potentially has a dampening effect on the competitive procurement process.

5.3.4 The City Formally Adopts the Design-Build-Finance-Maintain Model

In July 2011, Schepers submitted a report to City Council on implementing the OLRT1 project. The report provided Council with an update on the OLRT1 project's progress and included several recommendations. Among other things, the report recommended that Council approve the DBFM model for the OLRT1 project, promising several benefits. The report highlighted the benefits of private financing and emphasized that long-term financing would "harness the full benefit of private sector management and innovation." It went on to note that Infrastructure Ontario's view was that including private finance in the delivery model would reduce overall planning, design, project management, and construction costs, given the competitive bidding process and upfront due diligence associated with bidding on the project as a P3.

The report also recommended that the City retain Infrastructure Ontario as its Commercial Procurement Lead for the OLRT1 project. In support of this recommendation, the report cited Infrastructure Ontario's expertise in procuring large infrastructure projects and project financing. It also outlined advantages demonstrated on prior projects, including "date-certain delivery at a fixed cost" and "rigor and discipline brought to the procurement process and particularly to the Project Agreement based on the experience it has gained and the opportunity to enhance the City's capacity to implement the project." Pattison, who led Infrastructure Ontario's LRT team at the time of the OLRT1's procurement, testified that in 2011 his experience was typically with P3 models. He also testified that, to his knowledge, Infrastructure Ontario was primarily experienced with procuring what he described as "vertical" structures, such as hospitals, courthouses, and schools, but did not have much experience in the transit sector. Indeed, Marian Simulik, City Treasurer, testified that the City was Infrastructure Ontario's "guinea pig" for its first LRT project.

On July 14, 2011, Council voted unanimously to accept the recommendations in Schepers's report.

5.4 Impact of the Procurement Model

The selection of the DBFM model had a mixed impact on the OLRT1 project. In response to positions taken by certain of the Inquiry's participants, through their questioning of witnesses and in their closing submissions, regarding the impact of adopting a P3 model on this project and the best course for future projects, the positive and negative effects on the OLRT1 are discussed here.

5.4.1 Risk Transfer

The DBFM approach to procurement effectively transferred the costs associated with certain project risks to the private party, the consortium (namely, RTG). Most importantly, while the City paid a significant premium to transfer the geotechnical risk on the project to RTG, in doing so the City obtained a material advantage, because that risk eventually materialized in the form of the Rideau Street sinkhole (described in Chapter 10). The financial impact of the sinkhole was substantial, as the City avoided remediation costs that were over $100 million. The City has also transferred significant costs associated with fixing the OLRT1 and related maintenance issues to the consortium.

It is unfair to dismiss these cost savings as a lucky benefit. Indeed, the heightened geotechnical risk (due to including the downtown tunnel in the plan for the OLRT1 project) was identified by the City and its advisors early on in the project. They acted in concert to mitigate that risk. The selection of a P3 model and the inclusion of the risk transfer ladder in the RFP process (see Chapter 6) were deliberate choices made to reduce this risk to the City. In this case, the P3 model worked precisely as it should have by transferring the risk. The people of Ottawa were the beneficiaries of that good planning.

It is important to emphasize that, if the geotechnical risk had not been transferred, the taxpayers of Ottawa would have been responsible for sinkhole-related costs. Because they were additional costs, they would not have been shared with the federal and provincial governments. Therefore, the choice of the P3 model had a clear and substantial financial benefit for the people of Ottawa.

5.4.2 Impact on the City's Role in the Project and Its Relationship with RTG

Despite the fact that significant liabilities were avoided, there were negatives associated with adopting a P3 model. The City's decision to use the DBFM model diminished its insight into and control of the project and introduced meaningful constraints for expanding the rail system. Further, once project challenges materialized, it contributed to an adversarial relationship between the City and RTM, which has led to costly litigation. Given that RTM is the maintainer of the OLRT1 for 30 years, the people of Ottawa now face the prospect of a rail system being maintained in circumstances where the relationship between the City and the maintainer is largely dysfunctional (and bearing the costs of any disputes that result).

Regarding the City's role in the project, because a P3 transfers design, construction, and, if applicable, maintenance and operational risks to the private sector for a premium, the public partner is less likely to work with the private consortium to manage and handle the project's challenges. The P3 approach to risk transfer tends to cause the public partner to view itself as a contract administrator, seeking to enforce its rights and the private consortium's obligations. In addition to undermining the partnership relationship, this commercial arrangement comes with diminished involvement in the decisions made in the delivery of the project and the challenges that are faced along the way. That is because, unlike the traditional approach, the public authority has not separately and directly engaged in different but interrelated project roles. The public agency using a P3 approach has less control over the project's delivery.

Jensen, the Director of RIO at the time of procurement, testified that the decision to construct the OLRT1 with a DBFM model rather than a traditional approach changed the City's role from what it had previously experienced. His evidence was that the City's role in the DBFM model was to provide "oversight of the contract," whereas, in a traditional approach, the City would try to "manage each component by themselves." Schepers shared that view and attributed the philosophy to Infrastructure Ontario. Simulik gave evidence that that philosophy was borne out in practice, and indeed, the City tried to follow the contract as closely as possible.

With respect to the relationship between the City and RTG, in October 2011 the City had prepared a Project Charter for the OLRT1, which established a framework for governance and for managing the relationship between the City (as the public partner) and its future private partner. In the Project Charter, the City set out the guiding principles, which included committing to an approach to the delivery of the OLRT1 project that encouraged all stakeholders "to work together in a shared team approach."

That was important to the City because it recognized that an aggressive and adversarial approach was more likely to lead to a poor outcome. Despite the City's Project Charter and its explicit recognition that the project would benefit from a team approach, the City later took a relatively rigid approach to its relationship with RTG based on enforcing the Project Agreement.

The "team approach" set out in the City's Project Charter becomes even more important in the context of a DBFM, because of the duration of the relationship between the parties. That is to say, the long-term relationship that extends beyond construction to maintenance or operations is significant. John Traianopoulos, a manager of Infrastructure Ontario's project finance team, gave evidence that an adversarial relationship could present a risk to the system's reliability. One way adversarial attitudes can develop and become entrenched is if one of the parties approaches the relationship without flexibility, insisting on strict adherence to the project agreement regardless of project developments and challenges.

RTG put the City in a difficult position. The City was faced with a project that continued to encounter obstacles and issues, at least some of which RTG ought to have been able to avoid, address, or minimize. The City was therefore required to balance flexibility and collaboration to remedy problems against the need to enforce compliance with the Project Agreement in the public interest. As discussed later in this report, the City struck the right balance at times and to the benefit of the project. Other decisions, however, such as the City's approach to the payment mechanism, were counterproductive to the goal of providing safe and reliable transit to the public.

5.4.3 Assessment of Impact of the P3 Model

Was using the P3 model wise for the OLRT1 project? It is tempting to provide a simple answer. However, the reality is that there is no simple answer. One of the primary rationales underlying P3s is to transfer risk. In this case, the risk transfer for one major risk (geotechnical risk) worked, as it effectively transferred over $100 million of risk that, under the City's agreement with the senior levels of government, the people of Ottawa would likely otherwise have been responsible for. As noted, that risk transfer was not a matter of luck. The risk was identified and consciously mitigated through the use of the P3 model.

Yet in this case, the downsides to the perceived advantages of a P3 model were in many ways realized. The City was left in a position where it had limited insight or control over the project. Further, when problems developed, the City's insistence on enforcing its contractual rights was a significant contributor to the breakdown in the relationship

between the parties. This adversarial relationship damaged the parties' ability to respond to the problems that developed on the project. It is evident that the parties that signed the Project Agreement and the subcontracts have shown that they often do not work together effectively. The ultimate result is that the City's biggest infrastructure project risks being operated and maintained though a largely dysfunctional partnership, which can come with substantial legal costs.

While the weighing of the relative merits of the P3 model in this project is an important consideration, regarding future projects, it has been overtaken by events. As will be discussed below, the market has changed such that the approach used by the City in this project, with one large contract and the complete transfer of significant project risk, will likely not be available in the future. It is necessary, therefore, in selecting a project delivery model for future projects, to consider a revised approach that reflects market realities. That revised approach will be discussed in the next section.

5.5 The Future of Procurement

The Commission heard evidence that the private sector is starting to become reluctant to bid on major P3 projects and assume the associated risk. Recently, there have been several high-profile examples of large companies such as SNC-Lavalin, Fluor Corporation, and Granite Construction leaving the business of fixed-price contracting, arguing that the risks on these projects are too great and that the turnkey model is broken. Indeed, the Construction & Design Alliance of Ontario suggested as early as 2013 that the very size of these contracts precluded many contractors from bidding. This reluctance is understandable because, in the context of significant infrastructure projects, the potential financial risk can be almost unlimited. In short, construction companies are becoming unwilling to take on a risk that could bankrupt their companies. Thus, while the City was able to effectively transfer key financial risks in the OLRT1 project, it may become more difficult or more costly to do so in the future. Further, if significant players in the industry become unwilling to bid, there is the concern that procurements using P3 models may not attract the top infrastructure constructors. Procurements for such projects may no longer attract sufficient industry interest to drive competition and, therefore, achieve the best price.

In this section, I discuss the approaches that should be taken in determining the appropriate project delivery model, given this new market reality. First, I recommend that all project delivery models be considered and that proceeding with a preconceived notion of the optimal model should be avoided. Second, I note that contracts for transit projects have changed since the OLRT1 project and recommend that government agencies should be responsive to changing market realities. Third, I propose a set of objective criteria to be used to assess the best delivery model for a given project.

5.5.1 Preconceived Models

It is apparent that the City believed that a P3 was the only viable procurement model for this project. Both Infrastructure Ontario and Deloitte directed the City to this option, and there appears to have been little consideration for proceeding with a different project delivery model. Government entities should avoid tunnel vision in selecting a delivery model. They must be open to different models that may be better suited for a particular project.

For example, the Commission heard evidence that many major infrastructure projects in Australia, New Zealand, and the UK have moved to the **alliance model**. This model gives up some of the cost certainty and schedule certainty associated with the P3 model for greater transparency and control. It fosters true collaboration through sharing both risk and reward. The parties' interests are all aligned and they can take advantage of collaborative efficiencies. Notably, the alliance model incentivizes a team-based approach, reducing the chance of an adversarial dynamic developing between the public procurer and the private-sector partner in the face of project challenges. It also contemplates an approach to the project that involves the public agency being able to influence decision-making and gain greater transparency through information sharing. However, alliance contracting requires a significant cultural shift from the current approach in North America, which tends to be seen as an adversarial, zero-sum game that lends itself to protective practices.

I do not suggest that the alliance model is the preferred approach in every circumstance. Rather, I raise it to highlight the slow uptake of new ideas in the infrastructure sector.

5.5.2 Market Innovations

It is essential that governments be responsive to the market and open to learning from the experiences of other governments on other projects. They should avoid approaching a project on the basis that there is only one acceptable way to proceed. Encouragingly, there have been signs that procurement for transit projects has evolved in this province. I cite two examples.

First, the procurement of some of the province's most significant recent transit projects, including Toronto's Ontario Line, have been broken up into smaller contracts.[4] (The Ontario Line is a 15.6-kilometre, 15-stop subway line that will run from Exhibition Place, through downtown Toronto, to the Ontario Science Centre.) In the case of the Ontario Line, there were design-build-finance contracts for the tunnelling and station construction on the south and north portions of the line; and a separate 30-year DBFOM contract for the rail rolling stock, systems, operations, and maintenance of the LRT line. The breaking up of contracts does not seem to have discouraged bidding, as the first two P3 RFPs for the Ontario Line received bids from some of the world's largest contractors, rail manufacturers, system operators, and infrastructure investors.

Second, there have been changes to the lengths of contracts, designed to give governments more flexibility. For example, in the case of the ION light rail line in the Kitchener Waterloo area, the operating contract is structured with the first 10 years guaranteed and then potential extensions at the option of the government (with four

extensions of 5 years each), providing ways to exit the long-term operating agreement. This enables the government to re-evaluate the operating contractor at regular intervals.

Thus, there has been innovation in the ways in which both the size and long-term aspects of P3 contracts are structured. It should be standard procedure that governments examine all options in deciding which procurement model suits a particular project. In making those choices, governments should be open to innovations in the structuring of contracts.

5.5.3 Objective Criteria

As noted, no single procurement approach is best suited for all infrastructure projects. However, it is helpful to develop a set of objective criteria for evaluating procurement models for future projects. Such criteria could include the following:

- *The model's comparative value from the perspectives of quality, cost, and schedule as compared with other procurement approaches*. Such analysis should not be conducted in a vacuum, but should account for the project's circumstances, including its complexity, the public procurer's experience with the infrastructure, and whether the infrastructure is static or dynamic.
- *Whether the model properly aligns the interests of the parties involved, and whether project risks are managed by the parties best positioned to handle them.* As part of that analysis, public agencies should consider the commercial terms built into the model, such as pay-for-performance mechanisms, risk-sharing protocols, and teaming approaches that could include the public procurer.
- *What levers the procurement model contains*. The options should be considered for what can enforce the contractual terms on each party if poor performance or disputes arise.
- *The measures in place to ensure public transparency, accountability, and oversight of major infrastructure projects*. This criterion requires finding an appropriate balance between authority delegated to professional staff to make operational decisions without political interference and appropriate political oversight and accountability for strategic decisions and outcomes.
- *The degree of control the government authority should retain, given the project's circumstances and the public authority's experience.* Thought should be given to crafting the appropriate contractual terms that give the public agency options in the event of poor performance.
- *Flexibility to extend or alter.* In the chosen procurement model, does the government maintain sufficient flexibility to extend or alter the system to respond to changing

circumstances and public needs over the project's life without facing major contract change fees?

- *The public interest prioritized*. Does the procurement model foster a culture of safety, enable meaningful community benefits, and prioritize public service?

5.6 Conclusion

My main point is that government agencies procuring a large and complex infrastructure project must critically analyze the project delivery options using objective criteria appropriate to the project's circumstances and the public procurer's various priorities.

I recognize that government agencies need to prioritize cost certainty, schedule certainty, and risk transfer. Still, decision makers should be cautious about assigning too much weight to these priorities in assessing delivery options. The full menu of project delivery options should be considered. Public procurers should be mindful of the technical sophistication associated with the infrastructure, whether there could be plans to expand the infrastructure, and whether the infrastructure is physically dynamic. They must appreciate that infrastructure projects may present distinctly different challenges – for example, "vertical" and static projects versus transit projects built in busy urban environments differ in the challenges they face. They must also appreciate that it may not always be helpful to structure the relationship in a manner that creates a zero-sum game whereby one party bears all the risk and "loses" if that risk materializes. A true partnership may be more effective.

Finally, as an overarching consideration, a public agency must prioritize the protection of the public interest. The public has the right to safe, reliable infrastructure and to receive regular and honest communications from the government regarding its construction status and operations.

Recommendations

See recommendations #1, 7, and 12–16 in Chapter 17.

Notes

1 PPP Canada was dissolved in 2018.

2 The *Ontario Infrastructure and Lands Corporation Act, 2011* amalgamated the Ontario Infrastructure Projects Corporation with the Ontario Realty Corporation and the Stadium Corporation of Ontario Limited. Between 2006 and 2011, Infrastructure Ontario was a corporation without share capital established under the *Ontario Infrastructure Projects Corporation Act, 2006*. Between 2005 and 2006, Infrastructure Ontario was established as a corporation under the *Business Corporations Act, 1990*.

3 While some geotechnical risk had previously been transferred to the private partner on prior similar projects, such as the Port*Miami* Tunnel in Florida, the OLRT1 project was the first time that the full geotechnical risk was transferred on a project like this.

4 It should be noted that the smaller contracts are still substantial in scope, cost, and scale.

Chapter 6
The Procurement (2011–2013)

Key Findings

- The City's procurement for the OLRT1 project involved two stages: a Request for Qualification (RFQ) and a Request for Proposals (RFP).
- The purpose of the RFQ was to pre-qualify potential private-sector partners based on their experience and capabilities in the construction and maintenance of LRT projects. The City qualified three RFQ respondents to participate in the RFP, including RTG.
- For the RFP, the qualified bidders made technical and financial submissions to show that they could meet the project requirements. The City's RFP included an "affordability cap" and a "geotechnical risk ladder" to incentivize the bidders to meet the City's budget and to have them take on as much of the geotechnical risk as possible.
- Bidders had to procure vehicle suppliers and pre-qualify them with the City. The proposed LRVs were required to be service proven. The City rejected RTG's first choice of vehicle supplier on the basis that its proposed vehicle was not service proven. This left RTG with Alstom as its only option and left Alstom with a much shorter time than is typical to prepare its bid. The City qualified Alstom and its proposed vehicle as meeting the service-proven requirement.
- The City and the bidders had numerous confidential consultations on the project requirements. The City accepted many of the bidders' suggested changes, but not all of them. Notably, it rejected the suggestion of a bedding-in period in the payment mechanism.
- RTG was selected as the winner of the RFP, with the highest combined technical and financial score. RTG's bid was under the affordability cap and took on the maximum amount of geotechnical risk.
- An independent Fairness Commissioner oversaw the procurement process to ensure it was fair. The Commission heard no evidence that would detract from the conclusion that the procurement was fair.

Chapter Contents

6.0 Introduction

The City's procurement process for the OLRT1 project involved two stages: (1) a Request for Qualification (RFQ), which the City used to identify and pre-qualify private companies as eligible to participate in the next stage; and (2) the Request for Proposals (RFP), which solicited proposals from potential bidders to design, build, and finance the construction of the OLRT1 system, and to maintain the system for 30 years. This chapter reviews the process for the RFQ and RFP, examines key RFP requirements and Project Agreement terms, and outlines the evaluation of the bids in response to the RFP. It concludes with the results of the process and a description of the corporate structure of the City's chosen private partner for the OLRT1 project, RTG, and its subcontractors.

This chapter also refers to the planning that preceded procurement (detailed in Chapter 4) and the procurement model (described in Chapter 5).

The parties that submitted in response to the **Request for Qualification**, or **RFQ**, and **Request for Proposals**, or **RFP**, could be variously called respondents, candidates, vendors, bidders, eligible bidders, proponents, or other terms; for simplicity, this chapter generally refers to them as **respondents** and **bidders**. Their responses to the RFQ and RFP are referred to as **submissions**, **proposals**, and **bids**.

The City took several steps – including contracting with Infrastructure Ontario to be its Commercial Procurement Lead and hiring a Fairness Commissioner to oversee the RFQ and RFP – to ensure the fairness of the procurement. By all accounts, the procurement process was fair; no concerns were raised in the evidence before the Commission in that regard.

The City's procurement process provided authorized ways for communication between the City and the bidders to take place. These provisions allowed the bidders to ask questions, seek feedback from the City on aspects of their bids, and provide views to the City's OLRT1 project team on the RFP's requirements and the contents of the Project Agreement. The City amended certain aspects of the RFP and the Project Agreement in response to bidder feedback, but it did not agree to all of the changes that bidders requested. In particular, the City refused to include a bedding-in period in the Project Agreement payment mechanism that would allow for a learning curve at the start of public service.

6.1 Overview of the City's OLRT1 Procurement

The City's procurement for the OLRT1 took place over approximately 20 months, between June 2011 and February 2013. It began with the City issuing the RFQ on June 30, 2011 and culminated with the signing of the Project Agreement between the City and RTG on February 12, 2013.

In July 2011, shortly after issuing the RFQ, Council unanimously approved the design-build-finance-maintain (DBFM) project delivery model for the OLRT1 project and the appointment of Infrastructure Ontario as its Commercial Procurement Lead for the procurement process (see Chapter 5). The agreement with Infrastructure Ontario provided, among other things, that the City retained final decision-making authority over the RFP. The agreement between the City and Infrastructure Ontario also contemplated a continuing role for Infrastructure Ontario following the end of the RFP and the awarding of the Project Agreement. One example of that is that two Infrastructure Ontario representatives – Rob Pattison (Vice President, Transit) and Mathew Kattapuram (Senior Vice President, Civil Infrastructure) – were appointed to the City's Executive Steering Committee (ESC), and Infrastructure Ontario was to provide contract interpretation and enforcement advice through the construction phase of the OLRT1 project. After that phase, Infrastructure Ontario was to transition to a support role for the City, providing contract interpretation and enforcement assistance through the maintenance term of the OLRT1.

Infrastructure Ontario was not the only advisor assisting the City with procuring the OLRT1 project – Deloitte and CTP were also advisors (see Chapter 3) and they continued to advise the City throughout the procurement process. The City also hired Boxfish, an infrastructure project advisory firm, in July 2011. Boxfish co-founder and CEO Brian Guest had no public-private partnership (P3) experience when Boxfish was hired as a consultant on the OLRT1 project; Guest's only light rail experience was his work on the City's diesel-powered O-Train (now called the Trillium Line).

RFQ respondents made their submissions to the City on September 13, 2011. Three submissions were successful. The City announced the results of the RFQ on October 21, 2011 and issued the RFP about a week later, on October 27, 2011.

The RFP remained open for one year. That period is called the **in-market period**. During that time, the City's procurement team and the bidders engaged in a series

of communications, including the pre-qualification of the bidders' vehicle suppliers, discussions about the RFP requirements, and negotiation of Project Agreement terms.

RFP bidders were required to deliver their general submissions, including information about their project teams, and their technical submissions, by September 10, 2012. Financial submissions were due on October 1, 2012.

The City's evaluation team reviewed and evaluated the proposals following a nine-step process (outlined in Figure 6-1), and staff delivered the RFP results to Council on December 4, 2012. Council voted unanimously to select RTG as the preferred bidder on December 19, 2012. On February 12, 2013, the City and RTG signed the Project Agreement.

Figure 6-1: Evaluation Process

NPV = net present value

6.2 The Request for Qualification

The City issued an RFQ in order to identify and pre-qualify who would be eligible to bid on the City's RFP for the OLRT1 project. The RFQ sought submissions from interested parties with the skills and experience required to deliver the OLRT1 project "in the manner required by the City, including on budget and on schedule." The City released the RFQ on June 30, 2011, two days after Deloitte provided its opinion that the preferred option for the OLRT1 project was the DBFM model, and one month later than planned in the City's accelerated project schedule (discussed in Chapter 4). Responses to the RFQ were due on September 13, 2011.

The RFQ described the City's intentions for the RFP and the OLRT1 project as a whole. Regarding **risk transfer**, the RFQ advised bidders that the City would "seek to maximize risk transfer to the private sector, within the boundaries of the City's affordability limits" and that the City would seek to "transfer those risks that the private sector is best suited to manage, while returning value to the City and respecting the City's affordability constraints." It stated that the City had determined that a DBFM delivery model best met those objectives. The RFQ included a maintenance term of at least 15 years, and noted that the City expected "that up to $400 million in long term financing may be required to achieve the desired level of risk transfer through the term of the maintenance contract," though the City might ultimately choose a different "length of term and magnitude of long term financing." The length of the maintenance term was later changed, for the purposes of the RFP, to a 30-year period. This change resulted from market feedback received during the RFQ phase, and Infrastructure Ontario advising the City that a 30-year term "provides the best risk transfer to the private sector, ensures best quality LRT system construction and provides overall best value to the City."

The RFQ also advised that, as part of the RFP process, bidders would be required to "procure a single systems and a single vehicle provider/manufacturer that conforms to the requirements and qualifications to be set out in the RFP." It explained that the City would review, provide feedback on, and ultimately confirm whether each bidder's proposed systems supplier and vehicle supplier complied with the City's requirements, after which point the bidder could include its chosen compliant suppliers in its RFP submission as prime team members.[1]

In their submissions, respondents to the RFQ had to meet many requirements, including providing information about their proposed team composition, organization, and structure; their project management approach; the experience of prime team members; and their design, construction, and maintenance capabilities and experience. Respondents were also asked to identify three examples of prior LRT projects, similar in scope to the OLRT1 project and delivered by DBFM, that showed their ability to get long-term financing, and to outline their proposed approaches to financing the OLRT1 project.

Regarding the private financing for the OLRT1 project, respondents were required to provide information about their financial condition and capacity, including financial statements and reports for the prior three years, "details of any material events that may affect financial standing since the last annual or interim financial statements provided," and "details of any bankruptcy, insolvency, company creditor arrangement, major litigation in excess of $10 million, or other insolvency proceeding in the last three (3) fiscal years."

The RFQ offered respondents the opportunity to communicate with the City while preparing their responses through commercially confidential meetings, or CCMs. The purpose of these CCMs, as described in the RFQ, was to "ensure that new and emerging issues are brought to the attention of the City and Respondents prior to the RFP release." The RFQ also offered respondents the opportunity to ask questions and seek clarification regarding its terms, providing that such requests could be "answered with copies to all Respondents." The intention was that additional information or clarification requested by any respondent would be available to all respondents.

The City hired a Fairness Commissioner, PPI Consulting, to ensure that the RFQ was "carried out with fairness, openness, transparency and in compliance with this RFQ." Other steps the City took to ensure the fairness of the RFQ included:

- Requiring that all communications from respondents be submitted to the designated recipients with the City;
- Prohibiting any communication between RFQ respondents "in a manner or fashion that would contravene applicable laws including in relation to collusion, bid-rigging, corruption or any other anti-competitive activity in the bidding process";
- Prohibiting lobbying by the respondents; and
- Reserving the right to disqualify any respondent that the City determined had a conflict of interest or an unfair advantage.

The City's evaluation criteria, which is shown in the table that follows, prioritized the respondents' experience and capability.

RFQ Evaluation Criteria and Weightings		
Criteria Subject to Point Rating		**Weighting**
G.1	Respondent Information	Not Scored
G.2.1	Proposed Team Composition, Organization and Structure	20
G.2.2	Respondent Prime Team Member(s) and Key Individuals Experience	40
G.2.3	Design, Construction and Maintenance Capability	40
G.3	Financial Submissions	Pass/Fail
G.4	Additional Information	Not Scored
	TOTAL	**100**

During the evaluation process, all evaluators of the RFQ submissions were restricted to communicating about RFQ-related matters only with other members of their evaluation team or with evaluation coordinators. In addition, each evaluation team member was required to execute a Confidentiality Agreement and Undertaking that required agreeing to certain terms and conditions regarding the confidentiality of the evaluation process, including that evaluation team members:

- Undertake the evaluations honestly and in good faith;
- Represent that they are participating in the evaluations in a professional capacity; and
- Treat all information related to the evaluation process as confidential.

On October 21, 2011, Mayor Jim Watson announced that the following RFQ respondents had been selected as successful in the RFQ process and thus were invited to respond to the RFP:

1. **Ottawa Transit Partners**, a consortium including VINCI Concessions, ACCIONA Concessions Canada, ACCIONA Infrastructure Canada, Aecon Construction Group, Bombardier Transportation Canada, and VINCI Construction Grands Projects;
2. **Rideau Transit Group (RTG)**, a consortium including ACS Infrastructure Canada, EllisDon, and SNC-Lavalin; and
3. **Rideau Transit Partners**, a consortium including Bouygues Travaux Publics, Brookfield Financial, Fiera Axium Infrastructure Canada, Parsons Enterprises, Parsons Canada, Colas Rail, and Johnson Controls.

6.3 The Request for Proposals

The City issued the RFP for the OLRT1 project on October 27, 2011. This section outlines key aspects of the RFP, including steps taken to ensure the fairness of the procurement process.

6.3.1 Overview of the RFP

The RFP required bidders (also called proponents) to submit their proposals in three parts:

- Part A: the proposal submission form and proponent team member declaration;
- Part B: the technical submission, including mandated technical submission information and any submissions about technical innovations; and
- Part C: the financial submission, including the price submission form, financial submission information, and any submissions about financing innovations.

In their technical submissions, bidders were required to "reasonably demonstrate" that they could "meet the responsibilities and obligations … set out in the Project Agreement." Technical submissions had to include:

- A project management plan, including information about the bidder's "plan for developing and maintaining a successful long-term partnership with the City";
- A risk management plan, including a description of the bidder's understanding of the OLRT1 project risks and challenges, and a risk register that, among other things, listed the project risks, along with the likelihood of the risks materializing and their severity if they did materialize, and response strategies and plans for each risk;
- A detailed project schedule and a design and construction schedule, including strategies to maintain and recover the schedule;
- A design submission, including sections addressing the tunnel, vehicle, and train control;
- A construction submission, describing how the construction would be "carried out in a safe, effective manner" and demonstrating that the bidder "has the capability to achieve its proposals in a reasonable and realistic manner"; and

- A maintenance and rehabilitation submission, explaining how the bidder would plan for, manage, implement, and achieve the Project Agreement maintenance and rehabilitation obligations.

The RFP required bidders' financial submissions to demonstrate that their financial model and plan were "well developed and robust" and to show that the bidder had "sufficient support from lenders and equity investors to satisfy the City." Bidders also had to demonstrate that their financial submission met the affordability cap, discussed in more detail below.

6.3.2 Communications during the In-Market Period

To ensure fairness and confidentiality in the procurement process, each respondent to the RFQ was required to execute a Confidentiality Agreement and Undertaking. The RFP also included rules and restrictions to ensure the confidentiality of each bidder's RFP submission. These measures are considered and discussed in this section.

The period between the release of the RFP and the bidders' submissions of their final bids is called the in-market period (as noted in section 6.1). The City engaged in confidential communications with each of the bidders during the in-market period through three defined processes:

- **Commercially confidential meetings (CCMs)**, which allowed bidders to provide confidential feedback on the RFP and Project Agreement;
- **Design presentation meetings**, following a schedule set out in the RFP, which allowed bidders to submit their design proposals and receive feedback from the City and its advisors on a confidential basis; and
- **Requests for Information (RFIs)**, a process under which bidders could ask the City if aspects of their proposals conformed with the requirements of the Project Agreement.[2]

Each of these processes involved commercially confidential communications between the City and individual bidders, protecting any information a bidder shared with the City from disclosure to the other bidders.

Bidders were also entitled to submit what are called **White Papers** to the City during the in-market period. White Papers are commercially confidential reports that may include suggestions and recommendations on elements of the RFP. The City and its procurement advisors engaged in "several intensive discussions," as Pattison told the Commission, about which bidder recommendations on the RFP to accept. The City accepted some, but not all, amendments bidders suggested through the White Paper process.

6.3.3 Fairness

The City implemented some initiatives to ensure that the RFP was fair. In addition to appointing Infrastructure Ontario as Commercial Procurement Lead, the City also appointed a Fairness Commissioner to "ensure that all activities associated with the RFQ Process [were] carried out with fairness, openness, transparency and in compliance with the RFQ."

The RFP prohibited bidders and their team members from:

- Communicating directly with any "Governmental Authority, property owner or utility company with respect to the Project";
- "Engaging in any form of lobbying as defined in the *Lobbying Act* (Canada) or the *Lobbyist Registration Act* (Ontario), of any kind whatsoever, to influence the outcome of the RFP Process";
- Contacting, directly or indirectly, a list of persons associated with the OLRT1 project, including the RFP Evaluation Committee, the Mayor, councillors, or their offices; and
- Communicating, directly or indirectly, with any other bidder about the preparation of their proposals "in a fashion that would contravene Applicable Law."

The RFP also stated that the City could exclude or disqualify any bidder or any individual member of a bidder's team on the grounds of a conflict of interest or unfair advantage.

John Traianopoulos, Senior Vice President, Transaction Finance at Infrastructure Ontario, told the Commission that representatives of the Fairness Commissioner were "very, very" engaged, attending internal meetings regarding bidder feedback and offering guidance on how to communicate with bidders. They also reviewed evaluations, requests for clarifications, and communications between the City and bidders to ensure that none of the bidders were provided with an unfair advantage.

In a report to Council dated December 4, 2012, Nancy Schepers, who was Deputy City Manager with responsibility for infrastructure and planning, provided a summary of the Fairness Commissioner's observations and findings:

> Present throughout each phase of the process, they [the team from the Fairness Commissioner] have certified that the DBFM RFP procurement process was clearly established in the implementation guidelines.… The evaluation process and criteria described in the procurement documents were applied consistently and equitably.

Witnesses testified at the Commission that the OLRT1 RFP was a fair process. No evidence of concerns or criticisms about the fairness of the procurement was raised before the Commission.

6.4 The RFP Incentivized Affordability and Risk Transfer

One of the City's key objectives (as detailed in Chapter 4) was to complete the construction of the OLRT1 project within its budget. This required that the City receive bids that came within the affordability parameters, as defined by the City in the RFP, and that project-related risks the City was responsible for be minimized, because those risks brought the possibility of increased costs for the City, or schedule uncertainty, or both. The risks associated with constructing the downtown tunnel were of particular concern. This section looks at two mechanisms included in the RFP to encourage or incentivize bidders to submit proposals with budgets within the City's limits and to accept the risks associated with the downtown tunnel: the affordability cap and the geotechnical risk ladder.

6.4.1 Affordability Cap

The City used an affordability cap to motivate bidders to (1) use design and construction innovations to reduce the capital costs associated with their bids, and (2) submit proposals that did not exceed the City's maximum capital cost. The cost calculation included direct capital costs (cost of construction work and equipment rentals), and financing and transaction costs (legal, financial, and technical advisor costs).

The affordability cap used a process referred to as **gating.** Gating typically refers to establishing a mandatory test, where any bid that successfully meets the test will automatically be chosen before any bids that do not. In the case of the OLRT1 project, gating was used to incentivize bidders to submit proposals that did not exceed the affordability cap. If any proposal that complied with the RFP's technical requirements also came in *under* the affordability cap, then no bids that came in *over* the cap would be considered.

City Treasurer Marian Simulik testified that the City worked with the three bidders "all the time" during the in-market period to try to find ways to reduce their overall costs and to "make certain" they would come within the affordability cap when they submitted their bids. As part of its efforts to assist bidders in meeting the affordability cap, the City amended aspects of the RFP requirements in response to bidder feedback. For example, the City heard from the bidders that the RFP's financing requirement was an obstacle to meeting the affordability cap. In response, the City lowered the required financing

component from $400 million to $300 million. The City also increased the affordability cap to help the bidders meet that requirement. The City initially set the affordability cap at $1.718 billion, but raised the cap to $2.075 billion in response to feedback from the bidders during the in-market period.[3]

The affordability cap was not an absolute requirement; the City built flexibility into the RFP to account for the possibility that none of the bidders submitted proposals that met the affordability cap. Simulik told the Commission that there were a number of "off ramps" that would allow the City to scale back the scope of work for the OLRT1 project if none of the bidders come in under the cap. She testified that staff were also "prepared to go to Council with … a final bid above the affordability cap."

Only two of the three proponents submitted final bids that were under the affordability cap. The affordability cap and gating operated to remove from consideration the proponent that bid over the cap, Rideau Transit Partners. Simulik told the Commission that the City viewed the bidders' ability to meet the affordability cap as an indication that the City's project budget was sufficient, reasoning that if the budget was too tight for the City's project requirements, proponents would have bid above the cap. (The City's project budget is discussed in more detail in Chapter 4.)

While two of the bidders committed to bringing in the project under the affordability cap, it is important to note that these bids may have been affected by optimism bias – an unconscious tendency to believe that bad possible outcomes on a project will not happen to them. (Optimism bias is described in greater detail in section 6.7.1.)

As well, the bidders invested significant amounts of money into preparing their bids and forwent other possible opportunities to pursue the OLRT1 project. Bidders were therefore motivated to avoid disqualification for failure to meet the affordability cap. While the City provided a fee to the bidders who were not selected for the project, that fee did not cover the significant investment bidders made in preparing their bids or compensate for the opportunities they passed up along the way.

6.4.2 Bidders Accept Full Geotechnical Risk

To keep the project costs within its budget, the City wanted to transfer sources of **cost uncertainty** to its private partner. The OLRT1 project's geotechnical conditions and associated risks, particularly for the downtown tunnel, were a major source of cost uncertainty. By February 2011, Council had directed City staff to transfer the complete **geotechnical risk** to the private partner.

The term "geotechnical" in this context means the conditions of the ground (and underground) involved in the OLRT1 project. Geotechnical risks for the OLRT1 project

included unknown (and potentially unfavourable) geotechnical conditions identified in the course of the project – including the risk of sinkholes due to these ground conditions.

Geotechnical conditions may be assessed by boring holes in the ground and analyzing the resulting samples. Stan McGillis, Vice President, Transportation, Roads and Highways at Morrison Hershfield, explained the process as follows:

> Geotechnical is a major issue because you're relying strictly on some boreholes you put out, and you don't know exactly what's happening in between those boreholes, so … there's challenges with that. The condition of … the soil, the rock.

For "vertical" projects (such as buildings), the building site is relativity contained, making it easier to assess the geotechnical conditions. Pattison explained that Infrastructure Ontario's typical approach to assessing geotechnical conditions on such a site involved drilling many investigatory boreholes, turning the project, he said, into "Swiss cheese." In comparison, assessing for geotechnical conditions for a tunnel project poses unique challenges not present in a vertical project. Pattison testified:

> Tunneling is different. You know, you're underground, and there are safety issues, the execution of a tunnel … deep underground is technically very challenging. And I believe at that time [of the bidding process], there had been major projects elsewhere in the world, where there had been bad outcomes on tunnels. And so the lenders were pretty skittish about it.

The complete transfer of geotechnical risk on a project like the OLRT1 project was unprecedented in North America at the time of the RFP. Some of the City's advisors, particularly certain Infrastructure Ontario representatives, were concerned that the market would not accept the entire geotechnical risk. As part of its assessment of the proposed risk transfer, Infrastructure Ontario retained Bank of Montreal, Capital Markets to advise on whether lenders would be willing to commit financing for a bid that took on the entire geotechnical risk. The bank was of the opinion that the City should share in the risk in some way and that the risk was too hard to transfer to the private partner in its entirety, particularly due to the results of recent tunnel projects in the United States.

The City, which retained final decision-making authority on the RFP, chose to encourage proponents to take on the full geotechnical risk. Early in the procurement process, the City received feedback from bidders and the financial markets more generally that the complete transfer of geotechnical risk, as set out in the RFP, was "unbankable," meaning

that bidders would not be able to source financing for bids accepting a total risk transfer. The City introduced a gated approach to incentivize bidders to take on the risk – referred to as the **geotechnical risk ladder**.

Before discussing the specifics of the geotechnical risk ladder, a brief explanation of the RFP evaluation scheme is required. The RFP responses were scored out of 1,000 points, with 500 total points available for each of the technical and financial submissions. Of the 500 points for the financial submission, 450 points were used to evaluate the **net present value (NPV)** for the project. The NPV is a financial measure of the entire cost of a project, including the value of future cash flows associated with it. In evaluating proposals in the RFP process, generally, the lower the NPV, the higher the score awarded in the financial evaluation. As shown in the table that follows, adjustments were made to a bidder's NPV if they selected either Risk Profile 1 or Risk Profile 2.

As the table demonstrates, the geotechnical risk ladder offered bidders three options to select from, ranging from a complete risk transfer (Risk Profile 1) to a limited risk transfer (Risk Profile 3). Bidders were rewarded for accepting more geotechnical risk through incentives corresponding to their financial evaluation score. These incentives included (1) an adjustment in the affordability cap, and (2) an adjustment to the NPV calculation. (A third aspect to the incentives is described below).

Geotechnical Risk Profile		Adjustment to Bid (Incentives)
1	■ Proponent assuming 100% of the geotechnical risk.	■ $60 million increase to the affordability cap; and ■ $80 million reduction to the proponent's total NPV for the purposes of evaluation.
2	■ Proponent assuming the first $10 million of the risk; ■ Proponent and the City each assuming 50% of the risk between $10 million and $140 million; and ■ Proponent assuming all risk greater than $140 million.	■ $40 million reduction to the proponent's total NPV for the purposes of evaluation.
3	■ Proponent assuming the first $10 million of risk; ■ Proponent and the City each assuming 50% of the risk between $10 million and $140 million; and ■ The City assuming all risk greater than $140 million.	■ None.

The more geotechnical risk the bidders took on, the bigger the reduction to the NPV calculation for their bid. An increase to a bidder's affordability cap would allow the bidder to increase the capital cost of its proposal, and the reduction to a bid's NPV would make it more competitive in the financial evaluation process. RTG's bid director for the OLRT1 project, Riccardo Cosentino, told the Commission that the NPV reduction for taking on additional geotechnical risk was a "very large incentive" for proponents to take on the entire risk.

A third incentive was as follows. If only one bidder for the OLRT1 project assumed the full geotechnical risk (that is, Risk Profile 1), was below the affordability cap, *and* was technically compliant, it would be declared the successful bidder.

The incentives for each of the three geotechnical risk profile options were calculated in relation to the anticipated likely costs if the geotechnical risk it accepted did, in fact, materialize. The anticipated likely costs were calculated using the findings of geotechnical engineers based on the number of boreholes they had drilled, the uncertainty between the boreholes, and the contents of the soil samples retrieved.

The geotechnical risk ladder created competitive tension among the bidders. As described in the 2015 Deloitte/Boxfish "Lessons Learned" report, "even though all the bid teams did not want to assume the full risk, they could not convince themselves that their competitors would not find a way to accept the risk." Despite the initial feedback during the in-market period that a complete geotechnical risk transfer was unbankable, each of the three bidders, including RTG, ultimately took on the full geotechnical risk in their proposals.

6.5 Vehicle Procurement

As part of its efforts to maximize the transfer of OLRT1 project risks to its private partner, the City required that RFP bidders procure and pre-qualify vehicle suppliers, who would then be incorporated into their bids. Requiring the bidders to procure vehicle suppliers transferred another significant risk to the private sector, because the vehicles were among the most complicated and therefore risky elements of the project. As the bidders were not themselves train manufacturers, they would have to subcontract for the vehicles, or rolling stock, as the vehicles are sometimes called. As John Jensen, Director of the City's Rail Implementation Office (RIO) explained, this approach "put the responsibility of all the design and development of the train, the vehicles and … everything else together in one package" that the City's private partner would be responsible for.

The RFP set out a series of criteria for the LRV, including requirements imposed by the Province of Ontario and performance specifications dictated by the City. This section reviews key LRV criteria and their impact on LRV supplier selection and the OLRT1 project more generally.

6.5.1 Canadian Content Requirement

The Province of Ontario mandated in 2008 that "all transit vehicles procured with provincial funding must have at least 25 per cent Canadian content"; this is referred to as the **Canadian content requirement**. The stated purpose of the Canadian content requirement is to "promote job retention and creation, foster economic development, protect skilled manufacturing jobs and continue to promote a fair, open and transparent procurement process that ensures value for taxpayers' dollars." The RFP required bidders to comply with the Canadian content requirement.[4]

The Canadian content of a transit vehicle was calculated "as a percentage of the total final costs to the manufacturer, less any applicable taxes." Costs that counted toward the Canadian content calculation were those "directly related to transit vehicles manufacturing process, distribution and acquisition" as detailed in a defined list of items including labour, components and subcomponents, project management, and engineering.

While all three bids for the OLRT1 project met the Canadian content requirement, this policy led to complications for the project. RTG ultimately chose Alstom as its supplier

of vehicles and subcontracted the manufacturing and assembly of the vehicles to the company.[5] However, Alstom was new to the North American LRV market, and it had to search out and qualify new suppliers instead of relying on its own established supplier relationships. Further, Alstom, which did not have facilities in Canada at the time the Project Agreement was awarded, ended up using a labour model that included a mix of Alstom employees and employees contracted through third-party companies. This resulted in a mix of LRV assembly staff, including experts from international factories and inexperienced local staff. The practical implications of the Canadian content requirement for the OLRT1 are discussed in Chapter 9.

6.5.2 The LRV Project-Specific Output Specifications

The City's requirements for the LRVs were set out in the project-specific output specifications (PSOS) in Schedule 15.2 of the draft Project Agreement that was included in the RFP.

In P3 projects, rather than dictating a specific design that must be followed, the project owner provides a series of outputs, or performance requirements, that the project must achieve. The private-sector partner determines how it will achieve those outputs.

Pattison told the Commission that Infrastructure Ontario always recommends that "the output spec have as little engineering in it as possible, and as few constraints in it as possible," because the private sector has "the financial incentive over the long term to do the right thing." He explained that "the more prescriptive you get on engineering things that might not benefit you at all, the more you constrain [the successful bidder], and sometimes you might actually prevent them from doing things that will enhance your safety quality outcome or save you money."

The City's work in preparing for the OLRT1 procurement process included industry outreach conducted by RIO and the consulting engineer consortium hired by the City, CTP, working together with RIO to understand what was available. These discussions informed the vehicle PSOS. (CTP's role in the OLRT1 project is discussed in further detail in Chapter 3.)

The City was open to feedback on the vehicle specifications during the in-market period, inviting bidders to submit their recommendations on the specifications via the White Paper process. The Commission heard from witnesses that the City accepted some, but not all, of the recommended changes to the PSOS.

The Commission heard conflicting evidence about whether the LRV PSOS was too prescriptive. Witnesses from STV, the City's primary vehicle advisor, and Alstom said the PSOS was within industry norms and permitted innovation. In sharp contrast, RTG witnesses testified that the PSOS requirements were prescriptive. Steven Cripps, the former Director of RIO (later, the O-Train Construction Office), also testified that some of the vehicle requirements were "overly prescriptive," and he gave the opinion that requirements in a P3 project should "obviously" be "primarily performance-based." Peter Lauch, the former CEO of RTG, told the Commission that he felt the rolling stock requirements were "quite prescriptive," but that "everybody signed up to it … they knew what they were getting into."

The City's key LRV requirement was that it be **service proven**, which it defined as substantially compliant with the following requirements:

- The major vehicle components have been integrated in a comparable LRV currently in service;
- A minimum of 10 of the comparable vehicles have been in public service for a minimum of two years;
- The vehicles have operated in similar climatic conditions and service conditions to those specified for the OLRT1 project; and
- There is available data confirming that the vehicle has attained a minimum "in-service" mileage of 50,000 kilometres.

Jensen explained that, to him, "service proven" meant that the City would not be on the leading edge "taking on research and development for something that is brand new that has never been tested … that increases the risk profile of the project." Despite this requirement, SNC-Lavalin concluded as part of a "Lessons Learned" review in March 2021 that the LRV that was ultimately deployed on the OLRT1 project was a "prototype hybrid vehicle with its first test runs on the OLRT project and therefore was a continuous trial and error scenario." (The service-proven requirement is also addressed in Chapter 8.)

Regardless of any views it may have had about some of the new aspects of Alstom's proposed LRV, RTG believed it would meet the City's specifications. As discussed in the next section, Alstom was not RTG's first choice for its LRV supplier. Instead, Alstom was a late addition to RTG's proposal, selected only after the City rejected RTG's first choice, Grupo CAF (Construcciones y Auxiliar de Ferrocarriles), for non-compliance with the LRV requirements.

6.5.3 Vehicle Procurement and Pre-qualification Process

The bidders responding to the RFP were required to pre-qualify their vehicle and train control suppliers with the City via a written process. The pre-approval process required the bidders to submit pre-qualification packages demonstrating that their LRV and train control suppliers complied with certain City-dictated requirements. These submissions were not scored, but they were evaluated to qualify proposed suppliers for inclusion in the bidders' proposals. The purpose of this vehicle and train control pre-qualification process was to allow RFP bidders maximum flexibility and choice in the vehicle selection process during the in-market period, giving them the freedom to, as Schepers put it, "select a vehicle that is going to work and that meets the bar that the City set."

The City's plan to maintain LRV supplier choice for the RFP bidders by allowing bidders to select their own vehicle suppliers for their bid did not play out as intended, at least for RTG. RTG identified four vehicle suppliers it thought would meet the City's requirements: Alstom, Bombardier, CAF, and Siemens. However, Bombardier and Siemens entered into exclusive agreements with the other bidders for the OLRT1 project before RTG completed its LRV procurement process, leaving only Alstom and CAF. RTG initially chose CAF as its LRV supplier, but the City advised RTG in late June 2012 that CAF's LRVs did not meet the City's requirements for a service-proven vehicle and, as a result, RTG's bid could be deemed non-compliant with the RFP. RTG's only remaining option was Alstom. The City pre-qualified Alstom, and RTG proceeded with Alstom as its vehicle supplier.

Alstom was included in RTG's bid preparation relatively late in the process, in the later part of July 2012, leaving it with three months to prepare its part of the bid (a much shorter timeline than industry norms). Justin Bulpitt, Alstom's Director of Bids and Proposals, told the Commission that the company's late involvement in RTG's bid preparation had several implications for Alstom. With limited time to work, Alstom had to provide its bid at a high level, with less detail than it would typically include. However, RTG's design for the remainder of the OLRT1 system was advanced, meaning that Alstom had to adapt to decisions that had already been made. For example, RTG wanted vehicles of a specified length (the longest in North America) to align with the length of the station platforms it devised. This demand required changes to the vehicle design. Alstom also had less time to "think through all the risks." (See Chapter 9 for more on the implications of Alstom's late introduction to the OLRT1 project.)

Witnesses told the Commission that the industry is increasingly unwilling to take on responsibility for rolling stock selection (that is, the choice of vehicles) on light rail

projects. Manuel Rivaya, of OLRT-C, explained to the Commission that the responsibility for the procurement of rolling stock now largely rests with the owner of the project, which in the case of the OLRT1 project, would be the City. Rivaya stated that contractors are no longer prepared to take on the risk of supplying rolling stock.

It is worth noting that the City has taken a different approach to the procurement of vehicles for Stage 2 of the OLRT. In this case, the City separated the main Stage 2 procurement process and the vehicle procurement for seven new trains. This meant that the City effectively took on potential resulting risks related to the vehicle procurement.

6.6 Negotiation of the Project Agreement

A draft of the Project Agreement was included in the RFP, and the negotiation of the draft Project Agreement largely took place during the in-market period. While the City incorporated many of the changes that bidders suggested into the Project Agreement, it did not accept all of them.

This section reviews two key aspects of the Project Agreement that the City negotiated with the bidders during the in-market period: (1) milestone payments during the construction phase, and (2) the question of a bedding-in period for the maintenance payment mechanism.

6.6.1 Selection of Payment Milestones

The City used a milestone payment approach for payments to be made during the construction and manufacturing phase of the OLRT1. Among other things, this was to address the City's financial constraints, and to help hold the successful bidder accountable to the OLRT1 project's construction schedule. Under the **milestone payment method**, the City made partial payments to the private partner when construction of defined elements of the project was completed. (See Chapter 7 for more detail on how the milestones functioned.)

Under the DBFM delivery model (detailed in Chapter 5), the successful bidder was required to obtain financing for the construction phase, which the City would ultimately pay back during both the construction period of the project and the maintenance phase, in order to ensure performance. Any associated borrowing or interest rate costs with financing would be added on to the final amount the City owed to the successful bidder; it was in the City's best interest in the circumstances to provide interim payments to its private partner during the construction phase to reduce the principal amount outstanding on the loan, which would also reduce the amount of interest accrued and ultimately payable by the City.

In addition, the milestone payment approach aligned with the terms of the Contribution Agreements the City had with the federal government and the Ontario provincial government. The contributions from both senior levels of government were based on eligible costs incurred by the City in the course of the project. These were the costs deemed by either level of government to be properly and reasonably incurred for the

construction of the project in order to bring the system into public service (revenue service). Interest payments on private financing were not eligible costs.

There were three short-term financing repayment options the City could pursue during the OLRT1 project's construction period: (1) a lump sum payment when the project was substantially complete, (2) use of progress payments, or (3) payment upon the successful completion of certain milestones.

1. The option of **lump sum payment at substantial completion** (or "private capital in first") meant the private partner would fund an up-front portion of the construction costs, with the City deferring full payment to the private partner until the project was substantially complete. This approach was, however, too costly for the City, as the City would have to pay the total amount of interest accrued by the private partner through the entirety of the construction period.
2. **Progress payments** are payments provided by the City during construction, based on construction progress as measured by costs incurred by the private partner. Progress payments are not linked to any event-driven milestones, and would leave no ability for contractual remedies against missing specific milestones, leading to potential schedule delays.
3. A **milestone payment approach** was the third option. Milestone payments were recommended by Deloitte as being able to drive behaviour "to ensure that critical path elements are completed on time." As described above, it also reduced the financing costs the City would ultimately have to pay.

Infrastructure Ontario only had experience with another approach to project payment mechanisms, interim payments, when aspects of a project are completed prior to substantial completion – for example, in the construction of a building. Under an **interim payment approach**, the owner makes partial payments to the constructor when certain predefined sections of a building (such as a hospital wing) are completed and ready for occupancy and use. The amounts paid using these traditional milestones have a direct connection to the cost of the work performed and are made after the work is complete.

Infrastructure Ontario recognized that an LRT project does not have the same option for the project to be completed and used in parts – with payments linked to those completion dates – because an LRT line would go into operation all at once. As a result, Infrastructure Ontario and the City decided on using a milestone approach, which was tailored to the unique construction timeline of an LRT but also mirrored an interim payment approach.

During the in-market period, bidders were able to select up to 12 eligible milestones from a menu of options (including 19 predetermined milestones). The eligible milestones were presented in the RFP and informed bidders' final proposals.

The RFP also encouraged bidders to propose additional milestones to the City for consideration, as the City was interested in providing additional milestone events that could help reduce the City's financing costs. This process allowed RTG and the other bidders to suggest milestones that were more suitable to their chosen OLRT1 project schedule.

The intention of the City's procurement advisors with the milestones was to encourage or incentivize the successful bidder to meet key schedule components, each of which coincided with contract payments. This was in an effort to ensure **schedule certainty** – or in plainer terms, the City wanted a reliable, accurate schedule and wanted the OLRT1 project to open for public service when it was supposed to.

RTG's selected milestone schedule appears as Schedule 19 of the Project Agreement.

While RTG's milestone schedule was set on February 12, 2013, at the time of the signing of the Project Agreement, the City worked with RTG during the course of construction to redefine some milestone payments in order for RTG to receive payment despite not having met certain milestones due to delays that occurred (in particular, in the tunnel construction). Ultimately the OLRT1 project was not delivered on schedule, despite the use of milestone payments. The schedule would become a contentious issue between the City and RTG (as noted in Chapter 10).

The Commission heard evidence that the market has moved toward the use of **earned value payments**, an approach that is flexible and performance-based. Chris Swail, formerly of Schepers's office, additionally concluded that the earned value approach complements the procurement model in a way that milestone payments do not "as readily."

In contrast to the milestone payment approach, the earned value approach requires that, in order to receive payment, a project company must demonstrate only that it has done an amount of work that achieves a required value threshold toward substantial completion. Payments to a builder through the earned value model are based on the percentage of the work performed in a particular period of time, typically on a monthly basis. This approach involves regular progress payments made to the builder for the work actually performed.

Swail and Claudio Colaiacovo, a member of the City's O-Train Construction Management Team, told the Commission that Stage 2 of the project has not used a milestone payment approach; it has shifted to an earned value approach to compensate the private partner during the construction period.

Pattison also confirmed that Infrastructure Ontario has not used the milestone payment approach on any of its subsequent LRT projects. He explained that Infrastructure

Ontario learned from the OLRT1 project that, if the project owner does not receive a functioning asset at the time of the milestone payment (such as a wing of a building), then making payments based on the amounts the private partner has spent works "just as well." Traianopoulos additionally told the Commission in his interview that he has seen "somewhat" of an industry move away from milestones.

6.6.2 No Bedding-In Period or Soft Start

During the in-market period, bidders asked that the City consider the inclusion of a bedding-in period in the Project Agreement's maintenance payment mechanism. Bidders made the request in an effort to benefit from the financial/contractual and operational benefits of bedding in or having a soft start. The City ultimately refused this request.

Bedding in can be defined as a period early in the life of a system in which latent problems surface. Bedding in can either take place before revenue service or after revenue service begins. On the contractual side, a bedding-in period involves a lessening or lowering of deductions against the maintainer on certain **key performance indicators (KPIs)** related to quality and service failures, to account for the expected learning curve at the beginning of the operation of a new system.

A **soft start** can be defined as a gradual opening of a system, with increasing public service over time.

During the early planning phases of the OLRT1 project, before the award of the contract to RTG, the City, in conjunction with Infrastructure Ontario, considered but ultimately rejected the idea of including a bedding-in period in the payment mechanism. The City's view, supported by Infrastructure Ontario, was that the early days of operation of the system were critical for public confidence in the system and that the LRT system was going to completely replace the existing bus transit system. Further, the City would be relying on revenue generated by public use of the system to help pay for it. The City's insistence that the system be fully operational from Day 1 drove many of its decisions about the OLRT1.

Traianopoulos, of Infrastructure Ontario, acknowledged that bidders prefer a bedding-in period in the payment mechanism, because it gives everyone time to adjust once the system goes into service, and that bidders on the OLRT1 project did in fact request one, though the request was rejected by the City and Infrastructure Ontario. Traianopoulos told the Commission that if the decision had been made to allow for a payment mechanism bedding-in period in the Project Agreement, it would have been calibrated so that there was still a deduction payment system in place for the maintainer, but with relaxed requirements for an initial period.

The view from OLRT-C's side was that "soft" openings, with reduced operating hours or a reduced line with fewer stations to service, are common industry practice. In the early days of public operation, a soft opening allows for longer maintenance hours, so the maintainer gets more access to the system, allowing staff to become more familiar with it and giving the opportunity to see if any systems are wearing or behaving abnormally.

In my view, the OLRT1 project would have benefited from both a bedding-in period in the payment mechanism and a soft opening, as is illustrated by the issues encountered when the system entered public service (see Chapter 12).

(Bedding in and the soft start are addressed again, in Chapters 13 and 14.)

6.7 RTG Wins the RFP

All three respondents who had been evaluated in the RFQ process as eligible to participate in the RFP submitted proposals to the City. Following the City's evaluation of the three proposals to the RFP, RTG's bid was selected as the successful one.

This section begins with a brief discussion of optimism bias, a theory that people's natural optimism interferes with their assessment of risk, and its impact on complex infrastructure procurement. The scoring of the RFP bids is then reviewed. Finally, RTG's corporate structure and the allocation of RTG's obligations under the Project Agreement between itself, its subcontractors, and their subcontractors are described.

6.7.1 Optimism Bias and Complex Infrastructure Procurement

In the context of complex infrastructure procurement like the OLRT1 procurement, **optimism bias** is a theory that recognizes that people believe that bad possible outcomes on a project will not happen to them. RTG's bid director Cosentino described optimism bias as "a tendency … to overlook the downside in order to move forward with a certain decision." Optimism bias can interfere with the objective, realistic assessment, budgeting, and planning for a complex infrastructure project, leaving parties unprepared when significant project risks materialize.

Much was made at the hearings about the fact that bidders went into the bidding process with their "eyes wide open" about the requirements of the Project Agreement that later became contentious. The City's counsel elicited evidence from a number of witnesses that RTG, as a sophisticated bidder, knew what it was bidding on. It is reasonable to conclude both that RTG was, in fact, aware of the risks it accepted with its bid, and that RTG's bid and subsequent approach to delivering the OLRT1 project were affected by optimism bias. Sophistication is not enough to counter optimism bias. External processes are required to counter the unconscious tendency to underestimate risk. An example of an approach to counter optimism bias is the UK Treasury's Green Book, which provides guidance on the appraisal of policies, programs, and projects, advising on how governments should assess potential projects.

6.7.2 Evaluation Process for the Proposals

The City described its evaluation process for proposals in response to the RFP as taking place over a two-month period in four streams: **completeness verification**, **compliance review**, **technical evaluation**, and **financial evaluation**. The completeness verification assessed whether the proponents' bids included all mandatory information. The compliance review evaluated whether the bids complied with the requirements of the RFP and its output specifications. An independent assessor confirmed that the Canadian content estimates submitted by each bid team were valid.

The technical and financial components of the bids were reviewed and scored by two distinct evaluation teams made up of subject-matter experts (including both private-sector advisors and City staff).

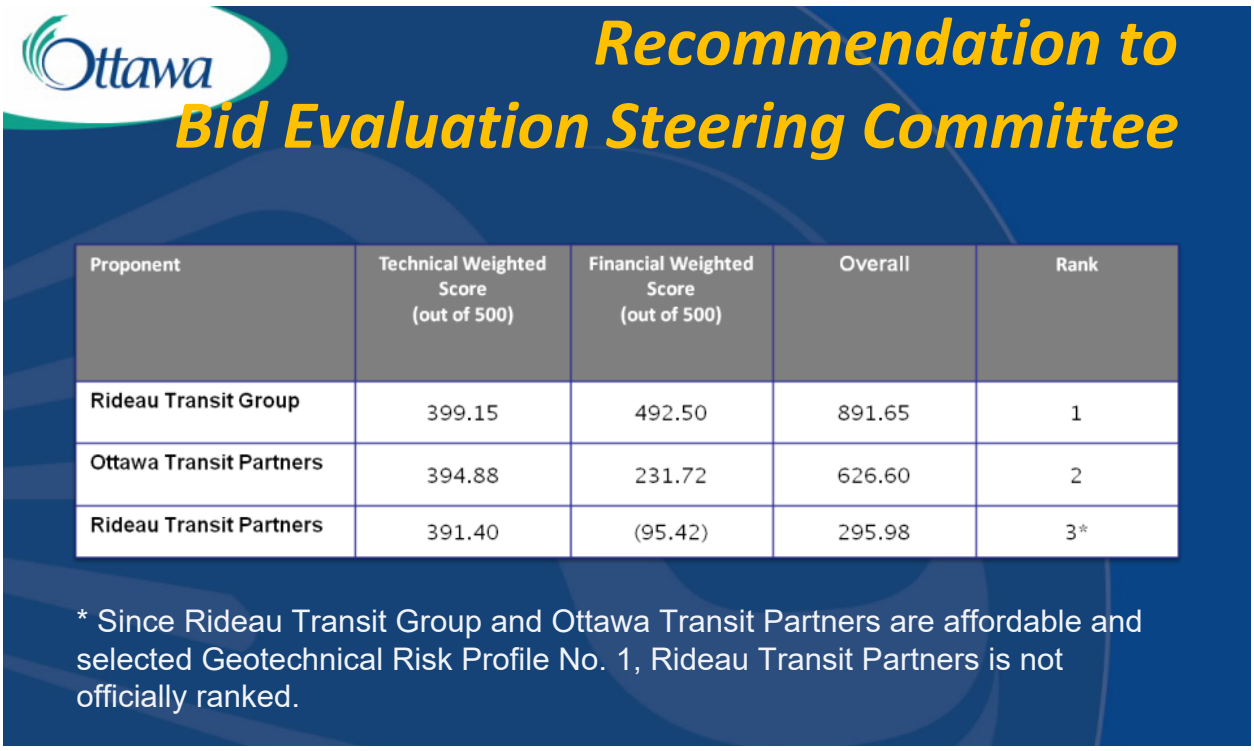
The evaluation scheme provided for a maximum of 1,000 total points available for each bidder's proposal: 500 for the technical submissions and 500 for the financial submissions. The technical evaluators did not know any information about the price or details of any bidder's financial bid, and the financial evaluators were not aware of the contents or scoring of the technical submissions. Evaluators were restricted from discussing the details of the proposals with one another to ensure they could "form independent views of each criterion without those views being influenced by knowledge of financial proposals by the Technical Evaluation Team or technical strength of the bids by the Financial Evaluation Team."

To further promote impartiality in the evaluation process, bid teams were only able to communicate with members of the City's team and its subject-matter experts through the Evaluation Coordinator and the Fairness Commissioner. The Evaluation Coordinator's role included, among other things, managing the evaluation process and working with the various submission review teams, including the financial and technical evaluation evaluators.

6.7.3 RTG Selected as Winner

During the course of both the formal interview process and the public hearings, the Commission heard uncontested evidence that RTG was the clear winner of the RFP. The summary of scores – which are shown in Figure 6-2 – was presented to the Bid Evaluation Steering Committee on October 22, 2012. RTG was awarded the highest overall score of the combined technical and financial submissions and achieved a lower NPV than the other two bidders. The Bid Evaluation Steering Committee oversaw the OLRT1 project's procurement and overall implementation, reporting directly to the ESC.

Figure 6-2: Recommendation to Bid Evaluation Steering Committee – Summary of Scores



Source: City of Ottawa

On December 4, 2012, Schepers delivered the results of the RFP evaluation process to Council in a report titled "Design, Build, Finance and Maintenance of Ottawa's Light Rail Transit (OLRT) Project" (the **OLRT1 Approval Report**). The OLRT1 Approval Report provided several recommendations, including that Council approve the selection of RTG as the "preferred proponent" to design, build, finance, and maintain the OLRT1 project and approve the budget of $2.13 billion. On December 19, 2012, City Council voted unanimously to award the OLRT1 project contract to RTG.

As noted above, while most elements of the Project Agreement were settled during the in-market period, negotiations continued afterwards on a few final details between the City – including a team of Infrastructure Ontario, and the City's legal, finance, and engineering team – and RTG. The City and RTG signed the OLRT1 Project Agreement on February 12, 2013.

6.8 RTG's Corporate Structure and Implications for the OLRT1 Project

RTG and the City are the only two contracting parties to the OLRT1 Project Agreement. Part of the appeal for the City in its selection of a DBFM model (in addition to the opportunity to transfer maximum risk to its private partner) was that RTG was responsible to the City for the design, construction, and integration of the various aspects of the OLRT1 project, leaving the City with one party they could hold ultimately responsible for the progress and development of the project, instead of having to deal with a variety of contractors working on different aspects of the project. Or, as RIO's Jensen described it, there was only "one throat to choke" (in this case, RTG) if issues arose.

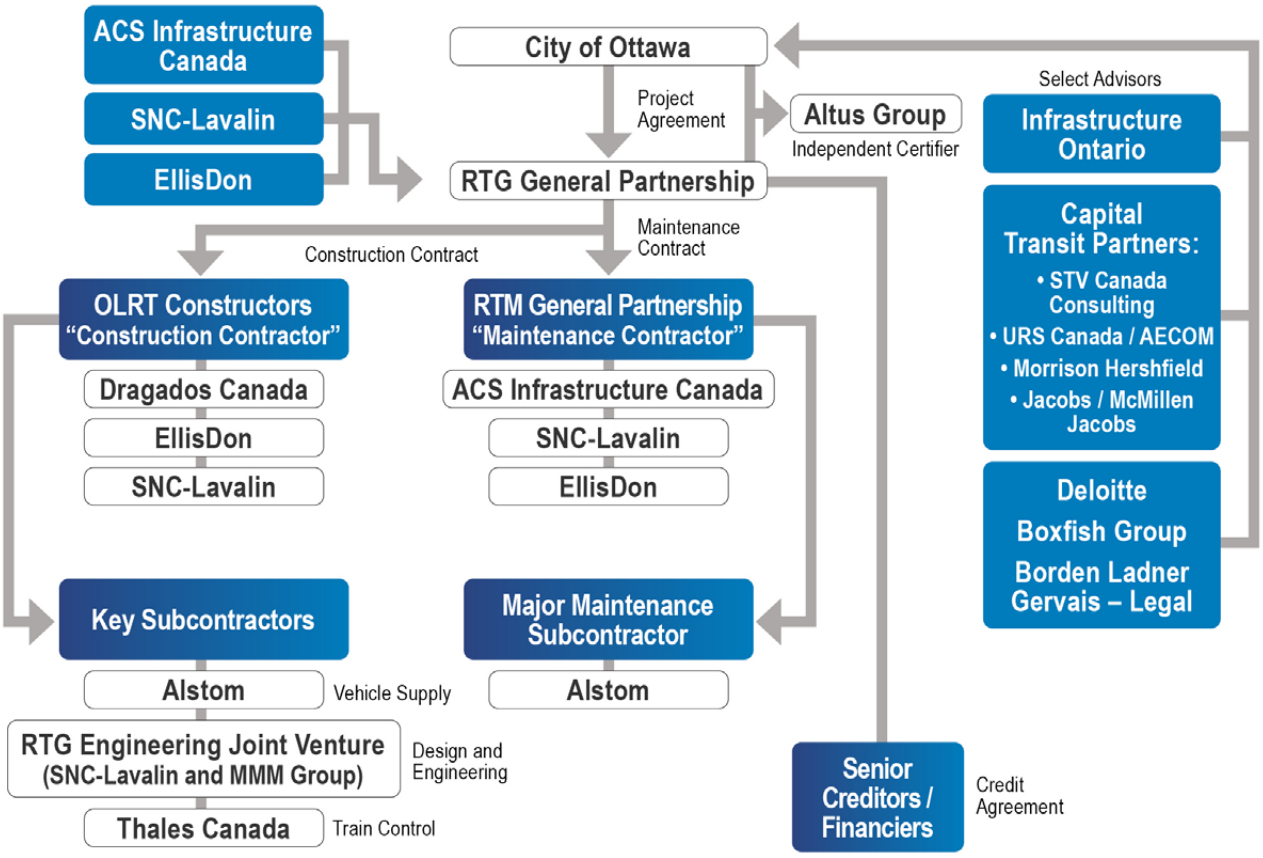
While RTG was accountable to the City under the Project Agreement, RTG did not undertake the construction or maintenance of the OLRT1 system. Instead, RTG entered into two contracts for those obligations under the Project Agreement. RTG contracted with **Ottawa Light Rail Transit Constructors (OLRT-C)**, an unincorporated joint venture between Dragados Canada, EllisDon, and SNC-Lavalin, to construct the OLRT1 project.[6] RTG also contracted with **Rideau Transit Maintenance (RTM)**, a general partnership between ACS Infrastructure Canada, SNC-Lavalin, and EllisDon, to maintain the OLRT1 system once it entered public service.[7]

Each of OLRT-C and RTM entered into agreements with service providers to fulfill aspects of their obligations to RTG. Key construction subcontracts included OLRT-C's subcontract with Thales Canada for Thales to provide the train control system, and OLRT-C's subcontract with Alstom for the vehicles. RTM's primary subcontract was with Alstom; Alstom was to perform maintenance services, including the replacement, refreshment, and/or refurbishment of system facilities, vehicles, and vehicle equipment.

There is no contractual relationship between RTG and the subcontractors of OLRT-C or RTM, nor does RTG have any right to manage or instruct those subcontractors. Therefore, while RTG owed obligations to the City under the Project Agreement, it had little practical control over those carrying out the obligations because this work was done by subcontractors to OLRT-C and RTM.

Figure 6-3 illustrates the relationships between the contractual parties and their respective roles.

Figure 6-3: Contractual Structure



The implications of the OLRT1 project's contractual structure for the City, RTG, OLRT-C, RTM, and the subcontractors are reviewed in detail in Chapter 9.

Recommendations

See recommendations #1–7, 11–21, and 38–40 in Chapter 17.

Notes

1 In Infrastructure Ontario's June 2011 Framework to Evaluate Responses to Request for Qualifications, a "Prime Team Member" is defined as any member of a bidder responding to the RFP that: "(i) will carry out 25 percent of the construction works or more, based on the estimated construction costs of the Project; (ii) will carry out 25 percent of the maintenance works or more, based on the estimated maintenance costs of the Project; or (iii) will either provide equity capital and/or act as debt arranger to the entity that will be put forward by the bidder to enter into the Project Agreement with the City."

2 Section 3.2.2 of the RFP permitted bidders to submit two categories of Requests for Information: general RFIs (an RFI that is of general application and that would apply to other bidders), and commercially confidential RFIs (an RFI that the proponent considered to be commercially sensitive or confidential to that particular proponent).

3 The affordability cap included costs associated with the widening of Highway 417.

4 The Canadian Content for Transit Vehicle Procurement Policy was later amended in 2010, and again in 2017. The 2010 version of the policy was in effect at the procurement stage of the OLRT1 project, and, for the purposes of this section of this report, will be the version of the policy referenced.

5 The initial 2013 vehicle supply contract with OLRT-C was signed with Alstom Power & Transport Canada Inc.; by 2019, the Amended Maintenance Contract with RTM was with Alstom Transport Canada Inc. Alstom, a company with global reach, is headquartered in France. Witnesses invariably simply referred to "Alstom."

6 Strictly speaking, there are different corporations in RTG and OLRT-C. RTG includes EllisDon RTG Partner Inc. and SNC RTG Partner Inc., while OLRT-C includes EllisDon Corporation and SNC-Lavalin Constructors (Pacific) Inc.

7 Strictly speaking, there are different corporations in RTG and RTM. RTG's composition is described at note 6. RTM is a general partnership including companies related to or associated with ACS, SNC-Lavalin, and EllisDon: ACS RT Maintenance Partner Inc., ProTrans RT Maintenance Partner Inc., and EllisDon RT Maintenance Partner Inc.

Chapter 7
The Project Agreement

Key Findings

- The Project Agreement was based on Infrastructure Ontario's template agreement for design-build-finance-maintain projects, adapted to the City's technical requirements, risk allocation, and budget. The OLRT1 project was the first time this template was used for a light rail transit project.
- The Project Agreement set out the scope of the project to be delivered by RTG and the performance measurements that the OLRT1 system was to meet through project specifications. Such specifications are meant to set out performance targets, but not prescribe *how* to meet the targets. The OLRT1 project specifications were more prescriptive than is typical, particularly related to the vehicles.
- The Project Agreement also provided for a full start to public service, following testing and commissioning and then a period of trial running to ensure the system was safe, functional, and ready for operations and met the requirements of the Project Agreement. However, the Project Agreement did not contain detailed requirements for trial running.
- The Project Agreement provided the City with the option to waive certain requirements for Substantial Completion, but not the requirements for Revenue Service Availability (RSA). Waiving requirements for RSA required an amendment to the Project Agreement.
- Through the Project Agreement, the City wanted to transfer significant risk to the private sector, particularly related to cost overruns and delays. The Project Agreement therefore transferred the geotechnical risk to RTG. The Project Agreement allowed RTG to be granted extra time and/or monetary compensation if certain events occurred during construction, but generally did not provide relief to RTG for issues relating to geotechnical events. The Project Agreement set May 24, 2018 as the Required RSA Date, and delays to this date had consequences for RTG.

- During the construction phase of the project, RTG received payments from the City upon meeting certain milestones. Payments were triggered by RTG completing specific portions of the work rather than based on the costs RTG had incurred. The payment amounts were structured so that a portion of RTG's construction costs would be paid back over the entire life of the contract, including the maintenance term.
- During the 30-year maintenance term, RTG is entitled to receive monthly service payments from the City on the basis of the performance of the system. A failure to meet the performance levels and offer reliable service can lead to monetary deductions from the payments. RTG can also incur failure points that can lead to an Event of Default. The goal of the payment mechanism is to incentivize good performance, while not being overly punitive.
- The Project Agreement set out terms for private financing, which was also used to incentivize RTG to perform well and to provide independent oversight of the project by the lenders. However, the financing component of the project was changed by the City to accommodate the expansion of the OLRT system. This change provided powers and additional security to the City. This negatively impacted the relationship between the City and RTG when the project was facing challenges.
- Under the Project Agreement, the City had the lead role in communications to the public. RTG was not allowed to communicate to the media or public about the OLRT1 project without the City's approval. The City therefore had significant control over what the public was learning about the OLRT1 project. This arrangement can work well when the relationship is co-operative, but can create challenges if the relationship breaks down.

Chapter Contents

7.0 Introduction

The City and RTG signed the Project Agreement on February 12, 2013. This chapter reviews the general structure of the Project Agreement and its many schedules (which are appended to the document and include additional contractual provisions, divided by specific topic). It then details certain provisions governing key issues identified in this report, including the mechanisms allowing for payment to RTG and the way in which responsibility for certain risks was allocated. This chapter also comments on what was not included in the Project Agreement – for example, how the Project Agreement addresses trial running and the launch of the system, and potential extensions to the OLRT1 project.

7.1 The Project Agreement: General Structure

The Project Agreement is a design-build-finance-maintain (DBFM) contract. DBFMs are a type of public-private partnership (P3) and are considered an alternative financing and procurement (AFP) project delivery model. The Project Agreement was based on Infrastructure Ontario's template agreement for DBFM projects (described in Chapter 5). The Infrastructure Ontario template was used because it was familiar in the market and "bankable" – in other words, potential bidders for the OLRT1 project would have seen the template before on other bids, be comfortable with the interpretation of the contract's terms, and feel confident that they would be able to get financing if such a contract was used. The Infrastructure Ontario template had already been used for other infrastructure projects, but this was the first time that the template was used and adapted for an LRT project.

Infrastructure Ontario's DBFM template was adapted to the City's requirements for the OLRT1 project, including modifications for the project's scope, design, technical requirements, financing requirements, preferred risk allocation, and budget.[1] These adaptations accounted for various aspects particular to the OLRT1 project, including the City's plan to expand the system eventually, the specific risks associated with digging and tunnelling over a considerable distance (referred to by witnesses as "geotechnical risk"), and the fact that OC Transpo would operate the system and so would work with the maintenance subcontractor when the system was in operation.

First and foremost, the Project Agreement sets out the parties' rights and obligations regarding the OLRT1 project. Under the Project Agreement, RTG was responsible for the design, construction, and ongoing maintenance of the OLRT1 project, and RTG was responsible for financing its design and construction. The City was responsible for making periodic payments to RTG during construction, and is responsible for making monthly service payments to RTG that began once the operations and maintenance phase of the OLRT1 project commenced. (Aspects of the Project Agreement are referred to in both the past and present tense in this chapter, as the Project Agreement was signed in the past, the construction phase has concluded, and the operations and maintenance phase of the OLRT1 project is ongoing.)

The Project Agreement accounted for the fact that, as is typical with this type of model, RTG would flow the bulk of its contractual obligations under the agreement down to subcontractors. Section 9.3 of the Project Agreement required RTG to ensure that its subcontractors complete the subcontracted scope of the OLRT1 project in the same manner and to the same extent as RTG is required to under the terms of the Project Agreement.

Accordingly, the obligations for the works required by the Project Agreement were set out in RTG's subcontracts with OLRT-C and RTM, respectively. Under the subcontract with OLRT-C, OLRT-C took on the obligation to complete the design and construction as required under the Project Agreement as well as the risk and associated payments if the obligations were not met. Similarly, the subcontract with RTM flowed down RTG's obligations to maintain the OLRT1 project as required under the Project Agreement, and RTM took on the risk and associated payments if the obligations were not met.

This structure allows RTG to be a small entity made up of only a handful of executives and support staff who would administer and oversee its contracts with its subcontractors. Any reporting from the subcontractors up to the City and back went through RTG.

From the City's perspective, even though the design and construction would be performed by one sub-consortium (OLRT-C) and maintenance would be performed by a separate entity (RTM), having RTG as the City's sole contractual partner would theoretically lead to better accountability, because RTG was the City's single point of interaction and ultimately responsible for delivering its contractual obligations. Even though RTG flowed its obligations to subcontractors, RTG would be responsible for addressing the City's concerns.

7.1.1 General Content of the Project Agreement and Its Schedules

The Project Agreement document is very long – with 220 substantive pages in the body of the document plus 37 schedules and sub-schedules appended to it, which stretch the length of the document to over 1,000 pages. It sets out in detail the rights and obligations of the parties in the design, construction, financing, and maintenance of the OLRT1 project.

In addition to the "standard" contractual provisions one might find in any commercial contract, the Project Agreement does the following:

In section	The Project Agreement ...
8	defines the City's responsibilities during the OLRT1 project
9	defines RTG's responsibilities during the OLRT1 project
11	provides for establishing the Works Committee
12	provides for establishing the Maintenance Committee
21	sets out how the City would access and monitor the progress of the project
22	obliges RTG to create and maintain a project schedule
24	provides for the energy and environmental requirements of design and construction
25	establishes the role of Independent Certifier
26	provides for the process and activities necessary for commissioning and for completion of construction
27	details the provision of maintenance services
29, 29.6	sets out specific requirements about the delivery of the LRVs, including the Canadian content requirement
34	details the method for making payments to RTG

Importantly, the Project Agreement also sets out the definitions for and consequences of **Delay Events** (section 40), **Compensation Events** (section 41), **Excusing Causes** (section 42), and **Relief Events** (section 43). It also defines **Events of Default** for both RTG (section 45) and the City (section 46). Further, the Project Agreement requires a **Dispute Resolution Procedure** to be followed in the event of a dispute between the City and RTG (section 58). These aspects of the Project Agreement are elaborated on later in this chapter.

For the most part, the schedules attached to the Project Agreement expand on sections and provisions in the body of the Project Agreement. The following are examples:

Project Agreement: Example Section	Related Schedule
Section 25 creates a requirement for the City and RTG to appoint an **Independent Certifier**.	Schedule 6 is the Independent Certifier Agreement, which the appointed Independent Certifier was required to execute. It contains all the terms of the Independent Certifier's appointment along with its duties.
Section 34.1 creates an obligation for the City to pay a **milestone payment** to RTG when the relevant milestone payment is due.	Schedule 19 sets out specifically what these milestones are, together with a description, the payment amount, and the scheduled date for completion of each milestone.
Section 58 provides, in full: "All Disputes shall be resolved in accordance with, and the Parties shall comply with, Schedule 27 – **Dispute Resolution Procedure**."	Schedule 27 sets out the Dispute Resolution Procedure in detail.

7.1.2 Performance-Based Project Specifications

The Project Agreement sets out the scope of the project to be delivered by RTG and the requirements that the OLRT1 system was to meet. It mainly does so through what are called the output specifications or project-specific output specifications (PSOS), which are detailed in Schedule 15 to the Project Agreement. In this report, output specifications or PSOS are interchangeably called the **project specifications**.

The project specifications set out how the City wanted the system to perform – simple examples include the number of passengers per hour that the system would need to transport and the desired headway (time between trains). Such project specifications would allow bidders to develop a system to meet the performance requirements that the system was meant to achieve. The project specifications do not prescribe how RTG should go about meeting any particular performance requirement. In theory RTG could design and build the system any way it saw fit, as long as the system met the project specifications.

However, the Commission heard evidence from RTG's bid director, Riccardo Cosentino, that the City's project specifications were more prescriptive than one would expect to find in a project like this, and certainly more prescriptive than RTG would have liked. Cosentino gave examples of items that he did not see as being performance-based, like maximum speed and acceleration rates of trains, being included in the project specifications. Prescriptive project specifications were a concern to RTG, because such requirements constrained the builder's ability to innovate and adapt to changes in circumstances.

While some of the more prescriptive elements of the draft agreement were removed at the request of bidders, other witnesses also told the Commission that project specifications in the Project Agreement remained overly prescriptive, particularly specifications related to the vehicles. For instance, the Project Agreement prescribed American standards, including for the track, whereas Alstom's witness Yves Declercq told the Commission that, to his knowledge, the LRV in Ottawa was the only vehicle in Canada based on American standards.[2] In another example, Steven Cripps, former director of the City's Rail Implementation Office (RIO), told the Commission that the specification for the steel of the body of the vehicles was "a very prescriptive specification." This specification caused issues and delay for the contractor, who later sought a variation of the Project Agreement to use a type of steel that was more appropriate. As Roger Schmidt, of OLRT-C, put it, "It almost changed the focus from success to compliance." He added, "Compliance was the mantra."

Regardless of the details of the project specifications required in the Project Agreement, by signing the Project Agreement, RTG agreed to be "responsible for the complete design, Construction, testing and commissioning and Maintenance of the complete Systems required for the safe and efficient operation of the LRT." That is, RTG signed the Project Agreement with "eyes wide open."

7.1.3 Variations to the Project Scope

According to the Project Agreement, both the City and RTG can seek a **variation** or change to the scope of the OLRT1 project. This could, for example, involve an "addition, reduction, substitution, or modification to the project scope," and it might involve related schedule changes, monetary changes, or both. (An example is the request for variation in the type of steel, mentioned earlier.) Section 39.1 and Schedule 22 of the Project Agreement set out a detailed process for how either the City or RTG may initiate a request for a variation.

The required process for the City is as follows:

1. The City issues a Variation Enquiry to RTG.
2. RTG must then prepare an estimate of the cost of implementing the variation, unless it objects to the variation on one of the grounds set out in Schedule 22, such as that the variation would materially and adversely affect either the health and safety of any person or the performance of activities in the project scope.
3. Following the estimate, the City can either withdraw its Variation Enquiry or issue a variation confirmation.

Under the terms of Schedule 22, the City also has the power to issue a **Variation Directive**, which requires RTG to proceed with the variation even though the estimate is not agreed upon or the variation may be under dispute.

Under the Project Agreement, RTG is also able to propose variations by issuing a notice to the City specifying the details of a proposed variation, RTG's reasons for proposing it, and indicating "all reasonably foreseeable implications of the Variation."

While either the City or RTG can initiate requests to vary the terms of the OLRT1 project, RTG's variation requests are ultimately subject to the City's discretion to consider and decide whether to issue a Variation Enquiry.

7.2 Risk Allocation during Construction

One of the City's main objectives in choosing the DBFM model (as explained in Chapter 5) was to transfer significant risk from the City to the private sector. As the City's witness John Jensen, of RIO, put it, "The City was looking for the best risk profile and looking to have the party best able to manage the risk to [actually] manage the risk." Jensen agreed with Commission counsel that from the City's perspective, this would mean that "the private sector partner is going to bear the risks of scheduling issues, budget issues, unforeseen events, et cetera." The model therefore provides that the risks associated with design, construction, and maintenance – including schedule and cost overruns – are borne by the private sector. In the context of the OLRT1 project, this meant that if these risks materialized and problems arose, RTG would be responsible for addressing the issue and bearing its cost.

Accordingly, the Project Agreement contains many provisions allocating design, construction, maintenance, and other risks to RTG. This section of the chapter details key provisions in the Project Agreement that allocated project risks between RTG and the City for the construction phase of the OLRT1 project. These include provisions about delays to the schedule, delays to Revenue Service Availability (RSA), cost overruns, events that might trigger some kind of relief, and geotechnical risk.

With certain exceptions, the Construction Contract (RTG's subcontract with OLRT-C) then transferred these risks from RTG to OLRT-C. This section will deal with the risks relevant to the construction phase. The maintenance risks relevant to the Commission's mandate are largely addressed by the payment mechanism described in section 7.4.

7.2.1 Failure to Maintain Schedule

The Project Agreement addresses construction schedules and milestones that led to payments from the City to RTG. Both the Project Agreement and the Construction Contract include provisions that could be triggered if and when RTG fell significantly behind its Works Schedule.

Section 22.3 of the Project Agreement addresses the different parties' rights and obligations if RTG failed to maintain its Works Schedule. Under this provision, if the City believed RTG had significantly fallen behind its Works Schedule, and the City issued a **Failure to Maintain Schedule Notice**, RTG had to deliver a report to the City and the

Independent Certifier outlining the reasons for the delay and a plan of the steps that RTG intended to take to eliminate or reduce the delay (a rectification plan). This section of the Project Agreement further required RTG to bring its design and construction works back on schedule in accordance with its plan to eliminate or reduce the delay to achieve RSA by the **Longstop Date** (the latest date by which RTG had to complete the project, which was 365 days after May 24, 2018). A failure by RTG to deliver a rectification plan would constitute an **Event of Default** under the Project Agreement and would entitle the City to terminate the Project Agreement in its entirety.

The above terms of the Project Agreement were reflected in the Construction Contract so that RTG could request a corresponding report from OLRT-C. OLRT-C would also be required to bring its design and construction works back on schedule. In addition, section 6.5 of Part 1 of the Construction Contract allowed RTG to request an acceleration of construction from OLRT-C, to the extent that it would be reasonably practicable, at RTG's cost.

7.2.2 Delays to Revenue Service Availability

The Project Agreement contains many provisions addressing delays to the RSA date.

Schedule 1 of the Project Agreement defines Revenue Service Availability as the achievement of the following conditions:

- Substantial Completion in accordance with the project specifications (see section 7.1.2 of this chapter) for both design and construction, and maintenance and rehabilitation (repairs or restorations);
- The commissioning of the system;
- Compliance with the testing and commissioning requirements in the Project Agreement (described later in this chapter);
- Compliance with the safety requirements as approved by the Independent Safety Auditor;
- Receipt by the City of the bill of sale for the LRVs;
- Completion of training for the staff provided by the City for operating the system; and
- Substantial Completion of the civil works.

The Project Agreement set May 24, 2018 as the **Required Revenue Service Availability Date (Required RSA Date)**. This was the date on which RTG was required to have received certification that the OLRT1 project had met the RSA conditions set out above. Five days after certification for RSA, RTG was entitled to be paid the RSA payment – an amount of just over $200 million.

The Project Agreement includes a financial incentive for RTG to meet the intended RSA date. Under the Project Agreement, RTG was required to notify the City at least 180 days prior to May 24, 2018 to confirm whether RSA would occur by that date, thus setting a **required notification date** in November 2017. If RTG failed to deliver this notice on time, then under the Project Agreement, such an omission would be deemed a notification that the Required RSA Date would *not* be met.

If RTG delivered a notice to the City saying that RSA would occur on or before May 24, 2018, but failed to achieve this target, then the Project Agreement required RTG to pay the City $1 million in **liquidated damages**. (Liquidated damages are a pre-estimate of the probable loss the City would suffer as a result of RTG's failure to achieve RSA when it said it would.) If RTG delivered a notice saying that RSA would *not* be met (or if RTG delivered no notice and thus was deemed to have indicated that the date would not be met), it was required to propose a new date within two months of the required notification date, for approval by the City, and that date would become the New Required RSA Date. If RTG failed to achieve the New Required RSA Date, then the Project Agreement required RTG to pay to the City $1 million in liquidated damages.

This process could be repeated until RSA was achieved. The Project Agreement did not set a limit on the number of times this process (setting a new RSA date, failing to achieve it, and owing liquidated damages) could occur. However, it did establish a Longstop Date of 365 days after May 24, 2018, at which point RTG would be found in **default**, entitling the City to terminate the Project Agreement in its entirety.

The Project Agreement stipulates that these amounts for liquidated damages "constitute the City's sole recourse against [RTG]" if the OLRT1 project did not achieve RSA by the Required RSA Date (or a New Required RSA Date). Witnesses from both Infrastructure Ontario and RTG stated that the amount of $1 million was designed to compensate the City for costs it would incur if it had already begun preparing for RSA and the operation of the OLRT1 system and then had to delay these preparations and begin them again later.

If there was a dispute over the achievement of RSA, the City was not entitled to payment of liquidated damages unless and until the dispute was resolved in the City's favour, following the dispute resolution provisions in the Project Agreement. If the dispute was resolved in the City's favour, the City would be entitled to the payment of the liquidated damages plus interest.

The Construction Contract between RTG and OLRT-C included the same Required RSA Date of May 24, 2018. Failure to achieve certification of RSA by this date required OLRT-C to pay to RTG both **delay liquidated damages** and **increased interest costs**. The Construction Contract set the liquidated damages for a delay as $124,820 for each

day (or part of a day) that elapsed between May 24, 2018 and the actual RSA date. The increased interest costs were designed to compensate RTG for the incremental amount of interest on the amount payable to the short-term lenders due to the delay in RTG receiving the applicable payment from the City because of the delay in achieving RSA.

The Construction Contract sets out a **construction contract liability cap** – the maximum amount that OLRT-C could be liable for under the Construction Contract and the Interface Agreement between RTG, OLRT-C, and RTM,[3] including any delay damages. OLRT-C's maximum amount was equal to 40 percent of the contract price for construction (approximately $1.8 billion). This liability cap is equal to approximately $725 million prior to any adjustments.

Part of this liability cap was a **delay damages subcap**. Delay damages include delay liquidated damages, non-refundable milestone delay damages, refundable milestone delay damages, and increased interest costs. The limit on this subcap was equal to 8 percent of the contract price for construction. This amounts to approximately $145 million, prior to any adjustments to the contract price.

7.2.3 Cost Overruns

Given its fixed budget (see Chapter 4), the City wanted to ensure that it transferred any responsibility for cost overruns during the construction phase of the OLRT1 project to RTG. This is what the Project Agreement did.

For example, the Project Agreement sets out RTG's obligation, "at its own cost and risk," to perform all activities within the scope of the OLRT1 project, including the performance of the design and construction works. It further specifies that, if at any time during the project term the design and construction works do not satisfy the output specifications or any other requirement in the Project Agreement, RTG is obligated to rectify the design and construction works "at its own cost and expense."

Similarly, between RTG and OLRT-C, the Construction Contract provides that "any cost overruns with respect to the [Construction Contract] Activities shall be the responsibility of the Construction Contractor and not Project Co [RTG]," though OLRT-C retained the ability to seek compensation or additional time.

7.2.4 Events for Which Relief Could Be Provided

Both the Project Agreement and the Construction Contract included provisions that allowed for RTG and OLRT-C, respectively, to be granted extra time, monetary

compensation, or both if certain events occurred during construction. In this way, the Project Agreement and Construction Contract allocated risk for various events that may result in project delays or increased costs. They were effectively exceptions to the general allocation of risk to RTG.

Those exceptional events, and the resulting relief, are captured in the Project Agreement and also carried over in the Construction Contract.

- **Delay Events** describe risks allocated to the City under the Project Agreement that delay RTG in carrying out its obligations under the Project Agreement. The Project Agreement enumerates a series of events or circumstances that constitute Delay Events, including any breach by the City of its obligations under the Project Agreement (unless the breach is caused by RTG); a requirement to perform additions, extensions, or variations of the design and construction works due to the discovery of contamination, objects having historical or archaeological value, or species at risk; a change to the terms and conditions of the environmental assessments; the discovery of a **Latent Defect** for which the City is responsible; and a **Stop Work Order** issued by a governmental authority.

  If a Delay Event occurred, the City was required to grant RTG an extension of time equal to the length of the delay. An extension of time included revising milestone dates or the Required RSA Date, as required. However, although Delay Events could extend even the RSA date, any such extension would not be carried over into the 30-year maintenance term contract – in other words, even if construction took longer, the project term would still end on the 30th anniversary of the original Required RSA Date (unless it was terminated earlier). In effect, the fixed project term means that the maintenance period, during which RTG can benefit financially, is shortened. This created an incentive to finish the design and construction phase of the project on time, or as early as possible.

- **Compensation Events** also describe risks allocated to the City under the Project Agreement. According to the Project Agreement, these events occur where any of the events or circumstances that constitute a Delay Event arise and cause RTG to incur a direct loss or expense (whether or not the event also causes a delay). If a Compensation Event occurred, RTG might be entitled to both an extension of time and financial compensation to put it in the same place it would have been if the Compensation Event had not occurred.
- **Relief Events** describe risks allocated to both the City and RTG under the Project Agreement. The Project Agreement enumerates a series of events or circumstances that constitute Relief Events, including fire, explosion, lightning, storm, hurricane,

tornado, flood, earthquake, riot, or civil commotion; failure by a utility company or local authority to perform works or provide services; failure or shortage of power, fuel, or transport; blockade or embargo; an official or unofficial strike, lockout, or other labour-related action; and any civil disobedience or protest action.

The occurrence of a Relief Event entitled a party to seek relief from the other party for non-compliance with its obligations under the Project Agreement. In other words, if any of the above-enumerated events occurred and prevented either party from performing its obligations under the Project Agreement, it would be entitled to claim a Relief Event. RTG may also be entitled to limited monetary relief, such as payment equal to the amount owed to its lenders under the lending agreements during the period of delay caused by a Relief Event.

- **Force Majeure Events** also describe risks allocated to both the City and RTG under the Project Agreement, if the occurrence of a Force Majeure Event makes it impossible for the City or RTG to fulfill its contractual commitments. The Project Agreement provides an exhaustive list of events or circumstances that constitute Force Majeure Events, including war, civil war, armed conflict, terrorism, acts of foreign enemies or hostilities; nuclear or radioactive contamination of any of the project works; chemical or biological contamination of any of the project works; and the discovery of species at risk or any objects having historic or archaeological value, which, as a result of applicable law, require the design and construction works of the OLRT1 project to be abandoned.

  In the event of a Force Majeure Event, the parties are relieved from liability under the Project Agreement, to the extent that the Force Majeure Event made compliance impossible. If a Force Majeure Event is also a Delay Event, RTG would be entitled to limited monetary relief.

For all types of events described above, the Project Agreement sets out specific duties to mitigate their impact. Generally speaking, the party entitled to assert a claim (e.g., RTG in the case of a Delay Event) was required to take “commercially reasonable steps” to reduce or eliminate the consequences of the event, to continue to perform its obligations to the extent possible, and to resume the performance of its obligations as soon as practicable.

As such, even if relief was provided to RTG, RTG was to take steps to reduce the impact of what was preventing it from meeting its obligations. In other words, the Project Agreement required RTG to reduce or eliminate the impact.

7.2.5 Geotechnical Risk

The City also sought to transfer risk to RTG by making RTG responsible for events related to geotechnical conditions. **Geotechnical risk** refers to taking on the risk for ground-related events and conditions that may impact the project. As detailed in Chapter 6, transferring geotechnical risk on the OLRT1 project was particularly important to the City because of the tunnelling work that would be undertaken as part of the project.

The City used a risk ladder in the RFP process, which allowed proponents to choose how much geotechnical risk they would assume for the OLRT1 project if their bid was chosen. In its bid, RTG chose to accept the highest level of geotechnical risk.

As a result, the Project Agreement transferred geotechnical risk – including the risks associated with tunnelling under the city centre – to RTG. The Project Agreement made it RTG's obligation to complete everything within the project scope at its own cost and risk. This included the design and construction of a 2.5-kilometre tunnel and three underground stations (Lyon, Parliament, and Rideau).

Notably, the Project Agreement did not provide for any relief (that is, Delay Events, Compensation Events, Relief Events, or Force Majeure Events) for issues related to geotechnical risk. The only partial exception to this is that the Project Agreement did create a Relief Event "with respect to Tunnel Work only" for "bursting or overflowing of water tanks, apparatus or pipes if such events are not attributable to the actions or omissions of Project Co [RTG] or any Project Co Parties and are not properly inferable, readily apparent or readily discoverable from the Background Information."

As noted, transferring the geotechnical risk was a key priority for the City. However, witnesses for RTG, including its current CEO, Nicolas Truchon, noted that "very rigid" risk transfer can create its own challenges. In his view, even where the private party is prepared to accept the risk, when certain types of risk materialize, it can "test the limits of the [P3] model and makes it very difficult for the private sector to keep its part of the equation, leading to projects that probably have bigger losses than expected."

Of course, significant geotechnical risk did arise on the ORLT1 project, most notably in the form of a large sinkhole on Rideau Street. This report will examine the effect the sinkhole had on the relationship between the City and RTG and for the ORLT1 project as a whole in Chapter 10.

7.3 Progress Reporting and Public Communications

Another key element of the Project Agreement is its allocation of responsibility for communications to the public. This section begins by explaining that the Project Agreement gives authority over public communications about the OLRT1 project to the City and gives RTG only a supporting role. Second, it addresses RTG's reporting obligations under the Project Agreement, which serve to inform the City's communications to the public. Third, this section sets out the City's governance process for managing its public communications role under the Project Agreement. Finally, it discusses potential challenges to the communications model used.

7.3.1 Authority over Public Communications about the OLRT1 Project

Schedule 18 to the Project Agreement is the communications and public consultation protocol that flows from section 52.8 of the Project Agreement. This protocol assigns the "lead communications role" to the City. In this role, the City is responsible for developing a "comprehensive communications strategy," handling crisis communications, and responding to all inquiries from media.

In contrast, the protocol directs RTG to play a "support" role. Accordingly, RTG is required to "direct all media enquiries and interview requests to the City's lead communications contact." Moreover, RTG is prohibited from issuing or disseminating "any media release, public announcement or public disclosure" relating to the OLRT1 project without the prior written consent of the City.

Witnesses from RTG and the City confirmed that the communications protocol in the Project Agreement was followed in practice. John Manconi, the City's former General Manager of Transportation Services, explained that it was the City's responsibility to communicate with the media and that RTG had to receive the City's approval before communicating with the media. RTG's former CEO, Peter Lauch, confirmed that RTG did not speak to the media on its own initiative. Instead, RTG would provide information directly to the City about the OLRT1 project, including RSA dates. In Lauch's words: "Our communications agreement was such that that type of information would come to the City." The City could then decide if and when the information should be made public.

7.3.2 Reporting to the City

The City's public communications about the OLRT1 project are based in part on the information it receives from RTG. Under the Project Agreement, RTG has responsibilities to report regularly to the City throughout the construction and maintenance phases of the OLRT1 project. For example, the Project Agreement requires RTG to attend and provide regular updates to:

- The **Works Committee**, consisting of City and RTG representatives, who attended regular meetings to review the progress of construction on the OLRT1 project and addressed construction issues; and
- The **Maintenance Committee**, also consisting of City and RTG representatives, who attend regular meetings to review the performance of maintenance services; compliance with project specifications, including safety, reliability, and quality matters; and any issues arising during the maintenance term.

In addition, RTG was required to provide the City with **monthly works reports** during the construction phase of the OLRT1 project. Schedule 33 to the Project Agreement sets out what these monthly works reports had to contain, including RTG's accomplishments in the past month, its planned activities for the next three months, its progress against design and construction milestones, and details of any delays.

RTG was also required to provide an **Updated Works Schedule** with its monthly works reports. The Project Agreement stipulates that the Works Schedule had to set out RTG's full plan for the design and construction phase of the OLRT1 project, including but not limited to all major milestone events and the schedule for testing and commissioning activities.

During the maintenance period, RTG is required to provide **operating reports** and **performance monitoring reports**. Schedule 15-3 to the Project Agreement requires RTG to prepare daily operating reports regarding the prior day's service delivery; vehicle, systems, and station performance; and helpdesk activity. Schedule 11 to the Project Agreement sets out that RTG must submit a report monitoring the system's performance for each payment period, which means once per month. These reports contain the **scheduled vehicle kilometres** (the total vehicle kilometres required by the City in a given contract month) and **station hours** (the number of hours in a contract month that a station is required to be open and available for use) for each period as well as any **service failures** and **quality failures**. The performance monitoring reports are based on the daily operating reports for the relevant payment period.

7.3.3 The City's Communications Governance

To execute its lead communications role, the City put the Rail Implementation Office in charge of communications. As explained in Chapter 3, RIO also had the broad mandate of advancing the OLRT1 project from functional design to preliminary engineering, preparing the procurement and selecting a proponent, and then overseeing the delivery of the OLRT1 project.

The City's **Project Charter**, which had the purpose of establishing "a high level framework of governance and management … for the planning and implementation of the OLRT project" stipulates that "all public communication will be managed through the communications office as part of RIO." Jensen, the former Director of RIO, agreed with Commission counsel that a key reason for making RIO responsible for all public communications was "to ensure coordination and consistency of the messages that the public is receiving."

Under RIO's management, one of the City's main communications objectives for the OLRT1 project was transparency and accountability. The Project Charter identifies transparency and accountability as "key guiding principles."

