




OTTAWA LIGHT RAIL TRANSIT

PROJECT


Trial Running Test Procedure

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| OLRT CONSTRUCTORS This document may contain confidential and commercially sensitive information. | | 2019/07/31 DATE |

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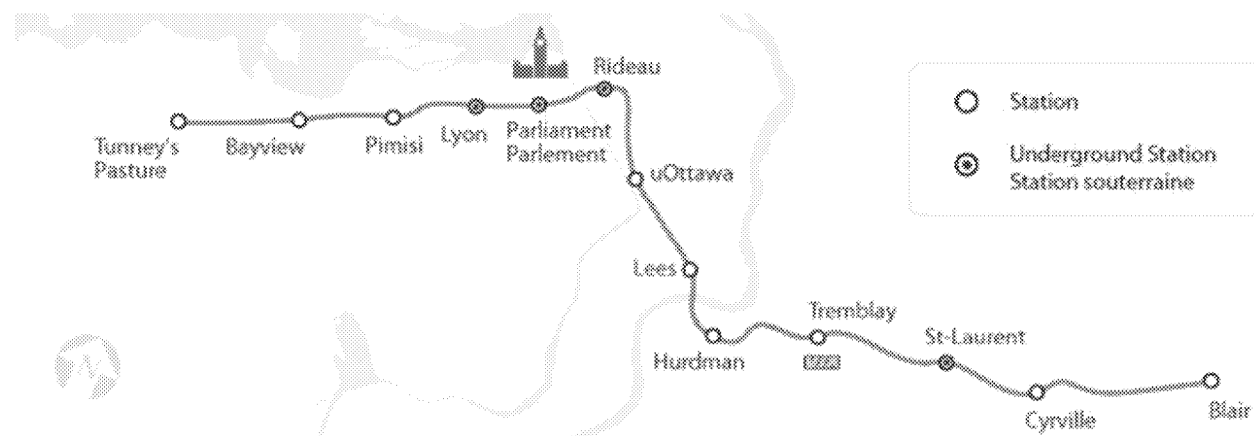
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2 Introduction

2.1 General

The Confederation Line will provide a Light Rail Transit (LRT) service between Tunney’s station in the west and Blair station in the east. The 12.5-kilometre line will feature 13 LRT stations, a LRT Maintenance & Storage Facility (MSF) and a 2.5km tunnel beneath downtown Ottawa. The Confederation Line revenue service availability date is determined as a result of the successful completion of this trial. The system is designed to have an ultimate capacity of 24,000 passengers per hour per direction.

Figure 1 – Confederation Line Alignment



2.2 Scope

This document describes the details of Trial Running, including:

- Daily Meeting
- Service Plan
- Daily Schedule


2.3 Definitions, Acronyms and Abbreviations

Definitions

Trial Running

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 15-1, Article 1, page 19 [1]

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LRT System Communications, traction Power and distribution, stray current, EMI, intrusion detection, Fixed Facilities, Vehicles, MSF, Electrical & Mechanical, and all other required and necessary elements, components and appurtenances to ensure the safe operation of the Confederation Line.

Schedule 15-1, Article 1, page 8 [1]

Integrated Functioning together as one coherent whole


Schedule 1, page 32 [1]

Commissioning Team A representative from Project Co, a representative from the City, the Commissioning Coordinator, the Independent Certifier and where applicable, representatives of the relevant Vehicle manufactures and Equipment manufacturers.

Schedule 14, 1.4 (a) [1]

Acronyms

| | |
|--------|--|
| ATO | Automatic Train Operation |
| IC | Independent Certifier |
| IMIRS | Integrated Management Information Reporting System |
| LRT | Light Rail Transit |
| LRU | Line Replaceable Unit |
| MSF | Maintenance and Storage Facility |
| OC | Ottawa-Carleton |
| OLRT-C | Ottawa Light Rail Transit Constructors |
| PA | Project Agreement |
| RIO | Rail Implementation Office |
| RTM | Rideau Transit Maintenance |
| RTG | Rideau Transit Group |
| T&C | Testing and Commissioning |

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3 TRIAL RUNNING

3.1 Objective

The objective of this activity is to confirm readiness for Revenue Service Commencement by exercising the Integrated LRT System.

