



Confederation Line Stage 1

Joint City / RTG Workshop

Review of OLRTC's RSA Readiness Timeline

Based on OLRTC's Schedule to Complete Presentation on Oct. 22, 2018

Presented to City Manager
City of Ottawa
October 25, 2018

Background:

John Manconi requested that O-Train Construction (OTC) and the Independent Assessment Team (IAT) participate in a Joint Workshop with OLRTC on October 22, 2018.

The purpose of the Workshop was for OLRTC to present a schedule update regarding their strategy to achieve a Nov. 30, 2018 RSA.

History of OLRTC's previously "proposed" RSA dates:

- May 24, 2018 (original PA requirement)

- August 14, 2018

- August 31, 2018

- November 2, 2018

- November 30, 2018

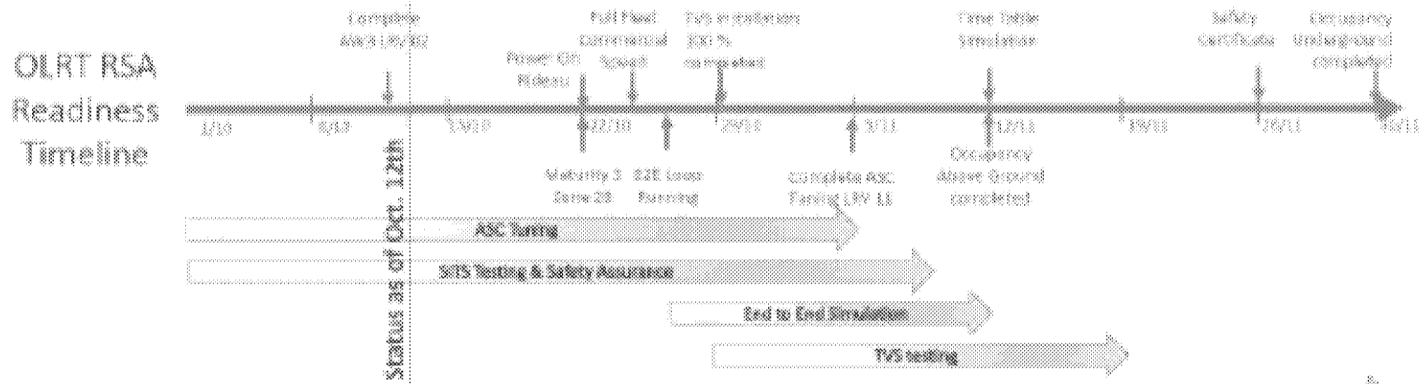
History of Prior Schedule Reviews & Workshops

Date	Assessment Type	OTC/IAT's Major Report Findings
5/1/2017	OTC/IAT Schedule Review	OTC/IAT opinion is 4-6 month tunnel delay, additional 6 month delay possible for typical Vehicles, Systems, T&C challenges.
5/24/2017	Joint Workshop with RTG	Same as above
11/3/2017	Joint Workshop with RTG	OTC/IAT opinion is Q4 2018 most likely RSA that RTG can achieve at this time.
12/12/2017	OTC/IAT Schedule Review	RTG submits a new schedule showing an August 14, 2018 RSA date. Over 50% of all activities are on the critical path. T&C schedule and operational prep time is being turned into construction float.
1/19/2018	Joint Workshop with RTG	RTG moves RSA to Aug. 31. Quantitively Risk Analysis (QRA) applied to new schedule. Less than 1% probability that Aug. 31 RSA can be achieved.
2/28/2018	OTC/IAT Schedule Review	RTG has experienced a 2-3 week slippage on their Aug. 31 RSA schedule.
5/4/2018	Joint Workshop with RTG	New OLRTC leadership inherits 3 consecutive months of schedule slippage and moves RSA date to Nov. 2, 2018. QRA suggests a November probability range of 51% on Nov. 1 and 88% on Nov. 30.
6/22/2018	Joint Workshop with RTG	New QRA lowers probability for achieving any RSA date in November to zero to 10% due to RTG's continued schedule slippage. OLRTC states they will be able to deliver a safe system in November but one that is not fully compliant with PA. They suggest "soft start" scenarios that are unacceptable to City. Due to continued schedule slippage QRA drops to 80% probability on 12/31/18.
8/17/2018	Joint Workshop with RTG	Auditors ability to review a lagging amount of RTG systems assurance documents at the 11th hour. Due to continued schedule slippage QRA drops to 80% on 2/26/19.
9/14/2018	OTC/IAT Schedule Review	RTG continues to maintains a Nov 30 RSA date is achievable despite evidence of continued schedule slippage. Assuming that Rideau Station is the critical path and 32 vehicles are acceptable to the City results in a QRA that moves the projected RSA data to 1/16/19.