One way to meet the City's transparency and accountability objectives was through regular reporting to the Finance and Economic Development Committee (FEDCO). Manconi, Ottawa's General Manager of Transportation Services, explained that RIO briefed and updated the FEDCO quarterly throughout the duration of the OLRT1 project. In addition, the FEDCO received technical briefings and could request additional reports beyond the quarterly updates. In general, FEDCO meetings are open to the media and the general public.

The following are two examples of public communications about the OLRT1 project through the FEDCO meetings. On February 6, 2018, Manconi appeared at a FEDCO meeting to explain that the RSA date of May 2018 would not be achieved and that November 2018 was the new target RSA. About a year later, on February 12, 2019, both Manconi and Lauch, RTG's CEO, appeared at a FEDCO meeting and spoke publicly. At this meeting, Lauch stated publicly that RTG was confident that it would meet its new RSA date of March 31, 2019. Manconi, on the other hand, stated that he was "highly skeptical" that this date would be achieved.

In addition to the FEDCO meetings, the City would organize media conferences at which Mayor Jim Watson would make announcements about major challenges or achievements in the OLRT1 project. For example, on June 18, 2019, Mayor Watson convened a face-to-face meeting with top executives from RTG and Alstom. Following

that meeting, the Mayor held a media conference, joined by the same executives, where he announced that RTG would hand the OLRT1 system over to the City in August 2019. Later that summer, on August 23, 2019, Mayor Watson held a symbolic key ceremony where RTG officials, including Lauch, gave the Mayor a large framed key to commemorate the handover of the OLRT1 system to the City.

In accordance with the communications and public consultation protocol, RTG's appearances at both FEDCO meetings and media conferences with Mayor Watson were at the City's express invitation.

These examples illustrate how the public communications requirements in the Project Agreement were carried out in practice. The result has been that the City has had significant control over what the public was learning about the OLRT1 project.

7.3.4 The One-Sided Communication Challenge

This kind of arrangement – where only one party has control over public communications and the other does not – can function well when the relationship between the contracting parties is co-operative. However, if that relationship hardens or breaks down, or if the parties' interests begin to diverge, a one-sided communications arrangement can create challenges in communicating necessary information to the public. Indeed, a reasonable observer would begin to have concerns about whether citizens would get all the information they need about the OLRT1 project or if they would receive a one-sided story.

There is some evidence that, at least from RTG and RTM's perspective, the public was eventually getting only a one-sided story about the OLRT1 project. For instance, in his testimony before the Commission, RTM's acting CEO and General Manager, Mario Guerra, stated that from his perspective, the City's approach to public communications meant that "there was only one side of the story being told." In Guerra's view, the City's approach led to a public perception that RTM was not performing well and that thus any payment to RTM "could be perceived as cutting us a break." This, in turn, hindered an open dialogue between the City and RTM on the payment mechanism.

This concern about "one-sided" communications is not to say that the public would benefit from receiving differing and inconsistent messages from two or more parties about the same subject. Rather, the different parties should strive to agree on communications to the public. In an internal March 2021 "Lessons Learned" document authored by SNC-Lavalin (one of the three partners that make up RTG), the company concluded that the OLRT1 project would have benefited from "a defined and prepared Communication Plan, commonly agree[d] upon, with a set strategy aligned between

the City/Client, the Project and the rolling stock [vehicle] provider to provide a common message to be presented to the media and general public and sharing in the transition, integration and service of their system."

The SNC-Lavalin "Lessons Learned" document states that in the case of the OLRT1, the City did not consult RTG on information that was provided to the media and that RTG did not issue its own communications to the media. To illustrate the difference more RTG input might have made, the document indicates that the City did not do enough to educate the general public about the new system and the challenges in transitioning from bus to rail. Had it done so, the public's expectations might have been better informed.

There are good reasons for giving one contracting party authority over public communications. From an efficiency perspective, this allocation of responsibility makes good sense. In a P3 model, it may often be best for the public partner to have this control. Nonetheless, the experience of the OLRT1 project shows that P3 partners should give careful thought to ensuring that public communications are as collaborative as possible. Indeed, when working as partners, the City and RTG both have much to contribute to an effective communications strategy. The City knows Ottawa and its stakeholders, but RTG has expertise in public transit, infrastructure, and technical matters. Consequently, to ensure that the media and the public are getting the full story, it may be beneficial to allow both parties to participate in public communications, particularly if the relationship between the contracting parties becomes strained. It is important to ensure that communications to the public serve the public's needs rather than being used by one party against another in the context of a contractual dispute. The bottom line is that the communications to the public must be fair, honest, and provide accurate information. The goal is to inform, not to spin.

7.4 Payment Mechanisms and Incentives

The Project Agreement sets out a milestone payment system for the design and construction phases of the OLRT1 project. It provides a different payment system for the 30-year maintenance phase, during which RTG is responsible for maintaining the OLRT system. Each payment system is meant to permit the City's payment to RTG for the work performed, and to incentivize certain behaviours through payments and allocation of costs.

7.4.1 Construction Milestone Payments

The Project Agreement provides that during the design and construction phases, RTG would receive certain milestone payments from the City upon completion of certain specified milestones. For example, the first milestone payment was for the demolition of existing structures to make way for the Belfast Yard Maintenance and Storage Facility (MSF) by November 25, 2013. The following list shows OLRT1 project milestones, along with the dates on which the milestones were certified.

Milestone	Certificate Date
1. Complete demolition for MSF	November 22, 2013
2. Completion of 50% of main-line tunnelling	June 26, 2014
3. Delivery of major equipment	September 3, 2014
4. Completion of 50% of MSF link tunnel	November 5, 2014
5. Interim design development	May 21, 2015
6. Completion of MSF	April 5, 2016
7. Completion of tunnelling	June 30, 2016
8. Civil works – completion of bridges	March 10, 2017
9. Completion of Station Bundle #4	January 20, 2017
10. 2017 readiness	July 25, 2017
11. Completion of Station Bundle #1	March 9, 2018
12. Substantial Completion of fixed facilities and vehicles	July 26, 2019

The final milestone payment, milestone 12 in the table, was for the Substantial Completion of the fixed facilities and vehicles. Reaching that milestone entitled RTG to payment of approximately $59 million from the City. The Project Agreement also provided for a significant payment once RTG met the requirements for RSA, as confirmed by the Independent Certifier. Upon achieving RSA, RTG was entitled to payment of roughly $202 million from the City. (The Project Agreement requirements that RTG needed to meet to achieve Substantial Completion and RSA will be discussed later in this chapter, and these events are addressed again in Chapter 12.)

During the RFP process, RTG was able to select the milestone events on which it wanted milestone payments to be based, and also determine the timing and amount of the milestone payments, subject to certain constraints detailed in the RFP. These constraints included requirements that:

- RTG would at all times have at least $250 million of private-sector financing payable to its lenders and investors; and
- The cumulative sum of all milestone payments would not exceed 80 percent of cumulative capital costs, as defined in the RFP.

These requirements ensured that RTG was always committing more money to the OLRT1 project than it was receiving in milestone payments (elaborated on below). This was to ensure that RTG always had private capital or “skin in the game” to drive the completion of the OLRT1 project.

Essentially, the Project Agreement was structured so that a portion of the construction costs (above the 80 percent mentioned above) was to be paid back to RTG over the entire life of the contract, including over the maintenance term.

As RTG was the chosen bidder, the milestone payments selected by RTG in its bid were incorporated into the Project Agreement. However, these milestones could be amended or redefined by RTG and the City in certain circumstances. Changes to the milestone payments also required the consent of the lenders involved with the OLRT1 project. Such changes occurred in a few instances on the OLRT1 project, due in part to a lack of clarity in the definition of what was required to achieve certain milestones.

For example, RTG and the City agreed to redefine the milestone payment for the completion of the first half of the main-line tunnelling activities (milestone 2 in the table). The redefinition did not change the milestone as such, which required that 50 percent of the tunnelling be complete, but it modified how that 50 percent was calculated. The definition of the milestone was unclear about whether 50 percent meant half of the length of the tunnelling or half of the volume of the tunnelling work to be performed. The City

and RTG ultimately agreed that this milestone should be based on the volume of the work and the level of effort expended in the context of the overall tunnelling work. These amendments to the milestone payments never resulted in RTG receiving payments for work that it had not yet performed.

7.4.2 Maintenance Term and the Maintenance Payment Mechanism

Following the achievement of RSA, **public service** (that is, service for passengers) on the OLRT1 line could start. This point also marked the start of the **maintenance term** under the Project Agreement. When the system entered the maintenance term, RTG became entitled to receive **monthly service payments** from the City throughout the 30-year maintenance term.

During the maintenance term, RTG is responsible, through its maintenance activities, for ensuring the performance of the OLRT1 system. Like the project specifications that applied to the design and construction of the system, the payment mechanism for the maintenance term was designed not to be prescriptive. For instance, it did not prescribe the specific tasks to be performed by RTG and other requirements such as staffing levels. Rather, it was designed to be performance-based and rested on RTG's ability to provide consistently reliable service. A failure to meet the performance levels can result in deductions from the monthly service payments that RTG receives. This payment mechanism was structured to incentivize RTG to perform its maintenance services to a high standard in order to receive full payment from the City.

The payment mechanism for RTG's maintenance services is the primary method for the City to enforce RTG's compliance with its maintenance obligations. Recall that the Project Agreement was structured so that a portion of the construction costs are paid back to RTG over the entire life of the contract, including during the maintenance term. As Deloitte explained to the City in a letter promoting the DBFM model (see Chapter 5), the City can ensure payment is only made if the performance standards are met throughout the maintenance term. This arrangement provides the City with the security to enforce the performance standards RTG is required to meet. The fact that the maintenance payments cover not only the maintenance costs but also some of RTG's construction costs also explains why receiving payment during the maintenance term is important for RTG. It is not just about RTG making a profit; it is also about RTG recovering the costs it incurred in the construction phase to build the system.

The monthly service payments that RTG is to receive for its maintenance work are subject to the terms of the Project Agreement. The Project Agreement sets out a

complex system of deductions and failure points that can be allocated to RTG if it fails to meet its maintenance obligations and the performance requirements.

The **deductions** are monetary reductions to the amounts RTG is paid monthly for its maintenance services. Deductions are applied where certain failures occur, and these are classified as **service failures**, **vehicle kilometres availability failures**, **station availability failures**, and **quality failures**. If any of these occur, the City may deduct certain amounts from RTG's monthly service payments. To determine how the failures impact the deductions, the Project Agreement sets out the formulas to calculate the performance of the system in a given month. The measures focus on the availability of both the vehicles and the stations – for instance, how many vehicles were launched in the morning and completed their runs throughout the day. The Project Agreement then sets out the deduction to be applied to the monthly service payments based on the availability ratios for the stations and vehicle kilometres, expressed as a percentage. Once the vehicle kilometres availability ratio (or **aggregate vehicle kilometre ratio, AVKR**) drops below 98 percent, RTG begins to incur deductions from its monthly service payments.

The Project Agreement imposes certain caps on the deductions that can be applied against RTG's monthly service payments. For example, there are limits on the aggregate amount of certain deductions that can be applied in a given day.

The Project Agreement provides that "the maximum aggregate of all Deductions that the City can make from a Monthly Service Payment in respect of any Contract Month shall be the Un-adjusted Service Payment relating to that Contract Month." Several witnesses, including witnesses from Infrastructure Ontario, told the Commission that the deductions are capped monthly and cannot be carried over from month to month, and that if the deductions would otherwise exceed the monthly service payment, the excess cannot be applied in subsequent months. This is consistent with Infrastructure Ontario's practice on other projects. As Remo Bucci, of Deloitte, explained, it is an incentive system, and it is not intended to capture the harm caused to the City. He added: "If you didn't deliver those kilometres, then you shouldn't get paid that month because the service wasn't available and look at the disruption that it's caused the city." However, any deductions for one month do not roll over to the next month.

In addition to the deductions, **failure points** can also be allocated to RTG for the same types of failures that result in deductions and based again on the same performance criteria. For example, RTG will incur failure points when trains are not available for service or are removed from service, and when system failures, such as a derailment, occur. RTG is required to monitor the performance of its maintenance activities and can be allocated failure points if these failures occur. The failure points are not dollar based.

Rather, if enough failures occur in a given period of time, the City has options to address the lack of performance. The Project Agreement applies escalating consequences for the accumulation of failure points, beginning with warnings and increased monitoring, with the ultimate consequence being an Event of Default that may lead to the termination of the Project Agreement.

The payment mechanism for RTG's maintenance services is subject to review by the parties. This can occur, if either RTG or the City requests it, once per contract year, and it must occur at least once in every five contract years. This option of review allows the parties to make changes to the payment mechanism, but it cannot alter what is called the "risk profile" that RTG assumed in taking on the responsibility for meeting the performance requirements. Any change to this aspect would require RTG and the City to use the variation procedure set out in the Project Agreement (and noted earlier).

The goal of the payment mechanism is for the City to achieve maintenance criteria by balancing incentives and disincentives, encouragement and discouragement, while not being overly punitive. As noted, the Project Agreement was based on Infrastructure Ontario's existing template used in other infrastructure projects. The benefit of this is that bidders can rely on the predictability that comes with Infrastructure Ontario's template agreement. Bidders can reasonably expect that agreements with similar payment mechanisms will work like those they have seen before on other projects. As John Traianopoulos, of Infrastructure Ontario, explained, when bidders do their due diligence on the project, "they take comfort in some precedent and some familiarity with [the] documents."

In P3s, partnership and co-operation between parties, such as the City and RTG, is fundamental to the success of the project. Traianopoulos testified that if either the City or RTG takes an adversarial approach to the relationship, it can cause a risk to the reliability of the OLRT system. This does not mean that the City or RTG should ignore the contract and not enforce the terms of the agreement, but it does mean that they should not use the contract as a tool to penalize the other party.

If a bidder knows that the payment mechanism is punitive, or that it will be enforced in a punitive way, it can account for this factor in its bid. In the case of the OLRT1 project, RTG did believe that the payment mechanism was punitive, but it came to believe through discussions with the City that the mechanism would not be enforced in a punitive way. As it turned out (and as is explained later in this report) the City did apply the payment mechanism in a punitive manner. This led to several problems in the relationship between the City and RTG during the maintenance term.

7.5 Role of the Independent Certifier

The Project Agreement, in section 25, establishes the role of Independent Certifier and provides for the appointment of an Independent Certifier to perform certain specified tasks. The Independent Certifier was to be appointed jointly by the City and RTG, and was, as the name suggests, independent of the City and of RTG; it took instructions from both, and was paid 50/50 by both the City and RTG. Although the Independent Certifier might have taken into account any opinions or representations made by the City and RTG, it was not bound to comply with any opinions or representations made by either of them when exercising its professional judgment.

A competition was held and Altus Group was selected as Independent Certifier for the OLRT1 project. At the time of the selection, Altus Group was a public company with over 1,800 employees and more than 60 offices in 14 countries. Altus Group promoted its experience in over 70 P3/AFP projects, including extensive experience acting as an independent certifier.

Altus Group signed the Independent Certifier Agreement on February 12, 2013, a draft of which was annexed to the Project Agreement as Schedule 6, the same day the City and RTG signed the Project Agreement.

7.5.1 The Role Generally

The role of Independent Certifier is established in the Project Agreement. The Independent Certifier Agreement sets out the responsibilities and tasks assigned to the Independent Certifier, as well as the obligations of the Independent Certifier in carrying out those tasks.

Appendix A of the Independent Certifier Agreement sets out in detail the required tasks of the Independent Certifier. Its primary responsibility during the OLRT1 project was to certify payment milestones – in other words, to confirm that a certain construction milestone had been met by RTG – so that the parties would know when payment was to be made, and to resolve any conflict over whether a payment milestone had been achieved. Overall, the Independent Certifier's tasks included, but were not limited to:

- Attending various committee meetings in order to review progress of the OLRT1 project;
- Issuing monthly status reports to the City and RTG on various aspects of the project, including reviewing schedules and exchanging documents; and
- Performing regular site visits to track the progress of the construction.

There were important limitations to the Independent Certifier's role on the OLRT1 project: while some of the Independent Certifier's staff might be certified engineers (including its team leader, Monica Sechiari), the Independent Certifier was not a professional of record *on the OLRT1 project* and had no responsibility for the project's design or construction. The Independent Certifier's role also ended at the end of construction and pending the issuance of the Final Completion Certificate; there was no role for the Independent Certifier during the operations phase of the OLRT1 project.

7.5.2 Certification Role

In the Project Agreement, Schedule 6 (the Independent Certifier Agreement) outlines the scope of the Independent Certifier's role in certifying a milestone payment.

The process for certifying that a given milestone had been achieved started with RTG issuing a request for certification. The Independent Certifier was then required to consider the views and comments of both RTG and the City about whether the conditions for the milestone had been satisfied. Then the Independent Certifier was required to either issue the certificate or issue a report outlining what outstanding work needed to be addressed before the certificate could be issued.

To decide whether the conditions for certification of a given milestone were met, the Independent Certifier would review both RTG's submission and the City's opinion regarding that submission, review documentation, and if warranted, perform a site visit. The Independent Certifier would not, however, perform any independent testing or validation related to certification of a milestone – this was not part of its role or function. Instead, the Independent Certifier would review documentation and reports prepared by the professionals of record on the OLRT1 project to assist in deciding whether the milestone was achieved.

Each certification that a milestone was achieved was issued within a separate report titled "Independent Certifier's Milestone Acceptance Certificate & Report" and included supporting documentation reviewed by the Independent Certifier, the notice from RTG regarding the milestone, and related correspondence from the City. As detailed in Chapter 12, the Independent Certifier was also required to prepare, in consultation with RTG and the City, a list of outstanding **minor deficiencies** in relation to milestones, Substantial Completion, and **Final Completion**. (This last term represents the end of the constructors' work on the project.)

An important facet of the Independent Certifier's role was that it could mediate in the certification process if the City and RTG disagreed on whether a milestone had been achieved. The evidence of Sechiari, the lead for the Independent Certifier, was that if

the City and RTG agreed that a milestone or other requirement had been achieved, it would be "highly, highly unlikely" that the Independent Certifier would intervene and take the position that it had not, in fact, been achieved. To intervene in those circumstances would indicate that there had been a total breakdown of due diligence by the parties and their experts.

7.5.3 Dispute Resolution Role

Schedule 27 of the Project Agreement (as noted earlier) addresses dispute resolution, and the Independent Certifier had a defined role in the dispute resolution process as well. The Dispute Resolution Procedure generally requires the City and RTG to try to resolve a dispute by amicable discussion between representatives before escalating the dispute for amicable resolution by the parties' senior officers. If those levels of discussion did not resolve the dispute, the Independent Certifier was tasked with making an independent determination of the dispute in certain areas of the OLRT1 project. These areas included disputes related to the following:

- Design and construction that arose prior to or in relation to any milestone, Substantial Completion, or RSA;
- Completion of minor deficiencies;
- Resolving whether any work constituted a variation;
- A review of estimates or other matters relating to variations; or
- Generally relating to the certification services provided by the Independent Certifier.

While the Independent Certifier's decision to issue or not issue a milestone certificate or the RSA certificate was binding on the City and RTG, the Independent Certifier's determinations were otherwise not binding under Schedule 27. Ultimately, eight disputes between the City and RTG were referred to the Independent Certifier, which made determinations on them.

While the Project Agreement required the parties to refer certain disputes to the Independent Certifier, RTG's Truchon expressed the view that the Independent Certifier may not be best placed to resolve disputes when issues of contractual interpretation were involved. In Truchon's view, the Independent Certifier was a "cost expert" rather than an expert on contractual interpretation.

7.6 Role of Third-Party Finance Providers and Project Extensions

7.6.1 The Role of Third-Party Lenders

The Project Agreement provides that RTG is responsible for financing the OLRT1 project's design and construction phases. The City was responsible for making periodic payments during the design and construction phases, and is responsible for making monthly service payments as of the beginning of the operation and maintenance term of the project.

In accordance with the Project Agreement, RTG entered into lending agreements, including a Credit Agreement, with certain lenders; through these agreements, lenders would provide short-term and long-term financing for the OLRT1 project. The Credit Agreement set out the rights and obligations of RTG and the lenders regarding the financing provided to RTG for the design and construction of the OLRT1 project.

The Credit Agreement provided RTG with both short-term and long-term financing. The short-term financing was in the form of a revolving credit facility. (The short-term financing allowed RTG to withdraw money, use it, repay it, and withdraw it again when needed – like a line of credit.) The outstanding balance for the short-term financing was to be repaid around the time the construction of the OLRT1 project was completed. The long-term financing was in the form of a non-revolving credit facility. The long-term financing must be repaid over an approximately 30-year period.

The financing component in a P3 is a mechanism to enforce risk transfer. The financing is not a funding mechanism for the OLRT1 project, because the City is ultimately responsible for paying RTG for its work. In other words, the financing is used to transfer risk to RTG and to incentivize RTG to perform well, but all construction and financing costs are ultimately paid by the City.

The incentives resulted from the fact that the City's payments to RTG were subject to the deductions and limitations described earlier in this chapter. RTG had the incentive to complete high-quality construction to meet the project specifications in order to receive its construction payments. RTG continues to have incentives to ensure high-quality maintenance services, as the monthly service payments from the City for RTG's

maintenance services (by RTM) may be withheld if the OLRT1 system is not performing to the established standards. If RTG does not perform to the agreed-upon standard, it must still make its debt payments to the lenders, but without payments from the City. The long-term financing must be paid back by RTG over an approximately 30-year term. Defaulting on a loan would be a serious matter for RTG's partner companies. Rob Pattison, of Infrastructure Ontario, explained that the financing is used as leverage against the project company (in this case, RTG).

The involvement of lenders in P3s also provides certain notional benefits. One benefit is that lenders provide independent oversight of the project. This independent oversight is exercised both in the proposal stage and during the term of the project.

During the proposal stage – and before they commit to lending money to a project – lenders assess the risk as part of their due diligence. This careful examination from possible lenders provides a level of oversight of a proponent's approach to a project and their plans. Potential lenders scrutinize the deal to see if it makes sense and if the team has the expertise to deliver the project.

Once a project is under way, lenders also provide a layer of independent long-term oversight for the project. The lenders monitor the project, because they have a direct financial interest in its successful completion. In other words, there are theoretical benefits to involving an independent party who has money to lose or, as Traianopoulos put it, "skin in the game."

As part of the expert panel on P3s, Matti Siemiatycki described the financing component of P3s as "the glue that holds the deal together."

7.6.2 The Credit Agreement and Lenders' Direct Agreement

The Credit Agreement that RTG entered into with lenders to access financing for the OLRT1 project sets out the rights and obligations of RTG and the lenders for the short-term and long-term financing.

RTG, the City, and the lenders are all parties to an additional document, called the Lenders' Direct Agreement, which is Schedule 4 to the Project Agreement. The Lenders' Direct Agreement is the contractual link between the lenders and the City. Among other things, the Lenders' Direct Agreement sets out the parties' rights in relation to the collateral pledged by RTG to the lenders, and it provides the lenders with certain powers to remedy certain breaches of the Project Agreement by RTG.

The Lenders' Direct Agreement and the Credit Agreement provide the lenders with significant benefits and powers that the City does not have. These powers are designed to protect the lenders if RTG does not perform under the Project Agreement.

One of the lenders' benefits is that they have access to a larger pool of security from RTG. For example, RTG and its partners and parent companies were required to secure RTG's borrowing with guarantees from the parent companies, letters of credit, and equity investments. The lenders have access to this security if RTG were to default on its repayment obligations. In contrast, the City does not in that same scenario have access to the same type of security as the lenders do.

The Lenders' Direct Agreement also provides certain powers to the lenders to enforce their rights. For example, the Lenders' Direct Agreement provides the lenders with "step-in rights" if RTG breaches the Project Agreement. As previously noted, the Project Agreement sets out the definitions and consequences of such events as Delay Events, Compensation Events, and Events of Default. The Project Agreement provides an exhaustive list of circumstances that can lead to an Event of Default by RTG. If there were an Event of Default by RTG, the lenders would be able to use the step-in rights set out in the Lenders' Direct Agreement. Broadly speaking, this means that lenders have the option to take over RTG's rights and obligations under the Project Agreement to address or cure an Event of Default.

Another protection for the lenders is that the City and RTG must not amend or modify the Project Agreement (except in accordance with its terms) without consent from the lenders. Specifically, the lenders must be asked for their consent if an amendment would do any of the following:

- Negatively affect their ability to exercise their guarantee rights, in a material way;
- Negatively affect the value of their guarantee, in a material way; or
- Increase their liability or that of RTG.

The reason that consent from the lenders is required for significant amendments to the Project Agreement is because significant amendments can change the risk profile of the project. Lenders take on debt (or not) and structure their debt for the size and scope of a given project. If that project grows, lenders will want to make sure that they are no worse off in terms of risk than they were under the original deal.

7.6.3 Extensions to the OLRT1 Project

The Project Agreement contains provisions addressing extensions to the OLRT1 system or the construction of additional stages of Ottawa's LRT project.

Schedule 38 of the Project Agreement outlines the process the City can use to seek a system extension during the project term. This process allows the City to negotiate with either RTG or a different contractor to implement an extension to the system. This can be done through negotiating a new agreement using the procedure set out in Schedule 38 or with a variation to the Project Agreement.

Schedule 22 of the Project Agreement sets out the procedure to be used when a variation is proposed by either the City or RTG. It also set out the procedure to be followed if the City decides to implement a system extension with a variation to the existing Project Agreement.

The Lenders' Direct Agreement requires consent from the lenders for certain material amendments to the Project Agreement. The Credit Agreement also provides for varying levels of lender approval for variations to the Project Agreement, depending on the cost and impact of the change.

During the OLRT1 project, the City considered amending the Project Agreement to account for the expansion of the system. To do so, the City and RTG required the lenders' consent to amend the Project Agreement to include components of Stage 2 of the OLRT project, such as the maintenance services. However, Schedules 22 and 38 to the Project Agreement (dealing with variations and system extensions) did not address the additional costs involved in obtaining the lenders' consent to the amendment.

To provide their consent, the lenders required RTG to inject in the range of $50 million to $100 million in additional equity, as security for the increased risk associated with this increased scope of work. This would be a significant cost to the City, given that financing costs are ultimately paid by the City.

In the Project Agreement and the other OLRT1 project documents, the other option available to the City for extending the system was for the City to pay out the long-term lenders to retire the debt. At a high level, this would require the City to pay the net present value of the debt, meaning the lenders would be paid up front the value of the interest that would have accrued over the approximately 30-year financing term. Referred to as a make-whole payment, this would also be a very expensive option for the City.

The Project Agreement did not provide for the step the City ultimately took to address Stage 2 of the OLRT project. The step involved a debt swap: specifically, in 2017 the City

and the lenders arranged that the City would make the debt payments to the lenders in exchange for the City assuming RTG's debt. Thus the City essentially stepped into the shoes of the lenders, which meant that the City would receive RTG's debt payments directly from RTG. This put the City in the position of the lender to RTG.

In addition to facilitating the amendment to the Project Agreement to account for the expansion of the system, this change provided the City with powers and additional security that were not previously available to it. For example, it gave the City access to enhanced security (guarantees) and additional reporting from RTG. As Chapter 10 will show, the debt swap negatively impacted the relationship between the City and RTG, at a time when the project was facing challenges.

7.7 Testing and Commissioning, Trial Running, and Handover

The Project Agreement, in section 26 and Schedule 14, sets out provisions for testing and commissioning of the OLRT1 project. The testing and commissioning provisions of the Project Agreement were intended to ensure that the transit system being delivered by RTG to the City met the specifications and requirements of the Project Agreement, and that it was complete, safe, functional, and ready for operations at **handover**. The testing and commissioning provisions were intended to protect the City, as the project owner, by ensuring that the system it took ownership of upon completion of the design and construction work was fully ready and safe for public service.

Under the Project Agreement, RTG was responsible for creating the plan for testing and commissioning. Schedule 14 required RTG to prepare and execute a plan to demonstrate the performance of the system in accordance with the requirements of the Project Agreement. Schedule 14 also made trial running the last part of the overall commissioning plan.

7.7.1 Testing and Commissioning

The Project Agreement sets out requirements for testing and commissioning, which is the process by which RTG demonstrates that it has completed its work, that the work meets the requirements of the Project Agreement, and that the system is ready for handover and the start of public service. **Commissioning** includes but is not limited to activities such as testing, verifying that the systems and vehicles are complete and operational subject to minor deficiencies at most, and training on the use and operations of the system.

For instance, to ensure that the performance of the LRT system meets or exceeds the requirements provided for in the project requirements and the Project Agreement, Schedule 14 provides for the commissioning "of the complete operating System Infrastructure" by RTG, in accordance with the standards set out in that same schedule. According to the Project Agreement, the City was to be provided with extensive documentation so that it could verify that these requirements had been met, and the plan was also to permit oversight and monitoring of testing and commissioning activities.

Schedule 14 also reasonably provided for RTG's commissioning plan to be developed and modified as required to address the evolution of the OLRT1 project, and for

it to be reviewed and modified during the project as agreed by RTG and the City. According to the Project Agreement, the plan and strategy was supposed to verify that the performance of the system met or exceeded the requirements of the project specifications and Project Agreement.

While the Project Agreement sets out that the testing and commissioning obligations would fall to RTG, these obligations were passed on to OLRT-C as part of RTG's subcontract with OLRT-C (the Construction Contract). Indeed, the subcontract between OLRT-C and RTG contained terms from the Project Agreement and flowed down obligations to OLRT-C to perform all of RTG's testing and commissioning obligations.

7.7.2 Trial Running

The trial running of the OLRT1 system is defined as the final part of RTG's overall required commissioning obligations under the Project Agreement, following Substantial Completion but prior to the system being ready for public service (that is, revenue service). In plain language, **trial running** involves running the system as if it were in public service, but without carrying passengers. The goal of trial running is summarized as being the exercise of the complete integrated LRT system, including operating personnel and procedures, to confirm that the system is ready for public service.

Both Schedule 14 and Schedule 15 address trial running. Schedule 15-1 defines trial running as "a twelve (12) consecutive day period that may commence upon the successful completion of testing and commissioning. Upon successful completion of trial running, the integrated system will be ready for revenue service." Schedule 14 addresses the objectives of trial running, its scope, and the performance criteria for trial running acceptance under the heading "Integrated Revenue Service Availability Testing."

The key requirements of trial running, as established by Schedule 14, were:

- To run for a period of 12 consecutive days;
- To be reviewed on a day-by-day basis by the commissioning team;
- To operate full regular service on the full line without passengers;
- To include a variety of failure management scenarios that could reasonably be expected to occur in public service;
- To collect operating data and demonstrate that the process to collect, evaluate, and validate the operating data has been properly established;
- To verify adequate trained staff; and
- To demonstrate to the Independent Certifier that the required performance of the system can be achieved, and for the Independent Certifier to validate trial running.

While Schedule 14 sets out what one might refer to as the objectives of trial running, it does not contain a specific procedure for how these goals would be achieved or how "success" would be measured. For that reason, OLRT-C devised and the City agreed to a specific trial running procedure that detailed the process to be followed and criteria to be applied to trial running.

While the specific events of trial running are dealt with in greater detail later in this report, here is an overview to address trial running as it relates to the Project Agreement.

OLRT-C began drafting the procedure for trial running around 2016. The City commented on drafts of the procedure.

On or around May 11, 2017, the City and RTG agreed to follow the "Trial Running Evaluation Process and 'Scorecard' Approach" (which is set out in a document known as RFI-O-266). However, in 2019 when the parties were closer to being ready to start trial running, a new iteration of the procedures and criteria was developed by OLRT-C, and agreed upon by the City. The final Trial Running Test Procedure, dated July 31, 2019, was prepared by OLRT-C's Matthew Slade and William Allman. It was reviewed and signed off on by RTG's Lauch and RTM's Claude Jacob and accepted by the City. The procedure contained a detailed list of criteria to be achieved by the system during the trial running period in the areas of safety, operations, maintenance performance, vehicle performance, station performance, customer systems, and other major systems, and it included a scorecard that the Trial Running Review Team (TRRT) would use to evaluate a day of trial running.

The TRRT was composed of Troy Charter (of OC Transpo), Larry Gaul (a consultant for OC Transpo), Richard Holder (City), Jacob (RTM), Kyle Campbell (of the Independent Certifier), Lauch (RTG), Slade (OLRT-C), and Allman (OLRT-C). Based on the review of data and discussions of the TRRT during its daily review meetings, the Independent Certifier scored each day of trial running as a "pass," "fail," "repeat," or "restart," in accordance with the Trial Running Test Procedure.

While a representative of the Independent Certifier was a member of the TRRT, and while the Independent Certifier was ultimately responsible for validating that trial running had been successful, the Commission heard that the Independent Certifier's role in that process was much more limited than the language of the Project Agreement might suggest.

The Independent Certifier's lead employee, Sechiari, told the Commission that, just as with milestone acceptances, if the City and RTG agreed that a change to the trial running criteria should be made or that a day of trial running should end in a particular result, the Independent Certifier was not likely to intervene in that agreement to impose a different result.

Trial running started on July 29, 2019. Before trial running was complete, however, the July 2019 procedures and criteria were modified to criteria that had been previously agreed upon in May 2017.

The Commission also heard that, while the Independent Certifier reviewed the Trial Running Test Procedure and the change to that procedure that was agreed to by the City and RTG during the process, the Independent Certifier had no role in drafting the procedure and its review of the procedure was not a substantive one to evaluate whether it fulfilled the terms of the Project Agreement. Because the City and RTG agreed on the procedure and the change of criteria, the Independent Certifier did not undertake such an evaluation and was not asked to do so. Any review of the procedure undertaken by the Independent Certifier was done solely to ensure that it was aware of the criteria that had to be met, not to evaluate or critique the criteria.

While the specific events of trial running are dealt with in greater detail in Chapter 12, I observe here that there are two aspects of the Project Agreement that later created issues with respect to the system's trial running: first, the period for trial running was specified as being only 12 days;[4] second, no specific criteria were incorporated into the Project Agreement itself to define the standards that the OLRT1 system had to achieve in order for trial running to be a robust test of the system and for it to be deemed successful.

7.7.3 Handover: Substantial Completion and Revenue Service Availability

In the Project Agreement, the two significant dates that occur at the end of the OLRT1 project to signal the end of the design and construction phase of the project and that the system is essentially ready for public service are Substantial Completion and RSA.

Substantial Completion refers to the point during the OLRT1 project at which the stations, tunnel, MSF, equipment, and LRVs are mostly complete and ready for use, and tested and commissioned to the point required under Schedule 14, except for trial running. In plain language, at the point of Substantial Completion, the design and construction is mostly or largely complete and there can only be "minor deficiencies" (which are addressed in Chapter 12).

As noted earlier in this chapter, **Revenue Service Availability,** or **RSA**, is defined as the point following Substantial Completion when testing and commissioning, including trial running, is complete; when the system complies with all safety requirements as approved by the Independent Safety Auditor; when the City has received a bill of sale for the LRVs, meaning the LRVs are complete and have been delivered; when City staff

have been trained on the operation of the system; and when all required civic works (meaning other related construction, for example, sewers and water mains) have been substantially completed.

Schedule 1 to the Project Agreement sets out a Scheduled Substantial Completion Date of May 7, 2018, and a Required RSA Date of May 24, 2018. These were the targeted dates for these two stages at the outset of the OLRT1 project. However, the Project Agreement also provided that the Required RSA Date could be extended if required due to a Delay Event, so in accordance with section 40 of the Project Agreement.

According to the Project Agreement, RTG was required to start providing maintenance services on the day following the day that RSA was actually achieved. RTG's contractual obligation to provide maintenance services only continues, however, until the 30th anniversary of May 24, 2018, the original Required RSA Date.

As with other payment milestones in the Project Agreement, the Substantial Completion milestone and the RSA event require a formal process. This process is described earlier in this chapter, but in brief, it is as follows: RTG must submit a notice to the City that the milestone has been achieved. The City must review that notice and give its own opinion on whether the milestone has been achieved. Then the Independent Certifier must consider the positions of both the City and RTG and determine whether the milestone had been met and the certificate could be issued.

The timelines in the process are short. The Project Agreement requires RTG to give the City and Independent Certifier 10 days' notice in advance of the date it believes a milestone would be met. The notice by RTG is required to contain "in reasonable detail, the satisfaction of the requirements" for the particular milestone. Following that notice, the City has five days to provide its opinion whether the milestone had been achieved, and, if the City is of the opinion that the milestone has not been met, the reasons for that opinion. Following the delivery of the City's opinion, the Independent Certifier has a further five days to determine whether to issue either the certificate for the given milestone, or a report "detailing the matters that the Independent Certifier considers are required to be performed" by RTG "to satisfy the conditions" for issuance of the relevant certificate.

Despite these short contractual timelines, the Commission heard evidence from the Independent Certifier that, particularly in the case of Substantial Completion, discussions between the City and RTG started up to a year before RTG issued its first Notice of Substantial Completion (in April 2019) to determine what evidence would be required to satisfy the conditions of the milestone and to begin tracking progress toward RTG issuing its notice.

The Commission also heard evidence that the existence of these two separate target dates in the contract occurring close together toward the end of the project – Substantial Completion and RSA – created some awkwardness in understanding the path to actual completion of the OLRT1 project and the readiness of the system for service to the public. Michael Morgan, of the City, suggested that the two dates should have been merged to prevent disconnects that occurred on the project regarding what was going to be done for Substantial Completion and what was going to be done for RSA. Morgan's evidence was that in subsequent LRT projects, the Infrastructure Ontario template was amended to provide only for a single Substantial Completion date as the final milestone when the system would be ready for public service.

Regarding Substantial Completion, it is important to note that section 26.4(d) of the Project Agreement provides the City with the unilateral ability to waive certain requirements for Substantial Completion. Any such waiver by the City had the effect of treating the requirements contractually as minor deficiencies, such that the Independent Certifier would not consider these unmet requirements when determining whether the Substantial Completion Certificate could be issued and trial running could start.

While the City had the contractual authority to waive requirements for Substantial Completion, it did not have the same option for RSA. Any change to the requirements for RSA required an amendment to the Project Agreement. As will be detailed in Chapter 12, the City and RTG ultimately agreed to a Term Sheet that amended the Project Agreement to defer certain incomplete items and that allowed the Independent Certifier to issue the certificate for RSA.

7.7.4 Revenue Service and Full Start to Public Operations

The Project Agreement suggests that passenger service to the public by the City would start on the day after RSA was achieved. This day after is defined in the Project Agreement as the **revenue service commencement date**, and RTG's maintenance term would start on the revenue service commencement date. However, there was no contractual obligation for the City – which at that point took ownership of the project – to actually put the system into public operation on that same day. As discussed in Chapter 6, the City could have continued running the system in public service conditions (but without passengers) to work out "bugs" in the system – what some witnesses described as a **bedding-in period** before revenue service.

The Project Agreement also suggests a "full" or "hard" start to revenue service: the opening of the entire OLRT1 line with train frequency capable of meeting full ridership

capacity requirements. Indeed, the Project Agreement makes no provision for a “soft” start (opening less than the full system for public service) in whichever form that could take. Nor does the Project Agreement make any provision for what the Commission also heard referred to as a bedding-in period once revenue service had started, for instance, a period of reduced performance standards for the maintainer, to allow the system to face early reliability challenges without being overly penalized.

Recommendations

See recommendations #21–44 in Chapter 17.

Notes

1 For instance, sections relating to the geotechnical risk ladder, mobility matters, and energy matters were new to the Infrastructure Ontario template and included in response to the City's requirements.

2 There were some indications in the evidence that this may have been the result of the cancelled North-South LRT project and the train manufacturing that was to be performed by Siemens in this earlier iteration of the project.

3 RTG, OLRT-C, and RTM entered an Interface Agreement to allocate responsibilities, manage the construction process and general operation, and make claims of one of the other parties to the agreement. The Interface Agreement governed the relationship between OLRT-C's responsibility for design, construction, testing, and commissioning, and RTM's responsibility for maintenance, addressing such issues as the transition from the construction phase into the operation phase of the OLRT1 project.

4 Michael Morgan, of the City, told the Commission that in hindsight, the 12-day period specified in the Project Agreement for trial running was arbitrary – it "didn't seem to be tethered to anything." A longer period would have allowed for a better demonstration of the system more in line with actual weekday service operations.

Chapter 8
Project Characterized by Inexperience

Key Findings

- The project was characterized by new relationships among key participants, unproven vehicles, new infrastructure, and new undertakings. These "firsts" were important to several critical aspects of the project: procurement, the Project Agreement, the vehicles, manufacturing and assembly, systems integration, operation, and maintenance.
- In particular, Alstom's Citadis Spirit LRV was effectively a new model of vehicle untested in circumstances similar to those of the OLRT1. The OLRT1 project was Alstom's first entry into the North American LRV market, and the Citadis Spirit was approaching the limits of what an LRV was capable of doing at the time that the project was procured.
- The OLRT1 project was also the first time Thales's communications-based train control system had been integrated with a low-floor LRV. This required OLRT-C to have a special focus on systems integration, which ultimately did not materialize.
- The assembly of the vehicles at the Ottawa maintenance and storage facility, using an inexperienced labour force and new suppliers, added difficulty and risk to the project.
- The City and RTG knew that the Citadis Spirit was sufficiently unique that they ought to have expected significant growing pains and reliability issues that would take time to resolve and that would need to be worked out during the testing and commissioning phase.
- The project's new aspects and the lack of experience should have been recognized so that the implications could be considered and incorporated into the approach to the project. This would have set appropriate expectations and mitigated the risk of optimism bias. The City and RTG failed to recognize this inexperience and plan for the possible risks and issues that could arise from it. They also failed to manage their own expectations and failed to communicate realistic information about the status of the project to the public.

Chapter Contents

8.0 Introduction

This chapter reviews the unproven elements and level of inexperience that affected the OLRT1 project prior to the start of construction, and the consequences that this had for the construction and testing of the OLRT1 system. In summary, the OLRT1 project was characterized by new relationships, new vehicles, new facilities, and new undertakings.

- The City had never before undertaken an electrified LRT project, had not previously done a public-private partnership (P3) project of this size and complexity, and did not have experience with a design-build-finance-maintain (DBFM) project delivery model;
- Infrastructure Ontario had never undertaken a light rail system or an infrastructure system involving a tunnel, and had therefore not managed procurement or contracting for a system as complicated as the OLRT1;
- The vehicle, Alstom's Citadis Spirit, was arguably a first in that it was an adaptation and not service proven (proven to be reliable through existing operation in a similar environment);
- This was a first (or possibly second, but in any case a new) effort for Thales and Alstom to integrate Thales's control system and Alstom's LRVs. More importantly, this was the first time a communications-based train control (CBTC) system was integrated with a low-floor LRV;
- Alstom had never previously built its LRVs in North America or worked with the Canadian content requirement;
- The maintenance and storage facility (MSF) in Ottawa that was used for vehicle manufacturing was a new facility, built for the purpose of vehicle maintenance;
- OC Transpo had never previously operated an LRT system that compares; and
- This was a brand-new system including entirely new infrastructure for the maintainers to maintain.

Collectively, these “firsts” affected nearly every aspect of the OLRT1 project: procurement, the vehicles, the Project Agreement, systems integration, manufacturing and assembly, operation, and maintenance.

Note that Ottawa does have, and OC Transpo operates, the Trillium Line, which is technically an LRT. However, the diesel-powered Trillium Line is not in any material respect comparable to the Confederation Line, so references in this report to the City not having experience with an LRT system or project must be read together with this qualification.

I do not criticize any of the parties involved in this project for attempting to do something they had not done before. However, where the City and RTG did fall short, in retrospect, was in failing to appreciate the extent to which they were entering uncharted waters and to anticipate the issues that would likely arise as a result. They ought to have planned better for lengthy delays (and managed the public communications accordingly); understood that reliability problems would arise (and staffed the system accordingly); and allowed time for testing and trial running that was sufficient in the context of an unproven vehicle, unproven relationships, and an inexperienced network of participants.

8.1 New Aspects of Work for the City and Its Advisors

The City and two of its key procurement implementation advisors (Infrastructure Ontario and Boxfish) were inexperienced in pursuing this type of project (an LRT system using a P3 procurement model). Although Infrastructure Ontario was sophisticated (both experienced and knowledgeable) with respect to P3 procurements, it did not have meaningful experience with a "horizontal" project or with a rail system that included an underground tunnel. (Some differences between "vertical" projects, such as hospitals and other buildings, and the OLRT1 project are described in Chapter 6.) Boxfish had virtually no relevant experience. The City found itself using a project agreement template that was not developed for the OLRT1 project's circumstances, and changes to that template that had not been tried and tested; and ultimately the City failed to appreciate the issues and risks that were made more likely because of the parties' inexperience in these areas.

As a starting point, the City had no experience with an LRT project. Although the City had previously commissioned the Trillium Line, that was a pilot project of short distance built on top of an existing rail line and without an underground tunnel. The budget for the Trillium Line had been roughly $16 million, as compared to $2.13 billion for the Confederation Line. Antonio Estrada, of RTG, told the Commission that the City was largely unfamiliar with P3 projects and the associated contracts, and the City quite properly recognized that it did not have the experience and expertise necessary to run a procurement for a project of this nature and magnitude. The City therefore (as noted in Chapter 6 and elsewhere) hired outside advisors.

The procurement and contract design and negotiation efforts were led by a combination of Infrastructure Ontario, Deloitte, and Boxfish. This was a critical phase of the OLRT1 project, because procurement and the contract formed the core of how the relationship between the City and the private-sector partner would work. Infrastructure Ontario and Boxfish were themselves inexperienced in developing those crucial elements in the context of an LRT project. This was Infrastructure Ontario's first LRT project and its first time working with a municipal government. The OLRT1 Project Agreement was based on Infrastructure Ontario's template for P3 projects. However, the lack of experience meant that the Commercial Procurement Lead did not have a body of experience that would allow it to guide the parties away from unsuitable aspects of, or anticipate gaps in, the Project Agreement (although Deloitte had looked at precedent agreements).

That led to real problems during the OLRT1 project. For example, Infrastructure Ontario carried over into the Project Agreement the milestone payment mechanism from its P3 template, but that mechanism was not optimal for a dynamic and complex project such as the Confederation Line. The consequences of that payment mechanism played a role in the events of the summer of 2019 (addressed in detail in Chapter 12). This included OLRT-C being in financial distress, giving it an incentive to declare Substantial Completion and hand the system over to the City so that it could receive approximately $250 million in payments and allow RTG to begin receiving maintenance payments to recover some of its costs, despite the known and ongoing reliability problems. Similarly, there was a gap in the Project Agreement (as explained in Chapter 7) in that it failed to provide clear criteria for trial running and handover.

RTG obviously entered into the Project Agreement, including the milestone payment structure, with "eyes wide open," and I do not criticize the City for adopting such a structure in circumstances where the approach was common at the time and neither it nor Infrastructure Ontario had experience with a similar project. The lack of experience should, however, have been acknowledged and its implications considered and incorporated into all participants' approach to the project.

The lack of experience at the City and Infrastructure Ontario contributed to the risk of **optimism bias,** which refers to the risk that the parties are overly optimistic at the start of a project and set the budget, schedule, and contract terms accordingly. Optimism bias and its pitfalls were reviewed at length for the Commission by Riccardo Cosentino, of RTG (and are also described in Chapter 6). Optimism bias is exacerbated by inexperience, because a lack of experience increases the likelihood of misjudging the participants' ability to overcome obstacles and meet project goals.

8.2 An Unproven Vehicle

8.2.1 The "Service-Proven" Requirement and Rejection of CAF

One of the City's key priorities during the procurement phase of the OLRT1 project was to ensure that the LRV was **service proven**, meaning that it had been tried and tested and, importantly, the City would not have to suffer through the growing pains that inevitably come with introducing new designs. The parties defined "service proven" in the Project Agreement as being "an existing ... design suitable for the OLRT Project," which they further specified to mean a vehicle that substantially complied with the following characteristics:

- The major components had been integrated into a comparable LRV that was already in use elsewhere;
- A minimum of 10 such vehicles had been in use for a minimum of two years;
- The vehicles in use had been operated in a climate similar to Ottawa's, and in service conditions similar to those specified for the OLRT1 system; and
- The vehicles in use had achieved a minimum kilometre threshold (50,000 in-service kilometres).

The City also had certain **performance requirements** for the vehicles, including the low-floor design and various requirements for trip time, operational **headway** (time and distance between trains), and system capacity.

In the procurement process, as it developed its bid, RTG initially proposed procuring the vehicles from Grupo CAF, and the City provisionally approved that choice. However, during the commercially confidential meetings (CCMs) that occurred within the procurement process, CAF was unable to satisfy the City that its vehicle was service proven, and the City therefore required RTG to find a new vehicle supplier. Cosentino testified that the City rejected CAF's vehicle because, although the major components were all in service, the particular configuration was not in use anywhere and the City therefore did not consider the vehicle to be service proven.

8.2.2 Alstom's Citadis Spirit Vehicle

After the City rejected CAF as a vehicle supplier, RTG brought in Alstom to provide the vehicle within RTG's bid. Cosentino told the Commission that Alstom was the only major vehicle supplier that was not either already disqualified from the process or participating with another bidder. Alstom was introduced late in the process, leaving less time for due diligence. For example, Cosentino testified that, although he was leading the bid for RTG, he did not review Alstom's submission regarding the vehicle in any detail.

Alstom participated in a CCM with the City and its technical advisors and presented the Citadis family of vehicles as Alstom's proposed vehicle. Specifically, Alstom would supply a vehicle known as the Citadis Spirit, which was an adaptation of the Citadis Dualis.

Alstom presented the Citadis as a service-proven vehicle, and the City accepted that the Alstom submission met the service-proven requirement. Neither the City nor RTG were concerned that the vehicle might not be service proven. However, there is good reason to question whether the Citadis Spirit was in fact a service-proven vehicle and whether RTG and the City ought to have been more cautious in their project expectations, given that the vehicle was in many respects new.

The evidence with respect to whether the Citadis Spirit was service proven (and thus more reliable) was inconsistent. Some witnesses, such as Lowell Goudge, of Alstom, testified that, while the Citadis Spirit was a new configuration, the essential components were all proven (in that they were in use elsewhere), and thus, the vehicle itself was service proven. Goudge emphasized that the components were in use elsewhere, the Citadis family had been running on tracks in Europe for years, and Alstom had successfully built trains (albeit not the Citadis Spirit) for use in cold-weather climates.

But there was also a significant body of evidence to suggest that the vehicle was not service proven. Some of the key evidence to that effect is as follows:

- This was the first commercial use of the Citadis Spirit;
- This was the first time that Alstom had developed what is called a low-floor LRV in North America. (The low floor was important to the City.) Goudge called the Citadis Spirit a "development project" for Alstom to demonstrate that it could bring low-floor technology to North America. (It should be noted that North American vehicle standards are materially different from European standards.);
- Alstom did not have a Citadis Dualis vehicle in operation in a climate similar to Ottawa's;

- Goudge also acknowledged that, while the Spirit was modelled on the Dualis, there were changes to virtually every part of the Dualis design to meet the City's specifications for capacity, speed, and climate, changes that Alstom had not previously combined in a single vehicle;
- This was the first time that an LRV had combined an automatic CBTC system with a low-floor LRV (this, combined with the necessary acceleration and deceleration rates, posed significant design challenges for Alstom); and
- The Citadis Spirit vehicle was longer than any other LRV vehicle in North America, and it remains so at the time of writing.

The City had reason to be aware that the Alstom vehicle did not necessarily meet the contract definition of "service proven." John Jensen, former Director of the City's Rail Implementation Office, testified that the City was aware that this was Alstom's first entry into the North American market. Jensen also agreed that RTG's submission regarding the vehicle expressly stated that the Dualis was only in use in two existing light rail systems, neither of which had a climate similar to Ottawa's. Jensen conceded that the City had been told that there was no low-floor LRT, with a CBTC system, operating in any climate similar to Ottawa's anywhere in the world. He further acknowledged that the City was told that there was no train in use in the world that combined the key elements of the vehicle that the City wanted. RTG also had reason to be concerned about this, as SNC-Lavalin (a member of the RTG consortium) came to essentially that conclusion in its retrospective "Lessons Learned" analysis.

Regardless of whether the Citadis Spirit met the contract definition of "service proven," there was certainly good reason to believe that it was not proven, and in any case the point here is not to make a finding regarding whether the Alstom vehicle was or was not service proven. The point is that the vehicle was sufficiently unique that the parties ought to have expected significant growing pains and reliability "kinks" that would have to be worked out during the testing and commissioning phase. The fact that the vehicle was a new design and the difficulties that created were partly attributable to the City's requirements for the vehicles' capacity, headway, speed, and braking, which were all pushing the limits of what any LRV in the market was capable of doing.

8.3 Unproven Relationships, Facilities, and Operator

There were also new, unproven relationships between key subcontractors, as well as new aspects of the vehicle manufacturing that affected the construction and manufacturing phase of the OLRT1 project.

The most significant of the new relationships was that between the vehicle supplier, Alstom, and the communications system supplier, Thales. While Alstom and Thales had worked together before, this was the first or perhaps second time (there was conflicting evidence on this) that Alstom's trains and Thales's signalling system had been integrated. Alstom's Goudge and Thales's Michael Burns also confirmed that this was the first time that Thales's signalling system had been integrated into a low-floor train. New relationships on key aspects of the project heightened the need for dedicated systems integration by OLRT-C – integration that, as described in Chapter 9, simply did not happen on this project. For example, there was no direct contract between Alstom and Thales setting out each company's specific responsibilities, leading to significant disputes between the two companies that were difficult to resolve.

Another key feature of the project that contributed to the inexperience was the **Canadian content requirement** (a precondition for funding by the province), which was a factor in the decision to assemble the trains in Ottawa at the MSF. This decision meant that Alstom was assembling the trains with an inexperienced labour force, something Estrada, of RTG, pointed to as a cause of real difficulty. Goudge confirmed that the inexperienced labour force created a greater risk of simple errors being made in the assembly process. Goudge further confirmed that Alstom needed to find new suppliers in North America, which created additional difficulty and risk. RTG had asked during the CCMs whether the Canadian content requirement could be relaxed, but the City advised that it could not.

Another key element of inexperience on this project was OC Transpo's role as operator of the trains. OC Transpo was the existing bus operator in Ottawa and was not experienced in operating an LRT system (except with the Trillium Line, which, as noted earlier, was not comparable). OC Transpo was therefore not in a position to offer design input the way an experienced operator might be – it simply did not have the history of

logged hours that would allow an operator to contribute meaningfully to project design. Estrada said that John Manconi, the City's General Manager of Transportation Services, had "operational concerns rather than operational insight."

These new elements to the relationship, facilities, and undertakings of the key participants had material consequences for the OLRT1 project. None of this is to criticize the City, OC Transpo, and RTG for not having sufficient relevant experience. Rather, the point is that they ought to have *recognized* that there was considerable novelty in nearly every important aspect of the OLRT1 project, and understood better that the novelty would have consequences, which they could have anticipated and for which they should have planned.

8.4 Implications of the New and Unproven Elements

The consequences for the OLRT1 project of so many new and/or unproven elements, inexperience, and unproven relationships are real, and they provide meaningful context for some of the significant problems that materialized on this project. I examine here the more significant consequences.

First, the inexperience exacerbated the problem of optimism bias, for the simple reason that it is easier to fall into that bias if one is not drawing on a body of experience from which to anticipate difficulties and risks. This was a factor in the planning and execution of the OLRT1 project. For example, repeated delays in delivery of usable vehicles were a major source of difficulty in 2018–2019. RTG and the City ought to have appreciated that, with a vehicle that was substantially new and was not proven in operation elsewhere, such delays were almost inevitable. Yet, Estrada, of RTG, told the Commission that they assumed there would be no vehicle problems: "We [RTG] were quite optimistic" and "I didn't have any reason to think that we were going to have problems, technical problems, with Alstom, which is one of the most experienced … companies in the world." These comments referred to a period after assembly was under way but reflect the overall problem of optimism bias that can arise, particularly where there is a lack of experience. While Alstom itself was an experienced supplier, the vehicle being supplied was sufficiently new that the parties could reasonably anticipate that difficulties would arise. Cosentino, of RTG, also pointed to the MSF (a new facility with a new labour force assembling a new vehicle) as an example of optimism bias. He testified that RTG knew that there *could* be issues arising from the dual use of the MSF for both assembly and maintenance, but that RTG believed those issues could be overcome. Goudge, of Alstom, testified that the problems that would arise from that dual use had not been adequately considered in planning the project.

Second, it ought to have been clear from the start that systems integration and new interfaces would require special attention, given the number of parties that were undertaking new tasks, or in a new manner, or in new relationships. The most obvious example of this is the Alstom-Thales relationship, which underpinned the crucial interaction between the trains and the control system. There is no question that OLRT-C did not devote sufficient resources to systems integration, as attested to by numerous witnesses and explored in greater detail in Chapter 9. Burns, of Thales, noted that this

integration was particularly important, because Alstom and Thales had not previously integrated these types of systems together. OLRT-C fairly and candidly acknowledged during the public hearings that it did not devote sufficient time and attention to the challenge of systems integration.

Third, the compression of the testing and commissioning schedule as a result of unexpected construction delays (as explained in Chapters 9 and 10) did not leave proper time to undertake that stage in a careful and comprehensive manner, which was critically important given the reliability issues that could be anticipated to arise, in part because of the many layers of inexperience and "firsts" in this project (including new relationships such as that between Alstom and Thales that caused design and implementation delays, new vehicles, new maintenance personnel, and a new assembly and maintenance facility). Estrada pointed out that one way to mitigate the risks of a new system, new manufacturing facility, and so forth is to have more time, which, as he noted, "is exactly what we didn't have."

Fourth, the City and RTG failed to properly manage expectations – both their own and the public's – given the uncertainty that they faced. Rupert Holloway, of OLRT-C, stated that expecting 100 percent performance from Day 1 is "inflexible" and not realistic in these kinds of complex projects. Yet the City continuously promoted the "on time, on budget" mantra to the public and held steadfastly to a **full start to public service**, and RTG continuously set unrealistic dates for OLRT1 project completion (as noted in later chapters in this report). As Professor Bent Flyvbjerg told this Commission, a "bespoke" system "is slow and expensive and generates cost overruns."

In conclusion, the participants obviously cannot be faulted for undertaking such a complex project and for being ambitious in their attempt to meet the City's needs or for seeking to use new suppliers or inexperienced operators. It is nonetheless apparent, with the benefit of hindsight, that this inexperience touched all aspects of the project and that the participants failed to appreciate what that meant for the task ahead of them.

Recommendations

See recommendations #1–7, 17–21, 31–41, 49, and 52 in Chapter 17.

Chapter 9 Construction and Manufacturing: Challenges and Delays

Key Findings

- Inadequate coordination and oversight by OLRT-C, and insufficient planning by Alstom, led to delays early in the OLRT1 project. These early delays led to changes in the location for manufacturing and testing the prototype vehicles. These changes impacted testing of the prototype vehicles, which led to late retrofits and compounded issues relating to delays in vehicle delivery.
- Building the vehicles in a maintenance and storage facility that was adapted for manufacturing, and not in a dedicated or permanent train manufacturing facility, resulted in manufacturing and supply chain challenges as well as issues with recruiting and maintaining specialized labour.
- Supplier issues, in particular resulting from Alstom's new North American supply chain, caused both quality and schedule issues.
- OLRT-C made several avoidable mistakes in its handling of the Alstom-Thales contracts and relationship, interface, and integration. This resulted in conflict and delays, and in some of the issues that arose as the trains started operations.
- OLRT-C failed in its overarching duty to integrate the different systems and subsystems. Systems integration and systems engineering and assurance were late and ineffective. These failures contributed to delays, retrofits, tensions between the City, RTG, OLRT-C, and subcontractors, and some of the issues the system faced after it went into operation.

Chapter Contents

9.0 Introduction

The construction of the OLRT1 project was an enormously complex undertaking, and it did not always go smoothly. Some of the challenges encountered were beyond the control of the constructor, OLRT-C; others were not. This chapter provides an examination of early issues faced during the construction and manufacturing phase of the OLRT1 project – including early delays that affected testing of the prototype vehicles and failures to integrate different systems.

The next chapter, Chapter 10, will look at later issues – a major sinkhole in the middle of the rail line, delays to completing both the vehicles and the infrastructure, and evolving relationship and communication problems between the parties.

Of course, every construction project of this size and complexity encounters problems. For the most part, and with the notable exception of the Rideau Street sinkhole, the problems that arose during the construction and manufacturing phase of the OLRT1 project were within the realm of what the parties could have expected. While they were not the result of any particular failing by the parties – other than a clear failure to integrate different aspects of the OLRT1 system – many could have been planned for or addressed differently.

9.1 Construction and Manufacturing Roles, Responsibilities, and Key Terms

Several parties contributed to the construction of the OLRT1 project and the manufacturing of its trains. This section will briefly recap the main parties and their roles and responsibilities in this phase of the project. It also presents some key terms related to the construction and the manufacturing phase. Names of key parties and key terms appear below in boldface so they can be easily referred to later.

9.1.1 RTG, OLRT-C, and Subcontractors

Under the Project Agreement, the **Rideau Transit Group (RTG)** was responsible for constructing the OLRT1 project. RTG then contracted with **Ottawa Light Rail Transit Constructors (OLRT-C)** to carry out its construction obligations. OLRT-C is an unincorporated joint venture of three companies: Dragados, EllisDon, and SNC-Lavalin. Thus, OLRT-C is related to RTG, as both EllisDon and SNC-Lavalin also own part of RTG, but OLRT-C and RTG are nonetheless separate entities with separate representatives and employees.[1]

OLRT-C oversaw the entirety of the construction and manufacturing for the OLRT1 project. OLRT-C also carried out much of the construction itself, including constructing the track, tunnels, train stations, the **maintenance and storage facility (MSF)**, and other infrastructure.[2] In addition, OLRT-C was responsible for testing the entire system and commissioning it. However, there were some major elements of the system that OLRT-C contracted out to others in February 2013:

- **RTG Engineering Joint Venture** was responsible for designing and engineering most of the system (everything except for the trains and train control system). RTG Engineering is an unincorporated joint venture of SNC-Lavalin and MMM Group. The involvement of SNC-Lavalin again created a crossover with RTG Engineering and both RTG and OLRT-C, but each remained a separate entity. The role of RTG Engineering involved preparing the plans and specifications that OLRT-C followed in constructing the OLRT1 project.
- **Alstom** was responsible for supplying the trains for the OLRT1 system. Its role extended from designing, engineering, and manufacturing the vehicles all the way

through to testing and commissioning them. Alstom also contracted to take on most maintenance obligations.

- **Thales** was responsible for the train control system. This system is required because trains in the OLRT1 project are fully automatic; their movement from station to station is controlled by an electronic system rather than by a driver on each train.

In 2017, OLRT-C also contracted with **SEMP**, a UK-based systems engineering and systems assurance consultant, to verify how well the different elements of the OLRT1 system were integrated, and to assist OLRT-C in preparing its safety assurance case, which is required to demonstrate the transit system's safety (see Chapter 11).

9.1.2 The City and Its Advisors

While the City was not itself responsible for constructing the OLRT1 system, it did oversee RTG and OLRT-C's work through its **Rail Implementation Office (RIO)**, which was folded into the **O-Train Construction Office** in 2016. When Steve Kanellakos became City Manager in 2016, he reorganized the City's decision-making and management structure, making one City official, John Manconi, responsible for all transit-related issues as General Manager of Transportation Services. In this role, Manconi oversaw both the operation of OC Transpo and the construction of the OLRT1 project.

OC Transpo, the City's public transit agency that would operate the trains, was not significantly involved in the design, construction, and manufacturing phases. Between 2012 and 2015, OC Transpo had minimal high-level involvement in the OLRT1 project, although it did have technical staff providing some input on service issues such as anticipated ridership and space needs. OC Transpo had more involvement in the later stages of construction leading up to public service.

Aside from City staff, the City also drew on an evolving team of experts to assist it in overseeing the project, such that the City at all times had advice and assistance from well-qualified external consultants. Initially, during the procurement phase of the project, the City relied on **Capital Transit Partners (CTP)** for expertise in design and specifications. CTP was a joint venture of the engineering consulting firms STV, URS, Jacobs Associates, and Morrison Hershfield.[3] CTP devised the preliminary engineering plans and many of the technical specifications ultimately included in the Project Agreement. In CTP's role as the engineer of the project owner (namely, the City), CTP was helping the City check for compliance with the Project Agreement. During the construction and manufacturing phase of the OLRT1 project, CTP assisted the City with issues that went beyond the City's internal expertise. For example, if the City needed to review a specific piece of infrastructure to

ensure that it conformed with the Project Agreement, and the City determined that it could not do this review on its own, it could draw on CTP for its expertise.

In 2015, the City retained **Parsons**, a large firm with expertise in rail transit and project integration, for additional assistance. In its work with the City, Parsons focused on four areas: (1) the implementation of the Thales train control system, (2) operations, (3) maintenance, and (4) system safety.

In 2017, the City created the **Independent Assessment Team**, a team of people with expertise in rail transit, headed by Tom Prendergast of STV. The role of the Independent Assessment Team (see Chapter 10) was to advise the City on two issues in the lead-up to Revenue Service Availability (RSA): (1) how far along RTG was in construction, and (2) how ready **Rideau Transit Maintenance (RTM)** was to maintain the OLRT1 system once it was in operation.

9.1.3 Key Terms and Steps in Construction and Manufacturing

As noted, Alstom was contracted to design and manufacture the light rail vehicles (LRVs), a total of 34 LRVs for the OLRT1 project. On the ORLT system, two LRVs can be coupled to form each single train. Each single LRV is numbered, thus the prototypes were LRV1 and LRV2. Throughout this chapter and the next, there are references to **vehicles**, **trains**, and **LRVs**.

For manufacturing the vehicles, the usual process, which was intended to be followed on the OLRT1 project, involves manufacturing, testing, and modifying the prototype vehicles until the prototype vehicles are performing properly, and then manufacturing the remainder of the fleet based on the refined prototype. As will be seen, that usual and intended process was not followed on the OLRT1 project because of delays.

Thales designed and provided the train control or signalling system, which is composed of a wayside **communications-based train control (CBTC) system** (located outside the train, along the track) that communicates with a **vehicle on-board controller (VOBC)** on each vehicle.

For the train control system and its relationship with the vehicles, key steps included developing the interface, developing the Interface Control Document (ICD), integrating the train control system with the vehicles and other systems, and testing repeatedly to reach the commissioning stage.

Key terms and steps related to the construction and manufacturing phase of the OLRT1

project include the following, which are elaborated on later in this chapter and in other related chapters:

- **manufacturing.** Manufacturing includes fabricating elements, sourcing elements from suppliers, and assembling all elements of the vehicles.
- **validation testing.** Validation testing evaluates the design to ensure that it works. This testing typically takes place early in a project. It is sometimes called “type testing.”
- **serial testing.** Serial testing is used to confirm that each manufactured product conforms to the design that has been validated in validation testing. Serial testing takes place once manufacturing begins and is done on each product. Serial testing is also called “factory acceptance testing.”
- **integration testing.** This stage involves testing of subsystems and the system as a whole to make sure that all the elements work together.
- **static testing.** In static testing, the vehicles are not in motion.
- **dynamic testing.** Dynamic testing is done with vehicles in motion.
- **serial manufacturing.** This is the step of manufacturing (which includes assembling) many products in a series, one after the other; serial manufacturing takes place after validation testing of the prototype.
- **retrofitting.** Retrofitting is revision or refitting that is retroactive, to address changes in design.
- **non-regression testing.** Non-regression testing is used to ensure that the retrofits have not introduced any new problems.
- **interface.** The technical interface is the connection between two items of hardware or software so that they can be operated jointly or communicate effectively with each other.
- **Interface Control Document (ICD).** The ICD details how a system will interact with other systems. In the case of the OLRT1 project, the document had to set out the precise way the VOBC fits into the vehicle, both mechanically and electrically, and how the software of the two systems communicate with one another.
- **post-installation check out (PICO) testing.** PICO testing evaluates the functioning of the VOBC after it is installed on the vehicle and ensures that the VOBC is communicating as it was designed to with the vehicle and the wayside signalling equipment.
- **system integration tests (SITs).** SITs check how a specific system interacts with one or more other systems.
- **commissioning.** Commissioning is assuring that all systems and components were designed and built and are operating according to the project requirements.

9.2 Changes to the Manufacturing and Validation Testing Location

The design and construction phase of the OLRT1 project did not begin smoothly. Almost immediately, Alstom, with the approval of OLRT-C, changed course regarding a key facet of the project: the manufacturing and testing location of the LRV prototypes.

In the early stages of the project, Alstom struggled with some of the challenges it faced trying to break into the North American LRV market. Alstom's early planning challenges were exacerbated by early delays to the LRV designs, in part resulting from a lack of coordination and integration by OLRT-C. To make up lost time, Alstom repeatedly changed its plans about where to assemble the first two LRVs. These delays and other changes had significant implications for validation testing, which resulted in a more costly and less efficient manufacturing process. That, in turn, contributed to pressure on the schedule and the compression of testing and commissioning of the LRVs and of the whole system.

9.2.1 Alstom's Early Planning Challenges

Alstom is a leading train manufacturer headquartered in France. The company has extensive experience producing LRVs, particularly for the European market. However, at the time Alstom joined the OLRT1 project, the company was not manufacturing and selling LRVs in North America. Alstom's bid director on the OLRT project, Yves Declercq, explained that despite previous attempts, Alstom had not been successful in the North American LRV market. The OLRT1 project, therefore, presented Alstom with an opportunity to break into this market.

However, the OLRT1 project also posed new manufacturing challenges that Alstom would not have had to contend with in its more familiar markets, particularly in Europe. Alstom witnesses candidly acknowledged that they had not sufficiently anticipated or planned for these challenges in the early stages of the OLRT1 project.

Perhaps most crucially, Alstom had to set up new supply chains for the LRVs for the OLRT1 project. This was necessary, in part, to respect the Canadian content requirement in the Project Agreement. However, Alstom also explained that, regardless of the Canadian content requirement, the company intended to use the OLRT1 project as

a strategic long-term investment to build relationships with suppliers that could be used for other business opportunities in North America.

Alstom did establish a detailed process for selecting suppliers and testing the suppliers' products for quality. However, as Declercq acknowledged, testifying in French, Alstom "underestimated the difficulties of setting up the supply chain, the supplier base, and the qualification of these suppliers." These supplier issues caused both quality and schedule issues that likely would not have occurred if Alstom had been using an established supply chain.

In addition, the evidence of the Alstom witnesses made clear that, when Alstom entered the contract with OLRT-C, Alstom had not fully worked through the best plan for manufacturing the prototype LRVs. Alstom's earliest plan was to manufacture the first two LRVs at Alstom's established centre of excellence in Valenciennes, France – the same facility where the LRVs were designed. However, Alstom quickly realized that this would pose unnecessary logistical burdens in a project where many of Alstom's suppliers for the OLRT1 LRVs were in North America. Most materials were sourced in North America, so it did not seem to make sense to ship those materials to France for assembly into LRVs and then back to North America again. Moreover, assembling the LRVs close to the suppliers made more sense so that any issues could be dealt with quickly. To be sure, this rationale became even more compelling after early delays created additional pressure on the schedule. Nonetheless, the fact that these considerations led to a significant change in the manufacturing plans at the very outset of the work illustrates that Alstom's early plans had not been sufficiently thought through.

To be fair, Alstom's early planning challenges are likely at least partially attributable to the fact that Alstom was a late addition to RTG's submission in the RFP process. Originally, RTG had selected the Spanish company Grupo CAF as its vehicle supplier. However, as noted in Chapter 6, during the procurement process, the City deemed CAF non-compliant with its requirement for a service-proven vehicle. Needing a replacement in short order, RTG asked Alstom to step in as its vehicle supplier. While Alstom had been engaged in the OLRT1 project procurement earlier on, it had not needed to prepare a full bid at that earlier stage and now had to make changes to its proposed vehicle solution in response to RTG's requirements. This left Alstom with just two months to prepare a full bid and about two weeks to seek qualification from the City.

In anticipation of the above challenges and to protect its commercial position, Alstom negotiated strict timelines with early deadlines in its subcontract with OLRT-C, particularly with respect to OLRT-C's obligation to provide the City's design and radio selections, and to provide Thales's ICD. Earlier dates would allow Alstom to claim compensation or seek a variation if OLRT-C failed to meet its obligations under the

timelines in the contract. As explained in section 9.4, the earlier dates were accepted by OLRT-C, even though they were unrealistic. Unsurprisingly, then, there were soon delays in the project as these overly optimistic deadlines were missed.

9.2.2 Early Vehicle Design Delays

Aside from its own early planning challenges, Alstom had to contend with OLRT-C's failure to meet deadlines for its deliverables under its contract with Alstom, thereby leading to delays early in the project.

First, the parties took longer than planned to finalize the design for the appearance of the LRVs. While Alstom designed the functional aspects of the LRV, the subcontract between Alstom and OLRT-C set out certain aesthetic choices that were for the City to make. Alstom had proposed different options for the exterior and interior design of the LRVs. The subcontract set out a series of meetings among the parties to narrow down the options and eventually settle on a **design book** (the collection of decisions about colours, materials, and other aspects of the LRVs' appearance, inside and out) to be approved by the City. After this, Alstom would put together a mock-up of the interior of an LRV for the City and the public to see. As part of this process, Alstom had to receive details of the colours of the LRV, the **stanchion layout** (the placement of upright support posts for passengers), and what radio and other communications equipment would be located inside the driver's cab so that Alstom could include them in its mock-up.

Within the first few months after Alstom signed its subcontract with OLRT-C, there was already a delay in finalizing the design. In a letter from Alstom to OLRT-C dated April 15, 2013, Alstom noted that the date for one key meeting in the vehicle delivery process (called the Design and Styling Freeze Meeting) had already been postponed by about three weeks because of the delayed start. Ultimately, Alstom and RTG claimed that the City did not sign off on the design book until nearly a year later than had initially been agreed in the subcontract between OLRT-C and Alstom.

There was some dispute about the cause of the delay in signing off on the design book and its ultimate impact on the schedule.[4] For present purposes, however, and without attributing blame to any particular party, the point is that there was a delay related to the design book and this delay formed part of the rationale for relocating the construction of the prototype LRVs.[5]

The second source of the early delay in vehicle design was the finalization of the ICD for the Thales CBTC system – the system that effectively drives the trains. The ICD sets out how the Thales CBTC would interface electrically and mechanically with the LRVs.

To produce the ICD, Thales needed to fully understand the performance requirements of the LRVs – how they would accelerate, how fast they would go, how they would brake, and so on. Alstom and Thales also had to agree on the precise physical location of the VOBC within the driver's cab.

Through a provision in its subcontract with OLRT-C, Alstom was entitled to receive a finalized ICD from Thales by April 26, 2013. However, this was an unrealistic date. It was only two months after the start of the contract. The LRVs were not sufficiently developed in April 2013 for Thales to be able to produce a finalized ICD: the relevant details of the LRVs were simply not yet known at that time. Where the details of the LRVs are unknown, it takes particularly long to finalize the ICD, as it cannot be known in advance that all the signals will communicate correctly between the CBTC and the vehicle. As Jacques Bergeron, of OLRT-C, said, the date set out in Alstom's subcontract was "impossible," "unreasonable," and ultimately just "a big dream." While the ICD and systems integration will be addressed again, the crucial point here is that the finalized ICD was not delivered to Alstom by the April 2013 date set out in the subcontract between OLRT-C and Alstom.

In summary, early in the project, Alstom did not receive two key pieces of design information when it was supposed to receive them and as stated in its contract: the design book and the Thales ICD. The Commission does not need to decide who was primarily to blame for either issue. What is important to note is that both delays influenced the parties' decisions about where to manufacture the first LRVs. In turn, those decisions about manufacturing had greater consequences, resulting in the inability of Alstom and Thales to conduct validation testing early in the process.

9.2.3 LRV Manufacturing Is Moved to North America

As a result of the delays and insufficient planning described above, the plans for where to construct the first two LRVs went through several iterations. The initial plan was for the first two prototype vehicles (LRV1 and LRV2) to be manufactured in Alstom's facility in Valenciennes, France, and for the remaining 32 LRVs to be manufactured in the MSF that was purpose-built as part of the OLRT1 project in Ottawa. The plans for the manufacturing location for the prototypes changed twice, but the remaining LRVs were manufactured in the MSF, as originally intended.

In the summer of 2013, Alstom and OLRT-C decided that the prototypes, LRV1 and LRV2, would be manufactured in Hornell, New York, rather than at Alstom's centre of excellence in Valenciennes, France. Alstom proposed this change in location mostly for schedule reasons: assembling the LRVs in Hornell would save time and reduce the risk

of delays. In a letter to OLRT-C dated June 24, 2013, Alstom described logistical hurdles, namely, that it did not make sense to ship materials from North American suppliers to France only to ship them back to North America, and that it was better to begin manufacturing closer to the suppliers. Moreover, time would be saved by not having to ship the completed LRVs all the way from France to Ottawa.

OLRT-C recognized how significant a change to the agreed-upon plans Alstom's proposal was and how many parties would be impacted by the change. Rightly so. One party that would come to suffer the consequences of this change was Thales, due to the impact that the change would have on the validation testing (as described below). Before agreeing to the proposed change, OLRT-C justifiably raised concerns and asked appropriate questions of Alstom, but in the end, it agreed to the new plan after Alstom provided answers and confirmed that the change would not affect the Canadian content requirement in the Project Agreement.

Thus, the manufacturing location for the prototypes changed to Hornell, but it would soon change again. The first LRV (LRV1) was, indeed, manufactured in Hornell, but the delays arising from vehicle design had been building up, and by 2014, OLRT-C was pushing Alstom to get back on schedule. In May 2014, Alstom responded with an idea to save some lost time: manufacture LRV1 in Hornell as planned but LRV2 in Ottawa at the same time. This plan would also allow Alstom to put in place the required human resources and to develop workers' skills on-site, in Ottawa, which would help prepare the MSF for assembly of the remaining 32 LRVs. OLRT-C agreed to this proposal in a letter dated June 2, 2014, although it later refused to compensate Alstom for the relocation costs that Alstom claimed.

9.2.4 The Effect of the Moves on Validation Testing

The Commission heard from several witnesses that changing the manufacturing location of the first two LRVs was not an ideal solution. Primary among the witnesses' concerns was the effect this change had on validation testing.

As described in the key terms earlier, validation testing serves to test a train's design to ensure that it works as intended. Validation testing almost inevitably leads to further changes in the design. Once the design has been tested and refined and shown to work as intended with the prototype, the rest of the fleet can then be manufactured in accordance with the tested design in a phase of construction known as serial manufacturing. As a matter of best practice, it is preferable to complete validation testing *before* starting serial manufacturing. This allows for refinements to be made to the

prototype vehicle(s) and for problems in the design to be rectified before manufacturing the rest of the trains.

If serial manufacturing begins before validation testing is complete, the trains may be manufactured in accordance with a design that does not fully work and that has not been finalized. As a result, when validation testing leads to further changes in the design, the trains that are already manufactured have to be retrofitted in accordance with the design changes. Moreover, when trains are retrofitted, they generally have to undergo further testing, called non-regression testing. When retrofits happen too late in the manufacturing process, it is sometimes necessary to implement mitigation or "containment" measures instead of complete design solutions. Late changes, retrofitting, and containment measures add risk to the reliability of the vehicle. They are also likely to cause delays in the schedule and increase manufacturing costs.

On the OLRT1 project, problems arose that were created by not following the best practice of completing validation testing first and only beginning serial manufacturing afterwards. The change in manufacturing location from Valenciennes to Hornell had significant consequences for testing. The original plan was to use LRV1 and LRV2 for validation testing, with about a year's gap between the completion of LRV2 and the serial manufacturing of subsequent LRVs in Ottawa. Both Alstom and Thales had been planning to do the early testing on the LRVs in Valenciennes, where Alstom's facility had a test track that could be used for dynamic testing. Thales also planned early testing on a test track; in its contract with OLRT-C, Thales had planned to install test track equipment in France and deliver the first two VOBCs there so that Thales could conduct validation testing using the first two LRVs. Dynamic testing of the VOBCs on the prototype LRVs at that early stage would have given Thales valuable information about how the LRVs performed and allowed Thales to reduce the engineering time for the rest of its work on the train control system.

However, there was no suitable test track in Hornell, so Thales was unable to do that early dynamic testing. For the same reason, Alstom was also unable to perform validation testing in Hornell to the same extent as it would have done in France. Clearly, when the decision was made to move the manufacturing of LRV1 and LRV2 to Hornell, Alstom did not intend to abandon dynamic validation testing. However, the move occurred without alternate plans in place for that testing. While Alstom raised the possibility of doing dynamic validation testing at the Transportation Technology Center in Pueblo, Colorado, this, too, did not take place. Despite OLRT-C's initial concerns about the location change, it does not appear that OLRT-C consulted Thales about the change in location and the impact that change would have on Thales's work.

Ultimately, except for some limited testing on LRV1 in Hornell, most validation testing took place in Ottawa. As delays to LRV design squeezed the schedule, the planned gap of about a year between the completion of validation testing and the start of serial manufacturing did not occur. Instead, serial manufacturing of the rest of the LRVs started right after the completion of LRV2. In another effort to save time, Alstom conducted validation testing on the first four LRVs (rather than the planned two prototype LRVs), which was more resource-intensive. More importantly, validation testing took place *at the same time* as serial manufacturing and serial testing were occurring.

A significant challenge resulting from the move to Ottawa was OLRT-C's delay in providing access to the test track. A portion of the main line for the OLRT was to be used as the test track for dynamic testing to complete validation testing. Alstom had expected to have a 4.5-kilometre segment of fully electrified main line going in both directions available for testing and commissioning by September 2016. It was OLRT-C's responsibility to provide this track. However, the track was not available by the deadline and what became available was much less than expected; even some months into 2017, only a 1-kilometre portion of the track was available between Blair and Cyrville Stations. Additionally, only the eastbound section of the track was available, and because construction was taking place on the rest of the OLRT1 system, the track used for testing could be fully electrified for only 5 to 6 hours a day, rather than for 24 hours a day. The late and limited availability of the test track led to further delays: Alstom and Thales were competing for test track time, and the lack of track availability also delayed OC Transpo's driver training.

The change in manufacturing location exposed Alstom and Thales to these manufacturing and testing challenges. They would not have been a factor if the testing had been conducted in France or in Colorado.

Ultimately, validation testing of the vehicles continued until very late in the project – into 2019. This delay then required an extensive retrofit campaign to bring the LRVs in line with the continually shifting design. Further, as the LRVs were retrofitted, they had to undergo additional non-regression testing.

9.2.5 Conclusion

In sum, insufficient planning by Alstom and inadequate coordination and oversight by OLRT-C led to significant delays early in the OLRT1 project. These delays formed the rationale for changing the construction location from Valenciennes in France, to Hornell in the United States, and finally to Ottawa. The change in manufacturing location had negative ramifications for validation testing. Instead of following the best practice of undertaking first validation testing and then serial manufacturing one after the other,

validation testing and serial manufacturing were pursued simultaneously. As a result, significant retrofits and further testing were required. All of this contributed to schedule delays and reduced time for testing and commissioning of the system.

There is little doubt that following best practices regarding validation testing would have benefited the OLRT1 project. While the parties' desire to produce creative solutions to reduce or eliminate delays is understandable – in particular, given the clear contractual incentives to deliver the OLRT1 system on time and on budget – the various challenges encountered by not following this best practice serve as an important lesson that can be learned from the Ottawa experience.

9.3 Train Manufacturing Challenges

For the OLRT1 project, 33 of the 34 required LRVs were assembled in the MSF in Ottawa. One of the main reasons this was done was to meet the Canadian content requirement in the Project Agreement.

However, as its name (maintenance and storage facility) suggests, the MSF that was custom-built in Ottawa for the OLRT1 project was designed to maintain and store the LRVs. It was not a dedicated train manufacturing facility like Alstom has in Valenciennes or Hornell. While the MSF was adapted for manufacturing and assembly, the decision to build the fleet of vehicles there nonetheless created challenges for the project. First, as previously noted, the construction location required Alstom to set up new supply chains in North America. Second, specialized labour was difficult to recruit and maintain in Ottawa. Third, the MSF did not have an ideal amount of space and was not ready for vehicle manufacturing when it should have been.

These issues did not prove insurmountable. Indeed, Alstom was ultimately able to manufacture 33 LRVs at the MSF. Nonetheless, the challenges caused by the location and capacity of the MSF contributed to delays in the schedule, compressed the time available for testing and commissioning, and may have affected quality.

9.3.1 The Canadian Content Requirement

While the plans for manufacturing and testing the prototype LRVs changed, the plan from the outset was to manufacture the remaining 32 LRVs in the MSF in Ottawa. Ultimately, LRV1 was built in Hornell, but LRV2 and the rest of the 34 LRVs – a total of 33 vehicles – were built in the MSF in Ottawa.

In large part, manufacturing the LRVs in Ottawa was necessary for Alstom to meet the Canadian content requirement of the OLRT1 project. Indeed, the evidence suggests that Alstom would have manufactured the LRVs in its established Hornell facility – or at least somewhere else in the United States – if there had been no Canadian content requirement for the OLRT1 project. Manufacturing the fleet in Ottawa allowed Alstom to meet the requirement. At the time, Alstom did not have an established LRV production line in Canada that could have been used instead.

The Canadian content aspect of the OLRT1 project stems from the Ontario government's Canadian Content for Transit Vehicle Procurement Policy. In accordance with this policy, the provincial government's $600 million funding contribution was contingent on the inclusion of a Canadian content requirement in the Project Agreement. Ultimately, both the Project Agreement and Alstom's resulting subcontract with OLRT-C incorporated this requirement, such that 25 percent of the overall value of the vehicles, including both materials and labour, needed to be sourced from within Canada.

9.3.2 Changes to Alstom's Supply Chain

The Canadian content requirement gave Alstom no choice but to work with Canadian suppliers. However, Alstom also had a broader strategic objective. As Lowell Goudge, of Alstom, explained, the company's "intention was to set up a supply chain in North America for the vehicle that was designed for North America.… So we were looking at this as a strategic long-term investment to set up suppliers to supply this vehicle for use in other cities in North America." Alstom was also working to develop a product that would meet North American transportation and safety standards, rather than European standards. It seems that the Canadian content requirement and Alstom's commercial strategy worked together to push Alstom to develop new supply chains.

As a result, although Alstom had an existing network of suppliers around the world, Alstom had to establish new relationships with new suppliers (essentially, "rewire" its network). Furthermore, while the particular vehicle chosen for the OLRT1 project was related to an established family of vehicles used worldwide, Alstom had to establish new supply chains to produce components for the fairly small fleet of LRVs required for the OLRT1 project. Working with new suppliers sometimes meant adapting the design to what the new suppliers were able to produce.

Some of these products from new suppliers had quality issues. For example, whereas the auxiliary power units and the line inductors on the roof of the trains that Alstom usually uses are manufactured in Europe, those for the OLRT1 project were manufactured in North America; both of these components had quality issues that affected the reliability and performance of the LRVs. Alstom similarly engaged a new North American supplier to build the bogie castings – a key structural component of the **bogie** (the chassis or frame that holds the wheelset for the LRV). The bogie castings from this supplier were often of poor quality and were, in some cases, not fit for the full life of the LRVs. Alstom also chose its brake supplier because of that supplier's presence in North America. The brake calipers initially provided by this supplier were unable to meet the mechanical stress requirements and ultimately had to be replaced by an entirely different type of caliper. These supply chain and quality issues may have added

to manufacturing delays, and it is likely that there would have been fewer quality issues if Alstom had been able to use its usual suppliers.

9.3.3 Finding Skilled Labour in Ottawa

Alstom's decision to manufacture the vehicles at the MSF in Ottawa was a direct and important result of the Canadian content requirement, and this decision led to significant issues in finding experienced labour for the OLRT1 project and training workers.

As noted earlier, only a single LRV was manufactured in Hornell, and 33 were manufactured in Ottawa. Yet at the time, Alstom did not have an LRV manufacturing facility anywhere in Canada, let alone in Ottawa. Therefore Alstom did not have a pre-existing team of experienced personnel available to manufacture the trains, the way it would have had in Valenciennes or Hornell. Additionally, there was no broad pool of skilled labour available to draw from in Ottawa – a city whose economy is not focused on manufacturing, much less on the specialty of train manufacturing.

Manufacturing the LRVs in Ottawa required hiring and training new personnel for the job, which took significant time and effort. While Alstom transferred some of its own employees to Ottawa, typically for managerial roles, the workforce responsible for manufacturing the LRVs was generally made up of new people hired locally through an agency and sent to Alstom's facility in New York for training. The new local personnel may have been trained, but they had no experience.

Inexperience among newly hired labour at the MSF was an issue because building a train is, as Joseph Marconi, of OLRT-C, explained, a "hands-on, labour intensive job, it's not automated as much as you would think." In other words, it requires a lot of know-how. People who lack the specific know-how may be able to follow a formally described procedure, but they may not fully understand what they are doing or the implications of that work, or the workings of the products. Alstom trains are ordinarily assembled in Alstom factories, by personnel who are highly skilled and permanently employed. The LRVs for the OLRT1 project were designed so that the manufacturing performed in Ottawa did not require special processes such as welding, cutting, machining, or drilling; it was a matter of assembling and fastening premade parts according to specific standards. Still, the relative inexperience of the workforce had the potential to lead to quality issues that would be less likely to occur with a workforce that has been building trains for years. In the case of the OLRT1 project, the inexperience of the workforce may have resulted in problems, such as defective wiring that then had to be fixed, adding to delays.

The labour issue was particularly challenging because the MSF was not a permanent manufacturing facility. In the long term, the MSF was going to be a maintenance facility, not a manufacturing facility, so there was no prospect of long-term employment assembling trains there. As Goudge, of Alstom, observed, "it becomes very problematic to cycle up a workforce of 100 to 150 people for 18 months to two years … and then say, Goodbye, we don't need you." Temporary employees may not have the same level of engagement as permanent ones. It seems that Alstom experienced a high turnover in its personnel, which required constantly training new people. When a workforce loses experienced members, this may mean that it is left without required skills. Marconi explained that those left behind may not know the relevant processes as well as they should.

9.3.4 Manufacturing LRVs at the MSF

The MSF site includes a main facility, warehouses for LRV storage, offices and workspaces, and a parking lot. The main facility is divided into four parts: a **final vehicle assembly area / heavy maintenance bay**, a **light maintenance bay (LMB)** with a dedicated track, a **utility area**, and a **wash bay / sanding bay**. These parts of the facility were used not just for maintenance, but also for manufacturing and testing. For example, Alstom used the wash bay for water testing; it would also be used to clean the vehicles during maintenance. Similarly, Alstom used the LMB for static testing, but it was also an area used to maintain the vehicles.

The Commission heard conflicting evidence about whether it was a good idea to manufacture the vehicles in the MSF. Some witnesses, including Alstom's Project Engineering Manager, Yang Liu, were of the view that using a mature manufacturing facility would have helped to avoid many of the issues that arose on the project. Others, including Alstom's lead engineer, Goudge, were more equivocal; while recognizing certain challenges, particularly with respect to labour, he was of the view that the MSF was still a sufficient facility, exemplified most clearly by the fact that 33 Stage 1 LRVs were manufactured there.

In any event, it is clear that manufacturing at the MSF created challenges. The facility had been designed to meet requirements for maintenance and then adapted for manufacturing. The space available to build the 33 LRVs in the MSF was more cramped than would have been ideal, with less room than there would have been in a dedicated manufacturing facility. The design of the facility left little leeway for faults or unexpected situations; such situations would have a greater impact in the MSF than they might have had in a larger, more established facility. This would have been the case even if the MSF had been ready on time and completely available for Alstom's use.

However, the MSF was not ready for manufacturing on time and was not completely available for Alstom's use. Under OLRT-C's subcontract with Alstom, OLRT-C was to have the MSF available for manufacturing on July 1, 2015. But the decision to manufacture LRV2 in Ottawa rather than Hornell required an earlier start in Ottawa than initially planned. OLRT-C agreed to move up the timeline so that some parts of the MSF – the final vehicle assembly area and offices for Alstom personnel – would be available in May 2015, for Alstom to begin installing its equipment. According to the revised timeline, the remainder of the MSF would be available for Alstom's use by July 2015, at which point vehicle assembly could begin. This did not go as planned. Following a review of the site on July 31, 2015, Alstom wrote to OLRT-C saying that the MSF was "still clearly a construction site." Alstom eventually took occupancy of the final vehicle assembly area on August 26, 2015, although it argued that even in November 2015, the site was still not ready given its state.

Once enough of the MSF was available for vehicle assembly to begin, there were further delays because of the lack of availability of the LMB, which included a dedicated track that was to be used for static testing of the LRVs as they were manufactured. Alstom expected the LMB to be available when the MSF building was made available for manufacturing in 2015, but in fact, the LMB was not available until August 2016. Even then, in August 2016, the LMB was not fully functional because it was not equipped with overhead catenary power. This meant that Alstom could not perform its full suite of tests in the LMB. Vehicles that Alstom manufactured began to accumulate but could not be fully tested until overhead catenary power was available; as a result, issues with the LRVs were not being caught soon after the assembly of each vehicle or before assembly of additional vehicles took place. Even once the LMB was usable for testing, it was subject to competition for space, as Alstom needed to use it for validation testing at the same time. In addition, over nearly three years, the LMB was subject to repeated power outages that prevented testing from taking place.

It is important to emphasize that the issues identified earlier regarding the change in manufacturing location for the first two LRVs compounded the challenges of manufacturing the LRVs in the MSF. Undertaking validation testing and serial construction simultaneously led to the need for significant retrofits. Of course, these retrofits had to take place in the MSF as well, alongside more assembly and still more testing (serial testing and non-regression testing). With qualified labour and manufacturing space already in short supply, the added need for significant retrofits only worsened the labour and space problems.

Finally, I note that Alstom has developed a dedicated manufacturing facility in Brampton, Ontario, to assemble the vehicles for Stage 2 of the OLRT. While examining Stage 2

goes beyond the limits of the Commission's mandate, I see the development of the Brampton facility as an implicit acknowledgement from Alstom that the MSF and the labour force in Ottawa would continue to pose challenges for LRV construction.

9.3.5 Considerations for Future Projects

Two central findings flow from this discussion of train manufacturing challenges.

First, for a project of this magnitude, it is beneficial to have a dedicated manufacturing facility. Ideally, such a facility will be already established and employ experienced personnel. Manufacturing LRVs for the OLRT1 project in a new geographic location and at the MSF, in particular, caused challenges with respect to suppliers and labour. Moreover, the MSF was not specifically designed for manufacturing or testing, and it had not even been fully constructed or properly powered and equipped when it was needed. Making use of a dedicated and established facility would have significantly reduced these challenges.

Second, there is good reason to be concerned about Canadian content requirements for a system with as much risk and as many firsts as the OLRT1 system in Ottawa. The local content requirements that applied to the OLRT1 project are not unique to Ontario. They have many benefits, including fostering economic development, reducing supply chain problems by having suppliers nearby, and protecting and promoting the creation of skilled manufacturing jobs. As a general matter, the local content requirements are to be encouraged. As was the case here, governments typically engage in a fair amount of consultations and due diligence to ensure that the requirements can be met by the private sector.[6] However, there are instances in which relaxing local content requirements may be advisable.

In the OLRT1 project, it is difficult to imagine that Alstom (and therefore OLRT-C and RTG) would have experienced the same challenges if more of the LRVs could have been built in the United States or, indeed, in France. The Canadian content requirement precluded the parties from seriously considering manufacturing outside of Canada as an option. While the requirement could be met, as it was in the case of the OLRT1 project, it restricted the ways in which the vehicle supplier could approach manufacturing and have recourse to its established supply chains and manufacturing facilities, including the experienced workforce that works in these facilities. Meeting local content requirements may require the introduction of new suppliers, with whom the vehicle manufacturer does not have any experience or pre-existing relationship. These unknown suppliers and inexperienced labour introduce new risk in an already risky area. In addition, the policy restricted the pool of vehicle suppliers that could meet the requirements, and thus the options available to both the City and bidders on the project.

Ontario's Canadian Content for Transit Vehicle Procurement Policy does exempt five types of transit vehicles, where it was deemed that meeting the requirements might place undue restrictions on a transit operator's efforts to procure specific transit vehicles to meet their individual strategic requirements to improve transit services. (Despite this exemption, the policy gives an advantage to the submission with the highest percentage of Canadian content.[7]) It also allows for the possibility of a waiver "in the event that no Canadian content compliant submissions are received as part of a fair, open and transparent procurement process." These exemptions and waiver were specifically included because of concerns raised during the consultation process regarding the ability to procure transit vehicles in an open and fair procurement process in compliance with the 25 percent Canadian content requirement. The exemptions are a recognition that there must be some leeway in certain instances.

Local content requirements for transit vehicles should be waived or adjusted as appropriate, to ensure the success of a complex project. This may occur not only where no compliant submissions are received, but also where meeting the requirement would prove too limiting – for example, where there is no significant local expertise and/or pre-existing manufacturing facilities that can adequately accommodate the project. One important consideration is whether, to meet the requirement, manufacturing would need to take place in a temporary facility or one not designated for vehicle manufacturing. Another is whether new supply chains for key components would need to be established.

However, the evidence showed that even without a local content policy, Alstom intended to use the OLRT1 project as a strategic long-term investment to build relationships with suppliers that could be used for other business opportunities in North America. As such, for the City to ensure that it was not at the receiving end of a new process, involving new supply chains and new parts, it would have had to include clearer "service-proven" requirements in its RFP.

One way in which a project owner like the City could ensure that quality parts already used elsewhere are used in the manufacturing of vehicles is to require the use of certain service-proven parts or materials. This would relate not merely to service-proven solutions, meaning technology that already exists, but actual components of the trains produced by an existing supplier and successfully used elsewhere. While there is a need to avoid hindering innovation and avoid the challenges that can be encountered with overly prescriptive requirements, consideration should be given to requiring such service-proven parts for select safety-critical components of the vehicles or where reliability issues abound. As submitted by RTG Engineering in its closing submissions, parties initiating a project could mandate the use of certain service-proven vehicle components such as wheels and line inductors. To be clear, the requirement should not

be for a specific, designated component (for example, a particular type of steel or brake to use); rather, the requirement would be to demonstrate that the part, manufactured by an established supplier, is used on other trains elsewhere in the world, with success.

Given that this may have the effect of potentially restricting the use of local content, it follows that local content requirements would need to account for such additional restrictions on the parts or materials that any supplier could use.

9.4 The Alstom-Thales Interface and Integration

The interface between the LRVs provided by Alstom and the signalling system provided by Thales is a critical element of the OLRT1 project. Simply put, if the vehicles were to move and stop on the track as expected, the Alstom system and the Thales system had to work together seamlessly, and for that, they had to be integrated successfully.

However, there were many challenges in achieving this goal. Alstom and Thales did not have a contract with each other; instead, each had a subcontract with OLRT-C. As a result, both subcontractors depended on OLRT-C as their point of contact, for coordinating their different but related activities, and for the integration of their systems. OLRT-C did not perform these tasks well: the schedules in the Alstom and Thales subcontracts were misaligned; the deliverables (what each company was to provide or do) in the two subcontracts were also misaligned; no one at OLRT-C was assigned to manage the integration of these key systems until nearly a year into the contract; and the lagging integration caused operational issues.

Today, the Alstom and Thales systems are integrated and functioning smoothly. However, OLRT-C could have managed this interface far more effectively if it had followed basic contracting principles and best practices for systems integration. Doing so would have avoided early issues with the OLRT1 project and delays that had broader implications. This section focuses on the integration of the Alstom and Thales systems; section 9.5 will look at the broader context of systems integration.

9.4.1 A Critical Interface

As described in the key terms earlier, the City selected a vehicle with a type of signalling system known as a CBTC system, which allowed for automatic operation of the LRV under manual supervision. This means that each train has a driver, but the drivers are primarily there to supervise the vehicle's operation and handle emergency situations. During normal operation, the trains drive themselves, automatically controlled by the CBTC system. Among other things, this allows for shorter and more consistent **headways** (time and distance between trains), a vital feature of the OLRT1 system that allows it to meet ridership demands.

Setting up this signalling system involved the installation of Thales equipment in each LRV, along the entire guideway, and in the control room of the OLRT1 system. The Thales equipment in each vehicle, called the VOBC, forms an integral part of the overall CBTC system.

Designing the Alstom vehicles and the Thales equipment to fit with each other and then installing the VOBCs into the vehicles demanded tight coordination between Alstom and Thales. This coordination was all the more important on the OLRT1 project because, although Alstom and Thales had worked together on previous large-scale transit projects, the OLRT1 project was the first time that a CBTC system was being integrated with a low-floor LRV.

To integrate their systems effectively, Alstom and Thales first had to work together at the level of hardware. They had to determine, for example, what the dimensions of the VOBC would be and where the VOBC would be positioned within the vehicle. The more important and difficult task was to then ensure that the software of the two systems could communicate to each other, so that signals and commands sent from one system could be properly responded to by the other. As a simple example, if the VOBC gave a specific brake command, the LRV needed to receive that command and then trigger the right level of braking in the calipers and other brake components.

The importance of getting this Alstom-Thales interface right is obvious. Without proper integration between the signalling system and the vehicles, the vehicles will not accelerate or brake properly, nor can safe headways be maintained. This was a critical interface.

9.4.2 Misaligned Subcontracts and Early Troubles

Because the Alstom-Thales interface was critical for the OLRT1 project, the systems had to be integrated carefully. Witnesses for OLRT-C candidly agreed that OLRT-C was responsible for this task. Unfortunately, OLRT-C made several avoidable mistakes in its handling of the Alstom-Thales contracts, interface, and integration.

The first problem with OLRT-C's systems integration work is that OLRT-C did not properly align its subcontracts with Alstom and Thales. This was most glaringly apparent in the schedules in each subcontract. Witnesses from Alstom, Thales, and even OLRT-C agreed that it was important for the schedule of their deliverables to be aligned. Yet, this did not happen.

An example is related to the ICD, that crucial document for setting out the precise way the VOBC fits into the vehicle both mechanically and electrically, and how the software of the two systems communicate with one another. The subcontract between Thales and

OLRT-C set out an iterative process for developing the design of the signalling system, with a conceptual design review in June 2013, a preliminary design review in September 2013, and a final design review in September 2014. According to this schedule and process, Thales was expected to provide a finalized ICD in September 2014.

