

**IN THE MATTER of a Commission of Inquiry Respecting the Ottawa Light Rail Transit Project  
by Order in Council 1859/2021**

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**Opening Statement of Alstom Transport Canada Inc.**  
6 June 2022

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**Commissioner:**  
The Honourable C. William Hourigan

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1. Alstom Transport Canada Inc. (“Alstom”) is pleased to provide this Opening Statement for the Ottawa Light Rail Transit Public Inquiry established by Order in Council 1859/2021 on December 16, 2021, with respect to the Ottawa Light Rail Transit system, otherwise known as the Ottawa Confederation Line Light Rail Transit Project (“OLRT1” or the “Project”).
2. This inquiry is tasked with investigating the commercial and technical circumstances that led to the OLRT1 breakdowns and derailments.
3. Public safety is paramount to Alstom. Following the two mainline derailments in August and September 2021, Alstom marshalled the full extent of its global engineering expertise to thoroughly investigate both occurrences. While investigations are ongoing, Alstom, Rideau Transit Maintenance (“RTM”), and the City of Ottawa (the “City”) have already taken extensive actions to optimize maintenance and operations activities to avoid similar derailments in the future. Additionally, Alstom continues to investigate necessary modifications to the track infrastructure to improve the wheel/rail interface to reduce vibrations that are a likely source of the first derailment, among other corrective and preventative actions.
4. As the Vehicle Supplier and Maintenance Subcontractor, Alstom has been front and center in the Ottawa media, and the target of many serious allegations about its performance and impact on the Project. Alstom is committed to supporting the work of the Commission and is hopeful that a thorough and proper investigation of the commercial and technical circumstances surrounding the procurement, design, build, and operation of OLRT1 will ultimately identify the true causes of the reliability issues the System has faced.
5. It is no secret that the System has faced reliability issues, including the LRVs supplied by Alstom. There are always teething problems for any new light rail system. Yet the challenges faced by the Project at the start of Revenue Service have been exacerbated by three important factors. First, construction delays left too little time for proper

testing and integration of the System. Instead of taking the time necessary to properly integrate, test, and commission the System, earlier delays were mitigated by compressing the schedule for these critical steps, and ultimately modifying Trial Running criteria to allow the System to be put into Service. Second, operational decisions have been made during Revenue Service with a keener regard to outward public appearances than operational integrity, reliability, and asset preservation. Third, the relationship between the City, Rideau Transit Group (“RTG”), RTM, and Alstom, which became strained during the fraught design-build period, has negatively impacted the System’s overall reliability during Revenue Service operations.

## **1.0 About Alstom**

6. Alstom is a subcontractor to OLRT-Constructors (“OLRTC”) for the design and supply of the LRVs to the Project. Alstom is also a subcontractor to RTM for maintenance services for the LRVs and a significant portion of the System Infrastructure.
7. At the time Alstom was awarded the LRV supply subcontract, Alstom employed 90,000 people in 100 different countries. Alstom has had a presence in Canada for more than 70 years, as a supplier of various train related systems. For example, Alstom’s global center of excellence for advanced passenger information, safety, communication and entertainment systems was (and remains) located in Montreal, and Alstom had more than 2,000 employees in Canada at the time the Contract was signed. Today, Alstom has nearly 4,300 employees in Canada, and more than 150,000 vehicles in commercial service worldwide.
8. While OLRT1 was Alstom’s first rolling stock project in Canada, Alstom has built more than 7,000 metro cars in the United States and has the largest rolling stock manufacturing plant in North America. There are currently 2,400 Citadis trams and LRVs in service in more than 50 cities, globally, and 3,000 Citadis on order.
9. Alstom is also an experienced P3 contractor. Prior to OLRT1, Alstom had experience in P3 projects across the globe, including:

- a) Barcelona LRT Phase 1: Spain 2000, delivery of 19 Citadis LRVs;
  - b) Barcelona LRT Phase 2: Spain 2003, delivery of 18 Citadis LRVs;
  - c) Jerusalem's LRT Line 1: Israel 2004, delivery of 46 Citadis LRVs;
  - d) Reims LRT Line 1: France 2006, delivery of 18 Citadis LRVs;
10. Alstom had and has the right experience for this Project, and marshalled its engineering resources from around the world to execute its work for the OLRT1.