This objective will be achieved by demonstration that, in the reasonable judgement of the Independent Certifier (IC), the performance of the Integrated LRT System has met the acceptance criteria, and the system is capable of safely and reliably operating in accordance with the Initial Service Plan—including required travel times and headways.

This trial has the following key objectives:


- to exercise and validate the operating schedules and operational performance requirements
- to exercise and confirm the operating reliability of the system and subsystems. *(Note : The basic design requirements and safety and security requirements will have been verified through the testing and commissioning program prior to this stage of Trial Running)*
- Verify and/or estimate vehicle availability parameters

3.2 Scope

The scope of Trial Running is (Schedule 14, 1.5, (ii), page 6) [1]:

- A. Project Co shall conduct the trial running for final acceptance which will be conducted for a period of **12 consecutive days** following successful completion of testing and commissioning; verification by Project Co that there are no deficiencies to prevent safe running of the System; and verification that there are an adequate number of trained staff to operate the System. At the end of this exercise, the integrated system will be ready for Revenue Service Commencement.
- B. Trial Running shall be reviewed daily by the Trial Running Team. It will be at the discretion of the Team, comprising of OTC, OC Transpo, Independent Certifier, RTG, RTM and OLRTC to determine if a day is a pass, repeat or restart.
- C. The objective of this stage is to operate a full regular scheduled service on the full line using the peak and non-peak schedules for an extended period. Passengers will not be carried.
- D. A repeat or restart day will commence as per the next normal calendar day

Failure scenarios will be tested in advance of Trial Running, such that Trial Running is just the pure 12 days of running. However, should a failure occur during the 12 day period, it will be managed and recorded appropriately.

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3.3 Service Plan

The Service Level 1 plan is included in Appendix B, this plan has been prepared by RTM for use in Trial Running only.

3.4 Trial Running Review Team

The Trial Running Review Team will comprise of core members consisting of


- Three representatives from ProjectCo (OLRTC, RTM and RTG)
- a representative from OTC
- a representative from OC Transpo
- the Independent Certifier

Chairperson : Systems Director or Delegate

Additional representatives for individual systems and equipment may be called as necessary.

3.5 Responsibility Matrix

| Stakeholder | Responsibility |
|-------------------------------|--|
| OLRTC | <ul style="list-style-type: none"> • Ensure infrastructure is tested and available • Ensure vehicles are tested and available • Manage the daily operations meetings to review progress • Witness any necessary SIT validation required under Trial Running |
| RTM – inc. Alstom Maintenance | <ul style="list-style-type: none"> • Ensure staff are rostered onto appropriate shift patterns • Undertake start of day inspections of LRVs • Deliver LRVs to the Handover platforms • Undertake maintenance of vehicles during maintenance period • Undertake maintenance of the infrastructure during the maintenance period • Respond to infrastructure failures (supported by OLRTC and Thales) • Respond to vehicle failures (supported by Alstom) • Operate the YCC (Help desk/Work orders) • Providing vehicle mileage at the beginning and end of each day • Opening and closing the stations on a daily basis |
| OCTranspo | <ul style="list-style-type: none"> • Prepare and load the Service Plan into the ATS • Operate the LRVs from the Handover platform • Operate the LRVs to Service Level 1 on the guideway • Provide the Controllers and Control Room staff at the TSCC to operate the railway • Operate the Help Desk • Provide all required staff to operate and manage stations as required |
| Independent Certifier | <ul style="list-style-type: none"> • Oversee the operations and participate in the daily operations meetings • Oversee and sign off on the Evaluation Scorecard each day |
| City | <ul style="list-style-type: none"> • Oversee the operations and participate in the daily operations meetings |
| RTG | <ul style="list-style-type: none"> • Oversee the operations and participate in the daily operations meetings |

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3.6 Daily Meeting

The daily meeting will be held at 14:00 every day of the 12 day trial running period. Each day of Trial Running will commence on the basis that the previous day was a success. The meeting will follow the format of the OLRTC Viz Meetings.