In contrast, in the subcontract with Alstom, OLRT-C agreed that it would provide Alstom with the "frozen" (or finalized) ICD from Thales on April 26, 2013, *over a year before* Thales was contracted to provide the same document. Moreover, the subcontract with Alstom stipulated that Alstom could "propose its own CBTC specification based on industry standards" if a finalized CBTC specification was not provided by that same date.

This misalignment of schedules in the subcontracts was contrary to both common sense and the expectations of Alstom and Thales. OLRT-C should have been aware it was also out of step with best practices. For example, an RTG design presentation dated May 10, 2012 – well before the Alstom and Thales subcontracts were signed – set out lessons learned from previous projects regarding the train control systems. One of these read: "Ensure all stakeholders have complete consolidated program schedule incorporating everyone's activities." Clearly, even at the contracting stage, OLRT-C failed to meet a fundamental precondition to establishing a feasible consolidated schedule: negotiating contractual obligations that were consistent with each other.

There was evidence that the April 2013 date for delivering a final ICD was unrealistic even from the start of the subcontracts on February 12, 2013. Witnesses for Thales and OLRT-C were adamant that such a deadline was essentially impossible to meet.[8] This raises questions about why OLRT-C agreed to the date in the Alstom subcontract in the first place.

One answer may be that OLRT-C did not have the right experts involved in the contract negotiations with Alstom – people who would have known that the date was unachievable. Nevertheless, Alstom proposed April 26, 2013, which it recognized, as its Bid Director Declercq explained, was an "aggressive date" that was clearly to its advantage. Alstom was concerned that "the main risk of this project was about interfaces" and so it sought to introduce "very strict dates" to protect itself. Setting early dates would allow Alstom to claim compensation or seek a variation if OLRT-C failed to meet its deadlines in the contract. Declercq was involved in the contract negotiations and explained that OLRT-C did not resist or raise questions about this date. He observed that OLRT-C did not have engineers at the table with the necessary skillsets to assess the deadlines and schedules: "There were people with an engineering background, project directors, the bid manager, but no technical experts in front of us.… We never felt the

presence of a system engineering [expert] that understood the integration and interface issues between the vehicle and the control train."

Whether the April 2013 date was attainable or not, the deadline clearly was not going to be achieved if Thales's own subcontract did not require its finalized ICD to be produced until over a year later, in September 2014.

Right from the start of Thales and Alstom working on the ORLT1 project, the misaligned schedules served as a point of conflict and a distraction for the two companies, instead of allowing them to get to work achieving their objectives on aligned schedules. A central point here is that, of the three parties (OLRT-C, Thales, and Alstom), only OLRT-C could see all the schedules. Therefore, it was incumbent upon OLRT-C to ensure these schedules aligned, and it failed to do so.

The subcontracts were also lacking in another way – regarding the scope of work and what the two subcontractors each had to deliver. Both subcontracts contained a "scope split" that set out whether Alstom or Thales was responsible for any given deliverable. In itself, this was positive because the work of the two subcontractors was deeply interconnected, and unlike the schedules, both subcontracts contained an identical scope split. However, this scope split did not cover off all eventualities, and certain disagreements between Alstom and Thales emerged.

For example, Alstom expected Thales to provide the VOBC in a "plug and play" form so that the VOBC rack, which contains the on-board system, would be fully assembled and could be quickly installed into each vehicle as one piece. Thales instead provided racks with wiring harnesses and then, separately, a set of modules that would fill each rack. The parties disagreed on who was responsible for fully assembling the rack, and the scope split in the subcontracts did not assist in resolving this issue.

The parties also disagreed on who was responsible for PICO testing: testing each VOBC after it was installed on a vehicle and to ensure that the VOBC was communicating with the vehicle and the wayside signalling equipment as it was designed to. Thales designed the PICO test procedure but took the position that Alstom was responsible for conducting the PICO tests. Alstom refused to do any testing that "involved going inside the envelope of the VOBC" because it did not believe it should be in the position of testing another supplier's products – a task that Alstom witnesses said goes beyond what any signalling supplier should expect a vehicle builder to do. Here, too, it appears that the scope split gave incomplete guidance to the parties as to who was responsible for this task.

Regarding the scope of work and how it was split, Michael Burns, of Thales, explained that he thought the subcontracts had an "unnatural division of responsibilities." In his

view, it would have made more sense for Thales to be responsible for installing its own equipment in the vehicles. This would have simplified the scope split and reduced opportunities for misunderstandings between the parties.

To be fair, when the work is so interrelated in a project of this complexity, it is perhaps unrealistic to expect perfection from the scope split and for there to be no issues in determining which party is responsible for what work. Moreover, a contractor must balance the efficiency of a scope split with its ultimate cost; for example, if one of the parties can do a task more cheaply, a less "natural" scope split may be preferred. Nonetheless, it is clear that OLRT-C could have more effectively used the subcontracts to delineate Alstom's and Thales's roles and responsibilities to make the systems integration process more seamless.

Notably, OLRT-C does not dispute that there was room for improvement in its management of the subcontracts with Alstom and Thales. On the contrary, Manuel Rivaya, OLRT-C Executive Committee member, readily agreed with Commission counsel's suggestion that, "in hindsight … the contractual deliverables in the Thales and Alstom subcontract[s] should have been better aligned."

The lack of clarity in the Alstom-Thales subcontracts, their misalignment of schedules and deliverables, and the "unnatural division of responsibilities" resulted in conflict and delays.

9.4.3 Gaps in OLRT-C's Systems Integrator Role

A second major problem with OLRT-C's integration of the Alstom-Thales systems was its failure to have a Director of Integration as soon as the subcontracts were signed, or ideally even earlier.

When OLRT-C entered into the subcontracts with Alstom and Thales, it had not hired anyone with the necessary training and expertise to manage this critical interface. Consequently, early in the project, Alstom and Thales felt they had been left on their own to integrate the vehicles with the signalling system, without support and without leadership. To paraphrase Alstom's senior engineer, Goudge, OLRT-C's approach to systems integration was to put Alstom and Thales in a room and let them figure it out, especially at the outset of the OLRT1 project. This was far from ideal for two entities that are competitors (which may have made them wary of sharing certain information) and that had no contractual relationship with one another. Indeed, one of the key roles of a systems integrator is to make decisions about how to move forward when conflicts arise.

A key objective of the integration process was for Alstom and Thales to develop ICDs that were integrated to ensure optimal performance of their systems. In the industry, this is a complex process that requires significant communication and negotiation back and forth between the parties and continues throughout the testing and commissioning phase of a project. Conflicts between the parties will almost inevitably arise. Frequently, decisions will need to be made about which party's design needs to change to ensure the proper functioning of the integrated system. A qualified systems integrator can be vital to resolving conflicts, overcoming obstacles, and allowing the continued development of the ICDs to proceed as expeditiously as possible.

In early 2014 – nearly a year after OLRT-C signed subcontracts with both Thales and Alstom – OLRT-C hired Jacques Bergeron as its Director of Integration. Once in place, Bergeron conducted a series of interface workshops between Alstom and Thales. The goal of these workshops, and Bergeron's work overall, was to develop Alstom's and Thales's ICDs so that they were fully integrated. Bergeron was also able to make recommendations to the subcontractors about how to proceed in the face of any disagreements.

Witnesses from all affected parties were unanimous in their praise for Bergeron's positive effect on integrating the Alstom and Thales systems. For example, Nadia Zaari, an Alstom project director, told the Commission: "[In] my opinion, he's the only reason why we made progress. He was a key person, key interface to the City, key interface to us. And without him, I don't think we would have gone that far." Burns, of Thales, further explained: "I think there would have been a material benefit to everyone if Jacques [Bergeron] was there on Day 1."

Despite Bergeron's clear positive impact on the OLRT1 project, certain challenges persisted. First, the evidence suggests that some communication issues between Alstom and Thales, created in the process of developing their ICDs, were not completely resolved, even despite Bergeron's work to coordinate their efforts. For example, Burns complained that there were times when the parties had agreed to specific changes in meetings that were documented with minutes, and then Alstom returned with an ICD that failed to reflect the agreed-upon changes. Alstom witnesses, for their part, countered that minutes of meetings are not a proper basis on which to develop ICDs or other design documents. To bolster its position, Alstom also relied on the terms of its contract with OLRT-C, which indicated that Alstom could use its own ICD specifications if the company was not provided with a finalized Thales ICD by April 2013. In short, it seemed that Alstom and Thales did not always agree on what information was required in order to move forward with a new revision of their ICDs.

Unfortunately, Bergeron retired on August 31, 2018, leaving the OLRT1 project before its completion. Perhaps unsurprisingly, given his impact on the project, some witnesses

testified that the relationship between Alstom and Thales deteriorated after Bergeron's departure. Alstom's Project Director, Bertrand Bouteloup, observed that without Bergeron on the project, OLRT-C began to manage Alstom and Thales in silos: "They were managing Thales on that site with their own schedule, and we were managed by [OLRT-C] with our own schedule, and sometimes the two schedules are not matching each other." Bouteloup referred to "fighting on both side[s], Thales and us," rather than working together and finding good compromises.

OLRT-C's own witnesses confirmed that they did not always give Alstom and Thales the same information, as a way of trying to keep pressure on them to meet the schedule. Rupert Holloway, of OLRT-C, explained:

> There's obviously a degree of subcontractor management where you don't necessarily want to communicate everything that one subsupplier is dealing with in relation to another subsupplier because you want to keep the competitive tension.… If you're a supplier, and you know that your delivery is dependent on another supplier and that supplier's gone late … you can take the foot off the gas and slow up your delivery, knowing that you're no longer the critical path.

In short, while the interface between Alstom and Thales benefited from the introduction of Bergeron as Director of Integration, the two subcontractors' relationship was not managed well by OLRT-C and became less collaborative after Bergeron's departure. This led directly to some of the operational issues that arose as the trains started being run, described below.

9.4.4 Operational Issues

The challenges described above delayed the full integration of the Alstom and Thales systems. These issues in turn caused tangible operational issues both before RSA and after the OLRT1 line went into public service.

For example, prior to RSA, the Alstom and Thales ICDs had failed to capture a systems integration issue related to emergency braking. Alstom had created a safety measure whereby too many emergency brake commands within a 15-minute period would cause a vehicle to reset. This measure was programmed into the vehicles' behaviour, but it had not been shared with Thales in Alstom's ICD. In routine maintenance checks, Thales would repeatedly check the emergency brake while the vehicle was at a standstill and prior to launching the vehicle. The result of Alstom and Thales not communicating effectively about what they or their systems were doing was that the

vehicles were being reset unnecessarily. When this was first discovered, the train "locked out" and was disabled while on the main line, creating delay along the line. According to Goudge, Alstom's lead engineer, this issue has not been fully resolved. Instead of a permanent solution, the parties are using a workaround by parking the vehicles in emergency brake overnight.

A greater concern was a change that was made after RSA to the functionality of the doors, a change not properly captured in the parties' ICDs. The result was that vehicle doors were closed prematurely, and catching, on at least one occasion, a passenger's arm in the doors. Alstom and Thales were able to rectify this issue with a relatively easy software change, but clearly, it would have been better for such an issue to have been discovered and rectified before passengers were on the vehicles.

Burns, of Thales, explained that issues like this likely could have been caught either if all changes were properly reflected in the ICDs or through earlier testing.

In fact, part of the problem that Alstom, Thales, and OLRT-C faced was the late validation testing and the fact that the systems integration process was delayed by the limited access to the test track. As explained earlier, the original plan for validation testing would have allowed Thales an earlier testing opportunity, which might have given it a head start in developing its train control system. Further, Bergeron indicated that one of the major hindrances to integrating the Alstom and Thales systems was lack of access to the test track. Alstom and Thales were not given access to the test track until months later than scheduled – and even then, they only got access to less than a quarter the track length originally planned. OLRT-C was also responsible for these infrastructure delays.

9.4.5 Conclusion

Eventually, OLRT-C successfully integrated the Alstom and Thales systems. However, this was not fully achieved until after RSA, when the vehicles were already in public service, and passengers had been affected by the integration issues between the vehicles and the control system. As well, the numerous failings in getting to this successful integration caused greater complications for the OLRT1 project, as will be described in Chapter 10.

OLRT-C should have done more to align its subcontracts with Alstom and Thales. Responsibilities could have been more clearly delineated, and the schedules should have been the same. Further, it was important to have a Director of Systems Integration in place from the beginning of the project – indeed, even during the contract negotiation phase, before the design and manufacturing phase commenced. Overall, OLRT-C

could have better managed both the relationship between Alstom and Thales and the expectations about communication. Finally, earlier validation testing and test track availability might have prevented serious operational issues that arose.

Ultimately, these issues were symptomatic of a wider problem caused by OLRT-C's insufficient attention to systems integration for the OLRT1 project as a whole, as will be discussed next.

9.5 Systems Integration

The connectivity and interworking between the various elements of a rail system – vehicles, infrastructure, train control system, communication system, safety system – is critical to a railway project. The need for integration engages two related engineering disciplines: systems integration, and systems engineering and assurance. Under the Project Agreement, RTG was responsible for both of these disciplines. Unfortunately, RTG, through its subcontractor OLRT-C, failed to deliver.

9.5.1 Systems Integration and Systems Engineering

The process of ensuring that systems function as a coherent whole is known as systems integration. At a high level, the purpose of systems integration is to ensure that all the many different systems and subsystems work together to function according to the project design to achieve the project's intended purpose. In the case of the OLRT1 project, that purpose is a safe and reliable LRT system. It is essential that systems integration be prioritized at the earliest stages of a project.

Related to systems integration is the overarching discipline of systems engineering and assurance. This discipline deals with identifying, mitigating, and tracing hazards through the design, construction, testing, commissioning, and maintenance processes to demonstrate the overall safety of a rail system. The overarching purpose is to ensure the design and construction of an integrated, safe, and operational railway. Systems engineering and assurance should be engaged from the concept stage of a project.

Systems integration, and systems engineering and assurance, are particularly important for a rail system such as the OLRT1 project, which involves multiple parties responsible for the design, construction, and integration of the various subsystems.

Ultimately, systems integration and systems engineering were late and ineffective on the OLRT1 project. These failures contributed to delays, retrofits, tensions between the City, RTG, OLRT-C, and its subcontractors, and some of the issues the system faced after it went into operation.

9.5.2 Systems Integration Was a Critical Risk of the Project

The City required – and the Project Agreement provided for – the operation of a fully integrated LRT system. In its response to the City's RFP, RTG identified systems integration as a key risk for the OLRT1 project. Having identified this key risk, it was incumbent on RTG, and by extension OLRT-C, to properly address and mitigate it.

A system like the OLRT1 is made up of various interacting subsystems that include tens of thousands of physical and digital assets that must be integrated. Several witnesses described the complexity of the engineering and integration tasks; this complexity should not be understated. Systems integration is a risk with any rail project.

With the OLRT1 project, however, systems integration was a critical risk because the project involved several "firsts" and unproven elements in the most important interface on the project: that of the vehicles and train control system. These elements included:

- LRVs that were significantly adapted from Alstom's existing Citadis Dualis model and that were to be operated at the limits of an LRV's capabilities;
- The first time Thales and Alstom had, reportedly, integrated their systems for an LRV;
- The first time an automatic train control system with a **moving block** (a zone of space around each train that moves with the train, thus allowing the trains to run closer together than other types of systems) was used with a Citadis family LRV; and
- The first time a CBTC system was integrated with a low-floor LRV.

Systems integration was also a critical risk because of the number of new connections and relationships between the parties involved in the OLRT1 project. These included OLRT-C's relationships with its various subcontractors. In addition, there was RTM's role as the maintainer and OC Transpo's role as the operator. OC Transpo's involvement also separately engaged the City as the contracting party under the Project Agreement. To reach OLRT-C or one of its subcontractors, communications from the City and OC Transpo first had to flow through RTG, down to OLRT-C. These interfaces added additional layers of complexity to the parties' relationships and communications.

On systems integration, OLRT-C had separate subcontractors involved in different aspects of the integration work, including RTG Engineering, Alstom, and Thales. With more subcontractors, there are more contracts, more overlap between disciplines, heightened coordination challenges, and greater potential for misunderstanding. Unfortunately, misunderstandings plagued this project. As Burns, of Thales, described it, there were "too many hand offs between parties, and every time there is a hand off,

there is an opportunity for misinterpretation or misconception of what the one party is giving and what the other party is maybe receiving."

9.5.3 Responsibility for Systems Integration

The Project Agreement placed responsibility for systems integration on RTG. It required RTG to design, construct, test, and commission all the elements of the system to ensure they function together as one coherent system in accordance with the performance requirements and other specifications defined in the Project Agreement.

In turn, RTG downloaded these requirements onto OLRT-C, which was responsible for the design and construction of the system and its integration. RTG also downloaded certain requirements to RTM, which was made responsible for maintaining the OLRT1 system over the 30-year maintenance term. However, RTG retained overall responsibility under the Project Agreement to deliver an integrated system to the City. Despite having this overall responsibility, RTG did not believe it had an oversight role over systems integration.

OLRT-C delegated some of its design and construction responsibilities to its subcontractors. As noted at the outset of this chapter, RTG Engineering was responsible for the overall design and engineering, except for the vehicles and train control system. Alstom was responsible for the vehicles, and Thales was responsible for the train control system. The City, through OC Transpo, also had a role to play in integration, as it is the entity that ultimately operates the system. Ideally, to meet the needs of OC Transpo and its users, OC Transpo's operational intentions should have informed the design.

In assigning certain design and integration responsibilities to its subcontractors, OLRT-C initially took a hands-off approach. It largely viewed its role as simply providing management and oversight, as opposed to taking a proactive role in systems integration to fulfill the requirements of its contract with RTG. OLRT-C expected its subcontractors to deal with each other to perform the various integration tasks among themselves. Therefore, OLRT-C relied on co-operation between its subcontractors to ensure that systems integration was completed in a proper and timely manner. This was true with Thales and Alstom – as noted earlier – and it was true of RTG Engineering, even though the three subcontractors did not have any contractual relationship with each other, but rather with OLRT-C.

OLRT-C's approach also ignored the fact that Thales and Alstom were competitors in the train control market. It was evident early in the OLRT1 project that their competition in the market was an issue, because there was a lack of co-operation between the two companies. The issue of Thales and Alstom being competitors was a known risk from

the outset of the project and should have been better managed by OLRT-C.[9] While co-operation eventually improved, this is an example of the difficulties arising from OLRT-C's approach to systems integration.

The project would have been better served had OLRT-C taken a more proactive approach to control and manage systems integration, a point that was acknowledged by Bergeron, its Director of Integration. Rivaya, of the OLRT-C Executive Committee, went further to state that, in hindsight, it would have been better for OLRT-C to retain control over systems integration as a single entity instead of downloading these responsibilities to several subcontractors. This would have allowed OLRT-C to retain control of the processes and better address the associated risks. I agree with that assessment.

9.5.4 Systems Integration and Engineering Were Late and Ineffective

Despite the critical importance of systems integration, the OLRT1 project began with a focus on the civil construction works. For the first three years of the project, this involved widening Highway 417 and excavating the downtown tunnel. The civil works were prioritized over systems integration and systems engineering, which became a source of problems as the OLRT1 project progressed.

Where there eventually was a focus on systems integration, it was mostly directed to the integration of the trains and the train control system, which was a critical interface on the OLRT1 project. Even so, the approach to the train and control system integration caused difficulties as well. Alstom and Thales were largely left to resolve issues among themselves, and OLRT-C did not play an active role, at least not until OLRT-C hired Bergeron as its Director of Integration in early 2014. This passive approach was even reflected in RTG's proposal (in response to the City's RFP) about how it was going to approach systems integration. The lack of early focus on systems integration, and the misalignment of the Thales and Alstom subcontracts, led to finger pointing over delays and responsibilities that took the focus away from the project itself.

As the OLRT1 project progressed, a fundamental misunderstanding emerged between OLRT-C and RTG Engineering over who was responsible for systems integration. Each thought that significant portions of this work were the other's responsibility.

OLRT-C viewed RTG Engineering as responsible for systems integration and systems engineering generally, except regarding the trains and the train control systems. In contrast, RTG Engineering viewed its role as generally providing only the engineering and design work. It considered OLRT-C's perception of its role as beyond the scope

of its services and believed that it was not being paid to perform this work. This led to disputes between these parties that hindered the focus on integration.

Part of the difficulty is that RTG Engineering's contract excluded the design of the trains and the train control system, which fell to Alstom and Thales, respectively. RTG Engineering suggested that one of the reasons for the exclusion of the trains and train control was that MMM Group (one of the companies making up RTG Engineering) was not a systems engineering firm and did not want to be involved in matters relating to systems integration, the vehicles, or the train control system. From RTG Engineering's point of view, the exclusion of the vehicles and the train control system implied that it could not be responsible for overall systems integration. From OLRT-C's perspective, this exclusion did not prevent RTG Engineering from being responsible for overall systems integration.

Despite this disagreement, Keith Brown, of RTG Engineering, assisted OLRT-C with integration in the early stages of the OLRT1 project. However, Brown ran into conflicts with OLRT-C about the scope of RTG Engineering's role and, in late summer 2013, started to back off from this responsibility.

Another issue between OLRT-C and RTG Engineering arose over who was responsible for preparing the system integration test plans. The purpose of the SITs is to test a particular system's interaction with other systems. These tests are a critical component of the systems integration process.

In January 2016, OLRT-C approved a change to RTG Engineering's scope of work to include developing certain SITs. However, RTG Engineering was not responsible for preparing the vehicle and train control SITs, among other non-systems-related plans. This late determination of responsibility for the SITs is another example of OLRT-C's inadequate approach to systems integration.

OLRT-C candidly acknowledged that the disputes and misunderstandings of the parties' responsibilities delayed the progression of systems integration. In the end, it does not matter who was right in the disputes regarding contractual responsibility for systems integration. The important point is that they left systems integration and engineering largely unaddressed until too late in the OLRT1 project. This was a failure by OLRT-C, which had the ultimate responsibility to deliver an integrated system to RTG.

Also, OLRT-C did not have anyone managing systems integration for the better part of the first year of the OLRT1 project. OLRT-C attributed the delay in hiring Bergeron to difficulties finding the right candidate. However, once Bergeron started, his primary focus was the integration of the vehicle and train control interface. He explained that he

operated under the assumption that RTG Engineering was responsible for the balance of the systems integration on the project, a view that proved to be subject to dispute and led to delays.

After he was hired in early 2014, Bergeron had a significant positive impact on the progress of the integration of the vehicles and signalling system. Zaari, of Alstom, stated that having Bergeron involved from the beginning of the project might have helped to accelerate the integration process. This illustrates the importance of properly resourcing and prioritizing systems integration.

Despite the positive steps taken by Bergeron, the integration of the vehicles and train control system was not without issues. For example, disputes arose between Thales and Alstom about who was responsible for the installation and testing of the VOBC racks in the vehicles. There were also delays in testing the vehicles with the train control system. Further, the vehicles underwent several retrofits due to the evolving design. One of the most significant retrofits, according to OLRT-C, was referred to as the "double cut" retrofit; it resulted from Alstom's alleged misunderstanding of Thales's interface document – its ICD.

The important point is that, with sufficient focus and effective systems integration processes on the part of OLRT-C, these issues might have been avoided or at least lessened. This would have been to the overall benefit of the project. Instead, OLRT-C had significant shortcomings in delivering on its obligations as they relate to systems integration. The responsibility for these shortcomings falls squarely with OLRT-C.

During the hearing, Holloway, a former Project Director with OLRT-C, acknowledged OLRT-C's shortcomings. He stated that "hindsight's a wonderful thing, and obviously you have to look at the consortium experience and say, 'We were late, and we planned not to be late, and therefore we didn't get it right, so we didn't have … whether it was the right focus or the people-skill mix, we certainly failed in regards of tackling that challenge as effectively as we could have done.[']"

These failings became widely apparent in the fall of 2017, only months prior to the initial RSA date of May 24, 2018. At that time, Sean Derry, Assurance Manager for OLRT-C, approached Derek Wynne, of SEMP, and communicated that he did not feel the systems engineering and assurance was being adequately addressed. Derry was looking to engage SEMP to fix the systems engineering processes for the project. However, there was resistance within OLRT-C to addressing these shortfalls. Wynne believed there to be a significant misunderstanding on OLRT-C's part about the extent of the shortfalls and the impact they would have as the OLRT1 project approached public service.

By September 2017, RTG was also concerned about the progress of systems integration. RTG was receiving very little information from OLRT-C on the subject. As a

result, RTG commissioned a report from the engineering and technology group SENER to review the systems integration activities. SENER's report, dated September 14, 2017, concluded that RTG's concerns were justified and the progress of systems integration against the schedule was unclear. However, SENER was ultimately unable to perform a full assessment of the systems integration activities, as those activities were not yet very developed.

In November 2017, SEMP, the consultant engaged by OLRT-C, delivered its Systems Engineering and Health Check Report. SEMP's findings were as follows:

> Summarising, the level of System Engineering on the project to date is considered to be substantially below the minimum acceptable level for a project of this size and complexity. This is especially evident at the Railway System level and for early phases of the lifecycle (requirements and design). This is likely to have significantly increased integration risk on the project in addition to OLRT-C being unable to provide appropriate Assurance evidence to the Client and SA [Safety Auditor].
>
> Given the advanced stage of the project, it is essential that robust effort is applied to agreeing the optimum set of Systems Engineering recovery activities and deliverables with the Client / SA … thus enabling the project to conclude.

At the Commission hearings, Wynne expanded on his comments from the report and stated that there was very little evidence of the design teams working together and coordinating to deliver a holistic, integrated railway. This view was shared by the City's Independent Safety Auditor, TÜV Rheinland, which had been retained to provide the overall safety certification for the OLRT1 project.

OLRT-C subsequently engaged SEMP to rehabilitate its systems engineering processes. As part of its work, SEMP conducted an intrusive audit of RTG Engineering's activities in June 2018. SEMP found that the systems engineering was not compliant with the required engineering standards and that industry best practices were not followed. SEMP and the Independent Safety Auditor believed that it was quite late in the OLRT1 project to have these issues with systems engineering and assurance.

SEMP developed a program to rehabilitate the systems engineering and assurance processes. This involved a shift from the standard where a safety analysis is started at the concept stage and traced to a holistic railway-level view, to one where the derived safety requirements are detailed after the fact and reverse-engineered to demonstrate those requirements during the construction phase. This "bottom-up" approach allows for the demonstration, although somewhat after the fact, that the design and construction

were appropriate. Where there is a misalignment between the safety requirements and the design and construction, those issues are addressed through design and construction changes or by restrictions, conditions, or limitations imposed on the operation or maintenance of the system. This involves a risk-based approach that is acceptable in the railway industry.

OLRT-C ultimately implemented this rehabilitation procedure recommended by SEMP and produced a project safety case that was accepted by the Independent Safety Auditor, which certified on September 13, 2019 that the system was fit for passenger service (see Chapter 11). However, this late approach to systems integration, and systems engineering and assurance, came at a significant additional cost to OLRT-C, in the tens of millions of dollars, and it contributed to the OLRT1 project delays.

Additionally, certain integration-related issues persisted into public service. An example is the failure to fully integrate the interface between the platform and train. Deficiencies with the display of the closed-circuit television (CCTV) images in the vehicle cab resulted in the need for spotters or whistle blowers on the station platforms to inform the vehicle operator when it is safe for the train to depart from a platform.

The Commission also heard evidence suggesting that the interface between the vehicle wheel and the rail of the track was not sufficiently integrated. As described in greater detail in Chapter 15, there is a misalignment between the wheel profile and the rail profile, and the misalignment places greater loads on both the rail and wheel, which can lead to certain issues such as **rail corrugation** (irregularity of the running surface of the rail) and wear on the rail and wheel components.

As a result of integration issues with the wheel and rail interface, certain maintenance activities such as increased inspections and grinding of the rail were imposed by OLRT-C in September 2019. Essentially, this decision passed the responsibility to deal with the issue from the constructor (OLRT-C) to the maintainer (RTM).

In conclusion, OLRT-C's approach to systems integration was too passive, too little, and too late. Where a focus on systems integration did emerge, it was mostly directed at integrating the systems from Thales and Alstom, but overall systems integration, and systems engineering and assurance, suffered.

9.5.5 The City Had Limited Involvement in Early Design and Construction

As the party that would be operating the OLRT system, the City had an important role to play in the integration process for the OLRT1 project. The City needed to develop its operational intentions so that OLRT-C could ensure that the design and construction of the system would be informed by those operational intentions.

One of the ways in which the operator of a transit system does this is through what is known as a **concept of operations**. A concept of operations describes how the transit system is going to operate, how a new system will integrate into the owner's overall transit system, how failure situations will be managed, and other operational matters. It also allows both the operator and maintainer to align their processes to address these matters. The purpose of the concept of operations is to guide the design of the system so that the design lines up with how the owner intends to operate the system.

In order to be useful, a concept of operations is prepared before the preliminary design of the project and sometimes before the project agreement itself. That early timing is to ensure that the design is informed by the perspective of those who will operate the system.

In the OLRT1 project and in its response to the City's RFP, RTG identified the inherent integration risk that arises when there are different parties responsible for operations and maintenance. However, the City failed to prepare a concept of operations until midway through the OLRT1 project. It was not until the engineering consulting firm Parsons was retained by the City in 2015 that the need for a comprehensive concept of operations was identified and prepared by Parsons on behalf of the City.

At this point, the design and construction were well under way, making the concept of operations less useful than is intended for these types of projects. Instead of developing the concept of operations and designing the OLRT1 project to the City's operational intentions, the operational concepts had to be moulded to the existing design. This defeated the purpose of a concept of operations, as the operational concepts could not be incorporated into the design to the same extent as if had been prepared at an earlier stage.

The lack of engagement on the part of the City in communicating its operational intentions was identified by OLRT-C early in the OLRT1 project. On April 15, 2014, Roger Schmidt, Technical Director for OLRT-C, prepared a memorandum setting out several of OLRT-C's perceptions and concerns about the City's approach to its role as the transit system operator. OLRT-C was in fact of the view, based on the terms of the Project Agreement and the City's conduct, that OLRT-C was responsible for developing the operational parameters and procedures, training City staff to use them, and eventually handing the operational package over to the City.

In his memorandum, Schmidt states:

> We have been through a rather long period of confusion in terms of understanding Operator responsibilities. The City has not shown leadership in defining those responsibilities but has rather taken a passive role. In previous meetings Project Co. [RTG] has noted concern with lack of Operator [OC Transpo] engagement.… Rather than the City responding with a clear definition of their expectations of [RTG] they responded with a request for a list … of [RTG] concerns or needs.…
>
> We have requested the City nominate an Operator who would "own" the role and with whom we could engage. The protracted period of misunderstanding shows the City does not have the knowledge to clearly define Operator expectations or the experience to communicate a reasonable or practical plan to implement or transfer the Operations package.

This memorandum illustrates the disconnect between the City and RTG – and by extension, OLRT-C – about the City's operational intentions. The preparation of a concept of operations at the outset of the OLRT1 project would have provided OLRT-C with the information required to alleviate certain concerns that ultimately materialized relating to the operation of the system.

While the impact of not initially having a defined concept of operations may have been reduced following Parsons's involvement, this disconnect contributed to the issues the OLRT1 project faced. Indeed, Jonathan Hulse, of Parsons, acknowledged that the late creation of the concept of operations led to compromises on the project as it entered public service, such as the lack of a maintenance vehicle that can be automatically controlled.

9.5.6 Conclusion

In addition to its failure to adequately integrate the Thales and Alstom systems, OLRT-C failed to adequately address overall systems integration. The design teams did not focus early enough on working together to deliver a holistic, integrated railway to the City. This stemmed at least in part from a disagreement as to whether RTG Engineering was responsible for this integration, something that was ultimately OLRT-C's responsibility.

This late approach to systems integration, and systems engineering and assurance, was costly, led to project delays, and resulted in integration-related issues occurring during public service. These issues included deficiencies with the display of the CCTV images in the vehicle cab and the alignment between the vehicle wheel and the rail of the track. These integration issues, in turn, created additional complexities and work for operators and maintainers during public service.

Recommendations

See recommendations #5–6, 17–21, 26, 29–30, 47–55, and 64 in Chapter 17.

Notes

1 Strictly speaking, there are different corporations in RTG and OLRT-C. RTG includes EllisDon RTG Partner Inc. and SNC RTG Partner Inc., while OLRT-C includes EllisDon Corporation and SNC-Lavalin Constructors (Pacific) Inc.

2 Many subcontractors also took part in aspects of this work.

3 Note that URS changed its name to AECOM, and Jacobs is now McMillen Jacobs.

4 Alstom suggested that the delay was caused by the City's lateness in providing its input on the design book. But it appears that the Independent Certifier rejected a claim by RTG that the City's lateness caused 15 months of delay to the ultimate production of the vehicle.

5 Alstom also sought a variation, including early move-in to the MSF, partly on the basis of the design book delays.

6 The Ontario Ministry of Transportation conducted stakeholder consultations with municipalities, transit industry manufacturers, suppliers, dealers, as well as its own transit agencies.

7 Indeed, the policy provides that transit operators and entities "will apply a 5% price preference to the price for the submission with the highest percentage of Canadian content" in order to encourage Canadian content. It explains, "In practice, this will result in the submission with the highest percentage of Canadian content being evaluated as if the price submitted in the manufacturer's offer were 5% lower than that which was actually submitted. The 5% price preference will be applied for evaluation purposes only, and will not represent an effective reduction in the price submitted by the manufacturer."

8 Some Alstom witnesses said they had received finalized ICDs at the outset of other projects and they therefore believed it was possible to do so, though they were in no position to ascertain whether this was realistic in the context of the OLRT1 project.

9 While their respective contracts required them to work co-operatively with each other, this was not sufficient.

Chapter 10
The Rideau Street Sinkhole, Increased Pressure, and Souring Relationships

Key Findings

- The Rideau Street sinkhole that appeared in the middle of the rail line in 2016 had a major disruptive effect on the entire OLRT1 project. It led to significant scheduling complications and a disorderly sequencing of construction and testing, and it meant that a fully connected line was not available until very late in the project. That in turn delayed vehicle testing on the track, contributing to less time for testing and commissioning the system.
- The sinkhole and (both related and unrelated) construction delays led to significant financial pressure on OLRT-C. The City, facing its own pressures, hardened its approach and enforced the contract more strictly as a significant delay to reaching Revenue Service Availability (RSA) became apparent. Completing the project as quickly as possible eventually became the shared goal.
- Project delays and a lack of transparency on the part of RTG and OLRT-C regarding their schedules and the anticipated RSA date damaged the relationship between the City and RTG/OLRT-C, and led to the City losing trust in RTG and OLRT-C more broadly. The City's decision to step into the shoes of RTG's long-term lender, thereby gaining additional leverage over RTG, worsened these relationship issues.
- The City, having transferred the geotechnical and delay risks that now materialized for RTG, relied on its advantageous contractual position to hold RTG to its obligations. Being at the receiving end of the risk transfer, RTG (and more specifically, OLRT-C) began looking for relief. OLRT-C started trying to push the risk back and began invoking claims against the City. The relationship between the City, on the one hand, and RTG and OLRT-C, on the other, began to suffer.

Chapter Contents

10.0 Introduction

As discussed in the previous chapter, several issues arose during the construction and manufacturing phase of the OLRT1 project, including early delays and failures to adequately integrate systems. But without doubt, the most disruptive event for the constructor, OLRT-C, was the sinkhole that occurred on Rideau Street during the middle of construction in 2016. The sinkhole created significant scheduling issues and resulted in delays and out-of-sequence work. These problems had important consequences for both the schedule and the relationship between the City, on the one hand, and RTG and OLRT-C, on the other.

Among the most significant consequences, construction delays reduced the time available for testing the system, and those delays led to relationship and communication problems between the City and RTG. When problems became apparent, both the City and RTG focused on the wrong thing. The City focused on holding RTG to its contractual obligations, including RTG's responsibility for risks that the contract had transferred to it. RTG focused on pushing the problems onto others. Both lost sight of what should have been the shared goal: delivering a reliable system to the people of Ottawa.

Note that this chapter refers to many key terms that were explained in Chapter 9; as well, some additional terms are explained and appear in bold for easy reference.

10.1 The Rideau Street Sinkhole

The sinkhole that appeared on Rideau Street in June 2016 caused significant challenges for the OLRT1 project. This chapter looks first at the appearance of the Rideau Street sinkhole and some of its direct impacts on the construction and manufacturing phase of the OLRT1 project. Then it addresses the dispute that arose between the City and RTG about the cause and the contractual effect of the sinkhole. Finally, it details the disruptive impact that the sinkhole had on the broader OLRT1 project, including on the relationship between the City and RTG.

10.1.1 The Rideau Street Sinkhole's Appearance

On June 8, 2016, at approximately 10:30 a.m., a large sinkhole appeared on Rideau Street near its intersection with Sussex Drive, in downtown Ottawa. This sinkhole caused several lanes of roadway on Rideau Street to collapse. A van parked on Rideau Street and a nearby light standard sank into the sinkhole. The sinkhole also resulted in both a water-main pipe breaking and a gas pipe leaking, leading to the evacuation of several nearby buildings. Fortunately, no injuries were reported; however, several surrounding buildings were left without water, power, and gas. The sinkhole was reported extensively by both national and international media outlets.

The sinkhole appeared in the area of OLRT-C's tunnelling works for the downtown tunnel. At the time, OLRT-C workers were in the process of working on the underground Rideau Station. As a result of the sinkhole, the tunnel was flooded and blocked several hundred metres back from the sinkhole itself. The progress of the underground tunnelling was significantly impacted by the sinkhole. At the time that the sinkhole appeared, the underground tunnel was nearly complete, with only about 50 metres of the approximately 2.5-kilometre tunnel to be completed.

Rupert Holloway, of OLRT-C, explained that the sinkhole appeared at one edge of the Rideau Station cavern, the underground area being excavated to make space for the station itself. Of all the stations, Rideau Station would be the deepest underground, it had the most infrastructure, and it was planned to be the last built. Because the set of activities with the longest timelines for the overall OLRT1 project all went through the cavern, the construction of Rideau Station was on what is called the "critical path" of the overall OLRT1 project schedule. The appearance of the Rideau Street sinkhole

significantly delayed the completion of Rideau Station and the tunnel. RTG suggested that the sinkhole caused a delay to the OLRT1 project of approximately six to eight months.

By all accounts, in the immediate aftermath of the sinkhole appearing, the City and RTG worked collaboratively and responsively to mitigate and repair the damage. However, the sinkhole soon became very disruptive for the OLRT1 project as a whole. There will be more detail about this disruption after some background on the dispute over what caused the sinkhole.

10.1.2 Geotechnical Risk Transfer and the Cause of the Sinkhole

The City and RTG disagreed on the root cause of the Rideau Street sinkhole. This led to a dispute that was submitted to the Independent Certifier and subsequently advanced in litigation between RTG, the City, and the project insurers. For the purpose of this report, the Commission does not need to make any findings regarding the cause of the sinkhole, nor was the Commission provided with the evidence necessary to make such findings. However, it is useful to set out the positions taken by the City and RTG to understand the dispute and how it affected their relationship.

The dispute between the City and RTG focused on the root cause of the sinkhole and whether it fell within any of the limited exceptions to the general transfer of geotechnical risk for the OLRT1 project. The Project Agreement transferred the **geotechnical risk** – the risk of ground-related problems and conditions – to RTG. This risk transfer was subject to certain limited exceptions described in the Project Agreement (as noted in Chapter 7). As a result of this risk transfer, RTG was generally responsible for the consequences of any geotechnical issues occurring, including any associated costs and delays.

This transfer of risk was particularly relevant for the tunnelling work, because tunnelling carries inherent geotechnical risk. However, it should be noted that RTG and OLRT-C did not have significant concerns with the required tunnelling work at the time of bidding on the OLRT1 project.[1] While they recognized tunnelling as an area of risk, RTG and OLRT-C were confident in the technology they had and believed it gave them an edge over competitors. The evidence heard in this Inquiry was that constructors do not anticipate or plan for an event like a sinkhole of this magnitude. At least RTG, in its optimism, did not.

The geotechnical risk that RTG had fully taken on in the OLRT1 project did indeed materialize in the form of the Rideau Street sinkhole. Although there was an earlier sinkhole, on Waller Street (in 2014), it was not of the same magnitude. The Rideau Street sinkhole had the greatest disruptive impact on the construction work and the broader OLRT1 project.

Following the opening of the OLRT1 line to the public in September 2019, RTG submitted a dispute to the Independent Certifier in which RTG claimed that the Rideau Street sinkhole was a Delay Event, as defined in the Project Agreement. RTG sought an extension of 281 calendar days to the Required Revenue Service Availability (RSA) and Longstop Date (see Chapter 7). In November 2019, RTG also claimed that the sinkhole was a Compensation Event and sought compensation of $230 million.

RTG argued that the Rideau Street sinkhole resulted from the City's improper installation of a Hymax coupler joint on a relocated fire hydrant. The fire hydrant and a water-main pipe had been moved away from the vicinity of Rideau Station during construction. This relocation work was designed by RTG but carried out by City staff. RTG's theory was that the Hymax coupler was installed improperly and failed, causing water to leak from the fire hydrant. In turn, the leaking water liquefied the soil in the surrounding area and led to an empty space (void) forming underground. The void led to the collapse of two underground duct banks (protective casings) carrying various utilities and a water-main pipe. The collapse of the underground duct banks caused the roadway structure to collapse because it no longer had sufficient support from the duct banks, resulting in the sinkhole.

The City had a different view of the matter. The City argued that the sinkhole was caused by RTG's tunnelling activities, performed by OLRT-C. More specifically, the City's argument related to tunnelling in different ground materials (including soil, clay, and bedrock) and the **tunnel heading** (a smaller tunnel dug ahead of the main tunnel). The City argued that, when the tunnelling moved from mining bedrock to mining soil, the vibration from OLRT-C's tunnelling activities, combined with the movement of unsupported soft ground on the vertical face of the excavation, caused the collapse of the near-surface layer of clay below Rideau Street. This created a void above the tunnel heading, creating the sinkhole, and rupturing the water-main pipe.

The City further argued that RTG, and by extension OLRT-C, failed to take appropriate precautionary measures for its chosen tunnelling method, which contributed to the sinkhole. In the City's view, these precautionary measures would have stabilized the soils before they became exposed during the tunnelling process and reduced the risk posed by the soil conditions underneath Rideau Street.

The City rejected RTG's claim that the Hymax coupler failed and disagreed that the sinkhole caused any delay affecting the critical path of the OLRT1 project's completion.

The Independent Certifier delivered its decision on February 5, 2021. In the decision, the Independent Certifier rejected RTG's claim that the sinkhole constituted a Delay Event or

Compensation Event. The Independent Certifier also denied RTG's requested extension and claim for compensation. In doing so, the Independent Certifier made the following findings:

- There was "insufficient evidence to support the claim" that faulty installation of the Hymax coupler by the City was the cause of the sinkhole and any water-main pipe leak;
- It was "very likely that RTG tunnelling activities" caused the sinkhole;
- The sinkhole occurred "as a consequence of the underlying geotechnical risk in the area of tunnelling," which was a risk assumed by RTG under the Project Agreement; and
- The dominant causes of RTG's failure to achieve RSA on time were delays to the construction activities for the other stations and vehicle delivery, testing, and commissioning.

RTG disagreed with the Independent Certifier and challenged its decision in a court action against the City. In that court action, the City also claimed from RTG the damages the City alleged to have incurred as a result of the Rideau Street sinkhole and the OLRT1 project delays generally. Both RTG and the City also started court actions against the insurers of the OLRT1 project to recover costs they claimed to have incurred as a result of the Rideau Street sinkhole. Ultimately, the claims between RTG and the City, and the claims between RTG and the insurers, were settled during a mediation held in June 2021. As a result, the City and RTG released each other from all claims regarding the Rideau Street sinkhole.

While the City and RTG ultimately resolved their disputes with each other over the Rideau Street sinkhole in 2021, the sinkhole significantly damaged their relationship during the OLRT1 project. This was partly because of the commercial dispute about who bore responsibility for the sinkhole, but as detailed next, it was also because of the sinkhole's impact on scheduling and the information RTG was providing to the City about the schedule and RTG's ability to meet the Required RSA Date. Whether the sinkhole was or was not one of the dominant causes of RTG's failure to achieve RSA on time, it led to significant scheduling complications and a disorderly sequencing of construction and testing. These issues surrounding the schedule and RTG's assertions about when it could meet RSA led to a strained relationship between the City and RTG.

10.1.3 The Sinkhole's Disruptive Effect

The Rideau Street sinkhole did not merely cause delays to one or several components of the OLRT1 project, it had a major disruptive effect on the entire OLRT1 project. After all, the sinkhole appeared when OLRT-C was nearing completion of the tunnelling phase of its work and transitioning from tunnelling to building the infrastructure, including the stations and various subsystems. Holloway, of OLRT-C, gave evidence that the sinkhole massively disrupted OLRT-C's planned sequencing of its work, and it had a ripple effect throughout the rest of the OLRT1 project schedule. The sinkhole was in the middle of the **alignment** (the path for the OLRT tracks and tunnel). That location created significant logistical challenges.

Peter Lauch, then-CEO of RTG, described it as having had a "domino effect" on the project. In this way, the sinkhole was different in nature from other sources of delay that were also affecting the progress of the OLRT1 project. Holloway agreed: even though the sinkhole was repaired in a timely manner, it had a knock-on effect to the project's progression. From the City's perspective, RTG diverted its resources and personnel from elsewhere on the OLRT1 project to focus on the Rideau Street sinkhole, and this diversion contributed to delays. As previously noted, RTG suggested that the sinkhole caused a delay to the OLRT1 project of approximately six to eight months. Perhaps most significantly, the sinkhole delayed OLRT-C's ability to deliver the required infrastructure for testing and commissioning. This included testing and commissioning of the OLRT systems generally, as well as testing and commissioning of the LRVs and train control system. OLRT-C could not complete the testing of all the systems and subsystems until Rideau Station was complete. As Manuel Rivaya, a former executive for OLRT-C, described it, "if the tunnel was delayed … the connectivity of the track … was delayed, and the testing and commissioning of the tunnel was delayed." Although OLRT-C was able to perform testing and commissioning work in both the east and west ends of the project, it was unable to perform tests along the whole system at the time when such testing was planned and necessary if the project was to avoid significant delays.

As noted in Chapter 9, Thales and Alstom required access to the full length of the track to complete validation and integration testing. However, at least in part due to the sinkhole, the full track was not available until September 2018. Jacques Bergeron, of OLRT-C, gave evidence that the main reason the RSA date of May 24, 2018 was missed was because the testing and commissioning of the LRVs and train control system were delayed because the tracks were unavailable. Bergeron attributed part of this delay to the sinkhole, because the tunnel could not be accessed.

It is true that there were concurrent delays impacting the vehicles and the stations in particular. However, even if all 34 LRVs could not be completed in time for RSA on

May 24, 2018, due to separate delays in LRV manufacturing, the LRVs that were ready could not begin testing along the entire track because that track was not yet available. The fact of the track being unavailable made a significant difference in the testing phase, and it contributed to reduced time for testing and commissioning the system (see section 10.2). Similarly, even if RTG was in no position to complete all the stations on time, having a fully connected line would have allowed other parts of the OLRT1 project to progress in a way that was more beneficial for the overall project than what occurred.

10.1.4 The Sinkhole's Financial and Contractual Impacts

Another impact of the sinkhole was financial, an impact primarily felt by OLRT-C because it had assumed the construction risks from RTG. OLRT-C, through its joint venture partners, was required as a result of the sinkhole to spend an additional $400 million to $500 million on the OLRT1 project. These costs are related to the efforts undertaken by OLRT-C to reduce the delays in work on the OLRT1, impacts on the schedule, supply chain issues, and increased costs from subcontractors. However, OLRT-C's evidence was that this additional cost did not affect its overall delivery of the OLRT1 project and that OLRT-C delivered all necessary resources to complete the project. But the costs did have obvious financial implications.

In addition to the direct financial impact, the sinkhole eventually created financial pressure to complete the OLRT1 project as quickly as possible. Section 10.3 will address how the sinkhole impacted OLRT-C's and RTG's communication with the City, and the contractual positions they took during the construction phase.

RTG sought relief under the Project Agreement for an extension of time and for compensation for additional costs under the limited exceptions to the geotechnical risk transfer set out in the Project Agreement. However, the parties agreed to suspend timelines for seeking relief or making claims related to the sinkhole, and not start any litigation or dispute resolution procedures about the contractual implications of the sinkhole: they made a **standstill agreement** that was extended several times. This agreement was followed by a narrower **tolling agreement** that postponed any litigation between the parties. This explains why RTG's claim (described in section 10.1.2) was only brought forward following RSA in 2019. Delaying the claim allowed the project to progress and the parties to investigate the root cause of the sinkhole.

Nevertheless, RTG notified the City in the immediate aftermath of the sinkhole that it intended to claim that the sinkhole was a Relief Event and Delay Event, as defined in the Project Agreement. It also wrote that, depending on the results of the investigations

into the root cause of the sinkhole, the sinkhole might also constitute a Latent Defect as defined in the Project Agreement. If the sinkhole was a Latent Defect, that would make the sinkhole the City's responsibility. The City disagreed with RTG's position, and the disputes were left unresolved and unaddressed while the standstill agreement was in place. However, as discussed later in this chapter, these unresolved disputes led to increased tension between the parties after RTG began providing notifications to the City about whether the RSA date would be achieved – even as that seemed highly unlikely. The City was looking to hold RTG to the May 24, 2018 RSA date. The City did not believe it needed to compromise with RTG about the impact of the sinkhole, as it felt RTG's tunnelling activities were to blame. This resulted in further strain on the relationship.

10.1.5 Conclusion

The Commission finds that the Rideau Street sinkhole was significantly disruptive to the OLRT1 project. It had repercussions for the construction work, and the testing and commissioning work, and it hurt the relationship between RTG and the City. Regardless of which party bore contractual responsibility for the consequences of the sinkhole, they are an important backdrop for the failures that occurred in 2019.

10.2 Delay Pressure and Changes to the Schedule

One effect of the Rideau Street sinkhole, and of the other delays to construction and manufacturing that affected the OLRT1 project, was that OLRT-C was constantly trying to catch up. The pressure from the City to reduce and eliminate the delays mounted, as did the financial pressure on OLRT-C and its consortium partners. Completing the OLRT1 project as quickly as possible to achieve RSA became the main goal. However, the location of the sinkhole and its implications for the sequencing of construction and testing prevented OLRT-C from catching up in an orderly way. Scheduling became an exercise in trial and error. As a result, OLRT-C repeatedly delivered revised schedules that would then be revised again.

The common pattern in these revised schedules was that the time available for testing and commissioning – particularly the testing and commissioning that needed to happen at the end of the construction and manufacturing phase – was compressed in order to make up for the delays caused by the sinkhole. This section will review some background on what testing and commissioning required. Next, it will explain the pressure that was mounting on OLRT-C to catch up and finish construction on time. Finally, it will go through OLRT-C's schedule changes in the years following the Rideau Street sinkhole, focusing on how these changes left less and less time for testing and commissioning and how the sinkhole affected integration testing.

10.2.1 Serial Testing and Integration Testing

The testing and commissioning addressed here take place late in the construction and manufacturing phase of a project. This section elaborates on what is involved in serial testing and integration testing.

In the OLRT1 project, serial testing occurred in different main phases and involved both Alstom and Thales. Alstom would test the electrical circuits to make sure the wiring was correct, and then begin the static testing of each assembled vehicle.

In static testing, the vehicle is powered on and tested section by section and subsystem by subsystem to check that everything is functioning as intended, but without the vehicle moving. For example, the testing will assess:

- Do all of the subsystems switch on?
- Do the heating and cooling systems work?
- Does the subsystem for communicating between subsystems work?

Static testing also included testing the vehicle on-board controller (VOBC), the on-board element of the train control system.

After static testing came dynamic testing, which required access to a track on which to drive the vehicle. First, the vehicle would be run manually by OC Transpo drivers, under Alstom's guidance, to test the vehicle acceleration and braking performance at various speeds. Next, the vehicle would be handed over to Thales to test the communication between the on-board VOBC and the track-side communications-based train control (CBTC) elements of the signalling system. Thales's testing also included running the vehicles in automated (driverless) mode. This testing had to be done on each vehicle individually, because each vehicle runs a little differently. Therefore, the software on each vehicle had to be adjusted to ensure that it drives and stops properly. Ultimately, Thales had to carry out its testing on every sector of the track line to ensure that the signalling system worked as expected.

Following the static and dynamic stages of serial testing, integration testing looked at whether the various subsystems all worked together. Many different functionalities are tested in integration testing. For example, the testing assessed:

- When the vehicles run on the track, do they fit properly in the track and tunnels between stations?
- How long does it take to get from one station to the next?
- When a vehicle arrives at a station, does it stop in the right place?
- Are the doors opening as they should?

Integration testing also addressed a range of other systems beyond the vehicles that are essential for the operation of the overall system, for example, tunnel vents, fans, and fire alarms.

On the OLRT1 project, integration testing was led by OLRT-C and supported by Alstom. Integration testing involved running the vehicles on the OLRT line to ensure that all of the interfaces – for example, the vehicle and the rail, or the vehicle and the power system – were functioning correctly. As Holloway explained, each station on the OLRT is also a digital hub, containing many electrical and telecommunications assets that link to those in other stations.

10.2.1.1 Why Testing and Commissioning

Why are testing and commissioning so important? Every kind of mechanical device that is electrically operated, or electromechanical system, is expected to need maintenance over time – greasing, grinding, the repair or replacement of parts, and so on. The rate at which things break down – from a switch not turning on, to a part wearing out early, to a major incident – is the **failure rate**. Testing and commissioning are important because the failure rate does not stay the same over time. Virtually every electromechanical system has a **"bathtub curve" of reliability** over its lifespan, from its first use to its decommissioning, when it is taken out of service. At the beginning of its life, the device or system has a high failure rate, which drops over time; then, it has a long period with a sustained low failure rate; finally, as it wears out and approaches the end of its lifetime, the rate of failure increases again. Given this fact, everyone involved with the OLRT1 project knew – or should have known – that there would be significant reliability issues in the early stages of the OLRT1 system, and that a robust testing and commissioning process, together with meaningful pre-trial running and trial running, were necessary to ensure that these reliability issues were minimized during the public operation of the OLRT1 system.

What happened instead was that OLRT-C continually compressed much of the testing and commissioning, and in particular the general running period for the vehicles, to address the delays and mounting pressure – financial and otherwise – to complete the OLRT1 project and achieve RSA by the Required RSA Date or as soon as possible after that.

10.2.2 Pressure to Catch Up

As delays mounted, so, too, did the financial pressure on OLRT-C and the partners in its consortium. More time means more money. The longer a project takes to complete, the more it costs. Staff hired to oversee and carry out the project must have their contracts extended; construction sites must be secured for longer. The disruption caused by the sinkhole also meant greater funds were needed for the construction. OLRT-C's consortium partners thus had to inject more and more money into the project: calls for them to inject further funds became a regular occurrence.

Moreover, once the RSA date of May 24, 2018 passed without RSA having been achieved, OLRT-C had to pay RTG close to $125,000 per day. These **liquidated damages** were set out in OLRT-C's contract with RTG (see section 10.3.3). In addition, and very significantly, some of the construction costs would only be recovered through the **maintenance payments** following the start of public service (i.e., revenue service). The longer the start of public service was delayed, the longer it would take to recoup

those construction costs. Moreover, because the maintenance term ends 30 years after the Required RSA Date and cannot be extended by a delayed opening to the public, the longer it took to reach RSA, the shorter that revenue-making period became. On top of that, while less significant, OLRT-C had to pay $1 million to the City every time it missed an RSA date it said it would achieve. OLRT-C missed three set RSA dates before RSA was finally achieved. In sum, these financial pressures gave OLRT-C an incentive to get things done as quickly as it could.

At the same time, the City required OLRT-C to do what it could to reduce or eliminate the delays. Maintaining the schedule (as will be explained in section 10.3.2) was of primary importance to the City. When significant delays became apparent, the City paid close attention. In the first few months after the Rideau Street sinkhole appeared, the City had a co-operative relationship with RTG. But once it became clear that the sinkhole would cause a major delay, the City's mood changed; its approach to the relationship hardened and the relationship became more strictly contractual. It appears that issues began to be escalated to higher-up officials in the City hierarchy rather than being dealt with co-operatively by technical staff. Although it became nearly impossible for OLRT-C to catch up, according to the evidence, the City "didn't want to hear about delays," as RTG's then-CEO Antonio Estrada put it. Around the same time, RTG and the City began to have discussions about who was responsible for the Rideau Street sinkhole and whether the sinkhole entitled RTG to any kind of relief. These conversations further contributed to the hardening mood, as Lauch, of RTG, said, because "now we are talking about delays, we are talking about relief, we are talking about money."

The City repeatedly made it clear to RTG that it had to catch up and that delaying RSA was out of the question. The best illustration of this pressure is contained in a letter sent by Steve Kanellakos, the City Manager, on November 27, 2017. The fact that Kanellakos signed the letter demonstrated an escalation on the City's part; the person typically responsible for these communications with RTG was the then-Director of O-Train Construction, Steven Cripps. To be fair, the letter was sent in response to correspondence from RTG that raises its own problems, to which the discussion will return below. However, in the course of responding to RTG's failure to state unequivocally that it would meet the RSA date, Kanellakos wrote that "there can be no forgiveness of a failure to achieve Revenue Service Availability by May 24, 2018." Additional correspondence where the City points to the parties' common objective of achieving RSA on time is detailed in section 10.3.3.

Thus in 2016, 2017, and 2018, OLRT-C faced pressure to catch up from several different angles. Internally, OLRT-C was facing significant financial pressure because of the delays and failures to meet RSA dates. Externally, OLRT-C was facing political and legal pressure from the City to catch up. As is explained next, these pressures led to repeated

revisions of the OLRT1 project schedule, which themselves had an impact on the relationship between the City and RTG and on the amount of time allotted for testing.

10.2.3 Revised Schedules

The immediate implication of trying to catch up was that OLRT-C needed to revise the schedule, specifically the **Works Schedule.** The Works Schedule contained a detailed breakdown of when specific tasks and subtasks were expected to be completed. When OLRT-C made revisions, it sent updates of the Works Schedule to RTG, which then passed updates on to the City. This section traces some of the schedule changes that occurred in the later years of construction and the consequences they had.

Consider the impact of the Rideau Street sinkhole on scheduling. As noted earlier, the sinkhole was in the middle of the OLRT1 line; it created a "giant plug in the middle," as Lauch, of RTG, put it. This blocked OLRT-C from moving material from one end of the line to the other and was one of the worst locations for such an event to occur. It had a ripple effect on OLRT-C's scheduling: as Holloway, of OLRT-C, explained, it forced a rescheduling of activities not only in the Rideau cavern and Rideau Station, but in other stations too. In other words, both construction and testing and commissioning could no longer be done in their most logical sequence. OLRT-C found itself in a most undesirable situation.

OLRT-C thus engaged in a process of trying to accelerate tasks through trial and error, for example, finishing construction for certain rooms in stations earlier, increasing its workforce, and doing longer shifts. Some of these attempts did not lead to the anticipated benefit, so OLRT-C would then try something else in an iterative process to attempt to get back on schedule. There was no full and methodical revised planning of the work.

10.2.3.1 Impact Estimates and Schedules

When the sinkhole appeared on June 8, 2016, the extent of the impact it would have on the schedule was not immediately apparent. Too much was unknown at that time. In a letter on June 21, 2016, OLRT-C estimated a three-month delay but conveyed its uncertainty about the sinkhole's effects. OLRT-C's estimate assumed that tunnelling would resume within a few days. In fact, tunnelling did not resume for nearly two months after the sinkhole appeared.

In the months that followed, the estimate for the delay caused by the sinkhole grew. On September 16, 2016, three months after the Rideau Street sinkhole's appearance,

OLRT-C submitted a revised Works Schedule reflecting some of the then-known consequences of the sinkhole. This schedule did not yet reflect the mitigation efforts OLRT-C intended to undertake (that is, the changes it hoped to make to catch up and reduce the delay caused by the sinkhole), but as of September 16, this is how OLRT-C assessed the sinkhole's impact on the schedule:

- Complete tunnelling by the end of December 2016;
- Complete final tunnel lining by April 11, 2017;
- Push integration testing into the summer and fall of 2018; and
- Achieve RSA on October 31, 2018.

On this "unmitigated" schedule, RTG expected a delay of just over five months after the Required RSA Date of May 24, 2018. As the full impacts of the sinkhole became apparent, even this estimate of five months proved to be optimistic: in the end, the sinkhole's impact on the schedule was estimated at between six and eight months.

There were additional delays unrelated to the Rideau Street sinkhole. In the months that followed OLRT-C's September 2016 communication, other sources of delays accumulated, including delays involving the test track between Blair Station and Cyrville Station. The purpose in this report is not to assign responsibility for any portion of delay, nor to track what particular source of delay affected the critical path or any given aspect of the project. That is not the Commission's mandate. What is relevant to the mandate, and what I am able to conclude based on the evidence cited in this Inquiry, is that the sinkhole had a major impact on the OLRT1 project, including on the ensuing construction schedules and on the approach that OLRT-C took in its scheduling and its communications with the City.

On December 20, 2016, RTG produced a mitigation schedule reflecting its plan to achieve the original RSA date of May 24, 2018. Under the mitigation schedule, final tunnel lining would only be complete by June 7, 2017 – about two months *later* than in the unmitigated schedule described above – no doubt the result of OLRT-C having gathered more specific information about the impact of the sinkhole on construction. However, despite the realization that some of the construction delays would be more significant than had been anticipated in the September 2016 Works Schedule, the mitigation schedule moved integration testing up into 2017 so that it would be completed before the RSA date. For example, overall systems integration testing was to be carried out between December 6, 2017 and April 9, 2018. This time frame for integration testing is in contrast to the September 2016 schedule, which had integration testing extending into the summer and fall of 2018.

OLRT-C's Works Schedule changed further as construction proceeded into 2017. This report will not attempt a comprehensive summary of all the changes, but will only discuss selected instances to illustrate the larger trends. In short: construction was pushed further and further into the future. While testing was also delayed, it could not be delayed by very much without coming up against the time needed for trial running and the RSA date. Instead, the time available for testing was reduced.

In March and April of 2017, OLRT-C's schedule updates showed delays to construction. Final tunnel lining was delayed to August 11, 2017 and then to February 13, 2018 – a full 180 workdays behind the mitigation schedule, causing the Independent Certifier to note "a substantial slippage in the Mitigation schedule." Other construction activities, such as the installation of the wayside signalling infrastructure, were also pushed into the future. Testing, on the other hand, was compressed into a shorter time frame. For example, the start of dynamic testing was delayed by over a month, but its end date was moved earlier by a day. Similarly, the start of overall systems integration testing was delayed by almost two months, but its end date was moved only a few weeks later.

The City lost confidence in the reliability of RTG's schedules, so it created an **Independent Assessment Team** in 2017. In early May 2017, this team of experts conducted a review of the schedule and concluded that it was "highly unlikely" that the RSA date of May 24, 2018 would be met; instead, the team estimated a delay of 6 to 12 months. It noted that delays to construction were impacting the testing of vehicles and rail systems. Following a "deep dive" into the schedule later in May, the Independent Assessment Team described OLRT-C's plans for meeting the RSA date as "extremely aggressive," noting that the systems installation and integration testing schedules were compressed and that there was no float time to serve as a buffer if things did not go perfectly through the stages. This raised the risk that problems that would have been discovered in testing would instead arise after the system was in public service. Indeed, it seems that RTG also knew that the plan for meeting the RSA date, which required everything to go perfectly, was unrealistic.

Further schedule updates through the summer of 2017 continued these trends. A City Rail Activation Management Program report on June 21, 2017 noted delays to tunnel construction, rail systems, and vehicle control and systems integration testing. Some major construction events crept forward: the completion of final tunnel lining was moved to February 21, 2018 and then to February 28, 2018. The installation and testing of wayside signalling infrastructure were delayed. Alstom's serial testing of the vehicles fell months behind schedule, with the Independent Certifier noting that it had become a bottleneck. However, the RSA date remained the same, and testing continued to be squeezed. The start of overall systems integration testing was delayed by three more weeks, but its end date remained the same as before.

On August 31, 2017, the City wrote to RTG, providing notice that construction had fallen significantly behind schedule and requesting a plan showing the steps RTG would take to reduce the delay. By this point in time, RTG knew that the RSA date was not achievable. Eventually, on October 3, 2017, RTG provided a "best efforts" mitigation plan, which the City rejected as non-responsive and not in accordance with the Project Agreement. Following the October 3, 2017 plan, OLRT-C did not provide an updated schedule in September, October, or November 2017; the Independent Certifier noted that this was "a major concern as a current and realistic assessment of the progress of works and ultimately the achievement of Revenue Service Availability cannot be made."

In early November 2017, the Independent Assessment Team presented the results of a second "deep dive" into the schedule. The Independent Assessment Team concluded that the likelihood RTG would meet the RSA date was zero. Delays to construction work were delaying the installation of systems elements such as the signalling system, causing "extreme" compression of the schedule for testing and commissioning.

On November 27, 2017, the City wrote to RTG requiring a detailed plan and schedule. On December 7, 2017, OLRT-C responded with a further updated, but unmitigated, Works Schedule. This schedule from OLRT-C showed an RSA date of August 14, 2018. (At this time, the RSA date under the Project Agreement remained May 24, 2018.) Commenting on the December 7, 2017 schedule, the Independent Assessment Team noted additional compression of testing and commissioning and the lack of float time to deal with new challenges. Following a workshop on the schedule in January 2018, the Independent Assessment Team concluded that there was a less than 1 percent probability of meeting an RSA date of August 31, 2018 and said November 2, 2018 was a more likely date.

When Matthew Slade was brought in to the project in late 2017, his first task at OLRT-C was to revise the schedule, with particular attention to the RSA date. His instructions were effectively to determine the earliest possible completion date. As he put it, "The executives and … we'll say the parent companies … don't want you to be too conservative because, obviously, it's in our interest to be finished as early as possible, especially when we know we're going to be late."

Slade explained to the Commission how the schedule was revised. First, OLRT-C used scheduling tools and computer simulations to generate probabilities regarding the end date for the OLRT1 project. This resulted in a 90 percent likelihood of meeting a March 2019 RSA date. Next, OLRT-C looked at ways of accelerating the schedule. One way was to not include time that would ordinarily be included for contingencies and risks. OLRT-C also held workshops with key suppliers – Alstom and Thales – to look at how to get to the earliest possible date. Based on these measures, the OLRT-C board targeted

a particular date. This decision was not only based on evidence about when the OLRT1 project would be complete, but was also intended to maintain pressure on subcontractors to get the work done. Finally, the City was brought in to discussions about the schedule, including the probability analysis and mitigation measures.

In these schedule discussions with the City, OLRT-C originally proposed an RSA date of August 31, 2018, and then an October 2018 date, despite knowing these were not realistic. The City suggested November 2018 instead, and RTG agreed. Yet even the November 2018 date was not realistic. Slade testified that the November 2018 date could only have been met "in a utopian world." Finally, in February 2018 (despite having known for several months that the May 2018 RSA date was not achievable), RTG gave notice that it would not meet the May 2018 RSA date but would meet the RSA date of November 2, 2018. However, despite the date having been pushed ahead to November 2018, the amount of time scheduled for integration testing remained reduced, and in some cases it was even less than previously planned.

Commenting on the schedule for achieving the November 2018 RSA date, the Independent Assessment Team noted that trackwork and vehicle assembly were slipping behind schedule, with risks to systems assurance activities. This slippage continued over the next few months, but the November 2, 2018 RSA date remained unchanged. In May 2018, an Independent Assessment Team presentation concluded that the chance of achieving RSA by November 2018 was less than 10 percent, with systems assurance being the most significant concern. By June 2018, this likelihood had been downgraded to less than 1 percent.

10.2.4 Track Completion

As noted, the location of the Rideau Street sinkhole in the middle of the track alignment created major complications for the sequencing of work. It had a direct impact on the completion of the tunnel, the track, and Rideau Station itself. OLRT-C had originally anticipated completing the full track by September 2017. This did not occur. Not having the full track complete was a disruption that had a direct impact on integration testing. Delays to completing Rideau Station and connecting the full track caused delays to Thales's testing, which required access to the whole line. Other elements of integration testing, such as testing the end-to-end travel time, also required access to the whole line. Indeed, Bergeron, who had been Director of Integration for OLRT-C, commented that track availability was the main reason the May 2018 RSA date was missed. (In the end, the full track was not provided until late September 2018.)

10.2.5 Conclusions

The Rideau Street sinkhole and the schedule changes related to the sinkhole had two major consequences. The first is that the time available for testing and commissioning, and in particular, for integration testing – was shortened. The time for pre-trial running and trial running was also compressed, increasing the risk of reliability issues in the early months of public service. All necessary tests during the testing and commissioning phase were performed and passed; what needed to be done was done, and no corners were cut: the witnesses the Commission heard were emphatic about this, particularly when it came to safety issues. However, there was little time left over to simply run the vehicles and increase reliability before beginning public service (see Chapter 12).

The second consequence is that, over time, the City lost confidence in the schedule information it was getting from OLRT-C. This contributed to the deterioration in the relationship between the City and RTG, which is addressed next.

10.3 Relationship and Communication Problems

Although the relationship between the City and RTG was positive in the early years of the OLRT1 project, as problems arose it began to break down. This section addresses how this breakdown unfolded and the position it left the City and RTG in as they entered the trial running and public service phases of the project.

First this section describes how and why the City stopped trusting the information it was receiving from RTG, in particular about when RTG would deliver the OLRT1 system. Then it considers the pressures that weighed on the City, pressures that informed the approach it took in response to the schedule information it was receiving from RTG and the delay disputes that arose. Then it reviews how the City and RTG each focused on their contractual position and how that led to disputes and a breakdown in their communication and relationship. Finally, this section addresses the City's decision to step into the shoes of RTG's long-term lender, a decision that had the effect of compounding the relationship issues as they developed.

10.3.1 The City's Loss of Trust in the Schedules and Delivery Date

One major cause of the deterioration in the relationship between the City and RTG was the lack of transparency and effective communication between them, particularly when it came to the achievability of RSA dates. The City lost confidence in the schedules it was receiving from OLRT-C through RTG, and this contributed to the City's broader loss of trust in RTG and OLRT-C.

As described in section 10.2, the City was aware of the likelihood that the May 24, 2018 RSA date was not going to be achieved. While OLRT-C's activities were not completely visible to the City, the City had its own experts and consultants and information about what was happening on the ground. In early May 2017, its own experts on the Independent Assessment Team concluded that it was "highly unlikely" that the May 2018 RSA date would be met. By the summer of 2017, the City was reasonably confident that OLRT-C was not going to achieve that RSA date. There was slippage month to month, and the City was concerned about how OLRT-C would get back on schedule. In early

November 2017, the Independent Assessment Team concluded there was no possibility the RSA date would be achieved.

Yet, this is not what the City was being told by RTG. While the City may not have actually been misled by OLRT-C's schedules, given the information it had at its disposal, the fact that it was receiving information from RTG that did not align with its own conclusions caused grave concern and led to a loss of trust in RTG and OLRT-C. Cripps, of the O-Train Construction Office, testified that in late 2016 or early 2017, the City began to feel that OLRT-C's planning "just wasn't reflecting reality."

RTG, through OLRT-C's schedules and communications, was not being transparent with the City. RTG knew at least by late 2017 that the May 24, 2018 RSA date was not achievable. RTG was receiving schedule updates from OLRT-C, and the two entities were composed of some of the same partners; RTG had a great deal of insight into how the work was progressing and could see that the May 2018 date was not going to be met.

Even earlier in 2017, OLRT-C was hearing from its subcontractors that the May 2018 date was not achievable. On March 13, 2017, Thales submitted a schedule update to OLRT-C, writing that its forecast for RSA remained November 2, 2018. On April 10, 2017, Thales wrote to OLRT-C that the schedule had slipped; its forecast for RSA was now December 6, 2018. Alstom was also suggesting that the date was not achievable. While OLRT-C suspected that these communications were intended to protect Alstom's and Thales's contractual positions and that measures could reduce or eliminate the delays, by January 2018, OLRT-C approved a Thales acceleration plan that aimed for an RSA date of November 2018. This rendered a May 2018 RSA date impossible.

Despite this, RTG was communicating ambiguous schedules and plans to the City and did not advise the City until February 2018 that it would not meet the RSA date that May.

To be fair, some of the difficulties in providing an accurate schedule and work plan resulted from the disruption caused by the Rideau Street sinkhole and the resulting uncertainties over the ensuing months. Also, OLRT-C's schedules were informed by the pressure the City was itself placing on OLRT-C to catch up and its intolerance for delays. Indeed, although the City knew by May 2017 that it was highly unlikely the original RSA date would be achieved, it was still holding RTG to it, requiring RTG to do what it could to mitigate delays. On August 31, 2017, the City issued a **Failure to Maintain Schedule Notice** to RTG under section 22.3 of the Project Agreement and asked for a formal recovery plan – a plan that would show in detail how OLRT-C would achieve the May 24, 2018 date as set out in its schedules. (RTG's view was that section 22.3 of the Project Agreement did not apply.) On October 3, 2017, OLRT-C provided a "best efforts" plan in response, and the City found it unsatisfactory.

Despite the foregoing, RTG was not transparent about the result: the anticipated impact on RSA. The Commission heard evidence from RTG executives, such as Lauch and Estrada, that the City knew about the schedule issues – indeed, that the City also knew that the May 2018 date was not achievable, and that it presumably understood OLRT-C was engaging in contractual positioning that was not to be relied on as accurate information. (Contractual positioning is explained further in section 10.3.3.) The City did in fact recognize that OLRT-C's schedules seemed to be contingent on getting schedule relief due to Delay Events. For its part, the City felt that OLRT-C was focused on how Delay Events would affect the RSA date rather than on accurate information and effective planning, and that OLRT-C was noncommittal about what the actual RSA date would be.

Despite the fact that the City was aware of the scheduling risks and recognized OLRT-C's contractual positioning for what it was, the fact that OLRT-C's schedules did not accurately reflect what (according to the best evidence OLRT-C had at the time) was going to happen meant that the City lost confidence in the information it was getting from OLRT-C and RTG. The schedules simply could not be relied on by the City. OLRT-C's and RTG's knowingly inaccurate statements about the likely RSA date eroded trust between OLRT-C and RTG and the City.

As explained below, what the City was looking for, aside from meeting RSA, was **schedule certainty.** Lorne Gray, the City's contract manager for the OLRT1 project, explained, "It became … quite a tense relationship because we were looking for certainty on the revenue service availability date.… We just wanted a schedule that we could rely on, that was achievable."

It was for this reason that the City retained the Independent Assessment Team (noted earlier in this chapter) to look into OLRT-C's schedules and offer an objective opinion on how things were progressing. In its early work, the team focused on how the project schedule had been affected by the sinkhole. Rather than relying on information from OLRT-C, the Independent Assessment Team carried out its own assessments based on the data and information that it could gather. The fact that the City could no longer rely on what RTG and OLRT-C were telling it about how the OLRT1 project was progressing, and instead developed its own source of information, shows just how far the communication between the parties had broken down. This lack of trust was further reinforced when the Independent Assessment Team's assessments generally confirmed that OLRT-C's schedules were unlikely to be met.

10.3.2 Pressures on the City and Its Resulting Abidance by the Contract

The City was under pressure to reach RSA and open the system to the public. This explains why the schedule was so important to the City, and why uncertainty about the schedule was so troublesome for the City's relationship with RTG.

This section will take a step back to explain why the City was under so much pressure. Much of the pressure was of the City's own making, as a result of the City's public commitments about how and when the project would be finished. But not all of it was. The City was also trying to respond to the real disruptions that had been occurring for years in Ottawa's transit systems, and to effectively manage the complicated transition from bus service to train service.

For many years, the City had been making public commitments about how and when the OLRT1 project would be completed. In the 2010 municipal election, Mayor Jim Watson and some councillors ran on a platform that included the mantra "on time, on budget" in relation to the OLRT1 project (see Chapter 4). These kinds of promises created a public expectation and a political imperative for Council. A similar dynamic took place in the later years of the OLRT1 project, as construction came to an end. Several anticipated RSA dates were publicly announced by the City, and each time, the date was not met. When these dates were not met, public pressure mounted to get the system to open. In the words of John Manconi, General Manager of Transportation Services, "There was disappointment. There was anticipation. There was pressure. There was excitement. There was energy…." RTG and OLRT-C experienced this energy somewhat differently. OLRT-C Project Director Slade said that he had never worked on a project that was "so politically driven," and that it felt like the project was "front-page news every day."

Another source of pressure on the City to open the service was the fact that Ottawa residents had faced disruptions in their transit systems during the years of construction, disruptions that the City was, reasonably enough, keen to put behind it. As in other cities, transit is a fundamental part of daily life for residents of Ottawa. A commute forms part of people's day-to-day routines; it is not something that riders like to change. But inevitably, the construction of the OLRT1 system caused changes and disruptions to existing commutes. As Manconi put it, by the summer of 2019, customers "were worn out because they had gone through five years of detours." In addition to detours, some bus stops were changed and some commute times were lengthened.

When RSA dates were announced, this also led to changes to bus services. Then, when those dates were not met, customers would call their councillors to complain. But going back to the old bus routes would, in Manconi's words, have led to "more pain and more

disruption and confusion." OC Transpo also faced the challenge of communicating with its customers about what was going to happen: as Troy Charter, of OC Transpo, said, "You want customers to know how to get to work, how to get where they need to go, what was the impact for school."

OC Transpo's obligations to its drivers and their union also added to the pressure. OC Transpo needed to book bus drivers for the parallel bus service for the first three weeks of public train service (as explained in Chapter 14). If the City was going to delay opening of the OLRT1 line to a later date than anticipated, OC Transpo would have to extend bus service for longer than planned. This would require a discussion with the drivers' union about extending service. OC Transpo was also potentially going to lay off bus drivers as a result of the reduction in bus service once the train service was fully operational; it needed to plan when these layoffs might occur and provide appropriate notice to bus operators.

The City, therefore, wanted the RSA date under the Project Agreement to be met. And if that wasn't achievable, it at least wanted to know for certain when the new date would be. The City was intent on protecting transit riders from further delays to their disrupted commutes and City taxpayers from incurring any additional costs.

The City had negotiated a Project Agreement that provided incentives for RTG to achieve the City's commitments to the public to deliver the system "on time and on budget." It had transferred the risk of delays and cost overruns onto RTG, as well as the geotechnical risk. All of these risks had now materialized. From the City's perspective, it had a contract that transferred the risks to RTG, so it was going to hold RTG to its obligations.

10.3.3 Commercial Positioning and Communication Breakdown

On the other side of this worsening contractual relationship was RTG, which had borne the delay, geotechnical, and cost overrun risks under the Project Agreement. RTG had downloaded responsibility for these risks to OLRT-C. As a result, OLRT-C started trying to push the risk back. It began invoking claims against the City. RTG aligned itself with its subcontractor. The relationship between the City, on the one hand, and RTG and OLRT-C, on the other hand, began to worsen.

As discussed in section 10.1, RTG gave early notice to the City of OLRT-C's intention to claim that the sinkhole was a Relief Event and Delay Event, and possibly a Latent Defect. On June 21, 2016, OLRT-C referred to the sinkhole as "the Relief Event" in its

communication relayed to the City by RTG. While the City and RTG continued to work co-operatively while these commercial issues were set aside under the standstill agreement, this changed as the RSA date approached and meeting it became impossible.

Under the Project Agreement, RTG had to give the City six months' notice before achieving RSA, so that the City would have time to prepare. If RTG missed the RSA date set out in the Project Agreement, it would be responsible for the delay; if the City recognized a Delay Event under the Project Agreement, however, RTG would get a formal extension on its deadlines. Under its agreement with RTG, OLRT-C would have to pay liquidated damages to RTG for missing the RSA date as well as money to cover the increased interest RTG owed on its loans; the liquidated damages would be reduced if a Delay Event was recognized. Finally, if the Delay Event also constituted a Compensation or Relief Event, RTG had certain entitlements to compensation from the City, and then OLRT-C could claim equivalent relief from RTG.

Given these financial repercussions, OLRT-C and RTG wanted to maintain pressure on the City to recognize that Delay Events had occurred and give them schedule relief. One way that OLRT-C and RTG maintained this pressure on the City was by making ambiguous statements about whether RSA would be met. As a result, RTG and OLRT-C did not give the City an accurate picture of when they believed RSA would be met. As RTG's CEO Lauch said, "It is not like we were walking around with blindfolds on," but "you are writing all these letters … with the hopes that you are going to come to an understanding and that there is going to be an acknowledgment of it, but until there is, you … kind of hold the party line."

Three Delay Events that RTG and OLRT-C wanted recognized were the Rideau Street sinkhole and issues related to the fare gates and the use of ash wood in stations. RTG provided notice to the City on October 13, 2017 of OLRT-C's position that events relating to the fare control equipment and weather protection of the fare control equipment constituted a Delay Event. The same day, RTG forwarded to the City another letter from OLRT-C pointing to a dispute relating to the ash wood ceilings for certain stations as constituting a Delay Event. The City rejected both positions very soon, by letter dated October 23, 2017. It noted that the RSA date in OLRT-C's Works Schedules remained the same as before, reflecting no information about any delays. On October 27, 2017, RTG forwarded to the City further details from OLRT-C about the claimed fare gate and ash wood Delay Events.

On November 24, 2017, RTG forwarded to the City a letter from OLRT-C stating: "We confirm that we will achieve Revenue Service by the Required Revenue Service Date, as such date may be extended due to the Project Agreement, including, without limitation, due to the occurrence of Delay Events, whether or not tolled, Variations, and

any other events or circumstances which may impact achievement of Revenue Service." The language in this letter is deliberately ambiguous, reflecting OLRT-C's **contractual positioning**; it was going to hold its ground until the City acknowledged some Delay Events. The hope was that the RSA date would be pushed back, but that the City would bear the responsibility for the delay, rather than RTG.

When the City received this notice, it knew that something was not right, and read between the lines that the RSA date was not going to be met. On November 27, 2017, City Manager Kanellakos wrote in response to RTG that it would not be forgiven for not achieving the May 24, 2018 RSA date. Speaking of the City's increased "level of concern about the ability to achieve the Required Revenue Service Date," Kanellakos added: "This potential breach of the representations and warranties RTG has made to the City and the lenders to complete work on schedule will most certainly compromise the City's reputation, negatively affect public perception of the City and will have a material adverse effect on the planned availability of the transit service to its customers." Kanellakos requested "a report identifying a plan showing the steps that are to be taken by RTG to achieve Revenue Service Availability by May 24, 2018." The City also provided "advance notice that, in the event that Revenue Service Availability by May 24, 2018 is not achieved, RTG shall be expected to indemnify and save harmless the City from and against any costs that the City may suffer, including, without limitation, any costs incurred as a result of the required unplanned extensions to the City's transit operations and related services that support these operations for the period of such delay." The City also wielded its powers as long-term lender (which will be explained in section 10.3.4).

At the same time as the City held RTG to its contractually required RSA date of May 24, 2018, it rejected any compromise to testing and commissioning and to the safety and reliability of the system. The City wrote: "All of RTG's obligations must be fully dispatched with adequate time to deal with issues that may arise and to ensure full readiness for Revenue Service Availability." Further, the City did not welcome RTG's contractual positioning that accompanied its schedule updates. In sum, the City had transferred the geotechnical and delay risks that had now materialized, and it relied on its advantageous contractual position that resulted from this risk transfer. The City was holding RTG accountable.

Being at the receiving end of this risk transfer, RTG was looking for relief. Estrada replied to Kanellakos's letter on November 30, 2017, maintaining that RTG's November notice was not deficient. He wrote, "The reality is that the achievement of Revenue Service Availability has been, and may in future be, impacted by Delay Events and Variations and the Project Agreement contemplates that the May 24, 2018 date may be adjusted to account for such impacts, to the extent that such impacts cannot be mitigated." Estrada

added that RTG had already provided its report on the reasons for the delay and its plan to show the steps being taken to achieve RSA by the Required RSA Date.

Discussions concerning the three Delay Events being claimed by OLRT-C and RTG continued into 2018. On January 10, 2018, RTG forwarded to the City a lengthy letter from OLRT-C with further details about the sinkhole as a Delay Event and Relief Event, stating that delays to Substantial Completion and RSA in its current Works Schedule were primarily a result of the sinkhole. Cripps responded on behalf of the City on January 12, 2018, denying that the sinkhole constituted a Delay Event or Relief Event. The City's position was that the sinkhole was caused by RTG and therefore could not count as a Relief Event; the sinkhole also could not count as a Delay Event caused by a Latent Defect, because the water main in the area was not incorporated into the project under the Project Agreement. The City concluded the letter by stating, rather pointedly, that it was "committed … to better and more clearly understanding [RTG's] current Works Schedule."

OLRT-C, via RTG, had provided draft Works Schedules to the City on December 7, 2017 and January 12, 2018 that were subject to caveats about Delay Events and potential extensions to the RSA date. On January 22, 2018, Cripps responded on behalf of the City to again reject RTG's unmitigated schedule as being "the worst case scenario and the exact opposite of what we expected." The City requested schedule certainty and did not give an inch on the delay disputes. Indeed, the City conveyed that it had previously advised RTG that "the City did not intend to treat the completion of the works associated with the Delay Events as critical to the requirements to meet RSA and that your Works Schedule update should reflect this. The purpose of this approach was to establish a date, with reasonable certainty, when the LRT System would be available for Revenue Service."[2] The City then referred to the one common goal that the City and RTG did have, meeting the schedule: "It is clear that the parties need to work together towards a common objective of achieving RSA on time in accordance with a Works Schedule that is both realistic and provides reasonable certainty of success."

Eventually, on February 5, 2018, RTG confirmed in a letter to the City that RSA would be achieved on November 2, 2018. The next day, on February 6, RTG wrote again to the City attaching correspondence from OLRT-C setting out the issues OLRT-C wanted to have resolved under the Project Agreement, along with a proposal on those issues. OLRT-C wrote that its "confidence" with respect to achieving RSA on November 2, 2018 was "linked to [its] expectation that the issues highlighted below … will be resolved in the near future through negotiation." The issues OLRT-C identified included "restructuring" the remaining payments for the milestone of Substantial Completion and the RSA date; resolving the disputed compensation for variations; resolving the disruption and "global"

impact of Supervening Events, including the sinkhole and changes attributable to the City; compensation for costs; and an extension to the Concession Period.

But the City, at this juncture, held steadfastly to its position. In a March 2018 presentation to the Finance and Economic Development Committee (FEDCO), City staff referenced many of the tools it had to "fully recover [its] costs and lost revenues" for the delays to RSA, including the fact that "the City is using the [Project Agreement] including the payment schedule and the term of the maintenance contract, as leverage to seek reimbursement of the City's additional costs." This approach was reflected in the City's increasingly rigid approach to payment milestones. Shortly after the sinkhole, the City had agreed to pay RTG for milestone 7 (the completion of tunnelling), even though tunnelling was not complete, to ensure that RTG and OLRT-C had the cash flow they needed. By early 2018, the City's approach had become less flexible. RTG Board minutes from February 28, 2018 state that the City had "rejected approach to Milestone acceptance. Now more resistant than with previous milestones in accepting deferred items." As Estrada put it, the City's approach became "much more strictly contractual."

In a subsequent presentation to the FEDCO in September 2018, the City wrote that it had been firm in its position that it would hold RTG accountable to its contractual obligations. It added (in reference to proposed changes from RTG that would affect customers' daily commutes): "The options put forward by RTG transfers the risks to the city on many fronts including operationally, reputationally, and potentially additional costs." Staff informed the FEDCO that the City

> continues to use all its tools contained in the [Project Agreement], including:
>
> - All remaining milestone payments continue to be deferred;
> - City costs are being deducted from future milestone payments;
> - Monthly service payments to RTM have been withheld until the light rail system is turned over to the City; and,
> - If RTG does not achieve November 2 RSA date, the $1M Liquidated Damage Clause will be applied.

The back-and-forth communication and pressure intensified in the late summer and early fall of 2018, as the new RSA date of November 2, 2018 approached. To summarize, the City repeatedly wrote to RTG requiring updated Works Schedules that were not contingent on recognition of Delay Events or relief from the RSA requirements of the Project Agreement. RTG and OLRT-C provided schedules, but stated that their achievement of the RSA date was linked to the resolution of their other claims. RTG and

OLRT-C continued to claim that they were entitled to an extension because of Delay Events. On September 28, 2018, OLRT-C wrote, "The RSA Date is not a fixed date; it is subject to the occurrence of Delay Events, many of which remain unresolved." In response, the City denied that these issues were unresolved, as it had rejected all of the alleged Delay Events. It added that it was "losing confidence in RTG's ability to meet the dates in the schedules it delivers" and that this loss of confidence was "not alleviated given the poor quality of the schedules recently delivered."

Aside from the claimed Delay Events, RTG also sought to have the City compromise on what it needed to deliver and when. RTG argued that 32 rather than 34 LRVs would be enough for the milestone of Substantial Completion and that 32 LRVs would also be enough for public service, as the additional vehicles were only needed for maintenance. It wanted the City to agree to RSA on the basis of 32 vehicles. The City strongly rejected this suggestion, writing that "*all* Vehicles must be substantially complete" and that "at no time during the course of this Project, until now, was it contemplated that Revenue Service would commence with less than *all* the Vehicles ready for use."

For the time being, the City continued to stand its ground and hold RTG to account. RTG, on the other hand, continued to try to get the City to compromise. Contractual disputes were left unresolved. The financial pressure on OLRT-C continued to escalate, and tensions mounted.

10.3.4 The Debt Swap and Resulting Imbalance

An additional source of problems in the relationship between the City and RTG was the debt swap. In 2017, as a result of a planned extension to the OLRT line, an opportunity presented itself that would allow the City to gain more insight into RTG. The City took this opportunity, but the decision had (likely unintended) effects on the relationship between RTG and the City and served to compound existing tensions.

In 2017, the City wanted to amend the Project Agreement to address the impacts that Stage 2 of the OLRT was going to have. The Project Agreement (see Chapter 7), which covered Stage 1 of the OLRT, was not designed in a way that took these impacts into account. One major issue was that the City wanted RTG to take over maintenance responsibilities for OLRT Stage 2 in addition to Stage 1, so that there would be a single maintenance provider for both parts of the system. This would require changes to the Project Agreement for the OLRT1 project, and those changes required the lenders' consent. Given the effects that increasing RTG's responsibilities would have on the long-term lenders' risk profile, the lenders were insisting on a large equity infusion (between $50 million and $100 million), which would impose a significant additional cost

on the City. Even if RTG had to put in additional equity, there would be a corresponding cost to the City. While the Project Agreement contemplated the termination of the Project Agreement by the City for convenience (along with a make-whole payment to the lenders), or that RTG pay out the long-term debt by way of a make-whole payment, thereby removing the lenders, the City chose not to take this route, as it would have been very expensive.

Instead, the City's advisors recommended that the City itself step into the role of the long-term lenders. The lenders would be left in place, but they would be paid by the City instead of by RTG. RTG would continue paying on the same terms, but to the City instead of to the lenders. This would eliminate the need for the lenders' consent to the changes needed for OLRT Stage 2. The lenders were happy to agree, because the City was a less risky debtor than RTG; they would be paid the same amount, but with a lower risk of default. The risk of RTG's default, which had been transferred to the long-term lenders, was transferred to the City. The negotiations on the debt swap took place between the City and the long-term lenders; RTG was not involved in the negotiations. While RTG had to consent to the debt swap by signing documents to formalize it,[3] RTG did not have any real say in whether the swap took place, short of turning down the Stage 2 contract altogether (which was likely not a realistic option). The debt swap was confirmed in the spring of 2017 and took place later in the summer.

However, the debt swap was not only done for financial reasons. The City also saw it as a strategic move that would give it more leverage over RTG at a time when it was frustrated with RTG's performance. Under their Credit Agreement with RTG, the lenders had significant oversight powers; as lender, the City would gain these powers. The lenders were entitled to additional information from and about RTG – in particular, information about RTG's financial position. The lenders also had the right to attend lender committee meetings where the possibility of calling the debt was discussed, and even the right to replace RTG prior to the completion of the project.

This is why the debt swap mattered. The City gained additional leverage over RTG. Even if it did not use its newly gained powers, the fact of having these powers changed the balanced structure under the Project Agreement. As explained by RTG's bid director, Riccardo Cosentino, a public-private partnership (P3) agreement is a triangle-shaped structure composed of the client, the project company, and the lenders; the debt swap effectively removed one of the three parties in this balanced structure. Third-party lenders provide a degree of independent oversight; they are a reality check for both the client and the project company, to ensure that both are acting in a reasonable way. Replacing the lenders removed this oversight.

Initially, it was unclear what effect this change would have. The debt swap was an uncommon, and by all accounts unprecedented, move in the P3 context. John Traianopoulos, of Infrastructure Ontario, said that he had never seen one before or since. But it raised concerns with RTG. RTG, said Cosentino, felt that the City was "tinkering with an established structure in a way that hasn't been really done before, outside the mechanism envisioned in the contract." Infrastructure Ontario learned from this experience; it structured later project agreements differently to hard-wire in consent from the lenders to system extensions, which makes debt swaps less likely to occur.

The debt swap increased the City's leverage, and its dual relationships to RTG (as client and as lender) led to more problems. The City became privy to additional information that a client would not typically see. While the City had some understanding of the importance of keeping its roles as client and lender separate, given its internal organizational structure, it would have been difficult to keep these roles apart. The Credit Committee, which the City set up to manage its responsibilities as lender, reported to Marian Simulik, the City Treasurer; she, in turn, sat on the City's Executive Steering Committee, which oversaw the construction of the OLRT1 project. If the City did gain any additional information through its role as lender, it is not clear how that would have been kept separate from its deliberations as client.

The City also wielded the powers it gained as a lender to further its interests as a client. In the letter of November 27, 2017, responding to RTG's notice regarding RSA, Kanellakos wrote that the City was writing "in both its capacity as counterparty to RTG under the Project Agreement and long term lender under the Credit Facility." Throughout the letter, the City relied on both its positions as client and lender. As set out above, the City requested pursuant to the Project Agreement (as client) a detailed report on its plan to achieve RSA. It then indicated that, "as long term lender," the City "will require independent technical advisory services to assess the RTG recovery plan and schedule. Such services will be to the account of RTG, as per the requirements of the Project Agreement and Credit Facility."

The City also wrote that "in [its] capacity as long term lender under the Credit Facility, the City expects and will require the continued interest and principal payments from RTG under the Credit Facility, irrespective of any delays referred to above." In other words, the City was demanding that RTG meet the RSA date of May 24, 2018; and if RTG did not, the City put RTG on notice that it would require, as lender, payment on both the principal and interest portions of the loan. The City did not seem to consider giving RTG relief from this obligation, despite the fact that a rational lender might have elected to simply receive more interest. It appears that the City was instead seeking to place added financial pressure on RTG to complete the OLRT1 project. The letter concluded by

reserving “all other rights and remedies that may be available to the City under either the Credit Facility or the Project Agreement.”

RTG was concerned that the City was writing both as client and as lender at the same time, and felt that it was inappropriate to mix these two roles. It responded to the City on November 30, 2017, noting that the City appeared to have “conflated its various and differing rights and obligations” under the Project Agreement and the Credit Facility; it appeared that the lender was seeking to rely on the Project Agreement, and the client was seeking to rely on the Credit Facility. RTG requested that in future, correspondence from the lender not be combined with correspondence from the counterparty to the Project Agreement to “avoid any appearance that either the Long Term Lender or the Authority [the City] is acting outside the scope of their respective agreements and not fulfilling the terms and conditions of those respective agreements in good faith.”

The upshot of all of this was an adversarial relationship between the City and RTG in which the City had multiple leverage points available to it. Some came from the Project Agreement, such as the right to review OLRT-C’s Works Submittals and require responses to its comments; the ability to issue notices, for example Warning Notices or Monitoring Notices; and the ability to hold RTG to the construction milestones as originally defined and despite the change in circumstances brought about by the Rideau Street sinkhole and other events. Other leverage points came from the City’s new role as lender, which gave the City new information and new powers to step in if necessary. The City intended to have the OLRT1 project finished and open to the public, and given the structure of the Project Agreement, the risks of failure lay mainly with RTG.

Recommendations

See recommendations #2–3, 7, 16, 22–27, 29–31, 44–46, and 53–58 in Chapter 17.

Notes

1 Indeed, RTG opted to assume all of the geotechnical risk, despite the fact that the Request for Proposals for the project set out three geotechnical risk profiles from which bidders could choose when making a bid.

2 This passage is ambiguous, but “critical” is likely intended to refer to the critical path.

3 RTG had to sign the subordination agreement, subordinating the City’s rights to those of the short-term lenders. RTG could also decide whether to take on the additional maintenance for Stage 2 of the OLRT.

Chapter 11
Safety of the OLRT1 Entering Public Service

Key Findings

- OLRT-C prepared the necessary engineering safety and assurance case prior to handing the system over to the City. This case concluded that the OLRT1 system was fit for operation. For the safety case to remain valid through public service, conditions and limitations set out in the Operational Restrictions Document must be implemented and all safety-related deficiencies must be addressed.
- The Independent Safety Auditor also determined that the OLRT1 system met the Project Agreement's safety requirements and was ready for passenger service. However, the Independent Safety Auditor's role is limited in scope – it does not involve an assessment of reliability or a consideration of maintenance, and the safety certification is based on a review of documentation, as it assumes the system is built to design.
- Transport Canada delegated regulatory authority over the OLRT1 system to the City, making the City ultimately responsible for the system's safety. Under this authority, the City developed its own Safety Management System and appointed a Regulatory Monitor and Compliance Officer to monitor compliance with the City's safety regulations.
- The City has limited options to respond to safety issues. It can shut down service entirely. Short of that, however, the City cannot require RTG to take specific remedial action. It can only attempt to enforce RTG's contractual obligations.

Chapter Contents

11.0 Introduction

Before examining (in Chapter 12) the events of the summer of 2019 and the multiple pressures to get the OLRT1 open to the public, this chapter turns to the safety of the OLRT1 system, how safety was assessed leading up to public launch in September 2019, and the parties and steps involved. This chapter explains key roles, the process of how the OLRT1 was certified as safe and fit for operations going into public service, and the limits of that certification. It then describes the underlying safety analysis conducted by OLRT-C and its subcontractors. Finally, it discusses the City's responsibility for the safety of the OLRT1 system and the layers of safety oversight that the City put in place going into public service.

Safety is again addressed in later chapters, including those about the lead-up to public service (Chapter 12), maintenance (Chapter 13), public service (Chapter 14), and derailments (Chapter 15).

11.1 Key Roles and Key Terms

Railways are complex systems, and several parties are responsible for safety. RTG, through OLRT-C, was responsible for building and delivering to the City the infrastructure and components of the LRT, including the vehicles and communications-based train control (CBTC) system, to meet the OLRT1 project's safety requirements. RTG, through RTM, is responsible for the safety associated with its maintenance activities. Finally, the City is responsible for the overall safe operation of the system during public service – as described in section 11.4. Another key role is that of Independent Safety Auditor, described in section 11.2.

In the following discussion some key terms are used, including those that appear in boldface below (and throughout this chapter) for easy reference.

- A **safety case**, in the rail industry, means an overview of how an organization approaches safety; it includes information about procedures, equipment, and other means to keep people safe. The **engineering safety and assurance case (ESAC)** is one such case.
- A **Safety Management System (SMS)** is the documented safety framework used to identify safety risks and to eliminate or mitigate those risks.
- **Hazard analysis** is the process of identifying and analyzing potential safety hazards.
- **Standard operating procedures** provide direction to perform a task in a certain way to eliminate a risk. These procedures are an established, orderly way of doing things.
- The **Operational Restrictions Document** sets out the conditions for the operation and maintenance of the system that are required to mitigate outstanding hazards that were not addressed through the project design.
- **Project design** is considered part of planning and construction for safety (as explained in Chapter 9, related to systems integration).

11.2 The Independent Safety Auditor

The City retained TÜV Rheinland in 2017 to act as the **Independent Safety Auditor** of the OLRT1 project. The Independent Safety Auditor's role was to perform an independent audit (a third-party review) of the systems engineering and assurance, and the safety processes of RTG and OC Transpo. The purpose of the audit was to "verify that the system has been implemented to meet safety requirements specified in the Project Agreement." The Independent Safety Auditor's role was not to evaluate the sufficiency of those requirements, though professional obligations would have required the Independent Safety Auditor to identify any shortcomings it encountered.

The City requested the Independent Safety Auditor's report in November 2017, six months in advance of the originally planned Revenue Service Availability (RSA) date of May 24, 2018. Due to delays in construction, and testing and commissioning, the Independent Safety Auditor ultimately provided five revisions of its report to the City. Sergio Mammoliti, the Independent Safety Auditor's lead on the file, submitted the fifth and final version of the report to City staff member Richard Holder on September 13, 2019. The Independent Safety Auditor's final report concluded that its audit supported the use of the OLRT1 for operations carrying passengers. Once the Independent Safety Auditor submitted that report, its mandate on the OLRT1 project ended.

The Independent Safety Auditor's safety audit consisted of the following basic steps.

1. Ensuring the safety and security requirements for the OLRT1 system were detailed and expanded upon in the project documentation, so that they could be traced to the project's subsystems (as described below);
2. Ensuring that the safety requirements were managed through an SMS;
3. Ensuring that the safety requirements were satisfied in the safety cases prepared for the primary subsystems, namely, the Thales signalling system, the Alstom vehicles, and the railway infrastructure (including the maintenance and storage facility, the stations, the train control centre, the backup control centre, the tunnel, the communications system, the track, and energy);
4. Ensuring that all safety hazards were tracked through the design and construction processes and addressed in a safe manner or transferred to the responsibility of the operator or maintainer to mitigate;

5. Ensuring that the safety requirements for the operation of the system were satisfied in the operational safety case prepared by OC Transpo; and
6. Ensuring that the safety requirements were satisfied in the overall system safety case prepared by OLRT-C (the engineering safety and assurance case, or ESAC).

In earlier revisions of the report, the Independent Safety Auditor expressed concerns about the relatively late stage at which some safety-related activities were undertaken by OLRT-C. In particular, the Independent Safety Auditor's concerns involved three main points.