OLRTC's Current Strategy to Complete



Summary Schedule



	1/10	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	30/11
Systems Occupancy	0 0	0 0	0 0	2	5	5	0			1
Config #1 vehicles	27 28	30 28	30	30	30	30	31	32		
Config #2 vehicles	14 0	16 0	20	23	26	30	31	32		

Legend: Planned Actual

Note- latest forecast and actual vehicle figures on slides 9 & 10

Without Prejudice

OLRTC's Current Strategy to Complete

OLRTC's strategy is a practice plan and it does not identify Substantial Completion or Trial Running. It is an incomplete process that deviates from the PA path to RSA. We do not support deviation from the PA but we do support the concept of a practice plan.

RTG has introduced the term **Time Table Simulation**. RTG has stated that they are not doing Pre-Trial Running. The IAT is supportive of this as it assesses the ability of the CBTC and LRVs to meet schedule requirements, yard operations, service launch and accumulates kilometres on the vehicles to help assess vehicle reliability.

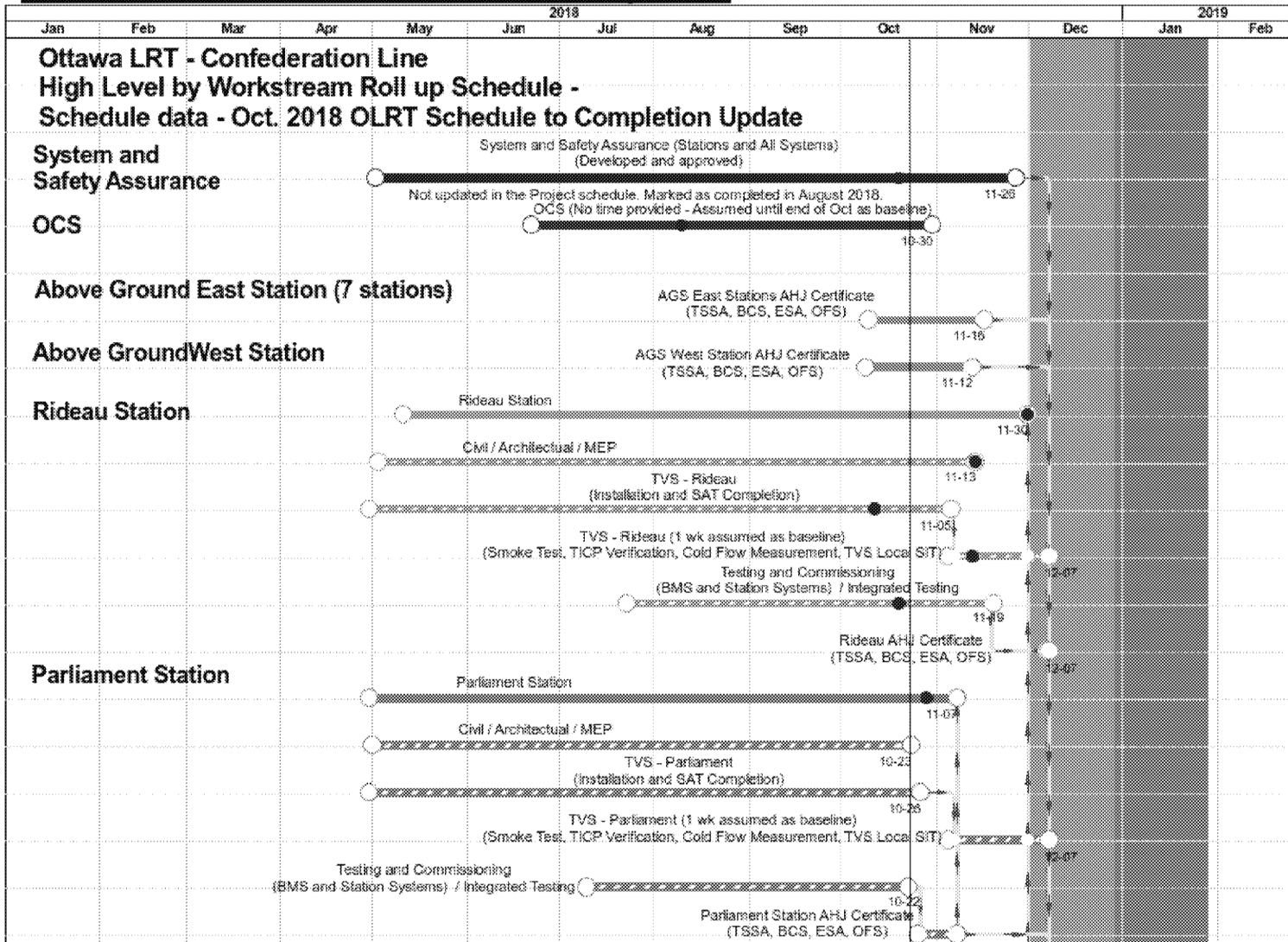
OLRTC meeting with their EXCO on Thursday. A more detailed proposal is expected soon thereafter.