The meeting will be chaired by the OLRTC Systems Director or appointed delegate.

The meeting will be held at the MSF.

The meeting will follow the following rules:

Attendance is mandatory

Meeting will commence promptly at 14:00

Attendees must come to the meeting with all relevant information required

No food or drink to be brought into the meeting room

Meeting will last no more than 30mins

Attendees will be required to stand for the duration of the meeting

Phones and computers are not allowed in the meeting

The outcome of the meeting will be a completed scorecard from the IC

4 12 Day Plan


The 12 day plan includes specific activities for which various stakeholders are responsible; OLRTC, RTM & OCT.

| Day | Day 1 Saturday | Day 2 Sunday | Day 3 Monday | Day 4 Tuesday | Day 5 Wednesday | Day 6 Thursday | Day 7 Friday | Day 8 Saturday | Day 9 Sunday | Day 10 Monday | Day 11 Tuesday | Day 12 Wednesday |
|-----------------------|--|---|---|---|--|---|---|---|---|---|--|---|
| Peak Number of Trains | 11 | 11 | 15 | 15 | 15 | 15 | 15 | 11 | 11 | 15 | 15 | 15 |
| ERD Activity | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 | Service Level 1 |
| Station Operation | Blair PA CCTV Escalator Elevator ETEL | Cyrville PA CCTV Escalator Elevator ETEL | St Laurent PA CCTV Escalator Elevator ETEL | Tremblay PA CCTV Escalator Elevator ETEL | Hurdman/Lee PA CCTV Escalator Elevator ETEL | Ottawa PA CCTV Escalator Elevator ETEL | Rideau PA CCTV Escalator Elevator ETEL | Parliament PA CCTV Escalator Elevator ETEL | Lyon PA CCTV Escalator Elevator ETEL | Pimisi PA CCTV Escalator Elevator ETEL | Bayview PA CCTV Escalator Elevator ETEL | Turney's PA CCTV Escalator Elevator ETEL |
| Guideway Maintenance | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches | Track DCS TPSS Switches |
| Vehicle Maintenance | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash | Daily Insp. Scheduled Corrective Wash |

Over the course of the 12 day trial, achievement of the following goals will be verified to the satisfaction of the Independent Certifier (Schedule 14, 1.5, (e), (iii), (A&C)) – Specific calculation methods identified in Section [REF _Ref527373390 \r \h].

Trial running can commence on any day of the week and will follow the Service Plan associated with that day.

There will be observation field teams roaming between stations on a daily basis throughout the trial running period

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Note : some additional requirements are also stated in the PA but in order to make the maximum usage of the trial time they will not be demonstrated as part of this trial, rather, they will be covered by pre-trial running or demonstrated as appropriate.

Safety

No Safety Incidents or minor safety incidents managed appropriately Pass/Repeat/Restart

Operations

Travel Time (ATO) 23 mins

Headway Achieved 3 out 4 scenarios

Three or more of the four success criteria must be achieved for the day to be a pass

1. Morning westbound – Arrivals at Lees

Between 06:45:00 and 08:45:00

Scheduled = 35 trains (average headway 3 min 25 s)

Success for trial running = 94% 33 trains or more arrive during the two-hour period

2. Morning eastbound – Arrivals at Pimisi

Between 06:45:00 and 08:45:00

Scheduled = 35 trains (average headway 3 min 25 s)

Success for trial running = 94% 33 trains or more arrive during the two-hour period

3. Afternoon westbound – Arrivals at Rideau

Between 15:00:00 and 18:00:00

Scheduled = 45 trains (average headway 4 min 00 s)

Success for trial running = 93% 42 trains or more arrive during the three-hour period


4. Afternoon eastbound – Arrivals at Lyon

Between 15:00:00 and 18:00:00

Scheduled = 45 trains (average headway 4 min 00 s)

Success for trial running = 93% 42 trains or more arrive during the three-hour period

- Primary source of data will be field observations verified by ATS
- Measurement of time to be based on time train arrives at the specified station, reaches zero-speed, and doors are authorised to open