First, the Independent Safety Auditor had the view that the identification and detailing of the system's safety requirements occurred well into construction, whereas this step typically occurs in the design phase of a project. This delay prevented the Independent Safety Auditor from performing a meaningful audit in 2017. It also created a risk that many safety requirements would have to be mitigated through the use of standard operating procedures, because there would not be sufficient time to address the hazards by changing the design of the OLRT1 system. As Mammoliti explained, it is better to eliminate or mitigate a hazard through design where possible, because standard operating procedures rely on people to implement them.

The Independent Safety Auditor's final report concluded that the concerns about the delayed development of safety requirements were sufficiently addressed, relying in particular on OC Transpo's safety case and its conclusion that "OC Transpo has mobilized the necessary staff, with the appropriate skills, training and certifications, and with the appropriate rules and procedures in place to allow for the safe operations of the System in revenue service."

Second, because of time constraints created by OLRT-C's late approach to systems engineering and assurance (addressed in Chapter 9), OLRT-C shifted in 2017 to a risk-based approach to managing the safety requirements. OLRT-C was late in completing the hazard analysis at the core of that approach, which involved identifying hazards and ensuring they were mitigated within the subsystems' safety cases or standard operating procedures. Ultimately, the Independent Safety Auditor's final report concluded that all hazards had been properly mitigated.

Finally, Mammoliti told the Commission and the City that he thought the City retained the Independent Safety Auditor too late in the OLRT1 project. (Although Stage 2 of the OLRT is itself outside the scope of this Commission, it is noteworthy that the City heeded his feedback and engaged a safety auditor much earlier on Stage 2.)

Mammoliti confirmed that he did not have concerns about the safety of the OLRT1 system at the end of the Independent Safety Auditor's mandate. He explained that if he had seen any issues, he would not have concluded that the audit supported the use of the system for passenger-carrying operations.

However, in considering the Independent Safety Auditor's conclusion, it is important to note the limitations of that role. The Independent Safety Auditor's conclusion related to the OLRT1 system's overall compliance with the safety requirements set out in the Project Agreement. It was not a statement that the OLRT1 system was completely prepared to operate as a public service, nor was it a guarantee that the system would be operated and maintained safely or that service would be reliable once the system launched.

Several features of the independent safety audit speak to its limited scope:

- The safety audit assumes the OLRT1 system is built to design, with OLRT-C's ESAC providing the main evidence regarding the design and construction process;
- The safety audit is "almost entirely" based on the review of documentation for the OLRT1 project. The Independent Safety Auditor did not inspect the OLRT1 system, participate in testing and commissioning or trial running, or witness the implementation of the safety processes. In other words, the safety audit is *not* a hands-on examination of the track, vehicles, stations, and their systems, and how they perform in operation;
- The safety audit is not concerned with reliability or operational performance of the system. As Mammoliti explained, the train could take hours to travel across the whole system, but as long as it is safe, it would pass the safety audit. The train is safest when it is not moving;
- The safety audit relies on the safety cases, certification letters, and reports provided to the Independent Safety Auditor. These include the safety cases for the vehicles (provided by Alstom), for the signalling system (provided by Thales), and for the infrastructure (provided by OLRT-C);
- The safety audit relies on the operator safety case prepared by OC Transpo. That case is incorporated into aspects of the hazard analysis to ensure that the appropriate standard operating procedures are in place to meet the safety requirements and that OC Transpo has trained and mobilized the necessary staff; and
- Finally, the safety audit did not consider the maintenance processes to be performed by RTM, because the maintenance component was outside of the Independent Safety Auditor's mandate.

An example of the final point is that the Independent Safety Auditor did not review RTM's maintenance plans or determine whether it had mobilized the necessary resources to carry out maintenance activities to the standard required. However, Mammoliti noted that RTM was aware of the safety-related requirements that would apply to it.

11.3 Safety Certification of the System Infrastructure

OLRT-C was responsible for building and/or delivering to the City the railway infrastructure, vehicles, and train control system required to meet the OLRT1 project's safety requirements, as described in the Project Agreement and the Construction Contract (see Chapter 7). To meet its safety obligations, OLRT-C had to prepare the safety-related documents and obtain the necessary safety certifications for the railway infrastructure prior to RSA.

The highest-level safety document prepared by OLRT-C is the ESAC, the engineering safety and assurance case. The purpose of the ESAC – also referred to as the OLRT1 project use case – is to demonstrate that the railway infrastructure is fit for operation from a design and systems engineering perspective. Derek Wynne, of SEMP, described the ESAC as a "map" of the safety assurance evidence for the railway. At a high level, the ESAC is an audit of the safety of both the products used in building the railway and the processes used by OLRT-C to design, build, test, and integrate the overall system.

The ESAC includes a review of all the lower-level safety documents and analyses performed by OLRT-C and its subcontractors to prove the safety of the various components of the system. These lower-level safety documents include those prepared by OLRT-C, such as its Case for Safety and the Operational Restrictions Document, as well as safety cases from Alstom (for the vehicles) and from Thales (for the signalling system).

As the vehicle supplier, Alstom prepared its own safety case for the vehicles, which was incorporated into OLRT-C's ESAC. Alstom's safety case summarizes the safety analysis it performed for the vehicles; it certified that the vehicles were fit for their intended use in public service, subject to nine **minor deficiencies** related to safety. These minor deficiencies included, for example, the malfunctioning rear-view camera system for monitoring the platform prior to departure of the trains (addressed in Chapter 15). Alstom performed a risk assessment of these minor deficiencies and determined that the vehicles were safe for operation. It was acceptable for these minor deficiencies to be resolved following RSA. The Independent Safety Auditor also reviewed these minor deficiencies and concluded that they were not safety-critical items. (Minor deficiencies and what they meant related to Substantial Completion and RSA are described in Chapter 7.)

Lowell Goudge, the Alstom employee responsible for certifying the safety of the vehicles, confirmed that he did not have any concerns about the safety of the vehicles. He stated that "the system is largely designed [so] that it won't move if it's not safe."

The ESAC summarized the conclusions and arguments from these lower-level safety and assurance documents, including Alstom's safety case, and concluded that the OLRT1 was fit for operation. However, as with the Independent Safety Auditor's safety audit, it is important to understand the limitations of the ESAC.

The ESAC contains several caveats (warnings or provisos with stipulations) and imposes certain limitations and restrictions on the OLRT1 system to address outstanding safety concerns. These conditions must be satisfied for the ESAC to remain valid through public service. They include, for example:

- The completion of all identified safety-related deficiencies designated to be completed prior to Substantial Completion or prior to RSA;
- No safety-related events occurring during trial running relating to the infrastructure or LRVs; and
- Correct maintenance of the railway throughout the period before revenue service (public service).

Mammoliti stated that it is typical and acceptable for the ESAC to contain caveats such as these. The Independent Safety Auditor would not necessarily be aware of whether the caveats were satisfied before public service; what matters, Mammoliti explained, is that the caveats were communicated so that "everybody knows what they're inheriting" and RTG and the City are aware that they have to manage those limitations.

Another constraint applying to the ESAC is that it is subject to the restrictions, conditions, and limitations set out in the Operational Restrictions Document, which includes limitations imposed on the system to ensure it meets the level of safety assurance provided in the ESAC. Recall that the Operational Restrictions Document sets out the conditions for the operation and maintenance of the system required to mitigate outstanding hazards that were not addressed through the project design; thus, the restrictions and limitations set out in this document must be followed for the project's overall safety case to remain valid.

The Operational Restrictions Document for the OLRT1 project included conditions such as employing **spotters** on the platforms to inform the vehicle operator when it is safe to depart from the station platform (due to the deficiency with the **rear-view camera system**), and a recommendation for increased track maintenance to correct rail

corrugation and to monitor the **wheel/rail interface**, the interaction between the vehicle wheel and the track (discussed in greater detail in Chapters 9 and 15).

The Commission heard evidence from Wynne, of SEMP, who assisted in preparing the Operational Restrictions Document, that it is not uncommon for railways to have operating restrictions; however, he was disappointed with the number of operational restrictions that were required on this new railway.

The OLRT1 was ultimately deemed fit for passenger-carrying operations. The Independent Safety Auditor was satisfied that all outstanding deficiencies were sufficiently addressed and that outstanding issues were captured by the Operational Restrictions Document.

During the same period that the Independent Safety Auditor was conducting its safety audit, the City also had its own consultants involved to ensure safety compliance. As Tom Prendergast, of STV, stated, “From a safety standpoint, if something was so unknown or so unresolved that it would have affected safety, we would have raised our hand and said, This can’t continue.”

11.4 The City's Safety Oversight Role

The City is responsible for the overall safety of the OLRT1. The City Manager, specifically, is the executive ultimately accountable for the OLRT1 system's safety. This section discusses the City's safety oversight framework as the OLRT1 went into public service and following the handover from RTG. It first addresses the delegation of regulatory authority from Transport Canada to the City, followed by the City's regulatory and safety oversight framework established under that delegation of authority, and the City's powers to respond to issues that arise during operations and that relate to safety.

11.4.1 The Delegated Authority Agreement

The federal Minister of Transport (Transport Canada) delegated regulatory authority over the OLRT1 system to the City in a Delegation Agreement effective October 1, 2011. The **Delegation Agreement** granted the City authority to regulate (that is, control through rules and regulations) the design, construction, operation, safety, and security of the OLRT1. Without this agreement, Transport Canada would have kept that authority.

The Delegation Agreement requires the City to take a number of actions, including to:

- Develop, implement, and enforce a comprehensive regulatory framework for the safety and security of the OLRT1;
- Establish an independent internal auditor or other responsible City official to monitor and report on compliance with the regulations and procedures;
- After the first year of the OLRT1's operations and at least every three years after that, obtain independent audit reports of the safety and security management systems and provide a plan for corrective measures flowing from those audit reports to the Minister of Transport; and
- Every year after the start of the OLRT1's operations, provide a safety and security report to the Minister of Transport outlining safety and security incidents from the previous year, among other things.

As regulator, the City is also responsible for investigating, as a September 2015 Transit Commission report puts it, "occurrences or incidents during the operation of the OLRT that potentially affect the safety and security of the OLRT system, the passengers, or the general public."

The Delegation Agreement broadly defines the regulations the City is required to develop, implement, and enforce to include standards, rules, guidelines, policies, Safety Management Systems, and other similar instruments.

The City designated the City Manager as the accountable executive for its regulatory framework. This means that the City Manager has ultimate responsibility for implementing the SMS and for ongoing compliance with regulatory requirements, including reporting to the Minister of Transport.

11.4.2 The City's Regulatory and Safety Oversight Framework

Heading into public service, the City had a framework of regulations and methods to provide oversight related to safety. This framework was largely developed by the City before public service (with some elements developed by RTG and then submitted to the City for review), as part of the City's preparations for public launch and operating the system. The City has taken steps to strengthen its oversight of RTG and RTM's compliance to regulations and performance of maintenance since the start of public service, at least in part to promote safety.

The regulatory framework applicable to the OLRT1 has two main pillars:

- Obligations the City has imposed on various City departments to adopt certain programs, plans, procedures, and practices relating to the OLRT1; and
- The layers of oversight that the City has adopted to manage or direct those who have to comply with these programs.

The bulk of the City's regulatory framework is made up of a series of programs that OC Transpo is obliged to implement and oversee. OC Transpo's programs include the following:

- Safety Management System, or SMS;
- Security Management System;
- Standard operating procedures;
- Operating rules and procedures;
- Maintenance and Rehabilitation Plan;
- Accidents and safety incidents reporting requirements; and
- Mobility requirements.

OC Transpo is responsible for providing the oversight necessary to ensure compliance with these programs. To this end, OC Transpo should "generally require" contractors and their subcontractors (in this instance, RTG, RTM, and Alstom Maintenance) to adopt programs, plans, procedures, and practices that are "substantially consistent" with its own programs. However, as we will see, OC Transpo has not always succeeded in ensuring that contractors' and subcontractors' programs are substantially consistent with its own.

In addition, RTG is contractually required by the Project Agreement to comply with the OLRT regulations. RTG is explicitly required to establish an SMS (also referred to as a safety protocol or safety management plan) in consultation with the City and to comply with it in performing maintenance. RTM is bound by equivalent obligations in its contract with RTG.

Going into public service, several layers of oversight were in place in this regulatory framework, including its safety-related aspects. These include the following, which are further described below the list.

- The City's implementation and enforcement of the OLRT regulations relating to safety;
- Monitoring for the OLRT1 by the Regulatory Monitor and Compliance Officer (RMCO);
- Transport Canada's oversight;
- The response to events of the Transportation Safety Board of Canada (TSB);
- Confederation Line Safety Management Committee activities; and
- The activities of RTG and its subcontractors.

OC Transpo's SMS is a core part of the City's implementation and enforcement of the OLRT regulations relating to safety. These regulations are required to be updated regularly, which the City has done. OC Transpo also reports annually on its SMS to the City Manager.

The SMS is based on four pillars (policy and objectives, risk management, safety assurance, and safety awareness), and outlines a number of processes to ensure safety, including processes for establishing safety targets and initiatives, identifying and assessing risks, reporting and managing hazards and occurrences, ensuring compliance with the regulations, and implementing remedial action.

At the time the OLRT1 system was going into public service, Wynne, of SEMP, was critical of OC Transpo's SMS, because he viewed it as trying to "push that responsibility down" to the contractor. He recalled sharing those concerns with the Independent Safety Auditor and the City. However, the Independent Safety Auditor

looked at whether the safety requirements for the operation of the system were satisfied in the operational safety case prepared by OC Transpo, which referred to and relied on OC Transpo's SMS.

When public service started, the OC Transpo Chief Safety Officer's team, the Rail Operations team, and OC Transpo's internal audit staff performed some oversight of safety and regulatory compliance, but the level of oversight has since been strengthened. For example, when public service began, OC Transpo did not have a formal oversight plan in place for monitoring either RTG's or RTM's performance of contractual obligations for the safe operation and maintenance of the OLRT1, or OC Transpo's compliance with regulations and its own internal policies, procedures, and plans. OC Transpo developed a formal oversight plan for 2021 and 2022.

The **Regulatory Monitor and Compliance Officer**, or **RMCO**, is another part of the safety oversight; its monitoring activities began once public service started. The RMCO reports to the City Manager, Transit Commission, and City Council on its monitoring. The RMCO fulfills the Delegation Agreement's requirement that an independent internal auditor perform this role.

The RMCO takes a risk-based approach to monitoring, which means selecting different areas for monitoring during certain time periods. For example, between September and December 2019, the RMCO monitored the training and certification of employees involved in the movements of vehicles.

The RMCO only monitors compliance with the OLRT regulations; the RMCO does not address whether those regulations are sufficient or adequate.

Transport Canada reviews the City's required reporting under the Delegation Agreement. This oversight role is limited.

The **Transportation Safety Board of Canada**, or **TSB**, is involved when responding to incidents that are reported to it. The TSB does not perform operational oversight, but gets involved to ensure rail safety. The TSB's activities are described in greater detail in Chapter 15.

The Confederation Line Safety Management Committee is chaired by OC Transpo's Chief Safety Officer and includes representatives from OC Transpo (Rail Operations and the Chief Safety Officer's team) and RTM. It was established "to ensure that safety matters involving the operation of Line 1 are coordinated between RTM and OC Transpo operations" and to promote continuous improvement of safety matters.

As Brandon Richards, the former Chief Safety Officer for OC Transpo (and formerly of OLRT-C) explained, the committee reviews data and trends to identify risk areas and how to respond to them. It looks at incidents that have occurred on the line and how to improve the response to them. The committee also approves targets and initiatives to be pursued within OC Transpo's SMS.

RTG and its subcontractors also have their own contractual obligations related to safety. RTG must comply with the OLRT regulations and implement its own SMS, which should be developed in collaboration with the City and be "substantially consistent" with that of OC Transpo. However, the RMCO found that, at the start of public service, RTG (through RTM) was not conforming to all contractual obligations relating to the OLRT regulations, and the City was not monitoring conformance with those obligations as diligently as it could have been. As the RMCO found in its report for 2021, RTM had not updated its SMS since 2018, even though it must be updated annually, and did not have a formal Emergency Response Plan in place, even though one was contractually required.

As Richards explained, it was "a real struggle to bring the contractor into alignment with OC Transpo" regarding its SMS. But he added that there was now a process in place to ensure RTM's SMS would be aligned with that of OC Transpo.

OC Transpo strengthened its oversight of safety and maintenance quality assurance in 2021–2022. OC Transpo did so after public launch in response to, among other things, its realization that it could not rely on RTM to oversee Alstom Maintenance as thoroughly as it had expected, and in response to the RMCO's findings that it could improve monitoring of RTM.

11.4.3 The City's Safety Enforcement Powers

The City has two options to respond to safety issues that it identifies on the OLRT system: to stop activity on the line or to take contractual steps to attempt to resolve the issue. The first option is drastic and takes a significant toll on the public, but can be used urgently and with immediate effect. The second option is less drastic, but can also be slow to yield results (if it yields results at all).

As Richards explained, the Chief Safety Officer has the power, in response to a safety concern, to shut down the Confederation Line or prevent specific vehicles from going into service. If a safety-related or regulatory compliance issue does not compromise safety, the Chief Safety Officer and OC Transpo can follow the milder contractual route, which typically involves writing letters and/or imposing monetary penalties on the contractor.

Although Richards told the Commission that taking the contractual option can "drag on for quite a while," in his experience, RTG or RTM responded productively and collaboratively to issues that created real safety concerns. He could not recall any instances, during his role as Chief Safety Officer at OC Transpo (May 2020 to March 2022), in which a safety issue was brushed aside.

Richards also created a new safety enforcement tool for use by OC Transpo's Chief Safety Officer – the power to issue a **Safety Order**. However, as he explained, the City cannot force RTG to take the remedial steps identified in Safety Orders, unless those steps involve shutting the line down. The main purpose of Safety Orders is to formally record and document safety-related issues.

In summary, short of stopping a particular vehicle or stopping OLRT service entirely, the City cannot require RTG to take specific remedial action in relation to safety. It can only attempt to enforce RTG's contractual obligations.

11.5 Conclusion

The Commission heard that there were no concerns with the safety of the OLRT1 system as it was going into public service, except for the caveats stated earlier. Indeed, the witnesses involved in certifying safety would not have signed off on the safety case for the vehicles, the ESAC, and the Independent Safety Auditor's report if they had had concerns.

However, there were limitations to the safety cases, the role of the Independent Safety Auditor, the safety certifications, and the framework of the SMS, standard operating procedures, and operational restrictions. These measures did not guarantee that the system would be operated and maintained safely following public launch, and they did not address the reliability or operational performance of the OLRT1 system.

The City is ultimately responsible for ensuring that the OLRT system operates safely; it established a regulatory framework for the OLRT1 and had several layers of regulatory and safety-oriented oversight in place. However, there was still room for improvement to strengthen the City's safety oversight framework. As later chapters will address, better, more concerted efforts on safety were made after the second derailment.

Recommendations

See recommendations #28 and 64–66 in Chapter 17.

Chapter 12
Events of Summer 2019: Substantial Completion, Trial Running, Revenue Service Availability

Key Findings

- By 2019, the City and RTG were under significant pressure to bring the OLRT1 project to completion. In this high-pressure environment, they made several poor decisions.
- After the City rejected RTG's first Notice of Substantial Completion due to outstanding items, the City then enabled RTG to achieve Substantial Completion despite many of the same items remaining unresolved, and then agreed to amend the Project Agreement to ensure that RTG could achieve Revenue Service Availability, despite numerous ongoing concerns about the reliability of the system.
- Maintenance performance was not sufficiently assessed during trial running, despite long-standing concerns about maintenance readiness, and the City and RTG/ RTM being aware that maintenance would be significantly burdened by the launch of the new system.
- After the system encountered several challenges during trial running, the City and RTG decided to revert to an earlier version of the trial running criteria with criteria that were easier to meet, thereby allowing the system to pass.
- Communications to Council immediately before and during trial running were inadequate and, in some cases, misleading. Council was not told about the concerns of the City's expert consultants regarding the reliability of the system, or that trial running was encountering serious problems leading to a "pause," or the reasons underlying the change to the trial running criteria.

- A group of key City personnel including people in the Mayor's office, City Manager Steve Kanellakos, and General Manager of Transportation Services John Manconi joined a WhatsApp Group to communicate about trial running. These individuals received important, concerning information about the system's performance that should also have been provided to Council.
- A memorandum to Council drafted by Manconi – to provide Council with what he viewed as important information about the OLRT1 system's struggles and the exceptional decision to pause trial running – was not sent to Council because it was stopped by Kanellakos. Kanellakos and Manconi then provided several updates during trial running that contained none of the important information about what was going on with the system at the time, and Kanellakos then sent a memo to Council at the end of trial running that misled Council about the system's readiness and performance during trial running. Mayor Watson was aware of the important information and that it was not being provided to Council; Mayor Watson's conduct frustrated Council's ability to perform its statutory oversight function.
- The system continued to demonstrate reliability problems in late August and early September 2019. Nonetheless, the City chose to go ahead with the public launch on September 14, 2019.

Chapter Contents

12.0 Introduction

This chapter reviews the events of mid-2019. This was a critical time for the OLRT1 project. It included RTG and the City confirming that Substantial Completion was achieved, that the system had passed trial running and achieved Revenue Service Availability, or RSA (meaning the system was complete and ready for the City's final preparations for public launch), and that the system was available for public service. The City then decided to launch public service. Each of those steps required RTG and the City to make decisions about whether the system was ready to move on to the next step. Was it operating effectively, was it reliable, and was it safe for public service? Those were the questions the parties were facing.

Three features dominate the analysis of this period. First, RTG, OLRT-C, and the City were under significant and mounting pressure. RTG was under pressure from the City. OLRT-C was under intense financial pressure, which it could relieve only by achieving Substantial Completion and RSA (for which it stood to receive payments under the Project Agreement that totalled approximately $250 million). The City was under intense political pressure to avoid yet more missed deadlines: the public had already lost confidence, and City officials were embarrassed.

Second, the OLRT1 system was performing poorly and could not meet the required criteria for Substantial Completion and RSA. The City and RTG were therefore stuck between mounting pressure and an unreliable LRT system.

The third major feature of this period that emerged from the evidence is poor decision-making. Rather than acknowledge that the OLRT1 system was not yet ready and insist on demonstrated reliability, the parties found shortcuts. They waived some of the

requirements for Substantial Completion. They then changed the trial running criteria to make it easier for the system to pass. They then changed the requirements for achieving RSA. While there is no reason to think that any of this was done in bad faith or with knowledge of the problems that would result, the Commission cannot escape the conclusion that these decisions were made under pressure and out of expediency rather than through the exercise of proper, sound judgment. The unreliable performance after public launch in September 2019 was almost inevitable in the circumstances.

This chapter refers to key terms that were explained in Chapters 7 and 9–11; some additional terms are explained and appear in bold for easy reference.

12.1 Backdrop to Trial Running: Environment for Poor Decision-Making

The period of approximately 18 months leading up to the summer of 2019 was a challenging time involving delay, frustration, and mounting pressure. This section briefly recaps the difficult circumstances that came together to create an atmosphere of intense pressure in the spring and summer of 2019 to get the OLRT1 project done, handed over to the City, and open to the public. As will be seen, by the time the contractual milestone of Substantial Completion was achieved in late July 2019, there "wasn't any appetite" for further delay (as Matthew Slade, of OLRT-C, testified).

First, in 2018 and early 2019, RTG repeatedly proposed new schedules and new dates to hand over the OLRT1 project to the City, but then (as explained in Chapter 10) repeatedly missed those new dates. Tensions between RTG and the City increased as a result: they exchanged letters disputing even such matters as whether proposed schedules from RTG (prepared by OLRT-C) met the contractual requirements for a "schedule," let alone whether RTG would achieve targeted dates. The City lost confidence in RTG's schedules, and both the City and RTG lost credibility with the public, causing the relationship between RTG and the City to sour.

Second (as recounted in Chapter 10), OLRT-C continued to compress the period planned for testing and commissioning the OLRT1 system, forcing the various stakeholders to play catch-up (including by changing the anticipated sequencing of testing). Although the causes of the need to compress the schedule for testing may be in dispute, the fact of the compression is not. There were also issues that arose during construction and vehicle assembly that created frustration and tension between other stakeholders, including Thales and Alstom, as well as between OLRT-C and Alstom.

Third, the OLRT1 system was not performing reliably through the winter and spring of 2019. The OLRT1 system struggled in winter conditions, particularly with vehicle and switch issues (a switch is the mechanism by which the train changes from one track to another). Vehicle and switch reliability problems continued into the spring of 2019, and RTG struggled to get 15 coupled trains (meaning, trains consisting of two individual LRVs that are coupled together) onto the line. Slade, of OLRT-C, recalled that going into trial running, vehicle reliability was still below desired levels due to a variety of system problems, including brake issues, door issues, and auxiliary power issues.

Finally, both the City and RTG/OLRT-C faced significant pressure to get the OLRT1 system open – namely, public, political pressure on the City, and financial pressure on OLRT-C. Missing multiple target RSA dates damaged the City's credibility and caused a loss of public confidence. City Manager Steve Kanellakos agreed that by August 2019 there was "a lot of public pressure, and Council pressure, media pressure with respect to launch of the system." Slade similarly testified that the pressure to hand over the system was "very significant" in the summer of 2019. This intense pressure was felt by both the City and RTG. OLRT-C was suffering financially: the consortium partners had been called upon to inject substantial additional cash into the OLRT1 project due to cost overruns, and (as explained in Chapter 7) OLRT-C continued to incur liquidated damages and costs with each day of further delay. OLRT-C was keen to receive the large financial payments associated with achieving the contractual milestone of Substantial Completion and achieving RSA (a total of approximately $250 million) in order to, as Slade put it, stop the bleeding (meaning, they had paid out substantial sums to fund the ongoing work without receiving these substantial payments).

This was the context in which the parties entered a period in which they would have to decide whether the important milestone of Substantial Completion was met, undertake trial running, determine whether RSA was met, and decide whether to open the system for public service. Those activities all involved exercises of judgment and discretion that were undertaken in a high-pressure environment (detailed next) and in the context of the responsibility for a safe system (described in Chapter 11).

12.2 Substantial Completion: Contract Criteria Changed for the First Time

Substantial Completion is an important milestone event in the Project Agreement. It was a confirmation that RTG had completed the "fixed" component of the OLRT1 project (including the maintenance and storage facility at Belfast Road, the MSF) and the "vehicle" component of the OLRT1 project (including making available all the LRVs as required by the Project Agreement). Completion of the vehicle component would also mean that RTG had complied with the testing and commissioning requirements set out in the Project Agreement. Achieving Substantial Completion would trigger a milestone payment to RTG and, importantly, indicate that the system was ready to move to trial running.

This section reviews the process in the Project Agreement for achieving the milestone of Substantial Completion and how RTG achieved Substantial Completion in 2019.

12.2.1 Contract Process for Substantial Completion

The Project Agreement (see Chapter 7) sets out the process for RTG to achieve the Substantial Completion milestone. In summary:

- RTG was to give at least 10 days' notice to the City prior to the date on which RTG anticipated all the requirements for Substantial Completion would be satisfied.
- After receiving notice, the City then had 5 days to provide its opinion of whether RTG had achieved Substantial Completion, and if the City objected, to provide reasons in writing.
- Following receipt of the City's opinion, the Independent Certifier had 5 days to consider RTG's submission and the City's opinion and determine whether RTG had satisfied the conditions for Substantial Completion.
- The Independent Certifier could then either:
  - Issue a certificate of Substantial Completion, along with the minor deficiencies list (described below), or
  - Issue a report setting out any outstanding matters that had to be completed in order to issue the Substantial Completion Certificate.

The Project Agreement allows for **minor deficiencies** to be present at the time of Substantial Completion. In essence, a minor deficiency is a defect or deficiency that would not materially impair "the public's or the City's use and enjoyment of the System," the performance of maintenance services by RTG, or "safety or traffic flow on the System in any relevant respect." If only minor deficiencies were outstanding when RTG delivered the Substantial Completion notice to the City, then the Independent Certifier could issue a Substantial Completion Certificate.

As the parties moved through the summer of 2019, it became important that the Project Agreement had given the City the ability to waive any of the contractual requirements for achieving Substantial Completion, which meant that the City had the discretion to support a submission for Substantial Completion even if RTG did not actually meet the contractual requirements. This discretion, as will be seen below, allowed the City to agree that RTG had achieved Substantial Completion despite the contractual requirements not having been met.

12.2.2 RTG's First Application for Substantial Completion

RTG delivered a Substantial Completion notice to the City on April 26, 2019, indicating that it believed that the requirements for Substantial Completion had been satisfied.

The City was well prepared to receive and consider RTG's notice. Monica Sechiari, the lead for the Independent Certifier, gave evidence that the parties had been meeting since 2018 to make sure that everyone knew what the requirements for Substantial Completion were and how to demonstrate that those requirements had been achieved. The City had also developed an extensive plan for assessing RTG's application for Substantial Completion and for issuing its opinion. That plan, titled "Path to Substantial Completion, Revenue Service Availability and Final Completion," set out the process that the City would follow when arriving at its opinion on Substantial Completion, and the plan made it clear that the City was going to take a strict approach in assessing whether RTG met the Project Agreement requirements for Substantial Completion.

The City's plan recognized that one of the requirements putting the achievement of Substantial Completion at highest risk was the obligation to make 34 LRVs (17 double-car trains) available for use. The City planned to consider four specific criteria with respect to that obligation.

On May 6, 2019, the City gave its opinion in response to RTG's Notice of Substantial Completion. Consistent with its planned strict approach, the City's opinion was that RTG

had not met the requirements for Substantial Completion, and the City responded to RTG that there are "significant outstanding issues that remain unresolved." One of the key deficiencies that the City identified was that 25 of the 34 vehicles to be delivered under the Project Agreement had defects and deficiencies that would prevent them from being available for use. The City noted that OLRT-C had not yet been able to run 15 double-car trains (30 LRVs) on the track. The City outlined 130 issues in Appendix A to its opinion letter, identifying:

- Issues concerning safety, including the incompleteness of the engineering safety and assurance case, or ESAC (which is explained in detail in Chapter 11);
- Issues related to vehicles, including the fact that the City required *all* vehicles to be ready for use; defects related to brakes, doors, communications, and the line contactor; and several items of outstanding work; and
- Several other issues with the transit operations control centre, the supervisory control and data acquisition system (described in Chapter 13), the communications-based train control (CBTC) system (described in Chapter 9), the stations, winter performance of snow removal and switch heater equipment, and the tunnel ventilation system.

On May 13, 2019, the Independent Certifier issued its report rejecting RTG's submission. The Independent Certifier identified 15 items (plus sub-items) that could not be considered minor deficiencies, and that would need to be addressed before the Substantial Completion Certificate could be issued. However, the Independent Certifier also noted that "due to the nature and number of conditions that were not met at the time of issuance of the Substantial Completion Notice and the large volume of documentation that has been submitted post [Substantial Completion] Notice, [this] list is not exhaustive."

The Independent Certifier agreed with the City's position that it was a requirement for Substantial Completion that all 34 vehicles needed to be completed and ready for use. The Independent Certifier specifically noted fleet-wide issues of brake defects (failures relating to the hydraulic pressure units) and door sensitivity issues as two specific examples (among other issues) that needed to be resolved to demonstrate vehicle reliability before Substantial Completion could be certified.

12.2.3 RTG's Second Application for Substantial Completion

On July 22, 2019, RTG delivered its second Notice of Substantial Completion to the City, to indicate once again RTG's belief that the requirements for Substantial Completion had been satisfied. At that time, several of the issues identified by the

City in its objection to the first submission remained outstanding. The Substantial Completion Tracker that had been created to monitor unresolved items after the first submission was attached to the July 2019 submission; it listed 86 issues and noted the current status of each (as "closed," "open," or "monitor"). Several of those items were not marked "closed" and thus remained outstanding, including issues regarding the stations, transit operations control centre, CBTC system, vehicles, and other system-wide issues. Two vehicle issues identified in the Substantial Completion Tracker as affecting reliability were marked as "monitor," with no stated deadline for completion. The City knew that items listed under the Project Agreement as requirements for Substantial Completion, and that the City had previously insisted upon when it objected to RTG's first submission, remained outstanding.

Despite these unresolved issues, the City responded to the July 2019 notice with its opinion on July 26, 2019 and supported RTG's claim to have achieved Substantial Completion. In order to address the outstanding items that were not minor deficiencies, the City and RTG agreed to defer a number of defects, deficiencies, and other outstanding items that they agreed would be completed before achieving RSA (the **deferred work**).

The City and RTG formalized the agreement in the **Substantial Completion Agreement**, and signed it on July 26, 2019 – the same day that the City issued its opinion that RTG had achieved Substantial Completion.

The Substantial Completion Agreement was clear that RTG and the City agreed that the deferred work items were not minor deficiencies (which, under the Project Agreement, had a separate process for correction and completion). However, the parties agreed to treat the deferred work items as though they were minor deficiencies under the Project Agreement. The impact of deferring those items and requirements, and their technical classification as "minor deficiencies" under the Project Agreement, was that the Independent Certifier did not review or consider them when assessing whether Substantial Completion had been achieved. The Independent Certifier was made aware of the Substantial Completion Agreement, but the Independent Certifier was not asked to give an opinion on the deferred work.

From the perspective of the Independent Certifier, the Substantial Completion Agreement profoundly changed the Project Agreement requirements for Substantial Completion. Thus, although the Independent Certifier was aware that many of the same issues that had caused it to reject the earlier submission remained outstanding, the Independent Certifier accepted RTG's second application and issued the Substantial Completion Certificate because the City and RTG had entered into the Substantial Completion Agreement.

Sechiari's evidence to the Commission was that if the City and RTG had not entered into the Substantial Completion Agreement, the Independent Certifier would not have been able to certify that Substantial Completion had been achieved by RTG.

12.2.4 The City and RTG Were Aware That the System Was Not Substantially Complete

Sechiari, of the Independent Certifier, told the Commission that the City and RTG were well aware of what was necessary to achieve Substantial Completion. There had been a long lead-up to RTG's first application for Substantial Completion, during which the parties did extensive work with the Independent Certifier to clarify both what the requirements for Substantial Completion were and how those requirements should be demonstrated. The Independent Certifier discussed with RTG in advance of the first application for Substantial Completion what items were outstanding and why many of them were not minor deficiencies. The parties knew that the "open" items that were part of the deferred work meant that the system was not "substantially complete" within the definition under the Project Agreement.

By July 22, 2019, when RTG delivered its second Substantial Completion notice, key decision makers at the City and the City's consultants were well aware that the OLRT1 system was still facing a number of problems, including vehicles becoming immobilized on the line, difficulty readying vehicles for the morning launch, and issues with fault codes (indications of errors) on vehicles. The City's consultants, STV, were expressing serious concerns in June 2019 to the City about the vehicles and about RTG's ability to execute its maintenance obligations, with Tom Prendergast, of STV, giving RTM a rating of 3 or 4 out of 10 in terms of overall readiness. STV had been expressing concerns for months and continued to do so through the summer of 2019.

Troy Charter, of OC Transpo, told the Commission that these open (unresolved) issues were being addressed over the course of summer 2019, and as a result the City had reason to believe that the OLRT1 system's performance was improving and would continue to improve. However, Richard Holder, the City's lead on trial running, acknowledged that the system-wide issues the City was seeing with the vehicles at the time of the Substantial Completion Agreement would certainly impact the public's enjoyment of the system, and that certain issues, including the number of trains that would be available at RSA, could be considered significant.

Given the ongoing, visible problems with the system and the history of issues with RTG in 2018 and 2019, the City's apparent optimism that the issues it was seeing would be addressed and the OLRT1 system would improve over time was misplaced. The City's

decision to defer certain items in July 2019 so that RTG could reach the milestone of Substantial Completion, when many of those same items had been reason to deny RTG Substantial Completion in May 2019, was made because the City was set on moving the OLRT1 project into trial running, whether it was ready or not.

12.3 The Trial Running Criteria and Process

The final major step before the public launch of the OLRT1 system was the period of trial running, during which the system was to be run *as though* operating for public service, but without passengers, to demonstrate reliability. The Project Agreement (as noted in Chapter 7) was relatively unspecific regarding the criteria that would be applied to achieve a successful demonstration, leaving it to the City and RTG (with RTG's work subcontracted to OLRT-C, as usual) to design and agree upon appropriate criteria. The parties first agreed upon criteria in 2017 when the OLRT1 project was still very much in the construction and manufacturing phase, and little if any meaningful integration testing had taken place. In 2019, when integration testing was complete, the parties reviewed the 2017 criteria and revised them to reflect the performance expectations set out in the Project Agreement.

The 2019 trial running criteria were more stringent than those from 2017 and therefore more difficult to meet, but both the City and RTG believed that the 2019 criteria were appropriate. The parties therefore agreed upon the 2019 criteria and proceeded into trial running on that basis. This section of the report provides a high-level review of what trial running is and how the criteria were developed in 2017 and then replaced with new criteria that the parties agreed upon in 2019.

12.3.1 What Is Trial Running and Why Was It Important?

Trial running is what the name implies: a period of simulated operation (undertaken after testing and commissioning, as detailed in Chapters 9 and 10) that follows the intended schedule and manner of operation in public service to demonstrate that the system can meet expected performance levels safely and reliably. Trial running was required by Schedule 14 of the Project Agreement, which states: "The fundamental objective of Trial Running is to exercise the complete integrated System, including all subsystems, operating personnel and operating procedures, to confirm readiness for Revenue Service Commencement." Holder, of the City, explained in simple terms that trial running would "demonstrate that the system as a whole at the railway level could provide passenger service as would be expected once we moved into passenger service"; it was the "very final step of the process."

Council was routinely told that trial running was the step in the OLRT1 project's construction that would demonstrate reliability, and that strict adherence to the trial running requirements was necessary to protect the public. Thus, when RTG made a proposal to the City in September 2018 to ease the trial running requirements so that RTG could achieve RSA earlier, John Manconi, the City's General Manager of Transportation Services, told the Finance and Economic Development Committee (FEDCO) that the City was rejecting RTG's request, writing: "A dilution of the prescribed Trial Running requirements that are outlined in the [Project Agreement] and have been contractually agreed to by RTG degrades the ability of the City to be assured that the system will operate as designed – a risk that the City is not prepared to take."

Throughout the late stages of the OLRT1 project, including into the spring of 2019, Council was routinely told that trial running required meeting demonstrated success for a period of 12 *consecutive* days. That was the language in the Project Agreement, and it was confirmed to Council in May, June, and July 2019 – for example, Council was advised that the objective of trial running is to "complete 12 consecutive days of regular scheduled service." Not surprisingly, City councillors told the Commission that they had understood that trial running required meeting the required service thresholds for 12 consecutive days.

It was appropriate for RTG and the City to underline the importance of trial running in their communications with one another and with key stakeholders. Trial running was indeed a critical step that would determine whether the OLRT1 project was sufficiently reliable to open for public service. It was also appropriate for the City to insist on strict compliance with the trial running criteria, as it did in September 2018, when it rejected RTG's request to water down those criteria.

12.3.2 Development of 2017 Criteria for Trial Running

The Project Agreement stated that trial running would be conducted for a period of 12 consecutive days following successful completion of all testing and commissioning. However, beyond that statement, the Project Agreement was generally silent about the criteria required to confirm readiness for public service. Thus the City and RTG (through OLRT-C) were left to develop and agree upon the appropriate criteria.

That effort was first made in 2017, with the City's independent experts (at the instruction of Manconi) taking the lead. The criteria developed in 2017 were somewhat vague, at least as compared to the later 2019 criteria. The key components of the 2017 criteria were:

- Each day would be evaluated via a scorecard setting out specific metrics, and the day would be scored as a "pass," "fail," "repeat," or "restart"; and

- The system had to demonstrate an **aggregate vehicle kilometre ratio (AVKR)** of a minimum of 90 percent per day (with the minimum during peak service of 88 percent), no three consecutive days below 94 percent, and an average of 96 percent or higher over 9 of the 12 days. (Note that AVKR essentially refers to the ratio of number of kilometres travelled to intended kilometres, expressed as a percentage.)

Many aspects of trial running were left unaddressed in 2017. For example, what would be included in the scorecard and what would the required performance measures for the maintenance system be?

In hindsight, there are reasons to question whether the parties could or would have begun trial running in 2019 using the 2017 criteria. The 2017 criteria left important issues undefined, such as the criteria for demonstrating maintenance readiness. The 2017 criteria also used AVKR thresholds that the City's evidence suggests may have been too low. For example, the 2017 criteria call for a minimum of 90 percent per day, with only 88 percent during peak service, but Michael Morgan, Director of Rail Operations for the City, testified that an AVKR of 90 to 91 percent would ruin passengers' commute to work. In any event, as described below, the City and RTG did not proceed into trial running using the 2017 criteria. Instead, they developed and agreed upon new criteria in 2019.

12.3.3 The City and RTG Agree upon New Criteria in 2019 That Match the Performance Required under the Project Agreement

When the OLRT1 project was close to being ready for trial running in 2019, the City and OLRT-C revisited the trial running criteria. It was reasonable for them to revisit the criteria in 2019 because, by that point, the OLRT1 system was closer to being complete and the parties had more information about what they were testing, including reliability issues that arose in the interim and were a problem in the summer of 2019. For example, there were concerns at the time about the brakes, doors, and switches – concerns that did not yet exist in 2017. It is therefore reasonable for the parties to have taken a second look at the criteria that they'd agreed to back in 2017, when the parties had significantly less information about the system than they did in 2019.

The effort to develop new criteria was led by Slade (of OLRT-C), Russell Davies (the City's consultant), and Holder (a City employee). They reviewed the 2017 criteria and determined, as Slade told the Commission, that it had "errors in it" and would be "difficult to apply." They therefore started working on new criteria.

Drafts of the new criteria for trial running were prepared as early as December 2018; they were circulated among OLRT-C and the City in March and April 2019, and ultimately

finalized in July 2019. Slade and other witnesses confirmed that the basis for the 2019 criteria was the performance expectations set out for the OLRT1 system in the Project Agreement. This alignment was intentional: it made "complete sense" to OLRT-C, said Slade, to hold the OLRT1 system to the same requirements to which the City would be holding RTM under the maintenance contract, and RTG wanted to protect RTM from failing to meet the Project Agreement requirements by ensuring that the OLRT1 system could meet those requirements at the time of trial running. Holder similarly agreed during his evidence that the 2019 criteria more closely resembled the expected performance of the OLRT1 system than did the 2017 criteria.

The 2019 criteria were captured in a detailed document drafted by OLRT-C and titled "Trial Running Test Procedure." The test procedure stipulated specific requirements for AVKR, headway (time and distance between vehicles), station availability, maintenance performance, and major systems availability.

The 2019 criteria also set out in detail the process for conducting trial running and scoring the performance each day. Each day's performance would be reviewed by the **Trial Running Review Team (TRRT),** which consisted of three representatives from the OLRT1 project companies (RTG, OLRT-C, and RTM) as well as one representative from each of the City, OC Transpo, and the Independent Certifier. A considerable amount of data was collected each day, then analyzed and synthesized during a morning meeting the following day by the Morning Team (not the TRRT). The TRRT met daily at 2 p.m. to receive the Morning Team's analysis and determine how to score the previous day. There were 21 individual components to the scorecard, and an overall decision about whether the day was a pass, fail, repeat, or restart. (An example scorecard is reproduced later in this chapter.)

The Commission finds that the 2019 criteria were (1) developed deliberately and after due consideration of the shortcomings of the 2017 criteria, (2) considered appropriate by the City and RTG, (3) clearly agreed upon by the City and RTG, (4) appropriately aligned to the Project Agreement service requirements, and (5) devised at a time when the parties had the best possible knowledge of the system.

12.3.4 The 2019 Criteria Were More Stringent and Difficult to Meet

There is no question that the 2019 criteria imposed a higher threshold on the OLRT1 system's performance than did the 2017 criteria. Though there were many differences, the crucial difference between the two versions was related to the AVKR standards. AVKR was a critical metric, because it was the best representation of vehicle reliability for passengers once the OLRT1 system opened.

The 2017 criteria required an average AVKR of 96 percent for the best 9 of 12 days. In contrast, the 2019 criteria required an average AVKR of 98 percent over the full 12 days. Morgan testified that, although the difference between 98 percent and 96 percent may not be noticeable to transit users on a single day, the difference becomes more significant when averaged out over 9 of 12 days. Averaging the performance out over 9 of 12 days, as the 2017 criteria did, meant that the system could perform at, for example, 91 percent (a level that, as Morgan described it, would ruin someone's commute) for up to one-quarter of the trial running period and still pass.

An important aspect of the criteria – both the 2017 and 2019 versions – is that there was room for the exercise of discretion in applying the criteria. The TRRT could decide whether a failure to meet one or more of the 21 pass/fail criteria meant that the day should be scored a pass or fail. Critically, the discretion was protected from interference for political or financial reasons, because the TRRT consisted of professionals with relevant expertise and did not include senior decision makers from the City. The TRRT daily meetings were to be private, with no computers or phones permitted in the room.

12.3.5 The Role of the Independent Certifier

The Independent Certifier was ultimately responsible for signing off on each day's scorecard and overall grade (pass, fail, and so on). However, that should not be confused with the Independent Certifier being responsible for scoring. As with most of the Independent Certifier's functions (described in Chapter 7), the Independent Certifier would take direction from the City and RTG, and would not intervene if those parties agreed on any specific question. So, if the City and RTG agreed that a particular day was a pass (whether because the performance criteria were met or because the TRRT chose to exercise its discretion to grant a pass), the Independent Certifier would accept that. The Independent Certifier also had no role in developing the trial running criteria.

12.4 Detailed Review of the Trial Running Period

Trial running began July 29, 2019, and was declared successfully completed on August 23, 2019. The trial running period is among the most important in the life of the OLRT1 project.

Trial running began under difficult conditions: the OLRT1 system was not performing reliably, and both the City and RTG faced enormous pressure to get the system open for public use. Members of Council were keenly interested in seeing how the OLRT1 system performed.

Unfortunately, the OLRT1 system did not do well during trial running, repeatedly failing to meet the criteria established in 2019. These failures and the pressure to open the system to public use combined to cause poor decision-making by both the City and RTG. Most significantly, the City and RTG agreed to revert to the easier and flawed 2017 criteria, because the OLRT1 system simply could not pass if they continued to use the 2019 criteria. Rather than acknowledge the problem and seek expert advice about what to do, the City and RTG instead agreed to revert to the easier standard, but there is a lack of any documented expert or other analysis of the reasons for and consequences of doing so.

As will be seen, the City's decisions during trial running were being made by a select group of people who were given full and accurate information, rather than by the City Manager (to whom sole authority had been delegated), the FEDCO (the Council committee responsible for the OLRT1 project), or Council.

12.4.1 Information Sharing as Trial Running Began

From the start of trial running, Council was keenly interested in knowing how the OLRT1 system performed. Council had repeatedly been told that trial running was the demonstration of reliability that would ensure that the system was ready to open and that Council members would be kept apprised of all relevant information about it. For example, senior City staff were directed in early 2018 to provide monthly updates to the FEDCO, and thereafter the monthly memos to Council from City staff referred to the "ongoing commitment to keep Council apprised of the progress of the

O-Train Confederation Line Stage 1," and included detailed updates. There can be no question that City staff had committed to sharing information about the OLRT1 project with Council. This was appropriate, given that the OLRT1 project was the largest infrastructure project in the City's history and substantially affected the daily lives of Ottawa's residents and visitors.

Information sharing was also important because of the difficulties and delays that had already been experienced with the OLRT1 project prior to the start of trial running. Several RSA deadlines had been missed, and unreliable performance was a cause for concern.

Unfortunately, as discussed in greater detail below, information sharing with the FEDCO and Council started to break down in the weeks before trial running. The problem began on July 10, 2019. On that date, City staff provided what proved to be the last FEDCO update until after trial running was complete. The PowerPoint presentation from that meeting reviewed the process for trial running and stated that, "once RTG has achieved all Trial Running requirements, staff will inform Council." That statement was repeated almost verbatim in a July 22, 2019 memo to Council. In its submissions to this Commission, the City relies upon those two documents as evidence that City staff made an *express commitment* not *to update Council until after trial running was complete*. The Commission's findings with respect to that alleged commitment are set out later, in section 12.5.3. The City's position in this Inquiry has been that those statements were an express commitment *not* to update Council, and City witnesses such as Kanellakos rejected any suggestion that no such commitment was made.

The information sharing and commitment to keeping Council informed also broke down in mid-July 2019 with the creation of what will be referred to here as the **WhatsApp Group**. (Its members used WhatsApp, a messaging platform in which multiple people can exchange messages in a group via their smartphones.) This was a group of key personnel initially consisting of the Mayor's Chief of Staff, Serge Arpin; Councillor Allan Hubley, Chair of the Ottawa Transit Commission; City Manager Kanellakos; John Manconi; and two other people in the Mayor's office. (Mayor Jim Watson was later added to the group.)

This select group of people was receiving real-time updates throughout the trial running period, and as a result, had knowledge of the events described below. In contrast, Council as a whole did not receive the information shared in the WhatsApp Group, and thus did not have the benefit of any meaningful insight into the trial running results.

12.4.2 Performance Issues Heading into Trial Running

Heading into trial running, there was good reason to be concerned about the OLRT1 system's reliability and readiness for what was anticipated to be public launch by September 2019. Although trial running was not yet under way, the trains were being launched and run daily as part of the testing and commissioning process, and the City's experts, including from STV, were expressing concerns about reliability in June and July 2019, as they had been for months. RTG was also concerned about reliability and noted during a July 25, 2019 board meeting that faults with the trains continued to make it difficult to get 15 coupled trains (30 LRVs) on the track reliably. Those concerns were borne out: the train launch was quite disappointing on both July 25 and July 26. Manconi told the WhatsApp Group that July 25 was the first day applying the Project Agreement requirements to the launch and that "unfortunately RTM did not do well. Only 4 vehicles [of 15] are on the line." The next day, only 5 trains launched because the "others did not meet launch criteria."

Mayor Watson agreed during the public hearings that this information was cause for concern and that he was concerned. However, on July 27, 2019, Manconi delivered a memo to Council advising that trial running would start on July 29. Council was advised that trial running would consist of 12 consecutive days of regularly scheduled service, which Mayor Watson agreed a councillor would reasonably understand to mean 12 straight days (rather than the 9 of 12 days prescribed by the 2017 criteria that had been superseded). The memorandum did not advise Council of the ongoing concerns expressed by the City's experts, the poor performance in the days leading up to trial running, or the Mayor's ongoing concerns.

This was the unfortunate start of a period in which Council was not given accurate or complete information about what was happening during trial running and, as such, could not exercise its oversight function. That lack of transparency is described in detail in section 12.5.2.

12.4.3 Start of Trial Running and the Early "Pause"

The start of trial running was disastrous. The first day, July 29, was scored as a "fail" and many individual items on the scorecard were not even close to passing. The AVKR was below 86 percent (the minimum was 90 percent; recall that even that threshold was described by Morgan as ruining users' commute to work). The travel time was too long. The ratio of trains successfully completing trips fell far short of the 2019 criteria requirement. Station subsystems such as the closed-circuit television (CCTV) cameras and passenger information system failed.

July 30 was arguably worse, with headway and station ratios badly missing the scorecard criteria, station availability failing, and AVKR again at approximately 86 percent. The day was scored a "repeat." That same day, Deloitte advised the City that the **integrated management information reporting system (IMIRS)** was not providing reliable data. (The IMIRS, described in Chapter 13, is the computer system RTG used to track work orders.) That was a problem because, as the TRRT minutes put it, the City and RTG were "heavily reliant" upon the IMIRS to demonstrate and confirm that the maintenance system was ready for public launch.

On Day 3 of trial running, July 31, the OLRT1 system showed poor performance again. The scorecard for that day is shown in Figure 12-1.

After the July 31 results, the TRRT decided to "pause" trial running. The Trial Running Test Procedure (the document that captured the 2019 criteria) described a pause as being available in "exceptional situations," for example, to address any gaps in systems discovered during trial running or to conduct further investigation of a safety incident. If a pause was taken, the Test Procedure required a restart from Day 1.

Mayor Watson was upset about and concerned by the early failures and the need for a restart, and he wanted information so that he could decide whether to act. He obtained that information from staff, including via the WhatsApp Group chat, which gave him direct and immediate insight into the extent of the issues. Manconi apparently shared that concern and felt that Council should be informed about the poor start to trial running and the need for a restart. Manconi thus drafted a memo dated July 31, 2019 to Council to advise of the OLRT1 system's struggles, obviously feeling that it was appropriate to inform Council of this significant step (the use of the exceptional "pause and restart" option). However, that memo was never sent to Council. Manconi explained to the Commission that City Manager Kanellakos "reminded" him that they had committed not to update Council unless and until trial running was complete. That alleged "commitment" is the City's explanation to this Commission for the decision not to send that important memo to Council, which meant that Council did not have the chance to learn of Mayor Watson's concern and did not have the opportunity to inform itself and potentially act.

Figure 12-1: Trial Running Scorecard, July 31, 2019

OTrain Confederation

Trial Running Scorecard (Rev 07)

Date:	Wednesday, July 31st, 2019
Trial Running Day # :	3

Overall Pass/Repeat/Restart

Restart

		AM	PM	Average
Safety	PASS			
Operational				
Travel Time (ATO Mode) 23 mins	Fail	00:22:50	00:27:08	0:24:59
Weekday Headway 3 out of 4 required for pass	Fail			

		Scheduled No. Trains	Actual No. Trains	Ratio %
1 Morning westbound – Arrivals at Lees Between 06:45:00 and 08:45:00 average headway 3 min 25s = 35 Trains Pass Ratio = 33 Trains 94%	Fail	35	25	71.4%
2 Morning eastbound – Arrivals at Pimisi Between 06:45:00 and 08:45:00 average headway 3 min 25s 94% = 33 Trains Pass Ratio = 33 Trains 94%	Fail	35	23	65.7%
3 Afternoon westbound – Arrivals at Rideau Between 15:00:00 and 18:00:00 average headway 4 min 00s = 45 Trains Pass Ratio = 42 Trains 93%	Fail	45	25	55.6%
4 Afternoon eastbound – Arrivals at Lyon Between 15:00:00 and 18:00:00 average headway 4 min 00s = 45 Trains Pass Ratio = 42 Trains 93%	Fail	45	25	55.6%

Maintenance Delivery

Maintenance practices	fail			
Demonstration of IMIRS process	PASS			

Vehicle Availability	**Aggregate Vehicle Km Availability Ratio (AVKR) Ratio**		AVKR Daily		
			Scheduled KM	Actual KM	AVKR Ratio %
AVKR (minimum daily average)	90%	Fail	12,217	9,027	73.9%
AVKR (average over 12 days)	98%		N/A	N/A	N/A

Station	**Ratio**		ASAX Daily		
			Scheduled Service Hours	Actual Hours	ASAX Ratio %
Availability	99.7%	Fail	269.62	256.62	95%
Customer Systems & Other Major System	**Ratio**				
Traction Power	99.5%	PASS	214.2	214.2	100.0%
Passenger Announcement System	99.5%	Fail	269.62	186.32	69.1%
Passenger Information System	99.5%	Fail	269.62	166.61	61.8%
Fare Control Gates	99.5%	Pass	269.62	269.62	100.0%
Ticket Vending Machines	99.5%	Pass	269.62	269.62	100.0%
CCTV Cameras	99.5%	Fail	269.62	0	0.0%
Tunnel Ventilation System	99.5%	Pass	269.62	269.62	100.0%
Station Lighting	99.5%	Pass	269.62	269.62	100.0%
P25 Radio	99.5%	Pass	269.62	269.62	100.0%
Fire Monitoring & Suppression	99.5%	Fail	269.62	249.12	92.4%

Name	Company	Signature
Claude Jacob	RTM	
MATTHEW SLADE	OLRTC	
PETER LAUCH	RTG	
RICHARD HOLDER	OTC	
Troy Charter	OCT	
WILL ALMAN	OLRTC.	
Kyle Campbell	Altus	

Source: Independent Certifier

I find that quashing this memorandum was inconsistent with Kanellakos's obligation as City Manager to keep Council informed about important matters and was an act of intentionally misleading Council. I further find that Mayor Watson, by not ensuring this information was provided to Council, prevented Council from exercising its statutory oversight authority. Mayor Watson had a duty to "ensure the accountability and transparency of the operations of the municipality, including the activities of the senior management of the municipality." These obligations are not mere words on a page; keeping Council informed is a critical element of municipal governance.

The City provided the Commission with an expert opinion from Mary Ellen Bench, a lawyer specializing in municipal law and affairs. Bench offered evidence about typical delegation and communications between Council and staff, as well as opinion evidence with respect to whether the communications in this case were consistent with the *Municipal Act, 2001*. Bench's evidence does not change my findings, for the following reasons.

1. Bench's evidence regarding interpretation of the *Municipal Act, 2001* is not of any assistance because her evidence is tendered as expert evidence, and expert evidence does not assist in interpreting the law;
2. Her evidence regarding typical municipal government delegation and information sharing or communication is not seriously disputed. I have accepted that it is not necessary for Council to receive precisely the same information as the Mayor does, or at precisely the same time. However, Council must be given important information about major projects and must receive that information at a time when Council can act on it; and
3. For the reasons set out in this chapter, I disagree with and reject Bench's evidence that the governance, delegation, and communications / information-sharing decisions in this case were appropriate.

It is also obvious in retrospect that the pressure was mounting during trial running, and that the pressure was contributing to a breakdown in governance and communication. As a result of this pressure, which Kanellakos agreed was "acute," Mayor Watson became directly involved in discussions about how trial running should be undertaken. For example, Mayor Watson suggested that trial running could restart on a Friday but using a weekend schedule so that it would be easier to pass the first day. This insertion was unnecessary and unhelpful. That is not to suggest or find that the Mayor was inappropriately inserting himself into the process on an ongoing basis; only that the Mayor providing ideas as to how trial running might be conducted was an example of the breakdown in process that occurred as the result of the ongoing, increasing pressure.

What ought to have happened is that City staff should have made these decisions, in consultation with experts. Where a decision was sufficiently important to be escalated to elected officials, that had to be done through the standard process of Council committee and, where necessary, Council.

12.4.4 August 2–9, 2019, the Emergency Briefing, and the Reversion to the 2017 Criteria

The OLRT1 system started to perform better after returning from the pause taken on August 1. The trial running restart began with a new Day 1 on Saturday, August 3, 2019, rather than Friday, August 2, making it easier to pass because the weekend schedule was less demanding than the weekday schedule in terms of the number of trains that had to launch and how frequently they ran. The system passed on August 3, and again on August 4, 5, and 6. However, despite the overall "pass" grade, there were still reasons to be concerned on those days. There were days that maintenance, an ongoing source of problems, was scored a "fail," and station subsystems continued to fail to meet the required thresholds. The AVKR fell below the required average of 98 percent on three of the four days, and on August 6 (the last "pass" day), it was 91.1 percent – a rate that was bad enough to ruin the commute, even if technically a pass.

The system's performance then took a significant turn for the worse on August 7 and 8. August 7 was a terrible day, with failures in nearly all categories and an AVKR ratio of just 85.2 percent. August 8 was worse. The moderately improved performance of August 3–6 was gone, and the City and RTG were searching for answers.

Unfortunately, the combination of intense pressure on both the City and RTG and poor performance led to people who were not on the TRRT interfering with trial running. This is apparent from the conduct of those parties on August 7 and 8. The most obvious and significant example is the decision to revert to the easier 2017 trial running criteria as a means of securing a "pass" for the OLRT1 system on trial running, thus allowing public launch to occur. The process, which concluded on August 16, appears to have started early in the morning on August 7. The launch did not go well that morning, and Manconi sent a chat message asking Morgan to bring him the language from the Project Agreement that required a 98 percent AVKR threshold for trial running. The only apparent reason for doing so would be to review the criteria and begin to consider possibly changing it somehow in order to make it easier to pass trial running.

Manconi then met on the evening of August 7 with RTG and OLRT-C, and it appears from a contemporaneous email summarizing that meeting from Peter Lauch, of RTG, that Manconi began a discussion about how the parties could use their discretion and

make changes to trial running in order to ensure a pass. Lauch cites an email from Slade, which states that OLRT-C expected the score from that day to be a "fail" (which, because of past "fail" days, would require a restart) and that OLRT-C tried to "make a case" that it could be a "repeat" rather than a "restart," characterizing this as a "favour" it needed from the City. The summary email then notes that Manconi asked "'what's in it for me' to get you a PASS on Trial Running." At the public hearings, Manconi denied making the "get you a pass" comment. Other witnesses could not recall whether he had said that, though they confirmed that Lauch's email summary was the best evidence they had of who had said what at the meeting.

The statements attributed to Manconi in the email are entirely consistent with what else was being said and done by Manconi and Kanellakos around that time. On August 8, Manconi was asking his team (via another WhatsApp messaging group he had with City staff and STV) whether August 7 and 8 would be scored a "fail" and, if so, whether trial running could still be successfully completed by August 16. He was advised that there would likely have to be a restart. On August 9, Manconi responded to a question from the Mayor's office about the impact of the August 7 and 8 results by stating that he had a "bigger strategy" he was bringing to the group.

Regardless of what precisely Manconi said on August 7, there can be little doubt that Manconi was not on the TRRT and yet was engaged in a process of trying to figure out what could be done to ensure the OLRT1 system passed trial running and could therefore open for public use. This was not appropriate. Trial running was supposed to be a rigorous demonstration of reliability, overseen by professionals with the relevant expertise, and without external interference from senior officials who had their own motives. It was wrong for Manconi to prioritize finding a way to stay "on schedule" by interfering with the criteria being used and how discretion was being exercised by the TRRT, rather than delivering a reliable system.

August 8 and 9 brought further pressure on City staff. Manconi reported to the WhatsApp Group – the select group of people including the Mayor's office who were receiving real-time updates – that the morning launch had not gone well, and the Mayor's office advised that the Mayor wanted to know why spare trains had not been launched. Mayor Watson testified that this "wasn't a minor issue" and his question was a "pretty major request." Manconi noted later on August 8, in his messaging group with senior City staff and STV experts, that he was being called in to the Mayor's office that afternoon for an "emergency briefing."

Pressure on both City staff and RTG caused the parties to agree to revert to the 2017 trial running criteria. There is good reason to think that the suggestion came from the City: Manconi had asked his staff on August 7 for the Project Agreement language

that referred to the 98 percent, and he called a meeting on August 9 at which the issue was first raised with RTG and OLRT-C. Slade, of OLRT-C, testified that Manconi was the proponent of the plan to revert to the 2017 criteria and that Manconi told RTG that, if it formally asked to revert to the easier 2017 criteria, the City would agree. Other witnesses, including Manconi and Larry Gaul, of STV (who was a member of the TRRT) said that the suggestion came from RTG. Morgan acknowledged that Manconi played a large role in the change but could not recall who specifically suggested it.

The change to the trial running criteria appears to have been made without any substantive analysis of the reasons for and consequences of making the change. Prendergast, of STV, testified that he did not recall STV being asked for its opinion about whether the change in criteria was appropriate. City witnesses were adamant that there had been a robust discussion with STV, including Prendergast. However, documents from the same time suggest that STV (specifically Prendergast) continued to operate on the basis of the 98 percent standard, which is inconsistent with STV having participated in discussions to lower the threshold to 96 percent.

In the end, it does not make much difference who suggested the change to the 2017 criteria, or how involved the experts were in the decision, if at all. The more important point is that the City and RTG were searching for ways to pass trial running regardless of the reliability problems, each for their own reasons: political, in the City's case; financial, in RTG's. They therefore decided together to revert to a set of criteria that were developed earlier in the OLRT1 project's life, criteria that had been reviewed and rejected just a few months earlier by those responsible on both sides in favour of stricter criteria – and all of this was apparently done with limited analysis.

This reversion to the 2017 criteria took place at a time when the reliability problems were persistent and would have been obvious to both RTG and the City. There can be no doubt that all parties were aware of this. STV advised Manconi on the evening of August 8 that "the reliability of the system is not where it needs to be to provide dependable service." Manconi is reported to have told RTG and OLRT-C during the meeting on the evening of August 7 that even the days on which the system had passed (August 3–6) would be "horrendous" customer experiences.

12.4.5 Performance, August 9–23, 2019

Over the period from August 9 to August 23, the OLRT1 system continued to have days of good performance and days of poor performance. August 9–13 were each a "pass" but August 14 and 15 failed badly and were scored as "repeat" days. The parties then acted on the August 7–9 discussions by agreeing to revert to the 2017 trial running criteria. RTG sent the City a letter on August 16, 2019 confirming the agreement. That

letter is difficult to accept at face value, as it states that the parties had demonstrated that the system could perform to the 98 percent threshold, which it quite clearly had not done. It goes on to state that it was therefore appropriate to move into another "phase" of trial running in which the 2017 standards would be applied – but two phases with different standards had not previously been contemplated. The letter also suggests that the change was appropriate in order to account for causes of reliability problems that were not OLRT-C's fault, but Slade confirmed that that issue was already accounted for in the 2019 criteria.

The system then barely passed on August 16, which was the first day scored according to the 2017 criteria. Although the system continued to pass on subsequent days and ultimately was given a "pass" based on the 2017 criteria of 9 of 12 days at 96 percent AVKR, there were ongoing reasons for concern. Many of the "pass" days did not score well, for example, with ongoing failures of station subsystems such as the CCTV and the passenger information system (which Manconi referred to as a "safety issue"); low AVKR on pass days (e.g., 92.3 percent on August 16); and repeated failures on the maintenance metrics.

Trial running was deemed complete on August 23. The City asserted that the "overall" AVKR was 96.9 percent, but that is inaccurate if it is intended to reflect all days on which trial running took place. If *all* days on which trial running was conducted are considered, the AVKR was approximately 93.5 percent. Nearly every witness who testified about trial running and reliability agreed that there were ongoing reliability problems right to the end of (and indeed after) trial running. Mayor Watson acknowledged concern all the way through trial running. So, too, did the City's expert Prendergast, of STV; and Holder, the City employee responsible for trial running.

The Commission finds that the determination by the City and RTG that the system had passed trial running was only possible because the criteria were changed and discretion was applied for the purpose of achieving a pass. This conduct was not consistent with the goal of trial running, which was to demonstrate that the system could reliably perform as intended.

12.4.6 The Approach to Maintenance Review

In the summer of 2019, both the City and RTG were concerned about the maintainer's readiness to handle the burden it was expected to bear at the start of operations (which is discussed in detail in Chapter 13). In light of these concerns, and the crucial role that maintenance plays in providing reliable service, maintenance should have been a focus during trial running. It was not.

The parties expected there to be a heavy load on the maintainer at the start of public service given that the OLRT1 system was new, with a fleet of vehicles plagued by reliability issues; OC Transpo was new in its role of operator of an LRT system; and the critical operator-maintainer relationship between OC Transpo and RTM was new. Several other factors further increased the pressure on maintenance going into operations, including a growing maintenance workload, concurrent work and retrofits being done on the vehicles, a disorganized handover of the OLRT1 system, and an under-resourced maintenance team. These overlapping maintenance issues would negatively affect service reliability at the start of operations.

In particular, both the City, on the one hand, and RTG, OLRT-C, and RTM, on the other, were concerned that Alstom did not have sufficient resources devoted to maintenance in the lead-up to public service. Yet RTM had subcontracted vehicle maintenance to Alstom because they were Alstom vehicles and Alstom was seen to be in the best position to handle the vehicle maintenance. The City and RTG pushed Alstom to increase its staffing in the summer of 2019. Although Alstom responded to this request, its staffing did not reach the levels the City and RTG wanted, and their concerns continued.

STV, the City's expert consultants, also expressed concerns about maintenance readiness that went beyond resourcing levels. For instance, Prendergast evaluated RTM's maintenance readiness as a 3 or 4 out of 10 in an email he sent to high-level OC Transpo staff on June 24, 2019, about a month before the start of trial running. He flagged several issues of particular concern, including lean maintenance resources; Alstom staff's inexperience in performing inspection, maintenance, and troubleshooting functions; issues managing the MSF yard; and outstanding vehicle issues that would have to be resolved using space and resources in the MSF. Scott Krieger, of STV, also shared these concerns.

Maintenance readiness concerns continued into trial running. Gaul, of STV, wrote to Charter, of OC Transpo, on August 7, 2019 about RTM's failure to manage the delivery of **inspection sheets**, which is paperwork that must be submitted to verify that the trains the maintainer was releasing to OC Transpo in the morning were safe and ready for service. Gaul described this failure as "just another example of how unprepared they are for Trial Running." Gaul explained to the Commission that the inspection sheet process is a basic aspect of the launch procedure followed every day that is "very easy … to manage." Despite this, and despite OC Transpo having raised the issue with RTM before, RTM could not seem to "get this process down" – even though it was by that point well into trial running. Toward the end of trial running, and in the period between trial running and the start of public service, issues with maintenance performance, including inspection sheets, continued. These issues, Gaul explained, were "known by the OC Transpo staff and everybody associated with the start up of this railroad … for months."

In the context of these well-founded and widely shared worries about maintenance readiness, trial running should have robustly tested maintenance. Instead, maintenance performance was assessed randomly, rather than rigorously, and was given relatively little attention.

Only 2 of 21 line items on the trial running scorecard directly assessed maintenance performance: they were labelled "Maintenance practices" and "Demonstration of IMIRS process." The "Demonstration of IMIRS process" was qualitatively assessed by the TRRT and the Independent Certifier.

Maintenance practices were evaluated based on an audit of no more than five randomly selected work orders per day. The TRRT assigned a "pass" or "fail" each day based on its assessment of the work orders, which was more focused on the quality of the work order than on the quality of the actual maintenance activities performed in response to it. Indeed, Gaul, of STV and the TRRT, noted that work orders reflect "actual work performed if they're properly filled out." He also acknowledged that the random nature of the evaluation made it fairly easy to miss maintenance issues. Further, issues that would not find their way onto a work order, like the vehicle inspection sheet issues addressed above, were not captured by the "Maintenance practices" assessment.

The TRRT had discretion to override a failing grade on either the "Maintenance practices" or "Demonstration of IMIRS process" metrics and mark a day an overall "pass," if it provided a note to justify that judgment on the day's scorecard. The TRRT used that discretion often. For example, maintenance failures were logged on 13 of the 25 days of trial running. On 7 of those 13 days with maintenance failures, an overall "pass" was given by the TRRT. Further, 5 of those 7 days were part of the 12 consecutive days used to grant a "pass" on trial running.

Gaul was "a little surprised" that the TRRT decided to override maintenance failures to grant overall passes for 7 days. While he said that the TRRT would have "fully vetted" any maintenance failures before granting a pass, and he thought that many of the failures related to paperwork deficiencies, he agreed that the notes the TRRT included at the bottom of the daily scorecards to justify passing were fairly cursory. Gaul also stated that "in hindsight maybe there should have been a more stringent metric for performance of maintenance" than assessing randomly selected maintenance work orders.

Further, some of the daily maintenance sheets (recording success or failure on the five sample maintenance tickets) are internally inconsistent. For instance, the scorecard for August 2, 2019 indicates that three of five work orders are incomplete, and includes notes for all three of those work orders stating that the "completion comments" are "insufficient" for two of them and not completed at all for the third. Yet, the scorecard

recommends a “fail” for two of those work orders, and a “pass” for the other (which is also marked untimely). The scorecard does not explain or justify this apparent inconsistency. Several other scorecards similarly include passes granted for incomplete work orders.

Notably, the scorecard for August 2, 2019 reflects a disagreement between representatives from RTM and OC Transpo about the overall recommendation for the day’s maintenance practices score: the RTM representative recommended that the overall score be a “pass” and the OC Transpo representative recommended that it be a “fail.” Even though three of five work orders were classified as failures, and one of the work orders classified as a “pass” was marked “incomplete,” the TRRT erred on the side of leniency and gave the day a “pass” on maintenance practices.

In summary, maintenance plays a central role in providing reliable service. The evaluation of maintenance performance during trial running should have been stricter and should have been given more weight in the overall daily score, particularly in light of ongoing concerns about maintenance readiness. This ought to have been apparent to RTM, RTG, and the City in the summer of 2019 – no hindsight is necessary.

12.5 Decision-Making and Transparency during Trial Running

A troubling aspect of the City's conduct during the summer of 2019 is the process of decision-making and information sharing immediately prior to and during trial running.

12.5.1 Decision-Making

Decision-making with respect to the OLRT1 project was delegated to the City Manager by the December 2012 Delegation of Authority. The City Manager was given broad authority to oversee the OLRT1 project, including the power to amend the Project Agreement, with a responsibility to report to Council and seek Council's direction on significant matters.

That delegation of authority broke down in the summer of 2019, as evidenced by the creation and operation of the WhatsApp Group. The select membership in the WhatsApp Group – including City Manager Kanellakos, the Mayor (through his staff) and Manconi – were the only senior executives or councillors within the City who had accurate information about trial running, and although Kanellakos denied that the Mayor and Hubley were participating in decision-making, Mayor Watson testified that the group of people on that WhatsApp chat were indeed making decisions about how to proceed, what information to share with Council, and when. Mayor Watson stated that the people on the WhatsApp Group were the "decision makers," including with respect to deciding when to update Council.

There are three problems with the creation of this small body of decision makers with exclusive access to important information.

First, it is inconsistent with the 2012 Delegation of Authority to the City Manager (Kanellakos) and with Council's designation of the FEDCO as the Council committee that would interact directly with staff on the OLRT1 project. The 2012 Delegation of Authority did not include licence to create a small working group that would have immediate access to all relevant information and make decisions among themselves based on that information without sharing it with Council.

Second, having Mayor Watson participate directly in decision-making related to trial running encouraged political interference with trial running, a process that was supposed

to be independent of such interference. That independence, and trial running itself, would protect the residents of Ottawa by helping to ensure delivery of a reliable LRT system. This was a problem both in principle and in practice. As a matter of principle, witnesses who testified at the public hearings repeatedly stated that it was important to respect the delegation of authority and maintain the separation between City staff and the City's elected officials. That is a sensible approach, because it helps to prevent elected officials from influencing City staff's decision-making for political reasons. As a matter of practice, the political influence was real. Mayor Watson had been involving himself in the small, precise details of the OLRT1 project in the early days and again as the construction and manufacturing phase came close to completion in late 2018 – failing to heed his own warning from the 2010 mayoral campaign that politicians should not be meddling in infrastructure projects.

Third, the existence of this small group of people who were sharing information and making decisions was misleading to Council. Any member of Council who wanted to know who was making decisions related to the OLRT1 project would have looked to the 2012 Delegation of Authority and understood that the City Manager had broad authority over the OLRT1 project, *not* the City Manager plus Mayor Watson. As Kanellakos testified, the "whole point" of a clear, written delegation of authority is so that everyone knows who is responsible for what. Councillor Diane Deans testified that the existence of the WhatsApp Group, which only came to light during the Commission's public hearings, proved what Council had previously suspected: that there was an "inner circle" of people with access to information and decisions to which the rest of Council was not privy.

City witnesses (principally, Manconi, Kanellakos, and Mayor Watson) asserted to the Commission that the WhatsApp Group was not a problem, essentially advancing two arguments in support of that assertion. The first is that the WhatsApp chat application was a simple matter of expediency and efficiency. That argument does not address the problem, because if it were simply about efficiency, then the rest of the FEDCO could have been added to the WhatsApp Group and the rest of Council would have had access to the same information at the same time.

The City's second argument is that sharing information only with the Mayor and Councillor Hubley was appropriate because they were the chairs of the FEDCO and the Transit Commission, respectively, and as such had every reason to get more information and get it faster than the rest of Council. Again, that is not a reasonable answer. The Mayor acknowledged that the WhatsApp Group was not part of the additional briefings that committee chairs would receive prior to committee meetings. While committee chairs may get information sooner than the rest of their committee or sooner than Council, important information should be quickly shared with the rest of the committee

and Council so that those bodies can participate properly in debate and decision-making. However, that is not what happened during trial running.

To be clear, the problem is not that senior City staff were sharing information with or updating the heads of relevant committees. That is undoubtedly a necessary part of a municipality's operation. What is inappropriate is that there was a small group of people, the existence of which was unknown to others in the FEDCO and Council, sharing information privately (via the WhatsApp platform), and making decisions about not only what action to take but also what information to share with the rest of the FEDCO and Council, and when. The WhatsApp Group was an end run around proper governance. As Kanellakos noted in his evidence, if Mayor Watson wanted to participate in decision-making with respect to the OLRT1 project, the only way for him to do so properly was through the appropriate channels at Council.

12.5.2 Communications to Council

Communications to Council immediately before and during trial running were inadequate and, in some cases, misleading.

An important part of the background for communications to Council in 2019 is the commitment that City staff made in February 2018 to provide monthly updates to Council and the "ongoing commitment to keep Council apprised of the progress of the O-Train Confederation Line Stage 1." This February 2018 commitment came after some councillors raised concerns in late 2017 about what information was being shared and who was participating in decision-making regarding the OLRT1 project. It would have been obvious to senior staff such as Kanellakos and Manconi, and to Mayor Watson, that Council considered the OLRT1 project to be of the utmost importance and wanted timely and comprehensive information.

Transparency with Council was crucial, because Council could only perform its oversight function if it had the necessary information, and because transparency fosters a relationship of trust and confidence between Council and senior City staff. Councillor Deans and Councillor Catherine McKenney testified that they needed the information about the OLRT1 system's reliability problems and the ongoing concerns expressed by experts in order to fulfill their responsibilities as members of Council. Councillor Deans also testified that she lost confidence in the process because of the lack of transparency, saying, "I had a general sense that information was being withheld from me and other members of Council and that there was work going on behind the scenes."

A review of the communications that were provided to Council during trial running demonstrates that those concerns were well founded. The content of the memos that

Kanellakos and Manconi used to communicate with Council during trial running stands in stark contrast to what was occurring on the ground.

The first relevant memo is dated July 27, 2019 – two days before trial running began. The July 27 memo advised Council only that trial running was about to start. It said nothing about the ongoing problems that were occurring in the immediately preceding days related to launching vehicles, and nothing about the experts' ongoing statements that the OLRT1 system was not performing effectively and was not reliable. That information, which the Mayor himself testified was concerning and that he wanted and needed to have, was not shared with the rest of Council.

The next relevant event is Manconi's draft memo of July 31, 2019. That memo, if sent, would have informed Council of the disastrous start to trial running and the need to use the "pause" and "restart" function that the Trial Running Test Procedure (the document that captured the 2019 criteria) described as reserved for "exceptional circumstances." But the July 31 memo was never sent. It was suppressed by Kanellakos, allegedly because of the "commitment" made in the July 10 memo not to update Council until trial running was complete.

Council received another memo on August 7, which was framed as a regular quarterly update on the progress of the OLRT1 / Confederation Line project and OLRT Stage 2 projects. This memo was sent at a time when Kanellakos, Manconi, and Mayor Watson were alarmed at the OLRT1 system's poor performance. By August 8, the system had been in trial running for 11 days and had only passed on 4 of those days. Slade told the Commission that, on that very day, Manconi apparently (according to Lauch's email summary) said to OLRT-C representatives that even the "pass" days would be "horrendous" for customers. The Mayor was sufficiently concerned that he called Manconi into his office for an emergency briefing on August 8, and Manconi appears to have begun considering reverting to the 2017 criteria for trial running. Yet, the August 7 memo to Council did not disclose any of the performance issues that caused the "decision makers" to be so concerned. Instead, the memo noted only that trial running was ongoing and City staff anticipated a public launch in September 2019.

Council received another update memo on August 16. This was also an important date, because the OLRT1 system had performed dismally on August 15 and 16, and because August 16 was the date on which RTG confirmed the agreement with the City to revert to the 2017 trial running criteria. Manconi drafted a memo to Council advising that additional time would be required for trial running, the anticipated RSA date would be missed, and the City would levy another $1 million liquidated damages payment against RTG for that failure. Again, however, that draft memo was not sent. Instead, a shorter memo was written and sent, and that memo gave the impression that

everything was fine, in particular by stating that RTG had made "significant progress" toward completing trial running by "exercising the Confederation Line system at full functionality." Council was told that this was a "complex and rigorous process where high performance standards must be met." This memo was sent on the *very day* that RTG confirmed the agreement with the City to decrease the standards because RTG and the City understood that the OLRT1 system could not meet the higher 2019 standards. The August 16, 2019 memo was misleading by its multiple significant omissions.

The final trial running update to Council was sent on August 23, 2019. That memo, sent by Kanellakos, deliberately misled Council. Kanellakos reported that he was "pleased to inform the Mayor and Members of Council that the objectives of Trial Running and the requirements of the Project Agreement have been satisfied." The memo stated that "the City of Ottawa established targets for the Trial Running period that were based on industry best practices," including, for example, a requirement to achieve 96 percent AVKR on 9 of 12 days. He wrote that the City recognized that the TRRT required "additional tools" to deal with specific events and had thus provided the TRRT with options such as repeat days. All of this was entirely misleading. Kanellakos did not tell Council that the TRRT had been compelled in the early days to use the pause and restart "additional tool" that was described as being reserved for "exceptional circumstances." He did not tell Council that repeat days had been required on several occasions. He did not tell Council that discretion had to be exercised to achieve a pass on several of the days, or of the difficulties that existed even on the days that were marked a pass.

The memo also misled Council about the change in criteria midway through trial running. The memo stated that "RTG … wanted to not only meet these targets [i.e., 96% on 9 of 12 days] but exceed them. RTG targeted a figure of 98% for service availability and wanted to assess if they could reach 98% for the entire twelve (12) day period." That statement was inconsistent with the reality, which was that the parties had agreed on the 98 percent for 12 consecutive days standard after finding that the 2017 criteria should not be used, and RTG and the City then agreed to revert to the 2017 criteria of 96 percent on 9 of 12 days only because the system could not otherwise pass.

The memo then stated that the system had achieved an average AVKR of 97 percent over the 12 days of trial running. It did not tell Council that the average over all days during which trial running occurred was approximately 93.5 percent.

There can be no doubt that Kanellakos knew the memo was misleading. Kanellakos himself conceded during his testimony that in certain respects the memo was "inconsistent with the reality." This is shocking conduct, which constitutes deliberate wrongdoing, by the most senior public servant employed by the City.

12.5.3 The Alleged "Commitment" Not to Update Council until after Trial Running

City witnesses (Kanellakos, Manconi, and Mayor Watson) repeatedly asserted to the Commission that it was appropriate not to provide Council with information about what was happening with trial running, because City staff had committed in the July 10 presentation and July 22 memo not to update Council until after trial running was complete. That assertion must be rejected because no such commitment was made.

The most important source of information about what, if any, commitment was made to Council is the documents of July 10 and July 22. Those documents state in clear terms that, "once RTG has achieved all Trial Running requirements, staff will inform Council." Those words cannot reasonably be understood to mean that no updates would be provided for any reason during trial running. The councillors apparently also did not take those words to be a commitment not to provide updates. Councillor Deans testified that she was "shocked" to learn of the changes to the trial running criteria and expected to be informed of such important matters immediately. She also said it was "appalling" that Manconi's July 31, 2019 draft memo regarding the need to pause and restart trial running was not sent. That reaction is consistent only with councillors having a (reasonable) expectation that they would be updated regularly, and with any particularly important developments, immediately.

The OLRT1 project was the largest infrastructure project in Ottawa's history, affecting each resident's daily life. It is difficult to give credence to the suggestion that City staff committed to *not* providing important information to Council about this key stage of the OLRT1 project, particularly in light of the "ongoing commitment" to "keep Council apprised" that had been in place since early 2018. It is absurd to suggest that Kanellakos and Manconi, the two most senior public servants responsible for this project, honestly believed that they had a duty to *not* inform Council about critical information regarding an infrastructure project of this magnitude.

The City's conduct is also inconsistent with this alleged commitment to not inform Council about this key stage of the OLRT1 project until the stage was finished: the City sent and Council received updates (however brief and misleading) on August 7 and 16, 2019. Mayor Watson fairly acknowledged in his evidence to the Commission that sending the August 16 memo to Council was inconsistent with the alleged commitment to not inform.

Finally, even if there had been such a commitment, it was inconsistent with the Mayor's statutory obligation to keep Council informed in a manner that allowed Council to exercise its oversight function.

The Commission finds that City staff did not make a commitment on July 10 and/or July 22 to not update Council during trial running. Instead, decision-making authority and information sharing were informally restricted to the people on the WhatsApp Group, and crucial information was not provided to Council. This finding is reinforced by reference to the August 23 memo sent by City Manager Kanellakos, which makes impossible any suggestion that he had been forthright with Council.

12.5.4 These Were Not "Operational" Issues

The City asserted in its written submissions to the Commission that the information referred to in this chapter did not need to be shared with Council because it relates to "operational" issues and decisions and, as such, falls within the purview of City staff. The City then explained the presence of Mayor Watson and Councillor Hubley on the WhatsApp Group (and thus receiving the complete information that was shared in that group) on the basis that they each had a special role, the Mayor as Chief Executive Officer (CEO) and Councillor Hubley as Chair of the Transit Commission.

The City's characterization of the events during trial running as being purely "operational" matters for City staff cannot be accepted. First, Councillors had expressed a strong desire for comprehensive information about the OLRT1 project's progress, and for good reason: as noted above, it was the largest infrastructure project in the City's history, and it was integral to the daily lives of Ottawa's residents. The distinction between policy issues that are for Council to address, and operational issues that are for City staff to deal with, has to be considered in that context. Second, on at least two occasions – when the July 31 memo was drafted and when the initial August 16 memo was drafted – Manconi recognized that staff had a duty to provide detailed information to Council. Third, Mayor Watson repeatedly confirmed that the information he received was concerning to him and important to have so that he could consider it and decide whether to act. The only way for him to act was through Council. The rest of Council ought to have had the same opportunity he did by having access to the same information. Fourth, it is simply not credible to assert that these were merely operational issues: trial running was utterly disastrous and only achieved a "pass" because of crucial decisions to change the criteria and change the Project Agreement (through the RSA Term Sheet, described below). Accepting that trial running was passed put the City on a course to public launch, and was a key moment when Council could have intervened if it had been given full and accurate information.

12.6 Fewer Trains, the RSA Term Sheet, and Public Launch

Prior to confirming that trial running was complete, the parties agreed on one additional significant change: a reduction in the number of vehicles that had to be available for use. The change was from 17 double cars (15 in use during peak periods, plus 2 spares) to 13 double cars (with 13 in use during peak periods, and no spares); this meant a change from 34 LRVs in total to 26. This was a significant change from the City's previous position, which was to insist upon having all 17 double cars (34 LRVs) available for use, and it represented a further watering down of the RSA requirements that was agreed upon out of expediency rather than because it would be in the transit users' best interest. This change was memorialized in a Term Sheet that amended the Project Agreement to allow the parties to confirm that the requirements for RSA were achieved.

With those obstacles removed, RTG formally submitted a notice for RSA completion and the City accepted the submission on August 30, 2019. Public launch occurred on September 14, 2019, despite ongoing and known reliability problems.

12.6.1 The City Initially Holds Firm to Requiring 34 LRVs (17 Double Cars) Available for Use

The requirement in the Project Agreement was that RTG had to make 34 LRVs, or 17 double cars, available for use to achieve RSA. Prior to trial running, there had been suggestions that perhaps that number would be reduced because of the difficulties in getting vehicles from Alstom that were reliable and available for use.

However, the City had repeatedly emphasized that, in order to provide reliable service, it required all 34 LRVs (17 double cars) available for use, as stipulated in the Project Agreement. For example, at a FEDCO update presentation on September 10, 2018, City staff wrote that the City "requires all vehicles (34) fully tested and commissioned to ensure service can be provided to the level prescribed in the Project Agreement." Shortly before that FEDCO meeting, RTG had proposed a plan for getting to RSA by November 2018, which included reducing the number of trains that were required to 15 (or 30 LRVs). The City held fast to the requirement of 17 trains (34 LRVs).

In 2019, the City's "Go / No Go" list – a set of 10 criteria that were treated as fundamental requirements before public launch – included making all 34 LRVs available for use. The City's March 2019 update to its provincial funding partner stated that RSA would not be achieved until RTG demonstrated that it could put 15 double cars on the line consistently (which, with 2 spares, meant 17 double cars, thus 34 single LRVs in total). Finally, one of the reasons that the City opposed RTG's initial submission for Substantial Completion in May 2019 was that RTG had not made 17 double cars available for use.

The City's position was supported and reinforced by the independent experts it had retained from STV. Prendergast told the City as early as September 2018 – when RTG proposed moving to RSA without the full complement of vehicles – that with a new system, inexperienced drivers, and a new maintenance operation, reliability would already be tested. Prendergast emphasized the need for all 34 LRVs (17 double-car trains) to be available for use. Manconi, at that time, agreed, writing, "Full 34 [17 double cars] fleet continues to be my position. As the accountable executive people seem to want me to take risk to the public which I will not do."

12.6.2 The City and RTG Agree to Reduce to 26 LRVs (13 Double Cars) Available for Use

The problems caused by not having enough spare trains were evident during trial running, because of the consistent reliability issues during that time. The Mayor demanded to know why spares were not launched. STV noted on August 8, 2019 that the limited number of spares was exacerbating the reliability problems.

Somehow, despite the expert advice that had emphasized the need for a full complement of 34 LRVs (17 double cars: 15 double cars and 2 spares, or 30 LRVs and 4 spares) available for use, the known issue of a new system with inexperienced operators and maintenance, and Manconi's prior refusal to reduce the number of trains and "take risk to the public," the parties agreed in August 2019 to reduce the number of vehicles available for use required to achieve RSA to 26 LRVs (13 double cars). Manconi's evidence to the Commission was that the decision was made because City employee Pat Scrimgeour did an analysis to show that ridership was below anticipated levels, and so not all LRVs would be needed during peak periods. That explanation is not credible, because Scrimgeour's analysis was done in September 2018, and Manconi at that time expressly rejected the suggestion that the ridership analysis justified reducing the number of cars necessary to achieve RSA. It was Scrimgeour's email containing that analysis that Manconi was commenting on when he said he would not reduce the number of vehicles and thereby "take risk to the public."

The Commission finds that what happened is that the City and RTG were both aware that they could not meet the Project Agreement requirement for RSA of having 34 LRVs available for use, so they agreed to amend the Project Agreement to reduce the requirement to 26 LRVs, and the City later used Scrimgeour's September 2018 analysis as a retroactive justification. Manconi's evidence to the Commission was that Scrimgeour reviewed the 2018 analysis and "reminded" Manconi of that analysis during trial running. The Commission does not accept that the City's insistence on 34 LRVs (17 double cars) available for use changed because of a belief that suddenly formed in August 2019 that Scrimgeour's September 2018 analysis had been correct. Other witnesses from both the City and RTG acknowledged that the change was made because RTG was struggling to get the full number of 34 LRVs on the line.

The parties set out their agreement to reduce to fewer vehicles, and the prior agreement to revert to the 2017 trial running criteria, in a Term Sheet that was effective August 30, 2019. The Term Sheet, like the Substantial Completion Agreement, amended the Project Agreement requirements in order to allow for RSA to be achieved despite the fact that RTG had not yet met all the criteria. The principal changes were the reduction to 13 trains (26 LRVs) and the reversion to the 2017 trial running criteria, but other changes included that RTG was required to provide additional staffing and monitoring once public service began. For example, per the Term Sheet, RTG had to provide vehicle technicians on certain trains for 30 days after public launch, and temporarily provide specialized door technicians on all trains. Finally, the Term Sheet also required RTG to provide the City with certain plans for mitigating known issues, such as a plan for maintenance of the equipment at the MSF. In essence, the parties recognized that they could not achieve RSA based on the existing state of the OLRT1, so they drafted and agreed upon the Term Sheet to change the RSA requirements and allow public launch.

As noted in Chapter 7, Sechiari, of the Independent Certifier, testified that, like the Substantial Completion Agreement, the Term Sheet changed the requirements the Independent Certifier had to consider to determine whether RTG had achieved RSA. Because the parties agreed on the requirements that were changed by the Term Sheet, the Independent Certifier did not, and was not asked to, weigh in on or consider the impact of these changes on the OLRT1 system. Further, because the Independent Certifier's contractual role in this phase of the project ended once the RSA Certificate was issued, the Independent Certifier had no ability to confirm the completion of the items on the Term Sheet before the system entered public service, and was not asked to do so. Indeed, Sechiari agreed that, despite the certification of RSA because of the Term Sheet, the certification did not actually mean that the system was ready for public service (revenue service).

12.6.3 RSA to Public Launch

Once RSA was achieved, the City was responsible for preparing for public launch and choosing the date for it. City staff repeatedly expressed the intention to have a period of approximately one month after RSA during which the City would undertake its preparations. RSA was achieved at the end of August 2019, meaning that according to City staff's stated expectations, public launch could occur at the end of September.

However, the City had already announced on August 23 the public launch date of September 14, 2019. The City therefore cut the period of time available for preparations by 10–14 days (the evidence was not entirely consistent on this point), which is as much as half of what had been anticipated. That came as a "shock" to RTG, which was not consulted by the City.

During the period from August 30 to September 14, the system continued to demonstrate reliability problems. The City knew this. The WhatsApp chat between Manconi, other key City staff, and STV records the following issues between RSA and public launch:

- There was a "rough launch" on September 1, with two trains disabled and no technicians available;
- On September 2, one train had to be removed from service and the spare was delayed. Another train experienced on-board control issues. There were also maintenance concerns arising from communication failures over shift changes, as "the supervisor coming on does not know what he has to deal with"; and
- September 3 and 7 were described as "not a good launch."

Despite these continued problems, there was no consideration given to delaying the public launch. Manconi wrote to City staff and STV on September 12, 2019 that they needed to be able to run trains in manual mode if necessary because "cancellation of launch is not an option." Public launch indeed took place on September 14, 2019, despite the ongoing reliability concerns.

12.7 Why Did the Parties Decide to Launch despite the Reliability Problems?

The decisions to accept that the OLRT1 system had achieved RSA and then to launch public service were not good ones, because the system continued to suffer from ongoing, known reliability problems that were too significant to disregard. The OLRT1 system was not reliable, and the maintenance operation was not ready for the burden being placed upon it. Slade, of OLRT-C, testified that these issues were "100 per cent clear."

Many factors contributed to the City, with input from RTG, deciding that the OLRT1 system was ready for public use. This section addresses the most significant factors.

First, as City Manager Kanellakos acknowledged, there was an enormous amount of pressure to get the system open. This pressure took many forms, not the least of which were the many public statements made by Mayor Watson. The Mayor's public statements, and his concern to make good on those statements, had a precedent in his 2010–2011 "on budget" mantra that helped crystallize the early Class D estimate into something approaching a hard cap on the cost of the OLRT1 project (as explained in Chapter 4). Mayor Watson became increasingly involved in the OLRT1 project as time went on, to the point that during trial running he was using the WhatsApp Group to make suggestions about trial running procedures, demanding answers about the availability of spare trains (a "major request"), and calling Manconi into his office for emergency meetings.

In a troubling example of what appears to be interference for political reasons, Mayor Watson took to the podium several times in the spring and summer of 2019 to announce to the media dates when the OLRT1 system would open. He did so on June 18, immediately after summoning the CEOs of Alstom and RTG to his office. He then held a news conference to announce that the system would open for public launch in September. He also advised the media at a news conference on July 10 that handover would occur on August 16. Although Mayor Watson quite fairly noted in his testimony that these were dates that the RTG and/or Alstom CEOs had told him they were confident in, the City had already concluded (as noted in Chapter 10) that the private consortium had no credibility with respect to schedule projections. There is also a material difference between RTG setting dates and the Mayor announcing dates for political reasons. It is

difficult not to conclude that Mayor Watson was staking his own credibility on the dates he announced, and in doing so contributing to the pressure-packed environment.

This pressure surely affected City staff. Kanellakos agreed during his testimony that the existence of a daily WhatsApp chat involving the Mayor's office contributed to "an enormous amount of pressure" on both him and Manconi during trial running. The pressure on senior City staff also appears to have contributed to key staff directly interfering in trial running, undermining the independence and integrity of that process. Recall that Manconi apparently directly inserted himself into discussions that ought to have been within the exclusive purview of the TRRT. Based on the August 7 email summary from Lauch (referred to in section 12.4.4), Manconi may well have engaged in bargaining with RTG for a "pass" on trial running despite the fact that Manconi was not a member of the TRRT. Manconi also either suggested the change, or convened the meeting at which Lauch suggested the change, to the 2017 criteria for trial running.

The responsibility for this pressure cannot be laid only at the feet of elected officials; RTG also played its part by missing four different RSA deadlines that it had identified and committed to, which contributed to the public's frustration and resulting pressure on RTG and City staff. Kanellakos agreed during his evidence that the missed deadlines caused an "acute" loss of public confidence by August 2019.

Second, the City lost sight of protections that were in place prior to trial running to ensure that it received only a safe and reliable system. The governance framework that included delegating authority to Kanellakos as the City Manager and to the FEDCO as the Council committee responsible for this OLRT1 project was replaced by the WhatsApp Group; that select group became the recipients of information and the decision makers.

The City had also held fast, prior to trial running, to the idea that the Project Agreement set out the requirements that had to be met and that the City would achieve a reliable system by ensuring that those requirements were met. Yet shortly before and during trial running, the City agreed to waive requirements that had previously been treated as critical, including via the Substantial Completion Agreement and the later Term Sheet.

The City had previously relied upon the experts on technical matters, and considered such reliance to be an important protection for the people of Ottawa. But it is not at all clear that the experts were involved in the decision to revert to the 2017 criteria for trial running. Some witnesses said that the decision was discussed with experts, but STV's Prendergast testified that he did not believe STV gave an opinion on the change to the trial running criteria, or on whether the system passed trial running or had satisfied the requirements of RSA. There was, in any case, apparently no documented analysis supporting the decision.

Third, Council was not able to exercise its oversight function, because it was not being properly informed by City staff.

Fourth, RTG did not insist on delivering a reliable system, because it was under significant financial pressure. Slade testified that RTG was better off "stopping the bleeding" on the OLRT-C side and pushing the burden onto RTM, despite knowing that RTM and Alstom were not up to the job. Nicolas Truchon, the current CEO of RTG, candidly and fairly acknowledged that if it were not for RTG's desire to receive its payment tied to achieving RSA, "better decisions … would have been made" during trial running and in the lead-up to public launch (it is to be noted that Truchon was not CEO at the time of those decisions).

Fifth, there appears to have been misplaced reliance upon the Independent Certifier and the Safety Auditor. Several City witnesses testified to believing that if the Independent Certifier signed off on the OLRT1 project, that essentially meant that the project was ready for public launch. However, Morgan, of the City, confirmed that the Independent Certifier would not intervene if the parties agreed that the Project Agreement requirements were met on any issue. This was confirmed by Sechiari, who testified that the Independent Certifier's sign-off is not an indication or opinion regarding reliability.

12.8 Causation and Conclusion

The City asserts that the OLRT1 project's problems do not arise from the City's conduct, oversight, or approach to the project, arguing that "none of those matters caused or contributed to the issues that led to the breakdowns and derailments." This is akin to a legal argument that "causation" has not been established. The City submitted that this Commission's mandate is limited only to matters that can be shown to have *caused* the breakdowns and derailments, such that if there is no direct connection between the City's conduct and those problems, then the City's conduct is outside the Commission's mandate. Thus, according to the City, because causation has not been proven, it is not responsible for any of the problems that plagued the system, and this Commission has no basis to criticize the City's behaviour on this project.

Causation is a part of negligence law. In a negligence claim, it is not sufficient that a plaintiff prove that a defendant acted negligently. Generally, a plaintiff must also establish that the plaintiff *would not* have suffered an injury *if it were not* for the defendant's negligent conduct. (This is referred to in the law of negligence as the "but for" test for causation.)

The City's submission is entirely inconsistent with the facts and the very purpose of this Inquiry.

Before considering the substance of the City's submission, it is vital to place it into the overall context of the City's approach to this Commission of Inquiry. Unfortunately, the position asserted is entirely consistent with the approach taken by the City at this Inquiry, which relied on adamant denials of any suggestion that the City could have approached or undertaken the OLRT1 project differently. The City demonstrated time and again that it was not willing to accept any responsibility or criticism, or even that the Inquiry offered an opportunity to make improvements in its approach to major infrastructure projects. The City's position in its submissions to this Commission is also consistent with how the City approached the construction and manufacturing phase of this project: as explained in Chapters 9 and 10, the City approached that important project phase on the basis that, having offloaded risk and responsibilities to RTG, it fell squarely to RTG to deal with the problems that arose and still meet its contractual deadlines.

Turning to the substance of the submission, it is helpful to consider its potential impact. If I were to accept this submission, the Commission would be endorsing an argument that it does not matter if a government entity made fundamental mistakes on a public project,

that a senior civil servant deliberately misled the democratically elected representatives to whom they were to report, or that they refused to accept and acknowledge obvious shortcomings in their conduct. According to the City, it has no responsibility as long as it is not proven that its misconduct directly created problems. This submission is not only wrong but also repugnant in the context of a review of a public entity's actions while engaged in a civic endeavour. Three points are worth emphasizing.

First, the City seems to mistakenly believe that it is involved in a negligence case where the injured party must prove its case, including causation, on a balance of probabilities standard. At the risk of stating the obvious, this is not a negligence case. This Commission is obliged to identify the problems that plagued the OLRT1 project and to help prevent them from occurring again in future projects. The Commission must examine, understand, and highlight the entire chain of events on this project, including circumstances that led to poor decision-making by key officials within the City and RTG, so that similar poor decision-making can be avoided in the future. Indeed, as reflected in the Order in Council (see Appendix A), the Commission has explicitly been mandated to inquire into the decisions and actions that were taken in determining the procurement approach the City selected for the OLRT1 project, whether the Project Agreement was adequate to ensure the project met industry standards of performance and safety, and whether the City's oversight of the Project Agreement and the OLRT1 project was adequate to ensure compliance with such standards. Further, it explicitly requires the Commission to inquire into "the decisions that led to the declaration that the OLRT1 Project had reached substantial completion and any associated testing carried out to support such declaration." The Order in Council also prohibits the Commission from "expressing any conclusion or recommendations regarding the potential civil or criminal liability of any person or organization."

Second, the City's submission that this Commission should ignore everything the City did wrong because causation has not been proven is reckless and arrogant. Is the City suggesting that it will only consider modifying its behaviour if it can be proven that the City's behaviour directly caused damage? Does it believe that it has nothing to learn from the OLRT1 project's many failures? The public should not have to wait, and does not have to wait, until a direct line can be drawn between the City's conduct and the project's problems before they can expect the City to engage in a meaningful review of all of the circumstances of this project, including taking a hard look in the mirror. The City's unwillingness to consider improvements in its approach to infrastructure is not encouraging for the success of future projects; it is a red flag.