For the first time, there was no mention of Substantial Completion, Trial Running or Revenue Service Availability in the current strategy to complete.

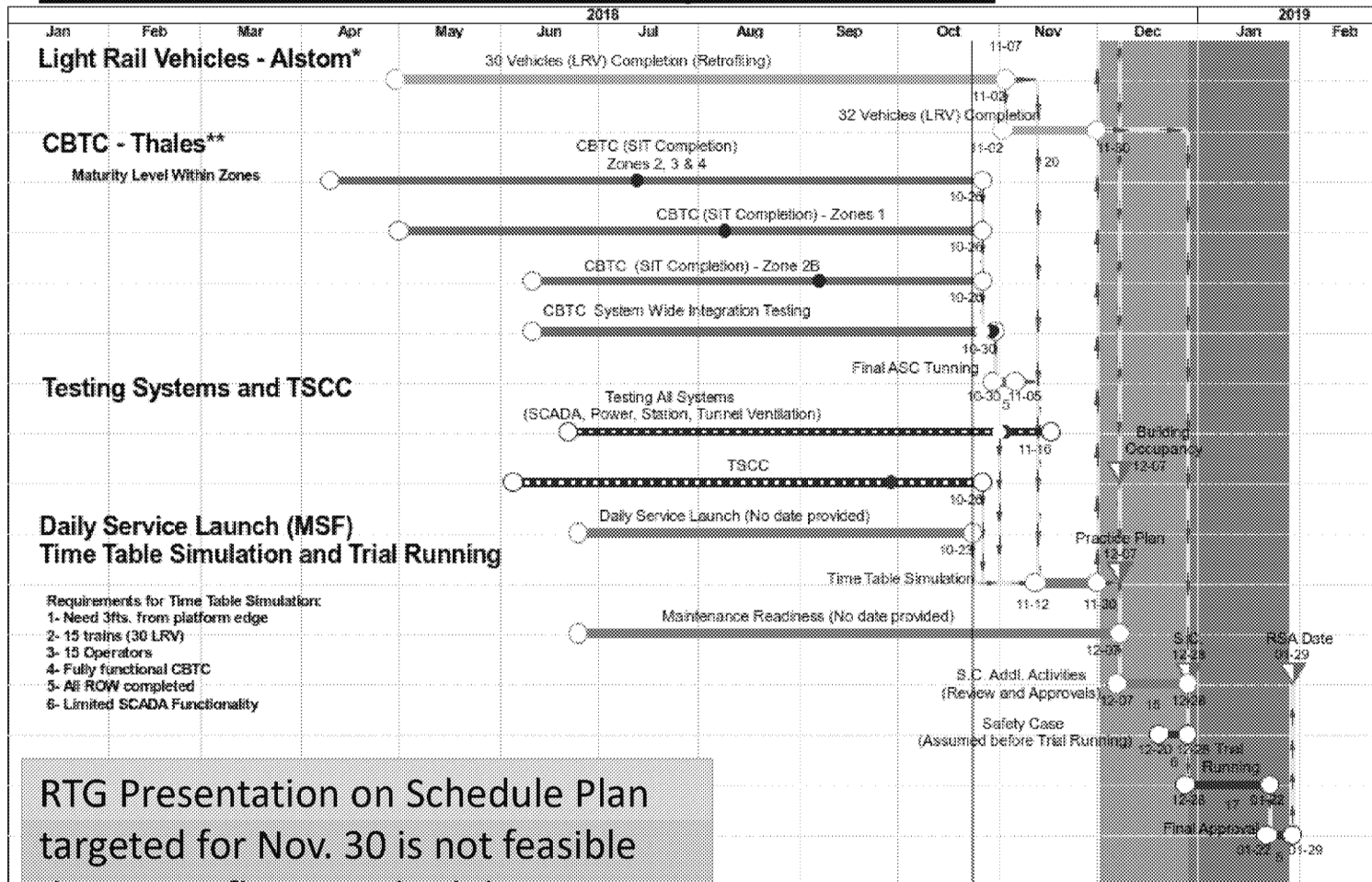
Project Agreement's Path to RSA

- Substantial Completion achieved
- Commissioning and preliminary operations of the system for operations
- Approval of the Safety Auditor
- Vehicles – Bill of Sale
- OC Transpo and RTM staff trained
- RTG must provide a notice of proposed RSA date

OTC/IAT Schedule Analysis:



OTC/IAT Schedule Analysis Cont'd:



RTG Presentation on Schedule Plan targeted for Nov. 30 is not feasible due to conflicts in schedule activities and current status. It did not target Substantial Completion or RSA dates.

- 23-Oct-2018**
- Aug. 2018 Schedule update on estimated finish date
 - * Dates taken from RTG Presentation on Vehicles (Oct. 22)
 - ** Dates taken from RTG Sep. 2018 P6 schedule submitted
 - Period during Proposed Time Table Simulation
 - Period during Approval and Review for Substantial Completion
 - Period during Trial Running until RSA date

OTC/IAT Schedule Analysis - Outputs:

The quantitative risk assessment accounts for risk events and uncertainties on main activities.

Caution: Assessment based on a high level strategy presented by OLRTC and should not be used as an indicator. The City has pressed RTG for Substantial Completion, Trial Running and RSA dates.