## **2.0 Alstom was a late addition to RTG's proposal**

11. Alstom initially sought to be qualified to bid for the Project as part of a P3 consortium with civil contractors, but the consortium was not successful.
12. Subsequently, Alstom approached two of the qualified consortiums to be their rolling stock supplier, but neither accepted. Alstom turned its focus to other projects. However, in June 2012, well into the negotiation stages of the Request for Proposal phase of the Project, Alstom was approached by RTG, and invited to submit a Proposal to become its rolling stock supplier. By that time, RTG's original vehicle supplier, CAF, had been disqualified by the City.
13. In July 2012, Alstom met with RTG and the City to present, in part, Alstom's proposed vehicle solution. Alstom's proposed vehicle was derived from Alstom's Citadis line of vehicles delivered for projects in Istanbul, Turkey and Paris. The Citadis is a tram-train Vehicle, which is a hybrid Vehicle intended for urban-based tram operations, but capable of travelling at high speed out to suburban areas, like a train. It is also 100% low floor, a feature unique to Alstom's Citadis, for this kind of hybrid application.
14. Given the late stage of the procurement process, Alstom's proposal was constrained by design choices required by RTG to address the City's specifications and cost parameters. For example, RTG's design intent and ridership requirements demanded a

Vehicle that was 45 meters long, so that two vehicles coupled together would be compatible with a 90-meter platform design, whereas the City's specification would have required a 120-meter platform to be compatible with other pre-existing vehicle designs. At the time, there was no light rail product in North America that considered such a long consist for a single vehicle. To this day, the Citadis vehicles operating on the Ottawa Confederation line are the longest LRVs operating in North America.

15. Time was tight. RTG was required to submit its tender to the City by September 2012, giving Alstom only three months to prepare a full vehicle supply bid to be incorporated into RTG's Project bid to the City. This is significantly less than industry norms, which is typically a 9-to-18-month tender process for rolling stock manufacturers.
16. The City's specific performance requirements necessitated several changes to Alstom's Citadis platform. First, Ottawa was the first Canadian City to require LRVs to meet American Public Transportation Association ("APTA") standards. European standards are far more typical in Canada. This meant changes to the Citadis platform for fire safety standards, shell design, and height and weight dynamics, for example. Second, the City wanted an LRV with metro/subway level passenger capacity, which did not exist anywhere. Typical LRV capacity is about 10,000 passengers per hour per direction ("PPHPD"). The City required 24,000 PPHPD. That requirement necessitated longer LRVs, to fit more passengers, and faster speeds with significantly reduced headway (the distance between two trains operating on the line). The short headways could only be achieved by a fully automated system, with a highly aggressive acceleration and braking profile.
17. No supplier in the world had an LRV in their stable that could achieve the City's requirements "off the shelf". All the proponents for the Project would have had to modify their existing Vehicle designs to meet the City's goals, which are at the absolute edge of what an LRV can do.

18. Alstom continued to refine its bid proposal for RTG after the July 2012 meeting with the City and on September 10, 2012, RTG submitted its proposal to the City, including Alstom as its supplier. On December 19, 2012, the City awarded the Project to RTG and on February 12, 2013, the City and RTG executed the Project Agreement to design, build, finance and maintain the Project.