Third, asserting that causation has not been established is a false argument. There is ample evidence that the issues identified in this chapter contributed to the poor outcome. Although the City asserts that none of the reliability problems experienced in

the summer of 2019 (including during trial running) arose after the public launch, that is not true. There were problems with doors, brakes, and switches before and after public launch. The decision in August 2019 to reduce the number of trains that had to be available from 17 double-car trains to 13 meant that there were no spares available for the morning rush hour service, and the City's experts had repeatedly emphasized the direct link between the availability of spares and the reliability of service. Also, it appears that Manconi tied earlier decisions to post-launch problems: he advised Mayor Watson in November 2019 that the Mayor "did have the option during the design and bid phase to [implement] platform doors that are designed to do exactly what you are asking [stop passengers on the platform from holding the vehicle doors] but that was not affordable in your financial cap." Finally, it is evident that the City, in its rush to get the system into operation, placed an unrealistic burden on RTM as maintainer. This directly resulted in reliability problems when the OLRT1 system went into operation.

Recommendations

See recommendations #1, 5, 7, 22–25, 28, 33–37, 45–47, 56, 58–63, 67, and 70 in Chapter 17.

Chapter 13
Maintenance Was Not Ready for Burden

Key Findings

- Unresolved vehicle and system issues, and a high risk of further reliability problems, were pushed from the construction and manufacturing phase of the OLRT1 project into the public service phase. This increased the workload and pressure on those maintaining the system once it went into public service.
- Maintenance did not have enough personnel or experience to manage the burden RTG, OLRT-C, and the City pushed into the public service phase of the project. Late delivery or completion of aspects of the LRT system left little time for training on those system components. RTM also did not provide sufficient oversight of Alstom's maintenance activities.
- These maintenance failures contributed to the passenger service issues on the OLRT1 line. The City was aware of the maintenance staffing issues and the implications for the reliability of service.
- The transfer of responsibilities and information from OLRT-C to RTM and Alstom Maintenance was inefficient and incomplete. This added to the challenges RTM and Alstom faced in maintaining the system.
- The mistrust that developed between the City and RTG during the construction and manufacturing phase carried over into public service, fuelling behaviour that was counterproductive to providing reliable service. In particular, the City overreached by generating a large number of work orders, categorizing them as it did, and applying certain deductions to RTM's maintenance payments.
- The level of communication and coordination between OC Transpo and RTM/Alstom Maintenance that was required to respond effectively to issues on the line was not present at first, but improved over time.

Chapter Contents

13.0 Introduction

This chapter examines the readiness of RTM and its subcontractors to maintain the OLRT1 system in public service and the pressure on the maintenance team, particularly Alstom Maintenance, as the Confederation Line was opened to the public.

Maintenance is vital to providing a reliable LRT service. Unfortunately, in the case of the OLRT1 project, an increasing maintenance workload combined with a disorganized handover from OLRT-C to the maintenance team, an under-resourced maintenance team, and a steep learning curve for the operator and the maintainers led to inefficiencies in maintenance, which detracted from the reliability of service after the OLRT1 system was publicly launched.

Further complicating matters, the relationship tensions between the City and RTG, and between Alstom Maintenance, RTM, RTG, and OLRT-C, interfered with the collaboration and co-operation required between operator and maintainers to consistently deliver reliable LRT service to the public.

13.1 Maintenance for Public Service: Roles, Responsibilities, and Key Terms

As noted in earlier chapters, many parties were involved in the construction and manufacturing phase of the OLRT1 project, and its handover from constructor (OLRT-C) to the City (as owner and operator) and RTM and Alstom Maintenance (as maintainers) presented many challenges. As well, the process was delayed and stressed, resulting in rising tensions and a backlog of tasks.

Although most of these parties have already been described in previous chapters, this section summarizes the main parties and their roles and responsibilities in the public service phase of the OLRT1 project. Names of key parties and key terms appear below in boldface so they can be easily referred to later.

Under the Project Agreement, **RTG** was responsible for constructing the OLRT1 project and is responsible for maintaining the OLRT1 system. RTG contracted with OLRT-C to carry out its construction obligations; and OLRT-C subcontracted some of those responsibilities to others, including Alstom (for manufacturing the LRVs). RTG continues to be responsible for maintenance and subcontracted its maintenance responsibilities to **RTM**. RTM, in turn, subcontracted with Alstom for *some* of the maintenance responsibilities. The responsibilities are split as follows:

- **OC Transpo** operates the OLRT1 system for the City.
- **RTM** is responsible for maintaining the stations and maintenance and storage facility (MSF) equipment. As well, RTM is responsible for overseeing Alstom's maintenance work under their subcontract.
- **Alstom Maintenance** (Alstom's maintenance team) is responsible for maintaining the vehicles, track, aspects of the communications and signalling systems, and the **overhead catenary system**, which supplies electricity to the LRVs. This includes providing the required number of vehicles for public service each morning (called **making score**), responding to any issues that arise during passenger service (**corrective maintenance**), and performing regularly scheduled work intended to keep the system in working order (**preventive maintenance**).
- **Alstom Rolling Stock** (Alstom's vehicle manufacturer, under subcontract to OLRT-C) was responsible for the outstanding **retrofits** and any vehicle **warranty** issues

that arose. (Retrofitting, explained in Chapter 9, is revision or refitting to address retroactive changes in design. The warranty is explained below.)

This chapter distinguishes between Alstom Maintenance, Alstom Rolling Stock, and Alstom as a whole.

An **Interface Agreement** existed between RTG, OLRT-C, and RTM. As both OLRT-C and RTM had contractual relationships with RTG, but not with each other, the Interface Agreement allowed the three parties to allocate responsibilities, manage issues relating to process and general operations, and make claims of each other. This avoided the need to flow issues up to RTG and then back down to the respective subcontractor. In other words, OLRT-C could communicate directly with RTM and vice versa. The Interface Agreement governed the relationship between OLRT-C's responsibility for design, construction, testing, and commissioning, and RTM's responsibility for maintenance, addressing such issues as the transition from construction into the operations phase of the project. Despite the Interface Agreement, there was still a grey area of responsibility between OLRT-C and RTM; on the occasion when OLRT-C and RTM could not agree on the responsibility for addressing an issue, RTG would step in to direct that the issue be corrected and recover funds from the responsible partner.

Work that the maintainers (RTM and Alstom Maintenance) are to do is documented in **work orders**. The **integrated management information reporting system (IMIRS)** is a computer system that RTG uses to track work orders on the OLRT1. The **supervisory control and data acquisition (SCADA)** system is also critical to maintenance. Both systems are further described in section 13.5.1.

Regarding RTG's maintenance obligations, the Project Agreement sets out obligations and a maintenance payment mechanism (see Chapter 7). The City can levy extra payments and deductions on RTG to enforce certain requirements in the Project Agreement. RTG's subcontract with RTM allows RTG to "flow down" extra payments and deductions levied by the City to RTM for issues that fall within RTM's maintenance purview. RTM's subcontract with Alstom, in turn, allows RTM to pass along to Alstom penalties and deductions related to Alstom's maintenance responsibilities. As discussed in more detail in section 13.5.3, this contractual enforcement mechanism led to disputes between RTG and the City and between RTM, Alstom, and OLRT-C. More importantly, it was ineffective in producing the required maintenance results.

Preparations for public service of the OLRT1 did not go smoothly. At the beginning of the public service phase, the City was preparing for the public launch and OC Transpo staff were being trained to operate the vehicles and control the system. However, there were many outstanding items and tasks under OLRT-C's responsibility that had been pushed

to later in the timeline, from Substantial Completion to Revenue Service Availability (RSA) (see Chapter 12). A significant example is that OLRT-C's subcontractor, Alstom Rolling Stock, was responsible for the vehicle retrofits that continued after the OLRT1 line opened for public service. So, while OLRT-C's construction role ended at the RSA date and OLRT-C was largely demobilized, it (and its subcontractors, including Alstom Rolling Stock) had ongoing obligations for outstanding work. Specifically, these obligations included any items from the minor deficiencies list and deferred work, plus warranty claims on construction defects.

The Construction Contract between RTG and OLRT-C provided for a warranty period of two years after the RSA date. During this period, OLRT-C had to correct, in a timely manner and at its expense, all construction defects that it received notice of or that it otherwise had knowledge of. These **construction defects** were defined as "any deficiency, defect, error, fault or non-compliance by the Construction Contractor" in carrying out its contracted responsibilities. OLRT-C was not responsible for defects that resulted from events of force majeure (described in Chapter 7), normal wear and tear on the system, or any defects caused by faulty operations or maintenance activities. The Interface Agreement between RTG, OLRT-C, and RTM also allowed OLRT-C to simply pay for RTM to do any required warranty work, provided RTM agreed.

13.2 Growing Maintenance Burden Passed Along from Construction Phase

RTG and the City made a series of decisions during the construction and manufacturing phase of the OLRT1 project that increased the workload and pressure on those maintaining the system once it went into public service. In particular, RTG and the City agreed to relax requirements for Substantial Completion and RSA before the OLRT1 system could be opened to the public.

These decisions increased the maintenance workload in three ways. First, the OLRT1 system had recognized reliability issues that RTG did not resolve prior to handover to the City, and the City did not require RTG to resolve those issues prior to the system's public launch. Second, the reduction of time allotted and compression of the testing and commissioning made it likely that the OLRT1 system also had undiscovered deficiencies that could require significant work to fix. Third, several vehicle retrofits were still outstanding when the City opened the OLRT1 system to the public. The deferred work increased competition for access to vehicles and for work space, as the warranty and maintenance teams each strove to complete their required work.

These factors, as this section will show, contributed to an increasing workload for RTM and Alstom Maintenance, the companies directly responsible for maintaining the OLRT1 system during public service.

13.2.1 Reliability and Performance Issues Pushed to Public Service

As described in Chapter 12, the OLRT1 project had defects and deficiencies that caused reliability problems in the spring and summer of 2019. Under the terms of the Project Agreement, some of these defects and deficiencies would have prevented RTG from achieving Substantial Completion and RSA, and handing the system over to the City. The original Project Agreement requirements for Substantial Completion and RSA protected the City from receiving a system that was not ready for public service. Instead of taking the time required to resolve the problems with the OLRT1 system, the City and RTG agreed to amend the Project Agreement requirements. The amendments, captured in the Substantial Completion Agreement and the RSA Term Sheet, permitted RTG to

achieve Substantial Completion and RSA despite the OLRT1 system's known reliability issues and outstanding defects and deficiencies.

Considerable pressure was mounting (as discussed in Chapters 9 and 12) to hand over the OLRT1 to the City and open the system to the public. Unfortunately, both the vehicles and the system as a whole were experiencing issues when RTG first attempted to achieve the Substantial Completion milestone in April and May 2019. Unsurprisingly, the City expressed the opinion that RTG had failed to satisfy the milestone requirements, and the Independent Certifier agreed. More specifically, the City identified several problems with the OLRT1 system, including the following:

> As of April 29, 2019, there were 25 Vehicles that had defects and deficiencies that would prevent the Vehicles from being used. The defects and deficiencies are extensive and ongoing and result in a lack of access to the complete fleet. The Vehicles have not been shown to be reliable…

The City's opinion specifically identified defects including brakes, doors, on-board communication system issues, and line contactors, along with several communications-based train control (CBTC) system defects and other problems with the OLRT1 system.

While OLRT-C made progress resolving some outstanding items (and recorded this progress on a tracker sheet) before RTG submitted its second application for Substantial Completion, many of the issues that had prevented RTG from achieving that milestone in May 2019 remained unresolved. RTG included a Substantial Completion Tracker in its second Substantial Completion application that addressed "the items that were deemed to be lacking in [RTG's] prior submittal." A number of the tracker entries that could interfere with public service were not yet resolved, including the following:

Item	Technical Area	Subelement	Description/Open Items	Status	Timing
29–62	Vehicles	LRV 1–34	Confirm availability & open issues	Info	Pre-SC
72	Vehicles	Systemwide	Failure to meet service standards due to reliability of subsystems	Monitor	
73	Vehicles	Systemwide	Failure to meet fleet requirements due to ongoing defects/ deficiencies	Monitor	

SC = Substantial Completion

Instead of rejecting RTG's second application for Substantial Completion, the City's decision to defer certain Substantial Completion requirements was a marked departure from the approach it had previously taken.

With the Substantial Completion requirements met or deferred, the next step toward RTG's handover of the system to the City was trial running. Trial running (which is discussed in detail in Chapter 12) started three days after the Independent Certifier confirmed RTG's achievement of the amended requirements for Substantial Completion. As set out in the Trial Running Test Procedure agreed to by RTG and the City, trial running was intended to test whether the OLRT1 system could be run reliably under public service conditions. The trial running criteria provided important protections to both the City and RTM: they ensured that the City did not accept delivery of a system incapable, or not yet capable, of performing to the standards set out in the Project Agreement, and they protected RTM from taking responsibility for maintaining an unreliable or issue-plagued system.

Deferring Substantial Completion requirements meant, among other things, that RTG and its subcontractors would have to overcome the system's reliability challenges to pass the trial running test. Although the system's reliability improved through the summer of 2019, meeting the 2019 trial running criteria proved to be an unrealistic goal. There were reliability challenges and the maintenance team was overwhelmed with corrective maintenance tasks during trial running and repeatedly struggled to make score, that is, to have the required number of vehicles ready on time each morning.

Maintenance was not a focus of evaluation during trial running. Of the 21 evaluation items on the trial running scorecard (see Chapter 12), only 2 directly assessed maintenance performance: "Maintenance practices" and "Demonstration of IMIRS process." During trial running, maintenance practices were evaluated based on an audit of no more than five randomly selected work orders; the IMIRS process was subject to a qualitative assessment by the Trial Running Review Team and the Independent Certifier. Given the central role that maintenance plays in providing consistent, reliable service, it would have been preferrable to give more attention to the evaluation of maintenance performance and to accord more weight to the results in the overall scoring of each day during trial running.

Maintenance failures were logged on 13 out of the 25 days of trial running; of the 12 days used to pass trial running, there were maintenance failures for 5 days. This track record did not bode well for public service. As elaborated in section 13.3, the City and RTG were concerned about the maintenance team's capacity to support public service. Those concerns were well founded.

However, after trial running, the City and RTG once again agreed to depart from the requirements of the Project Agreement, this time for RSA. These contractual amendments, set out in the RSA Term Sheet, permitted RTG to achieve RSA despite known system defects and deficiencies. Witnesses agreed that there were no safety issues with the OLRT1 system when it went into public service (see Chapter 11); however, they generally agreed that there were known reliability issues with the vehicles and the system as it entered public service. Some of those reliability issues continue to interfere with public service in 2022: Richard Holder, of the City, told the Commission that "there are several system issues that are still having an impact on the reliability of the system that still need to be addressed."

13.2.2 Risk of Latent Defects, Deficiencies, and "Bugs"

On top of its known defects and deficiencies, the OLRT1 system was put into public service with the risk that further defects could surface as part of the system's expected growing pains.

The OLRT1 was a brand-new LRT system and the vehicle type (Citadis Spirit) was, as a March 2021 SNC-Lavalin memo puts it, a "prototype hybrid vehicle with its first test runs on the OLRT project and therefore was a continuous trial and error scenario." Any LRT system was expected to show a pattern of reliability with a high early failure rate, followed by a sustained period of consistent and reliable performance, and then an increasing failure rate as it approaches the end of its lifetime; this is the "bathtub curve" of reliability (see Chapter 10). As well, the Citadis Spirit LRV was effectively a new model of vehicle unproven in circumstances similar to those of the OLRT1.

Railways typically address expected early vehicle and system failures by running the system without passengers to identify and resolve problems. Consultants from STV advised the City in 2018, "Traditionally months of extensive testing in real operating condition[s] is performed to identify latent design issues." Lowell Goudge, of Alstom, told the Commission that "the more things you have running and moving and working," the more likely you will be to discover problems. Running the trains in public service conditions (but without passengers) to work out any "bugs" in the system is sometimes referred to as "bedding in."

The Project Agreement (as noted in Chapter 7) did not explicitly provide for a bedding-in period for the OLRT1 system. Vehicles were run on the OLRT line as part of the testing and commissioning program, but (as discussed in Chapters 9 and 12) OLRT-C

shortened and compressed the testing and commissioning period as part of its efforts to deliver the system as soon as possible. While the vehicles had collectively run approximately 1.1 million kilometres before the OLRT1 system opened to the public, that distance was not run in public service conditions. For example, as the City identified in its May 6, 2019 opinion on RTG's first application for Substantial Completion, OLRT-C had not yet been able to run 15 trains (each consisting of two joined LRVs) on the track as of April 29, 2019. The City wrote, "This falls significantly short of capacity needed for passenger service."

The City had the opportunity to bed in the system during the period between trial running and the launch of public service. Indeed, the OLRT1 system was run for approximately three weeks following the completion of trial running and before it opened to the public. That three-week period, however, was nowhere close to the "months of extensive testing in real operating condition[s]" mentioned earlier by STV.

As a result, the risk that problems would surface with the OLRT1 system or vehicles during public service remained high. As will be discussed in Chapters 14 and 15, that risk was repeatedly realized once the OLRT1 system opened to the public.

13.2.3 Retrofits Increase Reliability Risks, Complicate Maintenance

In their efforts to support consistent and reliable public service, RTM and Alstom had to contend with the known and potential unknown defects and deficiencies in the OLRT1 system. They also had to compete for vehicles, resources, and space with the team working on the outstanding retrofits that had been deferred to the public service period, and on additional retrofits that were identified after public service began.

Outstanding vehicle retrofits compounded the risk of reliability issues on the OLRT1 system. The deferred retrofits put reliable LRT service at risk in three ways.

First, though none of the retrofits that were deferred to the public service period were seen as critical to safety, some of those retrofits would have assisted in providing reliable service if they had been completed prior to the OLRT1 system's public launch. Deferring those retrofits until after the launch, therefore, increased the chances that passenger service would be interrupted.

Second, retrofits introduce new elements to a product that has already been tested, and as a result, they introduce reliability risks. While (as discussed in Chapter 9) those risks may be mitigated by non-regression testing, reliability risks remain. Retrofits completed during public service, therefore, introduced new reliability risks into the OLRT1 system.

Third, doing the deferred retrofits interfered with completing required vehicle maintenance – both corrective and preventive maintenance. Alstom's manufacturing workers, who were responsible for completing the retrofits (i.e., Alstom Rolling Stock) and Alstom's maintenance workers (Alstom Maintenance) were competing for space in the MSF; there were limited engineering hours during which certain necessary maintenance and retrofit work could be done; and the need for vehicles on the OLRT1 line during public service hours left a limited number of vehicles available for retrofit work and maintenance. As RTM General Manager Mario Guerra explained to the Commission, "The more retrofits and deficiencies you need to address, the less time you may have to deal with other issues such as maintenance … whether it be corrective or preventative." Maintenance capacity is directly connected to the reliability of the OLRT1 system. A failure to keep up with maintenance activities may have, as Michael Morgan, of the City, acknowledged, a "cascading effect over time," including taking vehicles out of service completely.

Witnesses told the Commission that the number of outstanding retrofits in the lead-up to public service was higher than originally planned due in part to schedule compression. The demands of public service materially slowed the pace at which the retrofits could be completed because, as Holder, of the City, told the Commission, "any changes have an impact on operations, potentially require shutdowns of the system or can only occur during the evening and weekend maintenance periods so there have been some challenges … on OLRT-C's side to deal with some of the deficiencies because we now have a fully functional transit system." As of the Commission's public hearings in June and July 2022, retrofits remained outstanding.

13.2.4 Incomplete and Disorganized Handover to RTM

RTM and Alstom witnesses told the Commission that the handover of the OLRT1 line from OLRT-C to RTM and Alstom Maintenance was inefficient and incomplete. Former Alstom employee Stephen Lennerton characterized the transition as "absolutely terrible." This disorganized transfer of responsibilities and information added to the challenges RTM and Alstom already faced in maintaining the OLRT1 system and addressing the outstanding deficiencies and defects.

There was a backlog of maintenance tasks awaiting RTM and Alstom in the summer of 2019. One example is the **ballast** (the foundation that acts as a support base for railway tracks). As described in a draft email prepared for RTM to send to OLRT-C:

> There appears to have been no maintenance undertaken on the track since it was constructed, other than the grinding that was done just after RSA and the greasing of switch plates and machines. It is clear that the ballast was never tamped from when it was laid until revenue service. This is some 3 years (2016 to 2019) with little or no maintenance. As a result of this, the guideway now requires extensive additional ballast and tamping.

The draft email went on to state that up to 10,000 kilometres of travel had been accumulated per LRV, "and in all this distance, the track had not been maintained."

Guerra agreed that it would have been better for the maintainers to be involved during the construction phase, because then the OLRT1 system would have been better maintained at the start of public service and the maintainers would have been further along the learning curve, "as opposed to having those learning experiences while there are passengers on the system."

Further, information required for the maintenance of the LRT systems and vehicles was delivered late, provided in a fashion that made it difficult and time-consuming to locate, or simply not available. Of the information provided, Alstom Maintenance found that documents were incomplete or early drafts. The failure to deliver the required information in a logical fashion interfered with the maintenance team's preparation for public service.

One area of missing information was records of what maintenance had been performed by OLRT-C during the construction phase. There was preventive maintenance to be done during the construction phase, but that maintenance work had not been consistently completed. Therefore, there was a backlog of maintenance work outstanding at the time the system was handed over. Alstom did not receive records of the maintenance work performed before RSA. Alstom project manager Richard France described the consequences of this information gap as "significant," explaining that "you want to know where you are in terms of the life cycle of those assets. Where you are in the maintenance plan to be able to start them off properly." Further, without the maintenance records, Alstom was forced to make assumptions about the needs of the system infrastructure, creating additional work for the maintenance team.

At the same time that the maintenance workload increased as the system was pushed through Substantial Completion and RSA, the maintenance workforce did not have enough personnel or experience to manage the burden that RTG, OLRT-C, and the City pushed into the public service phase of the OLRT1 project. The maintenance workforce will be further examined in section 13.3.

13.2.5 Conclusion

Unresolved vehicle and system issues, and a high risk of further reliability problems, were pushed from the construction and manufacturing phase of the OLRT1 project into the public service phase in order to hand over the OLRT1 system to the City as soon as possible and open it to the public. The City was betting on RTM and Alstom to mitigate the risks of known and potential reliability issues during public service. As the next sections of this chapter will elaborate, this approach was flawed for three reasons.

First, the City was never satisfied that sufficient maintenance resources were deployed to operate the system reliably. Second, the maintenance staff and the operating staff were facing a steep learning curve as the OLRT1 entered public service, so, while their efficiency would improve, they were not starting with the experience required to resolve issues in the public service environment quickly. Increasing maintenance staffing alone would not address the root causes of the issues affecting the reliability of the OLRT1 system – the causes would need to be identified and remedies or resolutions determined and implemented. As Alstom's Bertrand Bouteloup explained to the Commission, "You do not overcome technical issues only by having people." While more maintenance staff might have assisted, there was also the need, as Morgan told the Commission, to have "the right fixes … the right technical solutions [and] … the right processes in place." Third, the parties were operating in a climate of mistrust, which threatened to undermine their partnership.

13.3 Insufficient Maintenance and Warranty Staffing

When the Confederation Line was opened to the public, there was pressure to address the outstanding deficiencies and to provide reliable public service. That was a tall order. However, to the extent that the OLRT1 system's issues could be addressed by having sufficient appropriate people in place, RTM and Alstom were inadequately prepared to provide the necessary resources. The parties each had distinct but related responsibilities, as outlined earlier (in section 13.1).

Unfortunately, despite repeated requests from the City, RTG, and RTM, Alstom did not provide sufficient human resources to consistently and effectively maintain the elements of the OLRT1 line that it was responsible for. Further, RTM did not provide sufficient oversight of Alstom's maintenance activities. These maintenance failures contributed to the passenger service issues that were experienced on the OLRT1 line after it opened.

This section reviews the inexperienced and inadequate staffing of RTM and Alstom as they prepared to maintain the OLRT1 in the period leading up to RSA and at the launch of public service.

13.3.1 Inexperienced Maintenance Workforce

Alstom Maintenance's workforce lacked the experience necessary to meet the maintenance demands of public service on the Confederation Line in September 2019.

Alstom Maintenance was responsible for maintaining the vehicles and systems (including the track; overhead catenary system; and aspects of communications and signalling). Alstom employed workers in Ottawa who were inexperienced; they had not maintained rail systems before. Preparation for RSA was, therefore, key to meeting the maintenance demands of public service.

Alstom's maintenance contract did not require the company to begin maintaining the system until RSA. This created, in the words of OLRT-C's Matthew Slade, a "difficult situation" between RTM and Alstom when it came to Alstom's preparations for maintenance. Some witnesses told the Commission that Alstom Maintenance refused to engage with the OLRT1 system prior to RSA. For example, Steven Nadon, of RTM

and OLRT-C, said that when he sought to provide "on-the-job training" to his former personnel whom Alstom had hired for its maintenance team, Alstom refused, taking the position that under the maintenance contract, RSA was the first day they were allowed to work on the system. Similarly, Slade told the Commission that OLRT-C's testing and commissioning team invited Alstom Maintenance staff to participate in testing and commissioning to familiarize themselves with the equipment, but Alstom, relying on the maintenance contract, refused. Other witnesses told the Commission that the efforts of Alstom Maintenance to gain access to the OLRT infrastructure to "learn and develop their … maintenance expertise" were frustrated, and email correspondence from early 2019 indicates that Alstom Maintenance expressed interest in accessing the system for learning purposes. In any event, it is clear that the Alstom Maintenance team did not have the training and hands-on experience that RTG, OLRT-C, and RTM thought was required.

The start date provided in RTM's maintenance subcontract with Alstom was not the only factor that interfered with the training of Alstom's maintenance staff. Alstom staff did not get all the time on the line that they requested because parties were competing for track access as OLRT-C strove to complete construction, testing, and commissioning and thus meet Substantial Completion and RSA. Justin Bulpitt, of Alstom, told the Commission that this limited line access impaired Alstom Maintenance's preparation, training, and system inspections. In addition, late delivery or completion of aspects of the LRT system left little time for training on those system components.

The inexperience of Alstom's maintenance staff was apparent to STV; the City's consultants told the Commission about Alstom's apparent lack of urgency when it came to getting the scheduled number of trains out on the line in peak periods (that is, making score) and failing to provide sufficient line technicians to respond quickly to issues on the line.[1]

Witnesses suggested to the Commission that Alstom had staffing options other than training up new maintenance staff. For example, the company could have brought in experienced maintenance staff from its worldwide facilities. Although Alstom did temporarily bring in staff from around the world, including for the start of operations, the Confederation Line required a permanent, skilled, local maintenance workforce. Alstom could not reasonably be expected to permanently relocate a full maintenance team of experienced workers from other projects to Ottawa. As the City's Manager of Transportation Services, John Manconi, explained, once the system was in service, Alstom Maintenance would bring in staff from New York or France, reliability would improve, those staff would leave, and reliability would decrease again. Alstom had to train local staff or gain access to more experienced local labour. While Alstom did both

to some extent after the start of public service, Alstom Maintenance staff lacked the experience required to efficiently maintain the Confederation Line at the time of the public launch.

13.3.2 Insufficient Maintenance and Warranty Personnel

RTM and Alstom Maintenance created their maintenance teams based on the assumption that the OLRT1 system would perform as described in the Project Agreement – in other words, that the system would run reliably. Alstom Maintenance did not anticipate a high level of problems, deficiencies, deferred work, and "bugs" on the system, nor did it anticipate that its staff would be required to manage "work-arounds."

However (as described in Chapter 12), OLRT1 was not consistently performing at the reliability levels required by the Project Agreement through the summer of 2019. RTM and Alstom Maintenance were not resourced to deal with the maintenance demands of the system as they received it in September 2019.

Further, Alstom's initial staffing plan assumed that OLRT-C would provide the required warranty support (efforts to address construction and other defects or deficiencies covered by warranty) and that experts from Alstom Rolling Stock would transition to Alstom Maintenance, thus bolstering the existing maintenance team. Neither of these assumptions bore out. France, of Alstom, told the Commission that OLRT-C significantly demobilized around the start of public service, leaving infrastructure warranty issues for Alstom Maintenance to address and increasing its workload. The reduction of time for testing and commissioning and compression of those activities, along with the deferred vehicle retrofits, meant that the experienced Alstom Rolling Stock staff were still occupied with work that was originally to have been completed before RSA, during the construction and manufacturing phase, leaving Alstom Maintenance with fewer experienced staff than planned.

The City was aware of the maintenance staffing issues and their implications for the reliability of OLRT1 service. STV's Tom Prendergast wrote an email dated June 24, 2019 advising members of the OC Transpo leadership team, including Manconi, Morgan, and Troy Charter, that he ranked RTM's maintenance readiness as 3 to 4 on a scale of 1 to 10. In support of his low ranking of RTM's readiness, Prendergast identified concerns that included:

- Lean resources;
- Alstom staff's inexperience in vehicle inspection, maintenance, and public service support; and

- The need to address "open" or outstanding issues, explaining that critical heating and ventilation issues, and a large number of smaller issues "will require specific attention and will compete for space and resources in the MSF…. This will mean that either they will take longer to complete and/or that the … vehicle work will suffer. The 'knock on' effect on vehicle availability could be significant."

Prendergast also identified the consequences that could flow from the issues he identified, warning again that "there is a strong possibility that vehicle availability will suffer." Meanwhile, Alstom also became aware of the need to increase resources to support OLRT1 system operations. France testified that upon joining Alstom Maintenance in June 2019, he realized they were going to need more maintenance staff, and he started recruiting staff, including service operators, infrastructure maintenance supervisors, and an engineering manager. Alstom Rolling Stock also hired additional retrofit, warranty, and commissioning technicians, said Bulpitt, to address the "significant number of modifications" required on the LRVs.

Increasing the number of maintenance staff was not something that could be done quickly. Bouteloup told the Commission that it was a challenge to secure and train people to maintain the OLRT1, explaining that there were difficulties learning aspects of the related systems and subsystems. The Commission heard that there was a limited labour pool from which to hire staff and the required technical training took several months.

The City pushed RTG for increased staffing through the summer of 2019, with some success. OC Transpo wanted RTM and its subcontractors to "over-resource" the Confederation Line to support the demands of early public service. STV's Larry Gaul told the Commission that "Mr. Manconi was pushing like heck to get them to step up on their resources and improve their overall processes." Morgan agreed that the City was trying to get RTM and Alstom to focus on "putting enough resources on maintenance to ensure that any issues that might be experienced after launch would be addressed." Mayor Jim Watson even got involved. Morgan said that RTM and Alstom promised to bring the appropriate resources to the OLRT1 project and that they would be ready for public service.

RTG, OLRT-C, and RTM shared the City's concerns about understaffing as the system headed into public service. Slade said that OLRT-C was meeting with members of Alstom and the RTM board every day "to try and get them to understand what needed to be done. We had phone calls and meetings with the [Alstom] CEO in Paris to try and get the level of urgency up…. We tried absolutely everything but it was and still is a struggle." Guerra (of RTM) and Peter Lauch (of RTG) said that, while Alstom assured RTM that it had sufficient staff and capacity, RTM continued to view Alstom Maintenance as under-resourced and lacking a sense of urgency.

However, the terms of the maintenance subcontract between RTM and Alstom did not allow the City or RTM to make specific staffing demands of Alstom. Morgan said "their obligations are simply to provide service, not staffing levels," explaining that while the City could direct Alstom to respond to specific issues after they were identified, such as door software or platform-edge cameras, "the contract did not provide a mechanism" for the City to direct Alstom to increase staffing more generally. Guerra explained, "The contract is performance-based, so we cannot tell Alstom they must have x number of employees. We can simply say it's performance-based, the reliability is such, and we believe one of the reasons [is] a lack of resources."

While Alstom increased its staffing levels in certain respects during the period between May and September 2019 in anticipation of system handover, Alstom's staffing increases did not meet the City's demands. Charter, of the City, said that RTM did not provide all of the resources the City sought; Manconi told the Commission that Alstom should have been "flooding the system with technicians," but that the company failed to do so. The City's concerns about Alstom's staffing levels continued into September 2019.

13.3.3 Insufficient RTM Oversight

Under its Maintenance Contract with RTG, RTM was and is responsible for monitoring performance of maintenance work on the OLRT1. Given the concerns about Alstom Maintenance's resourcing, RTM should have been prepared to provide thorough oversight of Alstom's maintenance work. Unfortunately, RTM did not do enough in this regard.

Guerra said that RTM "underestimated the amount of oversight that would be required" over the maintenance activities it was contracted to perform. Slade, of OLRT-C, told the Commission that RTM was

> pretty naive at the time.… I guess they just felt that the contract was in place and that, at a point in time, Alstom would turn up the gas and get going and do what they were supposed to do. RTM didn't have the knowledge or the expertise to be able to do that, which is why it was subcontracted out. But the leadership, or lack of leadership at Alstom, just meant it didn't happen.
>
> I think that [at] the point of revenue service availability – I think RTM and Alstom were lacking in leadership and ability and urgency.

At the start of public service, RTM's oversight structure was too thin to provide a high level of assurance that Alstom's maintenance activities were sufficient. Given

the reliability and resource issues present in the lead-up to the public launch, RTM's oversight should have been robust enough to provide that assurance. The Alstom and RTM staffing issues contributed to the Confederation Line's unreliability.

13.3.4 Conclusion

It was apparent to the City and RTG that the maintenance team was inexperienced and under-resourced. Despite concerns about maintenance capacity, RTG told the City that RTM and its subcontractors were prepared to maintain the system, and the City launched the OLRT1 to the public. These decisions had consequences for public service, including slower-than-expected response times to failures that contributed to system delays. OC Transpo's LRT customers paid the price.

13.4 OLRT1 Learning Curve

OC Transpo operations staff for the Confederation Line also faced a learning curve, with resulting public service impacts. While staff had completed their training, they had limited opportunities to work on the full system and to work in coordination with RTM and Alstom Maintenance prior to public launch.

Providing public service was going to involve a learning curve regardless of the number of deficiencies or reliability issues with the OLRT1 system. RTM and Alstom Maintenance staff were inexperienced; OC Transpo's operations staff were also operating the OLRT1 for the first time. Further, the relationship between OC Transpo as operator and RTM and Alstom as maintainers was new. This section discusses how these factors affected the reliability of OLRT1 public service.

13.4.1 OC Transpo's First LRT System

OC Transpo was new to operating an LRT system with the size, complexity, and carrying capacity of the OLRT1. Although some members of its management team had comparable rail experience, its staff and the agency as a whole did not.

Before the OLRT1 opened, OC Transpo operated a busy bus rapid transit service (known as the Transitway), along with a small, diesel-powered rail line called the O-Train (now known as the Trillium Line). The Trillium Line (as noted in Chapter 8) is not comparable to the OLRT1 project. The Trillium Line consists of five stations along eight kilometres of single track – a much shorter line with fewer than half of the OLRT1 (Confederation Line) stations. The Trillium Line provides less-frequent passenger service, with trains running every 15 minutes. The Trillium Line's fleet is also significantly smaller than that of the OLRT1: between 2001 and 2015, the O-Train had a fleet of three vehicles, with two trains running on the track at a time; in 2015, the fleet grew to six, with four trains running at a time. Due to the differences between the Trillium Line and the Confederation Line, including size, capacity, and technology, OC Transpo's experience with the diesel-powered LRT line did not meaningfully prepare it for public service on the OLRT1.

OC Transpo staff were trained to work on the OLRT1, including as operators, controllers, and supervisors, and to OC Transpo's credit, they began preparing for LRT operations

long before public service. The Commission heard from Gaul, an STV consultant hired to provide operational support to OC Transpo, that OC Transpo's training program was "very good." To complete this training program, staff had to fulfill certification requirements overseen by OC Transpo. OC Transpo staff did so before 15 two-car trains were available, and before they could practise operating trains on the LRT line. Witnesses agreed that OC Transpo's staff were prepared to safely operate the system when the Confederation Line was launched to the public.

Despite the staff's certification, OC Transpo was expecting to encounter some issues at the start of operations attributable to a "green workforce" that was still learning to do things like troubleshoot vehicles and the system, and to do so under the pressure of regular public service. As Gaul explained to the Commission about training for commonly experienced scenarios in advance of regular operations, there are "two components" at play:

> You can train an operator on how to overcome basic door faults. And they can practise that.… You can practise … troubleshooting a lot of these problems in the yard. But then on the other side of it … the controllers and the operators don't get a sense of that pressure of trying to overcome these problems when there's 14 other trains out on the line and … delays going on to passengers.

It should be noted, though, that due to the reduced time for testing and commissioning on the OLRT1 project, competition for track and vehicle access, and issues with vehicle reliability and retrofits (see Chapters 9 and 10), OC Transpo's operations staff did not gain as much experience as originally planned. For example, they did not have the benefit of running LRVs on the entire line in simulated service conditions for as long as originally planned. The original testing and commissioning plan included 26 weeks of integration testing and simulated practice running that included some OC Transpo drivers. Ultimately, full system access with 15 trains (30 coupled LRVs) was not available until about a week before trial running began. While Gaul thought that OC Transpo ultimately had a "fair amount of time" to practise, operators and controllers still faced a learning curve as the system progressed through trial running into public service.

More practice operating the system in an environment approximating public service would no doubt have helped to address this learning curve. Gaul explained that operators "had to have the time to get really comfortable and used to the full services being operated out on the alignment and … gain that sense of urgency in what they were doing." Despite this, the Project Agreement is silent on how much time operators are required to spend practising on the line, which Morgan, of the City, described as a

potential gap in the Project Agreement. The controllers faced a much longer learning process: Gaul said, “You can’t even consider yourself a good controller until you’ve had five years of experience.”

One of the critical functions that operators and controllers perform together is to troubleshoot issues that arise on the system, with the goal of resolving them as quickly as possible and avoiding the removal of trains from service. However, it takes time for operators and controllers to become comfortable doing this, and OC Transpo staff were still gaining experience in troubleshooting when public service began.

Of course, it was not only OC Transpo staff who were learning a new system and facing this learning curve, but also RTM and Alstom Maintenance staff. RTM and Alstom Maintenance played a critical role in responding to issues on the line. The interplay between the inexperience of the operator and the inexperience of the maintainers is discussed next.

13.4.2 The Relationship between OC Transpo, RTG, RTM, and Alstom

OC Transpo and RTM must work collaboratively and co-operatively to run the OLRT1 efficiently. It is, therefore, no surprise that witnesses agreed that the working relationship between OC Transpo and RTM is critical to the smooth operation of the system. As City Manager Steve Kanellakos explained, the relationship between OC Transpo and RTM is, in his view, “the critical linkage point … in terms of the success of the system, because we depend on them and they depend on us.”

In particular, there must be effective communication and coordination in place between the maintainers and the operator in responding to issues on the line. The Commission heard from Gaul, of STV, that that level of communication and coordination was not present at first but improved over time.

The Commission heard that in the earlier preparations for public operations, Alstom did not want OC Transpo operators performing any troubleshooting on vehicles, even though, in Gaul’s experience, the operator is the “first line of defence” and can respond to issues immediately by going through troubleshooting steps with the guidance of a controller or technician. Alstom eventually agreed that OC Transpo staff could troubleshoot certain types of issues without waiting for an Alstom technician. As a result, before public service began, OC Transpo developed checklists for the controllers to lead operators through the troubleshooting process for various issues.

Similarly, in earlier stages of operational preparations before public service, OC Transpo controllers would have to call the RTM helpdesk or Yard Control Centre when a vehicle-related problem arose. Later on (but still before public service began), OC Transpo pushed for, and "were finally successful [in] having RTM put a vehicle technician in the control centre during certain hours…. As soon as the problem was reported, they were there; they were listening in; they were helping troubleshoot over the radio." This helped improve response times to certain issues.

Even with these significant improvements, OC Transpo and RTM still faced an operational learning curve in responding to incidents leading up to and during the early months of public service. In November 2019, for example, Gaul suggested to RTM's Tom Pate that they start up a joint vehicle troubleshooting task force. Gaul believed at the time, about two months after system launch, that RTM and OC Transpo could have collectively done a better job at overcoming issues on the line (in an email he wrote, "The recent vehicle problems on the mainline are killing us"). Gaul also recalled that there were many vehicle problems for which they did not have troubleshooting checklists.

Beyond responding immediately to issues on the OLRT1 line through troubleshooting, it is critical to efficient operations that RTM, Alstom, and OC Transpo communicate about and collaborate on resolving those issues. Gaul agreed with counsel for Amalgamated Transit Union Local 279 that, if close co-operation and coordination are absent, "things can break down for the public." Alstom's France said that co-operation and coordination is a "key ingredient" of reliable service. Gaul also agreed that when maintenance and operations are under the same "umbrella" – that is, carried out by the same stakeholder – it allows for better coordination and co-operation between the two sides. In contrast, in the OLRT1 system, which is operated and maintained by separate entities, communication and coordination between those stakeholders presents more of a challenge.

In the lead-up to and start of public service, coordination and co-operation between the maintainers and operator had not been optimized. The Commission heard from RTM's Guerra that different stakeholders were operating in "silos" even when he joined the project in July of 2020. Since then, OC Transpo as operator, on the one hand, and RTM and Alstom as the maintainers, on the other hand, have become "collectively" better at sorting through issues and tracking actions required to resolve them. One factor contributing to this improvement is the operational experience that OC Transpo and RTM and Alstom Maintenance have gained since the start of public service; another factor is OC Transpo's direct communication with Alstom Maintenance, as Alstom Maintenance now attends certain OC Transpo meetings with RTM. In Guerra's view, having "everyone in the same room" has helped to expedite the collective resolution of issues and promote

“open and honest” communications. Until those steps were taken, however, the mistrust between the operator and the maintainers undermined the efforts of OC Transpo, RTM, and its subcontractors to provide consistent, reliable customer service.

13.5 Mistrust Undermines Partnership

OC Transpo, RTM, Alstom Maintenance, and OLRT-C did not begin their working relationship with a clean slate. The mistrust that developed between the City and RTG during the construction and manufacturing phase carried over through RSA into public service, fuelling behaviour that was counterproductive to the provision of reliable OLRT1 public service.

During the first few months of public service (also referred to as passenger service or revenue service), OC Transpo staff generated a high volume of work orders that required attention from RTM and Alstom. This activity was driven at least in part by the City's interest in, as Charter put it, ensuring that RTM and its subcontractors "maintain the system properly and that the City has gotten what it's paid for." The number of work orders and the manner in which they were reported increased the pressure on RTM and Alstom.

Many of the City's work orders were entered in a manner that triggered a quick response from the maintainers, even though at least in some cases the underlying issue did not affect the safety of the OLRT1 system or pose a threat to its reliability – for example, work orders that were cosmetic in nature and would not affect public service.

RTM and Alstom were required to devote significant time and effort to addressing the City's work orders, time and effort that could have been allocated to more pressing and critical maintenance issues. The City's practice also placed additional financial pressure on RTM and Alstom and strained their relationships with the City.

On top of the additional work required by the City's work orders, RTM and Alstom Maintenance were also distracted from the day-to-day business of maintaining the OLRT1 system by disputes over responsibility for issues that were arising on it. More specifically, Alstom Maintenance contended that certain issues were the responsibility of OLRT-C under its warranty obligations; OLRT-C generally disagreed. These disputes further interfered with the efficient maintenance of the OLRT1.

The impact of the misgivings that the operator and maintainers, and the maintainers and constructor, had about each other is the subject of this section of the report. Before examining how the relationships between OC Transpo, RTG, RTM, Alstom, and OLRT-C affected early public service, however, a brief explanation is required regarding two communication systems involved in their work on the OLRT1.

13.5.1 Systems Engaged in OLRT1 Maintenance

During the maintenance phase of the OLRT1 project, OC Transpo, RTM, and Alstom Maintenance have had two key communication systems in their work (as noted in section 13.1): the SCADA system and IMIRS.

The supervisory control and data acquisition, or SCADA, system provides information about various aspects of the LRT line. For example, individual pieces of equipment on the line (such as a switch, door, or closed-circuit camera) are linked to SCADA, and the SCADA system reports on the status of these system components (such as whether they are working or not).

The integrated management information reporting system, or IMIRS, is RTG's system for tracking orders for work to be done. During early public service and until November 2019, City staff in the transit operations control centre would monitor the SCADA system and input work orders directly into IMIRS based on problems that they observed in SCADA or directly on the OLRT1 line. The information from IMIRS informed the City's assessment of the maintenance services provided.

Many of the work orders that OC Transpo staff entered into IMIRS triggered potential financial deductions to the City's monthly service payments to RTG if the work orders were not resolved within defined time frames. As the next section lays out, those work orders and the City's approach to the Project Agreement in the face of maintenance and system underperformance indirectly interfered with the reliability of the OLRT1 system.

13.5.2 City Generated a Flood of Work Orders in Early Revenue Service

Leading up to the public launch of the Confederation Line and during early public service, the City had "a number of people" who were "tasked with being out and available on the system, and if there were issues, to report them." OC Transpo's Charter explained that the City took a proactive approach to generating work orders following the launch of public service:

> We want people in the system using the system, and we'd like to capture issues before they happen. So I'd rather have my staff trying the escalators and elevators before having maybe potentially a customer … stuck in an elevator for a period of time…. So it was a combination of mimicking what customers would do, but as well it was part of our oversight.

RTM's Guerra was of the view that the City was "picking on just every little thing out there" regardless of importance. France, of Alstom, similarly described the City as "going around and shaking the systems, pushing these buttons, and checking everything to see what faults would generate. And then they'd raise a work order for the activity. And so we got a big wave of problems in the start of revenue service that shouldn't have been there."

City staff were also generating work orders for items that were already on the minor deficiencies list, which should not have happened. The minor deficiencies list (described in Chapters 7 and 12) had a "huge number of deficiencies on it," so flagging these known issues as work orders greatly increased the volume of work orders. Charter acknowledged that in the first few months of public service, City staff were reporting "outstanding deficiencies that they needed to resolve" and that they were reporting the same issues "over and over again" when the issues were not resolved quickly. This distracted the maintainers from the central challenge of maintaining the OLRT1 system.

Another issue was that City staff were inputting work orders into IMIRS based on alarms that they observed in the SCADA system. However, as all parties recognized, the SCADA system had configuration issues that impacted public service. France stated that the SCADA system generated a high volume of "nuisance alarms" that raised issues that were too insignificant to warrant work orders. As a result of these configuration issues, City staff were flagging work orders based on SCADA alarms that may not have been actual issues that the maintainers needed to address.

RTM and Alstom Maintenance were surprised and unprepared for the number of work orders that City staff generated during early public service. Guerra, of RTM, recalled that City staff issued 900 work orders during the first month of public service. Lauch, of RTG, also described the City as "flooding" the maintainers with work orders.

In addition to the volume of work orders, the manner in which City staff initially entered work orders also created challenges for RTM and Alstom Maintenance. At first, City staff were inputting work orders as a batch at around midnight, triggering the time frame for RTM's response to numerous work orders all at once, and overwhelming the maintenance staff. RTG's CEO Nicolas Truchon described this behaviour as follows:

> Shortly after Revenue Service began the City was consistently and improperly entering work orders into the Project reporting system in large batches rather than promptly entering these work orders as each issue arose. This made it impossible for RTG to be responsive within the timelines contemplated by the Project Agreement.

While the issue of overly voluminous and redundant work orders was largely resolved by the time RTM took over generating work orders around November 2019, RTM's Nadon testified that the City continued to input work orders in batches through to the time he gave his evidence (April 2022). He explained that when work orders were "batched" in this way, it required him to sit down and take time to triage the costliest ones to address first. "I don't have an infinite amount of staff," he said. "I don't have ten technicians that I can send to that one station where they each handle one door. I have to go and identify which door is going to cause me the most penalties."

Nadon also told the Commission that, despite requests from the maintainer, the City had refused to allow maintenance staff to walk the stations with City staff who were testing various aspects of the system to identify and resolve issues more efficiently. It is hard to see how the City's approach led to the most efficient resolution of issues that were identified by its staff or otherwise encountered on the OLRT1 system. It certainly did not contribute to a harmonious working relationship between the operator and the maintainers.

13.5.3 City Mischaracterized Work Orders

The City's approach to classifying work orders – on top of the issues of work order volume, redundancies, and timing discussed above – likely indirectly interfered with effective maintenance and increased financial pressure on RTM and, in particular, Alstom. This further strained the relationship between the City and the maintainers during early public service.

RTM and Alstom witnesses contend that City staff incorrectly characterized certain work orders as requiring the fastest response, rectification, and/or remediation time from the maintainers. As RTG's Truchon explained, "The City has continued to apply deductions in an aggressive manner that seeks to maximize the penalties that are imposed on RTG." As described above, failure to meet the time requirements associated with each work order triggered deductions to the monthly maintenance payment the City made to RTG. Deductions were cumulative, increasing the longer an issue went unaddressed. Those deductions were often passed down to RTM, and through RTM to Alstom.

The parties often disputed the City's classification of work orders. The City asserts that the monthly maintenance payment deductions were appropriate. Setting aside the merits of either party's position, these disputes themselves contributed to inefficiency on the OLRT1 system.

The Project Agreement maintenance payment mechanism included a system intended to incentivize RTM and its subcontractors to perform the maintenance services to a high standard. The payment mechanism provided, among other things, that certain issues

requiring maintenance attention had defined response and rectification times. Generally, the response times were supposed to correspond to the severity of the issue identified: the more serious the issue, the shorter the response time.

Alstom's France told the Commission that many of the work orders generated by the City did not impact the safety or reliability of the system. For example, some work orders involved purely cosmetic issues, or were repetitive or incorrectly classified as affecting safety or security of the system when they did not in fact do so. As well, as noted above, City staff were reporting matters included on the minor deficiencies list. Holder, of the City, explained that the parties had already agreed that minor deficiencies list matters would not materially affect safety or reliability, and that RTG and RTM would endeavour to address these issues as quickly as possible in the lead-up to and following RSA. In France's view, City staff should not have been treating these issues as requiring work orders that triggered deductions under the Project Agreement. Further, RTM staff were then required to "go through the work orders that had been raised overnight and correlate those against the deficiencies," which, Slade explained, added additional work.

Because of the financial deductions that it would otherwise face, Alstom was required to respond to and deal with these work orders rather than focus on other more significant aspects of maintenance. Alstom, said Guerra, "couldn't keep up" with these work orders, and as a result, some "service critical" (but not safety critical) tasks were not completed in a timely manner.

Further, in some instances the City applied a key performance indicator (KPI) to a work order retroactively, leaving the maintainers unable to meet the timeline required by the KPI as the clock had already run out. KPIs set specific performance requirements for the work orders they were associated with. If the KPIs were not met, the City could apply deductions and, in some instances, failure points under the payment mechanism in the Project Agreement. Guerra told the Commission that the deductions associated with such retroactively applied KPIs could amount to hundreds of thousands of dollars.

Lauch described his staff as feeling "defeated" by the City's approach to maintenance during this time frame. RTG and RTM staff felt that the City was trying to "nail the maintainer" with penalties and deductions, which contributed to the partnership becoming "soured." Lauch contended that at times, the City levied more deductions against RTM than RTM could have been paid under the Project Agreement for that month. Lorne Gray, former Contract Manager for the City, agreed that the City exercised a strict approach to the Project Agreement in terms of KPIs and resulting deductions and penalties, to the point it became unmanageable and took focus away from more important issues.

Considering the many disputes that arose regarding the strict and over-expansive application of deductions and penalties by the City, a contractually agreed-upon bedding-in period for the payment mechanism following RSA (see Chapter 7) might have facilitated a better relationship between the City and RTG/RTM. It might have permitted the maintainers to adjust to the learning curve with less pressure and might have avoided many of the disputes that arose. Most significantly, it would have given the City the opportunity to calibrate its expectations regarding the early performance of the system. Those expectations should align with the reliability growth of any new system.

13.5.4 Disputes between Alstom and OLRT-C Slow Maintenance

There was tension between Alstom Maintenance, RTM, and OLRT-C over responsibility for issues that arose on the OLRT1 during the warranty period (the period described in section 13.1). The warranty claim process required Alstom Maintenance to first raise warranty claims for construction defects with RTM in writing; RTM would bring a written claim to OLRT-C. Where the alleged defect involved the vehicles, OLRT-C would then pass the claim down to its subcontractor, Alstom Rolling Stock.

There were significant disputes, primarily between Alstom Maintenance and OLRT-C, regarding whether any given defect or deficiency was attributable to OLRT-C and its subcontractors, on the one hand, or RTM and its subcontractors, on the other. When the parties could not agree on who was responsible, it limited the entire maintenance team's ability to respond to issues effectively and efficiently. These disputes caused significant relationship strain, due to both the substantive disagreements over the cause of defects, as well as the warranty claim process. They were ongoing at the time of the Commission's public hearings.

Guerra, of RTM, also explained that when the City assessed a maintenance payment deduction against RTG, "RTG would flow those deductions down to RTM. If it's within Alstom's scope, then deductions get flowed down to Alstom." Alstom Maintenance, he said, would claim the deductions were due to defect or subject to warranty, so then they would come back up through RTM to OLRT-C, and ultimately to Alstom Rolling Stock.

Members of Alstom Maintenance believe that RTM failed to sufficiently protect Alstom's interests as a subcontractor. Instead, they believed that RTM aligned itself with OLRT-C in its interpretation of responsibilities under the Project Agreement, because OLRT-C had a relationship with the consortium, both contractually and because many individuals working at RTM for the maintenance phase of the contract were previously members of OLRT-C. For example, after the OLRT1 system experienced an issue with the overhead

catenary system, Alstom determined it was a result of an issue with OLRT-C's construction. Although Alstom communicated to RTM that resolving the issue was the responsibility of OLRT-C, RTM communicated to the City that it was a maintenance issue, and therefore Alstom's responsibility. Alstom Maintenance also indicated that it was excluded from meetings between RTM and RTG/OLRT-C.

13.5.5 Conclusion

Ultimately, the contractual structure created relationship-management issues and exacerbated the tensions between parties during the maintenance phase. Ineffective communication, collaboration, and integration prior to public service created significant challenges for the maintainers, which were already facing an increasing maintenance burden due to the delays and decisions made during the construction phase and did not have sufficient experience and resources to handle that burden.

Recommendations

See recommendations #21, 26–27, 37–42, 45–47, 67–68, 70–73, 77–82, and 90–92 in Chapter 17.

Notes

1 While Prendergast's evidence on this point referred to RTM, the substance of his evidence discussed matters under the responsibility of Alstom Maintenance.

Chapter 14
Public Service

Key Findings

- The City rejected RTG's proposals to begin public service with a soft start that would have allowed RTG and its subcontractors to work out reliability issues and become familiar with processes and procedures.
- After a full start to the Confederation Line and short-term availability of parallel bus service, the OLRT1 system was plagued by a variety of faults, failures, and breakdowns that undermined reliable service and frustrated members of the public, City politicians, and OC Transpo staff. Some of the problems had been identified before public service began, and it was well understood by the City and RTG that there was a heightened risk that new, unknown issues would affect the system's reliability.
- The City used opportunities that the Project Agreement – in the City's interpretation – provided to refuse payment to RTG for the maintenance period, resulting in tens of millions of dollars in payments not being made over several months.
- The City's strict approach to the maintenance payment mechanism, and the corresponding disputes, put significant financial pressure on RTG and its subcontractors, added to existing tensions between the City and RTG/RTM and between OLRT-C, RTM, and Alstom, and diverted attention and resources away from the goal of providing reliable service to the public.
- The City's approach to public communications about the OLRT1, and the Project Agreement terms that prevented RTG from engaging in public communications about the system without the City's approval, contributed to negative media coverage that increased the tension between the City and RTG and worsened the work environment for maintenance staff.
- Changes in leadership and resources at RTG and RTM improved their work on the OLRT1 system and their relationship with the City. The City, RTG, and RTM began to co-operate on several major issues, improving OLRT1 service and strengthening the relationships between the parties.

- After the City, RTG, RTM, and Alstom took action to improve system performance and reliability, work together better, and work through the backlog of issues, the performance of the system from September 2020 to August 2021 improved. There were fewer operational issues, and service was more stable.

Chapter Contents

14.0 Introduction

This chapter reviews key events that characterized the first two years of OLRT1 public service. The City had rejected RTG's proposals to begin public service (also called revenue service) with a soft start (or soft opening). That approach would have seen the system gradually open to the public and allow OC Transpo, and RTG and its subcontractors, to work out reliability issues and get used to their new roles. Instead, the City launched the Confederation Line with full service from Day 1.

OC Transpo briefly ran a parallel bus service, and after three short and uneventful weeks, the parallel bus service ended in accordance with plans that had been made before the events of the summer of 2019. After the parallel bus service ended, the OLRT1 system was plagued by a variety of faults, failures, and breakdowns that undermined reliable public service and frustrated members of the public, City politicians, and OC Transpo staff. The City was repeatedly required to implement replacement (R1) bus service. The buses for R1 bus service were pulled from existing bus routes, inconveniencing riders who relied on those services.

The repeated interruptions to public service should not have come as a surprise to RTG or to the City. Some of the problems that stopped trains in their tracks had been identified before public service began. While other failures may not have been foreseeable when the OLRT1 system went into public service, the heightened risk that new, unknown issues would affect the system's reliability was well understood by the City and RTG.

The City publicly blamed RTG for the system's poor performance. Councillors called for an end to the City's contract with RTG. City Manager Steve Kanellakos delivered a memo to Council explaining the City's approach to making monthly maintenance payments to RTG, stating: "Using the Project Agreement, the City was able to start significant deductions in October 2019. As a result of the deductions, these monthly

payments, which equate to approximately $4–5 million per month, have not been made by the City of Ottawa."

The City flooded the maintainers with work orders. RTG disputed the City's classification of various tasks, which had implications for both financial deductions and failure points (see Chapter 7). RTG also disputed the City's interpretation of the Project Agreement as allowing the City to carry over deductions incurred in one month to reduce the maintenance payment in the following month. There were several months in which the City did not make *any* maintenance payment to RTG, despite good OLRT1 performance during those months.

Against this backdrop of repeated failures, blame, heightened public dissatisfaction, and internal pressure to get paid, RTG, RTM, and Alstom Maintenance made changes to their leadership, staffing, and approach to the OLRT1 system. OC Transpo worked with the maintainers (RTM and Alstom Maintenance) to resolve technical issues on the OLRT1 line, create opportunities for dedicated rehabilitation and maintenance, and improve responses to incidents that arose. These efforts improved the maintenance and performance of the system, and contributed to an improving relationship with the City. By the early summer of 2020, RTG had a new CEO, RTM had a new acting CEO and General Manager, Alstom Maintenance had enhanced its team, RTM's working relationship with Alstom Maintenance was improving, and the City was working more collaboratively with the maintainers.

This chapter draws on information discussed in several other chapters, particularly the Project Agreement (Chapter 7), the Summer of 2019 (Chapter 12), and Maintenance (Chapter 13). It examines public service from the launch of the OLRT1 system to August 2021. The time period from August 2021 onwards, particularly the derailments, is discussed in the next chapter. Key terms that are new to this chapter appear below in boldface so they can be easily referred to later.

14.1 The OLRT1 System Launches with Full Public Service

The City launched the Confederation Line to the public with full service from Day 1 of operations, September 14, 2019. The Project Agreement did not provide for a soft start to OLRT1 operations, and the City believed that the OLRT1 should run as described in the Project Agreement, with nearly perfect performance, right from the start of public service. Despite the deferrals of certain Project Agreement requirements (discussed in Chapter 12), the City wanted the full benefit of the system it had paid for. The City was also concerned about the impact of a soft start on the public – a partial opening could be confusing and inconvenient for riders, and it might undermine the public's confidence in the OLRT1 before the system even started operating at full capacity.

RTG believed that a soft start would provide the operators and maintainers with a learning opportunity in conditions that resembled full public service while shaking "bugs" out of the system. A soft start would also allow the City and RTG to test drive the payment mechanism and other parts of the Project Agreement governing the maintenance phase of the OLRT1 project. This would provide the parties with an opportunity to see that everyone agreed with the interpretation and application of the contract, and try to resolve any related disputes before the pressure of full public service.

This section reviews the City's refusal to consider a soft start to public service, the efforts the City made to ease the Confederation Line launch, and the City's decision to provide only three weeks of parallel bus service. It also provides an overview of the replacement bus service that OC Transpo was repeatedly required to implement to supplement the OLRT1 when train service was interrupted.

14.1.1 No Soft Start

The Project Agreement between the City and RTG (as noted in Chapter 7) did not contemplate a soft start (or soft opening / soft launch) for the Confederation Line. As a result, there was no uniform definition of these terms in the Project Agreement, and no uniform definition was used during the Commission's hearings. However, at a high level, witnesses shared a similar understanding of what a **soft start** is and why a soft start is beneficial.

Former OC Transpo Chief Safety Officer Brandon Richards indicated that a soft start is akin to a "progressive build-up" to a fully operating system. Matthew Slade, who held roles at OLRT-C and later at RTM, testified that a "soft launch" is "where you would open the system up at a progressive rate rather than [immediately] going all the way to full service," to "give everyone a chance to become familiar with the system, whether that's the operators or the maintenance team or the public." RTM General Manager and acting CEO Mario Guerra explained that a soft start typically involves "stressing out the system" before launching full public service, to provide the "ability to look at anything that might come up and through discussions and workshops ensure that it's dealt with before you go into full revenue service."

Larry Gaul, of STV, explained that a "soft opening" can take various potential forms:

> A soft opening can be anything from … you don't open the entire system, you only open a segment of it. You don't open all the stations, maybe you just open some of the stations. You don't operate your full hours, it's reduced hours. But it can also be you don't change your … bus network to feed into the rail system on opening day. To me, the bus side is a big component of this "soft opening" definition.

RTG asserts that it is "well understood" in the industry that a **bedding-in period** will occur no matter what – in other words, there will always be a period in which the kinks in the system must be worked out – but it is preferable for riders if the operator implements a soft start to minimize disruption. Slade said that he "would never contemplate opening a rail system without a soft opening."

Slade testified that RTG raised the idea of a soft start with the City twice. First, at the end of 2018, RTG suggested a partial opening consisting of "a shortened part of the railway" between Blair and uOttawa Stations. Later, in 2019, Slade himself tried to propose a soft start in which the full line would run on reduced hours. The City, he said, would not even hear his full proposal. Former RTG and RTM CEO Peter Lauch testified that the possibility of a more comprehensive "soft start" or bedding-in period was a "non-starter" for the City. Lauch emphasized that in making that request, RTG was not "looking for a concession" or a "freebie" – RTG genuinely believed that a soft start would result in a "better product" for the ridership.

The City did not seriously consider or agree to a soft start because it was not part of the Project Agreement and was not contemplated when the LRT system was in the planning stages. Richard Holder, testifying for the City, explained:

> It was always known that the system would be a high-capacity system from Day 1, and that made the launch of the Confederation Line unique in comparison to the launch of other systems around the world, and that was on the basis that this was the first conversion of a bus rapid transit system to a light rail system. We already had the passengers, we already had the demand, and we were replacing one mode of transport for another mode of transport, but we were not replacing passengers. So it was always the expectation that on Day 1 we would be carrying [9,000] to 12,000 passengers.

In other words, the OLRT1 was conceived to be not a new system with ridership that would slowly grow, but rather a high-capacity BRT system with a large and established ridership that would convert to the LRT.

In explaining why the City did not accept RTG's proposals for a soft start, City witnesses discussed challenges that those proposals would pose to the OLRT1 ridership. As Troy Charter, OC Transpo Director of Operations, explained:

> If you're talking about partial station opening and … certain doors and certain stairwells being opened, some stations opened, some stations not, it just becomes a logistical nightmare for customers.… So it becomes a real communication and logistical nightmare … here's where you can go, here's where [you] can't. Here's what functionality you have, here's what functionality you don't. Oh, by the way, train frequency is only this. It becomes really hard to message that the system is ready to go. You know, why would you open the system if you had limited functionality and you didn't have all the – I don't want to over simplify it and say bells and whistles, but if you don't have the systems, you don't have the trains, you don't have all the stations, why would you do a partial opening? It's not ready.

Other witnesses, including Lauch, acknowledged that a soft start would have been disruptive to passengers. OLRT-C's Slade also believed that the consortium's soft start proposal was viewed with suspicion by the City, given the City's diminishing trust in RTG and OLRT-C.

The City also contends that there was effectively a soft start through a combination of the practice running period after trial running (from August 24 to September 13); three weeks of bus service running parallel to the train service (starting September 14); opening with 13 double-car trains (26 LRVs) rather than 15; lower opening ridership numbers; opening public service on a weekend, with a corresponding lighter weekend

schedule; and not offering free service, which would have increased the number of riders. Witnesses such as Guerra disagreed that this constituted a soft start.

Leaving the definition of soft start aside, it is apparent that the OLRT1 system, those staffing the system, and OC Transpo's riders would have benefited from a more comprehensive soft start that was responsive to the actual condition of the system. As well, a soft start likely would have brought to light the payment mechanism disputes that arose during public service and strained the relationships between the City and RTG, and between OLRT-C, Alstom, and RTM.

14.1.2 Parallel Bus Service Shut Down after Only Three Weeks

The Commission agrees that a partial and gradual opening of the OLRT1 line would have been inconvenient for OC Transpo's customers and the public more generally than full, reliable service from Day 1. However, given the way that the first several months of public service went – with numerous LRT breakdowns and service disruptions that required intermittent R1 bus service to accommodate riders – members of the public still experienced major inconveniences. It would likely have been less of a burden on customers to contend with a *planned* **hybrid service** at the beginning of OLRT1 public service that ramped up to full service as the system's reliability improved – as compared with an intermittent and reactive hybrid service for the first two years of the system's public service. Further, if customers knew to expect hiccups (temporary or minor problems) in service, and that parallel bus service would remain available for as long as needed while the system bedded in, that likely would have mitigated their loss of confidence in the system.

After the first three weeks of public service, the City imposed a hard stop to parallel bus service. Prior to this decision (that the City made unilaterally), Slade said that "there was a conversation about whether turning the buses off all in one [go] was a wise decision or whether or not that should have been progressive." Ultimately, the City instead decided to "turn all the buses off in one go rather than do it gradually."

The City emphasizes that there were no major disruptions during the first three weeks of public service, so at that time, extending parallel bus service did not seem necessary. However, the decision to end parallel bus service after three weeks had been made in advance, and the City had already made the decision to reallocate bus drivers months before. Tom Prendergast, of STV, testified that while he was present for a conversation about a soft start with the City, at the time of this conversation, the City has already made a decision "to go with a hard start once they went through … all the steps required in the Project Agreement."

14.1.3 Replacement Bus Service

While the City expected the OLRT1 to meet the Project Agreement performance requirements for full service from Day 1, it also made provisions for service failures. As part of its launch plan for the OLRT1, the City planned an R1 service, or replacement bus service. R1 service was a contingency plan by which buses would run parallel to the OLRT1, from station to station, at times of significant disruption to the OLRT1. The R1 service would run if trains could not move on all or part of the track, if train service was disrupted during peak service periods, or if both of these situations arose. Implementing R1 service required OC Transpo to pull buses from other existing bus routes and deploy them as R1 buses.

Although R1 service was developed to mitigate the effects of service disruptions on the OLRT1, it did not alleviate them entirely. Deploying the R1 service affected OLRT1 passengers, as it caused longer travel times, longer wait times, and crowding at OLRT1 stations and OC Transpo bus stops. Deploying the R1 service also meant requiring OC Transpo operators to, at times, cover different routes than they were originally scheduled for, and some operators were required to work extra shifts and/or overtime. At times, this use of the R1 service affected bus passengers, because trips on originally scheduled bus routes were late or cancelled. The complicated exercise of reassigning service from the LRT service to R1 service also imposed significant difficulty on the LRT control centre and supervisors responsible for the task.

Over the period of October to December 2019, the OLRT1 experienced over 50 events that required deploying the replacement bus service and/or **single tracking** (running service in both directions on a single track over a section of the LRT line to avoid an obstacle on the other track). By early 2020, issues with the OLRT1 continued to interfere with public service. Indeed, the frequent need to deploy the R1 service prompted the City to reserve 20 buses solely for that purpose. The need for additional buses, in part due to the OLRT1's lagging performance, placed pressure on the City's 2020 budget. The next section examines the problems that required frequent R1 service – breakdowns caused by catenary system failures, events related to electricity, switch failures, and multiple events in which vehicles were disabled.

14.2
Known Issues Hinder Public Service

Based on OLRT1 system performance during the summer of 2019, before public service began, reliability problems were – or should have been – expected when it launched. As set out in Chapter 12, the OLRT1 system faced serious challenges during trial running, and it would not have passed trial running if the requirements had not been modified midway through to make them less stringent and easier to pass.

It therefore should not have surprised anyone that, after public service began, the Confederation Line experienced a high number of failures and reliability issues. In particular, some of the problems that caused or contributed to interruptions in OLRT1 public service had already been identified as problems in the months before public service began. Many of the issues involved door faults, power supply issues, and track buckling – which are all addressed here.

Before addressing each issue in detail in turn, I must first consider the extent to which some issues were known or had been predicted. For example, door faults and failures began on the OLRT1 line even during the testing phase, and some of the software issues that caused the door problems were known before public launch. The parties could have postponed public launch to wait for a new software version to be certified that would have prevented some of the door faults, but chose not to do so. As well, there was insufficient real-world testing of the doors prior to public service – the employees riding the trains before public service did not hold, push, and block the doors in the way that real passengers do. With realistic testing, more of the door problems could have been identified and mitigated before public service.

The power supply issues were also well known at the time of trial running. Alstom struggled at that time to get support from the relevant supplier to address the high failure rate of the auxiliary power supply (APS) units on the trains. Only at the time of the Commission's public hearings was Alstom in the process of replacing all existing APS units with new ones from a new supplier.

Finally, the track buckling that occurred a year after public service began was not an issue at the time of public service, but had been identified by the City's advisors, STV, just before public service began. STV advised that this issue should be monitored and repaired promptly, but this work was not done in time to prevent the track buckling, which became a burden on maintenance to fix.

The failures to proactively address these issues may have allowed the City and RTG to reach public service faster, but this approach shifted the burden of addressing these issues to the maintainers and forced passengers to suffer numerous service disruptions and delays.

14.2.1 Door Faults and Failures

In the fall of 2019, the OLRT1 experienced a series of door faults and failures that required vehicles to be taken out of service and led to service delays. The door problems manifested in four ways:

- Doors reopened because an obstacle blocked their path and then would not shut after the obstacle had been removed;
- Doors would not open despite valid system commands instructing them to;
- Doors would shut automatically when the operator removed their key, on one occasion causing a passenger to become trapped in a door; and
- Operators could not easily isolate doors after a disruption.

The door faults and failures were caused by a combination of software issues and problems with the mechanical design of the doors. Some issues were known prior to public service; others were discovered during the first four months of service.

One software issue caused doors to stay open after encountering an obstacle that prevented them from closing. It stemmed from door features that were designed to prevent the LRV from moving if the vehicle doors malfunctioned. When a door is held open or pushed, or when the doors try (but fail) to close three times in a row, the doors stay open and prevent the train from moving so as not to endanger passengers. A door stays open until it is reset. The LRV operator would need to attend to the door and do some troubleshooting to reset it. If the operator did not succeed in resetting the door, which sometimes occurred, the train would need to be removed from service so that a technician could examine it, which would then cause service disruptions and delays. The solution identified for operators who were unable to easily reset the doors was a software update that allowed an “auto reset” of the door to ensure it would close after a disruption.

The extent of this door fault and how disruptive it could be was not discovered prior to public service, because in that period only employees were riding the trains and there had not been a lot of use of the trains’ doors. As a result, the problem was not clear until public service – when customers frequently held open or pushed at doors, and the doors would be stuck. Gaul explained:

> We saw many, many people try and grab the doors as [they were] closing to try and reopen the doors so they could get on. And that seemed to be what was causing the big problems, and then … the operator … could go back to try and close the door, but the door close button or switch wasn't working properly.

RTG also identified a glitch in the software that "randomly" prevented doors from opening despite a valid command to do so.

A different software issue caused a passenger to become momentarily trapped in a door. Lowell Goudge, of Alstom, explained that Build 7 was a version of Thales's software that changed the "functionality of the doors" so that when a driver took out the operator key, the doors would automatically close. On one occasion, when the key was removed, the doors closed and a "passenger was still kind of stuck in the door, not in physical harm but just plain stuck nonetheless." A retrofit ultimately resolved this issue.

There was also a mechanical issue creating difficulty after a door fault or failure. Ideally, after a door malfunction, an operator would **isolate the door**, which is the process of locking a malfunctioning door in a closed position so that the train control system no longer registers the door as a fault; then the train can move with the door not functioning but safely closed. Isolating the door allows the train to continue to function, and the door fault can be addressed later by a technician. However, the initial problem with isolating the doors meant that, once a door stalled in the open position, the entire train could not move and passengers suffered service interruptions as a result. This problem required a design revision to allow for easier door isolation. Slade advised that now, "it's pretty rare that you have to send a technician out to a door."

Charter, Ottawa's Director of Transit Operations, outlined the process that OC Transpo would undertake when there was a door fault. When an operator has a train with one door not closing, the train controller uses a troubleshooting checklist. It outlines a series of steps for the operator to follow "based on experience already dealing with [similar] door problems or based on documentation [received] from RTM or Alstom." Charter described the checklist as "a series of steps; 'Try this. If this doesn't work, try this. If this doesn't work, try this.'" He continued, "I'm simplifying this quite a bit, but that's basically what the checklist would be."

In cases where the issue could not be resolved on the line by the operator or the attending technician, the train had to be removed from service, towed, and repaired in the maintenance yard by Alstom.

Yang Liu, of Alstom, testified that even in the testing phase, there were a lot of door faults, and that "normally the doors are one of the least reliable components." What was

"strange" to Liu was the fact that the door issues persisted beyond the serial testing phase, which partly stemmed from the doors being jostled out of adjustment when the trains were lifted during the assembly process. The doors were readjusted prior to public service, and Liu did not know why the door faults persisted into public service.

Goudge said that to some extent, the door reliability issues were known at the time of trial running. There was a new software version that would solve certain of the door issues, but it needed to be certified for safety, a process that would take two to three months. That was too long for the time remaining before public service, so, Goudge testified, "what we chose to do is roll the software back to the past certified version, even though there were reliability issues because it was certified as safe."

The door faults significantly disrupted passenger service early in the OLRT1's life. As Mayor Jim Watson explained, when door faults occurred and required a technician to be sent out to troubleshoot the problem, that process would "backlog the system" for "upwards of 20 or 30 or 40 minutes." When on-site technicians could not fix the issue and the train had to be removed from service, passengers would have to board another train. As Mayor Watson indicated, "the problem multiplies itself when one train is down," as "you end up with double the number of people on a platform" trying to cram into the next train, which caused a lot of frustration. Individual instances of passengers being hit by closing doors – or in one instance trapped by the door – also did not help the public's confidence in the LRT system.

Resolving the door issues took some time. Gaul stated that when the door issue was first identified, RTG explained that the doors were functioning as they were meant to, and it took a while for the City to convince RTG/RTM that there was, in fact, a door problem.

Once RTG/RTM did acknowledge the problem, RTM made commitments to bring in additional resources, including door technicians, until new software was installed and a corresponding new fleet safety certificate was issued. While Charter acknowledged RTM's effort in bringing in more door technicians, he testified that more generally, he "wanted to see … more expertise, more resources" to "help ensure the success of the line and good service for our customers."

Alstom and Alstom's door supplier, Vapor Rail, developed options for software and systems changes to address the issues. The parties made progress in implementing these solutions throughout late 2019 and into 2020. The new software version was approved and released into service in spring 2020.

RTM worked with OC Transpo to ensure that vehicle operators had the information required to respond to door faults and to isolate doors so that the entire LRT system

would not stall following a door fault. RTM, said Guerra, also undertook "an educational process" with the public about "the dos and don'ts and how that impacts the reliability of the system."

While these solutions have significantly mitigated the door problems, some limited door issues remain, due to ordinary wear and tear of the system, rather than software issues. Liu explained that now, "when door faults happen, it is normally due to adjustments needed on various parts of the door." To solve the remaining door issues, "a technician has to … adjust, tune the door so that it fits better mechanically, and then the door is fine."

14.2.2 Power Supply Issues

The OLRT1 experienced various problems with its power supply after public service began, the most significant issue being failures of the **auxiliary power supply**, or **APS**, units that provide power to the trains. (APS units are also known as constant volt supply units.)

The OLRT1 uses an overhead catenary system, which needs to be described first before the power supply issues can be explained. The **overhead catenary system** is the suspended wire system that powers the train, and it includes the live (electrified) wire that runs above the train. The overhead catenary system is connected to the train by the **pantograph.** The pantograph is the arm-like framework extending up from the train roof.

An APS unit is a device mounted on the roof of the train that acts as a power converter. It takes the high-voltage power from the overhead catenary system, and converts it to other voltages to power other pieces of equipment on the train.

These APS units experienced failures, which caused delays in service. While the root cause of the APS failures is still unconfirmed, Mott MacDonald (a consultant company hired by the City) provided an "independent review report" to the City in April 2022 that concluded that it is "clear that internal electronic components are failing with serious damage from possible overload/temperature related issues."

Slade told the Commission that these failures were happening frequently because the supplier of the APS units, Additel, provided faulty units. This supplier had never provided APS units for the Alstom Citadis vehicle model before. Typically, Alstom used a European supplier for APS units, but could not do so for the Ottawa LRT vehicles due to the Canadian content requirement, so Additel was used as the supplier instead. Further, APS units are "normally designed for 750 volts" rather than the 1,500 volts on the OLRT1. Slade remarked that the APS problems might not have occurred if the LRT vehicles had run on 750 volts and if Alstom had used its typical European supplier.

The APS failures significantly undermined the reliability of OLRT1 service, because without power, an LRV is unable to move, forcing passengers to disembark and board a new train.

Goudge testified that the APS failure "was a known issue" with an "unacceptable failure rate" during trial running; heading into public service, these issues presented a known risk to vehicle availability. At the time, Alstom struggled to get support from the APS supplier. APS units were still frequently failing as late as fall 2021, and the APS issues were still not fully resolved at the time of the Commission's public hearings. Goudge told the Commission that Alstom was working with a new supplier to completely replace the auxiliary power system on the LRT vehicles.

14.2.3 Train Control Management System

Starting in the fall of 2019 after the shutdown of parallel bus service, the **train control management system**, which is essentially a computer that controls systems on the train, began to experience networking problems that required the trains to effectively be rebooted when they reached the end of the line. This process caused delays in service. A software upgrade addressed this problem.

14.2.4 Track Buckling

In May and June of 2020, unseasonably warm weather caused high rail temperatures, which in turn caused the track to **buckle**, meaning to expand and deform. Buckled sections of the track had to be taken out of service for repair. Delays in service followed.

RTM investigated the track buckling and came to a preliminary conclusion that refers to **rail neutral temperature**, which, as former OC Transpo Chief Safety Officer Richards explained, "is essentially a temperature that you have the steel pulled to … so that it will react appropriately in that swing of temperatures." RTM's preliminary conclusion was that the rail neutral temperature for the line, which was set at 10 to 20 degrees Celsius, was too low. As Richards advised, because the rail neutral temperature for the Confederation Line was not set properly, "when it got hot outside the rail had a tendency to buckle and kink because it expanded too much from its neutral temperature."

Liu, of Alstom, explained further:

> If the neutral temperature is below, that means when the temperature exceeds that neutral temperature, your steel will expand and that will introduce stress to your

> tracks, to your rails. In the sections of track where it is on … concrete, the tracks can't move, whereas on the sections of the track where it's ballasted … the stress experienced by the rails will be transferred onto the ties, and if the ballast is not firm enough, then your rails will move.

Richard France, of Alstom, put it, "You'll get the rails squiggling off to the sides like spaghetti."

Liu explained the problem and described the short-term mitigation, stating: "As the steel expands there was basically an excess of steel in that section. So, we would need to come overnight and cut a section out and weld it back together so that there is no longer the stress in the rail." This process, called destressing the rail, was burdensome on maintenance, as there is a need to "destress a long stretch of track because it is continuously welded, and that would require an extensive maintenance period."

One of the long-term mitigation plans for the problem of track buckling was for RTG to complete an engineering assessment of what the rail neutral temperature should be; however, it was unclear at the time of the Commission's public hearings whether this assessment had been completed.

Notably, the problems with the rail neutral temperature were predicted before public service began. A July 2019 memo from STV that consultant Prendergast shared with the City reported that "rail was laid with low neutral temperatures based on field reports in the 10º C–20º C (56º F–68º F) range." Because the rail neutral temperature was set lower than standard in Ottawa's climate, there was a higher risk of sun kinks or track buckling. The July 2019 memo concluded that "hot weather conditions are causing sun kinks along the Confederation Line track and are causing speed restrictions." The memo further predicted that "sun kinks can force track out of alignment causing a major event if not detected early and repaired." On July 31, 2019, Prendergast provided this memo to John Manconi, General Manager of Transportation Services, and Michael Morgan, of the O-Train Construction Office; thus, the City was aware of the risk of track buckling at least a year before these issues caused problems in summer 2020.

France, of Alstom, explained that Alstom later suspected that the track buckling had also stemmed from an additional issue, namely, from construction defects. Specifically, Alstom suspected that the ballast (the track bed made of small rocks underneath the train tracks) was not properly tamped down when the line was originally built. Ballast needs to be tamped or packed tightly under the rail; if the ballast is loose, then "the rail isn't as secure," because the ballast will "move when the rails are expanding and contracting." When Alstom undertook a campaign to tamp the ballast in summer 2021,

it appeared that the ballast had not been properly compacted. Once the ballast was tamped properly, far fewer rail buckling issues arose in the summer.

Ultimately, failure to address the risk of track buckling during the construction phase shifted these issues from before public launch to during public service, and distracted from the other maintenance work that needed to be done in that period.

14.3 Winter Conditions Cause Technical Failures

Ottawa's winter conditions interacted with aspects of the OLRT1 system, causing numerous breakdowns. While design flaws played a role, more winter testing might have identified these problems, and earlier preventive maintenance could have reduced their impact on public service.

Certain functions of the LRT line can only be fully tested in winter. Goudge explained that winter testing had been undertaken, but acknowledged that spending more time running the system in Ottawa's winter climate would have helped to better prepare the system to operate more reliably in the winter. Goudge acknowledged that the winter testing, which was largely conducted through simulations of natural winter conditions in a laboratory setting, might not have been identical to the real environment. Slade acknowledged that with Ottawa's "unique" winter environment, the fact that there was not any specific winter testing required in the Project Agreement "may have been a shortfall." Based on what happened on the OLRT1, Slade would recommend specific winter testing requirements for similar projects.

As a result of the limited winter testing, problems stemming from Ottawa's winter conditions only became fully apparent after they began affecting public service. The issues included ice salt that damaged the line inductors, the extent of emergency braking in slippery conditions that contributed to wheel flats, and the buildup of ice and snow that inhibited the switch heaters. If there had been more testing in Ottawa's winter conditions, all parties would have been able to act on the findings. The maintainers would likely have been aware of the additional preventive maintenance that was needed to deal with Ottawa's harsh winter conditions before public service suffered. The operator might have also become aware of operational changes that could lessen the likelihood of these failures and breakdowns.

As further set out below, the design flaws were largely rectified by the time of the Commission's public hearings, and Alstom has implemented preventive maintenance routines to prevent problems from recurring.

14.3.1 Failures of the Line Inductors and Overhead Catenary Systems

The supply of power for the trains on the OLRT1 system depends on many interrelated parts, including the APS units, the overhead catenary system, and the pantograph. (These parts were described in section 14.2.2; more detail is provided in this section.)

The LRV power distribution system involves substations that send electricity to the system to power the trains. The substations are connected to cables that feed power to the main line of the overhead catenary system, and the overhead catenary system is connected to the train by the pantograph. **Line inductors** are components contained in equipment cases positioned on top of the trains.

Through the winters of 2019–2020 and 2020–2021, the faulty design of the equipment case for the LRV line inductors caused vehicle failures. Perhaps most dramatically, on New Year's Eve at the end of 2019, multiple trains on the Confederation Line were disabled, causing huge delays and lowering public confidence in the LRT system.

Through the first two winters of public service, environmental contaminants got inside the line inductor equipment cases and caused short-circuits. More specifically, faulty design of the equipment case for the line inductors allowed contaminants to enter the cases, damaging the equipment inside. These contaminants included salt water (created when adjacent highways, bridges, and tunnels were salted to prevent ice) and carbon dust. The carbon dust came from the pantograph. Another piece of equipment that connects the pantograph itself to the wire had been "clipping" the pantograph, damaging the pantograph carbons and creating carbon dust. The carbon dust flowed into the equipment case, where it combined with salt water and metallic dust and damaged the equipment inside. To make matters worse, during the first winter of public service, Alstom was not routinely checking the line inductor as part of its preventive maintenance program.

One of the solutions to this problem was to repair the pantograph. Ultimately, the equipment case for the line inductors was changed out for another case that protected against contaminants flowing in. Liu said that, after the cause of the line inductor issues was discovered, Alstom "added all sorts of mitigations into the preventive maintenance, including checking [the line inductor] before and after every winter" for any buildup of contaminants and cleaning it. These mechanical and maintenance changes have largely resolved the line inductor issues.

The use of highway salts in winter caused a similar issue with the overhead catenary system on the OLRT1 line. In January 2020, a **parafil rope** that suspends the catenary

system was corroded by highway salts and broke in the downtown tunnel, cutting off the train's connection to power and immobilizing the vehicle.

France, of Alstom, testified that loose components attached to the ceiling of the tunnel added to the problems. He said that this issue was "inherited" from OLRT-C's construction work and also resulted from maintenance work that was not completed. France testified that "had things been maintained properly, surely someone would have spotted that and tightened it up and made sure that was secure."

The solution was for Alstom to institute inspections to ensure that the parafils are kept cleaner. If more winter testing and practice running of the OLRT1 had been completed before public service, Alstom might have identified this issue earlier and instituted a more robust approach to cleaning the parafils.

14.3.2 Electric Switch Heater Failures

In the first winter of public service, the Confederation Line experienced switch failures, causing numerous issues on the line. For example, on January 17, 18, and 19, 2020, "ongoing and repeated switch failures" caused "major delays" and significantly reduced passenger service.

On a rail line, the **switch** is the mechanical device that changes the direction of a train on the tracks. The switches must be heated in the winter to ensure that ice and snow do not build up and inhibit the switch mechanism.

The City had raised concerns about the switches with OLRT-C even before Substantial Completion. At that time, the City raised the poor performance of the switches with Lauch (of RTG) and Slade (of OLRT-C); Slade and Lauch concluded that inadequate maintenance during the testing phase was contributing to the switch issues. Morgan, of the City's O-Train Construction Office, observed that once maintenance of the switches was increased prior to public service, the switch issues improved to some extent. However, the switch issues returned during the first winter of public service, and there was a dispute between OLRT-C and the maintainers over whether the recurrent switch issues stemmed from design problems or insufficient maintenance.

By October 2020, RTG had determined a solution and implemented it; RTG replaced all electric switch heaters on the tracks with gas-powered switch heaters, which are more effective at heating the switches and preventing ice and snow buildup. Once that change was made, switch performance improved. Morgan noted that, "in hindsight, we probably could have … been more aggressive with the selection of switch heaters." That would have mitigated a lot of the winter issues in advance.

14.4 Wheel Problems Take LRVs out of Service

Wheel problems began interfering with public service around January 2020. There were frequent wheel flats – which began to take trains out of service in January 2020 – and there were wheel cracks, discovered the following July, that posed further problems. The wheel problems are addressed in detail below.

Both wheel issues took some time to address. Fixing the wheel flats was slowed by the lack of properly functioning maintenance machinery, and the cracked wheels on the system were not fully replaced until February 2022. The mitigating measures put in place for both problems were labour-intensive, placing additional burden and stress on the maintainers. Following the two main-line derailments mid-2021 (detailed in Chapter 15), the City changed its position regarding the wheel crack inspection program in light of, among other things, the risk the inspection program introduced into the system, other service quality concerns identified in the work done following the derailments, and the significant pressure the maintainers were working under.

14.4.1 Wheel Flats

The LRVs started developing wheel flats – or flattened spots on the train wheels – in January 2020. As the winter progressed, more wheels developed flats, and by February 2020, there were one or two wheel flats per day. When the wheels developed flats, the flats would cause a significant thumping noise on the train; if a wheel flat became significant enough, it would require that the train be taken out of service. Altogether, the development of this issue and the maintainers' slow repair process caused disruptions in service and worsened tensions between the parties.

After the issue was discovered, the parties established a Wheel Flats Task Force. The task force included representatives from RTM, Alstom, and Thales, as well as an external company called JBA Consulting, which RTG brought in to assist with the investigation.

Alstom determined that the wheel flats stemmed primarily from emergency braking in cold weather, which could be resolved, in part, by revising the brake rate. Liu described how emergency braking can lead to wheel flats. He explained that the LRT vehicles are capable of two types of braking to slow or stop the vehicles: electrical braking, which

is a softer type of braking; and mechanical braking, which involves "clamping on the brake pads" and "applying a certain force" to mechanically brake the train. The LRVs' emergency brake system is particularly harsh, and it can be so forceful that the wheels stop turning entirely when the brake is applied. This causes the wheels to slide along the rail, which leads to wheel flats. By contrast, with many non-emergency brakes, the train control system protects against wheels sliding in this way by reducing the brake rate when wheel sliding is detected so that the wheels can begin to turn again. That feature is not available for an emergency brake, precisely because the purpose of an emergency brake is to brake in the shortest possible distance, rather than reduce the force applied to the wheels.

On the OLRT1, the emergency braking feature was overused, because the brakes engaged if the trains were speeding when they came to a part of the track with a lower speed limit. The trains are programmed through the signalling system to use the emergency brake if the train enters a new zone at a speed higher than allowed and the correct brake rate has not been achieved; these conditions are more likely to occur in bad weather conditions. As a result, the emergency braking and resulting wheel flats happened largely in the first winter of public service.

France said the City was "really driving the trains to their maximum performance under that signalling system" during the initial few months of public service. Goudge similarly said that "the fundamental problem at the onset was the City was trying to run a performance level that exceeded the design intent of the vehicle in winter conditions." Goudge explained:

> The vehicle is capable, in perfect conditions, of meeting performance requirements. The vehicle alignment, or the train alignment on the track, and what we were given, requires the vehicle to operate under a certain level of performance to make the schedule, that's just physics. You have curves, you can only go so fast on curves, and there's a lot of curves in the Ottawa system. So the [automatic train control] system is programmed to try and meet that schedule. That's fine when it's not raining or snowing or cold, but if you have adverse weather conditions you have to take the performance down.

Goudge further stated that "the City, having never run really a rail system before, didn't have that understanding so they were trying to run the fastest schedule possible in extremely bad weather conditions," which led to "overspeed, station overshoot, a lot of emergency brake events." Charter agreed that, to some extent, the wheel flats stemmed from the learning curve that OC Transpo and RTG faced in operating the system.

The primary solution to this problem was to change the brake rate in adverse weather conditions, which reduced the wheel flats dramatically. In winter 2019, "Type 1" braking – less aggressive braking – was introduced as an effort to avoid application of the emergency brake. France, of Alstom, indicated that "the implementation of Type 1 braking in poorer weather conditions significantly helped alleviate that problem."

Additional secondary solutions were also implemented. Goudge explained that part of this process involved setting parameters for the first time for when to reduce speed in inclement weather scenarios, based on data showing that the trains tended to slide in such conditions. There were also software corrections.

Notably, the City was at first hesitant to accept RTG's recommendation to reduce the brake rates. This hesitancy showed how little trust remained, just a few months after public service began. Charter expressed that the City was concerned that RTG was trying to get around the Project Agreement performance requirements, instead of proposing that solution for the "right reasons" after discovery of the wheel flats. Charter also noted that the City was concerned at the time about the unavailability of the wheel lathe, a "critical component" of vehicle maintenance.

A **wheel lathe** is a machine used to true the LRVs' wheels; **truing a wheel** makes it round. During the first two years of OLRT1 public service, RTM provided one wheel lathe, and it was broken (and therefore unavailable) for extended periods of time. Timely repairs were not made to the wheel lathe because the repair person was overseas.

Indeed, following discovery of the wheel flats, public service suffered further due to unavailability of the wheel lathe that was required to repair the damaged wheels. Liu explained that the unavailability of the wheel lathe "really contributed to the lack of availability of trains after wheel flats," because there was a queue of trains "waiting to enter the wheel lathe to get rid of the flats." Liu said, "When the wheel flats happen, we have a clear criteria of what's acceptable and what's not acceptable. Any wheel flat that's not acceptable needs to be corrected immediately before the train can be used again."

Morgan explained how these kinds of issues – while not debilitating on their own – built up over time, overwhelming the maintainers and leaving them unable to keep up. Eventually, the City was "running … reduced service and having to add supplemental bus service." The wheel flats problem was exacerbated by the operator and overwhelmed the unprepared maintainers, who did not have the capacity or tools required to address the issue. Altogether, the wheel flats issue led to significant negative impacts on public service, and predictably, caused the parties to point fingers at each other.

14.4.2 Cracked Wheels

Alstom discovered cracked wheels on the LRT vehicles in July 2020, and was not able to fully repair the affected wheels until February 2022. As set out below, this issue had significant ramifications for the OLRT1 line. The entire LRV fleet was grounded when the issue was discovered. The resulting wheel replacement plan disrupted service for passengers, burdened maintenance, and further strained the relationship between Alstom and the City, because the City believed that Alstom took too long to rectify the issue.

On July 2, 2020, Alstom discovered cracked wheels on some of the LRVs during a daily inspection. When Alstom identified the first cracks, it notified the City of the occurrence. Richards, OC Transpo's Chief Safety Officer, in turn notified the Transportation Safety Board of Canada (TSB), because the wheel cracks presented a serious safety concern. The TSB launched its own investigation and identified a total of four bogies with cracked wheels. (**Bogies** are the undercarriage under a train, with four or six wheels that pivot beneath the end of the vehicle; sometimes bogies are called "trucks." The bogie runs on the tracks.) Between July 2 and August 18, 2020, a total of eight cracked wheels were found.

The City gave RTG notice that it intended to exercise its right to increased monitoring by bringing in a small team from CTP. With the help of these consultants, the City performed a parallel investigation to the investigation by the TSB, working collaboratively with the TSB and providing updates and information to them throughout.

Alstom, in its role as vehicle manufacturer, also undertook its own investigation. Liu explained that upon learning about an incident like the wheel cracks, Alstom would form a working group of individuals involved in maintenance, rolling stock design, and quality engineering, with members who worked at Alstom's centre of excellence in Le Creusot, France. The working group was formed to identify the root cause of the problem and identify solutions to prevent the problem from recurring.

In this case, Alstom immediately grounded the fleet. Alstom's centre of excellence in Le Creusot, which designed the bogies in question, issued a "safety risk assessment" requiring daily inspection of each LRV wheel before any vehicle was permitted to re-enter service. Liu indicated that "many operators were hired to do this inspection" and were taught "how to identify if a wheel is safe or if it is affected by this failure." For "anything that was suspicious," said Goudge, Alstom "had an external, nondestructive testing company come and do a test to say whether there was a crack or not."

Richards reviewed Alstom's mitigation plan and consulted with experts like STV and Regulatory Monitor and Compliance Officer (RMCO) Sam Berrada. In particular, STV

brought in its own expert to determine the root cause in conjunction with the Alstom experts. The City gave Berrada a special mandate, outside of his regular role, to provide advice to the City related to the breakdowns (including the wheel crack issue) and derailments that were occurring on the OLRT1 line. With the support of the STV expert and Berrada, the City accepted the inspection system as appropriate and approved the return to service.

Alstom performed a preliminary analysis of the problem, which suggested that special screws called **jacking screws** had been installed improperly by the manufacturer and had contributed to the development of the wheel cracks. The LRV wheels were manufactured by a supplier to Alstom, a company called Lucchini RS. When Lucchini RS shipped wheels, it did not typically include jacking screws in the wheel's threaded hole. (Jacking screws are used to separate parts of the wheel during maintenance.) Goudge explained that the "threaded hole" is "used to assist in removing the wheel from the hub" by "pushing screws in" to get the wheel off the hub. However, wheels without jacking screws are prone to corrosion. Because the jacking screws were missing in the original wheels, Alstom requested that Lucchini RS put the jacking screws into the wheels before providing the wheels to Alstom to install on the LRT vehicles. Goudge said that "the correspondence back and forth [between Alstom and Lucchini RS] included the fact that they had to make sure that those screws, when they were installed, did not … stick into the hub and interfere with the installation of the wheel." However, Lucchini RS installed the jacking screws improperly, so that they stuck out in an incorrect way and the screws later began stressing the wheels and causing the cracks.

Once the root cause was identified, RTG and the City agreed that the inspections would be done until Alstom could replace all wheels that had jacking screws.

Goudge indicated that the wheel cracks are an unusual occurrence for any train and have not happened to other Alstom vehicles. He offered the opinion that the issue stems from "a miss at the supplier quality" level, and asserted that Alstom was reliant on the wheel manufacturer to provide the level of quality that it had promised.

Berrada agreed with Alstom's conclusion that the issue was caused by the wheel manufacturer improperly applying jacking screws.

As of November 4, 2021, the TSB and Alstom had identified that 116 of the 185 wheels had one or more jacking screws protruding from the rear surface of the wheel hub. It was determined that Alstom would replace all "stressed" wheels – in other words, all those that had the improperly installed jacking screws. Berrada, who was providing advice to the City on how to view and address the cracked wheel issue, agreed with this proposed solution.

The cracked wheels contributed to the unavailability of LRVs for public service and disrupted maintenance. Alstom had to take trains out of service to inspect the wheels. Goudge explained that the "inspection process carried on until we could start cycling wheels through and replacing wheels and/or wheel centres that were subject to crack, based on being stressed, over about an 18-month period." France described the process of replacing the wheels as "cumbersome."

In addition to disrupting public service, the cracked wheel issue caused the City to lose confidence in Alstom's work as both a manufacturer and maintainer. At the public hearings, Morgan complained that the issue of cracked wheels "should have been detected … or avoided, frankly, in the manufacturing process" and lamented the loss of service for a week, as well as the time that Alstom took to replace the wheels.

By September 2020, the City expressed frustration in internal communications in connection with the cracked wheels, due to Alstom repeatedly failing to complete the wheel replacements on its promised timelines. This frustration only grew over time. By February 2021, Alstom advised that the wheel replacement project could only be completed in May or August 2021, as a "best-case scenario," with 11 trains in service.

Part of the delay in replacing the cracked wheels stemmed from the time it took for the wheels to be shipped from Europe, which was further slowed during the COVID-19 pandemic. Guerra, of RTM, remarked that even taking these factors into consideration, Alstom was slow to respond overall to the issue of the cracked wheels.

As of December 22, 2021, the City – and specifically Richards, as the OC Transpo Chief Safety Officer – changed position and would only allow vehicles in service once the wheel replacement program had been completed for those vehicles. Note that this was after the two derailments (addressed in Chapter 15). The City felt that the stress on the maintenance team at that point was too great to be adding another "element of unnecessary risk in the mix," when there had recently been a significant quality failure and others were discovered during checks following the derailments.

Guerra indicated that after the City changed its position to allow only brand-new wheels in service, that further delayed the return of vehicles into service to some degree. Alstom could not run vehicles that had old wheels that had not yet been replaced, even if Alstom determined that the wheels were uncracked and safe to run. However, the additional delay was not particularly significant, as, despite significant delays in the replacement program, by that time the large majority of vehicles had already had their wheels replaced. It took until February 2022 for Alstom to completely replace the cracked wheels.

14.5 Safety during Public Service

The cracked wheels, and some of the other issues on the OLRT1 line, engaged the City's safety and regulatory oversight obligations. The City (as noted in Chapter 11) is ultimately responsible for ensuring that the OLRT1 system operates safely and for establishing, implementing, and enforcing a regulatory framework for the OLRT1. RTG is required by the Project Agreement to comply with the City's regulatory framework, to establish a Safety Management System (SMS) in consultation with the City, and to implement that SMS in performing its maintenance obligations. RTG's contract with RTM imposes equivalent obligations on RTM.

This section follows Chapter 11's focus on safety up to RSA. It outlines the elements of the City's safety oversight framework during public service, the evidence the Commission heard about the weaknesses in that framework, and the steps the City took to strengthen it during public service. As is explained in Chapter 15, following the derailments in August and September 2021, the City took a systematic and holistic look at the safety of the OLRT1 system in conjunction with quality control and assurance of maintenance activities, and took a series of concerted steps to strengthen (and to require RTM to strengthen) its oversight of these key areas. Indeed, at that time, both the City and RTM agreed that they needed to increase their oversight efforts beyond what was already in place.

14.5.1 The City's Safety Oversight Framework in Public Service

As explained in Chapter 11, the federal Minister of Transport (Transport Canada), delegated regulatory authority over the OLRT1 system to the City in a Delegation Agreement effective October 1, 2011. Among other things, the Delegation Agreement authorizes and requires the City to develop, implement, and enforce a comprehensive regulatory framework for the safety and security of the OLRT1 system.

The City's regulatory framework includes standards, rules, guidelines, policies, Safety Management Systems, and other similar instruments. The framework is largely made up of programs, many related to safety, that OC Transpo is obliged to implement and oversee. These programs include OC Transpo's SMS.

The OC Transpo SMS is a core part of the City's OLRT1 regulations. OC Transpo reports annually on its SMS to the City Manager, and the SMS must be updated annually. OC Transpo's Chief Safety Officer is responsible for ensuring that OC Transpo's SMS and other safety-related plans and procedures are implemented. Richards, OC Transpo's former Chief Safety Officer, described the SMS as a "continuous improvement model" that requires "a mindset that in your operation you're always going to improve and be better."

OC Transpo's SMS outlines processes to ensure safety, including processes for establishing safety targets and initiatives, identifying and assessing risks, reporting and managing hazards and occurrences, ensuring compliance with the regulations, and implementing remedial action. The SMS guides OC Transpo's oversight activities – specifically, the risks identified through the SMS process that are subject to monitoring by the Chief Safety Officer and the teams working with the Chief Safety Officer (as discussed in more detail below).