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Maintenance Performance

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| Daily demonstration of maintenance activities | Pass/Repeat/Restart |
| Daily demonstration of IMIRS process | Pass/Repeat/Restart |

Availability Performance – Aggregate Vehicle Km Availability Ratio (AVKR)

| | |
|-----------------------------|-------|
| AVKR (average over 12 days) | 98.0% |
| AVKR (minimum daily) | 90.0% |

Station

| | |
|--------------|-------|
| Availability | 99.7% |
|--------------|-------|

Customer Systems (PA, Fare Control, TVM, Lighting)

| | |
|---|-------|
| Each individual systems full availability | 99.5% |
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Other Major Systems (radio, CCTV, TVS & Fire Systems)

| | |
|-------------------------------|-------|
| All systems full availability | 99.5% |
|-------------------------------|-------|

4.1 Trial Running Process

The basic premise of the trial is that the system will operate for 12 days in a realistic simulation of all phases of an every day operation (operations, service delivery, maintenance etc.). The operation will be assessed against the criteria defined in the Performance Criteria (section [REF_Ref527116562 \r \h * MERGEFORMAT]) either daily or averaged over the course of the trial. This assessment will be tracked on a simple scorecard (as shown in Appendix A).

- i. The twelve day Trial Running period will be devoted to running regular scheduled service, with all systems and processes functional. RTM will generate a daily metrics report to highlight the system performance for the previous day.
- ii. An evaluation “scorecard” will be used by the Trail Running Review Team to log the outcome of this performance. The Scorecard is shown in Appendix A.
 - (i) The Trial Running Review team will meet at 14:00 each day to review the RTM reporting for the previous day and determine the result to be logged on the Scorecard. In addition to the daily review, this review will also include the cumulative calculation for any requirements that are based on the entire 12 day average; this will ensure that any overall goals are on track for success.
 - (ii) The Trial Running Review Team will answer questions or provide clarity to the IC to verify the daily result. The IC may request further investigation be conducted before making a final assessment for the day. The review team may make a case for exclusions at this stage (see section [REF_Ref527119048 \r \h * MERGEFORMAT])
 - (iii) The Independent Certifier will verify that team understands the reporting, the agreed upon results and consequences for trial running (pass, repeat, restart etc.).
 - (iv) The IC will provide final classification for the previous day as one of the following:
 - Pass Performance demonstrated for all evaluation criteria, move on to next day

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- Repeat Performance in one or more criteria does not meet the passing requirements
- Re-Start (Fail) Serious safety issues require re-starting Trial Running at Day 1

(v) A repeat or restart day will commence as per the next normal calendar day

(vi) All members of the Trial Running Review Team will initial the final approved results for each day.

(vii) Should a situation arise when one or more of the eighteen pass criteria is not considered a pass, the Trial Running Review Team will assess the conditions that led to the fail and will make a determination. Any fails within a pass day will be justified and recorded on the scorecard and verified by the Independent Certifier. If a dispute arises over the determination of a pass, repeat, fail then the Independent Certifier will make the final determination.

(viii) After the final day of the trial, the IC will prepare a report stating whether the fully integrated system and operation can meet the specified operational performance requirements. The IC will issue a letter to confirm that 12 consecutive days of Trial Running has been completed, supported by the 12 consecutive "pass" scorecards. The 12 "pass" scorecards signed by the IC is the validation for Trial Running.

Note: In some exceptional situations, the review team may agree to "pause" Trial Running for a pre-defined period of time. For example, a pause could be warranted to address any gaps in systems that are discovered during trial running, or to conduct further investigation of a safety incident. In these cases, the Trial Running will start again from day 1.

4.2 Exclusions from Availability Calculations

Some events may cause items to be excluded from the daily availability calculations. For example, an event outside OLRT-C's control that reduces availability would be an area of exclusion. Typical exclusions would be as follows:

- Any "Non Project Co. Cause" as defined in Schedule 20 of the Project Agreement [1]
- Relief Events as defined in section 43 of the Project Agreement [1]
- Delays associated with responses by police, fire or ambulance.
- Delays beyond the Operations Performance Standard (Appendix C)


Members of the Trial Running review team may classify incidents experienced during the trial using these exclusions during the appropriate discussions or as the result of subsequent investigations.