Time Table Simulation:

- RTG Target: November 30, 2018
- IAT/OTC Comment: Not achievable

Practice Plan:

- RTG Implicit Date: December 7, 2018
(Including completion of activities indicated after Time Table Simulation)
- IAT/OTC Comment: expected to be completed by January 31, 2019

Substantial Completion:

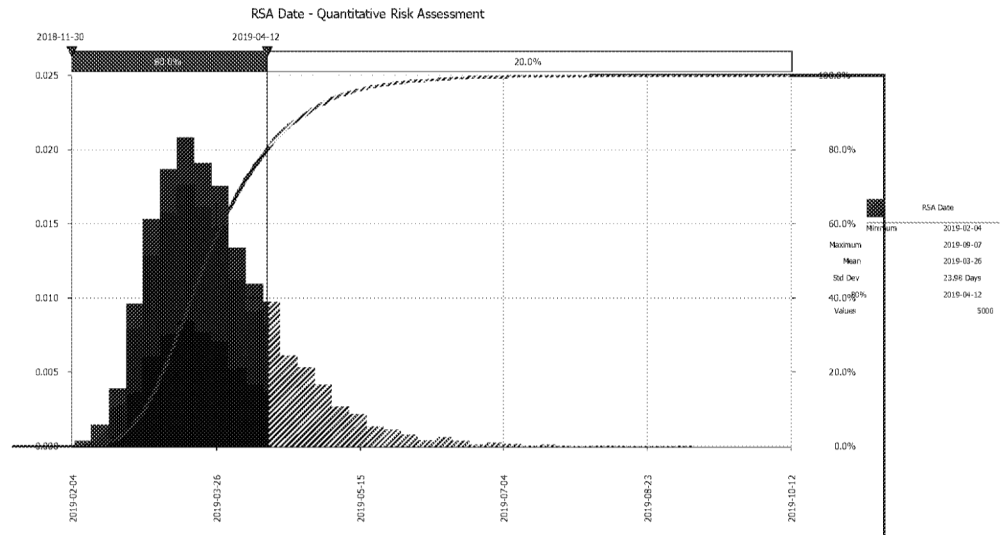
- RTG Implicit Date: December 28, 2018
- IAT/OTC Comment: expected to be completed by the end of Q1 2019

RSA Date:

- RTG Implicit Date: January 29, 2019
- IAT/OTC Comment: expected to be completed by the beginning of Q2 2019

	Planned	Risk Results in Confidence Levels (80 % C.L.)
Time Table Simulation		01-Jan-19
Practice Plan Milestone		31-Jan-19
Substantial Completion	17-Nov-18	18-Mar-19*
Revenue Service Availability (RSA) Date	30-Nov-18	12-Apr-19*

**Dates not derived from an RTG schedule. Dates extrapolated from RTG Strategy to Complete presentation on Oct. 22, 2018.*



RSA - Critical Path Issues

- Systems Assurance
 - Railway Level Documentation
 - 44/73 key documents delivered to City and Safety Auditor
 - 17 documents have received Statement of No Objection
 - Primary System Level Documentation
 - 126/290 documents completed
 - **OLRTC schedule has all remaining documents to be submitted by Nov. 16. This is not achievable.**
 - Safety Auditor reviewing on Oct 25/26. Update to follow.
- Operational Readiness
 - Achieve service performance requirements
 - Service Launch
 - Operator/Controller training
 - **OC Transpo's operational readiness is lagging due to late delivery of LRVs, Control Center, SCADA, and completion of testing & commissioning.**

RSA - Critical Path Issues

- Tunnel Ventilation Systems
 - **Incomplete installations**
 - **Testing & Commissioning**
 - **Failed their first test at St. Laurent Tunnel**

- Rideau and Parliament
 - **Large volume of work remains**
 - **Occupancy permits**

Light Rail Vehicles

- Alstom manufacturing and retrofit process is well structured and organized.
- Schedule to meet OLRTC's Time Table Simulation is aggressive for 15 two-car trains; some single car trains likely to be required.
- LRV 2, 8, and 11 are either being replaced by Stage 2 vehicles or being overhauled.
- Different production schedules for remaining fleet:
 - RTG's schedule was 30 LRVs by Nov 2
 - Alstom schedule shows 30 LRVs by Nov 19
- IAT assessment
 - 30th LRV, 19 NOV – IAT 80% confidence in 9 DEC
 - 31st LRV, NOV 30 – IAT 80% confidence in 15 DEC
 - 32nd LRV, DEC 2 – IAT 80% confidence in 10 JAN
 - 33rd /34th LRV, JAN 18 - IAT 80% confidence in 17 MAR