The SMS is based on what are called four pillars: SMS policy and objectives, risk management, safety assurance, and safety awareness. The first pillar, SMS policy and objectives, includes safety "targets and initiatives" identified in each year's updated SMS. Targets and initiatives are safety-related goals, and include plans for how to meet those goals. The targets and initiatives reflect aspects of the previous year's performance that can be improved. Risk management, the second pillar, includes assessing risks associated with changes to OLRT1 system operations to ensure that those risks are appropriately mitigated. The third pillar, safety assurance, chiefly involves monitoring and auditing safety performance and regulatory compliance, and implementing remedial action in response to identified risks. The oversight plan for the OLRT1 system, implemented in 2021, is a central part of this monitoring. Within the fourth SMS pillar, safety awareness, are processes aimed at increasing safety awareness throughout OC Transpo's organization, mainly through training and communication with staff and contractors.

14.5.2 Improvements to the City's Oversight

The City hired Richards as Chief Safety Officer in May 2020. Richards, who replaced Jim Hopkins in that role, was given a mandate to ensure that a "safety culture" was embedded in OC Transpo. Further to that mandate, Richards undertook several initiatives to strengthen the City's oversight and safety work on the OLRT1.

Richards sought to enhance the OLRT1 system's safety by increasing quality control and regulatory monitoring of OC Transpo, and of RTG and its subcontractors. He felt that

increased oversight was required, based both on his own observations that RTM was not overseeing **Alstom Maintenance** (which differentiates here from Alstom Rolling Stock, as noted in Chapter 13) to the extent that the City expected and on the findings in the RMCO's annual reports. There was also a need for increased maintenance and better quality control by Alstom Maintenance.

Richards created a regulatory compliance team within OC Transpo's safety branch, called the **Regulatory, Training and Development division**. Prior to the creation of this team, the Rail Operations branch had performed some regulatory work; Richards believed that bringing regulatory compliance into the safety branch would improve its effectiveness. The reorganization brought safety and regulatory compliance together to address safety issues with RTG and its subcontractors, or within OC Transpo, using a "two-pronged approach." Richards believed that the creation of this new team gave OC Transpo more strength in addressing safety issues. While enforcing regulatory requirements through the Project Agreement, the new team could promote safety at the same time. The other two departments in the division are the **Safety Standards, Investigating and Reporting branch**, made up of safety specialists whose work includes investigating safety incidents when they occur and performing proactive audits to identify risk areas that require attention, and the **Transit Training and Development branch**, which is responsible for all training within OC Transpo.

In early 2021, Richards worked with Charter, Ottawa's Director of Transit Operations, to develop a **Line 1 Oversight Plan**. Prior to that, OC Transpo did not have a formal plan in place for monitoring RTG or RTM's performance of contractual obligations for the safe operation and maintenance of the OLRT1.

Richards created the **Safety Order** around September 2021 (with Manconi's approval) to strengthen the City's safety system. Safety Orders, which are issued by the Chief Safety Officer, document safety issues and set out the remedial steps to be taken to resolve them. The remedial steps must be completed to have the Safety Order removed. The Chief Safety Officer may issue a Safety Order against anyone who affects operations in an unsafe way. While the City could not require RTG or its subcontractors to complete the actions identified in the Safety Order, the Safety Order was intended to create a formal record of safety issues identified and the specific steps required to address them.

In 2021, the RMCO's monitoring focused on the SMS and emergency management processes. The RMCO's Compliance Report, delivered in March 2022, found that RTM's and Alstom's SMSs and Emergency Response Plans had some "gaps." RTM had not updated its SMS since 2018, even though it must be updated annually, and did not have a complete Emergency Response Plan in place, even though one was contractually required. As well, the risk assessments in the RTM and Alstom SMSs were focused on

occupational health and safety, rather than on operational safety. The RMCO concluded that the City was not monitoring conformance with those obligations as diligently as it could have been, and could improve its monitoring.

Richards agreed with the RMCO's findings. He described RTM's failure to provide an updated SMS as a "pain point," until the parties settled on a process through the Project Agreement to make sure that the programs of RTG and its subcontractors aligned with those of OC Transpo.

In 2022, following the two main-line derailments of 2021, OC Transpo made improvements to the Line 1 Oversight Plan in consultation with STV, TRA, and the RMCO. The 2022 Oversight Plan was more regimented: it included a more formal documentation process, a process for conducting regular inspections, and a specific schedule of monitoring activities, and it assigned specific individuals with responsibility for those tasks.

How do OC Transpo and the RMCO work together related to operations and maintenance of the OLRT1? At a high level, the RMCO monitors and reports on regulatory compliance, and the City is responsible for ensuring that regulatory compliance takes place. More specifically, OC Transpo's **Trains and Systems team** is responsible for overseeing maintenance, while OC Transpo's **Regulatory Compliance, Quality Control and Assurance team** is responsible for overseeing and monitoring policies, procedures, and plans relating to the City's regulatory framework.

The Commission heard that further steps to strengthen the City's oversight framework may yet be taken. Part of the work that the City's consultants, TRA, have been doing following the OLRT1 system's post-derailment reopening is to assess OC Transpo's oversight and monitoring programs and to make recommendations for improvement. Richards told the Commission that TRA's work was still under way when he left his position as Chief Safety Officer in March 2022.

The activities that the City, RTG and its subcontractors, and TRA undertook as part of the return-to-service process after the 2021 derailments are addressed in Chapter 15.

14.5.3 Regulatory and Safety Concerns

As noted above, the City had concerns about the quality of maintenance being performed by RTM and Alstom Maintenance before the derailments occurred in August and September 2021, and it expressed its concerns about quality issues to RTG in formal contractual correspondence. However, Richards recalled that the quality concerns were not serious enough at the time to justify shutting down the

system for safety reasons. In particular, he explained that after the issue of wheel cracks arose in July 2020, the stakeholders met regularly to exchange status updates. These updates included explanations of the steps taken to ensure safety on the OLRT1 line. Richards also recalled that RTM and Alstom had committed to having more staff oversee certain activities.

The City raised several examples of maintenance quality issues (or "workmanship" issues) in correspondence. In September 2020, for example, Alstom Maintenance failed to properly torque (tighten) a bolt on a vehicle; Richards described this as a quality control failure. At the time, the City, RTG, RTM, and Alstom were dealing with the issue of cracked wheels (see section 14.4.2), and the City was frustrated with Alstom's failure to meet certain deadlines and commitments. Richards told the Commission that the City's "expectation [of Alstom] was dropping."

In response to the September 2020 failure to properly torque a bolt, Richards explained that, if the bolt was a "safety critical component" (which he recalled that it was), the City would have required Alstom to do an inspection of the full fleet before vehicles could go back into public service (which he recalled had been done). There may have also been subsequent inspections to gain confidence that the problem would not occur again. Richards also recalled that Alstom put a process in place to ensure that the problem would be mitigated, but he did not remember its substance. Between this mitigation and the Rail Operations branch's monitoring of maintenance, Richards was satisfied that the system would operate safely. (Notably, OC Transpo's formal oversight plan, the Line 1 Oversight Plan discussed above, was first implemented in 2021.) Richards also told the Commission that he would have consulted with experts like STV and Berrada, the RMCO, when making decisions about the adequacy of mitigations.

In a letter sent August 6, 2021 – two days before the August 2021 derailment – the City expressed concerns to RTG about the delays in implementing the wheel replacement program (related to the cracked wheels) and about what the City described as "numerous instances … of unsatisfactory workmanship." The City gave two examples. The second example, Richards recalled, was the failure to properly torque a bolt discussed above. The first example was of "torque seal cracks" identified on a wheel that had been pressed in Ottawa to replace one of the wheels that was susceptible to cracking. To mitigate this issue, Alstom had to retorque and mark the wheels that had been retrofitted so far. Richards explained that the issue with torque seal cracks did not necessarily mean that the wheels were improperly torqued; it meant that it was not possible to visually check whether they were properly torqued, so the bolts had to be tightened to verify that they were properly torqued and then torque marks (which indicate the level of torque on the bolt) had to be reapplied. Richards considered this issue to

be less serious, and not significant enough to justify shutting down service. But it did warrant a written communication to RTG, because it should not have happened, RTG needed to take it more seriously, and it added to the City's existing quality concerns. Richards also noted that, although the letter was sent on August 6, 2021, the City had spent some time preparing it beforehand.

In conclusion, until the derailments in August and September 2021, the City's concerns about the quality of maintenance did not lead it to shut down the line for safety reasons. However, the September 2021 derailment demonstrated that maintenance quality issues could have drastic, dangerous consequences. As Chapter 15 sets out, the City's approach to reopening the system after the derailments reflected a new level of concern about maintenance and its impact on safety. While improvements had already been made to the City's safety oversight framework, the derailments prompted the City and TRA to thoroughly re-examine that framework and take further steps to strengthen it.

14.6 Relationship Issues in Public Service

In light of all of the problems with the OLRT1 during its first two years of public service, it should come as no surprise that the relationship between the City and RTG/RTM suffered during that time. Mistrust and discontent increasingly characterized the relationship between the two parties.

For the City, the seemingly unrelenting string of problems that disrupted public service led to public frustration with the OLRT1 system; internal frustration at the City with RTG/RTM, whom the City perceived as lacking in effort and urgency to resolve the problems; and an increased workload for OC Transpo, which had to implement the R1 bus service whenever OLRT1 service was interrupted. By early 2020, calls from the public and from several City councillors to explore ending the maintenance contract with RTG only added to the tension. As Councillor Catherine McKenney described it, members of Council and the Transit Commission had lost confidence that RTM was capable of resolving the system's problems; there was a "tremendous amount of public pressure to do something." In this difficult climate, RTG/RTM perceived that the City was reluctant to take any steps that might be seen as giving it a "break" or favour, which would draw the anger of the public and the Transit Commission.

As noted in Chapter 13, from the RTG/RTM side, public service started with RTM facing a "flood" of work orders from the City; the work orders began building up as soon as RTG handed over the system to the City. This overwhelmed maintenance staff and drew the focus away from the goal of providing reliable service, including RTM's ability to prioritize resolving service-critical issues. From RTG/RTM's perspective, the City was looking for every little error to find, every nit to pick, and the highest possible deduction to apply against RTG – indeed, the City did not pay RTG (who did not pay RTM, who did not pay Alstom) for an extended period of time. The Commission heard varying evidence from RTG/RTM witnesses about the length of the period of non-payment: Guerra said it lasted five or six months, and Nicolas Truchon said it lasted seven months. RTG/RTM also told the Commission that the City faced public and political pressure to act "tough" and viewed RTG/RTM's suggested mitigations and solutions with suspicion, leaving little room to engage in open dialogue with the City to collaboratively solve problems. Disputes between the City and RTG relating to payment deductions that arose at the start of public service remained unresolved at the time of the Commission's public hearings.

Charter, of OC Transpo, told the Commission that, after the first few months of public service, the relationship between OC Transpo and RTM started to "become strained." Lauch, of RTG/RTM, similarly said that the relationship "soured." City staff involved in operations and maintenance had become frustrated with RTM's inability to quickly resolve system issues. Charter explained that the City was enforcing the Project Agreement "more and more" in early 2020 and considering what contractual rights it had "to incentivize or direct RTG/RTM to take the right decisions to try to turn these things around more quickly." The City's dissatisfaction and increasingly strict enforcement of the contract culminated in its Notice of Default issued against RTG on March 10, 2020.

By the summer of 2020, when Truchon joined the project as RTG's CEO and Guerra started as RTM's acting CEO and General Manager, there was a lack of trust between the City and RTG/RTM and "a lot of … baggage that needed to be dealt with," which Truchon traced back to the tension that built up following the Rideau Street sinkhole and delays to get to Revenue Service Availability (RSA). Guerra felt that the City was enforcing the contract punitively and that the relationship was challenging, although he noted that the parties were able to work constructively to resolve some issues. Truchon told the Commission his priority was to start getting RTG paid, and to be paid, RTG needed to deliver reliable service.

The evidence before the Commission about the actual number of work orders in September 2019 is not clear. Guerra recalled 900 work orders in September 2019, while the minutes from the October 2019 meeting of RTM's Executive Committee meeting appear to show that there were about 1,900, and correspondence from RTG to the City from 2020 includes assertions by RTG that there were "tens of thousands of work orders during the first several months after service commencement." What is clear is that RTG/RTM saw the volume of work orders in September 2019 as unusually large. Charter acknowledged that the deductions incurred in September 2019 as a result of the number of work orders were "very, very high"; they exceeded $15 million.

14.6.1 Ongoing Payment Disputes between the City and RTG

Payment disputes that had characterized early revenue service (or public service) remained largely unresolved at the time of the Commission's public hearings. In addition to the City's approach to issuing and classifying work orders (discussed in Chapter 13), the City's administration of the **payment mechanism** is a matter of contention between the City and RTG. Two aspects of the City's contract administration are at the centre of the dispute: the City's practice of carrying forward deductions incurred in one month

to the next month's payment period, and the City's interpretation of the impact of the delayed RSA date on the maintenance payment schedule.

The City has taken the position that deductions RTG incurred in one month can be carried forward and applied to the next month's maintenance payment. This means that RTG may lose part or all of its monthly maintenance payment because of deductions incurred the month before. RTG asserts that this practice of carrying forward deductions has left RTG unpaid for months in which the OLRT1 system performed very well.

Truchon told the Commission that a "fundamental principle" of the payment mechanism that the private sector takes for granted on other public-private partnership (P3) projects is that the contractor can do no worse in a month than lose its full payment. Deductions accumulate within a month, but they are not carried forward: the next month starts "with a clean slate." Similarly, John Traianopoulos told the Commission that, having been with Infrastructure Ontario for a long time, he has always understood the contractor to be at risk of losing the monthly payment for maintenance services in a given month but "no more, no less." Traianopoulos agreed that the City's view – that it is entitled to carry forward deductions – is contrary to his interpretation of the contract and to his experience working with similar agreements. The carrying forward of deductions had serious financial consequences for RTG, RTM, and Alstom.

A second aspect of the City's contract administration that has had a detrimental impact on RTG is the City's treatment of the **maintenance payment schedule**. The monthly payments the City makes to RTG include **life cycle payments**, **availability payments**, and **capital payments**. The life cycle payment fluctuates every year in accordance with expected expenditures for the OLRT1 system, with payments in the last 18 months of the 30-year maintenance period envisioned in the Project Agreement being higher; in that period the system is to be upgraded and returned to what is called the "hand-back standard." The City has applied the schedule for maintenance service payments beginning with the very first month of the 30-year schedule, rather than with the month that would have applied if the RSA date had not been delayed by 15 months. As a result, RTG will not receive the higher monthly service payments that are scheduled for the final 15 months of the 30-year maintenance contract. That is because (as explained in Chapter 7) the 30-year maintenance term ends 30 years after the contractual RSA date of May 24, 2018, regardless of the delay to that RSA date.

Truchon told the Commission that, given the 15-month delay in getting to RSA, he would have expected payment for maintenance services to begin with the payment scheduled for Month 15 after the original RSA date. He explained that this is the usual practice in P3 projects, and noted that the contractor is generally able to claim from its insurers the initial months of payment it loses as a result of a delayed handover (here, the first

15 months). However, the City has taken the position that the maintenance payment starts on Month 1 of the 30-year schedule, meaning that RTG will lose the higher payments from the final 15 months of the schedule.

The City's approach materially disadvantages RTG: Truchon explained that the payments scheduled for the final 18 months of the maintenance contract are "quite significant." Truchon said that RTG will not be able to recover the loss of these payments. This payment issue exemplifies the ongoing effects of RTG's delay in getting to RSA on the relationship between the parties during public service.

The disputes between RTG and the City about carrying forward deductions and applying the payment schedule remained outstanding at the time of the Commission's public hearings. Together with the other outstanding disputes between RTG and the City, they have become a drag on the project, impairing RTG/RTM's ability to focus on operations and the parties' ability to engage in constructive dialogue.

The deductions that the City applied to the maintenance payments have had a substantial financial impact on RTG – and on RTM and Alstom, to whom deductions are passed down. The Commission heard from Guerra that RTG, RTM, and Alstom went through a period of five or six months in 2019 and 2020 without any monthly payment from the City; from Truchon the Commission heard that this period of non-payment was seven months. The Commission also heard that the period of non-payment had an especially significant impact because RTG and its subcontractors were bringing in additional resources to work overtime during that period. Although the partners behind the consortium supported the OLRT1 project throughout, the "whole supply chain [was] starving for cash," as Truchon put it, adding tension to the work environment. RTG was doing extensive work on the system but was not getting paid to do it.

The financial impact of the deductions levied by the City and ultimately passed down to Alstom has worsened existing tensions between RTM and Alstom. RTG witnesses acknowledged the significant financial pressure that deductions placed on Alstom. In addition, Alstom contends that deductions passed down to it have an "outsized impact," because its monthly payment includes payment for maintenance services only and is much smaller than the City's payment to RTG, which includes both payment for maintenance services and repayments of capital spent building the OLRT1 system.

The Commission heard that, at a certain point, the City levied so many deductions that the deductions stopped being a useful tool for shaping behaviour. As Traianopoulos explained to the Commission, the "intent of a payment mechanism is to kind of shape and enforce behaviour and penalties if things are not going well, but it has to be balanced so it's not overly punitive or not punitive enough." At times, it seems this

purpose of shaping behaviour was lost: Lauch testified that, when the City did not make monthly payments, RTM no longer had any financial incentives to motivate Alstom Maintenance to improve its performance. RTM was just "piling on" more and more deductions, to the extent that they lost their behaviour-shaping effect. As a result, Lauch said that RTM had to rely on other incentives to perform, like appealing to Alstom's "good will and to their sense of pride and so forth." Guerra similarly stated that, as it affected RTM and Alstom Maintenance, "not being paid is not a good motivator."

For the Commission's purposes, three things about the City's strict approach to the payment mechanism in the contract are clear: the City's approach, and the corresponding disputes, put significant financial pressure on RTG and its subcontractors; it added to existing tensions between the City and RTG/RTM and between RTM and Alstom; and it diverted attention and resources away from the goal of providing reliable public service.

14.6.2 Public Communications

In the latter years of construction, the OLRT1 project was the subject of much public and media attention, particularly after the original RSA date in the Project Agreement passed. Once the Confederation Line went into public service, it remained a topic of interest with the public, Council, the Transit Commission, and the media.

The public and media response to the issues presented at the beginning of this chapter was, unsurprisingly, negative. The City controlled the public messaging about the OLRT1; the Project Agreement (as noted in Chapter 7) states that the City "will assume the lead communications role" for the OLRT1 project, acting as the primary media contact and providing "final review and approval of all public communications materials." RTG was not able to respond directly to the "barrage of negative coverage" through public communications of its own, because the Project Agreement prevented RTG from communicating with the public without the City's approval. The negative media coverage increased the tension between the City and RTG and worsened the work environment for maintenance staff.

RTG contends that the City ought to have informed the public that the OLRT1 system would experience "growing pains," and that this is a natural and expected part of implementing any new complex transit system. As well, the City knew that, on top of the normal growing pains, there were existing issues that could affect reliability going into public service; the City also knew that additional issues could arise during public service. Instead of transparently educating the public to be prepared for expected service interruptions, the City presented the OLRT1 as a turnkey system that would work seamlessly from Day 1.

Guerra and Slade agreed that the City expected perfection from the start of public service and managed the media accordingly. When the OLRT1 system launched and began to encounter problems, the ensuing media attention was negative; RTG/RTM perceived it as aggressive. If the City had more effectively managed the media and educated the public about the issues arising on the new system, Guerra thought that the OLRT1 project would not have been perceived so negatively. The public, he thought, would have better understood the issues and why they were occurring.

The City's approach to public communications and the negative media coverage of the OLRT1 system during public service likely had at least two other effects, as Guerra explained. First, RTG's inability to communicate its views about the system's issues would have been difficult for RTG, RTM, and Alstom staff, whose work environment undoubtedly became more challenging as a result of negative media attention. Second, negative media attention, on both traditional and social media, contributed to the City's fears of being perceived by the public as giving RTG or RTM a "break."

RTG witnesses told the Commission that public pressure to be tough on RTG contributed to the City's generally strict contractual enforcement and was an impediment to open dialogue between the parties. For example, Truchon told the Commission that when the City made its first monthly maintenance payment to RTG, Manconi was sharply criticized by Council, with some councillors calling for his resignation from his role as the City's General Manager of Transportation Services. Manconi confirmed that a number of councillors were concerned by late fall of 2019 about the City making any payments to RTG. At least partly in response to the pressure not to make payments to RTG, City Manager Kanellakos wrote a memo to the Mayor and Council dated February 8, 2020 about the position the City was taking on payment to RTG/RTM. In the memo, Kanellakos explained that, while the Project Agreement had "effectively required" the City to make the first monthly payment to RTG, at "every opportunity that the City has had under the Project Agreement to not pay RTG to date, the City has used its authority to not provide payment."

The City's reluctance to take at face value RTG's suggestions for mitigating the problem of wheel flats is another example of the City's fear of being seen as giving RTG a "break" in action, and of the City's mistrust of RTG. After the wheel flats issue arose in the winter of 2019–2020 (as noted in section 14.4.1), RTG suggested that using a less aggressive brake rate in inclement weather conditions could help reduce the number of flats. There was some back and forth with the City before the City agreed to the suggestion. This dialogue slowed down the implementation of the joint initiative that is now in place and that has resulted in less frequent wheel flats.

Charter agreed that the City was hesitant to take RTG's suggestion at face value. He explained that the City "needed a better explanation as to why they were requesting to

change the brake rates": the City wanted to make sure that adjusting brake rates would be implemented for "the right reasons," to mitigate the wheel flats, rather than as a way for RTG/RTM to "move away from the [Project Agreement] requirements." Charter said that the City was particularly sensitive to the latter concern, because agreeing to reduce brake rates would also mean agreeing to relax the Project Agreement provisions that required the system to be able to transport a certain number of passengers per hour per direction.

Although Charter denied that the City's hesitancy to take RTG/RTM proposals at face value affected the parties' ability to resolve issues, he stated that the dialogue between them has improved significantly since the first winter of service. Guerra also told the Commission that the City has become less suspicious of RTG/RTM's suggestions over time, making constructive dialogue easier. Improvements to the parties' relationship, which have led to more positive dialogue, are discussed at the end of this chapter.

14.6.3 The Transit Commission Received Limited Information

When RTG handed the OLRT1 system over to the City, the Finance and Economic Development Committee handed oversight of the system to the Transit Commission. The Transit Commission has eight Council members (one of whom serves as Chair) and four citizen members. The Mayor (as noted in Chapter 3) is also a member of Transit Commission by virtue of being Mayor of the City.

The Transit Commission received updates on the City's transit services, including the OLRT1 system, from the General Manager of Transportation Services at the start of every regular Transit Commission meeting. The Transit Commission also received updates by memo and reports from staff where required. The Transit Commission was required by bylaw to hold regular meetings "once every month, eight times per calendar year." Transit Commission meetings are open to the public, except when certain sensitive topics, such as legal advice, are discussed. The Chair or a majority of the Transit Commission's members may also call special meetings. The Chair of the Transit Commission is permitted to cancel up to two successive regular meetings if the Chair does not think the meetings are necessary to "the proper conduct" of the Transit Commission's business.

Transit Commissioners Sarah Wright-Gilbert, Councillor McKenney, and Councillor Riley Brockington, testified that they did not think the updates the Transit Commission received about the OLRT1 system during operations were frequent or thorough enough. Transit commissioners' concerns about transparency began before the start of public service.

Some transit commissioners (as explained in Chapter 12) had serious doubts that they were receiving complete and accurate information during and following the trial running period. These concerns spread into the start of public operations.

Transit Commissioners Wright-Gilbert, McKenney, and Brockington were likewise frustrated with the updates they were receiving in the initial stages of public service. Wright-Gilbert and McKenney recalled that these updates were irregular and high level, or "generic." McKenney told the Commission that there were periods of two to three months when the Transit Commission did not meet, and the first update following public launch was in November 2019; Brockington expressed frustration to the Commission about the lack of regularly scheduled Transit Commission meetings in the first half of 2020. For example, he recalled that there was a period of four months in 2020 without a regularly scheduled meeting.

Some members of the Transit Commission took steps to increase the consistency and transparency of informational updates they received. For instance, going into 2020, Councillor McKenney and several other councillors held a news conference to publicly appeal for more information, particularly about the proposed resolutions to the problems that had emerged with the OLRT1 system. Transit commissioners also made requests for Transit Commission Chair Allan Hubley to call emergency or special meetings in the first few months of service, and again following the derailments; these requests were denied.

In addition, on November 20, 2019, Brockington brought a motion to have the OLRT1 system added as a standing item on the Transit Commission agenda, because he wanted to ensure that updates on the OLRT1 system would be consistent and would take place in public. Transit Commission Chair Hubley had earlier refused Brockington's request to add the update as a standing item. Hubley explained to the Commission that he saw the proposed addition to the agenda as redundant, because OC Transpo's General Manager always provided an update on the transit system as a whole, which included the OLRT1 system, at meetings. Councillor Brockington's motion passed.

Another point of frustration for Transit Commissioner Wright-Gilbert was the inability to get information directly from RTM about issues on the OLRT1 system. Until RTG and RTM representatives were invited to attend certain Transit Commission meetings beginning in early 2020, information about the system was delivered by OC Transpo staff in a process that Wright-Gilbert compared to "broken telephone."

Both Hubley and Wright-Gilbert considered RTG/RTM's attendance at Transit Commission meetings to be positive. They agreed that the attendance of RTG/RTM representatives at Transit Commission meetings assisted in helping the public better

understand issues, and that the ability to directly ask them tough questions put them under more pressure to give better answers.

By contrast, some RTG/RTM representatives did not view their appearances at Transit Commission as productive. Guerra said that RTG/RTM representatives were “pretty much … lambasted” by commissioners at the Transit Commission meeting held after the September 2021 derailment. Truchon explained that it was difficult to have technical discussions at Transit Commission meetings, because the transit commissioners are not experts but they seek to micromanage operations. He said there is a tendency for issues to become blown out of proportion at Transit Commission. More recently, RTG/RTM representatives stopped attending Transit Commission altogether, because of the ongoing litigation between RTG and the City.

14.7 Improvements Are Made

Changes in approach from RTG, RTM, Alstom, and the City eventually improved the OLRT1 system's performance and the effectiveness of the maintenance team. RTG, RTM, and Alstom made changes to company leadership and added resources. The City, RTG, and RTM also began to work together more co-operatively, and all parties learned from experience about how to operate and maintain the OLRT1 system effectively. The final section of this chapter details those changes.

14.7.1 Management Changes at RTG and RTM

In 2019 and 2020, changes in leadership and resources at RTG and RTM improved their work on the OLRT1 system and their relationship with the City.

In November 2019, Lauch, who was already CEO of RTG, took on the role of CEO of RTM, replacing RTM General Manager Claude Jacob. Before Lauch, there was no CEO of RTM. One of the reasons for Lauch's appointment was to introduce changes to the structure of RTM. As Lauch put it, "Sometimes you don't change all the players but you change the coach."

When Lauch was appointed as CEO, RTM made other changes to personnel and to the way it treated its personnel. One of the goals of these changes was to improve transparency at the management level – to provide "a bit more communication, a bit more openness, a little bit more support" to managers. RTM wanted to empower its management level to do more: rather than having to wait for approval from higher up, RTM wanted to give managers room to make decisions. This way, the managers could react faster to issues, knowing they had access to the budget and resources necessary to address them.

Lauch stayed in his dual role at RTG and RTM until around July 2020, at which point Guerra was brought in as acting CEO and General Manager of RTM. Truchon replaced Lauch as CEO of RTG. I would note that, under the Project Agreement, the City has to approve key individuals involved in the project, including RTG and RTM leadership appointments, and can request their removal if it feels they are not performing. Thus, these appointments would have been subject to City approval.

Guerra and Truchon brought further changes that improved RTM's effectiveness as a maintainer. In part, these changes were triggered by the difficult winter of 2019–2020,

in which (as discussed above) the system faced a number of problems. As Truchon described it, the pressure of all of these issues had put RTG and RTM into a reactive rather than a proactive mode: “When you’re dealing with this volume of issues, you probably start losing perspective and you focus on fixing the immediate short-term problems, and you lose a bit of planning capabilities.”

In March 2020, the City issued a **Notice of Default** to RTG. In the spring of 2020, in response to the Notice of Default, RTM put together a remedial plan (that it then revised), which aimed to address many of the issues that the OLRT1 had encountered during the winter. This remedial plan also drew on additional resources from the parent companies, and in Truchon’s words, “provided a fresh perspective and allowed the operating teams to elevate themselves and start thinking, as opposed to just reacting.” The City rejected the remedial plan and the revised plan, but RTG disagreed with the rejections and committed to implement the revised plan.

The changes that Guerra and Truchon introduced also included investing in further staff at RTM. RTM brought in new people, including a vehicle specialist, as a response to the reliability issues that were occurring in the early phase of public service, and other key people were replaced. One reason for the changes was, Guerra said, to get “a new voice in the room”; another reason was to bring in people with more technical expertise. When Guerra came in, RTM comprised about 30 people. As of the date of Guerra’s interview with the Commission in April 2022, the number was about 40. Working relationships at RTM were also changed. Reporting relationships were streamlined and more responsibility was delegated down, again ensuring that managers could make decisions rather than having to wait for approval. As a result of these changes, the flow of information was better, there was more clarity about who was responsible for what, and there was less duplication of effort.

Guerra and Truchon also worked to improve the working relationship between RTG/RTM and the City. As Truchon put it, when he joined in 2020 there was a lot of “baggage” affecting trust between the City and RTG/RTM that needed to be dealt with. Guerra and Truchon sought more open and honest communications with the City. As Truchon put it: “It’s all about being straightforward and not overpromising and … effectively being really pragmatic about what the issues are. And … there are places that we acknowledge that we could do better…. It’s not about hiding. It’s about addressing and facing the music.”

Guerra and Truchon wanted to get rid of “all the posturing” and focus on the end goal: providing safe and reliable service to the people of Ottawa.

The City recognized the changes Guerra and Truchon implemented. Councillor Hubley, Chair of the Transit Commission, said that splitting Lauch’s role as CEO of both RTG

and RTM into two separate roles, with CEOs for each of RTG and RTM, had "worked quite well"; Hubley said he had not heard of "any issues with either one of them." He further testified that "the relationship is much better than it was before because it seems to be more straight talk back-and-forth." Similarly, Charter testified that when Guerra was brought in, "he really brought a change in approach," such that the parties were able to work together much more effectively and work through a lot of earlier problems. Charter felt that Guerra had taken responsibility (on behalf of RTM) for the maintenance work that needed to be done, had improved the flow of information to the City, and had contributed to a more collaborative and proactive working environment with the City.

14.7.2 Staffing Changes at Alstom

There were also changes at Alstom over the same period, partly as a result of pressure from RTM and the City, and partly as a result of Alstom's acquisition of Bombardier Transportation. When Guerra joined RTM, the relationship between RTM and Alstom Maintenance was, he said, "somewhat contentious." He felt that Alstom Maintenance lacked a "sense of urgency" in addressing issues on the OLRT1 system and that this led to difficult discussions. Similarly, Lauch said that even at critical times, when RTM staff would be in "at all hours," the Alstom side of the building "would be a ghost town." Guerra accepted that at times there was not a lot of co-operation between RTM, RTG, and Alstom, and this did not help the reliability of the system.

RTM also felt that Alstom was short-staffed, particularly when it came to technicians. Lauch suggested that Alstom's under-resourcing could be seen even during the manufacturing and assembly phases, but it became particularly evident during public service. "We started to have to put more technicians on trains," Lauch said, "and … they were taking them away from the warranty side or the assembly side, so that really came to light that there were insufficient resources." Alstom had technicians on the line inconsistently. They were limited to certain times of day. This slowed response times, adding to delays on the system and impacting OLRT1 passengers. Being under-resourced also increased the potential for mistakes: where there is more work to do than people to do it, things can be rushed. Another issue was that Alstom did not always have a technician present in the morning when the vehicles were handed over for service, to deal with any issues that might arise.

On the whole, Guerra felt that Alstom did not fully understand how a P3 worked – in particular, that when you do not deliver service, serious penalties are levied as a result. That said, the lack of resources may not have been the responsibility of Alstom alone. There was evidence that Alstom requested additional hostlers (people who moved the trains around the maintenance and storage facility and yard). Gaul gave evidence that

Alstom did not have enough hostlers to move trains around the yard for public service. In May 2021, Alstom wrote to RTM that the number of hostlers was "becoming severely insufficient," that their workload was "overloaded," and that they were "suffering from fatigue." Alstom's requests were rejected by RTM on the basis that there was not enough evidence additional hostlers were necessary.

The City was also encouraging Alstom to increase its staff. Like RTM, it felt that Alstom was short-staffed for maintenance; it also felt that in the early days of a transit system, it makes sense to over-resource in order to be ready to deal with the unexpected events that will take place. As Charter put it, there are always going to be "some growing pains" and it makes sense to have additional staff to deal with these issues. However, the City did not have a contract with Alstom. Charter accepted that he could not force Alstom to hire extra staff but could only suggest it.

Alstom did not agree at first that it was short-staffed, but its level of resourcing did slowly ramp up. Guerra impressed on Alstom the importance of having, for example, a vehicle technician present in the morning to deal with any issues that might arise when the vehicles were being handed over for public service, and Alstom eventually ensured that someone was available. Guerra felt that his approach to managing the relationship between RTM and Alstom Maintenance differed from that of his predecessor, likely because Guerra had more experience in transit. Guerra felt that he was more tenacious in repeatedly reminding Alstom Maintenance of what needed to be done.

Eventually, RTM moved into more of a mentoring relationship with Alstom, with staff at RTM taking time to explain to those at Alstom Maintenance why they wanted things done in certain ways, such as having technicians available and planning for morning service the day before. As Guerra said, transit requires a lot of forecasting and advance planning to ensure that needed resources are available. France testified that Alstom now regularly reviews its resources, communicating to senior management about whether additional resources are needed in a particular area.

Importantly, Alstom Maintenance also changed its leadership and brought in people with more experience. When Alstom acquired Bombardier Transportation in early 2021, said Guerra, Alstom was able to tap into the "much more evolved services business" of Bombardier in North America. In particular, legacy Bombardier employees came to fill general manager and quality control positions at Alstom Maintenance. Lauch testified that, while he did not see a meaningful change in Alstom's lack of urgency, resources, and experience during the first few months of public service, he did see such a change eventually: "They brought in additional people. They were restructuring. But again … it's not a flick of a switch type of thing. I mean, it's time sensitive. It takes time to bring on resources. It takes time to make organizational changes. But the effort was there."

Guerra noticed a big difference "in terms of the skillset and the understanding of the type of business of these people." RTM and Alstom Maintenance formalized the improvements in their relationship in May 2021 when they entered into a Memorandum of Understanding (MOU). The RTM and Alstom Maintenance MOU expressed their joint intention to "improve the relationship between the Parties, improve the overall operation of the System and collaborate in good faith to fulfill their respective obligations under the Maintenance Subcontract." Truchon described this as an effort to "press the reset button" in the relationship between RTM and Alstom. All of these changes at Alstom contributed to improved discussions with RTM about resolving issues and, ultimately, better performance on the maintenance side.

14.7.3 Greater Co-operation between the City, RTG, and RTM

Alongside these changes in leadership and resources, the City, RTG, and RTM began to co-operate on several major issues, with the result that they improved OLRT1 service and strengthened the relationships between the parties. In the earlier days of public service, the City had been somewhat reluctant to take requests and suggestions from RTM or RTG at face value. Guerra suggested that the City was afraid of being seen to cut RTG any breaks, as this would not be looked on positively by the public. This fear had made it difficult to have an open dialogue and discuss issues that might be in the long-term interests of the OLRT1 project. Guerra felt this dynamic was driven, in part, by media coverage and discussions on social media.

The City had also lost faith in RTM's ability to deliver maintenance services, as a result of the difficulties in late 2019 and first three months of 2020. In early 2020, while some of the technical issues that appeared during the winter were being addressed, new issues arose, resulting in poor levels of performance. As Charter put it, this was "a particularly challenging winter" with "three months in a row" in which riders would have had some bad days. The City felt that RTM was not taking enough action to resolve the problems that were arising. It was frustrated to see new issues arising, and concerned that, in Charter's words, things "were trending in the wrong direction." This continued poor performance did not help the City trust RTM more. The City's reluctance to take suggestions at face value, while understandable, may have led to some issues not being addressed as quickly as they could have been.

But this reluctance on the part of the City changed. As public service got better, and as the parties were no longer distracted by dealing with short-term problems, there was more space for trust to grow between the parties. The City was more willing to have discussions with RTG and RTM, to hear their suggestions on how to improve service

further, and to collaborate in the best interests of the OLRT1 project. This is particularly important because the City, RTM, and RTG are likely going to be working together for a long period – or as Lauch put it, they will be "joined at the hip for the next 30 years." A collaborative relationship is essential for reliable service over this time.

One example of this collaborative approach was the extended shutdowns that took place in 2020 for maintenance work. The Project Agreement allows for periodic shutdowns of the system for maintenance work that cannot be done while the system is running, because while the system is running, maintenance can usually only be done in periods of about two to three hours per day during the week. RTG is required to request City approval for a shutdown at least 45 days in advance, and the City cannot "unreasonably" withhold its approval. These periodic shutdowns are permitted during public service hours for a maximum of 80 hours in a contract year (and with some other restrictions), with a limited ability to carry hours over into the next year.

At least three such shutdowns took place in 2020. The first was to update and monitor the train control software. The second was to carry out work on the track and on the overhead catenary system. The third was to allow for rail grinding and adding additional ballast. It is not clear that these shutdowns conformed to the letter of the Project Agreement. If they did not, this is an instance of the City co-operating with RTG, even where RTG's requests did not meet the requirements of the Project Agreement. For example, Lauch accepted that RTG's request for City approval may have been submitted less than 45 days before the first shutdown; the City, nevertheless, agreed to the shutdown. Similarly, the Commission heard evidence that the 2020 shutdowns may have exceeded the hours permitted under the Project Agreement. Although it is not possible to determine whether this is true without knowing precisely which hours the system was shut down for, it does seem likely: the second shutdown alone ran from May 9 to 13, 2020. Following some back and forth with RTG and RTM about why the shutdown was necessary to carry out the work, the City agreed. In this correspondence, while the City was certainly concerned about why such a long shutdown was necessary, it did not raise the question of whether the shutdown exceeded the provisions of the Project Agreement or use the requirements of the Project Agreement as a basis for refusing the request. The City's willingness to agree to these shutdowns reflects how co-operation between the City and RTG has benefited the OLRT1 and its ridership.

I should mention here that, while the shutdowns reflect co-operation between the City and RTG, they are not a perfect example of co-operation between *all* parties. In particular, Alstom Maintenance felt that it was not sufficiently informed about the shutdowns. It wrote a series of letters to RTM objecting to late notice and lack of information about the shutdowns, eventually stating that RTM was in breach of its obligations under its subcontract with Alstom Maintenance.

A second example of increased co-operation between the City and RTG was the change from electric switch heaters to gas heaters. In the winter of 2019–2020 (as explained in section 14.3.2), switches failed, stopping trains from running and requiring replacement bus service. The City felt that the existing electric heaters were not effective enough and needed to be replaced with gas heaters. RTG believed that the electric heaters were probably good enough and gas heaters were not required. By the winter of 2020–2021, RTG did upgrade the electric heaters to gas heaters, which worked more effectively. There were far fewer switch failures as a result of this change.

A third example of co-operation was the reduction in service levels as a result of reductions in ridership caused by the COVID-19 pandemic. On March 27, 2020, the City agreed to reduce service to fewer trains for morning service. Under the Variation Directive that the parties signed, impacts to the annual service payment and volume payment would be "agreed between the Parties acting reasonably." This accommodation gave RTG a chance to deal with issues that had arisen in relation to the provision of maintenance services – specifically, with fewer trains on the line, it was possible to catch up on maintenance work, subject to the other constraints resulting from the pandemic. Service started to improve. That said, it appears that RTG felt the reduction was insufficient. In a letter to the City dated May 6, 2020, Lauch wrote: "Rather than fully utilizing this time of reduced ridership … the reduced service levels implemented by the City as of March 27 provided RTG with only one extra hour of service shutdown per week."

The parties again agreed to reduce service levels in 2021, as the COVID-19 pandemic continued to affect ridership. On March 10, 2021, RTG and the City signed a Term Sheet allowing for a temporary reduction in service levels. This document stated that the reduction was "being implemented to take advantage of the period of low ridership and in order to improve reliability of the System." Under this agreement, RTG would put into service 11 trains during the morning and afternoon peak periods. RTG's performance would be measured against the reduced level of service rather than the ordinary level. The agreement was subsequently extended, so that RTG could run the 11-train service until the beginning of August 2021, and then run 13-train service during peak periods until August 16, 2021. Goudge, of Alstom, suggested that this reduction should have taken place earlier, as there were earlier periods in which "there was a very high utilization of vehicles when the ridership, at least in my perception, was not supporting that use of the vehicles." Still, when it did take place, the reduction of service levels allowed the maintenance team to focus on reliability by taking some stress off the system. Of course, RTG's payment was pro-rated to reflect the lower number of trains being run. Under the Term Sheet, the monthly service payment to RTG was reduced by $100,000 per contract month, in addition to any reductions in the volume payment. Given that the volume payment each month is a function of the total number of vehicle

kilometres for that month, in months when there were fewer trains running, the volume payment would be lower.

The decision to reduce service levels was a mutual one between the City and RTG, and it again reflects a collaborative approach to the end goal of improving transit service for the people of Ottawa. Unfortunately, before the planned return to full service on August 16 took place, the August 8, 2021 derailment occurred, overtaking most other considerations. Another stretch of peak period service with 11 trains instead of 15 was put in place in December 2021, following the return to service after the September 2021 derailment.

14.7.4 Improvements Due to Experience

As the City and RTM gained experience on the OLRT1 system in the second half of 2020 and the first half of 2021, things started to improve. There were still issues, but the responses to those issues were much quicker and more effective, such that there was less disruption to public service.

Operators were more experienced, so they were able to isolate faults and allow customers to continue to their destinations. As Guerra put it, “An incident does not cause as much disruption today as it may have caused two, two and a half years ago.” Instead of trying to troubleshoot issues with a train while it is on the line (thus impacting public service), trains experiencing difficulties are increasingly removed from the line and replaced to restore public service faster. In addition, operators were permitted to do more work than before to resolve issues that arise. They could do preliminary work to reset things to get the train back into service, or bring the train to a terminal to minimize impact on customers. With more experience, operators came to better understand how the system operates and what steps to take when issues arise.

RTM also benefited from experience. For example, after the winter of 2019–2020, RTM brought in changes to better deal with winter conditions. Truchon explained that “since the first winter, we implemented dedicated crews on snow,” as well as bringing in “more shift coverage.” As a result, he said, many of the issues that arose during the first winter were not issues during the second.

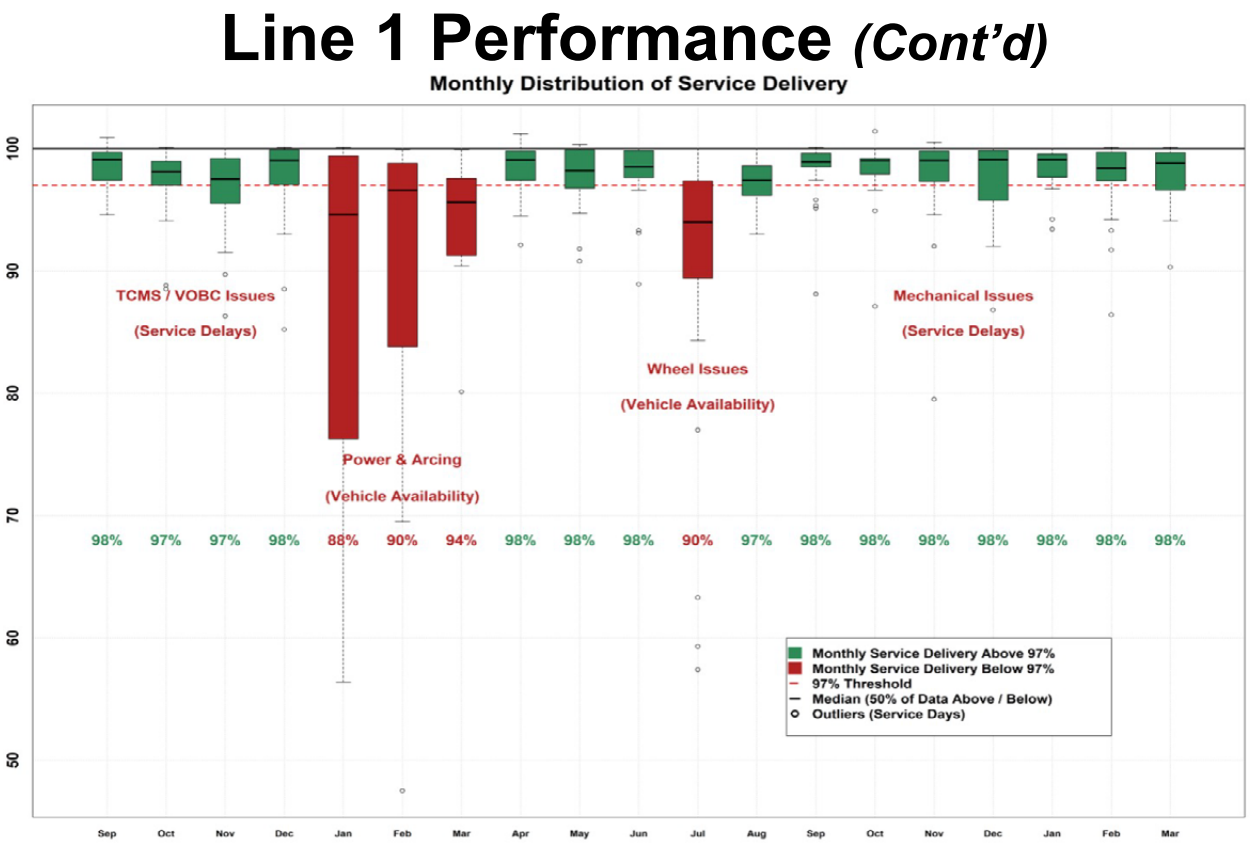
The OLRT1 public service improvements reflected an intentional effort at RTM and the City to learn from experience. As Guerra explained, every time there was an incident, a debrief meeting was held with all stakeholders present. The aim was to learn lessons, figure out what could have been done better, and improve things going forward. These meetings, he said, were mostly collaborative, and had been since Guerra came into his role at RTM. Guerra testified that the operators and maintainers

had become more efficient: there was a lot more experience, so the parties were able to sort through issues more quickly than before, and the actions required were also tracked more closely than before.

The changes that had taken place at RTM and Alstom Maintenance, and the improvements that resulted from co-operation between the City, RTG, and RTM, were also yielding positive results. All of these parties were taking action to improve system performance and reliability and work through the backlog of issues. As a result, the performance of the system from September 2020 to August 2021 was better than it had been in late 2019 and early 2020. There were fewer operational issues, and service was more stable.

The chart in Figure 14-1, which the City's Transportation Services Department presented to the Transit Commission in March 2021, shows a marked difference between the service levels during the months January to March 2020 and most months from April 2020 to March 2021.

Figure 14-1: Monthly Distribution of Service Delivery, September 2019 to March 2021



TCMS = train management and control system **VOBC** = vehicle on-board controller

Source: City of Ottawa Transportation Services Department, March 17, 2021.

Specifically, the chart shows the percentage of services delivered compared to the percentage of services planned, as measured by the aggregate vehicle kilometre ratio (AVKR). The comparison roughly captures whether customers were likely to have a good or bad experience commuting on the OLRT system. According to this chart, which covers September 2019 to March 2021, January 2020 had the most variation in service levels. January, February, and March 2020 all had a number of "bad days," with average service levels of 88 percent, 90 percent, and 94 percent, respectively. By contrast, aside from July and August 2020, when wheel issues arose, all of the remaining months from April 2020 to March 2021 show average service levels of 98 percent, meeting the level required by the Project Agreement (and August 2020 came close, at 97 percent). As discussed, there were still issues during this time, such as wheel cracks, wheel flats, and consequent problems with LRV availability for public service, but the average level of service provided was significantly better than it had been in the first three months of 2020.

Of course, in part the service improvements reflected the lower ridership and agreed-upon service reductions resulting from the COVID-19 pandemic. But they also reflected genuine improvements in performance. As Councillor Hubley put it, "We were seeing progress and the work being done.… To me, and certainly from what I was hearing from the public, it felt like they were getting their act together and that it was coming along."

Recommendations

See recommendations #22–27, 32–34, 37–40, 43, 45–47, 59, 72–80, 83, 86–95, and 101 in Chapter 17.

Chapter 15
Derailments

Key Findings

- The first derailment on the main line took place in August 2021 and was caused by a failure in the axle bearing assembly. Investigations into the root cause of the derailment are ongoing. However, it is clear that the OLRT1's wheel/rail interface is an issue.
- The second derailment took place in September 2021 and was caused by human error by Alstom maintenance staff, who failed to correctly tighten a key bolt while doing remedial work related to the first derailment. As a result, a gearbox fell off the train and caused the derailment.
- Alstom did not have a sufficiently robust quality control system in place at the time of the second derailment.
- The City's decision to shut down the OLRT1 and engage an independent advisor (Transportation Resource Associates) following the second derailment was prudent, and the return-to-service plan worked to get trains safely running again. However, there were unnecessary delays in the return to service.
- Alstom improved its quality control following the second derailment, and the City, RTG/RTM, and Alstom have begun to work better together.
- The system has provided largely reliable service since the return to service in November 2021. However, the parties still need to comprehensively address the wheel/rail interface issues, which were left unaddressed for too long after the public launch, and the root cause of the first derailment.

Chapter Contents

15.0 Introduction

This chapter examines the two derailments that took place on the main line of the OLRT1, in August and September 2021, and the follow-up to those events, including investigations and measures to return the OLRT1 to safe public service. While one investigation is still under way at the time of this report, this chapter examines what is known, how the parties responded to the challenges of the derailments, and the steps that were taken to remedy and prevent problems and get the trains running both safely and reliably. As well, this chapter addresses steps that could be taken to improve safe and reliable service on the OLRT1.

This chapter refers to many key terms that were explained in Chapter 14; as well, some additional terms are explained and appear in bold for easy reference.

The Transportation Safety Board of Canada (TSB) is the public body that has exclusive jurisdiction to determine the cause of the two main-line derailments on the OLRT1. The TSB is the federal agency responsible for investigating incidents and accidents in federally regulated modes of transportation, such as railways. It has exclusive jurisdiction over transportation occurrence investigations in the federal sphere, if it decides to assert that jurisdiction. The TSB has asserted its exclusive jurisdiction over these two derailments, and advised the Commission that the Inquiry cannot undermine its ongoing investigation into the OLRT1 (see Appendix B).

For clarity, the TSB opened three investigations in respect of the OLRT1. The first was initiated following the identification of cracked wheels on the trains (which are addressed in Chapter 14). This incident was classified as a "class 3" occurrence. A class 3 occurrence is one that, according to the TSB, may have "significant consequences that attract a high level of public interest" and where it is "quite likely that new safety lessons

will be identified." In such circumstances, the TSB's policy is to conduct a detailed investigation and produce a public report.

The TSB later classified the two main-line derailments as "class 5" occurrences, leading to less involved investigations, in part because a class 3 investigation into the OLRT1 was already open. A class 5 occurrence is an occurrence that, according to the TSB, has "little likelihood of identifying new safety lessons that will advance transportation safety…. The investigation is limited to data gathering and the data are recorded for statistical reporting and future analysis."

The TSB's class 3 investigation remains ongoing. The TSB has taken the position that its two investigations into the derailments, while technically closed, are bound up with its ongoing class 3 investigation. Again, the TSB has asserted its exclusive jurisdiction over that investigation and the related transportation occurrences, including the two derailments.

The Commission will not interfere with that jurisdiction, but this report will address the evidence regarding the two derailments.

15.1 The First Derailment

The OLRT1 experienced its first derailment on the main line on August 8, 2021. There were no passengers on board the train at the time of the derailment, but the track infrastructure was damaged. It is undisputed that this derailment resulted from the failure in the axle bearing assembly. However, RTG and Alstom disagree on the root cause that led to this failure. At the time of this report, the root cause of the derailment is still under investigation. As noted above, the Transportation Safety Board of Canada, or TSB, is the public body that has exclusive jurisdiction to determine the cause of the derailment on the OLRT1.

This section of the report discusses the derailment, the immediate actions undertaken in response to the derailment, and the preliminary investigations undertaken to determine its cause. Further, I will consider the steps required to mitigate the risk of a further derailment.

15.1.1 The August 2021 Derailment

On August 8, 2021, at approximately 8:30 p.m., a train derailed on the main line of the OLRT1. The train consisted of two coupled LRVs: LRV 1115 and LRV 1119.[1] The train derailed approximately 90 metres east of Tunney's Pasture Station. The derailment occurred while the train was travelling eastbound from Tunney's Pasture Station to go to the maintenance and storage facility (MSF) for repairs. There were no passengers on board at the time of the derailment.

Recall that the OLRT1 has parallel tracks that run east to west, one track to the north and one to the south. To move from one track to another, a train has to go over a crossover. At the time of the derailment, the train was travelling over a crossover from the north track to the south track at approximately 30 kilometres per hour. While travelling across the crossover, one of the wheels on LRV 1119 climbed the rail and began running on the outer side of the track. Its companion wheel on the same axle also derailed toward the inner side of the track and came to rest between the rails. The track infrastructure was damaged as a result. Specifically, the **concrete ties** below the tracks and the **tie plates** (which help attach the track to the ties) of the south track were damaged from the impact.

Following the derailment, the TSB sent a team of investigators to investigate the cause of the derailment. Its Rail Safety Advisory Letter 617-02/21 dated September 27, 2021 described the order of events. This description refers to both LRVs of the train, LRV 1115 and LRV 1119. The events extend from early afternoon and a trip east to Blair Station and returning west to Tunney's Pasture Station; to the train being taken out of service and held at Tunney's Pasture Station until after the peak commuter hours; to the derailment; and then getting the train back on the rails near midnight on the same day. The order of events that the TSB described is as follows:

a. At 1:25 p.m., the splined axle on the No. 3 wheel likely failed as the LRV travelled eastward between Cyrville and Blair Stations. The event recorder and vehicle logs showed that LRV 1119 had experienced multiple warnings of LRV wheels slipping on the track during this time;
b. After reaching Blair Station, the train continued westward on its regular route;
c. At 3 p.m., a technician identified burn marks on a brake disc on LRV 1115. The brake was isolated and the calipers were released. The train was removed from service and held at Tunney's Pasture Station until the evening;
d. With the reported problem on LRV 1115 identified, LRV 1119 was not inspected;
e. Between 8:15 and 8:25 p.m., a technician attended to the brakes on LRV 1115 and observed the train moving back and forth on the north track. The technician then cleared the train to return to the MSF;
f. At 8:30 p.m., the train departed Tunney's Pasture Station to return to the MSF with the technician on board the train;
g. As it travelled east toward the MSF, the train experienced an unusually rough ride as it exited the crossover switch between the north and south tracks;
h. The train was brought to a controlled stop, and an inspection revealed that the No. 3 and No. 4 wheels on LRV 1119 were derailed; and
i. To minimize service disruptions, it was decided to "re-rail" the train onto the track after 11 p.m.

The Rail Safety Advisory Letter noted that Alstom's initial root-cause failure analysis referenced a **roller bearing failure** and suggested that the failure was related to the loosening of the large locking nut that holds the cartridge assembly together. Alstom's illustrated timeline of the derailment is reproduced in Figure 15-1.

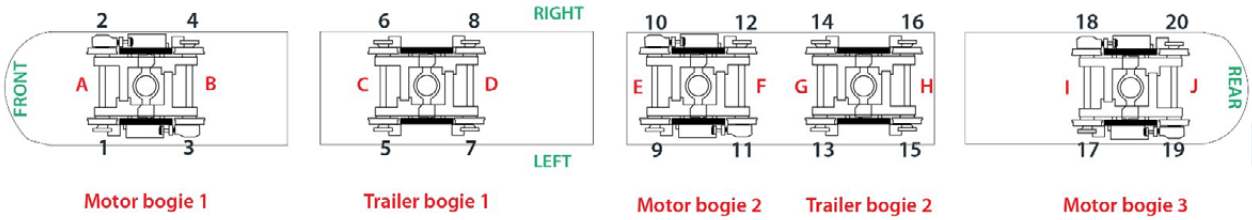
Figure 15-1: Derailment Details: An Illustrated Timeline

Source: Alstom, Ottawa LRT LRV1119 Derailment presentation, September 2, 2021.

15.1.2 The Vehicle Components Involved

To understand this sequence of events better, consider that each OLRT1 train consists of two LRVs coupled together. Each LRV has a vehicle body mounted on top of **bogies**. (Bogies are the undercarriage under a train, with four or six wheels that pivot beneath the end of the vehicle; sometimes bogies are called trucks.) In the case of the OLRT1, each LRV has five bogies – three **motor bogies** (bogies that carry a motor) and two trailer bogies. Figure 15-2 shows the locations of the bogies, axles, and wheels.

Figure 15-2: Schematic of an LRV Showing Bogies, Axle Locations A–J, and Wheel Positions 1–20



Not to scale
Source: TSB, Rail Safety Advisory Letter 617-02/21.

Regarding the components, how they are assembled, and how they function, here are more details. An **assembly** refers to a unit of components that have been fitted together. Each vehicle bogie includes, among other components, four **resilient wheel assemblies** and two **axle assemblies**. The **axle** is the rod or spindle that passes

through the centre of a wheel or group of wheels. Each axle assembly includes two wheel **hubs** (the central part of the wheel) and two **cartridge roller bearing sub-assemblies** connected by what is called a **solid splined axle**. The wheels are attached to the exterior of each wheel hub. The **cartridge assembly** integrates the splined axle with the rotating part of the wheel, allowing it to turn. Each cartridge assembly includes two **tapered roller bearing assemblies**. (These are like arrangements of ball bearings, and support and guide rotating machine elements. Bearings transfer load between components of machines.) The whole assembly is held together by a large **locking nut**. A cartridge assembly is installed on each end of the splined axle.

The **brake calipers** hold the brake pads. The LRVs have **disc brakes**; the disc from the brake rotates with the wheel and enables braking.

15.1.3 Grounding the Fleet

Immediately following the derailment, it was decided that the OLRT1 fleet of vehicles needed further inspection for loose cartridge assemblies before resuming passenger operations.

The City grounded the entire vehicle fleet for five days while inspections to the cartridge assemblies were completed.

15.1.4 Inspection Results

Alstom undertook an inspection to see if any other cartridge assemblies were loose. Where the cartridge assembly was determined to be loose, it had to be replaced with a new assembly. Specifically, the inspection measured clearances in the cartridge assembly axial end play, and any measured clearances in excess of 0.1 millimetre were considered to be loose. (The **axial end play** relates to the amount of movement between the two rings of the bearing.)

The inspection identified a further 17 loose cartridge assemblies on nine other LRVs, with clearances ranging from 0.12 millimetre to 0.89 millimetre. All failed or loose cartridges were replaced with new ones before the LRVs were returned to service.

Following this initial inspection by Alstom and the replacement of the affected components, Alstom implemented a new periodic inspection protocol as a measure to prevent similar occurrences. This protocol requires the ongoing inspection and recording of the axial end play clearances for all cartridge assemblies on the LRVs. It requires these inspections to be conducted by Alstom for each LRV every 7,500 kilometres. Alstom's mitigation protocol was validated by the City's experts.

15.1.5 Return to Service

Following the initial inspection, the OLRT1 returned to service with six trains on August 14, 2021. By September 2, 2021, the OLRT1 had returned to full service with 13 to 15 trains.

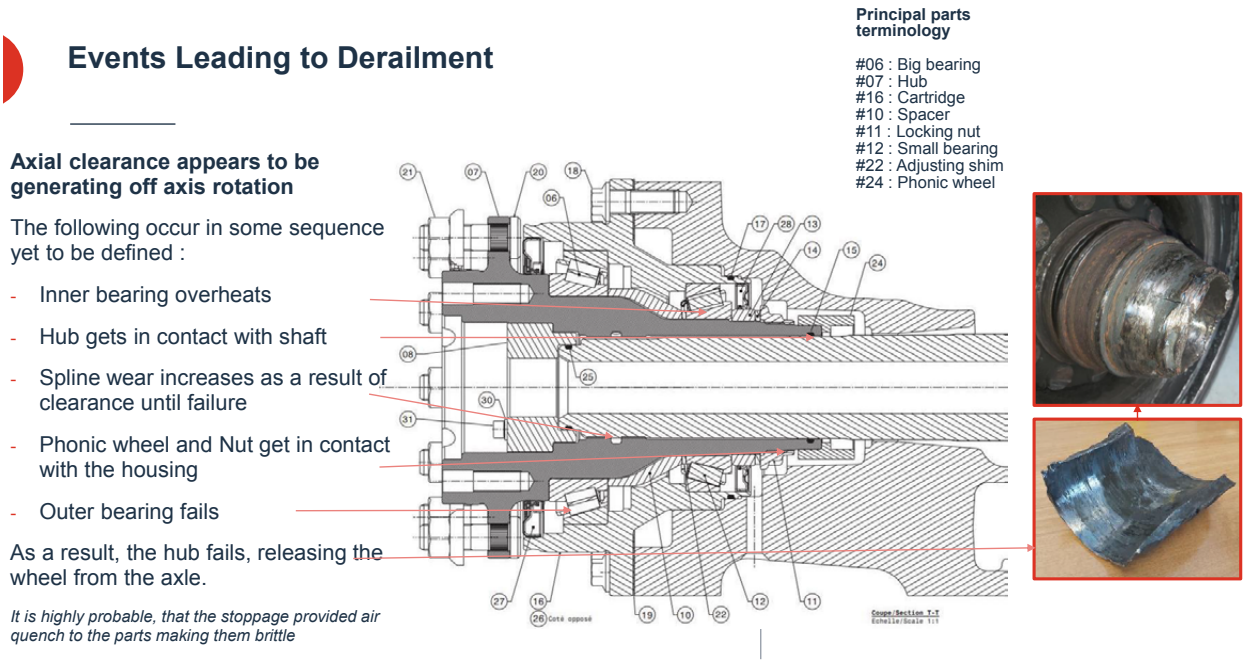
15.1.6 The Preliminary Investigations into the Cause of the Derailment

Following the derailment, several parties became involved in investigating the root cause of the derailment, implementing remedial actions, and ensuring the safe return to service of the OLRT1. The parties included Transport Canada, the TSB, the City's Regulatory Monitoring Compliance Officer, and various industry experts. RTM engaged engineers, technicians, and original equipment manufacturers to provide additional support. Alstom conducted its own investigation, involving experts from its centre of excellence in Valenciennes, France, and the cartridge bearing assembly manufacturer, Texelis. The City also hired consultants to assist in the inspection, oversight, and repair process.

It is undisputed that the derailment resulted from the failure in the axle bearing assembly described above. RTG and Alstom, however, disagree on the root cause that led to this failure. As noted earlier, the investigation into the root cause of the derailment remains ongoing as of the date of this report.

Shortly before the Commission hearings started, Alstom delivered its own investigative report, dated May 10, 2022, detailing the further analysis it conducted into the root cause of the derailment. The report specifically notes that it is preliminary in nature and that further investigation is required to determine the exact root cause of the derailment. Figure 15-3 shows a portion of a September 2021 presentation from Alstom, including Alstom's preliminary results, a diagram showing a cross-section of a wheel assembly, and photos.

Figure 15-3: Alstom's September 2021 Presentation on Derailment



Source: Alstom, Ottawa LRT LRV1119 Derailment presentation, September 2, 2021.

In its May 2022 preliminary report, Alstom concluded as follows. Some of these points are elaborated on after the quotation.

> The root-cause analysis demonstrates that the actual design of the track generates excessive transversal loads/forces that causes excessive fretting under the bearing of the axle. This fretting could lead to contact wear, that will generate axial clearance within the bearing assembly. The axial clearance is occurring on the Ottawa fleet at an accelerated and unprecedented rate with severe consequences not experienced on any other ALSTOM product operating with the same concept elsewhere in the world.
>
> Based on the analysis, the test and simulations demonstrate that the transversal quasi-static loads mainly generated during curving is a critical factor causing the fretting under the bearing of the axle. These loads are higher on the 2 motor bogies at the extremities of the trainset, mainly due to the exceptionally severe lateral forces on the extreme axles during operation and higher nominal axle load. This is in line with the fleet control status showing a higher percentage of failed axles on leading and trailing bogies at the extremities of the trainset.
>
> On track test results measured in January and February of 2022 that occurred after the track regrinding performed by the maintainer in July of 2021 showed an

improvement of track conditions in terms of vibration level (mainly related to rail corrugation in curves) as compared to the January 2021 results, at which point the track was generating a high level of vibration on the bogie. It is logical to consider that these levels of vibration contribute to the increased loads on the assembly during this period of time. Some of the axles being recently detected with a clearance could have been affected by fretting initiated prior to the track regrinding that occurred in June 2021. In summary, at this juncture we can state that the state and configuration of the track is a critical factor leading to the aforementioned fretting phenomenon. It must be stated that the actual as-built track was not in line with the design as stated in the wheel/rail interface specification agreed by OLRTC.

Lowell Goudge, of Alstom, explained that the **fretting** described in Alstom's report is the microscopic movement of two meeting surfaces under the bearing of the axle. This movement is caused by the loads and stress imposed on the axle assembly. The excessive forces are occurring mainly in three specific curves on the OLRT1 track alignment. The issue is a combination of the track itself, the interface between the wheel and rail, and the operating profile (how the system is used by the operator). The rail **corrugation** that is present in the curves of the track results in vibration to the vehicle components. (A surface that is corrugated has parallel ridges and grooves.) Goudge acknowledged, however, that Alstom was unable to make a direct correlation between the vibrations and the excessive fretting.

In its report, Alstom identified several remedial actions to help correct the issues it identified. The short-term actions include reducing rail corrugation through maintenance, increasing **track lubrication** (greasing), adjusting the **speed profile** (to lower the speed in some places, particularly along curves), and modifying the **wheel profile**[2] to better sustain the transversal forces coming from the track (that is, the tangential force that is felt in reaction to the angular acceleration). It also identifies two potential long-term actions: additional **track reprofiling** (grinding of the track) and enhancing the axle design to withstand the forces coming from the track.

For its part, RTG disagrees that the design or condition of the track as built caused or contributed to the derailment. RTG points out that Alstom failed to consider known issues with the spline axles in its root-cause analysis. In a presentation prior to the derailment dated June 30, 2021, Alstom identified a problem with the axles caused by excessive wear to the splines. Specifically, Alstom noted, "Wear of the splines [is] leading to excessive play between the hubs and the torque shaft and ultimately failure of the splines and loss of drive between the two wheels." Alstom intended to replace the axles on the LRVs to address this issue.

Goudge acknowledged that Alstom's failure to explain the full extent of its investigation was a shortcoming in its report. However, he explained that Alstom considered the issue of excessive wear of the spline axle and determined that it was unrelated to the derailment.

As noted earlier, the investigation into the root cause of the August 8, 2021 derailment remains ongoing at the time of this report. Where RTG and Alstom find common ground is that the **wheel/rail interface** remains an issue for the OLRT1.

The misalignment between the wheel profile and rail profile places greater loads on both the rail and wheel components and results in wear on these wheel and rail components. This misalignment was identified prior to the start of public service in the project safety documentation, in particular the Track Safety Justification Report and the Operational Restrictions Document (see Chapter 11). It was reviewed by the safety assessors and was accounted for in the recommendations.

While mitigation measures were implemented both prior to the start of service and since, the issue with the wheel/rail interface continues to cause problems and presents a potential safety issue if not adequately managed. The Commission has ongoing concerns about this wheel/rail interface and recommends that the parties follow through on the outstanding investigations to ensure that the root causes are addressed. It is critical that the risk of future derailments be mitigated. While the City and RTG need to continue with the interim measures already in place, and any others that are deemed advisable as more becomes known about the root cause of this derailment and the wheel/rail interface more generally, it is clear that a more permanent solution needs to be found. This solution may involve using a different wheel profile, replacing the track or part of the track, or even modifying the track alignment to address the issue of sharp curves. The issue of the wheel/rail interface and the Commission's recommendations will be discussed in greater detail in section 15.4.

15.2 The Second Derailment

Just six weeks after the first derailment, a second derailment occurred on the main line. After Alstom maintenance staff failed to properly bolt a gearbox to a train, it fell off and caused the train to derail with passengers on board. This derailment caused significant damage to the train, the track, and its surrounding infrastructure, but fortunately, no one was injured.

This section begins by describing, in detail, what happened during this incident. It then turns to an explanation of the root cause of the second derailment.

15.2.1 The September 2021 Derailment

On September 19, 2021, at approximately 12:15 p.m., a train derailed as it departed westbound from Tremblay Station. Specifically, the second (of three) motor bogies (see Figure 15-2 earlier) in the second of the coupled LRVs (specifically, LRV 1121) derailed near the middle of the Tremblay Station platform. While it was still off the rail, the train travelled along the track for about 427 metres, reaching a maximum speed of about 35 kilometres per hour. The train ultimately came to an emergency stop just west of the rail bridge over Riverside Drive.

Fortunately, no one was injured, but the derailment caused significant damage to the train and to track infrastructure. Side covers (side skirts beneath the train windows, which conceal the bogies) were torn or ripped off. The train struck and destroyed a signal mast (a post for railroad signalling) and switch heater that were adjacent to the track the train was moving along. In addition, the train derailment disturbed track ballast over the 427 metres that it travelled while derailed. A security video of the Tremblay Station platform shown at the public hearing provided a graphic depiction of the train spraying track ballast onto the platform at the start of the derailment.

In his written statement following the derailment, the train's operator stated that he did not notice the derailment until he exited the train. As discussed further below, the fact that the operator failed to notice the derailment and thus failed to stop the train earlier, before it caused the damage it did, raised concerns for Alstom, RTM, and OLRT-C employees, who would have expected the train to be stopped sooner. Witnesses for the City, including Troy Charter, of OC Transpo, explained that part of the reason for

this may have been that the operator sat at the front of the first (or leading) LRV, but it was the second (or trailing) LRV that derailed. In addition, an OC Transpo Safety Investigation Report indicated that around the time of the derailment, the operator was discussing a "smell of human waste" with the control centre, which may have distracted him. Moreover, the operator would have seen in the rear-view camera that the platform was clear and received confirmation from a platform spotter (see below) that it was safe to depart. In Charter's words, once an operator has the "all clear" that it is safe to depart, "we want them focussed on looking ahead at the track ahead."

Each LRV has a screen in the operator's cab to display closed-circuit television (CCTV) imagery that is transmitted from a camera located on the platform. The CCTV cameras provide the operator with a view of the train and platform looking backwards down the length of the train. This allows the operator to observe the platform edge as the train leaves the station to ensure that all doors are closed and that no passengers or items are too close to or trapped in the doors.

These screens in the operator's cab have not been reliably receiving information from the platform cameras and have not been functioning properly (as discussed in Chapter 12). To mitigate this safety issue so that the system could enter service, the City and RTG agreed to place spotters on the station platforms to use a whistle to signal the operator when it was safe to depart from the station platform.[3]

The evidence suggests that the rear-view camera display was working at the time the train departed Tremblay Station. Charter explained that the operator got the "all clear" from both the cameras as well as the spotter before departing the platform. If the rear-view camera display was functioning properly, the operator could have seen the ballast that was projected all over the platform as the train departed the station. Seeing the spraying ballast would have alerted the operator to a problem and allowed the operator to stop the train sooner. This could have mitigated the damage that was caused to the vehicle and infrastructure.

Alternatively, if the rear-view camera display was not functioning properly, or if the operators were trained not to view the display as the trains depart the stations and once they have received the "all clear" (as suggested by Charter), this can pose a safety concern. While it may be correct that, generally speaking, it is important for any operator of a vehicle in movement to be looking ahead, rather than back, the automated system on the OLRT1 enables the operator to have greater situational awareness than is usually the case. Indeed, because the automated system will react to dangers ahead, the operator has the ability to also look back (through the rear-view camera display) and consider all of the surroundings. This instance demonstrates why that ability can be important. After the derailment occurred, the operator was best positioned to mitigate

the effects of the derailment in terms of both property damage and the safety of the passengers. The failure or inability of the operator to observe the display as the train departed Tremblay Station resulted in the train continuing to travel until the emergency brake was automatically engaged after the train damaged a track switch.

In a strange coincidence, RTM's Maintenance Director, Steven Nadon, was aboard the train with his family shortly before it derailed. He was not working at the time, but taking his grandchildren for their first ride on the OLRT1. Nadon explained that between St-Laurent and Tremblay Stations, he heard a "clinging sound" beneath him and "thought a cable had come loose, or something was dragging." He and his family exited the train at Tremblay Station, and he made a phone call to the transit operations control centre to suggest that the train be taken out of service. As the train departed, Nadon witnessed that the train "kicked ballast up all over the platform" and derailed.

Ultimately, it was the automatic train control system that stopped the train. As the train travelled while derailed, the train disturbed a switch when it crossed over it, which triggered the emergency brake.

At the time of the derailment, the operator and 12 passengers were on board the train. There were also one spotter and at least five passengers on the Tremblay Station platform.

By about 12:45 p.m., the City's Chief Safety Officer, Brandon Richards, and OC Transpo's General Manager, John Manconi, quickly agreed to shut down the OLRT1 system. The passengers waited about 30 minutes while the system was shut down and the electricity to the line was turned off. They were then safely evacuated from the train with the assistance of OC Transpo personnel. OC Transpo began running replacement (R1) bus service for passengers affected by the OLRT1 system shutdown. Richards then called in the TSB to investigate the cause of the derailment.

15.2.2 The Root Cause

In the simplest terms, this second derailment was caused by the human error of Alstom's maintenance staff. When they reattached a **gearbox** (a box containing gears, which transmits power from the motor to the wheel set and serves to increase or reduce speed) to LRV 1121, Alstom maintenance technicians failed to bolt on a key part according to the necessary torque values. (The part was the **splined axle stub**, which connects with the gearbox and is secured to the wheel hub.) This means that the bolt was tightened too much or too little. As the bolts were not properly torqued, the gearbox fell off the train, contacted the rail and the ballast below, and ultimately caused the derailment.

The cause of the second derailment was, in fact, linked directly to the first derailment on August 8, 2021. As explained earlier in this chapter, the first derailment was caused by

a roller bearing failure. As part of the remedial work in response to the first derailment, the full fleet of LRVs was grounded to assess the cartridge assemblies on every wheel. The fleet inspection identified 1 destroyed and 17 loose cartridge assemblies, all of which had to be replaced. LRV 1121 – the vehicle that would later derail in the second derailment – had 3 loose cartridge assemblies.

Alstom and its supplier of bearings (Texelis) undertook the remedial work for LRV 1121 on September 9, 2021. Alstom employees did the preparation work, which included removing the gearbox, splined axle stub, and disc brake so that Texelis employees could replace the cartridge assemblies. Alstom employees were then responsible for reassembling the bogie, which included reinstalling the splined axle stub and gearbox with new bolts.

At 11 p.m., Alstom employees finished their shift without realizing that the bolts securing the splined axle stub had not been properly torqued. The employees working this shift therefore did not advise the next shift that this work remained outstanding. On the next day – September 10, 2021 – the morning shift continued the remedial work unaware that the bolts holding on the splined axle stub were not properly torqued. Alstom then did its final inspection and LRV 1121 was sent back into service on September 14, 2021.

Note that the splined axle stub is attached to the bogie with 12 bolts according to a three-step procedure with precise torque values. First, the bolts must be torqued by hand to 50 Newton-metres (a standard measurement of force). Second, a torque gun is used to torque the bolts to 150 Newton-metres. Third, the bolts must be torqued to an additional 135 degrees of rotation. As noted, and although some torquing was done, Alstom employees failed to follow this procedure for LRV 1121. The result was that all 12 bolts failed after only about 800 kilometres of service. When the bolts failed, the gearbox fell off the LRV and caused the derailment.

In contrast to the first derailment, the root cause of which remains controversial, witnesses at the public hearing were largely in agreement on the root cause of the second derailment. Witnesses from Alstom, the City, and OLRT-C all agreed that the derailment was caused by the “human error” of Alstom’s employees, who had failed to properly torque the bolts that held a safety-critical component (the splined axle stub) to the train.

At the time of the derailment, Alstom’s maintenance work was inconsistent and lacked sufficient quality control checks. This human error might have been avoided with effective quality control measures. While Alstom maintenance employees were familiar with the steps to reattach the splined axle stub onto the bogie, they would often perform the work out of order, and the completed steps were not consistently documented. Further, Alstom’s procedures required that each bolt was to be identified

with a suitable marker or indicator after it was torqued, but TSB's review showed that there was some inconsistency in marking torqued bolts. In addition, although Alstom kept written records for wheel torques, it did not keep equivalent records for any other components with torquing requirements, including the splined axle stubs. There was also no requirement for supervisory or quality control sign-off on the torquing of these parts.

Witnesses at the hearing also agreed that Alstom did not have sufficient oversight and quality control in place to ensure the proper torquing of bolts. Alstom's witnesses acknowledged this problem. Yang Liu agreed that "looking back at it," there was "a lack of oversight by Alstom with regards to the refurbishment work." Goudge further explained that there was "a miss" in the application of the torque and a failure to detect that missed step. If the torque machine and its results had been reviewed prior to releasing the train for service, the machine would have shown that the torque process had not been completed. Goudge believed that some of these failures were preventable.

Given these issues, the Commission finds that Alstom did not have a sufficiently robust quality control system in place at the time of the second derailment. Such a system requires proper checklists and record keeping for the assembly and repair of safety-critical parts. This work should be reviewed and approved by supervisory or quality control staff who are qualified to ensure that work has been completed to the proper standard. The second derailment shows that such a system is all the more important where maintenance and repair work is started by one shift of workers but continued or completed by another.

Although they agreed with the root cause, witnesses for Alstom also provided some additional background regarding the derailment. Most notably, Goudge explained that, as part of the plan to return trains to service after the first derailment and system shutdown, Alstom was initially only launching 7 trains per day to allow it to do more safety inspections. At the time of the second derailment, Alstom was cycling back up to service of 11 trains per day. This meant that Alstom's employees were under "an incredible amount of pressure to increase the fleet." This, in turn, increased pressure on Alstom's maintenance staff because they had to continue to conduct the safety inspections required after the first derailment, which are labour-intensive and time-intensive. In Goudge's view, the level of ridership at this time – which was still low, at least in part due to the pandemic – did not warrant the increase to 11 trains that had been requested by the City. Alstom's root-cause report echoed Goudge's sentiment that there had been significant pressure on Alstom following the first derailment, stating:

> The investigation and refurbishment activities [into the first derailment] were conducted on an expeditious basis within a climate of intense pressure from all stakeholders. The pressure on the team was constant and was flowed down systematically by way of multiple site visits to our assemblers working on the vehicles as there was a need to return the fleet to full service levels.

In addition, Alstom argued in its closing submissions to the Commission that the damage caused by the second derailment was exacerbated by the train operator's error. Alstom submitted that the operator should have heard the noise of the derailment and seen the ballast being thrown onto the platform, and suggested that his preoccupation with a human waste smell on the train may have distracted him. Other witnesses shared this view, including RTM's Mario Guerra, who stated that the operator "should have noticed the problem and stopped the vehicle sooner."

On the other hand, and as noted earlier, witnesses for the City thought that the operator had good reason to be focusing on the track ahead once the cameras showed the platform was clear to depart and the spotter confirmed it was safe to depart. Goudge was also of the view that the operator would have less awareness because the train is automatically controlled. In Goudge's words, "He may have had more engagement and awareness if he was physically driving the train. It's a guess, but the fact that he's not driving the train, clearly he would be less aware of the train's response." While that may be true, as I indicate above, the automatic train control system also allows the operator to have greater awareness of the various surroundings. In such a circumstance, and provided the camera display is working, the operator can be looking ahead but also remain aware of what is happening toward the back of the train, which would help prevent such scenarios and resulting damage to the line.

In its closing submissions and its examination of Guerra, counsel for the City argued that Nadon could have done something more to stop the train. Counsel suggested, for example, that Nadon could have activated the passenger emergency intercom or held the train door with his foot.

While the pressure that Alstom maintenance staff were under, the possibility of operator error, and Nadon's presence on the train provide important additional context, they do not take away from the established and agreed-upon root cause of the second derailment. While increased pressure on maintenance staff may be a partial explanation, it is not a justification for the failure to properly secure safety-critical components to the train. Further, although in an ideal world, the operator would have noticed the derailment sooner and mitigated the damage to the train and track infrastructure, nothing that the operator did actually caused the derailment. It is unfair and unfounded to suggest that

Nadon, while off duty and based only on sensing something unusual during his ride, should have done more than he did to try to get the train removed from service.

Ultimately, these other issues only serve to distract from the real cause of the second derailment. The Commission concludes that the second derailment was caused by the human error of Alstom employees. Further, this human error might have been prevented if Alstom had an adequate quality control system in place.

15.3 The System Shutdown

After two derailments in the span of six weeks, the City ordered a system-wide shutdown of the OLRT1. It took the parties almost two more months to assess the causes of the derailments and agree on a plan to return to service, that is, to reopen the system.

This section begins by explaining the system shutdown and the City's decision to hire an independent third-party expert – Transportation Resource Associates (TRA) – to assess the measures that would be required to get the system running again as soon as possible and provide safe, reliable service. It then explains the negotiations between the City and RTG on the return-to-service plan. Next, this section sets out TRA's assessment of the root causes of the derailments and its supervision of RTG's implementation of the return-to-service plan. Finally, it explains TRA's ongoing involvement in assessing the long-term measures to respond to the derailments.

Ultimately, the steps that the City took were prudent and necessary, and the return-to-service plan was relatively successful in addressing the issues (as identified to date) that led to the derailments. However, it took longer than it should have to reopen the system, given the delay in retaining the City's experts and the back and forth between the City and RTG on the return-to-service plan. This delay negatively impacted Ottawa transit riders. The relationship between the City and RTG also continued to suffer during the system shutdown. This relationship must improve and independent third parties must continue to be involved in monitoring safety issues, in order for the people of Ottawa to feel confident about the overall safety of the system.

15.3.1 The System Shutdown and Engaging TRA

Following the second derailment, Richards – in consultation with Manconi – shut down the Confederation Line. Richards and Manconi decided that the system would need to stay closed to passenger service until the root cause of the derailments could be identified and a sufficient return-to-service plan could be put in place. Richards issued a Safety Order suspending all service on the Confederation Line (as Chapter 11 explains, the Safety Order was a new tool available to the Chief Safety Officer).

On September 20, 2021, the day after the second derailment, the City's Transit Commission held a meeting to determine how the City would respond to the derailment.

At this meeting, the Transit Commission directed the City to retain an independent third-party expert to advise the City on a safe return to service.

Initially, the City planned to hire STV for this role. The City informed RTG of this plan, and STV began work to assess what would be required for a safe return to service. Shortly thereafter, however, the media and certain public officials – including Councillor Catherine McKenney – criticized the City's selection of STV, because STV had been a key engineering consultant during earlier stages in the OLRT1 project. The concern was that STV was not in a position to make an independent determination on returning the OLRT1 to service, as STV would be assessing work that it was supposed to have overseen and been involved in, in the first place. In response to this concern, the City reversed its decision to engage STV and began looking for another third-party expert that had not done previous work on the OLRT1 project.

The City ultimately engaged TRA as its third-party expert consultant on October 1, 2021. TRA began its work on site and met with the parties on October 4, 2021.

According to the scope of work agreed to between the City and TRA, TRA was to independently assess the OLRT1's safe return to service. More specifically, TRA was to (1) evaluate if the root-cause analyses of the two derailments were adequate and appropriate, (2) examine how comprehensive the corrective action documents developed in response to the root-cause assessments were, (3) assess the validity of the proposed short-term and long-term corrective action plans to address the root causes of the derailments, and (4) independently observe and evaluate the implementation of the corrective actions.

In light of the two derailments in quick succession, the City's decision to shut down the system and seek independent third-party advice was prudent. It was abundantly clear that the City and RTG needed to get to the bottom of what had occurred. Like in the construction phase of the project, it was logical for the City to seek independent third-party advice to accomplish this goal, given its lack of experience with complex rail systems. As is detailed further below, TRA was up for the job; the organization was clearly qualified and, unlike STV, there was no suggestion that TRA lacked the independence to undertake this work. However, it was unfortunate that it took a full two weeks after the derailment to get an independent expert on the ground to begin its work. In my view, this clearly contributed to the delay in restoring service to the Confederation Line after the second derailment.

15.3.2 The Second Notice of Default and the Return-to-Service Plan

At the same time as the City was looking for an independent third-party expert, it began a contractual dispute with RTG in which the City claimed that RTG was in default of the Project Agreement. The City demanded a rigorous return-to-service plan in response.

On September 24, 2021, as a result of the two derailments, the City sent RTG a Notice of Default in accordance with the Project Agreement. (To be clear, this was the second Notice of Default the City had issued to RTG; the first, issued in March 2020, is described in Chapter 14). In the notice given in September 2021, the City called on RTG to fulfill its obligations under the Project Agreement. Specifically, Project Agreement section 45.1 requires RTG to provide "a reasonable plan and schedule for diligently remedying the breach and mitigating its effect" within five business days of receiving the notice.

In the weeks that followed, RTG and the City exchanged extensive, prolonged, and contentious correspondence about the Notice of Default and the request for a plan and schedule to address the derailments.

On October 3, 2021, RTG wrote to the City disputing the City's claims of default. Regardless, RTG provided the City with a first version of the return-to-service plan as developed by RTM and Alstom. RTG stated that the plan focused on "immediate activities that will be required for the System to return to service as well as longer term initiatives associated to operational improvements to the Maintenance Activities under [Alstom's and RTM's] respective scope."

On October 6, the City rejected the return-to-service plan, because it did not contain or respond to any conclusive report on the root cause of the second derailment.

On October 8, RTG provided Alstom's preliminary root-cause analysis for the second derailment to the City, and stated that it had provided its return-to-service plan in the letter of October 3, 2021. On October 15, 2021, RTG provided an updated return-to-service plan.

In response, on October 17, 2021, the City repeated its position that the return-to-service plan provided on October 3, 2021 was not a "compliant or adequate" plan and schedule as required by section 45.1 of the Project Agreement and was "wholly unsatisfactory to the City." The City went on to say that the updated return-to-service plan was under review, but that the revised plan did not appear to have changed in any substantive way to address the City's concerns. The City emphasized that, while the return to service

was RTG's responsibility, the City would expect that the RTG plan and schedule would at least include a "comprehensive approach for all elements of the system including but not limited to updates to the safety case, changes to the infrastructure configuration, changes and updates to vehicles configuration, quality assurance procedures, personnel training and updates to maintenance assignments and staffing levels."

This correspondence continued back and forth while commuters were without trains for almost three more weeks, with RTG providing updates to its return-to-service plan while maintaining that it was in full compliance with the Project Agreement, and the City continuing to reject the plans. Finally, on November 5, 2021, RTG provided a return-to-service plan that was satisfactory to the City and TRA.

For the Commission's purposes, and considering ongoing litigation between the parties, I need not concern myself with which party's interpretation of the Project Agreement was right, nor with the precise details that must have been included in RTG's return-to-service plan to make it compliant with the Project Agreement. Nonetheless, a review of this correspondence allows me to draw two conclusions related to the Commission's mandate.

First, the communications between the City and RTG clearly show that their relationship was continuing to break down. The language in this correspondence, particularly from the City, is strident and legalistic, and appears focused more on enforcing the smallest detail of the Project Agreement than on coming to a shared understanding that would get trains running safely as soon as possible.

Second, it took the parties longer than it should have to agree upon a plan to get trains back into service. In response to questions from counsel for the City, Richards suggested that it was possible that service would have returned earlier if RTG had provided a sufficient return-to-service plan from the very beginning. However, in its closing submissions to the Commission, RTG suggested that the City and TRA were focused on issues that went far beyond what was necessary to get trains running safely as soon as possible.

In my view, as a result of their fraying relationship, both parties made this process more challenging than it needed to be, and that caused unnecessary delays in getting the OLRT1 system back up and running.

15.3.3 TRA's Assessment of the Root Causes

On November 5, 2021, TRA delivered a technical briefing to the City's Transit Commission. TRA explained that in the month since it had been engaged by the City,

it had conducted over 80 inspections, interviews, and meetings with key stakeholders, including the City, OC Transpo, RTM, and Alstom. TRA also conducted an extensive review of documentation, including root-cause reports, and it assessed Alstom's resources and personnel through site inspections of the MSF. According to TRA, all of the relevant stakeholders and parties were "transparent and cooperative throughout TRA's work."

In its technical briefing, TRA also explained that it was in general agreement with the root-cause analyses of the derailments conducted by Alstom, RTM, and the TSB. The following summarizes some key points from the briefing:

- In its summary of the first derailment, TRA agreed that the derailment had been caused by a failure in the axle bearing, which resulted in a wheel disconnecting from the axle. TRA was satisfied with Alstom's short-term mitigation to test the bearings and replace them as required. TRA also noted (as explained further in Chapter 14) that other analyses were still going on, and that these analyses were needed to develop the most suitable long-term mitigations.
- Regarding the second derailment, TRA agreed that bolts on the bogie gearbox had not been properly torqued, which caused the gearbox to fall off the train and caused the train to derail with passengers on board. TRA's assessment supported prior conclusions that Alstom's "process, quality assurance, safety management, and organizational issues contributed to key steps being missed."

15.3.4 Implementing the Return-to-Service Plan

Having agreed on the causes, the more challenging task for the parties (and for TRA in its assessment of them) was to develop and implement a satisfactory return-to-service plan.

Multiple witnesses identified the particular challenge posed by the second derailment for return to service. Michael Morgan, the City's Director of Rail Operations, explained that the first derailment was caused by a complex set of issues, including the rail design, track design, and wheel/rail interface. However, addressing these issues (at least in a temporary way) required a simple, technical solution. In contrast, the cause of the second derailment was simple and easy to identify – someone failed to tighten the bolts properly. Yet responding to this derailment was more difficult, because it involved Alstom's "culture of supervision" and the maintenance "processes that they have in place," which underpin everything in the vehicles. In other words, if the cause of the first derailment was complex, the short-term fix was relatively simple. For the second derailment, however, the cause was simple to identify, but the fix was more challenging.

Richards shared this assessment of the complexity of returning to service after the second derailment. He stated, “To ensure that service could go back in safely we had to have confidence in the quality of the work that Alstom and RTM were doing, RTM in its oversight of its contractors and Alstom on delivering in its work.”

Ultimately, the work that was done to address these concerns and to ready the system for return to service can be broken down into four categories.

First, Alstom conducted a full, physical reinspection of all critical connections on each LRV – from the roof to the wheels. This process took several days for each LRV, and Alstom had to produce documentation that was specific to each vehicle and demonstrate that this process was complete before any LRV could return to service. Each LRV then had to make two full trips on the main line without experiencing any issues.

Second, TRA oversaw revamped quality control and assurance processes that were implemented for all maintenance involving critical connections on the LRVs. Witnesses from Alstom and RTM confirmed that they made significant changes to their quality control processes after the second derailment. For instance, Alstom’s work method statements and documentation procedures were revised and safety-critical maintenance now requires a quality control sign-off.

Third, OC Transpo conducted retraining of its operators on safety reporting systems and on situational awareness (that is, staying attentive to details of what is happening in the circumstances and environment – for example, in the running of the train, the system, and the surroundings). Charter explained that the purpose of this training was to reinforce initial training that had already been provided, and to ensure that operators were aware of the need to observe and report any issues that arose during their work.

Fourth, TRA monitored and actively reviewed the repairs to infrastructure and then overall systems testing, or what it called **mock service.** The City and TRA required that seven full trains (14 LRVs) run on the system without passengers for two full days without issue. To the extent that any issues were identified during testing, the LRVs would be pulled out of service and the issues would be investigated and resolved before mock testing would be deemed complete.

With all of the above steps completed, on November 10, 2021, TRA advised the City that it believed it was safe for the system to return to service with seven trains. Two days later, on November 12, 2021 – slightly less than two months since the second derailment – the City took this advice and reopened the system.

15.3.5 TRA's Ongoing Engagement

For the trains to return to service, Alstom and RTM had to demonstrate that the short-term measures outlined above were in place and that the trains could safely run on the main line. In addition, however, they had to commit to long-term mitigation measures, including adherence to a revised Safety Management System (SMS). Prior to the derailment, RTM had a safety management plan that was not fully aligned with the City's SMS (described in detail in Chapter 11). As part of the return-to-service plan, RTM drafted a revised SMS to align with the City's.

The City engaged TRA to monitor and assess RTM's and Alstom's compliance with their long-term obligations. As Charter put it, the City "felt it was important for TRA to continue to work with us, to work with Alstom, to ensure that the commitments that have been made as part of that safe to return to service plan are followed through and implemented." Moreover, TRA's involvement has brought welcome transparency to the process. Indeed, Citizen Transit Commissioner Sarah Wright-Gilbert and Councillor McKenney spoke positively about the increased transparency TRA has brought to Transit Commission meetings, which TRA began attending in October 2021.

According to Councillor McKenney, TRA has provided answers about "exactly what was happening," including about the cause of the derailments, the role RTM has played in connection with the system's significant issues, and the steps taken in the return-to-service plan following the September 2021 derailment to increase quality control and oversight. For the time being, TRA's involvement has lessened Councillor McKenney's concern that information is being withheld. At the time of writing, TRA remains engaged in this oversight work.

15.3.6 Conclusion

In general terms, engaging TRA and establishing the return-to-service plan worked to get the trains operating again. The evidence before the Commission also demonstrated significant improvements in overall service levels, and the problems that caused the two derailments have been mitigated.

However, arriving at that point was more difficult than it should have been. While it was prudent for the City to engage third-party experts, it would have been preferable if they had recognized STV's conflict from the start so that TRA could have been brought into the OLRT1 project faster. Moreover, the negotiations between the City and RTG demonstrated ongoing conflict that needs to be resolved if they are to work together as partners for the duration of the OLRT1 maintenance term. The parties must recognize that resorting to contractual squabbles does nothing to assist riders of the OLRT system.

Further, given the ongoing litigation disputes between the parties, it is essential that an independent expert organization like TRA remain engaged. Finally, in light of the communication issues within the Ottawa municipal government (described in Chapter 12), it is necessary that any independent safety expert reports directly to Council and the Transit Commission.

15.4 Return to Service

Since the OLRT1 system resumed operation in November 2021, service has been largely reliable. The resumed service has been accompanied by a more collaborative relationship between the City and RTG/RTM. An improved relationship between the parties is critical for the future success of the system.

Despite these improvements, significant issues remain. An important issue is the misalignment in the **wheel/rail interface** (described in section 15.1.6), which continues to cause problems and present a potential safety issue if not addressed. The evidence suggests that it was a significant factor in the first derailment (in August 2021). The misalignment in the wheel/rail interface was identified before the OLRT1 system entered public service, including in the Operational Restrictions Document. While RTG/RTM and Alstom implemented all the necessary operational "restrictions, conditions and limitations" cited there, it took a long time for them to begin to meaningfully address the wheel/rail issue, including by implementing one of the Operational Restrictions Document's recommendations.

This section will begin by discussing the reliability of the system following its return to service in November 2021 and the improved relationship between the City and RTG/RTM. It will then discuss the ongoing problem of the wheel/rail interface and the remedial actions that may have to be taken to ensure the continued safe and reliable operation of the OLRT1. It will conclude with a postscript on the issues the system experienced following the conclusion of the public hearings.

15.4.1 System Reliability Following the Return to Service

The OLRT1 returned to public service on November 12, 2021, following the second main-line derailment, a shutdown, and considerable work to implement a return-to-service plan. The return to public service was incremental; it began with 7 trains (14 LRVs) in operation from November 12 to 17; moved to 8 trains (16 LRVs) from November 18 to 22; to 9 trains (18 LRVs) from November 23 to 28; and finally to 11 trains (22 LRVs) in operation starting on November 29, 2021. At the time of the Commission's hearings, the service level remained at 11 trains. In light of the reduced ridership due to the pandemic, the City and RTG agreed to keep the service level at 11 trains.

The system provided largely reliable service following its return to service. Between December 2021 and March 2022, the reliability ratio (aggregate vehicle kilometre ratio, or AVKR, referred to in Chapter 12) ranged from a high of 99.17 percent to a low of 96.34. That means that the vehicles were available and meeting the AVKR requirements at a high frequency. In its closing submissions to the Commission, Alstom said that the system has experienced sustained levels of reliability above 99 percent since March 2022. In their closing submissions to the Commission, RTG parties (RTG, RTM, and OLRT-C) echoed Alstom's assessment, with the caveat that the system's aggregate service reliability ratio fell to 98.9 percent in August 2022 because of service disruptions caused by lightning strikes.

The City and RTG/RTM have also engaged in a greater level of co-operation in the operation and maintenance of the system in recent years and, most significantly, following the two derailments.

There has been a greater flow of information and a more collaborative approach between the City, RTM, and Alstom. In addition, there has also been an increase in the level of trust between the parties. This has allowed the parties to work more collaboratively with the interests of the riders in mind. As Charter, of the City, explained, there are still issues to manage, "but, at the end of the day, our customers are getting better service, safe and reliable service, and that allows us the opportunity to work more proactively together."

These improvements to the system's reliability and the increased partnership between the City and RTG/RTM bode well for the future of the OLRT1. However, significant concerns remain and there are further improvements that should be made.

15.4.2 The Wheel/Rail Interface

While the parties have taken several steps to improve the safety and reliability of the OLRT1 system, and those steps have had a positive impact on the safety of the system, more must be done.

The most significant area that must be improved is in respect to the wheel/rail interface. The misalignment between the wheel profile and rail profile was identified before Revenue Service Availability (RSA), in OLRT-C's Track Safety Justification Report dated August 14, 2019, and included in the Operational Restrictions Document for the system.

The Track Safety Justification Report notes that the **rail inclination** (angle or degree of slope) is not fully matched with the wheel profile. In other words, the wheel and rails are misaligned, because the characteristics of the wheels and the rail are not optimally matched to each other.

Misalignment in wheel and rail profiles can result in unusual patterns of wear on the **railhead** (the upper part of the rail, which looks like the horizontal bar on top of this capital letter **I**). The misalignment also places greater forces on both the rail and wheel. The misalignment can lead to problems such as rail corrugation, which becomes more prevalent on the sharper curves in the track alignment. Corrugation (described in section 15.1.6) causes wear to the rail and wheel components.

The Track Safety Justification Report also raises concerns about the hardness of the rail, and suggests that the rail is too hard for the chosen trains.[4] One consequence of a too-hard rail is that it can lead to rail corrugation. Rail hardness is one consideration of the wheel/rail interface; other considerations include the track geometric forces being applied for the given line speed, and the type of vehicle using the system.

Rail corrugation can also lead to vibration of the vehicle components as they travel over the area with corrugation. If the rail is not absorbing the energy generated by the vibrations (for example, if it is too hard), the energy can be reflected back into the vehicle, causing an excessive buildup of heat. The vibrations may also contribute to increased loads on the bogie assembly, which could be transmitted further into the bogie and affect the wheel and related components.

The misalignment in the wheel/rail interface has likely contributed to some of the issues observed on the OLRT1 system, most significantly the buildup of corrugation that has at times become quite severe in the tight corners, and the stresses experienced on the wheel components. The evidence suggests that the August 2021 derailment was related to the ongoing issues with the wheel/rail interface. However, as noted earlier, at the time of this report, the root cause of the derailment is still under investigation.

According to Alstom, the misalignment in the wheel/rail interface is the primary factor in creating the excessive loads it says are experienced on certain axles of the vehicles. While Alstom and the RTG parties disagree on who is responsible for this misalignment (whether it is an issue with the wheel or with the track), both agree that the misalignment is causing problems.

Because of the misalignment in the wheel and rail profiles, a recommendation was made in the Track Safety Justification Report and the Operational Restrictions Document that RTM establish a working group *prior to* the start of passenger operations to monitor wear on the wheels and rails and collect that data.

The purpose of this working group was to identify remedial actions that can be taken to prevent the deterioration of the rail and wheel components. The following summarizes the recommendations for the working group to focus on:

a. Increasing visual inspections of wear on the rail on all sharp curves to measure **side wear rates** (the rate at which wear occurs at the side of the head of the rail);
b. Using ultrasonic testing as well as visual inspections;
c. Monitoring the rate of wear on the wheel profile through increased visual inspection or **non-destructive testing** (testing to evaluate the properties of the structure or component without causing damage to it);
d. Using lubricators mounted on LRVs, monitoring their effectiveness to address locations with rail wear, and evaluating the possibility of installing rail-mounted lubricators and **friction modifiers** (to reduce friction and wear);
e. Increasing the frequency of preventive rail grinding across the whole system to reduce the risk and growth of a degradation phenomenon called "rolling contact fatigue" in the harder rail; and
f. Reviewing the profile of the **switch blade** or **switch rail** (the movable rail that guides the train wheels to another track) to reduce the rate of wear, as some switches had noticeable wear.

It should be noted that this recommendation for a working group to focus on these issues was not part of the "restrictions, conditions and limitations" set out in the Operational Restrictions Document. And while the issue was highlighted, no one foresaw that it might lead to a derailment. Nevertheless, the author of this recommendation, Derek Wynne (of SEMP), expected it to be implemented.

The recommendation to establish a working group focused on the wheel/rail interface was explained in the conclusions of the Track Safety Justification Report. Some elaborations follow this excerpt from the report.

> The track design has not undertaken any specific wheel-rail interface analysis and has not declared [that] any specific rail-head profile modifications are to be implemented to aid the conicity management. The specification of the rail was defined by the Client [the City], based upon the principles of the AREMA engineering manual. The profile of Citadis B15 wheel profile was proposed by Alstom, as part of their LRV specifications. This Safety Justification Report has made recommendations to establish a wheel-rail interface working group to monitor all parameters that could affect wheel and rail interface performance and prevent accelerated failure of the track.