Agreed specific exemptions throughout the trial running period are listed in Appendix 'C'

5 Performance Criteria Definition and Calculations

5.1 Safety

This will be a qualitative assessment of the performance of the system, the maintenance and operational staff and procedures. In terms of assessing safety incidents and the responses, safety incidents will be defined as an incident

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causing physical harm to equipment or persons, including near-misses for which there is no mitigation defined in the hazard assessments.

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| Pass Criteria | <p>Any safety incidents that occur are reported as per City and regulatory reporting requirements; corrective actions do not involve significant changes to infrastructure, vehicles, systems, training, or policies/procedures; AND</p> <p>All safety-critical systems required for system operation are functional (as defined by the safety regulations, safety management system or other safety documentation) and operate as intended.</p> |
| Repeat Day Criteria | <p>One or more safety incidents occur that are a result of Confederation Line design or operation; corrective actions involve significant changes to infrastructure, vehicles, systems, training, or policies/procedures; OR</p> <p>Safety incidents are not reported as per city and regulatory reporting requirements; OR</p> <p>Failures of systems required for safe system operation (as defined by the safety regulations, safety management system or other safety documentation).</p> |
| Restart Trial Criteria | <p>Life-threatening or loss of life injury* linked to Confederation Line operations; OR</p> <p>LRV collision with a person or other LRV on the Confederation Line.</p> <p><i>*Note that injuries may need to be assessed on a case-by-case; for example, for a heart attack or suicide, a "pause" may be more appropriate than a "restart".</i></p> |

Process: Chief safety personnel from OLRTC, OC Transpo and RTM to meet daily and decide outcome; to be reported by 09:00 daily.

Chief safety officer to forward information daily to Program Manager Contracts to then distribute as necessary

5.2 Operations


5.2.1 Travel Time (ATO)

Schedule 15-2 Part 1, 2.7 b) (ii) & Schedule 15-2 Part 1, 2.7 e) (iv)

This will be an assessment of the ability of the CBTC to run the Confederation line in regular mode.

The Travel time in ATO mode will be reported by RTM. The travel time will be an average of all reported end-to-end trips run on each specific day. The specific trips will be monitored from Initial departure time to arrival at the opposite terminal station. The operation will include designed dwell times at each station.

Pass Criteria Average <=23 mins

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Repeat Day Criteria Average >23 mins

Restart Trial Criteria More than 3 Repeat Day events during the trial period

Process: ATS will produce a read only set of metrics that can display the departure and arrival times at terminus stations specific to individual block numbers as per the scorecard.

- AM 06:45 to 08:45
- PM 15:00 to 18:00

5 runs will randomly be selected to investigate each day during the morning and afternoon peak periods during the weekday. At the weekends one time period will be captured between 10:00 – 12:00.

OLRTC staff will take info from the ATS output to produce a chart on the 5 runs for the set period of time displaying (Run #, Departure time from terminus, Arrival time at opposite terminus and total).

A manual process exists to play back the ATS and document times, should it be necessary or requested.

OCT (or designate) may preform audits to ensure randomness of selection and validate the information provided.

OLRTC to forward information to Program Manager Contracts 2 hours prior to the Daily operating meeting

5.2.2 Headway Achieved – Scenario 1 – Peak Period *Schedule 15-2 Part 1, 2.5 a) i)*

This is an assessment of the system to be able to handle typical daily headways for expected periods similar to operations planned for 2021.

For the trial, it must be demonstrated that 15 2-car consists can arrive at a specific station (a different station for each day of the evaluation) and that the average time between any sequential 10 of the 15 arrivals will be assessed. This headway analysis will be provided via RTM reporting.

Pass Criteria Three or more of the four success criteria must be achieved


Repeat Day Criteria Less than three

Restart Trial Criteria More than 3 Repeat Day events during the trial period

Process:

a) OLRT personnel will be monitoring ATS and will produce a chart on the amount of trains for a set period of time.

b) Times for assessment will be AM 06:45 to 08:45 and PM 15:00 to 18:00

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5.3 Maintenance Performance (RTM)

This will be a qualitative assessment of the performance of the maintenance system, the operational staff and procedures.