### **3.0 Construction delays compressed the schedule, with significant impacts down the road**

19. Alstom's design of the LRVs required certain decisions to be taken by the City during the design review process, which is a typical process for any LRV supply. However, the City was more than a year late finalizing its design choices. The City's delay directly impacted the start of production for Alstom's first prototype Vehicles by about 12 months.
20. The impact of the City's early delay was far reaching because it in turn delayed Vehicle validation testing, which is required to validate the engineering design of the LRVs to ensure they meet the performance requirements. Typically, serial manufacturing of Vehicles would only start after validation testing is complete. On this Project, in an effort to mitigate delays, Alstom, OLRTC, RTG, and the City agreed to start serial manufacturing in parallel to validation testing. The risk, known and accepted by all the parties, was that engineering issues identified during validation testing would result in retrofits to Vehicles already produced. Predictably, that is exactly what happened on this Project.
21. The delay to the start of validation testing was exacerbated by delay to the Project's Test Track. To save time and money, OLRTC suggested that Alstom move its testing programme to Ottawa and perform necessary dynamic testing on a portion of the mainline designated as the Test Track. Alstom agreed, but OLRTC then failed to provide the Test Track on time for Alstom to advance its testing schedule. Other infrastructure delays, like the late and incomplete MSF and the late and incomplete overhead catenary system ("OCS") also negatively impacted Alstom's ability to manufacture and test LRVs.

22. Other validation tests that required access to the entire mainline were delayed even further because of the late completion of System infrastructure. The result was a compressed testing and integration period for not only the LRVs but the entire System. In particular, Thales's wayside CBTC equipment was only certified complete in September 2018, the track and OCS were certified as fit for use in October 2018, and the tunnel only in November 2018.
23. Only after OLRTC confirmed the fitness of the Track System and OCS in late 2018, was Alstom able to use the full track and travel up to mainline speed. But even then, Alstom was not the only party performing testing. For example, Thales, OLRTC's signalling subcontractor, needed access to the track to perform its testing, and OC Transpo required access to the track and LRVs to train its operators.
24. Notwithstanding all this activity, the inspection certification letters for the System infrastructure acknowledged that construction was not yet complete, deficiencies had to be addressed, concurrent construction activities would have an impact on the serviceability of the track, and OCS sections in the tunnel required adjustments, among other items. This was no way to prepare for Revenue Service.
25. In addition to these infrastructure delays, Alstom's own production fell behind schedule, with the result that at the time the parties were ramping up toward Revenue Service Availability, the testing and commissioning schedule was highly compressed, and made more challenging by the number of Vehicle retrofits required to be performed because of the late Vehicle validation.

#### **4.0 RTG and the City agreed to put the System into Service before it was ready**

26. Substantial Completion was required before Trial Running could start. In July 2019, the City and RTG entered into an agreement which allowed RTG to achieve Substantial Completion of the System, even though certain elements of the Work were not complete.

27. Alstom was not involved in determining the requirements for Trial Running or whether any particular requirement for Trial Running was met and was only provided with the pass or fail status of the day after the determination had been made by RTG, RTM, OLRTC, the City and the Independent Certifier. All the parties were aware that the System was not ready for Revenue Service but the City and RTG pressed ahead anyway. Rather than further delay the start of Revenue Service, the City preferred to start the System by September 14, 2019, no matter what. Moreover, the City refused to ramp up Revenue Service through a soft launch, an industry standard operational approach to allow a new System to shake out operational and maintenance issues before taking on the full capacity of ridership.
28. For RTG and OLRTC, the motivation was financial. The consortium was accumulating millions of dollars in delay liquidated damages tied to the achievement of Revenue Service Availability. On the other side of the ledger, RTG needed to achieve RSA to earn a significant lump sum payment, and start earning their monthly service payment for maintenance services.
29. OLRTC's own Project Director, Matthew Slade, acknowledged that RTG and the City fully understood the added burden on the maintenance teams of starting the System before it was ready. Mr. Slade has candidly acknowledged that RTG "was better off stopping the bleeding on the OLRTC side, and if it means we have to suffer a bit of bleeding on the RTM side then so be it."<sup>1</sup> The decision was not a difficult one to make for RTG. Under the Maintenance Subcontract with Alstom, RTM passes on almost 100% of the Deductions it incurs to Alstom.
30. Alstom was never consulted about RTG and the City's decision to prematurely enter Revenue Service.
31. The result was predictable. In the first two months of Revenue Service, the City levied more than \$15 million in deductions against RTG, for defects and deficiencies, many of

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<sup>1</sup> Ottawa Light Rail Commission, Transcript of Matthew Slade, dated 5 May 2022, pg. 139, lines 5-8.

which were known to the City and on the Minor Deficiency List approved by it prior to Substantial Completion and Revenue Service.

