

Document 4 – OLRT Public Inquiry

Lessons Learned – Technical Items

The following is a summary of the principal technical changes that have been undertaken on Stage 1 infrastructure, Stage 1 and Stage 2 Alstom Citadis vehicles, and/or lessons learned that have been applied to Stage 2 infrastructure. This list provides a look at the major changes that have been made but is not an exhaustive listing of every change.

1. **Vehicle Passenger Doors:** Software modifications were completed which improved the system reaction to doors being held open (overcurrent) and enhanced the ability for operators to reset doors. Additionally, changes to the isolation mechanism were made to help operators more easily and quickly lock out and isolate malfunctioning doors.
2. **Train Control & Management System (TCMS) Software:** An issue arose with onboard networking of the vehicles that required the Operator to reset the control system. This had the effect of requiring the onboard systems to be reset and for customers to switch trains. This issue has been resolved through a software update.
3. **Vehicle Passenger Handhold Straps:** The addition of handhold passenger straps has been added to the fleet to meet customer expectations.
4. **Vehicle Inductors:** The inductors are part of the primary electrical circuit that powers the train and a quality issue emerged during the first winter of service that caused the inductors to fail. The failures were exacerbated by ingress of dirt, salt, and water. The cover to the junction box was changed to a chimney style lid to limit ingress of water and other debris and the original inductors were replaced.
5. **Vehicle Software Systems:** Additional modifications were made to various onboard control systems to improve the recovery of vehicles in specific failure modes and to optimize the integrated braking systems. The software changes are being applied to Stage 1 and Stage 2 vehicles to maintain a consistent configuration.
6. **Vehicle Wheels:** Due to an error in the handling and installation procedures, small cracks developed in a number of wheels and the risk of further cracks existed. The wheels affected by the configuration error have been replaced.
7. **Station Flooring:** During the initial winter period, the proximity of many entrances to the exterior created slippery conditions directly inside the entrances. The application of winter maintenance mats as well as a surface treatment were applied to increase the friction of the floors. The specification for flooring in the Stage 2 Project Agreements was updated to reflect a new standard.
8. **Switch Heaters:** The electric switch heaters on the eastern portion of the line did not perform reliably and/or required an unsustainable level of maintenance to

keep them operations. An upgrade to gas switch heaters was made to key heaters in the east and the Stage 2 program has standardized the use of gas switch heaters on the new extensions.

9. Overhead Catenary Systems: Materials used in the catenary design included a nylon element as part of electrical isolation requirements. This nylon element is susceptible to corrosion from winter highway chemicals and salts and has failed on multiple occasions. Additional sheathing has been added to the existing units and additional inspection/cleaning are required. The Stage 2 design for the overhead catenary system uses a different configuration that does not require the nylon cord.
10. Guideway Intrusion Detection System: Additional improvements were made to the system including with the software configuration and heating elements to reduce the rate of false positive activations.
11. Rail Neutral Temperature: The original rail neutral temperature (10 degrees Celsius to 20 degrees Celsius) and the condition of the ballast resulted in sun kinks and temporary slow orders during the initial few summers of service. Rideau Transit Maintenance completed a work program to improve the condition of the ballast and to cut/weld the rail to help reduce the high rail stresses in the summer period. For Stage 2, the initial rail neutral temperature has been set at a higher (23 degrees Celsius to 27 degrees Celsius) to help reduce the possibility of kinking in high temperature months.
12. Rigid Rail Maintenance practices: Within the first year of service, a tear down of the rigid rail which was attributed to an incorrect application of grounding straps. The procedures have been updated to reflect the correct use of a grounding clamp on the rigid rail.
13. Cab Driver Platform Edge Display: During the initial launch of service the integration of these systems presented reliability challenges and RTG added spotters to the platforms to mitigate the issue. Software changes have since been made and the platform spotters have been removed.
14. Connectivity Enhancements at “bridge” stations: Major changes to the roadways, transit stops and active transportation links to Convent Glen Station and Jeanne D’Arc Station have been made in order to make the bridges more comfortable for customers accessing the stations.
15. Increased Noise Mitigations in Base Design: Following the initial period of Confederation Line Stage 1 service, a decision was made to add rail dampers and noise absorbing panels in the rock cut area near Parkdale Avenue as a retrofit to the infrastructure. The use of noise mitigations in areas with similar configurations are planned to be added to the infrastructure prior to opening of Stage 2.

16. Additional Highway Ramp Snow/Ice Protection: In reviewing the configuration of Stage 2, there are two critical areas near Pinecrest interchange and near Richmond interchange that have a large vertical height differential to the roadway, and it has been determined that permanent wall structures are required to protect trains and infrastructure from snow and ice being thrown by high-speed highway snow removal equipment.