The verification of the ability of the system maintenance practices to support full operations will be validated as follows:

Maintenance Activities On a daily basis, an audit will be conducted on a random sample of maintenance work orders. A maximum of 5 work orders per day will be assessed. The work orders will be evaluated for completeness, timeliness, accuracy and authorizations. *Completeness* – are all fields completed as required with sufficient information as to be meaningful
Timeliness – For a scheduled maintenance activity, was the activity performed according to a planned schedule; For unscheduled maintenance, was the work conducted in a manner so that system downtime was minimized.
Accuracy – is the information presented in the work order correct and meaningful? Is it in sufficient detail – do repairs show the affected LRU etc.
Authorization – has the process been followed with the appropriate approvals in place to verify the work.

Demonstration of IMIRS process Over the course of the 12-day trial, a qualitative assessment will be made by the TRRT & IC to determine if the IMIRS system is understood, used correctly and produces accurate, meaningful and timely reports.


OCT System team to bring all relevant information to Daily operating meeting for decisions to be added to the score card.

At the end of the trial period, the TRRT IC will assess the Maintenance Activities as follows

Pass Criteria All maintenance practices (planned and unplanned) are conducted as expected and the supporting maintenance processes are being followed and reported on correctly. Some minor deficiencies in process may be seen (but will be remedied accordingly) and any deviations from practices or reporting are only minor with relatively quick and easy resolution expected.

Repeat Day Criteria Multiple errors or omissions were experienced on multiple occasions and possibly by multiple people. The remedy must be able to be immediately identified and implemented (e.g. tool box talks etc.). No fundamental errors should be seen that would adversely affect service or safety of the operation system. Changes to reporting may be identified but will not be considered as an error or omission and a longer period for remedy will be allowed as needed.

Restart Trial Criteria if more than 3 repeat day criteria are experienced during the trial OR Significant breakdown in maintenance practices such that sufficient vehicles cannot be reliably or consistently made available for service. Systematic errors in maintenance practices, planning or reporting such that performance cannot be adequately assessed will also be cause for the restart of the trial.

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This is obviously a serious condition and this matter will be discussed in depth and may be amended on a case-by-case basis.

5.4 Vehicle Performance

5.4.1 Vehicle Reliability

Vehicle reliability will be assessed using the Aggregate Vehicle Km Availability Ratio (AVKR)

AVKR for any period n means the total Revenue Service Vehicle Kilometers in period n , divided by the total Scheduled Revenue Service Vehicle Kilometers for period n .

$$AVKR_n = \frac{Rkm_n + NPCCkm_n}{Skm_n}$$

| | |
|------------|---|
| $AVKR_n$ | Means the Aggregate Vehicle Kilometers Ratio for the relevant period n ; |
| Rkm_n | Means the total amount of Revenue Service Vehicle Kilometers for period n , and includes both Peak and Off-Peak service |
| $NPCCkm_n$ | Means the number of Scheduled Revenue Service Vehicle Kilometers which were "missed" or not achieved during period n and which are attributed in the relevant Performance Monitoring Report as being due to a Non-Project Co Cause; and |
| Skm_n | Means the total Scheduled Revenue Service Vehicle Kilometers for period n , and includes both Peak and Off-Peak service |


Pass Criteria All AVKR requirements in section [REF_Ref527116562 \r \h] are met

Repeat Day Criteria None

Restart Trial Criteria Failure to meet the minimum daily AVKR requirement.

Process: Both processes to be done simultaneously by RTM and Audited by OCT or there designate.

- a) Analysis of TPMS data to calculate AVKR.
- b) RTM will gather Odometers readings for all 34 vehicles during inspection at the shed and record them on the inspection sheet daily (Odometer on both LRVs in coupled vehicles must be recorded).
 - I. LRV's with out recorded kilometers for both vehicles will not be launched until the Kilometers are recorded.
 - II. Hostlers will relay odometer readings for the leading cab as they bring them to the hand over platform for the YCC to record.
 - III. ERC will have to record in the rail log the station that is the first or last revenue stop an LRV makes for non scheduled reductions or launches. If this information is missed it will have to recovered on an ATS playback.
 - IV. Monitoring of Kilometers to be done in a consistent method day to day.
 - V. Non-revenue kilometers will be removed in proportion to the non-revenue kilometers in the schedule.