Overarching Major Issues

- Escalator Plywood and TSAA/OBC
- Overhead Catenary System
- Flank Protection Issue (switch)



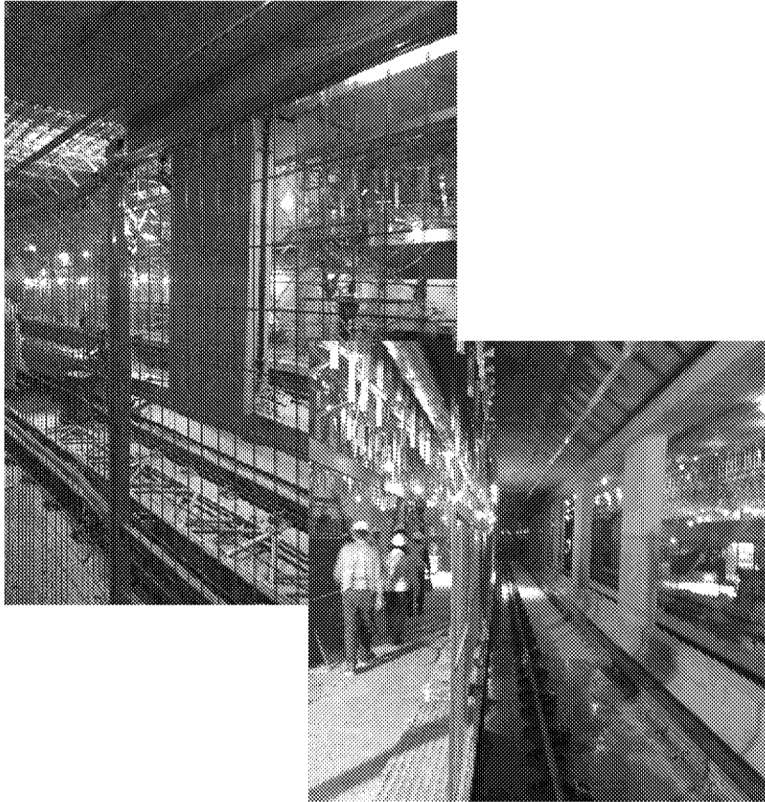
Summary Findings

- OLRTC's new leadership is making progress but failing to meet their ambitious schedule.
- OLRTC consistently underestimating challenges associated with System Assurance, Operational Readiness, Tunnel Ventilation, Station Occupancy Permits, Light Rail Vehicle issues, state of the Overhead Catenary System.
- Overarching major issues require resolution now.

Next Steps

- RTG executive committee needs to provide a revised schedule immediately. Without a revised schedule RSA target dates cannot be assessed.
- Timetable Simulation safety plan needs to be provided.
- Immediate response on Overhead Catenary required.
- Resolution of plywood in escalator needed.