#### **5.0 Deficiencies in the track design have caused excessive stress on the vehicles**

32. The August 2021 derailment occurred as a result of a failed axle. While axle failures can occur, it occurred on this Project at an unprecedented rate, far faster than any previously observed failures in other Alstom products currently operating across the globe. Early investigation results indicate that non-compliant track design has contributed to excess stress on the Vehicles that has led to this accelerated axle failure rate.
33. Following the first derailment, in collaboration with the City and RTG, Alstom has implemented a rigorous containment plan to ensure the continued safe operation of the System, while a thorough assessment of these axle failures is completed to identify the root cause.
34. Alstom's root cause analysis was performed by its highly specialized bogie engineers at its Centre of Excellence in Le Creusot, France. Following a months-long, in-depth investigation, Alstom has produced a detailed report, which it has submitted to RTG and the City, though further analysis continues. Notably, Alstom's report demonstrates that the design of the track generates excessively high transversal stress on the vehicles during operation, particularly in certain curves, that causes excessive fretting under the bearing of the axle. This fretting likely led to contact wear, creating axle clearance within the bearing of the assembly, that ultimately leads to axle failure.

#### **6.0 Short-sighted operational decisions and a lack of trust and cooperation between the parties have impacted the System's overall reliability**

35. The City's administration of the Contract, and in particular, its interpretation and application of the Deduction regime has been punitive and counterproductive. In particular, the City's decisions have focused on maximizing Deductions against RTM and Alstom, without regard to the negative impact such decisions have on the short- and

long-term conditions of the asset. Disputes with the City regarding past Deductions have still not been resolved, almost three years into Revenue Service, with no prospect of resolution in sight. This is no way to manage a thirty-year relationship.

36. The Project Agreement disincentivizes the City from operating the System with any regard to asset preservation, or the long-term impacts on the physical System. For example, the City initially refused to implement the Vehicle's reduced braking profile in inclement weather, resulting in an excessive number of wheel flats, requiring trains to exit service for premature wheel truing. In fact, the result was a net financial benefit to the City, which enjoyed the benefit of Deductions from the Monthly Service Payment for the lost kilometers when trains are out of service, a cost borne by Alstom. The cost of the corrective maintenance for those wheel flats is also borne by Alstom, and the long-term cost of early wheel replacement will ultimately be borne by Alstom. While the City benefits from the Deductions, the public suffers the impact to availability.
37. The City has made other short-sighted and arbitrary choices that have directly impacted the reliability of the System. For example, it has insisted on automatic door controls during extremely cold and hot days, during which doors remain open to the elements during extended dwell times at terminus stations, making it impossible for onboard HVAC systems to function properly.
38. The City refused to allow Stage 2 Vehicles onto the mainline to perform burn-in and acceptance testing, which if allowed, would have added spare Vehicles to the operating fleet. It similarly refused to allow Vehicles with original, but uncracked wheels, from operating in Revenue Service, even though an acceptable containment plan had previously been reviewed and approved by the City and implemented by Alstom.
39. More recently, the System has finally started to demonstrate its full potential, with average availability of more than 99% over the last two months. This improvement is a direct result of the parties' efforts to reorient their focus away from contractual

positioning, to the greater public good, allowing what is best for the ridership to drive decision making.

40. Alstom is optimistic that this Public Inquiry will be a catalyst for continued positive change and looks forward to assisting the Commission in its investigation into the commercial and technical circumstances that have given rise to the breakdowns and derailments on the Confederation Line.

**All of which is respectfully submitted by Alstom Transport Canada Inc. this 6<sup>th</sup> day of June 2022.**

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