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- VI. Vehicles introduced or removed from service outside the schedule will have non-revenue kilometres removed in accordance with the measurements taken jointly by RTM and OCT on This will be a manual calculation (excel spread sheet) by RTM with Deloitte validating.
- VII. Should the deciding factor for a day's pass or fail criteria be kilometer related and under 100Km a closer examination of non-revenue Kilometers may be requested.

5.5 Station Performance

The station performance is essentially an availability performance criteria.

5.5.1 Station Availability

Station availability will be assessed using the Aggregate Station Availability Ratio (ASAR). For consistency, this plan will use the ASAR monthly calculation from the PA as the basis for calculations.

Aggregate Station Availability Ratio for Contract Month n means the total Scheduled Station Hours for reporting period n less the total Station Availability Failure Hours for all Stations in reporting period n , divided by the total Scheduled Station Hours for all Stations in reporting period n . For clarity, the formula is provided below:

$$ASAR_n = \frac{SSH_n - SAF_n}{SSH_n}$$

Where:


- $ASAR_n$ Means the Aggregate Station Availability Ratio for the reporting period n ;
- SSH_n Means the sum total of Scheduled Station Hours for all Stations during reporting period n , and includes both Peak and Off-Peak hours; and
- SAF_n Means the sum total of Station Availability Failure Hours for all Stations during Reporting period n , and includes both Peak and Off-Peak hours.

Station Availability Failure is where any Station does not comply with the Station Access Standard otherwise than by reason of any Station-Related Non-Project Co Cause.

Article 3.0(b)(ii) of Attachment 7 to Appendix A of Schedule 15-3 to the Project Agreement

A Station is considered to meet the Station Access Standard if:

- All entrances to the Station are open and passengers have access to the passenger waiting areas in the Station;
- Each Station platform is accessible from each station entrance, via: (i) elevator; or (ii) alternate means of vertical transportation within 50m of the station entrance.;
- The Station is free from any unsafe accumulation of ice and snow, and for clarity accumulation of ice and snow shall be deemed to be "unsafe" only if: (1) the Station is not in compliance with the Snow and Ice Clearing Standard pursuant to Attachment 10 of this Schedule, and (2) safe access to Trains for all passengers, including mobility impaired passengers, is compromised;

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- D. The Station is free from any other hazard or event that results in passengers, including mobility impaired passengers, being unable to safely enter and leave the Station for purposes of accessing Trains, for example, failures with fire life safety systems; and
- E. During any period of time when a Station does not meet the Station Access Standard due to non-compliance, Project Co shall make best efforts to mitigate the effects of such non-compliance and to provide, where possible, safe access to Trains for as many passengers as possible.

| | |
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| Pass Criteria | All ASAR requirements in section [REF _Ref527116562 \r \h] are met |
| Repeat Day Criteria | At the discretion of the Trial Running Team based on the days score in relation to the daily availability pass ratio of 99.7% |
| Restart Trial Criteria | None |

Process: Calculation based on work order response and rectification times from IMIRS. Total hours of scheduled station hours less hours lost from failed rectification times divided by total scheduled station hours yields the percentage which determines pass/fail.

In field and through SCADA random validation of the opening and closing of the stations will be preformed by OCT system team.

5.6 Customer Systems and Other Major Systems

The availability performance of all other systems needs to be assessed unless they are considered part of another parameter. These are systems that may not directly affect the operation of the system immediately, but they will impact customer perception or failure monitoring.