Conicity management is used to investigate the dynamic interactions between the vehicles and track. (Note that conicity refers to the fact that the wheels are cone-shaped.) The AREMA engineering manual refers to the American Railway Engineering

and Maintenance-of-Way Association. AREMA publishes recommended practices for design, construction, and maintenance that are used in the United States and Canada.

The Track Safety Justification Report also noted that the track design has excluded any rail lubrication or friction modifier equipment, which is to be provided as on-board equipment of the LRVs. The effectiveness of the LRV-mounted lubricators was to be monitored in the wheel/rail interface working group to determine its effectiveness with rail wear.

Unfortunately, the recommended working group was never established to monitor the wheel/rail interface. While RTM took steps to address issues relating to this interface, including commissioning a study from the National Research Council (see below), this was a significant failure on the part of RTM.

During public service operations, Alstom's rail-grinding subcontractor, Advanced Rail Management (Canada), delivered a report noting that corrugation was prevalent throughout the track in November 2020 and was most severe in the curves. Advanced Rail Management noted that the level of corrugation was surprising, given that the system had only been in service for approximately one year. The report went on to state that the rails were very flat (Advanced Rail Management suggests this could have been caused by natural wear or prior maintenance activities) and that flat rails are prone to the development of corrugation due to the wheel and rail interaction. It further explained that these issues can be reduced with the correct wheel and rail profiles to help steer the train through the curve. The issues can also be minimized by applying lubrication to the track. The report concluded by explaining that the combination of the wheel profile, flat rails, and wear on the **high gauge** (the outside rail of the two rails in a curve of the track) are leading to, and indicating, lateral instability and that the wheel/rail profile is not optimized for steering through the curves.

In its report, Advanced Rail Management stated the following:

> While the types and root causes of corrugation can be quite complex, the end result is the same: high frequency vibrations resulting in an increase in noise emissions. Left unchecked, the corrugation can develop into more severe rolling contact fatigue … [and] lead to broken fasteners and cracking in rolling stock undercarriage components.

In its March 2021 report, Advanced Rail Management went on to recommend, among other things, that a wheel/rail interaction study be undertaken to determine if the rail or wheel profiles can be redesigned to optimize system performance. The report further notes

that custom wheel and/or rail profiles may be required. These new profiles could drastically improve ride quality, reduce noise and vibration, and increase the life of the assets.

The April 2022 report of Mott MacDonald, a consultant company retained by the City, also noted the prevalence of rail corrugation in several locations around the OLRT1 system. Due in part to the prevalence of corrugation, Mott MacDonald recommended that a wheel and rail interaction study be conducted to seek to minimize rail and wheel damage. It recommended that the study consider if changes to the track or vehicle would be beneficial, and how the new profiles would develop with wear over time.

Mott MacDonald also recommended that measurements of corrugation be taken throughout the whole system at least every three months, as part of the maintenance practices, to help understand where corrugation is forming and what the growth rates are. This information would then be used to inform a proactive program of rail grinding.

In the summer of 2021, RTM did commission a study of the track by the National Research Council, which concluded that one of the reasons there was so much corrugation of the track was that the profiles of the wheel and rail were not optimally matched and there was a lack of lubrication (greasing) in certain areas of the track. While this report was commissioned prior to the first derailment, it was only completed in early 2022. In its later report to the City, Mott MacDonald recommended that a study be conducted to consider whether the existing lubrication of the track is sufficient or whether trackside lubricators are required, given the high degree of track wear.

In conclusion, it is clear from the evidence that the misalignment in the wheel and rail profiles is a significant problem. The misalignment in the wheel/rail interface has caused significant corrugation and appears to be a contributing factor to the August 2021 derailment. The need to study the wheel/rail interface was communicated to the parties before the launch of public service. Unfortunately, while some steps were taken to study and address this issue, these steps were not sufficiently timely. It took too long for the parties to get serious in their efforts to address this issue. In the intervening period, a train derailed.

The Commission has heard that, as a result of the issues the OLRT1 system has experienced following public launch, both Alstom and RTM have now placed greater focus on the wheel/rail interface to try to address the problem. This is important, as it is a critical safety issue affecting the OLRT1 system if left unaddressed.

The Commission recommends that RTM establish a working group with the goal of optimizing the wheel and rail profiles, improving maintenance practices, and minimizing the impacts on the rail and vehicle components.

In addition to establishing a working group, there are several other remedial actions that should be considered and implemented, where appropriate, to address these issues. I turn to these now.

15.4.3 Potential Remedial Actions

Several remedial actions have been suggested and undertaken in order to address the issues arising from the misalignment of the wheel and rail profiles. These include reducing track corrugation through maintenance, reprofiling (grinding) the track, modifying the wheel profile, and adjusting the operating parameters of the system (for instance, for speed).

Track corrugation can be removed by grinding the rail to try to return the rail profile as closely as possible to its original, proper profile. However, the downside of grinding is that it reduces the service life of the track.

In June 2021, prior to the first main-line derailment, the entire line was reground (reprofiled) by Alstom as part of its maintenance activities. In its root-cause analysis of the first main-line derailment, Alstom notes that its track test results after this regrinding campaign showed an improvement of the track conditions in terms of vibration level, primarily related to reduced rail corrugation in curves.

This is a positive outcome for the reprofiling campaign. In order to address the issues experienced by the system, it is likely that the track will need to be reprofiled more frequently than initially anticipated.

Alstom has increased its maintenance activities to inspect and regrind the track with more frequency to ensure that track corrugation is addressed promptly. It has also increased the frequency of its greasing of the **wheel flanges** (the rim of the wheel that is designed to keep the wheel on the rail; the flange has a larger diameter than the other rim on the wheel). However, the primary purpose of this greasing is to stop the squeal of the wheel on the track, as opposed to stopping wear to the track.

As Guerra, of RTM, noted, lubrication of components is needed when the train is coming into a curve to ensure the train goes through the curve smoothly, to prevent track wear, and to limit noise. He confirmed that RTM will likely need to look at the use of trackside lubricators to apply lubrication to the track. This is consistent with the reports suggesting that the existing level of track lubrication may be insufficient and may be contributing to the levels of corrugation.

The Commission has heard that RTM has recently been reorganized to provide more consistent oversight to ensure that the track maintenance is properly completed, as noted in Chapter 13. It is critical that the timely and proper completion of maintenance activities is prioritized to ensure the safe and reliable operation of the system.

Another solution that Alstom is considering is to alter the wheel profile. A modified wheel profile may change the loads that the axles are currently experiencing to better sustain those forces. Alstom tested an alternative wheel profile during its root-cause investigation into the August 2021 derailment and reported that the different profile would lead to reduced levels of stresses on the wheel assembly. Changing the wheel profile could mitigate future issues with the wheel components if the root cause of the first derailment is conclusively found to be related to the excessive loads that the wheel components are experiencing. Alstom estimates that this would be a medium-term solution that first requires further testing before it can be determined whether it is a viable solution. Consideration should be given to altering the profile of the wheels; however, this decision should be made in conjunction with the analysis conducted by the wheel/rail interface working group.

It may also be necessary to modify the operating profile of the system in order to mitigate the issues experienced by the vehicles. This could include adjusting the speed profile of the vehicle, particularly along the curves in the track; in other words, it would change how fast or slowly the LRVs travel on different parts of the OLRT1 line. Goudge, of Alstom, explained that reducing the speed could potentially reduce the stress, which would improve the situation.

In its closing submissions, Alstom noted that on July 29, 2022 it issued a safety memo mandating a 20 percent speed reduction on specific tight curves to reduce excess stress. The Commission did not hear evidence about this safety memo, as it would have been issued after the Commission's hearings, but its concept is in keeping with the remedial actions proposed by Alstom in its preliminary root-cause report relating to the first derailment. Consideration should be given to reducing vehicle speeds, particularly along the curves, in order to reduce the stress on the vehicle components.

Another potential remedial action is to install heat-detection systems to monitor the temperature of the bearing assemblies, or some other detection method. Following the TSB's Rail Safety Advisory Letter (noted in section 15.1.1) regarding the first derailment, the City requested that RTG perform the engineering necessary to install on-board heat-detection systems to monitor temperatures of LRV cartridge roller bearing assemblies. Traditional heat-detection systems are located on the side of the track and measure the heat of the axle bearings as the trains pass the detectors. In order to do this, the axle bearings have to be visible as they pass the detectors. However, the axle bearings

on the Citadis Spirit are enclosed in an assembly and surrounded by a casing, so the bearings are not visible to the traditional heat-detection systems. Another option, which the City asked RTG to implement, would be to install on-board sensors in the components to monitor the heat of the bearings.

The Commission has received evidence that RTG and its subcontractors are considering other detection systems. At the time of the City's request in the fall of 2021, RTG and Alstom were of the view that it was premature to consider the installation of detection systems, as the root cause of the August 2021 derailment had not yet been determined. Since then, Alstom has agreed to undertake some work toward considering the use of detection systems.

However, Alstom explained that a heat-detection system would not provide any real benefit, as it would not detect an issue sufficiently in advance of a derailment to provide real protection. Alstom estimates that the relevant bearing in the August 2021 derailment overheated within five kilometres of the derailment – a point it addresses with the annotated map in Figure 15-1. Typical practice with the use of heat detectors is to slow the train down and take it out of service at the operator's convenience after an issue is identified. In Alstom's view, a warning that provides five kilometres of advance notice is much less useful than an earlier warning based on other means of detection, such as periodic inspections. Alstom is of the view that the derailment would have been inevitable, even with five kilometres' advance notice. OLRT-C shares Alstom's view that heat sensors would not have made a difference. According to OLRT-C, heat sensors would not be a viable or sensible option, given what it would cost and the benefit that would be attained as a result.

The use of heat-detection systems may or may not provide the level of protection sought by the parties. It also may or may not be appropriate for LRVs, as evidence was given that heat-detection systems are typically in use for heavy freight and long-distance trains as opposed to LRVs. However, the use of some detection system should be considered as a potential remedial option.

The evidence before the Commission suggests that this derailment appears to be related to the misalignment in the wheel/rail interface. Therefore, it is critical that the parties take the necessary steps to address this issue and its cumulative effects, as this effort should have begun prior to the start of public service. Specifically, as was recommended to RTM, a working group to monitor the wheel/rail interface should be established.

15.4.4 Conclusion on the Return to Service

As a whole, the parties made reasonable efforts following the two main-line derailments to ensure the system was safe for its return to service. The return-to-service plan was approved by TRA, an independent third party retained by the City, and there has been ongoing monitoring to ensure compliance with this plan. The parties have been working together more collaboratively, and maintenance practices have improved. Provided the parties continue with these two trends, they will continue to have a positive impact on the safety and condition of the system going forward. However, more needs to be done.

To date, only temporary measures have been put in place to address the issues underlying the August 2021 derailment. Additional measures have also been proposed but have not yet been implemented. No permanent solution has been conclusively identified or implemented in response to this derailment.

It is critical that the parties follow through with the ongoing root-cause investigations into the August 2021 derailment and identify and collaboratively implement the permanent solutions necessary to ensure that the risk of future derailments is sufficiently reduced. In the meantime, the parties should continue to implement their current remedial actions to ensure the safe and reliable operation of the system until the appropriate permanent solution or solutions are identified.

Until permanent solutions are implemented, the Commission also recommends that TRA or another competent, independent third party continue monitoring the safety issues and remedial actions undertaken by the parties to ensure the continued safe operation of the OLRT1 system. This will provide a level of assurance that the necessary work is being performed in a proper and timely manner, and will provide an external level of oversight regarding any safety issues. Given the previous failures of senior City staff to honestly communicate critical information relating to the state of the system to Council (as referenced in Chapter 12), it is recommended that the third party report directly to Council or the Transit Commission. At this juncture, nothing less will suffice to regain the public's trust in the OLRT1 system.

15.4.5 Postscript on Issues Subsequent to the Public Inquiry Hearings

The Commission has learned through media reports and other publicly available means that the OLRT1 has experienced additional issues following the conclusion of the public hearings. These include a failure in one of the wheel hub assemblies of a vehicle and a lightning strike that took the system offline for a period of time. The Commission did

not receive any evidence on these issues, so I will not be addressing them in detail or making any findings.

I will comment that the fact the system continues to experience issues – whether natural occurrences such as lightning strikes or technical issues such as with the wheel hub assembly – highlights the importance of proactive and preventive maintenance, as well as timely and proper responses by all parties to mitigate these issues once they occur.

Despite the parties' best efforts, it is inevitable that issues will arise over the lifetime of a project of this complexity. However, it is critical that these issues be mitigated to the extent reasonably possible, in order to ensure the OLRT1's continued safe and reliable operation.

Recommendations

See recommendations #45–46, 69, 74–76, 80, 83–87, 90, 92, and 96–103 in Chapter 17.

Notes

1 These numbers reflect new LRV numbering related to the public service phase.

2 For instance, moving the wheel profile to a different spot such that it does not slip, or changing to a different wheel.

3 This mitigation measure was reviewed by safety assessors and approved.

4 It appears that the Project Agreement required the use of rail that met AREMA (American Railway Engineering and Maintenance-of-Way Association) standards. OLRT-C used rail rated at 310 on the Brinell Hardness gradient, which is the softest rail that would meet the AREMA rail requirement.

Chapter 16
Conclusion

Chapter Contents

16.0 Introduction

This chapter concludes the findings for the report, offering takeaways and final thoughts before recommendations are given in Chapter 17.

The Ottawa Light Rail Transit project was the biggest and most expensive infrastructure project in the City of Ottawa's history. It came after years of transit study and planning and the cancellation of a prior light rail project. The OLRT1, as the first part of the new project, was to be key to solving Ottawa's long-term transit needs by delivering safe and reliable transportation to the residents of Ottawa.

A project of this scale requires strong and consistent leadership. That, in turn, demands flexibility, collaboration, and transparency. The novelty and scale of the project should have made the City and RTG more cautious about the commitments they made, more flexible in approaching problem solving, and more transparent in their communications with one another and the public. Unfortunately, the project was characterized by a failure to appreciate the likely challenges with a complex project that had many new elements. It also suffered from political interference.

16.1 Report Takeaways

The evidence before the Commission and the findings in this report have identified a series of problems in the planning, construction, and implementation of the OLRT1 system. While not all of those problems were in the control of the parties involved, persistent failures of leadership, partnership, and communication harmed the parties' ability to plan for, mitigate, and resolve those problems when they arose. The takeaways from my analysis in this report are summarized here.

16.1.1 Budgeting

The budget for the OLRT1 project of $2.13 billion was based on a very preliminary estimate provided by City staff following the completion of the preliminary functional design elements, but prior to the completion of more detailed engineering designs. It became the subject of campaign promises made by Jim Watson in the 2010 mayoral campaign, and then crystallized into the budget after he became the new mayor and directed staff to take what can be described as a "design to budget" approach to the continued design and engineering work. It would have been preferable for the City to have more thoroughly considered an appropriate budget and commit to it publicly only after more comprehensive design and engineering work was completed.

16.1.2 Procurement

The design-build-finance-maintain (DBFM) model allowed the City to transfer significant risk to the private sector. However, the cost of that risk allocation was a loss of oversight and control on the part of the City. The experience on the OLRT1 project illustrates that although public procurers undoubtedly need to prioritize cost certainty, schedule certainty, and risk transfer, they must do so without losing sight of co-operation and the flexibility that is required to build successful projects of this nature. Public entities building large infrastructure projects must critically analyze the full suite of project delivery models and the specific requirements of their projects to determine which model best responds to the public's needs.

16.1.3 Inexperience

An impediment to collaboration on the OLRT1 project was the parties' lack of experience with each other and with important elements of the system they had contracted to deliver, maintain, and operate. Almost every core aspect and relationship in the project was new to the City or their private-sector partners. Some degree of novelty and risk is acceptable and indeed inevitable when undertaking a project like the OLRT1 for the first time. However, rather than approaching those challenges with humility and prudent planning, the City and RTG failed to anticipate and adequately plan for the number and severity of issues that arose.

16.1.4 New Vehicle

The City's decision to proceed with Alstom's Citadis Spirit vehicle model was problematic. The Citadis Spirit was not proven in the configuration and performance aspects required by the City. For example, Thales's signalling system had not previously been used with that type of train. Further, the Canadian content requirement for the vehicles required significant elements of the vehicle construction and manufacturing – already a risky endeavour – to occur in a market with an untested supply chain and in a facility not built for that purpose. As Bent Flyvbjerg noted in his expert presentation about complex infrastructure projects, parties to a project should aim for modular or standard components and avoid customized or "bespoke" elements. These issues compounded delays in delivery of the system, and have ultimately contributed to problems with system reliability.

16.1.5 Working Relationships

The contractual arrangements exacerbated the difficulties inherent in undertaking a project of this scale. The complexity of the contracts made it necessary for the parties to work collaboratively and integrate their efforts. With the adoption of its Project Charter for the OLRT1 in October 2011, the City at least initially recognized that a collaborative team approach with its private-sector partner would lead to a more beneficial outcome for the people of Ottawa. Unfortunately, the City largely abandoned this approach as problems arose on the project.

Further, RTG and OLRT-C did not effectively prioritize and deliver on the overall integration of the system, which was especially critical given the new and untested working relationships on the project. They did not implement an overall plan to coordinate the work of subcontractors at the outset of the project, which would have improved working relationships and reduced delays. OLRT-C instead downloaded

responsibility for systems integration to several subcontractors, leading to the parties having misunderstandings and a lack of clarity about their responsibilities. This lack of coordination and integration continued through the construction phase, and its repercussions are still being felt.

16.1.6 Testing and Commissioning

A robust testing and commissioning process should have been used, with several distinct stages, to ensure that the OLRT1 system was reliable and ready for operation. Several witnesses gave evidence to the Commission that a system like the OLRT1 would benefit from a sufficient period of early validation testing and later integration testing, in addition to both a "burn-in" (a continuous period of operation or running of the trains to check for defects) and bedding-in period. This would have included (1) the validation of the vehicle prototype before the rest of the fleet was manufactured and assembled; (2) the testing of each and every vehicle and system interface in an orderly way, with the involvement of the relevant subcontractors; and (3) the prolonged running of the vehicles on a fully connected system in accordance with actual service conditions, to identify and address issues. Unfortunately, due to political pressure to get the system open, that robust testing and commissioning process did not take place.

16.1.7 Radical Shift in Approach

Initially, the City, for the most part, was insistent on enforcing the terms of the Project Agreement. For example, when difficulties and delays occurred at various phases of the project – such as the Rideau Street sinkhole in 2016 – the City consistently responded by insisting on strict compliance with the Project Agreement. The City's approach to enforcing its contractual rights and remedies inhibited the project partners and subcontractors from engaging collaboratively to mitigate further problems.

This approach fundamentally changed when political pressure made the opening of the system a priority. Suddenly, the City was willing to compromise its rights under the Project Agreement and rushed the system into operation. The political (for the City) and financial (for RTG) pressures to deliver the OLRT1 without further delay led both parties to make several poor decisions. For example, the City agreed in July 2019 to accept RTG's claim that the system had met the Substantial Completion threshold under the Project Agreement in order to move the project on to trial running, despite known and ongoing operational issues that caused it to reject RTG's claim of Substantial Completion just months earlier. Similarly, RTG was content to push problems off to the maintainers for financial reasons.

As will be discussed below, this approach of compromise by the City was short-lived. Once the OLRT1 opened for service, the City returned to its prior position of insisting on strict compliance with the Project Agreement. In fact, the City became more aggressive in asserting what it believed its rights to be under the contract.

16.1.8 Trial Running Testing

Trial running was designed to ensure that the OLRT1 system could consistently meet performance requirements to demonstrate that it could be operated safely and reliably under conditions expected in public service. The early days of trial running demonstrated that the requirements the parties had most recently agreed upon in 2019 could not be met. The City and RTG then made a series of decisions that permitted the system to pass trial running. They agreed to revert to less stringent criteria for trial running that the parties had established in 2017. The City also agreed to reduce the minimum number of vehicles that had to be available for use.

16.1.9 Governance, Communication, and Accountability

At the same time as the City was making politically motivated decisions to push the OLRT1 system into public service, key information was withheld from City Council that prevented Council from exercising its oversight function and thereby protecting the public. Information about the system's initial poor performance during trial running, and the decisions made by the City and RTG to suspend trial running and later to revert to the less stringent 2017 criteria for trial running was not shared with Council. It was provided, though, to a select group of people, including those who ultimately came to participate in the key decisions: City Manager Steve Kanellakos, Mayor Watson, and General Manager of Transportation Services John Manconi. The evidence given at the Commission establishes that a deliberate decision was made to withhold vital information from Council, which prevented it from exercising its statutory oversight function on the critical issue of the system's reliability and readiness for operation.

16.1.10 Communication

The public communications on the project were unacceptable. The City promoted its "on time, on budget" mantra, setting both internal and public expectations that were unrealistic. Furthermore, as noted above, critical information was withheld from the public. For their part, RTG and OLRT-C likewise repeatedly gave the City dates for Revenue Service Availability (RSA) that they knew they had little hope of achieving,

especially once the impacts of the Rideau Street sinkhole were known. The failures to communicate led to a breakdown of public trust.

16.1.11 Public Launch

The City rejected proposals to begin public service (revenue service) with either a soft start or bedding-in period that would have allowed the system to be gradually opened to the public after RSA. The City also declined to maintain parallel bus service for a longer period of time than the initially planned three weeks. A soft start would have been advisable given the novelty of the system and the issues encountered during the manufacturing and testing processes. The Commission heard evidence that a soft start and bedding-in period were common industry practices, and that they were in fact recommended by bidders during the procurement process on the project, or later by RTG and OLRT-C.

The City instead insisted on full service from the day of opening. This misguided approach contributed to pushing issues that should have been resolved in the construction and testing phases into the maintenance and operational phase, which has resulted in the system operating at decidedly less than full service in the years since. These decisions were based upon political and financial pressures to open the system and were not in the best interests of the people of Ottawa. They were made in order to get the system opened, not because it was ready.

16.1.12 Operation of the System

It is clear that the OLRT1 system was rushed into service. When the system was handed over to OC Transpo to operate, and to RTM and Alstom to maintain, work had been deferred, a reduced number of vehicles was available for use, and there were known maintenance and operational issues that had not been resolved in the construction and testing phases. Those issues interfered with reliable public service. It was expected that reliability issues would arise, and they could have been mitigated by more testing, longer trial running, and generally more running of the system, as well as through better resourcing of maintenance in the period immediately before and after public launch.

The ability of Alstom and RTM to respond to the early problems on the system was hurt by the fact that they were not sufficiently prepared or resourced to meet the needs of the system upon its handover. The City knew that there were insufficient maintenance resources to address the known problems with the system. Despite that knowledge, the City filed hundreds of work orders in the first weeks of operations for what witnesses for Alstom and RTM described as minor issues, and classified them as requiring the fastest

response or remediation time. In addition, the City regularly applied deductions and penalties when those issues were not addressed as quickly as the City's classifications required. As a result of these deductions, there were months in which RTG received no monthly payments whatsoever from the City. These practices increased pressure on the maintainers and interfered with effective maintenance at a critical time for the system.

Encouragingly, changes in leadership and resources at RTG and RTM in 2020 improved their work on the OLRT1 system and their relationship with the City. Though issues continued to arise during the operation of the system, the responses to those issues were more effective and less disruptive to public service than in the earliest days after public launch. This improvement demonstrates that, over time, structural problems can be resolved through good faith, communication, and co-operation.

16.1.13 Derailments

The system experienced two derailments on the main line. The first, on August 8, 2021, occurred when a train was returning to the service yard from Tunney's Pasture Station. It grounded the fleet for five days. The derailment resulted from a failure of the axle bearing assembly, the precise root causes of which are complex and remain under investigation by the Transportation Safety Board of Canada, which has exercised its exclusive jurisdiction over the issue. However, the evidence at the Commission showed that there is a misalignment in the interface between the train's wheels and the rail, which places excessive forces on the LRT system when the train goes through specific curves on the track under normal operating conditions.

The second derailment, on September 19, 2021, occurred when the train was travelling westbound on the main line from Tremblay Station. This derailment was caused by human error – a failure by Alstom employees to properly torque bolts on a gearbox after its disassembly as part of the remedial work that followed the first derailment. The second derailment left riders without LRT service for 54 days.

Alstom and RTM have identified and implemented a plan to prevent similar issues from occurring in the future. RTM's oversight of Alstom's maintenance has improved, and outside safety experts were brought in to oversee that work. After early disputes about the return of the system to service following the second derailment, the City, RTG and its subcontractors have improved their ability to effectively communicate and collaborate to address any future challenges.

The Commission is nevertheless concerned that more could have been done to identify and prevent the issues that led to the derailments, and that more needs to be done

to ensure the continued safe operation of the system. The misalignment in the wheel/rail profile was an issue identified in 2019, *prior* to the start of public service. It appears that, given the rush to open the system, the parties did not take all the necessary steps to address the issue at that time. It is inexcusable that it took so long to marshal the necessary level of attention and response to this issue.

At the time of this report, there is no permanent solution yet to the issues underlying the August 2021 derailment. In the Commission's view, it is imperative that a third party monitor the remedial actions being proposed and undertaken to ensure the system continues to operate safely. While the City, RTG, and its subcontractors have improved their relationships, which have in turn improved maintenance practices, the project has also been beset by failures of communication between the parties and to the public, including on matters critical to the reliability of the system. I recommend the ongoing involvement and oversight of a third party, who should report directly to Council or the Transit Commission. In my view, it is required to preserve the integrity of the system and the public's trust in it.

16.2 Closing Thoughts

Ultimately, the light rail transit system that the City of Ottawa received was not reliable when it went into public service. The reliability issues arose in part from the system being pushed into public service before it was ready, for political and financial reasons, and contributed to a loss of confidence between the parties and on the part of the public – a loss of confidence that was then compounded by the derailments. While not every problem that plagued the OLRT1 system was foreseeable, stronger leadership and collaboration between the parties could have better identified, planned for, and responded to those problems. The City's inexperience in procuring and shepherding a large, public-private infrastructure project showed, as did the parties' inexperience with each other in the context of what was essentially an unproven vehicle. The parties responded to these uncertainties and difficulties by taking a narrow and rigid view of their responsibilities to one another, and to the public.

It is this last point that I wish to emphasize in closing. Public infrastructure projects will not succeed unless participants, both public and private, understand that their first duty is to the public. Those participants must never forget that the infrastructure belongs not to them but *to the people*, and it is the people to whom they must ultimately account. This is not to say that a standard of perfection is demanded. Mistakes are expected in any human endeavour, but it is asking too much of the people that they be required to forgive a reckless or deliberate dereliction of duty.

Chapter 17
Recommendations

Chapter Contents

17.0 Introduction

This chapter includes all recommendations resulting from the work of the Commission and organizes them by topic. The chapters referred to with each topic point to the related chapters that provide context for the recommendations. In some cases, the recommendations are specific to transit systems, while others may be applied broadly.

17.1 Planning Complex Infrastructure

Report Chapters 4, 5, 6, 8, 9, 10, and 12

As the OLRT1 project clearly demonstrated, early, effective planning sets the stage for the project that follows. Effective planning requires project-specific expertise and requires those involved to address unconscious biases that can lead to budget and schedule overruns. These recommendations focus on ensuring that the necessary skills are brought to bear in the early stages of a project, and on eliminating forces that work to undermine early planning efforts.

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.
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.
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.
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.
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.
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.

7. 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:

   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;

   b. Creating career paths within government to encourage civil servants to develop and use the project management skills and experience they gained through training or on previous complex infrastructure projects; and

   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.

17.2 Preparing Project Estimates and Budgets

Report Chapters 4, 5, and 6

Responsible cost containment measures are necessary for the effective delivery of complex infrastructure projects. However, care must be taken to ensure that cost containment measures do not outweigh considerations of quality. These recommendations focus on the appropriate approach to cost estimates on complex projects.

8. 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.
9. Public entities should avoid setting budgets too early, and remain flexible as project cost estimates evolve during the planning for such projects.
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.
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.
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 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.

17.3 Selecting a Project Delivery Model

Report Chapters 4, 5, 6, and 10

The success of any complex infrastructure project depends in part on the project delivery model used. These recommendations provide guidance on how public entities should evaluate all options to ensure the delivery model most suitable to any given project is selected.

13. 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:

    a. The model's comparative value from the perspective of quality, cost, and schedule as compared with other approaches;

    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;

    c. The incentives and tools that each model offers to enforce contractual obligations;

    d. The measures each model has in place to ensure public transparency, accountability, and oversight of major infrastructure projects;

    e. The degree of control the government authority should retain, given the project's circumstances and the public authority's experience;

    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

    g. The manner and extent to which each model prioritizes the public interest.

14. The public entity should ensure that the evaluation criteria used accurately reflect all the priorities set for the project.

15. The public entity should ensure that the potential benefits and drawbacks associated with each delivery model are identified and considered.

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 can demand as a condition to their consent.

17.4
Risk Reduction during Procurement

Report Chapters 6, 8, and 9

Complex infrastructure projects are inherently risky. Care must be taken to avoid introducing unnecessary additional risks to these endeavours. These recommendations focus on avoiding or minimizing project risks during the procurement process.

Proven Project Elements Should Be Preferred

17. 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.

Review of Canadian Content Requirements

18. 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 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.

Providing Time to Incorporate New Elements during In-Market Period

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 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.

17.5
Creating an Effective Contract Scheme

Report Chapters 6, 7, 8, 9, 10, 11, 12, 13, and 14

Project agreements are the backbone of project delivery – they define relationships, responsibilities, deliverables, and timelines, and they govern the conduct of the parties involved in the planning, design, construction, maintenance, and operation of the infrastructure. On the OLRT1 project, some of the terms and gaps within the Project Agreement created problems later on. These recommendations provide guidance on how to approach the contract for complex infrastructure projects.

Contract Review

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.

Public Communications about the Project

22. The project agreement should address responsibility for public communications to ensure timely and accurate information is provided during the life of the project.
23. The project agreement should provide for meaningful involvement from the public-sector and private-sector parties in all public communications about the project.
24. The project agreement should require that communications to the public be accurate and well founded. Uncertainty should be acknowledged.
25. The project agreement should require that communications to the public be focused at all times on furthering the public interest.

Dispute Resolution

26. Within a given model, the early resolution of disputes should be incentivized in the project agreement, particularly where those disputes will 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.

27. 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.

Independent Oversight

28. 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.

Project Changes

29. Where amendments to contracts are being considered, relevant and affected parties should be involved in those discussions, including relevant subcontractors.

30. Construction contracts should include mechanisms for calculating extensions of time and adjusting schedules if obstacles arise and delays are encountered.

Testing and Commissioning

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.

32. 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.

Trial Running

33. 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.

34. 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 *consistently* demonstrate that it can achieve those 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.

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.

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.

Bedding-In Periods

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 experience of the system before the public is asked to rely on it. The length of the bedding-in period should:

    a. Be appropriate to the project (including its technical complexity and inherent risk profile);

    b. Account for any aspects of the project that increase the risk of hidden issues arising; and

    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.

39. 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.

40. 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.

Handover

41. 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.

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.

Operations

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.

Project Additions or Expansions

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.

17.6 Fostering Successful Working Relationships

Report Chapters 4, 9, 10, 12, 13, 14, and 15

Collaborative relationships focused on serving the public interest in quality infrastructure are essential to the successful delivery of projects like the OLRT1. These recommendations address the relationship dynamics required to successfully deliver complex infrastructure projects.

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).

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.

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.

17.7 Transparency and Effective Planning and Oversight during Construction

Report Chapters 8, 9, 10, and 12

The OLRT1 project suffered from failures in planning, oversight, and communication, both between RTG and some of its subcontractors, and between RTG and the City. These recommendations provide guidance on how to avoid these kinds of failures on future projects like the OLRT1.

Subcontract Consistency and Completeness

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.

49. The contractor should involve or consult with the necessary experts to ensure that the plans, including timelines and scope of responsibilities for the subcontracted work, are logical and realistic.

Systems Integration

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.

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.

Validation Testing

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.

Maintaining a Current Consolidated Project Schedule

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.

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.

Communications regarding the Project Schedule

55. Material changes in the construction or manufacturing plans should be communicated to those stakeholders who may be impacted by the change. Ideally, these partners will be consulted in advance of a material change being made to the project.

56. The contractor must keep its public-sector client apprised of realistic timelines for the completion of the project.

Changes to the Project Schedule

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.

Fostering Timely, Candid Communications about Project Issues

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.

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.

17.8 Accuracy, Transparency, and Public Entity Decision-Making

Report Chapter 12

The public must be able to trust that the government is making decisions based on complete, accurate, and timely information. Anything less risks undermining public trust. These recommendations seek to ensure that government decision makers have the information they require to oversee the delivery of complex infrastructure projects.

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.

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.

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 on the public interest, council must be kept fully informed so that it has the opportunity to act.

63. 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.

17.9 Safety Requirements

Report Chapter 11

Safety must be a central focus during the planning, construction, operation, and maintenance of complex infrastructure projects like the OLRT1. These recommendations focus on ensuring that safety is appropriately considered throughout the life of a project.

64. The system's safety requirements should be identified and detailed during the design phase of the project and 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.
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.
66. An independent safety auditor should be engaged early on in the construction of complex infrastructure projects.

17.10 Preparing for and Achieving a Successful Handover and Start to Public Service

Report Chapters 12, 13, 14, and 15

The start of public service is a critical time for a new system. The system's performance will help determine the public's confidence in the system going forward. It is important that the entire system, including operations and maintenance, be ready and properly prepared for the beginning of operations. These recommendations set out what can be done to ensure that the start of public service goes smoothly.

Ensuring a Skilled Workforce

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.

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 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.

Providing Adequate Operations and Maintenance Resources

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.

Supporting Success in Early Public Service

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 pressure on the maintainers by, for example, generating unnecessary or overly voluminous work orders for the purpose of "testing" the system.

Clearly Defined Operations and Maintenance Responsibilities

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.

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 operators and the maintainers of the system.

Transparency between Operations and Maintenance

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.

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.

17.11 Public Service

Report Chapters 13, 14, and 15

The approach taken to operations and maintenance has implications for the proper running of a transit system or any infrastructure. These recommendations are aimed at creating an environment where the system performs well and avoids unnecessary breakdowns.

Oversight during Public Service

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.

Adopting a Partnership Approach between Owner, Operator, and Maintainer

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.

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.

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.

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.

Efficient and Effective Warranty Service

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.

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.

Maintenance during Public Service

83. It is critical that the timely and proper completion of maintenance activities be prioritized, including proactive and preventive maintenance.

84. The party or parties involved in providing maintenance must have effective and robust quality control 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.

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.

86. There should be a process that enables individual maintainers and operators to raise issues they observe 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.

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.

17.12 Recommendations for the OLRT1

Report Chapters 13, 14, and 15

While there have been many improvements made to the OLRT1 and measures have been taken to address various breakdowns and the derailments, additional steps could be taken. These recommendations provide guidance to the parties on what more can be done, and on how they can now run the OLRT1 in a manner that aligns with the best interest of transit users and the people of Ottawa.

88. Work undertaken to strengthen the City's oversight framework should continue, including assessing OC Transpo's oversight and monitoring programs and making any improvements identified to ensure safety and reliability of the system.

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.

90. A partnership approach should be adopted during the operations and maintenance phase and to address issues that arise on the system.

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).

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.

Future Assessments and Preventive Maintenance

93. If not yet complete, an engineering assessment of the appropriate rail neutral temperature for the OLRT1 should be completed, and the rail neutral temperature adjusted accordingly, so that the track buckling issues can be mitigated for the long term.

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.

95. Alstom should continue its regular inspections of the overhead catenary system to clean the parafils as required, or repair/replace them as necessary.

96. 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.

97. 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).

98. 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.

99. 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:

    a. Reducing rail corrugation through maintenance;

    b. Increasing track lubrication (greasing);

    c. Adjusting the speed profile (to lower the speed in some places, particularly along curves); and

    d. Modifying the wheel profile to better sustain the transversal forces coming from the track.

100. 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:

    a. Monitoring the rate of wear on the wheels through increased visual inspection or non-destructive testing;

    b. Increasing visual inspections of wear on the rail at all sharp curves to measure side wear rates;

    c. Using ultrasonic testing as well as visual inspections, and collecting related data;

    d. Monitoring the effectiveness of LRV-mounted lubricators to address locations with rail wear, and evaluating the possibility of installing rail-mounted or trackside lubricators and friction modifiers;

    e. Increasing the frequency of preventive rail grinding across the whole system to reduce the risk and growth of “rolling contact fatigue”;

    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;

    g. Reviewing the profile of the switch blade to reduce the rate of wear; and

    h. Identifying remedial actions that can be taken to prevent the deterioration of the rail and wheel components.

101. 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.

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.

103. The parties should consider the use of a detection system as a potential remedial option for overheated roller bearings.

Chapter 18
Inquiry Process

Chapter Contents

18.0 Introduction

A commission of public inquiry is unique in two senses. First, a commission of public inquiry is unique in the sense that *every* commission is a brand-new body, established solely for the purpose of its own mandate. Every commission of public inquiry must therefore "reinvent the wheel." Everything about the commission's work and process must be set up for the purpose of the inquiry, and then dismantled when the inquiry is complete. There is very little guidance on how to do this. As a result, past commissioners have included "process" chapters in their final reports, so that accumulated procedural wisdom can be shared. I am writing this chapter for that purpose.

Second, a commission of public inquiry is also a unique legal process – as I explain further below, an inquiry is not a trial to determine legal liability. Rather, its purpose is to get to the bottom of difficult and complex events with significant public import. Indeed, the Honourable Justice John H. Gomery has remarked that it is "extraordinary" that governments appoint commissions to investigate government conduct, and that very few nations subject their governments to such scrutiny. A commission of inquiry serves the public interest. It is therefore important that the public understand the choices made and the procedural processes followed by this Commission in fulfilling its mandate.

18.1 What Is a Commission of Public Inquiry?

Under the *Public Inquiries Act, 2009*, the executive arm of the Ontario government has the power to establish a commission to conduct a public inquiry into matters that are in the public interest.

The word "inquiry" comes from the word "inquire" – to seek information about something. The word "public" indicates that a public inquiry is public in the sense that it occurs by order of the government.

More significantly, however, the word "public" confirms that a public inquiry is directed at matters of public interest. As a result, public inquiries often respond to events giving rise to public skepticism or disillusionment and are established at, as the Westray Mine Commission put it, times of "public questioning."

A commission will often have both an investigative part – uncovering the truth about what happened – and a policy part, which it fulfills by developing recommendations for governments on how to prevent certain issues from happening again. In so doing, the commission hears from, and in turn informs and educates, the public. In this way, a public inquiry works to restore public confidence in government and institutions.

Key to effectively investigating government conduct and restoring public confidence in public institutions is the fact that although a commission of public inquiry is created by government, it is nonetheless non-partisan and independent – like the judiciary. But despite this similarity, a public inquiry is very different from a trial in court, even though the commissioner is often a judge, and the inquiry may involve calling witnesses to testify.

Unlike a public inquiry, a criminal or civil trial is an "adversarial" process where the plaintiff must establish their case and the Crown must establish criminal liability. By contrast, a public inquiry is "inquisitorial," which means that the primary purpose is for the commissioner to get at the truth, rather than establish fault.

In fact, under the *Public Inquiries Act, 2009*, people who give evidence to a commissioner are deemed to have objected to questions that might give rise to civil or criminal liability. Similar to other commissions, the terms of reference for this Commission specifically

preclude the Commission from making any conclusion or recommendation regarding potential civil or criminal liability. The Supreme Court of Canada has also confirmed that findings of fact made by a commissioner have “no legal consequences.”

In summary, a commission of public inquiry is an independent, non-partisan entity empowered by the government to investigate events of public importance. Although the head of the commission – the commissioner – may arrive at factual conclusions or make policy recommendations, a public inquiry is not a trial and does not result in civil or criminal liability.

18.2 What Was the Commission's Mandate?

As set out above, a commission of public inquiry is created to serve a specific purpose. That purpose is known as the commission's "mandate," and it is set out in the documents that establish the commission. The commission's work is always carried out with reference to the commission's mandate.

On December 16, 2021, the Lieutenant Governor of Ontario issued an Order in Council establishing this Commission and appointing the Commissioner (see Appendix A).

The preamble to the Order in Council identifies that Stage 1 of the OLRT project had experienced several issues that had had "a negative impact on the people of Ottawa," including "breakdowns and derailments," leading to a "system wide temporary shutdown." The Order in Council sets out the following mandate for the Commission with respect to these issues: to "inquire into the commercial and technical circumstances that led to the OLRT1 breakdowns and derailments."

In particular, the Commission's mandate required it to inquire into:

- The decisions and actions that were taken in determining the procurement approach that the City selected for the OLRT1 project, the selection of RTG, and the award of the alternative financing and procurement (AFP) contract for the OLRT1 project to RTG;
- Whether the City-led procurement process had an impact on the technical standards applied for the OLRT1 project and the design, building, operation, maintenance, repair, and rehabilitation of that project;
- Whether the AFP contract between the City and RTG was adequate to ensure that the design, building, operation, maintenance, repair, and rehabilitation of the OLRT1 project was carried out in accordance with all applicable laws and industry standards, including performance and safety;
- Whether RTG and its subcontractors carried out the design, building, operation, maintenance, repair, and rehabilitation of the OLRT1 project in accordance with applicable laws and industry standards; and
- Whether the City's oversight of the AFP contract and the OLRT1 project, including its audit, evaluation, inspection, and monitoring of the ORLT1 project, was adequate to

ensure compliance with the contract and any applicable laws and industry standards, including by inquiring into the decisions that led to the declaration that the OLRT1 project had reached Substantial Completion and any associated testing carried out in support of such declaration.

The Commission, therefore, had a fact-finding mandate – I was required to investigate the factual circumstances surrounding certain issues with the OLRT1 project. However, like most commissions, I also had overarching policy obligations flowing from the Order in Council. The preamble to the Order in Council indicated that the Commission was being appointed to "make recommendations to assist in preventing" the OLRT1 project issues from happening again, whether in respect of the OLRT1 project itself, any subsequent phases of that project, or any other municipal or provincial LRT projects. The Order in Council also required me to deliver a final report "including any recommendations."

In her report following the Public Inquiry into the Safety and Security of Residents in the Long-Term Care Homes System, the Honourable Justice Eileen Gillese observed that the process of an inquiry must be guided not only by the inquiry's mandate and overarching obligations, but also by the overall purpose of the inquiry. In this case, a broad purpose of the Inquiry was to address public concerns about the safety and reliability of Stage 1 of the OLRT system, as indicated in the preamble to the Order in Council.

The Order in Council specifically prohibited this Commission from interfering in any way with any ongoing investigation or legal proceeding relating to the OLRT project. The events of the OLRT1 project had generated multiple lawsuits and investigations that were ongoing at the time of this Inquiry.

18.3 What Were the Commission's Governing Principles?

Under the *Public Inquiries Act, 2009*, a commission has the power to control its own processes. This means that a public inquiry has no pre-existing established procedure. The commissioner must instead make many independent decisions about how the inquiry will work. Prior to establishing the processes and rules to be followed, I selected the principles that would guide this Inquiry. These would be overarching guiding principles in establishing the Commission's rules and processes. I selected four principles: fairness, proportionality, efficiency, and expeditiousness. As stated by the Honourable Justice G. Normand Glaude, although such principles can technically be considered in isolation, in practice they must be balanced against one another.

18.3.1 Fairness

The principle of fairness is essential to any public inquiry. Indeed, the Commission's power to control its own process is itself subject to legal limitations that ensure that the process is fair. For example, the Commission can only act within the parameters set by the Order in Council and the *Public Inquiries Act, 2009*. The Commission must also follow the common law rules of procedural fairness and constitutional principles more broadly. Finally, the Commission creates its own rules so that participants in the Inquiry know what to expect from the process.

Although an inquiry is not a trial, the Commission was still empowered under the *Public Inquiries Act, 2009* to make findings of "misconduct." However, under the *Act*, the Commission could not make such a finding against a person or organization unless they had been given reasonable notice that such a finding could be made and had a reasonable opportunity to respond, including by calling additional evidence. This is another way that the Inquiry is guided by considerations of fairness.

Finally, the principle of fairness captures the fact that the public inquiry bears on events that had a significant impact on people's lives, particularly those who used the OLRT system. As a result, I was committed to being fair not only to the participants in the Inquiry and those affected by its findings, but also to being transparent with members of the public who had an interest in the Inquiry's outcome.

18.3.2 Proportionality

In ordinary language, the word "proportion" conveys things being in balance. In the context of legal procedure, the principle of "proportionality" has a similar meaning: the Supreme Court of Canada has stated that this principle requires a decision maker to take "account of the appropriateness of the procedure, its cost, and impact on the litigation, as well as its timeliness, given the nature and complexity of the litigation." Any given procedural choice must be in proportion to what it costs – it must add sufficient value to the proceeding to justify the time, money, or other resources it uses. This is especially important in public inquiries, where time and cost are limited.

Here, the principle of proportionality required the Commission to balance the goal of comprehensiveness against the timeliness required to deliver my report.

18.3.3 Efficiency

An efficient process is one that achieves its goals with as little waste or redundancy as possible. Efficiency is critical in public inquiries because such inquiries are publicly funded. It is essential that taxpayers receive maximum value for their dollar.

Many procedural efficiencies were required of the Commission's processes. For example, the *Public Inquiries Act, 2009* requires any commission to refer to and rely on time-saving sources of reliable evidence, such as public transcripts and other records, reports, or background information already in existence. Under the Order in Council, the Commission was required to rely "wherever possible" on "overview reports," and could consider such reports instead of calling witnesses.

Commission Counsel prepared several key overview reports that contained core or background facts. In accordance with the Commission's governing principle of fairness, participants were given the opportunity to comment on the accuracy of the overview reports before they were finalized and could examine witnesses to challenge or supplement the overview reports at the hearings. The overview reports also cited hundreds of key documents, which then became a part of the evidence before the Commission.

18.3.4 Expeditiousness

The *Public Inquiries Act, 2009* also requires that a commission conduct its work "expeditiously." Given the Commission's short time frame, it was particularly important that expeditiousness be a governing procedural principle.

As noted, the Commission was created in response to derailments and breakdowns of the Confederation transit line that affected the residents of Ottawa. They wanted answers regarding what happened. Those questions needed to be answered in a timely manner.

18.4 How Did the Commission Meet Its Deadline?

The Commission was to complete its work by delivering a final report to the Minister of Transportation by August 31, 2022 – or, if granted an extension, by November 30, 2022. This means that the Commission had less than a single year to fulfill its mandate.

Because of this very tight timeline, the Commission could not approach its work in distinct, sequential phases. Rather, consistent with the guiding principle of efficiency, the Commission adopted a "blended" approach to the Inquiry to maximize the usefulness of every step of the process. This meant thinking about how the different parts of the process could work together cohesively.

For example, rather than first gathering, reviewing, processing, and summarizing all potentially relevant documents – which numbered over a million and a half – Commission Counsel undertook document review while simultaneously conducting witness interviews, generally under oath or solemn affirmation. These interviews were transcribed and were entered into evidence at the Commission's public hearings, which meant that affidavits would not be required for those witnesses, cutting down on preparation time for the hearings and providing the participants with detailed information about the witnesses' evidence. Document review helped to structure the witness interviews, and, at the same time, Commission Counsel analyzed witnesses' evidence on an ongoing basis to shape their understanding of the key factual issues. This allowed Commission Counsel to refine their document review strategies, which in turn further informed their understanding of the evidence. Gaps in witnesses' oral evidence could be addressed at the hearings.

As a further example, the Commission made full use of its broad production powers under the Order in Council and *Public Inquiries Act, 2009*. Producing parties were asked to identify key documents and to create a list of issues that were responsive to the Commission's mandate. In this way, Commission Counsel used the document production phase to streamline their preparation for witness interviews and document review. Calling on producing parties to contribute to the Commission's work in this way also reinforced the collaborative, truth-seeking function of the Inquiry.

Work on the policy dimension of the Commission's mandate also started early. Commission Counsel interviewed many individuals who had significant expertise in their fields of work.

These people were asked to provide their own recommendations in connection with the Commission's mandate. The answers provided informed my policy work.

The blended, iterative, and evolving nature of the Inquiry process made the work of Commission Counsel and staff much more complicated. It required exceptional teamwork as well as an agile approach. While challenging, this approach allowed the Commission to gather, interpret, and present a comprehensive evidentiary picture of the OLRT1 project issues in a matter of months.

18.5 What Rules Governed the Inquiry?

Under the *Public Inquiries Act, 2009*, a commission has the power to make rules governing its practice and procedure. These are the "ground rules" or "rules of the game." At an early point in the Commission's process, Commission Counsel drafted such rules for the Commissioner's consideration. Counsel also had the benefit of reviewing the rules of past commissions. The Commission's Rules of Procedure were issued on January 20, 2022. These rules were guided by the four principles of fairness, proportionality, efficiency, and expeditiousness.

The Honourable Justice Stephen T. Goudge has observed that although procedural rules provide a "road map" for everyone involved in a public inquiry, it can be a challenge to anticipate everything that the rules must cover. As a result, it is important that a commission take a "pragmatic and flexible" approach to its rules. The Commission's Rules of Procedure were revised on February 8, 2022 and March 21, 2022 as the team refined the anticipated procedure of the Inquiry.[1] Participants to the Inquiry were provided the opportunity to give feedback on the draft rules of procedure before they were finalized. (See Appendix C for the March 21, 2022 Rules of Procedure.)

18.6 How Did the Commission Communicate with the Public?

It is very important that a public commission of inquiry have open lines of communication with the affected public. Indeed, the Order in Council giving rise to this Commission expressly referenced public concern over the safety of the OLRT1 project. It was also important for the Inquiry that the public be able to access the Commission's materials and interact with the Commission in both of Canada's official languages.

The communications team promptly established a website for the OLRT Inquiry. The website was available in both English and French. It made clear that anyone could contact the Commission through its email address or by phone. The website provided the public with access to the Order in Council, the Rules of Procedure, decisions, documents, exhibits, and transcripts of the witness interviews, as well as transcripts and recordings of hearing proceedings. The Commission also created a Twitter account to keep the public informed of its progress.

As part of the Commission's goal of engaging with the public, I decided to hold public meetings before the Commission's public hearings. The purpose of the public meetings was to gather feedback from the community so that I could directly hear the concerns and opinions of those affected by the OLRT project issues. It is often local residents who are most directly affected, so their views provided valuable evidence to the Inquiry. The public meetings were held in Ottawa on May 25 and May 26, 2022. The meetings were also livestreamed on the Commission's website. Members of the public were invited to share information about the OLRT issues during the Commission's public meetings, either in person or by prerecorded video statement. These meetings proved to be invaluable to the Commission in understanding the impact of the breakdowns and derailments on the OLRT1 project on members of the public.

18.7 Who Participated in the Inquiry?

18.7.1 Commission Counsel

A commission of public inquiry typically retains lawyers to act as "commission counsel."

This Commission had three Lead Counsel: John Adair, Christine Mainville, and Kate McGrann. Commission Counsel built a counsel team that ultimately consisted of 10 lawyers.

18.7.2 Third-Party Participants

In the traditional legal context, the term "standing" refers to the right of a person to "stand before" the court. In this Inquiry, the Commission was empowered under the *Public Inquiries Act, 2009* to decide who had standing to participate in the Inquiry process, including the hearings. People who are granted standing by a commission to participate in the public inquiry are called "participants." Additionally, the Commission was empowered to make recommendations to the Minister of Transportation about whether the government should provide funding to people who would not otherwise be able to participate in the Inquiry.

The *Public Inquiries Act, 2009* required that the Commissioner consider (1) whether the person had a substantial and direct interest in the subject matter of the Inquiry, (2) whether the person was likely to be notified of a possible finding of misconduct, (3) whether the person's participation would further the conduct of the Inquiry, and (4) whether the person's participation would contribute to the openness and fairness of the Inquiry. I also took into account the guiding principle of expeditiousness – in other words, it was important to me that people's participation rights be balanced against the need for the Inquiry to complete its work expeditiously.

On January 20, 2022, I issued Rules of Standing and Funding that would govern people's ability to participate in the Inquiry and request funding (see Appendix D).

First, these rules confirmed my decision that Commission Counsel would have standing throughout the Inquiry and had the primary responsibility of representing the public interest. Second, the rules provided that any other person could apply for participant

status by identifying the nature of their interest in the Inquiry, why they wanted to participate, and how they proposed to contribute to the Inquiry. The application form for participant status also allowed applicants to set out how they wanted to participate in the Inquiry. Applicants were asked to submit their applications by February 28, 2022.

The Commission received 24 applications for standing. I delivered my decision on standing on March 3, 2022 (see Appendix E). I granted 10 applicants full status as participants in the Inquiry: (1) the City of Ottawa, (2) Amalgamated Transit Union 279, (3) Alstom Transport Canada Inc., (4) Ontario Infrastructure and Lands Corporation, (5) Morrison Hershfield, (6) the Province of Ontario, (7) Rideau Transit Group Engineering Joint Venture, (8) Thales Canada Inc., (9) Transport Action Canada, and (10) Ottawa Light Rail Transit Constructors, Rideau Transit Group General Partnership, and Rideau Transit Maintenance General Partnership.[2] I made this decision because each of these applicants was a significant player or had a significant interest in the events at issue. I was therefore satisfied that the considerations under the *Public Inquiries Act, 2009* were met. None of these applicants made a request for funding.

I decided that each of these 10 applicants would have full rights of participation, meaning that they would have (1) access to documents collected by the Commission, subject to the Commission's Rules of Procedure; (2) advance notice of documents proposed to be introduced as evidence during the hearings; (3) advance provision of witness statements; (4) a seat at counsel table; (5) the ability to request witnesses to be called by Commission Counsel, or to apply to lead the evidence of a particular witness; (6) cross-examination rights; and (7) the right to make closing submissions. However, I was concerned at the time that these parties had not made sufficient progress in their obligations to produce documents to the Commission. As I wrote in my decision, "The message that participants send when they do not produce documents in a timely manner is that they have no interest in expeditiously getting to the truth of the matters under investigation." As a result, I warned the participants that if they did not comply with their production obligations, or otherwise breached the Commission's Rules of Procedure, their participation rights could be revoked.

I also granted partial standing to four applicants: (1) STV Incorporated, (2) David Knockaert, (3) Justin Kelly, and (4) Ken Rubin. STV's participation rights were limited to having access to the Commission's background documents and the right to comment on background material or evidence prepared by Commission Counsel. Mr. Knockaert, Mr. Kelly, and Mr. Rubin were granted the ability to make limited written submissions.[3] STV later applied for full standing, which I granted.

Finally, I denied standing to a number of applicants on the basis that they either did not have a substantial and direct interest in the Inquiry, or on the basis that their participation

would not further the conduct of the Inquiry or materially contribute to the openness and fairness of the Inquiry.[4] However, I made clear that these applicants were invited to participate in the Commission's public meetings, so that their views and information could be placed on the public record and considered in the Inquiry process.

18.8 How Did the Commission Prepare for the Hearings?

As set out in the Commission's Rules of Procedure, the Inquiry began with an investigation phase conducted by Commission Counsel.

The purpose of the investigation phase was to identify core and background facts, gather documents, identify witnesses, and obtain witness statements and evidence. In practical terms, the investigation phase began shortly after the Order in Council was made and ran for approximately five months. It focused on document review and witness interviews.

As discussed more below, document production was entirely electronic. In addition, witness interviews were conducted remotely, cutting down on costs for all involved and allowing over 90 examinations to be conducted over a few short months.

Document production and review in this Inquiry was a tremendous undertaking. Commission Counsel began by identifying people or organizations with relevant documents. These document custodians were served with summonses that I issued, which required the production of relevant documents to the Commission. In keeping with the Commission's guiding principles of expeditiousness and efficiency, documents were produced to the Commission in electronic form and on a rolling basis. Those subject to a summons for the production of documents were also asked to provide the Commission with a "production plan," setting out anticipated production timelines, overviews of the categories of documents to be produced, and lists of key documents that were identified as responsive to the Commission's mandate.

It was critical to the Commission's ability to meet its timelines that it have timely access to relevant records. As a result, I issued two Procedural Orders in respect of the disclosure obligations of all recipients of a summons. The first order set timelines for the production of documents (see Appendix F). I required substantial production by February 28, 2022, with final production by April 29, 2022. It was reiterated that any failure to comply with production obligations would carry consequences – including the refusal or revocation of standing or the imposition of restrictions on standing.

Timely and complete production of documents was also necessary to give effect to the principle that a public inquiry is not adversarial in nature. As Justice Gillese has written,

those who participate in a public inquiry "have a shared commitment" to its goals and are "working together" to meet them.

My second Procedural Order set out a process for dealing with claims of confidentiality and privilege over productions (see Appendix G). I established a procedure for dealing with claims of confidentiality and privilege that would be minimally disruptive of the Commission's investigative work. Producing parties were asked to produce records to the Commission prior to reviewing the records for privilege or confidentiality claims. This was to allow Commission Counsel to begin their review of documents and advance the investigation as quickly as possible. The Commission's Rules of Procedure made clear that production of records to the Commission would not constitute a waiver of any subsequent privilege or confidentiality claim.

Document review was conducted on an ongoing basis. Following the April 29, 2022 production deadline, the Commission sent each producing party a weekly report identifying the documents that had been identified as relevant by the Commission. Parties then had time to identify which of those documents would be the subject of a privilege or confidentiality claim. Privilege and confidentiality applications were then due by April 8, 2022, for documents produced up to that date, and by May 2, 2022, for documents produced between April 8 and April 29, 2022, and on a rolling basis thereafter. This enabled producing parties to review only documents considered to be relevant by the Commission for privilege or confidentiality rather than all records. In addition, it allowed for efficiency in the process, as it also limited the number of claims to be adjudicated.

In the end, the Commission issued over 100 summonses and received over 1.5 million documents in response. The Commission engaged a document management firm. Documents were hosted, organized, and reviewed using cloud-based software called Relativity. Commission Counsel made requests for specified key documents to be identified by witnesses and participants. Commission Counsel also worked with external advisors to the Commission to identify key records and review technical records of relevance to the Commission's mandate.

Ultimately, Commission Counsel identified a subset of over 30,000 relevant documents. Several applications for confidentiality and privilege were made by producing parties. External counsel retained by the Commission worked to narrow the number of contentious claims, with a view to ensuring proportionality and efficiency. By then, Commission Counsel were quite advanced in their investigation and were able to readily identify categories of records deemed to be of central relevance to the Inquiry, and balanced this consideration against the claims made. This informed which claims would be challenged by external counsel retained by the Commission.

The Commission retained a separate adjudicator for the claims of privilege so that I would not become privy to privileged material (see Appendix H). Relevant documents that were not privileged, and with redactions as required to protect confidentiality, were shared with all participants.

Commission Counsel conducted over 90 formal witness interviews. These interviews were conducted under oath and transcribed, and the Commission's rules provided that the transcripts may be entered into evidence at the Commission's public hearings. In line with the Commission's commitment to an efficient and expeditious process, these transcripts were submitted into evidence. Witnesses' counsel were given the opportunity to question their own witness at the end of each interview. Witnesses who were formally interviewed were given the opportunity to correct or supplement their transcript evidence, and participants could request that a witness be called at the hearings for the purpose of cross-examination.

The Order in Council directed the Commission to "review and consider any existing records or reports relevant to its mandate" and enabled the Commission to consider these in lieu of calling witnesses. The Commission asked participants to identify and produce such records. This served to streamline the evidentiary process in two ways. First, the Commission relied on numerous reports that had already been prepared in response to various issues encountered on the OLRT1 project. It was important to consider that some of these reports were prepared in the context of litigation, but they nevertheless provided the Commission with a significant amount of information about issues of relevance to its mandate.

Second, Commission Counsel prepared a Court Book of evidence, which included all records identified as relevant through the investigative phase. The participants were granted access to these records via a participant database, which was made available in advance of the hearings and was updated on an ongoing basis as the Commission identified further relevant records. I issued a Procedural Order directing that all these records were in evidence before the Commission (see Appendix I). Participants were notified that any of these approximately 16,500 records could substantiate my findings and be relied on in my report. The relevant documentary evidence in this case was too voluminous to allow for each document to be put to one or several witnesses for comment, as would generally be done in a trial.

The process of issuing notices of alleged misconduct allowed the Commission to address fairness considerations that may arise from this approach. The *Public Inquiries Act, 2009* requires the Commission to issue notices to affected individuals or organizations prior to making a finding of misconduct. As such, any person or entity who may be the subject of a finding of misconduct in the final report first received confidential

notice of the alleged misconduct and the basis on which such a finding would be made, and was provided with the opportunity to respond.

Moreover, participants could submit affidavit evidence, propose additional witnesses to be called, and produce additional documentation for the Commission's consideration throughout the Inquiry process.

18.9 How Were the Public Hearings Conducted?

18.9.1 Room and Recording Logistics

The hearings were held in June and July 2022, at a time when the global COVID-19 pandemic was still a factor. In particular, it was difficult to know while planning what public health measures would still be in place at the time of the hearings. As a result, many traditional hearing processes were not available to the Commission. It was necessary to get creative. It was important to me to have a presence in Ottawa, and to allow for witnesses to attend in person. The Ian G. Scott Courtroom at the University of Ottawa was selected. This courtroom was set up to support "hybrid" hearings, with witnesses attending either in person or remotely via live videoconference. I was physically present in the courtroom, together with some of the Commission Counsel. For the most part, witnesses and their counsel appeared remotely. Witnesses were permitted to appear in person or remotely, unless they were part of a panel of witnesses. Panels of witnesses appeared remotely due to the need for physical distancing. (See Appendix N for the hearings schedule.)

Although the hearings were livestreamed on the Commission's website, members of the public could attend in person and observe a live feed of the proceedings in French, English, or both at the university. Since witnesses were encouraged to give evidence in either official language, the hearings were interpreted in real time into French or English. Captioning was also provided. The hearings were also recorded and transcribed. The transcription of each day of the hearings was made available on the Commission's website on the following day.

18.9.2 Evidence

Over 40 witnesses, located on several different continents, testified during 17 days of public hearings. Commission Counsel questioned the witnesses first. To aid the Commission in fulfilling its mandate of getting at the truth, Commission Counsel had procedural flexibility in their ability to ask questions – they were entitled to ask both leading and non-leading questions and to challenge any witness's evidence as appropriate.

Participants then had the opportunity to cross-examine witnesses. Commission Counsel and participants' counsel were required to provide advance notice of any documents they intended to put to a witness. Time limits were also set on cross-examinations, and these limits were dependent on the extent of any given participant's interest in the evidence of the particular witness or panel of witnesses. In practice, participants' counsel at times requested additional time for their cross-examinations, and these requests were always granted. Finally, counsel for the witness or organization had the opportunity to examine the witness. Because Commission Counsel represented the public interest during the hearings, they always had the opportunity to re-examine any witness.

To improve the efficiency of the hearings, several witnesses gave evidence in "panels" – this means that multiple witnesses were questioned at the same time and had the ability to respond to each other's evidence. This also enabled Commission Counsel and participant counsel to direct questions to a specific witness on the panel, or to any witness on the panel deemed best placed to answer the question. As Justice Goudge has observed, panel evidence can make "good sense." It avoids the duplication of evidence, allows for the quick identification of consensus, and can generate debate that is useful for the formulation of policy recommendations.

Finally, as provided for by the Order in Council, witnesses also acted as "institutional witnesses," and accordingly could provide evidence on behalf of the entity or organization they were employed by or represented, even if the evidence they were being asked to provide was outside of their direct knowledge.

At the end of the hearings, participants made closing submissions in writing, again in the interest of efficiency and proportionality. These closing submissions were posted to the Commission's website.

18.9.3 Expert Panel on Major Projects and Public-Private Partnerships

In addition to witnesses who had direct involvement in the events at issue, the Commission convened a panel of experts on major project delivery and public-private partnerships (P3s). The purpose of the panel discussion was to assist me in deliberating on recommendations. The experts did not make any comments or draw any conclusion on the OLRT1 project. Rather, they brought their expertise, based on decades of study of dozens of major projects, to discuss such issues as cognitive biases, including optimism and strategic misrepresentation biases, that affect planning and decision-making on large projects; the history of P3s in Canada and elsewhere; the benefits of and concerns regarding such partnerships; and the impact of such

partnerships on public accountability. The transcript for this panel discussion was provided to participants and posted on the Commission's website. Participants were permitted to submit questions in writing for the panel and to make arguments regarding the discussion in their final written submissions.

18.10 How Did the Commission Form Its Recommendations?

As set out above, part of my role was to make recommendations in the final report aimed at preventing the OLRT1 project issues from happening again. In large part, the recommendations flowed directly from the fact-finding role of the Commission. In other words, I was asked to determine the circumstances and contributing factors that led to the OLRT1 project issues. Many of my recommendations were directed at reducing the risk of those circumstances or conditions in future projects.

I also looked to witnesses and community members for their views on policy recommendations. Several witnesses were asked, during the formal interview, what recommendations they had for my consideration. Some of these witnesses gave thoughtful responses that helped shape my recommendations.

18.11 What Considerations Guided This Report?

A commission of inquiry's work culminates in a final, written report. The report is the "principal visible product" of the commission's efforts.

The report of this Commission presented several challenges. The events at issue spanned a lengthy time frame, dealt with complex commercial transactions, and involved many different individuals and organizations with complex structures. Much of the information considered was highly technical in nature, but the Commission was nonetheless mandated with communicating its findings to the affected public and making recommendations that would be relevant not only to the OLRT1 project, but also to other light rail transit projects. It was challenging to manage these competing considerations and prepare a single, cohesive report that addressed them all.

In the end, I decided that the report would have 18 chapters. As is typical with commissions of inquiry, the first chapter following my letter to the Minister is an executive summary that encapsulates my key findings. I then felt it would be most useful to situate readers with a chapter setting out the chronology of the OLRT1 project, so that readers could have a bird's-eye view of the entire picture. This is followed by a chapter setting out the background to the OLRT1 project.

I decided that the next 12 chapters of the report would track the major stages of the OLRT1 project: setting the budget and schedule, the choice of delivery model, procurement, contracting, construction and manufacturing, handover, maintenance, and operation. I made this decision because each phase raised its own factual challenges connected to the Commission's mandate. The final chapters are the conclusion, the recommendations, and this chapter setting out the Commission's process.

Notes

1 As discussed in section 18.7.2, certain third parties were granted status as “participants” in the Inquiry. These participants were also given the opportunity to comment on the Rules of Procedure.

2 These three participants had no diversity of interests and were thus treated as a single entity with a single grant of standing.

3 My grant of partial standing to Mr. Rubin came later, as he adequately explained why he had missed the application deadline.

4 I denied participation standing to (1) the National Capital Heritage Streetcar Committee, (2) Dr. Christopher Kones, (3) Modus Strategic Solutions Canada Inc., (4) IDEG Infrastructure & Energy Inc., (5) Mireille Lavoie, (6) Toussaint Smits, (7) Dominic L’Heureux, (8) Al Speyers, and (9) James O’Shea.

Appendices

Appendices Contents

Appendix A:
Executive Council of Ontario Order in Council 1859/2021 (December 16, 2021)

Ontario

Executive Council of Ontario
Order in Council

On the recommendation of the undersigned, the Lieutenant Governor of Ontario, by and with the advice and concurrence of the Executive Council of Ontario, orders that:

Conseil exécutif de l'Ontario
Décret

Sur la recommandation de la personne soussignée, le lieutenant-gouverneur de l'Ontario, sur l'avis et avec le consentement du Conseil exécutif de l'Ontario, décrète ce qui suit :

WHEREAS under the *Public Inquiries Act, 2009,* the Lieutenant Governor in Council may appoint a commission to inquire into any matter of public interest;

AND WHEREAS the City of Ottawa ("City") Stage 1 Light Rail Transit system ("OLRT1 Project") has experienced several issues that have had a negative impact on the people of Ottawa including, most recently, breakdowns and derailments which led to a system wide temporary shutdown and have raised concerns in the public about the safety of the OLRT1 Project ("OLRT1 Project Issues");

AND WHEREAS, as a major financial contributor to the OLRT1 Project, the Government of Ontario desires to ascertain the circumstances in the procurement, delivery and operations of the system that led to the OLRT1 Project Issues;

AND WHEREAS it is considered in the public interest for the Government of Ontario to appoint a commission to identify the circumstances and contributing factors that led to the OLRT1 Project Issues and make recommendations to assist in preventing such issues from happening again, both in respect of the OLRT1 Project, and any subsequent phases of the City's Light Rail Transit system, and in respect of other municipal or provincial light rail transit projects;

AND WHEREAS it is considered advisable to set out the terms of reference for such an appointment and recommendations.

THEREFORE, pursuant to the *Public Inquiries Act, 2009,* it is ordered as follows:

Commission

1. A commission is established, effective as of the date of this Order in Council (the "Commission").

2. The Honourable C. William Hourigan is appointed as Commissioner under section 3 of the *Public Inquiries Act, 2009.*

O.C. | Décret : 1859/ 2021

Mandate

3. Having regard to section 5 of the *Public Inquiries Act, 2009,* the Commission shall inquire into the commercial and technical circumstances that led to the OLRT1 breakdowns and derailments, including:

   (a) The decisions and actions that were taken in determining:

      (i) the procurement approach the City selected for the OLRT1 Project;

      (ii) the selection of the Rideau Transit Group ("Concessionaire"); and

      (iii) the award of the alternative financing and procurement ("AFP") contract for the OLRT1 Project to the Concessionaire;

   (b) Whether the City-led procurement process had an impact on the technical standards applied for the OLRT1 Project and the design, building, operation, maintenance, repair and rehabilitation of the OLRT1 Project;

   (c) Whether the AFP contract between the City and the Concessionaire ("Concession Agreement") was adequate to ensure that the design, building, operation, maintenance, repair and rehabilitation of the OLRT1 Project was carried out in accordance with all applicable laws and industry standards, including performance and safety;

   (d) Whether the Concessionaire and its subcontractors did carry out the design, building, operation, maintenance, repair and rehabilitation of the OLRT1 Project in accordance with applicable laws and industry standards; and

   (e) Whether the City's oversight of the Concession Agreement and the OLRT1 Project, including its audit, evaluation, inspection and monitoring of the OLRT1 Project, was adequate to ensure compliance with the Concession Agreement and any applicable laws and industry standards. The above includes an inquiry into the decisions that led to the declaration that the OLRT1 Project had reached substantial completion and any associated testing carried out to support such declaration.

4. The Commission shall perform its duties without expressing any conclusion or recommendations regarding the potential civil or criminal liability of any person or organization. The Commission shall further ensure that the conduct of the inquiry does not in any way interfere or conflict with any ongoing investigation or legal proceeding related to these matters.

5. Where the Commission considers it essential and at its discretion, the Commission may engage in any activity appropriate to fulfilling its duties, including:

   (a) Conducting research and collecting information, including conducting interviews and undertaking surveys;

   (b) Conducting inter-jurisdictional research to identify practices in other jurisdictions that are relevant to this inquiry;

   (c) Consulting with, or seeking submissions from, key stakeholders and sector experts;

(d) Consulting with the general public, including consulting prior to making its rules or determining who may participate in the public inquiry; and

(e) Receiving oral and written submissions.

6 The Commission shall, as much as practicable and appropriate, refer to and rely on the matters set out in section 9 of the *Public Inquiries Act, 2009.* In particular, the Commission shall review and consider any existing records or reports relevant to its mandate. Further, the Commission shall rely wherever possible on overview reports submitted to or created or written by the inquiry. The Commission may consider such reports and records in lieu of calling witnesses.

7. Pursuant to section 14 of the *Public Inquiries Act, 2009,* the Commission shall hold public hearings.

8. The Commission may exercise the powers provided in section 13 of the *Public Inquiries Act, 2009.*

9. The Commission shall, wherever practicable, rely on representative witnesses on behalf of institutions and may convene or consult, or both, with panels of representative witnesses to fulfill its mandate in a timely manner.

10. In accordance with the *Public Inquiries Act, 2009,* the Commission shall obtain all records necessary to perform its duties and, for that purpose, may require the provision or production of information that is confidential or inadmissible under any Act or regulation, other than confidential information which is described in sections 19 and 27.1 of the *Auditor General Act.* Where the Commission considers it necessary, it may impose conditions on the disclosure of information to protect the confidentiality of that information.

11. The Commission shall follow Management Board of Cabinet directives and guidelines and other applicable government policies unless, in the Commission's view and having regard to its mandate, it is not possible to follow them.

12. The Commission shall promote accessibility and transparency to the public through the use of technology, including establishing and maintaining a website and holding virtual hearings where the Commissioner deems it appropriate.

Designated Minister

13. The Minister of Transportation is designated as the minister responsible for the Commission under clause 3(3)(f) of the *Public Inquiries Act, 2009.*

Funding

14. The Commission may make recommendations to the Minister of Transportation regarding funding to participants in the inquiry to the extent of that participant's interest where, in the Commissioner's view, the participants would not otherwise be able to participate in the inquiry without such funding. Such funding shall be in accordance with Management Board of Cabinet directives and guidelines.

Final Report

15. The Commission shall conclude its mandate and deliver a final report to the Minister of Transportation containing its findings and conclusions and including any recommendations on or before August 31, 2022 or, if the Minister of Transportation agrees in writing, no later than November 30, 2022.

16. In delivering its final report to the Minister of Transportation, the Commission shall ensure that:

    (a) in so far as practicable, the final report is in a form appropriate for public release, and consistent with the requirements of the *Freedom of Information and Protection of Privacy* Act and other applicable legislation; and

    (b) any electronic version of the report is in at least one accessible format, satisfactory to the Minister of Transportation.

17. The Commission shall be responsible for translation and printing and shall ensure that its final report is delivered in English and French, at the same time, in electronic and, upon written request of the Minister of Transportation, printed versions.

18. The Minister of Transportation shall make the Commission's final report available to the public as soon as practicable after receiving it.

Financial and Administrative Matters

19. The financial and administrative support necessary to enable the Commission to fulfill its mandate shall be provided in accordance with sections 25, 26 and 27 of the *Public Inquiries Act, 2009.*

20. All ministries and all boards, agencies and commissions of the Government of Ontario shall, subject to any privilege or other legal restrictions, assist the Commission to the fullest extent possible, including producing documents in a timely manner, so that the Commission may carry out its duties.

- - - - - - -

ATTENDU QU'en vertu de la *Loi de 2009 sur les enquêtes publiques,* le lieutenant-gouverneur en conseil peut constituer une commission pour effectuer une enquête sur toute question d'intérêt public;

ATTENDU QUE l'Étape 1 de l'aménagement du réseau de transport léger sur rail (le « Projet TLRO1 ») de la Ville d'Ottawa (la « Ville ») a connu divers problèmes qui ont eu des répercussions négatives sur la population d'Ottawa, notamment - plus récemment - en raison de pannes et de déraillements qui ont mené à une fermeture temporaire de l'ensemble du réseau, et qui ont soulevé des préoccupations dans la population quant à la sécurité du Projet TLRO1 (les « problèmes liés au Projet TLRO1 »);

ATTENDU QUE le gouvernement de l'Ontario, en tant qu'important contributeur financier du Projet TLRO1, souhaite déterminer les circonstances de l'acquisition, de la livraison et de la mise en exploitation du réseau qui ont conduit aux problèmes liés au Projet TLRO1;

ATTENDU QU'il est jugé dans l'intérêt public que le gouvernement de l'Ontario nomme une commission afin qu'elle précise les circonstances et relève les facteurs contributifs qui ont conduit aux problèmes liés au Projet TLRO1 et qu'elle formule des recommandations en vue d'aider à éviter que ces problèmes ne se reproduisent en ce qui concerne le Projet TLRO1, les prochaines étapes d'aménagement du réseau de transport léger sur rail de la Ville, ainsi que les autres projets d'aménagement de réseaux municipaux ou provinciaux de transport léger sur rail;

ATTENDU QU'il est jugé utile d'énoncer le cadre de référence de cette nomination ainsi que de ces recommandations;

EN CONSÉQUENCE, en vertu de la *Loi de 2009 sur les enquêtes publiques,* il est décrété ce qui suit :

Commission

1. Une commission est constituée à la date du présent décret (la « Commission »).

2. L'honorable C. William Hourigan est nommé commissaire de la Commission en vertu de l'article 3 de la *Loi de 2009 sur les enquêtes publiques.*

Mandat

3. Compte tenu de l'article 5 de la *Loi de 2009 sur les enquêtes publiques,* la Commission effectuera une enquête sur les circonstances d'ordre commercial et technique qui ont mené aux pannes et aux déraillements au titre du Projet TLRO1, notamment :

    a) les décisions prises et les actes posés en vue de déterminer :

        (i) l'approche retenue par la Ville en matière d'approvisionnement pour le Projet TLRO1;

        (ii) le choix du Groupe de transport Rideau (le « concessionnaire »);

        (iii) l'octroi au concessionnaire du contrat sur la diversification des modes de financement et d'approvisionnement (DMFA) pour le Projet TLRO1;

    b) La question de savoir si le processus d'approvisionnement mené par la Ville a eu des répercussions sur les normes techniques appliquées au Projet TLRO1 et à la conception, à la construction, à l'exploitation, à l'entretien, à la réparation et à la remise en état relatifs au Projet TLRO1;

    c) La question de savoir si le contrat sur la DMFA conclu entre la Ville et le concessionnaire (l'« entente de concession ») était adéquat pour garantir que la conception, la construction, l'exploitation, l'entretien, la réparation et la remise en état relativement au Projet TLRO1 soient conformes à toutes les lois et normes de l'industrie applicables, notamment en ce qui a trait au rendement et à la sécurité;

    d) La question de savoir si le concessionnaire et ses sous-traitants ont procédé à la conception, à la construction, à l'exploitation, à l'entretien, à la réparation et à la remise en état relatifs au Projet TLRO1 conformément aux lois et aux normes de l'industrie applicables;

e) La question de savoir si la supervision de l'entente de concession et du Projet TLRO1 par la Ville, notamment la vérification, l'évaluation, l'inspection et la surveillance que la Ville a effectuées relativement au Projet TLRO1, était adéquate pour garantir la conformité à l'entente de concession et aux lois et aux normes de l'industrie applicables. Ceci comprend une enquête sur les décisions qui ont mené à la déclaration portant que le Projet TLRO1 était substantiellement achevé et que les essais associés au projet à l'appui de cette déclaration ont été effectués.

4. La Commission s'acquittera de ses fonctions sans formuler de conclusions ou de recommandations concernant la responsabilité civile ou criminelle de toute personne ou de tout organisme. La Commission veillera à ce que la conduite de l'enquête ne porte aucunement atteinte au déroulement de toute autre investigation ou instance judiciaire en cours liée aux mêmes questions.

5. La Commission peut, à sa discrétion et si elle l'estime essentiel, exercer les activités qui lui permettent de s'acquitter de ses fonctions, notamment :

   a) effectuer des recherches et recueillir des renseignements, y compris mener des entrevues et entreprendre des sondages;

   b) effectuer des recherches auprès d'autres territoires pour y repérer des pratiques pertinentes dans le cadre de cette enquête;

   c) consulter des intervenants clés et des spécialistes du domaine ou les inviter à lui faire part de leurs observations;

   d) consulter le grand public, y compris engager des consultations avant d'établir ses règles ou de déterminer qui participera à l'enquête publique;

   e) recevoir des observations orales et écrites.

6. La Commission se reporte aux documents visés à l'article 9 de la *Loi de 2009 sur les enquêtes publiques* et se fonde sur eux lorsqu'il est possible et approprié de le faire. En particulier, la Commission examine et étudie les dossiers ou les rapports existants qui se rapportent à son mandat. En outre, la Commission se fonde, dans la mesure du possible, sur les rapports sommaires soumis à l'enquête ou créés ou rédigés dans le cadre de l'enquête. La Commission peut étudier ces rapports et ces dossiers au lieu d'appeler des témoins.

7. Conformément à l'article 14 de la *Loi de 2009 sur les enquêtes publiques,* la Commission tient des audiences publiques.

8. La Commission peut exercer les pouvoirs prévus à l'article 13 de la *Loi de 2009 sur les enquêtes publiques.*

9. La Commission s'appuie, dans la mesure du possible, sur des personnes représentatives qui témoignent au nom d'institutions et peut convier ou consulter - ou convier et consulter - des groupes de témoins représentatifs afin d'exécuter son mandat en temps opportun.

10. Conformément à la *Loi de 2009 sur les enquêtes publiques,* la Commission obtiendra tous les dossiers nécessaires à l'exécution de ses fonctions et, à cette fin, elle peut demander la fourniture ou la production de renseignements qui sont considérés comme confidentiels ou non admissibles en preuve en vertu d'une loi ou d'un règlement, autres que les renseignements confidentiels décrits aux articles 19 et 27.1 de la *Loi sur le vérificateur général.* Si elle l'estime nécessaire, la Commission peut assortir de conditions la divulgation de renseignements pour protéger le caractère confidentiel de ces renseignements.

11. La Commission suit les directives et lignes directrices du Conseil de gestion du gouvernement ainsi que les autres politiques gouvernementales applicables, sauf si elle estime, eu égard à son mandat, qu'il n'est pas possible de les suivre.

12. La Commission favorise l'accessibilité et la transparence en ayant recours à la technologie, notamment en créant un site Web et en le mettant à jour, et en tenant des audiences virtuelles, lorsque le commissaire le juge approprié.

Ministre désigné

13. Le ministre des Transports est désigné ministre responsable de la Commission en vertu de l'alinéa 3 (3) f) de la *Loi de 2009 sur les enquêtes publiques.*

Financement

14. La Commission peut présenter au ministre des Transports des recommandations concernant le versement de fonds à des participants à l'enquête, dans la mesure de leur intérêt, si le commissaire est d'avis que ces participants ne seraient par ailleurs pas en mesure de participer à l'enquête sans ces fonds. Un tel financement doit être conforme aux directives et aux lignes directrices du Conseil de gestion du gouvernement.

Rapport final

15. La Commission mène à bien son mandat et remet au ministre des Transports un rapport final contenant ses constatations et conclusions et toutes recommandations au plus tard le 31 août 2022 ou, si le ministre y consent par écrit, au plus tard le 30 novembre 2022.

16. Lorsqu'elle remet son rapport final au ministre des Transports, la Commission veille :

    a) d'une part, dans la mesure du possible, à ce que le rapport soit remis sous une forme appropriée pour sa diffusion publique, et conformément aux exigences de la *Loi sur l'accès à l'information et la protection de la vie privée* et de toute autre loi applicable;

    b) d'autre part, à ce qu'une version électronique du rapport soit consultable dans au moins un format accessible, d'une manière jugée satisfaisante par le ministre des Transports.

17. La Commission assumera la responsabilité de la traduction et de l'impression de son rapport final et veillera à ce que ses versions française et anglaise soient présentées en même temps, en format électronique et, si le ministre des Transports en fait la demande par écrit, sur papier.

18. Le ministre des Transports rendra public le rapport final de la Commission dès que possible après l'avoir reçu.

Questions financières et administratives

19. Le soutien financier et administratif nécessaire pour permettre à la Commission de s'acquitter de son mandat sera prévu conformément aux articles 25, 26 et 27 de la *Loi de 2009 sur les enquêtes publiques.*

20. Sous réserve de tout privilège ou de toute autre restriction légale, tous les ministères, ainsi que tous les organismes, conseils et commissions du gouvernement de l'Ontario, prêteront leur concours à la Commission dans leur pleine mesure, notamment en produisant les documents en temps opportun, de façon que cette dernière puisse s'acquitter de ses fonctions.

Recommended: Minister of Transportation
Recommandé par : la ministre des Transports

Concurred: Chair of Cabinet
Appuyé par : Le président | la présidente du Conseil des ministres

Approved and Ordered:
Approuvé et décrété le : DEC 1 6 2021

Lieutenant Governor
La lieutenante-gouverneure

Appendix B:
Letter from Transportation Safety Board Counsel to Commission Counsel (February 9, 2022)

CONWAY

David P. Taylor
Direct Line: 613.691.0368
Email: dtaylor@conwaylitigation.ca

Assistant: Doreen Navarro
Direct Line: 613.691.0375
Email: dnavarro@conwaylitigation.ca

February 9, 2022

VIA EMAIL

Kate McGrann & Christine Mainville
Ottawa Light Rail Transit Inquiry
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Dear Ms. McGrann and Ms. Mainville:

RE: January 31, 2022 Summons to Produce Documents to Transportation Safety Board of Canada

OUR MATTER ID: 5303-009

I write following our February 3, 2022 call, regarding the Ottawa Light Rail Transit Inquiry's January 31, 2022 summons to produce documents, which was directed to the Transportation Safety Board of Canada (received on February 1, 2022) via Ms. Huot.

As I noted during our call, the TSB has conducted three investigations into transportation occurrences involving the OLRT:

1. Rail Transportation Safety Investigation R20H0079: regarding cracked wheels discovered on OLRT Light Rail Vehicles in July 2020 (investigation ongoing (Class 3) – the TSB will issue a public report);
2. Rail Transportation Safety Investigation R21H0099: regarding an August 8, 2021 derailment (investigation complete (Class 5) – Rail Safety Advisory letter issued on September 27, 2021); and
3. Rail Transportation Safety Investigation R21H0121: regarding a September 19, 2021 derailment (investigation complete (Class 5) – Rail Safety Advisory letter issued on November 2, 2021).

While R21H0099 and R21H0121 are complete, the information gathered in those investigations will form part of the analysis in the eventual public report in R20H0079.

As set out below, the TSB's position is that the OLRT Inquiry does not have jurisdiction to require production of the TSB's files regarding R20H0079, R21H0099 or R21H0121. The *Canadian Transportation Accident Investigation and Safety Board Act*, S.C. 1989, c. 3, provides the TSB with exclusive jurisdiction regarding the causes and contributing factors of transportation occurrences in the federal sphere, including these three railway occurrences (which arose on a federal railway).

However, in light of the public interest in the OLRT Inquiry's work, the TSB is prepared to voluntarily provide the following documents:

a. The TSB's Railway Safety Advisory letters, with inadmissible opinions highlighted (for counsel's reference);

b. The TSB's Railway Safety Advisory letters, with inadmissible opinions redacted (for use at the hearing held as part of the OLRT Inquiry, if needed); and

c. Photos taken by TSB Investigators at the derailment sites in R21H0099 and R21H0121.

Given that the Railway Safety Advisory letters are public and that the derailment sites open to public view, providing these documents would not compromise the TSB's ongoing railway safety investigations. However, given that R20H0079 is an ongoing investigation, supported by the information gathered during R21H0099 and R21H0121, the TSB will not be providing other documents to the OLRT Inquiry. As set out below, the OLRT Inquiry's ability to summons documents from the TSB regarding the three railway occurrences in question is limited by the paramountcy of the *CTAISB Act*.

Context regarding the TSB's mandate and investigations

The TSB is an independent federal agency with a statutory mandate to advance transportation safety by investigating "transportation occurrences" in the federally regulated air, marine, pipeline and rail modes of transportation. "Transportation occurrences" encompass both accidents or incidents associated with aircraft, ships, pipelines or rolling stock on a railway, as well as situations that, if left unattended, could reasonably lead to such accidents or incidents. The TSB is independent of the federal executive branch, reporting to Parliament through the President of the Queen's Privy Council for Canada.

The TSB's investigations, and the reports to which they lead, are important tools for advancing transportation safety in federally-regulated air, marine, pipeline and rail modes of transportation. Pursuant to the *CTAISB Act*, two core elements of the TSB's statutory mandate are "conducting independent investigations […] into selected transportation occurrences in order to make findings as to their causes and contributing factors" and "reporting publicly on its investigations and on the findings in relation thereto" (see *CTAISB Act*, ss 7(1)(a) and (d)).

Under the *CTAISB Act* and the *Transportation Safety Board Regulations*, SOR/2014-37, a wide variety of transportation occurrences must be reported to the TSB. However, under s. 14(1) of the *CTAISB Act*, the TSB retains the discretion to determine which transportation occurrences it will investigate. In 2020, 3,050 transportation occurrences were reported to the TSB. The TSB began 41 new investigations in the 2020/21 fiscal year, with 60 "in progress" investigations on March 31, 2021.

The *CTAISB Act* provides that where the TSB is investigating a transportation occurrence, no other federal department may commence an investigation into that transportation occurrence for the purpose of making findings as to the occurrence's causes and contributing factors (s. 14(3)), though such departments are permitted to investigate for purposes other than making findings regarding causes and contributing factors (s. 14(4)). The TSB is required to take all reasonable measures to coordinate its activities with other federal departments (s. 15(1)); however, the TSB's requirements and interests take precedence and are paramount to the extent of any conflict (s. 15(2)). While the TSB is required to take all reasonable measures to enter into agreements to ensure its procedures are compatible with those followed by coroners in the provinces (s. 16), there is no statutory requirement for the TSB to enter into such coordinating agreements with other provincial entities.

The TSB's Director of Investigations for the mode of transportation involved decides which transportation occurrences will be investigated. These decisions are guided by the *Policy on Occurrence Classification*, which sets out six classes of transportation occurrence. Occurrence classifications determine the TSB's level of effort and investment, the investigation process, the type of report or product and the target timeline for completing the investigation.

As noted above, R21H0099 and R21H0121 were designated as "Class 5" occurrences. The *Policy* describes Class 5 occurrences as having "little likelihood of identifying new safety lessons that will advance transportation safety. […] The investigation is limited to data gathering and the data are recorded for statistical reporting and future analysis." The data collected during the R21H0099 and R21H0121 investigations has been retained for use in the R20H0079 investigation; indeed, the fact that R20H0079 was already proceeding as a "Class 3" investigation is one reason that R21H0099 and R21H0121 were classified as Class 5 occurrences.

The *Policy* describes Class 3 occurrences as possibly having "significant consequences that attract a high level of public interest. […] There are public expectations that the TSB will investigate. It is quite likely that new safety lessons will be identified […]. A detailed investigation is required." The TSB produces a public report in Class 3 investigations.

There are three phases to a TSB investigation: (1) the field phase; (2) the examination and analysis phase; and (3) the report phase. I have enclosed a TSB infographic explaining the TSB investigation process with this letter.

In the Field Phase, TSB Investigators attend the site of the transportation occurrence in order to assess any perishable evidence available at the site. They may also interview witnesses while events are fresh in their minds. After on-site work is completed, the TSB Investigators assemble requests for information to gather evidence from any entities or individuals involved in, or with knowledge of, the transportation occurrence.

During the Examination and Analysis Phase, the TSB's Investigators review the documents collected, create simulations and reconstruct events, identify safety deficiencies, and may conduct further interviews.

In the Report Phase, TSB Investigators draft a report that lays out what occurred and identifies the key events that reveal safety vulnerabilities and areas for improvement. The Regional Manager then reviews the report, as does the Director of Investigations. Once approved by the Director of Investigations, the TSB's Board reviews the report, and may approve it, ask for minor amendments, or return it to the TSB Investigators for further work. After the draft report is approved, it is circulated to designated reviewers, in keeping with both s. 24(2) of the *CTAISB Act* and the *TSB Policy on Representations on Confidential Draft Reports*. Once representations are received from designated reviewers, the TSB Investigators determine which suggestions or changes to incorporate into the report and drafts an explanation detailing how the draft reviewers' comments were addressed. These products are reviewed by the Director of Investigations and then approved by the Board. There may be a further round of review if the resulting changes to the draft report are significant.

Once the TSB's Board has approved a final version of the report, it enters final editing, translation and formatting for publication and is then released to the public.

As is clear from the summary above, the TSB's investigative process depends on forthright and transparent participation from witnesses and entities with an interest in the transportation occurrences the TSB investigates. It is imperative that the information provided to TSB Investigators at all stages is accurate and complete, and that those participating in TSB investigations do not modify or restrict their participation for fear that their evidence, or TSB Investigators' or Board members' opinion on that evidence, may impact other proceedings. This is one of the reasons that the TSB has exclusive jurisdiction over transportation occurrence investigations in the federal sphere.

The TSB's ongoing investigation is paramount over the OLRT Inquiry as relates to R20H0079

As the Court of Appeal for Ontario held in *Re Ottawa-Carleton Regional Transit Commission and Amalgamated Transit Union, Loc. 279*, OC Transpo is a federal undertaking under s. 92(10)(a) of the *Constitution Act, 1867* due to its "continuous and regular" interprovincial operations.[1] Given that the OLRT is fully integrated into OC Transpo's system, it too is a federal undertaking.

[1] *Re Ottawa-Carleton Regional Transit Commission and Amalgamated Transit Union, Loc. 279* (1983), 44 O.R. (2d) 560 (C.A.).

The *CTAISB Act* (and thus the TSB's investigative jurisdiction) applies to "railway occurrences […] in Canada, if the railway […] is within the legislative authority of Parliament" (s. 3(4)(a)). As such, the TSB has jurisdiction over railway occurrences on the OLRT network. While Transport Canada has concluded a Memorandum of Understanding with the City of Ottawa that treats the OLRT as not being a "railway" within the meaning of the *Canada Transportation Act*, S.C. 1996, c. 10 or the *Railway Safety Act*, R.S.C. 1985, c. 32 (4th Supp.), this MOU does not apply to the *CTAISB Act* (nor could it, as the TSB is independent of Transport Canada).

For the purposes of responding to your January 31, 2022 letter and the Summons, the TSB does not take a position regarding whether the Province's financial interest in the OLRT project is sufficient to provide jurisdiction to institute an inquiry with respect to a federal undertaking under the *Public Inquiries Act, 2009*, S.O. 2009, c. 33, Sched. 6.

However, with respect to R20H0079, R21H0099 and R21H0121, the OLRT Inquiry's mandate appears to replicate the TSB's. Indeed, Order in Council 1859/2021 contains the following provisions [all emphasis below is added to indicate areas duplicating the TSB's jurisdiction]:

> **AND WHEREAS** the City of Ottawa ("City") Stage 1 Light Rail Transit System ("OLRT1 Project") has experienced several issues that have had a negative impact on the people of Ottawa, including, most recently, breakdowns and derailments which led to a system wide temporary shutdown and have raised concerns in the public about the safety of the OLRT1 Project ("OLRT1 Project Issues");
>
> **AND WHEREAS**, as a major financial contributor to the OLRT1 Project, the Government of Ontario desires to ascertain the circumstances in the procurement, delivery and operations of the system that led to the OLRT 1 Project Issues;
>
> **AND WHEREAS** it is considered in the public interest for the Government of Ontario to appoint a commission to identify the circumstances and contributing factors that led to the OLRT1 Project Issues and make recommendations to assist in preventing such issues from happening again […]
>
> […]
>
> **Mandate**
>
> 3. Having regard to section 5 of the *Public Inquiries Act, 2009*, the Commission shall inquire into the commercial and technical circumstances that led to the OLRT1 breakdowns and derailments […]

The underlined portions define the "OLRT1 Project Issues" as being focused on railway occurrences ("breakdowns and derailments") and resulting safety concerns. The Province seeks to identify "circumstances and contributing factors" leading to these safety-based issues, as well as recommendations to prevent their recurrence. These objects overlap with those of the TSB, in particular to "make findings as to [the] causes and contributing factors"

of transportation occurrences (*CTAISB Act*, s. 7(1)(a)) and to make "recommendations designed to eliminate or reduce any such safety deficiencies" (*CTAISB Act*, s. 7(1)(c)).

Assuming that there is valid provincial jurisdiction to convene the OLRT Inquiry, a provincial order of reference cannot go so far as to undermine the TSB's exclusive jurisdiction over railway occurrences on federal railways. Indeed, the TSB's jurisdiction in this regard is paramount over that of all federal authorities (*CTAISB Act*, ss. 14(1) and 14(3): "Notwithstanding any other Act of Parliament…"). Applicability of a provincial summons to an ongoing TSB investigation into a railway occurrence on a federal railway would vitiate that exclusive jurisdiction; as such, the January 31, 2022 Summons is inoperable with respect to the TSB's files related to its ongoing investigation, by virtue of the doctrine of paramountcy. Indeed, applying the OLRT Inquiry's summons power under the *Public Inquiries Act, 2009* to documents related to an ongoing TSB investigation would frustrate the *CTAISB Act*'s purpose of giving the TSB exclusive jurisdiction to conduct safety investigations over transportation occurrences on federal railways.

Any division of powers issues arising from the OLRT Inquiry's mandate are matters for the Attorney General of Canada and the Attorney General of Ontario. However, with specific reference to the TSB's ongoing investigations, the TSB's position is that the Summons is *ultra vires* the OLRT Inquiry, as regards the TSB's files in R20H0079, R21H0099 and R21H0121, given that those files are all bound up in the TSB's ongoing Class 3 Investigation.

Documents the TSB is able to provide without undermining its ongoing Class 3 Investigation into R20H0079

Despite the constitutional concerns noted above, the TSB is nonetheless prepared to assist the OLRT Inquiry on a voluntary basis. This is in keeping with the general principle in the *CTAISB Act* that the TSB ought to take reasonable measures to coordinate its activities with respect to transportation occurrences with other entities that may also be investigating.

As noted above, there are two public Railway Safety Advisory letters that the TSB's Director of Investigations (Rail/Pipeline) has issued, regarding R21H0099 and R21H0121, respectively. As noted above, the TSB is prepared to produce these Railway Safety Advisory letters (redacted to remove Investigator opinions), as well as photos taken by TSB Investigators at the occurrence sites in R21H0099 and R21H0121.

The TSB can also advise that it conducted a "teardown" of an LRV on September 27, 2021 as part of its data collection activities in R21H0121. While the results of this teardown cannot be provided due to their forming part of the ongoing investigation in R20H0079, the TSB can advise that representatives from Alstom, Rideau Transit Maintenance and the City of Ottawa attended and are not subject to confidentiality obligations under the *CTAISB Act* regarding this teardown.

As noted during our February 3, 2022 call, if you are in a position to provide a list of entities to whom Summons have been issued, I will seek instructions from the TSB regarding whether I can advise if its investigative file contains documents from any entity not included on the OLRT Inquiry's list.

TSB Investigator Opinion in the R21H0099 and R21H0121 Railway Safety Advisories are inadmissible in the OLRT Inquiry

You will note that the TSB will provide two versions of the Railway Safety Advisory letters: one with highlighting to indicate investigator opinion and one with opinions redacted, for use in the OLRT Inquiry. As noted above, pursuant to s. 33 of the *CTAISB Act*, "[a]n opinion of a member or an investigator is not admissible in evidence in any legal, disciplinary or other proceedings". This includes proceedings under the *Public Inquiries Act, 2009*.

The Manitoba Provincial Court recently addressed s. 33 of the *CTAISB Act* in the context of an inquest under the *Fatal Inquiries Act*, CCSM, c. F52. The Court found that s. 33 of the *CTAISB Act* barred any inference made by a TSB Investigator from observed fact from being admitted into evidence (*Anderson (Re)*, 2021 MBPC 37 at paras 11-13).

In the *Anderson* matter, the TSB provided a redacted version of a final report to the Inquest, with any of the TSB's "inferences from observed fact" removed. The TSB proposes to follow the same procedure here.

These versions of the letters, and the photos noted above, will be provided by way of the production protocol attached to your January 31, 2022 letter. These documents are, however, being provided by this means solely for the OLRT Inquiry's convenience, and not as an acknowledgment of compulsion pursuant to the January 31, 2022 Summons.

Should you have any questions regarding the positions taken in this letter or should you wish to discuss this matter further, please do not hesitate to contact me.

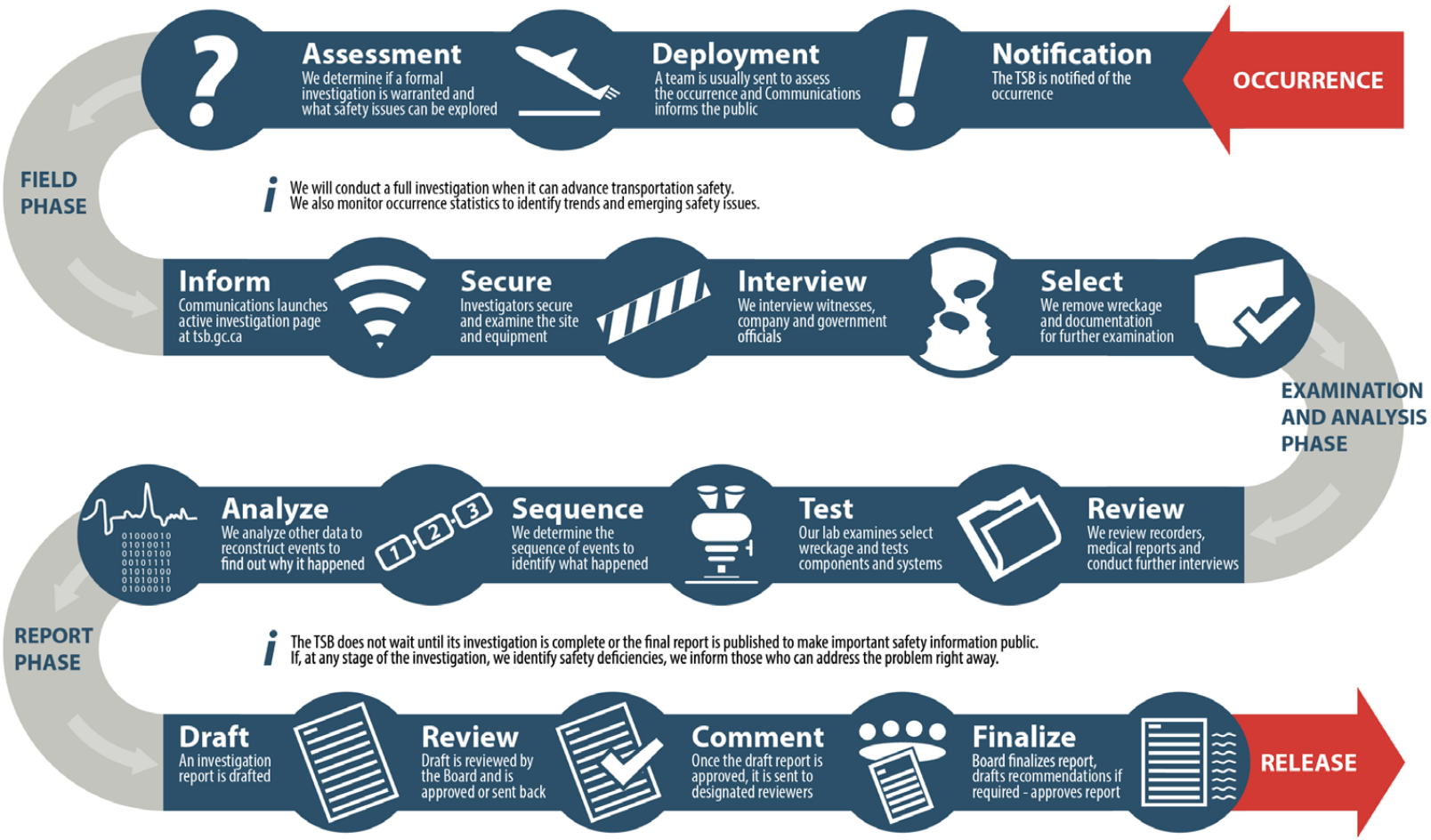
Yours truly,

David P. Taylor

DPT/dn
Encl
Copy to: Patrizia Huot, General Counsel, TSB

Transportation Safety Board of Canada | Bureau de la sécurité des transports du Canada

TSB investigation process



Once the Board approves the final report, it is translated, edited, and then released to the public on the TSB website and through traditional and social media.