Rideau Station



Aug. 15, 2018



Oct. 22, 2018

Rideau Station



Aug. 15, 2018



Oct. 22, 2018

Parliament Station

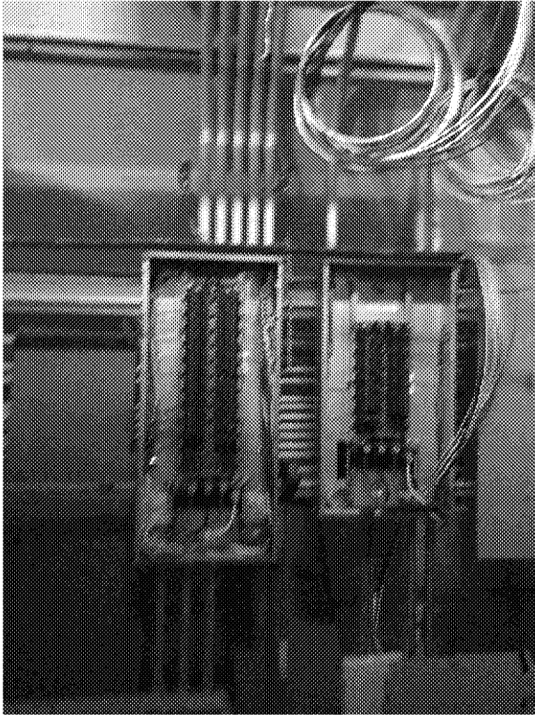


Aug. 15, 2018



Oct. 22, 2018

Parliament Station

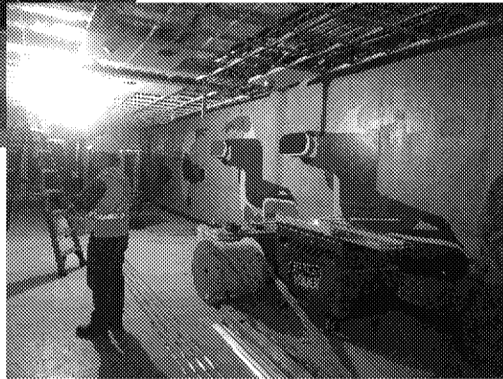


Aug. 15, 2018



Oct. 22, 2018

Lyon Station



Aug. 15, 2018

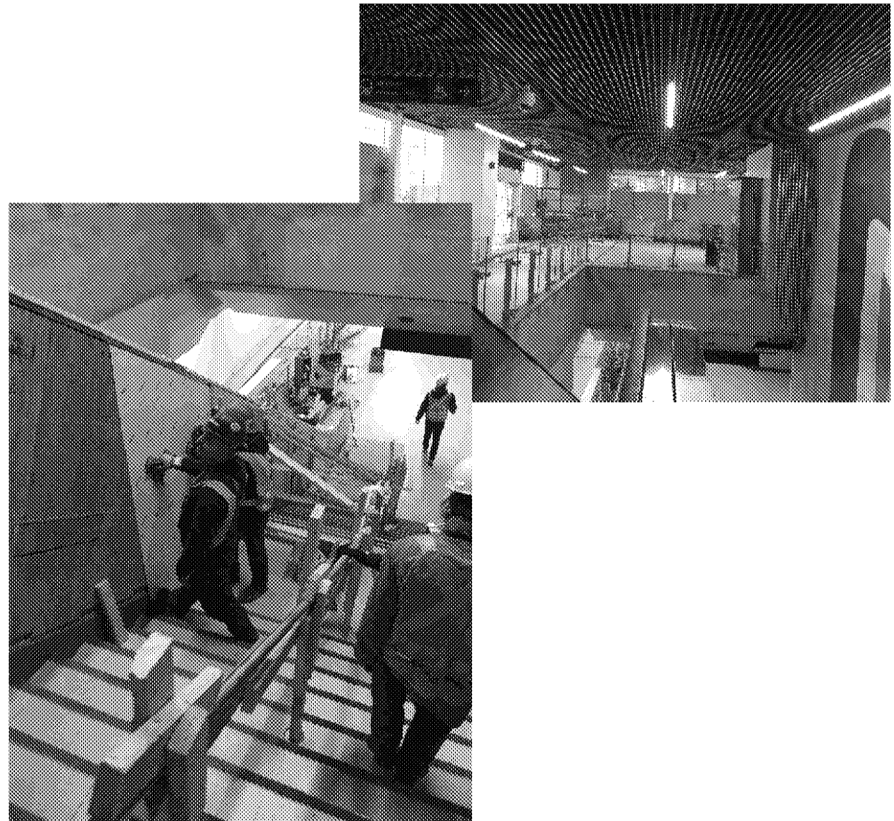


Oct. 22, 2018

Lyon Station



Aug. 15, 2018



Oct. 22, 2018

Pimisi Station



Aug. 15, 2018



Oct. 22, 2018

Bayview Station