All of these systems will be calculated in essentially same way


$$ASAX_n = \frac{SSHX_n - SAFX_n}{SSHX_n}$$

Where:

| | |
|----------|--|
| $ASAX_n$ | Means the Aggregate System Availability Ratio of System X for the reporting period n ; |
| $SSHX_n$ | Means the sum total of Scheduled System Hours for Systems X during reporting period n |
| $SAFX_n$ | Means the sum total of System X Availability Failure Hours for all System X elements during reporting period n |

For the purposes of the calculation, a failure of a system means if one or more of the elements in any systems fails to operate as required and is not repaired within the expected maintenance rectification time. If an item is repaired in the required time, then no failure hours will be accrued.

Systems covered by this measurement scheme are:


| | | |
|-----------------------------|---------------------------|---|
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- Traction Power
- Passenger Announcement Systems
- Passenger Information Displays
- CCTV Cameras
- Tunnel Ventilation System
- Station Lighting
- Fire monitoring and suppression systems
- Fare Control Gates *
- Ticket Vending Machines *
- Radio *


**Note : these are City Supplied Items, metrics will be recorded but failure would not be attributed to RTG unless the root cause is determined to be RTG equipment or activities. i.e Power or communications.*


| | |
|------------------------|--|
| Pass Criteria | All system availability requirements in section [REF_Ref527116562 \r \h] are met |
| Repeat Day Criteria | At the discretion of the Trial Running Team if any one or multiple fails to not meet the 99.5% pass ratio then a repeat day may be required. |
| Restart Trial Criteria | None |

Process: Calculation based on work order response and rectification times from IMIRS by RTM.

| | | |
|----------------------|---------------------------|---|
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Appendix A – Scorecard and Sign Off Sheet

|  | | Trial Running Scorecard (Rev 07) | | Overall Pass/Repeat/Restart | | |
|--|--------------|-----------------------------------|-----------------|-----------------------------|-------------------|--------------|
| | | Date: | Running Day # : | | | |
| Safety | | <input type="checkbox"/> | | | | |
| Operational | | <input type="checkbox"/> | | AM | PM | Average |
| <i>Travel Time (ATO Mode) 23 mins</i> | | <input type="checkbox"/> | | | | |
| <i>Weekday Hea. 3 out of 4 required for pass</i> | | <input type="checkbox"/> | | | | |
| | | | | 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% | | <input type="checkbox"/> | | 35 | | 0.0% |
| 2 Morning eastbound – Arrivals at Pimisi Between 06:45:00 and 08:45:00 average headway 3 min 25s = 35 Trains Pass Ratio = 33 Trains 94% | | <input type="checkbox"/> | | 35 | | 0.0% |
| 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% | | <input type="checkbox"/> | | 45 | | 0.0% |
| 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% | | <input type="checkbox"/> | | 45 | | 0.0% |
| Maintenance Deliv | | <input type="checkbox"/> | | | | |
| <i>Maintenance practices</i> | | <input type="checkbox"/> | | | | |
| <i>Construction of IMIRS prot</i> | | <input type="checkbox"/> | | | | |
| Vehicle Availability: Aggregate Vehicle Km Availability Ratio (AVKR) | | | | AVKR Daily | | |
| | Ratio | | | Scheduled KM | Actual KM | AVKR Ratio % |
| AVKR (minimum daily average) | 90% | <input type="checkbox"/> | | | | #DIW0! |
| AVKR (average over 12 days) | 98% | <input type="checkbox"/> | | | | N/A |
| Station | | | | ASAX Daily | | |
| | Ratio | | | Scheduled Service | Actual Hours | ASAX Ratio % |
| Availability | 99.7% | <input type="checkbox"/> | | | | #DIW0! |
| Customer Systems & Other Major S | Ratio | | | | | |
| Traction Power | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| Passenger Announcement Sy: | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| Passenger Information System | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| Fare Control Gates | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| Ticket Vending Machines | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| CCTV Cameras | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| Tunnel Ventilation System | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| Station Lighting | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| P25 Radio | 99.5% | <input type="checkbox"/> | | | | #DIW0! |
| Fire Monitoring & Suppressor | 99.5% | <input type="checkbox"/> | | | | #DIW0! |

| | | |
|----------------------|---------------------------|---|
| | Trial Running Plan |  |
| Revision: FINALREV02 | Date : 31/07/2019 | Owner : T&C |

Appendix B – Service Level 1 Timetable