Canada

Appendix C:
Revised Rules of Procedure (March 21, 2022)

RULES OF PROCEDURE
(REVISED MARCH 21, 2022)

General

1. These Rules of Procedure ("Rules") apply to the Ottawa Light Rail Transit system ("LRT") Commission of Inquiry (the "Commission" or "Inquiry"), established pursuant to the *Public Inquiries Act*, 2009, S.O. 2009 c.33 , sched. 6 (the "*Act*") and Order in Council 1859/2021 (the "Terms of Reference").

2. Subject to the *Act*, the conduct of, and procedure to be followed at, the Inquiry is under the control and discretion of the Honourable C. William Hourigan (the "Commissioner"). The Commissioner may issue directions or orders including on his own motion or following an application.

3. All participants, witnesses and their counsel are bound by these Rules and may raise any issue of non-compliance with the Commissioner.

4. The Commissioner may deal with any non-compliance with these Rules as he deems appropriate, including by revoking the standing of a participant or imposing restrictions on a participant.

5. The Commissioner may amend these Rules or dispense with compliance with these Rules as he deems necessary to ensure that the Inquiry is conducted efficiently, fairly, expeditiously, and in accordance with the principle of proportionality.

6. In these Rules,

   a. "person" refers to individuals, groups, corporations, governments, agencies, institutions or any other entity;

   b. "participant" refers to a person who has been granted standing to participate in the Commission pursuant to the Rules of Standing and Funding; and

   c. "document" is intended to have a broad meaning, and includes the following forms: written, electronic, audiotape, videotape, digital reproductions, photographs, maps, graphs, microfiche and any data and information recorded or stored by means of any device.

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8

Investigation

7. The Inquiry will commence with an investigation by Commission Counsel. The goal of the investigation, in part, will be to identify the core and background facts, to identify witnesses and to gather witness statements.

7.1 In accordance with section 26(1)(c) of the *Act*, the Commission may engage the services of persons having special technical or other expertise or knowledge to assist it in its tasks, under the direction of the Commission.

8. The investigation will consist primarily of document review, consultation with interested persons, and witness interviews by Commission staff, Commission Counsel and other persons engaged by the Commission in accordance with Rule 7.1.

8.1 Persons engaged by the Commission and who may assist it with document review, witness interviews and other tasks, are, as persons acting on behalf of or under the direction of the Commission, bound by the confidentiality obligations of the Commission under section 22(2) of the *Act*.

8.2 In accordance with subsections 7(2) and 31(1) of the *Act*, Commission Counsel may require that witness statements be recorded and transcribed. Statements may also be taken under oath or affirmation.

Document Production

9. Copies of all relevant documents must be produced to the Commission by any participant or recipient of a summons by the Commission at the earliest opportunity, in a format acceptable to the Commission, subject to direction from the Commission. Prior to taking part in the Commission, each participant or summons recipient, if a natural person, or the chief executive officer of each participant or summons recipient, if a corporation, must certify in writing that this obligation has been complied with.

10. Production to the Commission, and to persons engaged by the Commission, by a participant or summons recipient will not constitute a waiver of any claim to privilege, including solicitor-client privilege, which a participant or summons recipient may wish to assert. Participants or summons recipients are, however, required to identify

to Commission Counsel, within a reasonable time period, in accordance with the procedure set out in paragraph 11, any documents over which they intend to assert a claim of privilege.

11. Where a participant or summons recipient objects to the production of any document, or part thereof, or to disclosure to participants of any document, or part thereof, on the grounds of privilege, pursuant to subsection 8(3) of the *Act*, the following procedures will apply:

    a. The participant or summons recipient shall deliver to Commission Counsel a list setting out pertinent details of the document(s), or part thereof, over which claims for privilege are being asserted. This shall include the date, author, recipient(s) and a brief description of the document(s), and may include additional material, such as an affidavit, to support its claims;

    b. Commission Counsel shall review the list and decide if they will recommend to the Commissioner that he accept the claim for privilege;

    c. If Commission Counsel are not prepared to recommend to the Commissioner that he accept the claim for privilege, the list and any further material filed by the participant or summons recipient shall be submitted forthwith, together with written submissions on behalf of Commission Counsel, to the Commissioner or, at the Commissioner's option, to another adjudicator designated by the Commissioner, for determination. If the Commissioner or designated adjudicator is unable to make a determination based on the record before them, they may require a copy of the disputed document(s) for inspection; and

    d. If the claim for privilege is dismissed, the document(s) shall be produced to Commission Counsel forthwith and, subject to relevance, may be used by the Commission and participants in the inquiry.

12. Originals of relevant documents are to be provided to Commission Counsel only upon their request and where doing so would not interfere with any potential or ongoing investigation or legal proceeding. The participants and summons recipients

will otherwise preserve originals of relevant documents until such time as the Commissioner has fulfilled his mandate or has ordered otherwise.

13. Counsel to the participants and witnesses will be provided with documents and information, including witness statements or statements of anticipated evidence, only upon executing the written undertaking at Appendix "A" that all such documents and information will be used solely for the purposes of the Inquiry.

14. Counsel are entitled to provide those documents or information to their clients only on terms consistent with the undertakings given, and after the clients have entered into the written undertaking at Appendix "B" to the same effect.

15. Potential witnesses or participants who are unrepresented will also be entitled to receive documents or information relevant to their testimony after having entered into the written undertaking at Appendix "C".

16. The Commission orders that each person who has entered into a written undertaking in the form set out at Appendix "A", "B" or "C" comply with its terms. Failure to do so will be a breach of an order of the Commission and be dealt with in accordance with ss. 29 and 30 the *Act*.

17. These undertakings will be of no force or effect if any of the conditions of s.12(2) or 12(3) of the *Act* are met.

18. The Commission may require that the documents provided, and all copies made, be returned to the Commission if not tendered in evidence. Alternately, the Commission may require the destruction of those documents provided, and all copies made, such destruction to be proven by a certificate of destruction.

19. In accordance with section 10 of the Terms of Reference and subsection 10(3) of the *Act*, the Commission may require the provision or production of information that is confidential or inadmissible under any Act or regulation, other than confidential information which is described in sections 19 and 27.1 of the *Auditor General Act,* R.S.O 1990, c. A.35.

20. Where a participant or summons recipient objects to the disclosure of a document or information to other participants and/or to the public at the hearing or otherwise on the grounds of confidentiality, and seeks an order pursuant to subsections 10(4) or 14(3)

of the *Act*, a copy of the document and/or the information in issue will be produced in an unedited form to the Commission. The participant or summons recipient shall provide, in writing, a submission setting out the order requested and the reasons for it. In determining whether to make the order, the Commissioner will consider, among other things, the duty of procedural fairness to the other participants and his obligation pursuant to section 17 of the *Act*. Where the Commission considers it necessary, it may impose conditions on the disclosure of information to protect the confidentiality of that information.

21. Rules 10, 11 and 20 apply, with necessary modifications, to persons who have had documents seized by or produced to the Transportation Safety Board of Canada or the Auditor General (Ontario) in the course of their respective investigations or audits, and whose documents were then delivered to the Commission by the Transportation Safety Board of Canada or the Auditor General (Ontario) pursuant to a summons issued by the Commission.

Evidence

(i) General

22. The Commission may collect and receive information that it considers relevant and appropriate, whether or not the information would be admissible in a court of law and in whatever form the information takes, and may accept the information as evidence at the Inquiry. However, pursuant to section 8(3) of the *Act*, nothing is admissible in evidence at the Inquiry that would be inadmissible in a court by reason of any privilege under the law of evidence.

23. In accordance with section 6 of the Terms of Reference and section 9 of the *Act*, the Commission may prepare “Overview Reports” which may contain core or background facts. The Commission may also refer to and rely on any existing records or reports relevant to its mandate, and on any other matters set out in section 9 of the *Act*.

24. Commission Counsel will provide a reasonable opportunity to the participants, in advance of the filing of Overview Reports as evidence, to comment on the accuracy of the Overview Reports, and the Commission may modify the Overview Reports in response. Participants may also, pursuant to Rule 35, propose witnesses to be called to challenge or supplement the Overview Reports in ways that are likely to significantly contribute to an understanding of the issues relevant to this Inquiry.

25. The Overview Reports may be used to assist in identifying systemic issues relevant to the Inquiry, to make findings of fact and to enable recommendations to be made, but the Overview Reports will not be used in a manner precluded by section 4 of the Terms of Reference.

26. The Commission will rely, wherever possible, on the Overview Reports and may consider such reports instead of calling witnesses. Commission Counsel may call witnesses or experts, who may, among other things, support, comment upon or supplement the Overview Reports.

26.1 Commission Counsel may obtain certified transcripts of witnesses' evidence gathered during witness interviews as described in Rules 7 to 8.2. In accordance with subsections 9(1)(f) and (2) of the *Act*, these witness interview transcripts can be admitted into evidence in place of part or all of that individual's oral testimony, whether the evidence was taken under oath or affirmation or not.

26.2 Commission Counsel will circulate these witness interview transcripts to the witness and to participants prior to entering them into evidence at the hearings. The witness or participants may make a claim of privilege in respect of any portion of the witness interview transcript, in accordance with the procedure set out in Rules 10 and 11.

26.3 Commission Counsel may redact any portion that is the subject of a claim of privilege, or refer the matter to the Commissioner with its recommendation in accordance with Rule 11.

26.4 Commission Counsel may rely on the witness interview transcripts in lieu of calling the witness to testify, subject to the right of participants to request that the witness be called for the purpose of cross-examination. Commission Counsel may also call the witness to testify, and may seek to supplement, challenge or have the witness comment upon the witness interview transcript.

27. Commission Counsel and a witness may prepare a sworn affidavit of the witness's evidence. At the Commissioner's discretion, this sworn affidavit can be admitted into evidence in place of part or all of that individual's oral testimony.

28. Evidence may be received at the Inquiry from one or more panels of expert witnesses. In accordance with section 10 of the Terms of Reference, the Commission may also rely on representative witnesses on behalf of institutions and may convene or consult, or both, with panels of representative witnesses.

29. The Commissioner may modify these Rules as may be appropriate for the disclosure of documents and the questioning of panelists by the participants.

(ii) Oral Hearings and Witnesses

30. The Commissioner will conduct hearings as set out in these Rules.

31. The Commissioner will set the dates, hours and place of the hearings. Due to COVID-19 and the timelines set out for the Inquiry in the Terms of Reference, some or all of the public hearings may be conducted electronically.

32. The Commission anticipates that the hearings will address key issues relating to the procurement, design, building, delivery, operation, maintenance, repair and rehabilitation of the LRT that may have led to the breakdowns and derailments. This will include the issue of the City of Ottawa's oversight of these respective phases of the project.

33. The Commissioner may make such orders or gives such directions as he considers proper to maintain order and to prevent the abuse of the Commission's process.

34. Participants may propose witnesses to be called as part of the Inquiry. Participants will provide to Commission Counsel the names and addresses of all witnesses they believe ought to be heard and will provide Commission Counsel, where applicable, with copies of all relevant documents, including affidavits or statements of anticipated evidence, at the earliest opportunity.

35. Commission Counsel will have discretion to refuse to call or present evidence proposed by a participant. A participant may, however, apply to the Commissioner for leave to call a witness whom the participant believes has information relevant to the Commission's mandate. If the Commissioner is satisfied that the information of the witness is required, Commission Counsel will call the witness subject to Rule 42.

36. Anyone interviewed by or on behalf of Commission Counsel, is entitled, but not required, to have counsel present for the interview to represent his or her interests. Counsel will be retained at the expense of the interviewee. The Terms of Reference do not grant the Commissioner jurisdiction to order the Province to provide funding for legal counsel. However, requests for funding may be made to the Commissioner in accordance with the *Rules of Standing and Funding*. Pursuant to section 14 of the Terms of Reference, the Commission may make recommendations to the Minister of Transportation regarding funding to participants in the inquiry to the extent of that participant's interest where, in the Commissioner's view, the participants would not otherwise be able to participate in the inquiry without such funding.

37. Witnesses who are not represented by counsel for participants are entitled to have their own counsel present while they testify. Counsel for the witness will be permitted to make appropriate objections during the testimony of that witness.

38. Witnesses may be called more than once. Witnesses may be called upon to testify in panels.

38.1 Witnesses may choose to testify in person or remotely. When a witness chooses to testify in person, counsel for the witness may appear in person. Panels of witnesses will, subject to order of the Commissioner, appear remotely. Subject to the above and to an exemption being obtained from the Commission, counsel to participants must appear remotely.

39. Witnesses will give their evidence at a hearing under oath or affirmation. However, the Commissioner may admit evidence not given under oath or affirmation.

Rules of Examination

40. In the ordinary course, Commission Counsel will call and question witnesses who testify at the Inquiry. Except as otherwise directed by the Commissioner, Commission Counsel are entitled to adduce evidence by way of both leading and non-leading questions, and to challenge the witness's evidence.

41. Participants will have an opportunity to cross-examine the witness, to the extent of their interest, as determined by the Commissioner. The Commissioner will determine the order of cross-examinations.

42. Counsel for a participant may apply to the Commissioner to examine a particular witness in chief. If counsel is granted the right to do so, examination will be confined to the normal rules governing the examination of one's own witness.

43. The Commissioner may direct any counsel whose client shares a commonality of interest with the witness only to adduce evidence through non-leading questions, except with respect to non-essential matters.

44. Counsel for a witness, regardless of whether he or she is also representing a participant, will examine after the other participants have concluded their cross-examinations. If he or she has adduced the evidence of the witness in chief, he or she will have a right to re- examine the witness. If, however, counsel for the witness intends to adduce evidence in chief not adduced by Commission Counsel, he or she will examine the witness immediately following Commission Counsel and will then have a right to re-examine the witness following the cross-examinations by the other participants.

45. Commission Counsel has the right to re-examine any witness at the conclusion of his or her evidence.

46. The Commissioner may set time allocations for the conduct of examinations and cross-examinations.

Use of Documents at Hearing

47. In advance of the testimony of a witness, Commission Counsel will provide a transcript of the witness' evidence, if applicable, and in the absence of a transcript, will endeavour to provide the participants with reasonable notice of the subject matter of the anticipated evidence in chief and a list of the documents associated with that evidence.

48. In cases where counsel other than Commission Counsel is intending to lead the evidence in chief of a witness, they will provide the participants with reasonable notice of the subject matter and a list of documents associated with that evidence.

49. Neither participants nor Commission Counsel will be entitled to cross-examine a witness on any "will-say statement" (anticipated evidence statement or witness interview summary) that may be provided, except with leave of the Commissioner.

49.1 Participants and Commission Counsel will be entitled to cross-examine a witness on any certified transcript of the evidence of that witness or any other witness.

50. Participants who intend to cross-examine a witness will provide reasonable notice to Commission Counsel and the participants of any documents to which they intend to refer during their cross-examination, other than those documents for which notice has previously been provided pursuant to Rules 47 or 48.

51. For the purpose of these Rules, the Commissioner will have discretion to determine what constitutes "reasonable notice" or "at the earliest opportunity" in all of the circumstances.

52. The Commissioner may grant Commission Counsel or counsel for a participant or witness leave to introduce a document to a witness at any point during the hearing upon such terms as are just and fair.

Applications

53. A person may apply to the Commissioner for an order by:

    1. preparing an application in writing;
    2. attaching to the application any supporting materials; and
    3. delivering the application and supporting materials to the Commission by email at Notice@OLRTPublicInquiry.ca.

54. Unless the Commissioner otherwise directs, the Commission shall promptly deliver the application and supporting materials to each other participant.

55. Participants are entitled to respond to an application where their grant of standing identifies them as having an interest in the subject matter of the application.

56. Commission counsel may provide the Commissioner with any submissions or materials Commission counsel consider relevant and necessary to the proper resolution of the application. Due to time constraints, where there is an oral hearing on the application, Commission counsel need not file responding materials prior to the hearing of the application but should, as much as is practicable, advise the participants of Commission counsel's position on each application in advance of the hearing of the application.

57. The Commissioner will determine the schedule for the filing of submissions and materials and for the hearing of oral argument, if any. Applications may be dealt with in writing.

58. The Commissioner may make an order or direction based on the written material filed or, at his discretion, after hearing oral argument.

59. Subject to any order from the Commissioner, all application materials including submissions and responses will be posted to the Commission website.

Submissions

60. Commission counsel, and each participant authorized to do so, may make submissions to the Commissioner as permitted by the Commissioner. Submissions will primarily be in writing.

61. Subject to any order from the Commissioner, submissions will be posted to the Commission website.

Service

62. All documents shall be served by email.

63. If a Participant is represented by legal counsel ("Counsel"), service on the Participant shall be by email to its Counsel. If a Participant is not represented by legal counsel, service on the Participant shall be by email to the Participant's designated contact person (the "Contact Person").

64. Documents to be provided to, or served on, the Commission shall be delivered electronically no later than 4:00 p.m. on the specified date, to Notice@OLRTPublicInquiry.ca.

Notices of Alleged Misconduct

65. In accordance with subsection 17(1) of the *Act*, the Commissioner will not make a finding of misconduct on the part of any person unless that person has had reasonable notice of the substance of the alleged misconduct and was given the opportunity to respond.

66. All notices of alleged misconduct will be delivered on a confidential basis to the person to whom the allegations of misconduct refer, or their counsel.

67. If a notice of alleged misconduct is delivered, the recipient may apply to the Commissioner for leave to call evidence that the recipient believes may be helpful to respond to the alleged misconduct.

Revised February 8, 2022, March 21, 2022

APPENDIX
"A"

Confidentiality Undertaking
for Counsel to Participants or Potential Witnesses in the
LRT Commission of Inquiry

For the purpose of this Undertaking, the term "document" is intended to have a broad meaning, and includes any and all documents and information in connection with the proceedings of the LRT Commission of Inquiry (the "Inquiry" or "Commission"), including without limitation, any and all technical, corporate, financial, economic and legal information and documentation, financial projection and budgets, plans, reports, opinions, models, photographs, recordings, personal training materials, memoranda, notes, data, analysis, minutes, briefing materials, submissions, correspondence, records, sound recordings, videotapes, films, charts, graphs, maps, surveys, books of account, or any other notes or communications in writing, and data and information in electronic form, data and information recorded or stored by means of any device and any other information pertaining to the Inquiry, irrespective of whether such information or documentation has been identified as confidential, and includes all other material prepared containing or based, in whole or in part, on any information included in the foregoing, including will-say statements referred to in Rule 49 above.

I,_____, undertake to the LRT Commission of Inquiry that any and all documents which are produced to me in connection with the Commission's proceedings will not be used by me for any purpose other than those proceedings. I further undertake that I will not disclose any such documents to anyone for whom I do not act or who has not been retained as an expert for the purposes of the Inquiry. In respect of anyone for whom I act, or any witness, or any expert retained for the purposes of the Inquiry, I further undertake that I will only disclose such documents to the individual in question upon receiving the written undertaking annexed as Appendix "B" to the *Rules of Procedure*.

I understand that this undertaking has no force or effect with respect to any document which has become part of the public proceedings of the Commission, or to the extent that

the Commissioner has provided a written release to me from the undertaking with respect to any document. For greater certainty, a document is only part of the public proceedings once the document is made an exhibit at the Inquiry.

With respect to those documents which remain subject to this undertaking at the end of the Inquiry, I undertake to either destroy those documents, and provide a certificate of destruction to the Commission, or to return those documents to the Commission for destruction. I further undertake to collect for destruction such documents from anyone to whom I have disclosed any documents which were produced to me in connection with the Commission's proceedings.

I understand that a breach of any of the provisions of this Undertaking is a breach of an order made by the Commission.

Signature	Witness
_____	_____
Print Name	Print Name
_____	_____
Date	Date
_____	_____

APPENDIX "B"

Confidentiality Undertaking
for Participants and Potential Witnesses with Counsel to the
LRT Commission of Inquiry

For the purpose of this Undertaking, the term "document" is intended to have a broad meaning, and includes any and all documents and information in connection with the proceedings of the LRT Commission of Inquiry (the "Inquiry" or "Commission"), including without limitation, any and all technical, corporate, financial, economic and legal information and documentation, financial projection and budgets, plans, reports, opinions, models, photographs, recordings, personal training materials, memoranda, notes, data, analysis, minutes, briefing materials, submissions, correspondence, records, sound recordings, videotapes, films, charts, graphs, maps, surveys, books of account, or any other notes or communications in writing, and data and information in electronic form, data and information recorded or stored by means of any device and any other information pertaining to the Inquiry, irrespective of whether such information or documentation has been identified as confidential, and includes all other material prepared containing or based, in whole or in part, on any information included in the foregoing, including will-say statements referred to in Rule 49 above.

I,_____, undertake to the LRT Commission of Inquiry that any and all documents which are produced to me in connection with the Commission's proceedings will not be used by me for any purpose other than those proceedings. I further undertake that I will not disclose any such documents to anyone.

I understand that this undertaking has no force or effect with respect to any document which has become part of the public proceedings of the Commission, or to the extent that the Commissioner has provided a written release to me from the undertaking with respect to any document. For greater certainty, a document is only part of the public proceedings once the document is made an exhibit at the Inquiry.

With respect to those documents which remain subject to this undertaking at the end of the Inquiry, I further understand that such documents will be collected from me by the person acting as my counsel who disclosed them to me.

I understand that a breach of any of the provisions of this Undertaking is a breach of an order made by the Commission.

Signature	Witness
_____	_____
Print Name	Print Name
_____	_____
Date	Date
_____	_____

APPENDIX "C"

Confidentiality Undertaking for Potential Witnesses or Participants with No Counsel to the LRT Commission of Inquiry

For the purpose of this Undertaking, the term "document" is intended to have a broad meaning, and includes any and all documents and information in connection with the proceedings of the LRT Commission of Inquiry (the "Inquiry" or "Commission"), including without limitation, any and all technical, corporate, financial, economic and legal information and documentation, financial projection and budgets, plans, reports, opinions, models, photographs, recordings, personal training materials, memoranda, notes, data, analysis, minutes, briefing materials, submissions, correspondence, records, sound recordings, videotapes, films, charts, graphs, maps, surveys, books of account, or any other notes or communications in writing, and data and information in electronic form, data and information recorded or stored by means of any device and any other information pertaining to the Inquiry, irrespective of whether such information or documentation has been identified as confidential, and includes all other material prepared containing or based, in whole or in part, on any information included in the foregoing, including will- say statement referred to in Rule 49 above.

I, _____, undertake to the LRT Commission of Inquiry that any and all documents which are produced to me in connection with the Commission's proceedings will not be used by me for any purpose other than those proceedings. I further undertake that I will not disclose any such documents to anyone.

I understand that this undertaking has no force or effect with respect to any document which has become part of the public proceedings of the Commission, or to the extent that the Commissioner has provided a written release to me from the undertaking with respect to any document. For greater certainty, a document is only part of the public proceedings once the document is made an exhibit at the Inquiry.

With respect to those documents which remain subject to this undertaking at the end of the Inquiry, I further understand that such documents will be collected from me by Commission

Counsel or a person designated by the Commission Counsel who disclosed them to me.

I understand that a breach of any of the provisions of this Undertaking is a breach of an order made by the Commission.

Signature	Witness
_____	_____
Print Name	Print Name
_____	_____
Date	Date
_____	_____

Appendix D:
Rules of Standing and Funding (January 20, 2022)

RULES OF STANDING AND FUNDING

General

1. These Rules of Standing and Funding apply to the Ottawa Light Rail Transit system ("LRT") Commission of Inquiry (the "Commission" or "Inquiry"), established pursuant to Order in Council 1859/2021 (the "Terms of Reference").

2. Subject to the *Public Inquiries Act, 2009*, S.O. 2009, c. 33, Sched. 6 (the "*Act*") and the Terms of Reference, these Rules are issued by the Honourable C. William Hourigan (the "Commissioner"), in his discretion to facilitate the efficient disposition of the issues of standing and funding.

3. The Commissioner may amend these Rules or dispense with compliance of these rules as he deems necessary to ensure the Inquiry is conducted efficiently, fairly, expeditiously, and in accordance with the principle of proportionality.

4. All interested persons and their counsel shall be deemed to undertake to adhere to these Rules, and may raise any issue of non-compliance with the Commissioner.

5. The Commissioner may deal with a breach of these Rules as he deems appropriate.

6. In these Rules,

   a. "Persons" refers to individuals, groups, governments, agencies, institutions or any other entity; and

   b. "Electronic format" refers to pdf format.

Standing

7. Commission Counsel, who will assist the Commissioner to ensure the orderly conduct of the Inquiry, have standing throughout the Inquiry. Commission Counsel have the primary responsibility of representing the public interest throughout the Inquiry, including the responsibility of ensuring that matters that bear upon the public interest are brought to the Commissioner's attention.

8. Persons may seek standing at the Inquiry by way of the designated Application Form located on the Commission's website with supporting materials, to be filed, in electronic format if possible, with the Commission on or before February 28, 2022, or at the discretion of the Commission on any other date.

9. The application for standing must include the following information:

    a. The person's name, address, telephone number, and e- mail address, if available;

    b. The name(s) of the lawyer(s), if any, representing the person, together with the lawyer(s)'s address, telephone number, fax number and email address;

    c. The nature of the person's interest in the subject matter of the inquiry, why he/she wishes standing, and how he/she proposes to contribute to the Inquiry, having specific regard to the Terms of Reference; and

    d. Whether the person is seeking full standing or standing on one or more specific issues as outlined in the Terms of Reference.

10. Standing applications will be made and determined in writing.

11. Standing will be granted in the discretion of the Commissioner, in accordance with section 15 of the *Act*, the Terms of Reference and the desirability of a fair and expeditious proceeding. The Commissioner will consider, among other things, the following factors:

    a. Whether a person has a substantial and direct interest in the subject matter of the Inquiry;

    b. Whether a person is likely to be notified of a possible finding of misconduct under section 17 of the *Act*;

    c. Whether a person's participation would further the conduct of the Inquiry; and

    d. Whether a person's participation would contribute to the openness and fairness of the Inquiry.

12. The Commissioner may determine the manner and scope of the participation of persons granted standing, as well as their rights and responsibilities.

13. The Commissioner may direct that a number of applicants share in a single grant of standing.

14. All materials filed in support of a person's application for standing will be available to the public on the Commission's website at www.OttawaLRTPublicInquiry.ca.

15. Those granted standing will be designated as Participants before the Inquiry.

16. Subject to the Rules of Procedure, the Participants in the Inquiry may have, at the Commissioner's discretion, among other things:

    a. Access to documents collected by the Commission subject to the Rules of Procedure;

    b. Advance notice of documents which are proposed to be introduced into evidence;

    c. Advance provision of will say statements of anticipated witnesses;

    d. A seat at counsel table;

    e. The opportunity to suggest witnesses to be called by Commission Counsel, failing which an opportunity to apply to the Commissioner to lead the evidence of a particular witness;

    f. The right to cross-examine witnesses on matters relevant to the basis upon which standing was granted; and

    g. The right to make closing submissions.

17. The Commissioner may decide, in his discretion, that one or more applicants for standing will have more limited rights of participation than others. He may also decide that two or more applicants for standing will be required to participate as a group, and be required to exercise their rights of participation jointly.

18. Any updated information with respect to standing may be made available on the Commission's website.

Funding

19. Counsel will be retained at the expense of the witness or participant. The Terms of Reference do not grant the Commissioner jurisdiction to order funding for legal counsel. However, requests for funding may be made to the Commissioner in accordance with these Rules. Further to section 14 of the Terms of Reference, the Commissioner may make recommendations to the Minister of Transportation regarding funding for a participant to the extent of the participant's interest where, in the Commissioner's view, the participant would not otherwise be able to participate in the inquiry without such funding.

20. Persons may seek funding by way of the designated Application form located on the Commission's website with supporting materials to be filed, in electronic format if possible, with the Commission on or before February 28, 2022, or at the discretion of the Commissioner on any other date. Persons will be expected to seek funding at the same time as they seek standing, and the Application form in support of funding should be combined with the Application form in support of standing.

21. Applications for funding must include the following information:

    a. The person's name, address, telephone number, and fax number and e- mail address, if available;

    b. The name(s) of the lawyer(s), if any, representing the person, together with the lawyer(s)'s address, telephone number, fax number and email address;

    c. Evidence that demonstrates that a person does not have adequate financial resources that enables it to represent its interest; and

    d. How it intends to make use of the funds and how it will account for the funds.

22. Funding applications will be made and determined in writing.

23. Funding will be recommended at the Commissioner's discretion in accordance with section 14 of the Terms of Reference. The Commission will also consider, among other things, the following factors in making his funding recommendations:

    a. The nature of the applicant's interest and/or proposed involvement in the Inquiry;

    b. Whether the applicant has an established record of concerns for and a demonstrated commitment to the interest it seeks to represent;

    c. Whether the applicant has special experience or expertise with respect to the Commission's mandate; and

    d. Whether the applicant has attempted to form a group with others of similar interests.

24. The Commissioner may require persons seeking funding to file additional evidence in support of their application, including sworn affidavit evidence.

25. Where the Commissioner's funding recommendation is accepted, funding shall be in accordance with applicable Management Board of Cabinet directives and guidelines respecting rates or remuneration and reimbursement and the assessment of accounts.

26. All materials filed in support of a party's Application for funding will be available to the public on the Commission's website at www.OttawaLRTPublicInquiry.ca.

27. Any updated information with respect to funding may be made available on the Commission's website at www.OttawaLRTPublicInquiry.ca.

Dated January 20, 2022

Appendix E:
Order on Applications for Standing and Funding (March 3, 2022)

Order on Applications for Standing and Funding – March 3, 2022

Part 1: Introduction

Pursuant to Order in Council 1859/2021, the Government of Ontario established this Commission to conduct an inquiry into the commercial and technical circumstances that led to the breakdowns and derailments of the City of Ottawa Stage 1 Light Rail Transit Project (the "Project") and to make recommendations to assist in preventing such issues from happening in the future.

The Commission has the power under s. 15 of the *Public Inquiries Act*, S.O. 2009, c. 33, Schedule 6 (the "Act"), to determine, among other things, whether a person can participate in a public inquiry; section 15 provides as follows:

Determination of participation

15 (1) Subject to the order establishing the commission, a commission shall determine,

(a) whether a person can participate in the public inquiry;

(b) the manner and scope of the participation of different participants or different classes of participants;

(c) the rights and responsibilities, if any, of different participants or different classes of participants; and

(d) any limits or conditions on the participation of different participants or different classes of participants.

Considerations

(2) Before making a decision under subsection (1), the commission shall consider,

(a) whether a person has a substantial and direct interest in the subject matter of the public inquiry;

(b) whether a person is likely to be notified of a possible finding of misconduct under section 17;

(c) whether a person's participation would further the conduct of the public inquiry; and

(d) whether a person's participation would contribute to the openness and fairness of the public inquiry.

Representation

(3) A person who is permitted to participate in a public inquiry,

(a) may participate on their own behalf;

(b) may be represented by a lawyer; or

(c) may, with the leave of the commission, be represented by an agent.

Pursuant to the Commission's mandate, the Commission published *Rules of Standing and Funding* on January 20, 2022 to govern the application process, and called for applications to be submitted by interested applicants no later than February 28, 2022.

The *Rules of Standing and Funding* provide, in part, as follows with respect to granting applications for standing:

11. Standing will be granted in the discretion of the Commissioner, in accordance with section 15 of the Act, the Terms of Reference and the desirability of a fair and expeditious proceeding. The Commissioner will consider, among other things, the following factors:

    a. Whether a person has a substantial and direct interest in the subject matter of the Inquiry;

    b. Whether a person is likely to be notified of a possible finding of misconduct under section 17 of the Act;

    c. Whether a person's participation would further the conduct of the Inquiry; and

    d. Whether a person's participation would contribute to the openness and fairness of the Inquiry.

12. The Commissioner may determine the manner and scope of the participation of persons granted standing, as well as their rights and responsibilities.

13. The Commissioner may direct that a number of applicants share in a single grant of standing.

16. Subject to the Rules of Procedure, the Participants in the Inquiry may have, at the Commissioner's discretion, among other things:

a. Access to documents collected by the Commission subject to the Rules of Procedure;

b. Advance notice of documents which are proposed to be introduced into evidence;

c. Advance provision of will say statements of anticipated witnesses;

d. A seat at counsel table;

e. The opportunity to suggest witnesses to be called by Commission Counsel, failing which an opportunity to apply to the Commissioner to lead the evidence of a particular witness;

f. The right to cross-examine witnesses on matters relevant to the basis upon which standing was granted; and

g. The right to make closing submissions.

17. The Commissioner may decide, in his discretion, that one or more applicants for standing will have more limited rights of participation than others. He may also decide that two or more applicants for standing will be required to participate as a group, and be required to exercise their rights of participation jointly.

The Commission has no power to directly order funding for any participant. However, the Order in Council directed that the Commission may make recommendations to the Minister of Transportation regarding funding for participants in the Inquiry where they would not otherwise be able to participate.

In determining issues of standing, I am also obliged to consider practical procedural matters pertaining to the conduct of the Inquiry, including whether granting participation would expedite the Inquiry; as Justice Goudge has aptly observed, when determining whether to grant standing, "Commissioners must balance the imperative of openness against the requirement to conduct the inquiry expeditiously and without undue cost."[1] Accordingly, a general guiding principle that I have followed in making my determinations on these applications for standing is the need to balance the right to participation against the need for this Inquiry to complete its work expeditiously.

Part 2: Applications Received

The Commission received a total of 24 applications for standing from the following applicants by the February 28, 2022, deadline:

(1) Dominic L'Heureux
(2) Dr. Christopher Jones

[1] Stephen Goudge & Heather MacIvor, *Commissions of Inquiry* (Markham, ON: LexisNexis, 2019) at 171.

(3) The City of Ottawa
(4) National Capital Heritage Streetcar Committee
(5) Modus Strategic Solutions Canada Inc.
(6) Amalgamated Transit Union, Local 279
(7) Alstom Transport Canada Inc.
(8) Ontario Infrastructure and Lands Corporation
(9) Mireille Lavoie
(10) Morrison Hershfield Limited
(11) The Province of Ontario
(12) David Knockaert
(13) Al Speyers
(14) Justin Kelly
(15) James O'Shea
(16) STV Incorporated
(17) Rideau Transit Group Engineering Joint Venture
(18) Thales Canada Inc.
(19) Toussaint Smits
(20) IEDG Infrastructure & Energy Inc.
(21) Ottawa Light Rail Transit Constructors
(22) Rideau Transit Group General Partnership
(23) Rideau Transit Maintenance General Partnership
(24) Transport Action Canada

Part 3: Decisions on Standing

(a) Full Standing Granted

I am satisfied that the following applicants should be granted full standing as participants in the Inquiry:

- The City of Ottawa
- Amalgamated Transit Union 279
- Alstom Transport Canada Inc.
- Ontario Infrastructure and Lands Corporation
- Morrison Hershfield
- The Province of Ontario
- Rideau Transit Group Engineering Joint Venture
- Thales Canada Inc.
- Transport Action Canada
- Ottawa Light Rail Transit Constructors, Rideau Transit Group General Partnership, and Rideau Transit Maintenance General Partnership.[2]

[2] These participants are related entities with no diversity in their respective interests, and they have elected to be represented by the same counsel during the Inquiry process. Thus, a single grant of standing will be made, and they will be treated as one entity for the purposes of participation in the Inquiry.

I have reached the decision to grant these applicants full standing because they were all significant players in the events that led to the construction and implementation of the Project, including in the tendering process, the construction of the Project, the decision to accept the LRT system, and the ongoing operation of the LRT system. In accordance with the Act and the *Rules of Standing and Funding*, I am satisfied that these parties have a substantial and direct interest in the subject matter of the Inquiry, that their participation would further the conduct of the Inquiry, and that their participation would contribute to the openness and fairness of the Inquiry.

With specific reference to the fairness of the Inquiry process, noting that the Commission has as yet made no determinations in this regard and without any prejudgment as to the conduct of any specific party, a factor weighing in favour of granting participant status for these parties is that as significant players in the LRT process, there is the potential that one or more of these parties could receive a notice of alleged misconduct under section 17 of the Act. Accordingly, the full participation of these parties will contribute to the overall fairness of the Inquiry process.

I have determined that these parties shall have the full rights of participation as listed in paragraph 16 of the *Rules of Standing and Funding.* However, I caution the parties that these rights shall be subject to revocation or restriction at any time for non-compliance with the Commission's *Rules of Procedure*, including a party's disclosure obligations.

In this regard, I observe that I have significant concerns about these parties' lack of documentary production to date. The message that participants send when they do not produce documents in a timely manner is that they have no interest in expeditiously getting to the truth of the matters under investigation. I will continue to monitor the production of documents by these parties closely, and if the Commission determines that any of these, or other, participants have not fully complied with their production obligations, or have otherwise breached the *Rules of Procedure,* a party's respective rights of participation in the Inquiry will be revoked.

(b) **Partial Standing Granted**

I have determined that the following parties should be granted limited rights of standing in the Inquiry, for the following reasons:

STV Incorporated

STV Incorporated was part of the Capital Transit Partners Joint Ventures, which was awarded a preliminary engineering contract and performed various services during the Project. Accordingly, I am satisfied that STV Incorporated meets the criteria for standing set out under the Act and the Commission's *Rules*.

However, in its application, STV requests to limit its participation only to having access to the Commission's database of documents and the right to comment on background

materials or written evidence prepared by Commission Counsel. I am satisfied that this limited participation would nevertheless further the conduct of the Inquiry, and therefore I am granting STV Incorporated standing limited to participation in the activities it has requested.

David Knockaert

Mr. Knockaert seeks standing solely to bring to the Commission's attention his Access to Information request filed with the City of Ottawa related to the Project. He seeks to participate in the Inquiry only through written or oral submissions. I am satisfied that Mr. Knocker's information and contributions would further the conduct of the Inquiry and therefore order that he be granted standing limited to the ability to make a single written submission, of no more than 25 pages, at a time to be designated by the Commission.

Justin Kelly

Mr. Kelly has created and maintains a website that tracks the operation and downtime of the Ottawa LRT. He has sought limited standing in his application. I am satisfied that the Commission will benefit from his input and that such input would further the conduct of the Inquiry. I order that Mr. Kelly be granted standing limited to the ability to make a single written submission, of no more than 25 pages, at a time to be designated by the Commission.

(c) Standing Denied

I have determined that all other applications for standing received by the Commission prior to the February 28, 2022, deadline should be denied, as these applicants either do not have a substantial and direct interest in the Inquiry as contemplated by the Act and the Commissions *Rules*, or their participation would not further the conduct of the Inquiry or materially contribute to the openness and fairness of the Inquiry:

National Capital Heritage Streetcar Committee

The National Capital Heritage Streetcar Committee advises in its application that it proposes building a streetcar system that would connect the downtown cores of Ottawa and Gatineau, and that it has technical concerns regarding the design of OC Transpo LRT trains in the light of this proposal. While I appreciate that the subject matter of the Inquiry will be of interest to this organization, I am not satisfied that its participation would further the conduct of the Inquiry or that it has a substantial and direct interest in the subject matter of the Inquiry. In my view, any concerns that the Committee has regarding the compatibility of the Ottawa and Gatineau transit systems would best be addressed through direct communication with the City of Ottawa outside of this Inquiry process.

Dr. Christopher Jones
Modus Strategic Solutions Canada Inc.
IDEG Infrastructure & Energy Inc.
Mireille Lavoie

These applicants have each sought through their application for standing to provide professional services to the Commission. While the Commission will carefully consider those requests, and sincerely appreciates the interest of these applicants in participating in the Commission process, these requests are not properly the subject matter of an application for standing.

Toussaint Smits
Dominic L'Heureux
Al Speyers

These applicants are residents of Ottawa. It is fair to say that they all have a keen interest in the management of public transportation in the city. While I do not believe that granting them status as participants is necessary to further the conduct of the Inquiry, I would strongly encourage each of them to register to speak at the Public Meetings that the Commission will hold in Ottawa so that their views can be placed on the record and their information considered in the Inquiry process.

James O'Shea

Mr. O'Shea has indicated in his application that he was an employee of Alstom and, in that capacity, was involved in testing activities for the Project. Based on the information in his application, I do not believe that there is a basis to grant standing to Mr. O'Shea, but I direct Commission Counsel to interview him to determine whether he has relevant evidence to give as a witness to the Inquiry.

Part 4: Conclusion

Full and partial standing is granted in accordance with these reasons. No recommendations for funding will be delivered to the Minister of Transportation as none of the parties granted standing have applied for funding. The remaining applications for standing and funding are dismissed without prejudice to the rights of the applicants to participate in the Commission's Public Meetings.

I thank all parties for their applications.

C. William Hourigan, Commissioner

Appendix F:
Procedural Order 1 (February 11, 2022)

Procedural Order 1 – February 11, 2022

Pursuant to Order in Council 1859/2021, the Government of Ontario established this Commission to conduct an inquiry into the commercial and technical circumstances that led to the breakdowns and derailments of the City of Ottawa Stage 1 Light Rail Transit Project, and to make recommendations to assist in preventing such issues from happening in the future.

The Order in Council sets the deadline for the Commission to produce its final report at August 31, 2022, which date may be extended, if the Minister of Transportation agrees in writing, to no later than November 30, 2022.

In light of this deadline, and in order to accomplish its mandate, the Commission requires documents to be produced to it in a timely way. Accordingly, the Commission has already served a significant number of summonses directing recipients to produce all relevant documents touching on issues identified in the Order in Council that are in a recipient's possession, power, or control. Recipients have also been provided with a copy of the Commission's document exchange protocol designed to facilitate production. Further, the Commission has advised the recipients of summonses that they should produce their documents in tranches to accelerate production. Finally, summons recipients may consult with Commission Counsel to target document collection in order to complete timely document production.

The Commission has adopted a broad definition of the term "documents" as including any memorandum, note, data, analysis, report, minutes, briefing material, submission, correspondence, record, photograph, sound recording, videotape, film, chart, graph, map, plan, survey, book of account, or any other note or communication in writing, and data and information in electronic form, including material in off-site storage or which has been archived, including on microfiche, and specifically includes electronic communications including both internal e-mails and e-mails sent to or received from external sources, for the period commencing June1, 2007, and continuing through the present and concluding at the conclusion of the public hearings of this Commission.

Rule 9 of the Commission's Rules of Procedure requires the recipient of a summons issued by the Commission to produce documents "at the earliest opportunity",and the Commission expects that recipients will diligently comply with this requirement. The Commissioner is empowered by the rules to, among other things, revoke the standing of, or impose restrictions on, a participant where there has been non-compliance with the Commission's rules.

Pursuant to the Order in Council, and by virtue of s.13 of the *Public Inquiries Act, 2009*, S.O. 2009, c.33, Sched.6, this Commission "may apply, or authorize a person to apply, to a justice of the peace for a warrant to enter a place and conduct a search of the place, if there are reasonable grounds for believing that there are in any building, receptacle or place,

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8
info@olrtpublicinquiry.ca
Tel: 1-833-597-1955

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8
info@enquetepubliqueTLRO.ca
Tel: 1-833-597-1955

including a dwelling house, any documents or things relevant to the subject matter of the public inquiry."

IT IS THEREFORE ORDERED THAT, pursuant to rule 2 of the Commission's Rules of Procedure, the following timetable and directives shall apply to the production of documents by all recipients of a summons issued by the Commission:

(1) All persons and entities receiving a summons must have made substantial production of relevant documents in their possession, power, or control by February 28, 2022.

(2) Where a recipient of a summons has not produced all of the documents in their possession, power, or control by February 28, 2022, they must produce documents on a continuing basis as they become available. Further, they must notify the Commission in writing regarding their plan for production every two weeks until full production has been made.

(3) All documents in the possession, power, or control of the recipient of a summons must be produced to the Commission by no later than April 29, 2022.

(4) When a recipient of a summons has produced all relevant documents in their possession, power, or control, that person or entity shall, before taking part in the Commission, certify that their document production obligations have been complied with, pursuant to rule 9 of the Rules of Procedure.

(5) In making the orders above, the Commission reserves the right to make further or additional demands during the inquiry process regarding the production of documents, including making demands for specific documents or specific categories of documents as necessary.

(6) The Commission further reserves the right to take such further steps at any time as it deems fit to ensure the timely production of documents and compliance with this order, including but not limited to applying for and executing search warrants, and refusing standing or revoking standing for a participant or imposing restrictions on a participant's standing.

C. William Hourigan, Commissioner

Appendix G:
Procedural Order 2 (March 24, 2022)

Procedural Order 2 – March 24, 2022

This order addresses procedural matters that have arisen in the Inquiry.

Document Production

I order that Participants will not be getting access to the Participants' Relativity Database of documents unless and until material production has been completed. Whether material production has been met will be determined by the Commission.

Confidentiality and Privilege Claims

I order that the following process be implemented regarding confidentiality ("C") and privilege ('P") claims. Every Friday, the Commission will send each producing party a report identifying the documents they have produced that have been tagged as relevant to date (for the initial report) and that week (for subsequent reports). Parties will have until 6 p.m. on Monday to identify to the Commission which of those documents they are asserting privilege or confidentiality claims over. The remainder will be immediately available for use by the Commission and may be uploaded to the Participants' Relativity Database to which participants will eventually be granted access, at the discretion of the Commission. In addition to the foregoing, the Commission may also reach out to producing parties with interim reports as needed. A response must then be delivered within 24 hours. This process is being implemented to enable the disclosure of documents to participants and witnesses on a timely basis, including for the purpose of formal interviews.

Where a producing party has produced records that may engage the interests of another party or parties, the producing party is responsible for notifying the other affected parties of its production of the records and ascertaining their position on production.

For those records that have been held back by producing parties, or that parties identify in their weekly report as being the subject of a confidentiality application or privilege claim, deadlines for bringing the confidentiality and privilege claims are set as follows:

- Applications and claims must be made by April 8, 2022, for documents produced up to that date.
- Applications and claims must be made by May 2, 2022, for documents produced between April 8 and April 29 and for any other materially relevant records held back from production to the Commission.

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8
info@olrtpublicinquiry.ca
Tel: 1-833-597-1955

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8
info@enquetepubliqueTLRO.ca
Tel: 1-833-597-1955

This process will allow the Commission to respond to those claims and enable the disclosure of documents to participants and witnesses on a timely basis.

Ken Rubin Standing Application

I am satisfied that Mr. Rubin has adequately explained why he missed the deadline for applying for standing. I am also satisfied that Mr. Rubin's information and contributions will further the conduct of the Inquiry. Therefore, I order that he be granted standing limited to the ability to make a single written submission, of no more than 25 pages, at a time designated by the Commission.

C. William Hourigan, Commissioner

Appendix H:
Procedural Order 3 (May 31, 2022)

Procedural Order 3 – May 31, 2022

Pursuant to Order in Council 1859/2021, the *Public Inquiries Act*, S.O. 2009, c. 33, Schedule 6, and the *Rules of Procedure* of the Ottawa Light Rail Transit System Commission of Inquiry (the "Inquiry"), the Honourable Frank Marrocco is appointed as sole arbitrator (the "Arbitrator") for determining all privilege claims made by any party or participant in the Inquiry.

The Arbitrator shall be responsible for establishing the privilege claims procedure, which binds all participants and parties to the Inquiry.

The Arbitrator's decisions on privilege claims are final and binding on all participants and parties to the Inquiry and are not subject to appeal and shall not be altered or set aside in an application for judicial review.

The Arbitrator shall have the same complete immunity as a judge of the Ontario Superior Court for any civil or other claims arising from, or in any way related to, the Arbitrator's work for the Inquiry.

C. William Hourigan, Commissioner

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8

Appendix I:
Procedural Order 4 (June 6, 2022)

Procedural Order 4 – June 6, 2022

Evidence

Further to Section 6 of Order-in-Council 1859/2021 and Rules 22, 23 and 26.1 of the Rules of Procedure, I order that:

All records identified as relevant by the Commission and made available to participants by way of the Participant Database shall be deemed to be in evidence and may be used by the Commission including in its final report.

Overview Reports and records referenced therein will be posted on the Commission's public website at www.ottawalrtpublicinquiry.ca as they become available. Upon being posted to the website, they shall be deemed to have been entered as exhibits to the public hearings and will form part of the evidentiary record.

Transcripts of formal witness interviews will be posted on the Commission's public website at www.ottawalrtpublicinquiry.ca beginning on June 6, 2022, or as soon thereafter as is practicable. Upon being posted to the website, they shall be deemed to have been entered as exhibits to the public hearings and will form part of the evidentiary record. Documents referenced in the witness interviews are deemed to be exhibits to those interviews and shall be made available on the website.

Pursuant to section 26.2 of the Rules of Procedure, witness interview transcripts will be made available to participants at least one week ahead of being posted on the public website to allow participants the opportunity to make a claim of privilege in respect of any portion of the transcript.

C. William Hourigan, Commissioner

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8

Appendix J:
Arbitrator Order on Application by the City of Ottawa for Privilege (June 21, 2022)

Arbitrator Order on Application by the City of Ottawa for Privilege

Counsel for the moving party: Peter Wardle, Sharon Vogel, Betsy Segal, and Catherine Gleason-Mercier, Singleton Urquhart Reynolds Vogel LLP

Overview

The moving party, the City of Ottawa (the "**City**"), seeks to redact text messages from two WhatsApp conversation chains that STV Inc. intends to produce for the Ottawa Light Rail Transit Public Inquiry (the "**Inquiry**"). The City relies on ss. 10(4) and 14(3) of the *Public Inquiries Act, 2009*, S.O. 2009, c. 33, Sched. 6 (the "**Act**"), and Procedural Order 2 made under the Act, to bring its application.

The first chain of Whatsapp messages (STV0002026) is between Scott Krieger of STV Inc. and Brandon Richards, a former Director at the City of Ottawa.

The second chain of Whatsapp messages (STV0002030) is a group chat with numerous participants, including Scott Krieger and Larry Gaul of STV Inc., John Manconi and Phil Laundry of OC Transpo, and Brandon Richards, Michael Morgan, and Duane Duquette from the City, as well as others.[1]

The City, through its counsel, proposes redactions to these two Whatsapp chains on the basis of four categories:

- Personal telephone numbers;
- Personal information and/or medical information;
- Solicitor-client privilege; and
- Litigation privilege.

Commission counsel does not oppose the City's requested redactions of the telephone numbers and the personal or medical information, but rejects any claim of solicitor-client privilege and litigation privilege over the text messages.

For the following reasons, I allow the City's application in part. The City will be permitted to redact the Whatsapp messages related to the telephone numbers and other personal or medical information. However, the City's assertions of privilege are not persuasive. I order the City to produce, unredacted, all relevant text messages for the Inquiry's review.

City's Position

The City made its submissions in a chart format.

[1] I attach as Appendix A the names, positions, and numbers of the participants to the Whatsapp messages.

For ease of reference and sake of completeness, I attach an additional column to the City's chart with my reasons rejecting each privilege claim.

Framework & Applicable Law

(a) *Public Inquiries and the Open Court Principle*

Public inquiries are conducted in accordance with the open court principle. The Supreme Court of Canada and the Court of Appeal for Ontario have emphasized the heightened importance of open hearings in a public inquiry as opposed to other legal proceedings.[2]

Section 10(1) of the Act provides the Commission with broad powers to compel witnesses and disclosure of information. Under s. 10(3) of the Act, the Commission may even require the production of information that is considered confidential or otherwise inadmissible. To protect the confidentiality of any such information, the Commission can invoke s. 10(4) of the Act to impose conditions on its disclosure.

Pursuant to s. 10(4), the Commission has set out the Privilege and Confidentiality Claims Process applicable to this Inquiry in Procedural Order 2.

(b) *Solicitor-Client Privilege*

The City submits that certain Whatsapp messages are subject to solicitor-client privilege, and therefore must be redacted before its disclosure in the Inquiry.

Solicitor-client privilege is fundamental to the operation of our justice system. It ensures that individuals are able to speak with their lawyers candidly, so their interests can be fully represented. Any documents or communications found to be solicitor-client privileged are *prima facie* inadmissible, except for a few limited exceptions. The privilege is permanent, and will remain in force after the termination of the solicitor-client relationship.

In order to prove solicitor-client privilege, a party will have to establish three elements:

(1) That there is a communication between a solicitor and their client;

(2) That the communication entails the seeking or giving of legal advice; and

(3) That the parties intended the communication to be confidential.[3]

---

[2] *Canada (Attorney General) v. Canada (Commission of Inquiry on the Blood System in Canada – Krever Commission)*, [1997] 3 S.C.R. 44, at para. 30; *Episcopal Corporation of the Diocese of Alexandria-Cornwall v. Cornwall Public Inquiry*, 2007 ONCA 20, 278 D.L.R. (4th) 550, at paras. 42, 48-49.

[3] *Solosky v. The Queen*, [1980] 1 S.C.R. 821, p. 837.

(c) *Litigation privilege*

The City also submits that some of the Whatsapp messages should be redacted due to litigation privilege.

Unlike solicitor-client privilege, litigation privilege does not depend on the involvement of counsel. A party can assert this privilege if the documents or communications in issue were made for the dominant purpose of obtaining legal advice for, or preparing for, any existing, reasonably contemplated, or anticipated litigation.[4]

As Nordheimer J. (as he was then) described in *R. v. Assessment Direct Inc.*, 2017 ONSC 5686, at para. 14, litigation privilege "protect[s] the lawyer's work product, that is, his/her theories and strategy. It is not intended to shield facts from disclosure."

Frank Marrocco, Arbitrator

[4] *Lizotte v. Aviva Insurance Company of Canada*, 2016 SCC 52, [2016] 2 SCR 521, at para. 19.

Date	Msg #	From	Unredacted text	Basis for Redactions	City's Submissions	Decision on Privilege Claim
9/07/19	959	[redacted] 7834	[redacted]	Personal Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
9/07/19	971	[redacted] 8458	[redacted]	Personal Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
9/24/19	1418	[redacted] 4457	[redacted]	Personal Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
	1419	[redacted] 1729	[redacted]			
10/27/19	2232	[redacted] 8322	Ok Michael you need to connect with me when you can today. Major developments and also the mayor has ordered zero money goes to rtg or rtm. The tap is officially off and the mayor has full authority. Also remind me now how much we held back and by groupings . Ie xxx million for vehicles etc	Litigation Privilege	The redacted texts exchanged between John Manconi and Michael Morgan concerning an ongoing legal dispute to which the City of Ottawa is a party and a legal position to be taken by the City of Ottawa in that dispute.	Denied. The text messages do not meet the dominant purpose test. They discuss next steps with respect to the Mayor's decision to withhold funds. The text messages convey facts, and do not reveal any theory or strategy related to existing, reasonably contemplated, or anticipated litigation.
	2233	[redacted] 1133	Okay. I can touch base later this evening if that works. 16M vehicles, 2M doors, 2M on board cameras			
	2234	[redacted] 8322	What's the total holdback? All items? 38 M?			
	2235	[redacted] 1133	20M hold back as noted above. Other monies we withheld and don't plan to return: 30.5M for mobility matters, 4M damages, 1M hydro, 3M scope changes, and 3M lands			
	2236	[redacted] 1133	~62M total set off which includes 20M in hold back.			
	2237	[redacted] 4557	They suspect that the train tracer application that is installed is creating the TCMS issues. We are going to run an out of service train with it disconnected shortly to confirm it does not have unanticipated consequences. If confirmed ok, will be shutting this down on entire fleet overnight.			

Date	Msg #	From	Unredacted text	Basis for Redactions	City's Submissions	Decision on Privilege Claim
11/11/19	2803	[redacted] 8322	Saw that thanks. We should not be sharing that. Tell Jim Babe his Scu do not share that information as the only people permitted to do that legally are doctor and police. Next of kin can sue us. TOCC comms just put that out and shouldn't of .	Solicitor-Client Privilege	In this redacted text, John Manconi asks that Chief Special Constable James Babe, detailed to OC Transpo, be advised of the City of Ottawa's understanding of its legal obligations concerning the public disclosure of information of a private or confidential nature.	Denied. The communication is not between a solicitor and their client.
11/15/19	3034	[redacted] 8322	Serge was asking do you need a motion to Reinstate detours. I need answer today please	Solicitor-Client Privilege	In these redacted texts, John Manconi and Phil Landry discuss obtaining legal advice from internal or external counsel for the City of Ottawa and the matter in respect of which such advice will be sought.	Denied. The communication is not between a solicitor and their client.
	3035	[redacted] 8322	And a full timeline on what has to be done to reinstate all the detours with province etc			
	3036	[redacted] 1729	I dont think so as I beleive we have delegated authority for city roads. For 417, I think letter from mayor to minister asking mto to allow bus lanes on 417. Will check with legal.			
	3037	[redacted] 8322	Yes and make it a hurry up offence. City manager and mayor are asking for it .			
	3038	[redacted] 1729	Ok, we will prepare letter for mayor to send to mto			

Date	Msg #	From	Unredacted text	Basis for Redactions	City's Submissions	Decision on Privilege Claim
11/15/19	3040	[redacted] 8322	Phil no need for letter I just need to know process timelines and approvals today please	Solicitor-Client Privilege	See immediately above	Denied. The communication is not between a solicitor and their client.
11/15/19	3042	[redacted] 1729	Ok will get info on process and timelines this morning	Solicitor-Client Privilege	See immediately above	Denied. The communication is not between a solicitor and their client.
1/30/20	4739	[redacted] 3756	[redacted]	Personal Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
1/30/20	4741	[redacted] 8322	[redacted]	Personal Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
2/18/20	5335	[redacted] 4557	[redacted]	Personal Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.

Date	Msg #	From	Unredacted text	Basis for Redactions	City's Submissions	Decision on Privilege Claim
3/09/20	5951	[redacted] 8322	Kim I asked Andrea to manage all inquiries about default Notice to RTG. I do not want us taking any media calls on this . I will explain at our 7 pm conference call. Nobody is to comment as it could lead to serious legal implications	Litigation Privilege	The redacted text sent by John Manconi concerns an ongoing legal dispute to which the City of Ottawa is a party.	Denied. The text messages do not meet the dominant purpose test. They discuss next steps with respect to the default Notice. The text do not reveal any theory or strategy related to existing, reasonably contemplated, or anticipated litigation.
	5952	[redacted] 7834	Ok			
3/16/20	6070	[redacted] 1133	Public response from RTG: https://ottawacitizen.com/news/local-news/rtg-blasts-city-for-releasing-letter-with-erroneous-allegations-during-public-health-crisis	Solicitor-Client Privilege	The redacted texts contain a discussion between John Manconi and Michael Morgan concerning OC Transpo's intention to seek advice from counsel at Singleton Urquhart Reynolds Vogel LLP and the matter in respect of which such advice will be sought.	Denied. The communication is not between a solicitor and their client.
	6071	[redacted] 8322	Yes. Saw it thanks. Get it to Sharron please			
3/18/20	6081	[redacted] 3756	[redacted]	Personal Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.

Date	Msg #	From	Unredacted text	Basis for Redactions	City's Submissions	Decision on Privilege Claim
3/20/20	6088	[redacted] 4336	[redacted]	Passenger Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
5/27/20	6418	Scott Krieger	[redacted]	Phone Number	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
8/09/20	6998	[redacted] 6965	[redacted]	Employee Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
8/09/20	6999	[redacted] 6965	[redacted]	Employee Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
8/09/20	7004	[redacted] 7244	[redacted]	Employee Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
8/09/20	7005	[redacted] 6965	[redacted]	Employee Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.
8/10/20	7008	[redacted] 6965	[redacted]	Employee Medical Information	N/A	Allowed. No dispute between counsel for the City and Commission counsel.

Date	Msg #	From	Unredacted text	Basis for Redactions	City's Submissions	Decision on Privilege Claim
8/18/20	7051	[redacted] 4557	Ok. I am prepared to give some movement on the weekends. Will work it out.	Solicitor-Client Privilege	The redacted texts contain a discussion between John Manconi and Troy Charter concerning OC Transpo's intention to seek advice from counsel at Singleton Urquhart Reynolds Vogel LLP and the matter in respect of which such advice will be sought.	Denied. The communication is not between a solicitor and their client.
	7052	[redacted] 8322	Careful need it done on a without prejudice basis and only because of Covid. We should ask Sharon			
	7053	[redacted] 4557	K. Will connect with Michael and Sharon, but difficult to separate Covid from wheel cracks.			
	7054	[redacted] 4557	Fyi. Advised no weekend relief. Will continue to work with RTM on reduction times etc. But no weekend relief from the 11 trains.			

APPENDIX A

PHONE NUMBERS	NAMES
[redacted]8458	Larry Gaul (STV Inc.)
[redacted]4557	Troy Charter (Director, Transit Operations, OC Transpo)
[redacted]8322	John Manconi (General Manager, Transportation Services, OC Transpo)
[redacted]4336	Jim Hopkins (formerly Chief Safety Officer, OC Transpo)
[redacted]1133	Michael Morgan (Director, Rail Construction Program, City of Ottawa)
[redacted]7834	Kim MacEwan (acting Manager, Business and Tech Support, OC Transpo)
[redacted]1729	Phil Landry (Director, Traffic Services, City of Ottawa)
[redacted]3756	Duane Duquette (Director, Rail Operations, City of Ottawa)
[redacted]7244	Brandon Richards (formerly Director, City of Ottawa)
[redacted]6965	Derek Moran (Director, Rail Operations, City of Ottawa)
[redacted]4457	Unidentified

Appendix K:
Order on Application by Infrastructure Ontario for Confidentiality (June 6, 2022)

Order on Application by Infrastructure Ontario for Confidentiality

June 6, 2022

Counsel for the moving party: Sarit Batner and Julie Parla, McCarthy Tetrault

Overview

The moving party, Infrastructure Ontario ("IO"), applies for confidentiality orders with respect to two categories of documents:

- Category 1: Procurement Documents; and
- Category 2: Advice to Government.

IO, through its counsel, proposes to withhold entirely approximately 2,300 Category 1 and 2 Documents from public disclosure. In practical terms, such an order would mean that none of these documents would be available to the other participants in the Inquiry, or the public. IO would permit other participants' counsel to view the documents only with a confidentiality undertaking and, even then, on a "counsel's eyes only" basis.

These reasons explain why IO's application for confidentiality orders is dismissed. In summary, IO's position is meritless and runs counter to the fundamental purposes of this Inquiry. There is no legal basis to support the sweeping claims of confidentiality asserted by IO regarding documents that go to the core of the Commission's mandate. The granting of the orders sought would substantially and adversely impact the Commission's ability to investigate thoroughly the matters it was created to review. Further, it would unjustifiably deny the public access to critical information. IO's position belies and is antithetical to the Commission's truth-seeking function.

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8

IO's Position

IO asks the Commissioner to make confidentiality orders under ss. 10(4) and 14(3) of the *Public Inquiries Act*, *2009*, S.O. 2009 c. 33, Sched 6. (the "Act") preventing disclosure of documents. It argues that the Commissioner's discretionary power to impose limits on the disclosure of confidential documents under these sections is governed by the discretionary test for a sealing order set out in *Sherman Estate v. Donovan*, 2021 SCC 25**,** at para. 38, and *Sierra Club of Canada v. Canada (Minister of Finance)*, 2002 SCC 41, at para. 53. Under that test, the party seeking the order must satisfy the court that:

1. Court openness poses a serious risk to an important public interest;
2. The order sought is necessary to prevent this serious risk to the identified interest because reasonable alternative measures will not prevent this risk; and
3. As a matter of proportionality, the benefits of the order outweigh its negative effects.

Applying this test, IO argues that the Category 1 and 2 Documents described below should be withheld entirely from the Participant Database and the public hearings.

a) *Category 1: Procurement Documents*

The Category 1 Documents that IO seeks to withhold are broadly defined as "Procurement Documents." In support of this submission, IO argues:

> During the procurement for the OLRT Project, commercially sensitive information was exchanged in confidence and with the expectation of confidence between the proponents, the City of Ottawa, and IO in its advisory role. Commercially confidential information was exchanged in, among other things, the proponents' bids and proposals, Commercially Confidential Meetings (CCM), Requests for Information (RFI), Design Presentation Meetings

> (DPM), and in the evaluation of bids and proposals by the sponsor. Confidential information, including budgetary information and risk assessment advice, was also shared between the City of Ottawa and IO in its advisory role.
>
> As a result, IO has in its possession and has produced to the Commission documents that contain confidential information related to each Proponent and the City of Ottawa. IO has also produced to the Commission documents that contain commercially sensitive information of vehicle contractors, as well as bidders for other procurements required to facilitate the OLRT1 Project procurement, including procurements for Financial Advisors and the Independent Certifier. IO executed confidentiality agreements with each of these parties concerning the information exchanged.

IO makes two arguments in support of its position that the Category 1 Documents should be withheld.

First, IO argues that it has an obligation under the Broader Public Sector Procurement Directive, the IO Procurement Policy, and its own confidentiality agreements to continually increase confidence in IO's procurement processes, including by safeguarding confidential information submitted by proponents. IO submits that protecting commercially sensitive information and preserving confidentiality agreements are important public interests of the kind protected by the *Sherman/Sierra Club* test.

Second, IO submits that it has an ongoing statutory and common law duty to protect confidential business information supplied by a third party during the procurement process, including after the award of a contract. IO cites the obligation of public institutions to protect scientific, technical, commercial, and financial information under the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F.31 ("*FIPPA*"), and the specific obligation

under s. 18(1) of *FIPPA* to protect confidential information that could prejudice Ontario's economic or financial interests or one of its institutions.

Taken together, IO submits that disclosure of the Category 1 Documents would harm each of the proponents and the Province of Ontario's financial and commercial interests. It says that project proponents submitted commercially confidential information with the expectation that confidentiality would be maintained. This includes pricing, designs, and other proprietary innovations. According to IO, the public release of this information would undermine the expectation of confidentiality governing all other current and future public procurements and, therefore, the integrity of the public procurement process as a whole because future proponents may be unwilling to share similar information.

IO further notes that many Category 1 Documents relate to third parties who do not have standing in the Inquiry to make submissions to protect their confidential information, including unsuccessful project proponents. On this basis, IO submits that it has a heightened obligation to protect the confidential information of non-participants.

b) *Category 2: Advice to Government*

The second category of documents IO seeks to withhold is broadly titled "Advice to Government." In support of this submission, IO argues:

> During the OLRT Project procurement and implementation phases, IO provided ongoing advice and recommendations to the Province of Ontario, including confidential budgetary submissions to the Treasury Board Secretariat and Management Board of Cabinet. Category 2 Confidential Documents contain advice to government and budgetary information applicable to public procurements and are exempted from public disclosure under *FIPPA*. Disclosure of the Category 2 Confidential Documents to the public and other participants would harm the Province's interests and the public interest in an open, effective and neutral public service. [Citations omitted.]

Framework & Applicable Law

a) *Public Inquiries & The Open Court Principle*

Public inquiries are conducted in accordance with the open court principle. Both the Supreme Court of Canada and the Court of Appeal for Ontario have emphasized the public's heightened interest in open hearings in a public inquiry as opposed to other court proceedings.[1] The open and public nature of the hearing helps to restore public confidence not only in the institution or situation investigated but also in the process of government as a whole.[2]

Section 10(1) of the Act provides the Commission with broad powers to compel witnesses and information disclosure. Under s. 10(3) of the Act, the Commission may require the production of information that is considered confidential or inadmissible under another Act or regulation, and that information shall be disclosed to the Commission for the purposes of the public inquiry. Under s. 10(4), the Commission may impose conditions on the disclosure of information at a public inquiry to protect the confidentiality of that information. The Privilege and Confidentiality Claims Process applicable to this Inquiry is set out in Procedural Order 2.

[1] *Canada (Attorney General) v. Canada (Commission of Inquiry on the Blood System in Canada – Krever Commission)*, [1997] 3 S.C.R. 440 at para. 30; *Phillips v. Nova Scotia (Commission of Inquiry into the Westray Mine Tragedy)*, [1995] 2 S.C.R. 97; *Episcopal Corporation of the Diocese of Alexandria-Cornwall v. Cornwall Public Inquiry*, 2007 ONCA 20 at para. 42 and 48-49.

[2] *Canada (Attorney General) v. Canada (Commission of Inquiry on the Blood System in Canada – Krever Commission)*, [1997] 3 S.C.R. 440 at para. 30.

In this case, the Commission was established by Order-in-Council 1859/2021 (the "OIC") to investigate the "commercial and technical circumstances that led to the OLRT1 breakdowns and derailments." Pursuant to s. 3 of the OIC, the Commission is specifically authorized and directed to inquire into, among other things:

(a) The decisions and actions that were taken in determining:

  i. The procurement approach the City selected for the OLRT1 Project;

  ii. The selection of the Rideau Transit Group ("Concessionaire"); and

  iii. The award of the alternative financing and procurement ("**AFP**") contract for the OLRT1 Project to the Concessionaire;

(b) Whether the City-led procurement process had an impact on the technical standards applied for the OLRT1 Project and the design, building, operation, maintenance, repair and rehabilitation of the OLRT1 Project.

IO advised the City of Ottawa and the Province of Ontario on numerous facets of the procurement process, including the selection of the procurement approach. A proper and public investigation of the matters set out in the OIC requires consideration of IO's advice to the City and Province.

b) *Interaction between the Act and FIPPA*

IO asserts that it is bound to protect the confidentiality of Category 1 and Category 2 Documents as a public institution under *FIPPA*. However, the Act is clear that the obligation to make disclosure under the Act takes priority over obligations in any other Act, which overrides IO's obligations, if any, under *FIPPA*. Thus, under s. 10(3) of the Act, the Commission "may require the provision or production of information that is considered confidential or inadmissible under another Act or a regulation and that information shall be disclosed to the commission for the purposes of the public inquiry." Pursuant to s. 64 of the *Legislation* Act, *2006*, S.O. 2006, c. 21, Sched. F, this provision must be "interpreted

as being remedial and shall be given such fair, large and liberal interpretation as best ensures the attainment of its objects."[3] As discussed above, the objective of a public inquiry is to "clear the air" through public hearings and to restore public confidence not only in the institution or situation investigated but also in the process of government as a whole.[4] Moreover, s. 10 of the OIC establishing the Commission provides the Commission with the powers described in s. 10(3) of the Act. To the extent that there is a conflict between the obligations under *FIPPA* and the Act, the Act prevails.

In any event, to interpret *FIPPA* in a manner that restricts the Commission's powers under section 10 of the Act runs contrary to the purpose of *FIPPA* itself. *FIPPA* creates a general right of access to records in the custody of or under the control of a public institution unless an exemption or exception applies.[5] Indeed, the right of access to information created by *FIPPA* generally prevails over the confidentiality provisions in other Acts; in other words, it grants access where access would otherwise be withheld.[6]

Application of the Law

a) *Category 1 Claims*

IO describes the rationale for a confidentiality order over Category 1 Documents as follows:

> In order to protect the integrity of the public procurement process, it is of the utmost importance to protect the confidentiality of the evaluation process, the commercially sensitive information of the bidders, and government information, including budgetary and risk assessments (which may also be relevant to future procurement processes). [Emphasis added.]

[3] See also *Rizzo & Rizzo Shoes Ltd. (Re)*, [1998] 1 S.C.R. 27.

[4] *Canada (Attorney General) v. Canada (Commission of Inquiry on the Blood System in Canada – Krever Commission)*, [1997] 3 S.C.R. 440 at para. 30.

[5] *FIPPA*, s. 10, s. 12-22.

[6] *FIPPA*, s. 67.

This rationale fails on the second and third steps of the *Sherman/Sierra Club* test.

I accept that on the first step of the *Sherman/Sierra Club* test, the protection of commercially and financially sensitive information submitted by procurement proponents is an important public interest.[7] Moreover, to the extent IO is bound in its various agreements to maintain the confidentiality of information relating to the procurement process, the integrity of those confidentiality agreements has also been recognized by the Supreme Court as an important public interest.[8]

On the second step of the *Sherman/Sierra Club* test, IO has the onus of establishing that reasonable alternative measures will not prevent a serious risk to an important public interest. In its submissions, IO makes this assertion:

> IO submits that there is no reasonable alternative to withholding the Category 1 Confidential Documents, which would reduce the risks identified above. Partial disclosure of the documents would not ensure the protection of commercially confidential information or the expectation of confidentiality held by the parties to a public procurement.

In my view, a bald assertion that partial disclosure or redaction is insufficient to protect confidentiality does not meet IO's onus. In that regard, I observe that, unlike IO, other participants provided the Commission with details of what precisely was confidential in their documents. IO elected not to do that and instead simply asserted a broad claim that everything in this category of documents is confidential. In any event, in the review of the

[7] *Sierra Club of Canada v. Canada (Minister of Finance)*, 2002 SCC 41, at para. 59.

[8] *Sierra Club of Canada v. Canada (Minister of Finance)*, 2002 SCC 41, at para. 55.

Category 1 Documents, there is no indication that any potentially sensitive information is inextricable from other relevant information.

On the third step, the Commission must consider whether the benefits of the order outweigh its negative effects. The negative effects of withholding the Category 1 Documents outweigh the benefits for two reasons.

First, the Category 1 Documents are directly probative of issues within the Commission's mandate. IO's principal justification for withholding these documents is that disclosure would compromise the integrity of the procurement system by publicizing information that the parties disclosed in confidence. However, as noted above, the Commission was appointed to address concerns about the integrity of the public procurement system, and the Commission is explicitly directed to examine the OLRT1 procurement process under s. 3 of the OIC.

The public has a reasonable expectation that the Commission will make specific findings on the procurement approach the City selected, the selection of the Concessionaire, the award of the AFP contract, and whether the procurement process adopted by the City had an impact on the technical standards applied. If Category 1 Documents are withheld from the public, the Commission will be impaired in its ability to lead relevant documents, question witnesses, justify its conclusions with precision and, ultimately, fulfill its mandate. Indeed, a public investigation of and report regarding the procurement process should *increase* the integrity of future public procurements.

Second, IO has not identified the specific harms that IO, the City, the Province, or the proponents will suffer if the Category 1 Documents are made public. Instead, IO identifies

two broad categories of harms: 1) the harm to proponents of revealing proprietary pricing, designs, and innovations; and 2) the harms to the City and the Province in future public procurement processes if proponents are unwilling to share confidential information.

The purported risk of harm to project proponents is minimal and avoidable. There is no indication that the financial, technical, or proprietary information submitted by the proponents over ten years ago remains sensitive today. In any event, specific financial and technical details can be redacted, as other participants have proposed.

Similarly, the disclosure of the procurement documents will not, as IO submits, "undermine the expectation of confidentiality governing all other current and future public procurements." There is no indication that any participant or proponent will be tempted to withdraw from future tenders out of concern that their information could be made public in a subsequent public inquiry. In any event, the proponents are sophisticated parties who should recognize that when bidding on a public project, there is always the possibility that the public interest may require disclosure.

Finally, the passage of time is a relevant consideration. The City's procurement practices are the same as they were during the OLRT1 procurement process over ten years ago, or they are different. If practices are the same, it is in the public interest to know why they have not changed and what recommendations would improve them. Conversely, if the procurement process is different today, the Commission will not harm current and future procurements by revealing past practices.

For these reasons, IO's application for a confidentiality order with respect to the Category 1 Documents is dismissed.

b) *Category 2 Claims*

IO describes the rationale for a confidentiality order over Category 2 Documents as follows:

> During the OLRT Project procurement and implementation phases, IO provided ongoing advice and recommendations to the Province of Ontario, including confidential budgetary submissions to the Treasury Board Secretariat and Management Board of Cabinet. Category 2 Confidential Documents contain advice to government and budgetary information applicable to public procurements and are exempted from public disclosure under *FIPPA*. Disclosure of the Category 2 Confidential Documents to the public and other participants would harm the Province's interests and the public interest in an open, effective and neutral public service. [References omitted.]

I note that IO has not articulated claims of public interest immunity or other privileges over its advice to the government but rather describes them as confidentiality claims. This rationale fails for substantially the same reasons as above, with additional considerations.

IO's advice to the government during the design and implementation of the OLRT1 procurement process falls squarely within the Commission's investigative mandate. While such advice might sometimes be treated as confidential to preserve the integrity of the procurement process, there are serious public concerns about the procurement process employed in the OLRT1 project. Any limitation on the Commission's ability to use the Category 2 Documents at a public hearing and explain in a public manner what if any concerns there are with the procurement process would curtail the Commission's ability to make clear findings and specific recommendations.

The fact that documents containing advice to the government are generally exempt from public disclosure under s. 13(1) of the *FIPPA* is not a barrier to their public use by the Commission. First, section 13(1) of *FIPPA* is permissive, stating that a head "may" withhold records containing advice to the government. Second, there are numerous exceptions to s. 13(1) under s. 13(2), and a head is required to disclose advice to the government in certain circumstances.

Third, and in any event, the Commission may require the provision or production of information that is considered confidential or inadmissible under another Act or regulation, and that information shall be disclosed to the Commission for the purposes of the Inquiry. This power must be given a large and liberal interpretation in line with its remedial objectives.[9]

Based on the foregoing, it is evident that s. 13(1) of *FIPPA* does not create a barrier to the Commission's use of the Category 2 Documents. The question instead is whether the logic of the *FIPPA* exemption for government advice applies with equal force to justify a discretionary confidentiality order under s. 10(4) of the Act. It does not.

Advice to the government is exempt from disclosure under *FIPPA* to avoid "the intolerable burden to force ministers and their advisors to disclose to public scrutiny the internal evolution of the policies ultimately adopted."[10] This exemption reflects a concern that disclosure would compromise the ability of public servants to give full and frank advice to ministers and avoids the appearance of a partisan civil service.[11] However, that logic is

[9] *Legislation Act*, s. 64.

[10] *John Doe v. Ontario (Finance)*, 2014 SCC 36, at para 44.

[11] *John Doe v. Ontario (Finance)*, 2014 SCC 36, at para 45.

not persuasive in the exceptional circumstances of a public inquiry, particularly where the Commission is explicitly directed to investigate "the decisions and actions that were taken in determining the procurement approach the City selected for the OLRT1 Project". Put simply, the fact that a document may be withheld under *FIPPA* does not support the proposition that it must be withheld in a public inquiry.

For these reasons, IO's application for a confidentiality order with respect to the Category 2 Documents is dismissed.

Disposition

The Commission is mandated to get answers for the people of Ontario regarding what happened on the OLRT1 Project and how we can prevent the problems from happening again. All participants should be committed to obtaining those answers, and it should be obvious to them that solutions will not be discovered if thousands of relevant documents are suppressed. Accordingly, IO's application for confidentiality orders covering Category 1 and 2 Documents is dismissed for the foregoing reasons.

C. William Hourigan, Commissioner

Appendix L:
Order on Application by the City of Ottawa for Confidentiality (June 10, 2022)

Order on Application by the City of Ottawa for Confidentiality

June 10, 2022

Counsel for the moving party: Peter Wardle, Singleton Reynolds

Overview

The moving party, the City of Ottawa (the "City"), applies for a confidentiality order preventing the disclosure of approximately 1,600 documents, in whole or in part, to the public and the other participants in the Inquiry.

The City's documents are highly relevant to the issues at the core of the Commission's investigative mandate, and their production outweighs the City's concerns for alleged confidentiality and loss of strategic advantage. Further, the City has failed to articulate any appreciable harm that would result from releasing this information. At its essence, the City's application is a series of broad claims to suppress documents, wholly unsupported by any compelling factual or legal basis for doing so. Further, in its application, the City has repeatedly understated the scope of the Commission's mandate. The application must be rejected. To do otherwise would prevent the Commission from carrying out its mandate.

The City has also made more targeted claims of confidentiality regarding Stage 2 Budget Documents and Terms Sheets (as defined below). Those documents must also be publicly disclosed. However, counsel is granted an opportunity to suggest specific redactions within ten days of the release of this order.

The City's Position

The City applies for a confidentiality order under ss. 10(4) and 14(3) of the *Public Inquiries Act*, *2009*, S.O. 2009 c. 33, Sched 6 (the "Act") and argues that the test for such an order is governed by the discretionary test for a sealing order set out in *Sherman Estate v. Donovan*, 2021 SCC 25**,** at para. 38, and *Sierra Club of Canada v. Canada (Minister of Finance)*, 2002 SCC 41, at para. 53. Under that test, a party seeking such an order must establish three prerequisites:

1. Court openness poses a serious risk to an important public interest;
2. The order sought is necessary to prevent this serious risk to the identified interest because reasonable alternative measures will not prevent this risk; and
3. As a matter of proportionality, the benefits of the order outweigh its negative effects.

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8

Applying this test, the City argues that four categories of documents should be entirely withheld from the participant database and public hearings:

a) Documents containing commercially confidential information relating to the procurement process (the "Procurement Documents");

b) Documents produced in the City's internal Risk, Actions, Issues, and Decisions analysis (the "RAID Documents");

c) Documents containing the findings of Transportation Research Associates ('TRA") with respect to the return to service (the "TRA Documents"); and

d) Submissions to the Independent Certifier ("IC") and all decisions of the Independent Certifier ("IC Documents").

The City also applies to redact or otherwise protect the following documents:

e) Documents containing capital budget information for Stage 2 of the OLRT Project (the "Stage 2 Budget Documents"); and

f) Any document that is identified as a Term Sheet (the "Term Sheets").

Each category is discussed separately below.

a) *Procurement Documents*

The City describes its confidentiality claim over the Procurement Documents in the following terms:

> These documents contain commercially confidential information both in the confidential proposals provided by the three proponents, as well as in the nature of the City's evaluations of these proposals. The disclosure of this information risks divulging not only commercially confidential information belonging to the City and the proponents (which information would not be shared amongst the proponents) but also risks undermining the confidential nature of the RFP process itself. As noted by [Infrastructure Ontario ("IO")] Policy, "all participants to the evaluation process of an IO procurement must treat information in bidder proposals with appropriate regard for their confidential nature, including following any instructions given to them by IO procurement staff" (IO Policy, Section 5.2). It bears noting that the other two proponents (Ottawa Transit Partners and Rideau Transit Partners) are not participants in the OLRT Public Inquiry and cannot make any confidentiality claim over their confidential proposals.

The City has identified 565 Procurement Documents to be withheld from disclosure. Broadly speaking, the Procurement Documents relate to (i) the City's decision to use a design-build-finance-maintain model, (ii) the Request for Proposals, and (iii) the Project Agreement entered into between the City and Rideau Transit Group (**"**RTG" or the "Concessionaire").

The City submits that there is no reasonable alternative to fully withholding the Procurement Documents. Moreover, the City claims that the Commission's mandate is to inquire only into the "commercial and technical circumstances that led to the OLRT1 breakdowns and derailments" and argues that the Procurement Documents are not critical to the overall mandate of the Commission because they do not speak directly to questions of "breakdowns and derailments."

b) *RAID Documents*

The City submits that the RAID Documents contain its internal assessment of various risks arising during the OLRT1 Project and the City's assessment of various actions, issues, or decisions in relation to those risks. It has identified 911 RAID Documents.

Without claiming litigation privilege, the City argues that disclosing the RAID Documents would put the City at a legal and commercial disadvantage vis-à-vis the Concessionaire, RTG, in existing and future disputes. It claims that the release of the RAID Documents could result in RTG "obtaining an unfair insight into the City's view of its risks on the Project, thereby giving details not otherwise known by RTG for any additional claims by RTG against the City." The City submits that disclosure would compromise its position in disputes currently before the Superior Court, including those that remain at the IC stage but could later be appealed to the Superior Court.

Finally, the City submits that the RAID Documents are not critical to the Commission's overall mandate to inquire into the "commercial and technical circumstances that led to the OLRT1 breakdowns and derailments."

c) *TRA Documents*

The City retained TRA after the September 2021 derailment to assess and advise on the return to service. It has identified 6 TRA Documents. It submits that the information in the TRA Documents is commercially sensitive and contains confidential information regarding the City's assessment concerning the derailments and RTG's return to service. Given the City's dispute with RTG over the derailments, the City submits that disclosure would prejudice the City's position in its ongoing litigation against RTG.

In addition, the City submits that these documents are not critical to the overall mandate of the Commission to inquire into the "commercial and technical circumstances that led

to the OLRT1 breakdowns and derailments," particularly because the TRA Documents deal with the return to service post derailments, rather than the commercial and technical circumstances leading to the breakdowns and derailments.

d) *IC Documents*

The City submits that all submissions to the IC and all decisions of the IC contain commercially sensitive information relating to the various disputes between the City and RTG. It has identified 44 IC Documents. The City states that "public disclosure of these documents will prejudice the parties in the next steps relating to these claims."

The City further submits that the IC Documents are not critical to the overall mandate of the Commission and that there is no reasonable alternative to fully withholding the IC Documents identified by the City.

e) *Stage 2 Budget Documents*

The City submits that the Stage 2 Budget Documents contain commercially sensitive information relating to the capital budget for Stage 2 of the OLRT Project. It argues that this information is irrelevant to the Commission and remains confidential because Stage 2 is ongoing. The City proposes to redact the sensitive information before the Commission makes these documents public. It has identified 9 Stage 2 Budget Documents.

f) *Term Sheets*

In supplemental submissions dated May 9, 2022, the City asserts confidentiality over all Term Sheets containing commercially sensitive information. It submits that these documents "contain commercially confidential information as between the signatories, the public disclosure of which will disclose commercial negotiations and which can give the City's other contracting parties a competitive advantage in any future negotiations." The City does not specify whether it seeks to withhold the Term Sheets or redact certain portions.

Open Court Principle and the Mandate of the Commission

a) Public Inquiries and the Open Court Principle

The relationship between public inquiries and the open court principle was considered in my order on the application by IO for a confidentiality order. I will not repeat that analysis here. However, there are a few points worth emphasizing.

First, the Supreme Court of Canada and the Court of Appeal for Ontario have emphasized the public's heightened interest in open hearings in a public inquiry as opposed to other court proceedings.[1]

Second, the open and public nature of the hearing helps to restore public confidence not only in the institution or situation investigated but also in the process of government as a whole.[2]

Third, I have the power under s.10(3) of the Act to require the production of information that is considered confidential or inadmissible under another Act or regulation. That information must be disclosed to the Commission for the purposes of the public inquiry.

b) Mandate of the Commission

The Commission's broad mandate is found in the Order in Council ('OIC") that created this Inquiry. The language in that OIC is clear and straightforward. Yet, the submissions by the City on its application appear to suggest that the mandate is more limited and, on this basis, it should be permitted to withhold relevant documents. To clarify, the Commission is explicitly tasked with inquiring into, among other things, the following:

(a) The decisions and actions that were taken in determining:

  i. The procurement approach the City selected for the OLRT1 Project;

  ii. The selection of the Rideau Transit Group ("Concessionaire"); and

  iii. The award of the alternative financing and procurement ("AFP") contract for the OLRT1 Project to the Concessionaire;

(b) Whether the City-led procurement process had an impact on the technical standards applied for the OLRT1 Project and the design, building, operation, maintenance, repair and rehabilitation of the OLRT1 Project.

(c) Whether the AFP contract between the City and the Concessionaire ("Concession Agreement") was adequate to ensure that the design, building, operation, maintenance, repair and rehabilitation of the OLRT1 Project was carried out in accordance with all applicable laws and industry standards, including performance and safety;

---

[1] *Canada (Attorney General) v. Canada (Commission of Inquiry on the Blood System in Canada – Krever Commission)*, [1997] 3 S.C.R. 440 at para. 30; *Phillips v. Nova Scotia (Commission of Inquiry into the Westray Mine Tragedy)*, [1995] 2 S.C.R. 97; *Episcopal Corporation of the Diocese of Alexandria-Cornwall v. Cornwall Public Inquiry*, 2007 ONCA 20 at para. 42 and 48-49.

[2] *Canada (Attorney General) v. Canada (Commission of Inquiry on the Blood System in Canada – Krever Commission)*, [1997] 3 S.C.R. 440 at para. 30.

(d) Whether the Concessionaire and its subcontractors did carry out the design, building, operation, maintenance, repair and rehabilitation of the OLRT1 Project in accordance with applicable laws and industry standards; and

(e) Whether the City's oversight of the Concession Agreement and the OLRT1 Project, including its audit, evaluation, inspection and monitoring of the OLRT1 Project, was adequate to ensure compliance with the Concession Agreement and any applicable laws and industry standards. The above includes an inquiry into the decisions that led to the declaration that the OLRT1 Project had reached substantial completion and any associated testing carried out to support such declaration.

Analysis of Claims

a) *Procurement Documents*

This argument fails for substantially the same reasons that the application by IO for a confidentiality order for procurement documents was rejected in my previous order, and this decision should be read in conjunction with those reasons. In addition to those reasons, I note the following.

On the second step of the *Sherman/Sierra Club* test, there is no indication that redaction or partial disclosure would not provide a reasonable alternative, and there is no evidence to suggest that the confidential information is inextricable from other relevant information. The City's bald submission that confidentiality can only be preserved by fully withholding the Procurement Documents runs counter to a public inquiry's open and public nature.

On the third step, the Commission must consider whether the benefits of the order outweigh its negative effects. In this case, the negative effects of withholding the Procurement Documents would outweigh the benefits for two reasons. First, contrary to the City's submission, the Procurement Documents are directly probative of issues within the Commission's mandate. Consequently, the suppression of the Procurement Documents will impair the Commission's ability to fulfill its mandate. Second, the City has not identified any specific harm that could arise from disclosing the information.

For these reasons, the City's application for a confidentiality order concerning the Procurement Documents is dismissed.

b) *RAID Documents*

The City seeks to suppress the production of the RAID Documents principally on the basis that disclosure would allow RTG to commence additional new claims against the City or give RTG an advantage in existing disputes. It adds that the RAID Documents are not critical to the Commission's overall mandate because they are not directly relevant to the

"commercial and technical circumstances that led to the OLRT1 breakdowns and derailments." The City does not claim litigation privilege over these documents.

The City's relevance argument is meritless. Among other provisions, paragraph 3(e) of the OIC authorizes and directs the Commission to inquire into "Whether the City's oversight of the Concession Agreement and the OLRT1 Project, including its audit, evaluation, inspection, and monitoring of the OLRT1 Project, was adequate to ensure compliance with the Concession Agreement and any applicable laws and industry standards." The adequacy of the City's processes for identifying and mitigating various risks associated with the OLRT1 Project is clearly relevant to the Commission's mandate.

Applying the *Sherman/Sierra Club* test, the City has not specifically identified the public interest at stake in the confidentiality of the RAID Documents. The Commission understands the City to mean that disclosure would infringe the City's fair trial and discovery rights in its litigation with RTG. While the case law recognizes fair trial rights as an important public interest,[3] the Commission notes that if the RAID Documents are sufficiently relevant that they could prejudice the City in its disputes with RTG, and the documents are not otherwise privileged, then it is unlikely that disclosure within this Inquiry will prejudice the City's fair trial rights in any way.

The City argues that the RAID Documents could be used to commence new claims against the City, but it is unclear how this could be done, nor whether this engages a "public interest" beyond the isolated disputes between the parties. In any event, for the purposes of the *Sherman/Sierra Club* test, even if I assume that the first step is met, the City's application ultimately fails on the second and third steps.

In the second step, the City has not explained why reasonable alternative measures could not preserve the confidentiality of the RAID Documents. It must be remembered that the burden is on the City to show that the order sought is "necessary", in the sense that it is the least restrictive measure available.[4]

In the third step, the City has failed to meet its burden to show that the harms of disclosure outweigh the benefits. As the Supreme Court emphasized in *Sherman*, at para. 35, an applicant seeking a confidentiality order "cannot content [itself] with an unsubstantiated claim." Here, the City does not specify how RTG could use the RAID Documents to commence additional claims against the City, nor how disclosure could give RTG an advantage in existing disputes. Without a clear idea of the potential harms, the heightened public interest in open Commission hearings outweighs the harms the City would allegedly suffer if RTG used the RAID Documents in different litigation.

Based on the foregoing, the City's application for a confidentiality order regarding the RAID Documents is dismissed.

[3] *Sierra Club,* at para. 50-55.

[4] *Sherman*, at para. 105

c) *TRA Documents*

The City seeks to withhold the TRA documents on the following basis:

> The City submits that the information in the TRA Documents is commercially sensitive and contains confidential information regarding the City's assessment in relation to the derailments and RTG's return to service. As such, these documents should not be disclosed to the public. In particular, given the City's current dispute with RTG over the derailments, the City submits that disclosure of TRA's assessment of the derailments and RTG's return to service risks would prejudice the City's position in its ongoing litigation against RTG. It bears noting that TRA has attended various Transit Commission meetings and answered questions by Commissioners, but its final findings in its reports have not been made public on the basis of the concerns outlined above.

The City also submits that the TRA Documents are not critical to the overall mandate of the Commission because they deal with the return to service post-derailment rather than the "commercial and technical circumstances that led to the OLRT1 breakdowns and derailment."

The City's argument that the TRA Documents are not relevant is unpersuasive. Based on the Commission's review, five of the six TRA Documents identified by the City do not contain commercially or financially sensitive information. The remaining TRA Document (DocID #COW104836) is a TRA Technical Briefing presentation containing a root cause analysis of the derailments and recommendations for corrective actions. The TRA Documents, and the Technical Briefing, in particular, are directly relevant to the Commission's mandate. Indeed, it appears that TRA's mandate overlapped with the Commission's mandate.

The City does not explain how the disclosure of the TRA Documents would "prejudice the City's position in its ongoing litigation against RTG." For these reasons, the City has not met its burden to establish that the harms of disclosure outweigh the benefits.

d) *IC Documents*

The City seeks to withhold the IC Documents because they contain commercially sensitive information relating to the various disputes between the City and RTG and that public disclosure would "prejudice the parties in the next steps relating to these claims." Moreover, the City claims that the IC Documents are not critical to the Commission's overall mandate. The only remedy the City submits is to withhold the IC Documents entirely. Notably, the City does not assert mediation, arbitration, or settlement privilege in connection with the IC Documents.

On the question of relevance, there can be no doubt that the IC Documents are relevant and probative of issues within the Commission's investigative mandate. The IC is charged with dispute resolution under Schedules 6 and 27 of the Project Agreement. The City and RTG have submitted various disputes to the IC arising from cost overruns and delays. The information submitted to the IC, and the IC's determinations, are pertinent to the Commission's mandate.

Beyond its bald assertion that disclosure would "prejudice the parties in the next steps relating to these claims," the City does not specify the harm that would be suffered if the IC Documents were disclosed publicly. It is unclear how disclosing these documents would prejudice the "next steps" in the litigation between the parties when the parties have already exchanged their submissions before the IC or in other related litigation. The City has failed to discharge its burden to demonstrate that any harm would result from disclosure.

e) *Stage 2 Budget Documents*

The City proposes to redact certain commercially sensitive information contained in the Stage 2 Budget Documents. Based on the Commission's review, these documents include some information related exclusively to Stage 2 that is not relevant for the Commission's purposes and may be safely redacted. However, the Stage 2 Budget Documents also include relevant information related to Stage 1, which should not be redacted.

I order that the City provide, within ten days of the date of this order, proposed redactions of the commercially sensitive information, subject to further review by the Commission.

f) *Term Sheets*

In supplemental submissions dated May 9, 2022, the City asserts confidentiality over all "Term Sheets" containing commercially sensitive information. The City identifies DocID# COW0157107 as an example but has yet to identify any other Term Sheets in its document population. The City submits that these documents "contain commercially confidential information as between the signatories, the public disclosure of which will disclose commercial negotiations, and which can give the City's other contracting parties a competitive advantage in any future negotiations." The City does not specify whether it seeks to withhold the Term Sheets or redact portions.

Given the lack of information provided by the City regarding this claim, I am dismissing it without prejudice to the right of the City to file further written submissions, which identify the relevant documents and proposed redactions of the commercially sensitive information. Those submissions are due within ten days of the date of this order.

Disposition

The City's application for a confidentiality order over the first four categories of documents is dismissed. However, appropriately limited redactions may be applied to Stage 2 Budget Documents, and the City retains the right to deliver further submissions with respect to the Term Sheets (including proposed redactions) for further review and consideration by the Commission. Written submissions regarding these proposed redactions must be filed with the Commission within ten days of the date of this order.

C. William Hourigan, Commissioner

Appendix M:
Order on Application by Rideau Transit Group General Partnership for Confidentiality (June 16, 2022)

Order on Application by Rideau Transit Group General Partnership for Confidentiality

The Rideau Transit Group General Partnership ("**RTG**") and its associated entities (collectively the "**RTG Parties**")[1] bring this application for a confidentiality order under ss. 10(4) and 14(3) of the *Public Inquiries Act*, *2009*, S.O. 2009 c. 33, Sched 6. (the "**Act**") with respect to "all documents that were created by or for the arbitral proceeding between Alstom Transport Canada ("**Alstom")** and OLRT Constructors ("**OLRT-C**") (the "**Arbitration**").

Alstom and OLRT-C are parties to a subcontract (the "**Subcontract**") whereby Alstom agreed to design, engineer, manufacture, test, commission, and warrant the light rail vehicles for the OLRT1 Project. In 2020, Alstom and OLRT-C submitted certain issues under the Subcontract for arbitration before Mr. Stephen Morrison (the "**Arbitrator**"). The Arbitration has concluded, and a decision has been rendered by the Arbitrator.

In their submissions dated April 14, 2022, the RTG Parties applied for a confidentiality order over the Arbitration materials. Alstom opposed the confidentiality order over the Arbitration materials. The Commission invited the RTG and Alstom to provide further written submissions in respect of the Arbitration material.

On June 14, 2022, the RTG Parties withdrew their claims to confidentiality over the Arbitration Documents while maintaining claims for confidentiality only over project- financial and entity-financial information contained in the Arbitration Documents. The RTG Parties have agreed to provide redactions to the sensitive financial information on a timely basis.

The RTG Parties' application to apply limited redactions to the Arbitration Documents is granted. The RTG Parties shall be permitted to make reasonable redactions and are directed to do so as soon as possible. These directions are without prejudice to Commission counsel objecting to the scope or appropriateness of the redactions; counsel will make good faith attempts to resolve any such disputes, failing which the Commissioner will decide.

The rest of the application is dismissed.

C. William Hourigan, Commissioner

[1] ACS RTG Partner Inc., SNC RTG Partner Inc., EllisDon RTG Partner Inc., OLRT Constructors, an unincorporated venture consisting of Dragados Canada Inc., EllisDon Corporation and SNC- Lavalin Constructors (Pacific) Inc., and Rideau Transit Maintenance General Partnership, ACS RT Maintenance Partner Inc., ProTrans RT Maintenance Partner Inc., and EllisDon RT Maintenance Partner Inc.

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8

Appendix N:
OLRT Commission Hearings Schedule (June 22, 2022)

OLRT Commission Hearings Schedule

Please note: The hearings schedule is subject to change.

DAY 1 – June 13

1. John Jensen (City of Ottawa) – Morning
2. Riccardo Cosentino (Rideau Transit Group) – Afternoon

DAY 2 – June 14

3. Rob Pattison (Infrastructure Ontario) – Morning
4. Marian Simulik (City of Ottawa) – Afternoon

DAY 3 – June 15

5. John Traianopoulos (Infrastructure Ontario) – Morning
6. Nancy Schepers (City of Ottawa) – Afternoon

DAY 4 – June 16

7. Yves Declercq (Alstom Transport Canada Inc.) – Morning
8. Manuel Rivaya (OLRT Constructors) – Afternoon

DAY 5 – June 17

9. Antonio Estrada (Rideau Transit Group) – Morning
10. Rupert Holloway (OLRT Constructors) – Afternoon

Ottawa Light Rail Transit Commission
2 Bloor Street East, Suite 1802
Toronto, ON M4W 1A8

Commission d'enquête sur le réseau de train léger sur rail d'Ottawa
2, rue Bloor Est, bureau 1802
Toronto (Ont.) M4W 1A8

DAY 6 – June 20

11. Remo Bucci (Deloitte) – Morning
12. Michael Burns (Thales Canada Inc.) – Afternoon

DAY 7 – June 21

13. Lowell Goudge (Alstom Transport Canada Inc.) – Morning
14. Jacques Bergeron (OLRT Constructors) – Afternoon

DAY 8 – June 22

15. Bertrand Bouteloup (Alstom Transport Canada Inc.) – Morning
16. Parsons/Delcan Panel – Thomas Fodor, Mike Palmer, Jonathan Hulse – Afternoon

DAY 9 – June 23

17. Richard Holder (City of Ottawa)

DAY 10 – June 24

18. Matthew Slade (OLRT Constructors/Rideau Transit Maintenance) – Morning
19. Yang Liu (Alstom Transport Canada Inc.) – Afternoon

DAY 11 – June 27

20. Michael Morgan (City of Ottawa) – Morning
21. Brian Guest (Boxfish) – Afternoon

DAY 12 – June 28

22. Thomas Prendergast (STV Inc.) – Morning
23. John Manconi (City of Ottawa) – Afternoon

DAY 13 – June 29

24. Peter Lauch (Rideau Transit Group) – Morning
25. City of Ottawa Panel – Catherine McKenney, Allan Hubley, Sarah Wright-Gilbert, Diane Deans – Afternoon

DAY 14 – June 30

26. Derek Wynne (SEMP) and Sergio Mammoliti (TUV Rheinland/ISA) – Morning
27. Jim Watson (City of Ottawa) – Afternoon

DAY 15 – July 4

28. Steve Kanellakos (City of Ottawa) – Morning
29. Monica Sechiari (Altus Group/IC) – Afternoon

DAY 16 – July 5

30. Larry Gaul (STV Inc.) – Morning
31. Troy Charter (City of Ottawa) – Afternoon

DAY 17 – July 6

32. Richard France (Alstom Transport Canada Inc.) – Morning
33. Brandon Richards (City of Ottawa) – Afternoon

DAY 18 – July 7

34. Mario Guerra (Rideau Transit Management) – Morning
35. Nicolas Truchon (Rideau Transit Group) – Afternoon