Aug. 15, 2018



Oct. 22, 2018

Bayview Station



Aug. 15, 2018



Oct. 22, 2018

Bayview Station

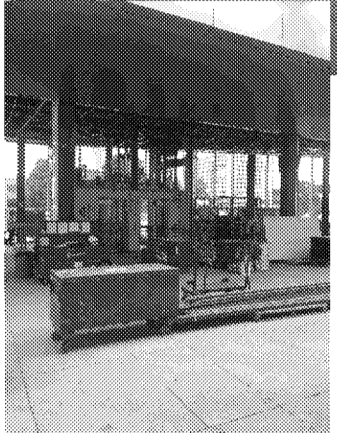


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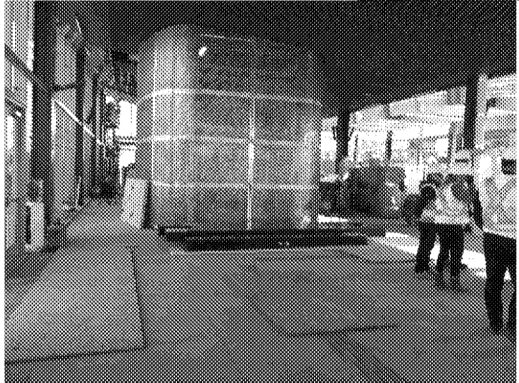


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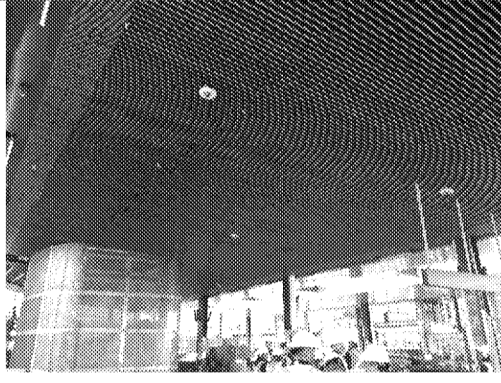
Tunney's Pasture Station



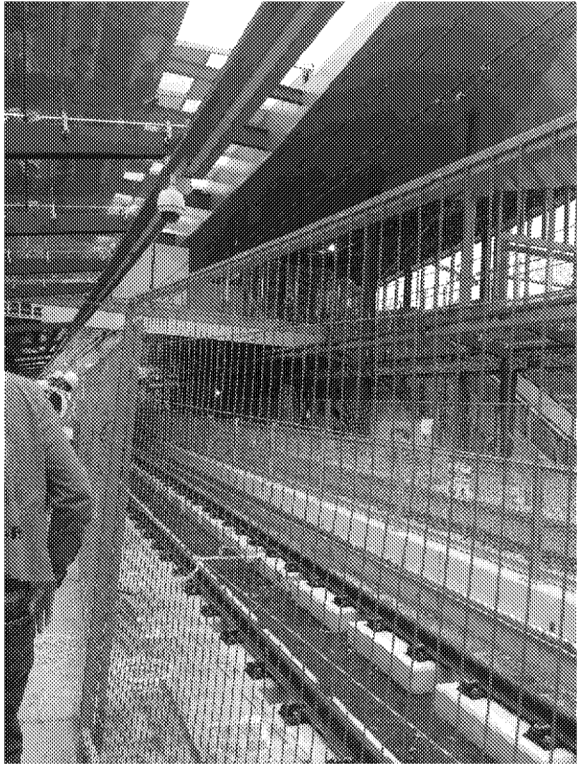
Aug. 15, 2018



Oct. 22, 2018



Tunney's Pasture Station



Aug. 15, 2018



Oct. 22, 2018